CODAN

HF RADIO COMMUNICATIONS

NGT Transceiver

Reference Manual

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1 About this manual

This manual provides an overview of the NGT *AR*, *SR*, *AR Voice*, and *VR* Transceivers, how to install them in mobile and fixed stations, how to operate the transceiver, and how to perform advanced setup procedures. This manual is for system administrators who set up and maintain HF communication networks.

This manual contains:

Section 1 About this manual—explains the terms and abbreviations used in this manual

Section 2 HF radio transmission—provides an overview of HF communication

Section 3 The NGT Transceiver—explains the transceiver's components, and a brief overview of the standard features

Section 4 Installation—explains how to install the transceiver and antenna in a mobile or fixed situation, and test the installation

Section 5 Operating the transceiver—explains how to use the transceiver, set your station self address, and set the time and date

Section 6 Using lists—explains the contents of the Main Menu, how to use lists, and how to manage them using the List Manager

Section 7 The Channel List—explains the settings in the Channel List and how to program a channel

Section 8 The Network List—explains the settings in the Network List and how to program a network

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Section 16 AES-256 digital voice encryptor option—explains how to set up and use the AES-256 digital voice encryptor option

Section 17 AES-256 digital data encryptor option—describes the RM50e HF Data Modem, and how to set up and use the AES-256 digital data encryptor option

Section 18 Using the transceiver in free tune and Amateur Mode—explains how to use the transceiver in free tune, how to create channels during free tune, and provides the frequency bands for Amateur Mode

Section 19 Hot keys—explains how to set up, manage and use hot keys

Section 20 Connectors—explains the connectors in the transceiver system

Section 21 System messages—explains the system messages that may be displayed on the handset screen

Section 22 Specifications—lists the specifications of the transceiver system

Appendix A Hot key examples—provides examples of hot keys and how to create them

Appendix B Get Status calls—explains the information you can retrieve from another transceiver by making a Get Status call to that transceiver

Appendix C Forgotten passwords—explains what to do if you have forgotten the password for the transceiver

Appendix D Operating the transceiver from a computer—explains how to operate the transceiver from a computer using CICS

Appendix E Compatibility between CICS V2 and V3.00 (or later)—describes the compatibility issues between CICS V2 and V3.00

Appendix F Controlling user access—describes the Message 10 entries and how to use them

Appendix G Compliance—compliance information and safety notices

There is an index at the end of this manual.

Standards and icons

The following standards and icons are used in this manual:

This typeface...	Means...
Italic	a cross-reference or text requiring emphasis
Bold	a key on a computer keyboard
Bold	a menu option in the transceiver
`Courier`	a command that you can enter via a computer, for example, `help`, or a segment of text that is taken directly from a computer screen

This syntax...	Means...
<variable>	the text within the brackets may vary depending on the context
option a|option b	there are a number of options from which you may choose
[optional]	the information or command in the brackets is optional

This icon...	Means...
❑	a step within a task
NOTE	the text beside 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

Definitions

Acronyms and abbreviations

This term...	Means...
4WD	four wheel drive
addr	address
AES	advanced encryption standard
AGC	automatic gain control
ALC	automatic level control
ALE	automatic link establishment
AM	amplitude modulation
ASCII	American standard code for information interchange
BER	bit error rate
CALM	Codan automated link management
CB	citizen band
CIB	Codan interconnect bus
CICS	computer interface command set
CR	carriage return
CTS	clear to send
DC	direct current
DSP	digital signal processor
DTE	data terminal equipment
DTR	data terminal ready
EMC	electromagnetic compatibility
ESN	electronic serial number
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
GP	general purpose
GPIO	general purpose input/output
GPS	global positioning system
HF	high frequency

This term...	Means...
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ID	identification
IF	intermediate frequency
ISO	internal sales order
LBT	listen before transmit
LCD	liquid crystal display
LED	light-emitting diode
LF	line feed
LSB	lower sideband
NC	normally closed
NO	normally open
NRI	NGT remote interface
NSP	NGT system programmer
OTA	over-the-air
p–p	peak to peak
PA	power amplifier
PEP	peak envelope power
PTT	press-to-talk
PVC	polyvinyl chloride
R&TTE	radio and telecommunications terminal equipment
rcvd	received
RF	radio frequency
RFDS	Royal Flying Doctor Service
RTS	request to send
Rx	receive
SB	sideband
SINAD	(signal + noise + distortion)-to-(noise + distortion) ratio
SWR	standing wave ratio
tcvr	transceiver
TDM	time division multiplex
TPE	transmit program enable

This term...	Means...
Tx	transmit
TxD	transmit disabled
TxE	transmit enabled
TxP	transmit prohibited
USB	upper sideband
UTC	universal time coordinated
UV	ultraviolet
V	firmware/software version

Glossary

This term...	Means...
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.
ALL call	An ALE address syntax used to broadcast to any station that is tuned to the same frequency in an ALE/CALM network, or scanning the network. The ALL call uses a special address syntax @?@ that ALE stations recognise. The global ALL address syntax may be used in Emergency, Message, Phone, Selective, and Send Position calls if the FED-STD-1045 ALE/CALM option is installed.
automatic gain control (AGC)	A process that automatically adjusts the gain with respect to the input signal to provide a constant output level.
automatic level control (ALC)	A process that automatically provides a constant output level as the input level varies.
automatic tuning antenna	An antenna designed for use with multi-channel 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 network.

This term...	Means...
Codan interconnect bus (CIB)	The CIB is a proprietary Codan specification that uses a digital bus protocol and TDM audio bus to connect and communicate between selected Codan products.
control cable	A cable connecting two items of equipment that allows control information to be passed between the equipment.
counterpoise	A radial array or a grid network of metallic wires arranged horizontally around the base of an antenna to provide an effective earth plane.
decoupling	The removal of unwanted noise and signal from electronic circuitry by transferring it to ground.
Emergency call	A call that enables you to trigger an emergency alert tone at a specific station then speak to an operator there.
fixed base station	A station 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. You can make a Get Position call if Option GPS Enable is installed.
Get Status call	A call that gets diagnostic 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 to the 2011 RF Unit via the handset and speaker connector. In this case, all instructions are processed by the RF unit.
listen before transmit (LBT)	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.

This term...	Means...
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 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 temporarily, 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.
revertive	A signal sent by a station in response to a call.
RF filtering	A device fitted to prevent noise from being generated and to minimise the noise radiated by the wiring connected to the noise source. These devices include filters, suppressing capacitors, and earth straps.
RFDS Emgcy call	A call that enables you to contact the RFDS (NGT *AR* and *AR Voice* Transceivers only).
RF unit	The unit 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.
scan rate	See *call detect time*.
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. You can make a Send Position call if Option GPS Enable is installed, and your transceiver has a GPS position registered.
shielding	A metallic barrier that is positioned between a noise source and the transceiver to minimise noise interference.
sideband	A band of frequencies that is above or below a modulated carrier frequency.

This term...	Means...
standing wave ratio (SWR)	The ratio of forward and reflected powers between a transmitter and its antenna load, which can be measured by an SWR meter.
station	A point of communication consisting of a transceiver, a power supply, an antenna, control and accessory devices, 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
Area	American wire gauge	AWG
Capacitance	farad	F
Current	amp	A
Frequency	hertz	Hz
Impedance	ohm	Ω
Length	metre (inch/feet/yard/mile)	m (in/ft/yd/mi)
Power	watt	W
Power ratio	decibel	dB
Temperature	degrees Celsius (Fahrenheit)	°C (°F)
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
µ	micro	0.000001
n	nano	0.000000001

About this issue

This is the ninth issue of the NGT Transceiver Reference Manual.

This issue is applicable from firmware V5.20. It describes:

- using the AES-256 digital data encryptor option in conjunction with the RM50e HF Data Modem
- changes to the AES-256 digital voice encryptor
- changes to the CES-128 voice encryptor

Associated documents

This manual is one of a series of publications related to the NGT *AR*, *SR*, *AR Voice*, and *VR* Transceivers. Associated documents are:

- NGT Transceiver Getting Started Guide (Codan part number 15-04127-EN)
- NGT System Programmer Help (Codan part number 15-04162-EN)
- Antenna Matrix (Codan part number 12-50133)
- NGT Transceiver System Technical Service Manual (Codan part number 15-02063-EN)
- NGT Transceiver System Repair Guide (Codan part number 15-04143-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)
- Expert Letter of Opinion for the NGT *AR* and *SR* Transceiver (Codan part number 19-40243)
- Expert Letter of Opinion for the NGT *AR Voice* and *VR* Transceiver (Codan part number 19-40245)
- Declaration of Conformity for the 3020 Transceiver Supply (Codan part number 19-40127)

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2 HF radio transmission

This section contains the following topics:

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

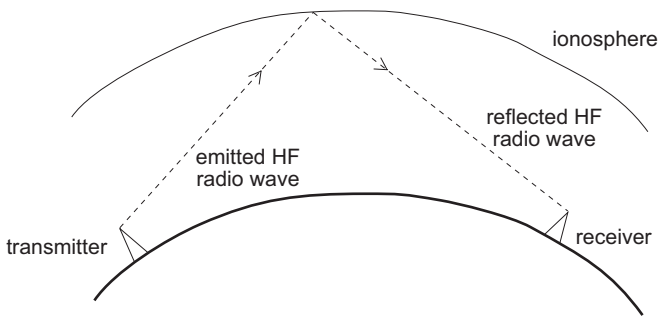
The direct wave travels in a direct line-of-sight from the transmitter to the receiver.

Sky wave

The sky wave is the most important form of HF propagation. The HF 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 1: The reflective properties of the ionosphere



Frequency, distance and time of day

The extent to which an HF 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 radio 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 radio 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, for example, ‘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 must specify the channel *and* the mode you want to use.

Table 1: 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 radio 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 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 scanning is switched on when you are not using the transceiver to communicate. This ensures that you can receive calls from stations in your HF radio communication network.

The FED-STD-1045 ALE/CALM option

If you want to use the ALE/CALM call system to automate the selection of channels, you must install the FED-STD-1045 ALE/CALM option in the transceiver. CALM stands for Codan Automated Link Management.

The FED-STD-1045 ALE/CALM option enables the transceiver to test the signal propagation qualities of your channels using soundings, and build a profile of each channel's suitability for use at different times of the day and night. The BER and SINAD information collected during sounding activity is stored in the transceiver using a 24-hour period LQA database. With this information, the transceiver is able to select the most suitable channel/mode for you when you make a call.

You are able to make global ALE ALL calls with this option.

CALM is interoperable with FED-STD-1045 ALE.

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 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.

NOTE If you have the Cfg LBT Mode set to **Enabled** or **Override allowed**, the transceiver checks that a channel is not being used; you do not need to check any channels first.

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 2 on page 18). 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 2: 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

3 The NGT Transceiver

The NGT Transceiver consists of:

- a 2020 Handset
- a 2030 Junction Box (NGT *AR* and *SR* Transceivers only)
- a 2010 RF Unit (NGT *AR* and *SR* Transceivers only)
- a 2011 RF Unit (NGT *AR Voice* and *VR* Transceivers only)

The handset is a hand-held device that has a microphone, PTT button, display and keypad. The microphone and PTT button are used for voice communication. The keypad enables you to control and configure the transceiver system. The handset is connected to the junction box, or in the case of the NGT *AR Voice* and *VR* Transceivers, to the handset and speaker connector from the RF unit, or to the rear of the Code 766 Desk Console.

The junction box is a unit to which the handset, RF unit, speaker and related units are connected. It interprets the instructions you enter through the handset then sends them to the appropriate units.

NOTE In the case of NGT *AR Voice* and *VR* Transceivers, the functionality of the junction box is incorporated into the 2011 RF Unit.

The RF unit modulates audio signals onto radio frequencies that can be transmitted on air, and demodulates the radio frequencies it receives into audio signals.

Figure 2: The NGT *AR* and *SR* Transceivers

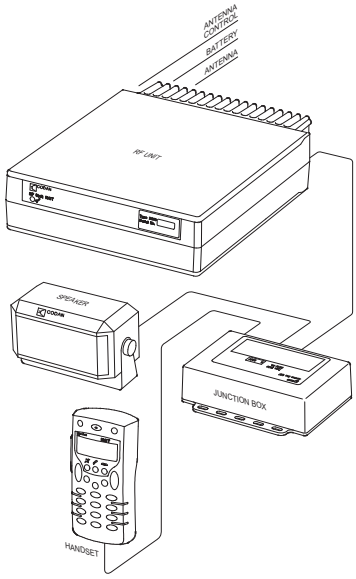
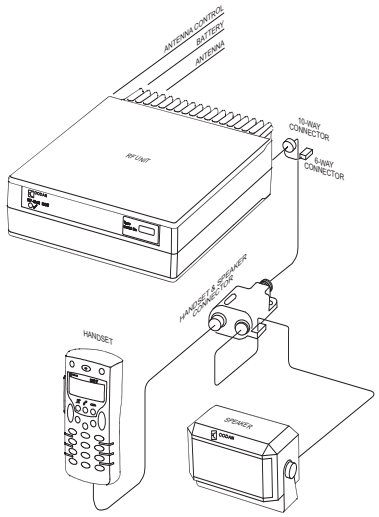


Figure 3: The NGT *AR Voice* and *VR* Transceivers



A range of options and accessories is available for the NGT Transceiver. For more information contact your Codan representative or refer to the product catalogue that is applicable to your transceiver.

The 2020 Handset

Figure 4: The 2020 Handset

The handset comprises:

- an LCD
- navigation keys (▲, ▼, ✓, ✕, 🔍)
- volume controls (🔊, 🔊)
- **MUTE**, **CALL** and **SCAN** hot keys
- alphanumeric keys (**0** to **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 Tick and Cross 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 kind of 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.

Table 3: Standard hot keys

Hot key	Function
MUTE	Pressing **MUTE** toggles mute on or off. For more information see page 76, *Muting the transceiver*.
CALL	Pressing **CALL** starts a call. For more information see page 173, *Making a call*.
SCAN	Pressing **SCAN** switches off scanning, or if you were in a call, ends the call and switches on scanning. For more information see page 77, *Scanning channels*.
TUNE	Pressing **TUNE** displays the **PTT to tune** screen so that you can manually tune the antenna. For more information see page 92, *Manual tuning*.
CLAR	Pressing **CLAR** enables you to adjust the receive frequency to compensate for any frequency offset between your transceiver and the remote transceiver. For more information see page 93, *Using the clarifier*.
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. For more information see page 76, *Muting the transceiver*. NOTE If an AES-256 digital voice encryptor is fitted to the transceiver, Digital Voice Only mute (**D**) may also be selected.
SEC	Pressing or *holding* **SEC** enters secure mode, if the hardware option is fitted and specific firmware is programmed into the transceiver and enabled. For more information see page 235, *CES-128 voice encryptor option*, page 253, *AES-256 digital voice encryptor option*, or page 267, *AES-256 digital data encryptor option*.
9	Pressing **9** displays your current GPS position, if your transceiver has valid GPS information and Option GPS Enable is installed. For more information see page 223, *GPS Screen entry*.
EASITALK	Pressing **EASITALK** toggles the DSP noise reduction algorithm on or off. For more information see page 94, *Reducing background noise with Easitalk™*.
VIEW	Pressing **VIEW** toggles between the channel screen and the Address List. If you are in any other list, pressing **VIEW** displays the channel screen.
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. For more information see page 181, *The Calls Out Log* and page 186, *The Calls In Log*.
⚠ (Emergency)	*Holding* ⚠ starts an automatic Emergency call transmission using call information contained in the Emergency entries in the Address List (see page 157, *Making several different types of calls*).

Table 3: Standard hot keys (cont.)

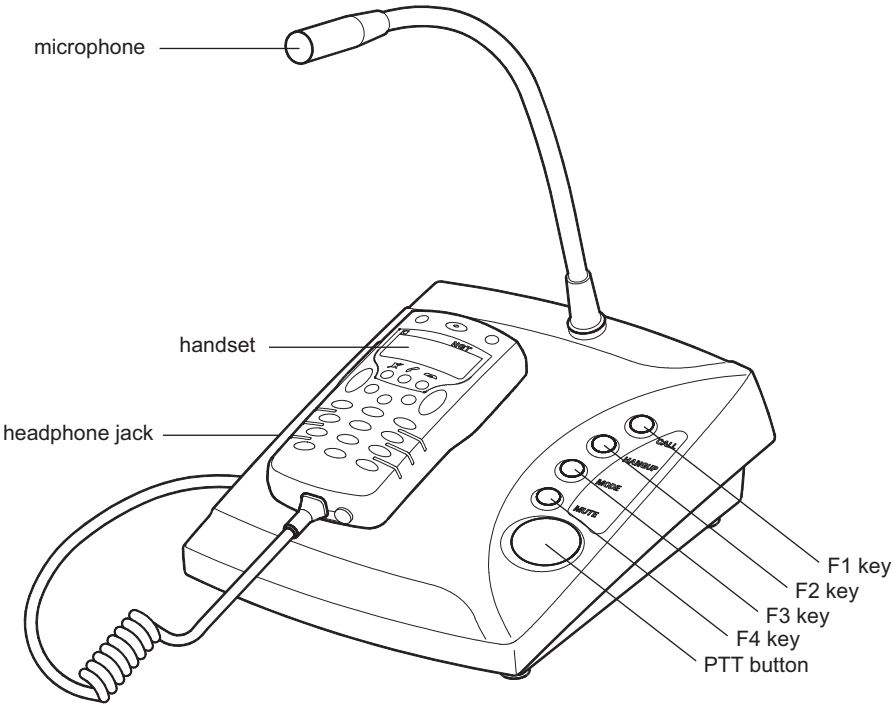
Hot key	Function
ⓘ + **SEC**	Pressing ⓘ + **SEC** enables you to erase all of the CES secure keys and AES secure keys from the transceiver, if the encryptor hardware option is fitted and specific firmware is programmed into the transceiver and enabled. For more information see page 245, *Erasing all of the CES secure keys*, page 261, *Erasing all of the AES secure keys* (voice), and page 275, *Erasing all of the AES secure keys* (data).
ⓘ + **9**	Pressing ⓘ + **9** enables you to change the default setting for the screen contrast. For more information see page 89, *Changing the screen contrast*.
ⓘ + **0**	Pressing ⓘ + **0** enables you to change the default setting for the screen and keypad backlighting. For more information see page 89, *Changing the screen brightness*.

The NGT Desk Console with handset

The NGT Desk Console is an optional accessory for fixed stations (Codan part number 15-10471 for NGT *AR* and *SR* Transceivers only, Codan part number 15-00766 for NGT *AR Voice* and *VR* Transceivers only). It features a microphone, a cradle for the handset, a PTT button, four hot keys, a built-in speaker, and a headphone socket.

The hot keys are labelled F1 to F4. The console is shipped with a standard macro assigned to each one (see Table 4). If you want to customise the hot keys you can create your own macros and assign them to the keys (for more information see page 289, *Hot keys*).

Figure 5: The NGT Desk Console with handset



NOTE With a Code 766 Desk Console, the handset connects to the rear of the console.

Table 4: Standard hot keys on the desk console

Key	Hot key task	Handset equivalent
F1	New Call: begins a call	**CALL** key
F2	Scan Toggle: ends a call if a call is in progress, or toggles scanning on or off	**SCAN** key
F3	Next Mode: switches to the next possible mode for the currently selected channel	**MODE** key
F4	Mute: switches mute on or off	**MUTE** key

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4 Installation

This section contains the following topics:

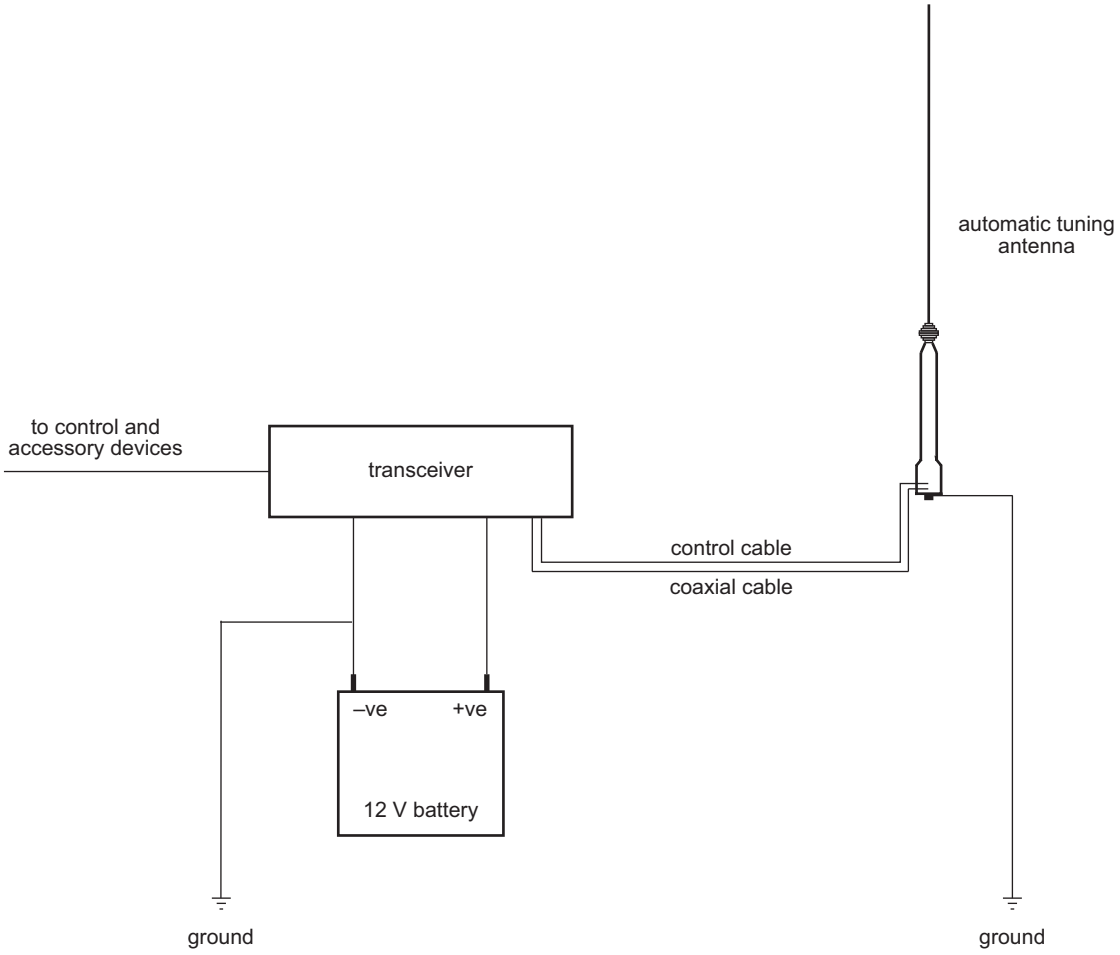
Types of stations

Mobile station

A mobile station typically consists of a transceiver, a 12 V DC power supply (battery), an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables. The antenna is connected to the transceiver by coaxial cable. An automatic tuning antenna also requires a control cable connected to the transceiver (see Figure 6).

When space is limited in a mobile situation, the transceiver may be located in the boot or behind/under a seat.

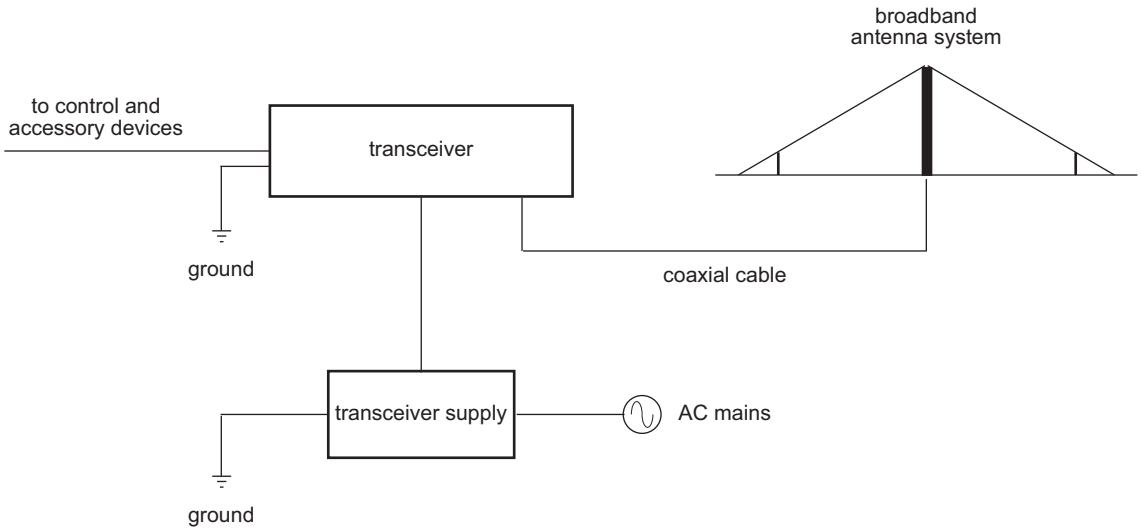
Figure 6: A typical mobile station



Fixed station

A fixed station typically consists of a transceiver, an AC transceiver supply connected directly to the mains, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables. The transceiver is connected to the DC output lead of the transceiver supply. The antenna is connected to the transceiver by coaxial cable.

Figure 7: A typical fixed station



Antenna tuners in a fixed station

The purpose of an antenna tuner is to adjust the wavelength of the antenna according to the selected frequency. This ensures an optimum load to the transceiver so that it achieves maximum efficiency. A tuner is usually installed when a single antenna is operating on a range of frequencies, for example, the long wire and vertical whip antennas, and when there is limited space available to install additional antennas.

The radiating portion of the antenna connects directly to the tuner through a high-voltage insulator. The antenna length must be compatible with the tuner installed, and be suitable for the working frequency range.

CAUTION It is essential that the correct antenna type, site location, and grounding technique be chosen so that the system operates effectively (see page 33, *Types of fixed antennas*).

Automatic tuners

These tuners automatically tune to the selected frequency, and can recall frequency settings for future use. Automatic tuners operate with almost any end-fed antenna with a length of 6 m (7 yd) or more, provided an effective ground system is used.

Antenna supports in a fixed station

Supports are used to position the antenna to face the desired direction of communication. The supports suspend the antenna in the air and provide it with adequate rigidity. The supports must be able to withstand extreme environmental conditions.

CAUTION The antenna may not tune or remain tuned if it sways or sags.

Existing supports can be used, such as trees or windmill towers, if they are suitably positioned according to the desired direction of communication. Support systems also include freestanding or guyed masts.

NOTE If the supports are unstable, additional support, such as guy anchors, should be provided.

The antenna is tied to various supports by wire or nylon rope guys to ensure the antenna is insulated from its supports. If wire guys are used, two ceramic insulators *must* be provided at each end of the antenna. If metallic supports are used, position the insulators so that the antenna is at least 2 m (2 yd) from the mast. Ceramic insulators ensure the signal is not connected directly to the ground via the metallic supports.

Types of mobile antennas

Automatic tuning whip antenna

Description

The automatic tuning whip antenna is a multi-frequency antenna. A microcontrolled stepper motor in the base of the automatic antenna adjusts an inductor until the antenna is tuned to the selected frequency.

Advantages and limitations

Table 5: Advantages and limitations of the automatic tuning whip antenna

Advantages	Limitations
Wide range of operating frequencies. Easier to operate than a tapped whip antenna.	Large physical size that requires a substantial mounting bracket. A control cable is required.

For information on installing the antenna see the documentation provided with the product.

Tapped whip antenna

Description

The tapped whip antenna is manufactured with taps to match the frequencies fitted in the transceiver. The shorting strap should be wound tightly around the antenna in evenly spaced turns. Frequency selection is achieved by inserting the end of the shorting strap into the corresponding tap in the antenna. Up to 10 frequencies can be installed into the tapped whip during manufacture.

Advantages and limitations

Table 6: Advantages and limitations of the tapped whip antenna

Advantages	Limitations
Lightweight and simple to install. Cost-effective when limited frequencies are required.	The frequency range of the antenna is limited to those frequencies installed at the time of manufacture. The antenna lead must be manually adjusted when frequencies are changed. Poor communication will occur if the antenna lead is not plugged into the correct frequency tap.

Types of fixed antennas

Vertical whip antenna

Description

The vertical whip antenna is omnidirectional in performance, therefore it provides radiation efficiency equally in all directions depending on its mounting position. When receiving, this omnidirectional performance may mean more unwanted signals are picked up, which contributes to high levels of background noise or interference.

Where used

The vertical whip antenna is designed for installation on buildings or open ground. The antenna is suitable for most transceivers operating with an associated antenna tuner.

Installation

The vertical whip antenna is designed for permanent or temporary installation. The antenna is easy to install.

For efficient operation of the vertical whip antenna, a good earth system is necessary. When the antenna is erected on open ground, especially in dry ground conditions, an earth mat consisting of at least four wire radials extending as far as possible from the base is desirable (see page 41, *Grounding the antenna*).

For roof-mounted installations, metal roofing or a radial earth plane is recommended (see page 41, *Grounding the antenna*).

Advantages and limitations

Table 7: Advantages and limitations of the vertical whip antenna

Advantages	Limitations
Suitable for long-distance communication. Omnidirectional antenna, therefore it can pick up signals equally in all directions. Suitable where space is limited.	Unsuitable for communication distances under 100 km (60 mi). This antenna is more susceptible to noise pickup such as that produced by welders, electric motors, power lines etc. If installed in a noisy environment, the received signal is degraded. Due to its relatively small size, it may require an antenna tuner for optimum performance.

End-fed broadband antenna

Description

The end-fed broadband antenna is a multi-frequency antenna.

Where used

The end-fed broadband antenna is designed for rural outposts, not built-up areas.

Installation

The end-fed broadband antenna is easily and permanently installed. It requires masts and sufficient space for installation. No installation or operational adjustments are required.

Advantages and limitations

Table 8: Advantages and limitations of the end-fed broadband antenna

Advantages	**Limitations**
Wide range of operating frequencies. Suitable for point-to-point and base-to-mobile applications.	Must be positioned at right angles to the desired direction of communication. Due to its large size, it requires a large area for installation. Due to its broadband properties, it has a low immunity to noise.

Broadband dipole antenna

Description

The broadband dipole antenna is designed for large-scale professional fixed station systems. The antenna is suitable for high or low-power, multi-frequency operation.

Where used

The broadband dipole antenna is designed for installation on buildings or open ground.

Installation

The broadband dipole antenna is generally erected on masts and requires sufficient space for installation.

Advantages and limitations

Table 9: Advantages and limitations of the broadband dipole antenna

Advantages	Limitations
Wide range of operating frequencies. Generally, more efficient than the end-fed broadband antenna. Suitable for point-to-point and base-to-mobile applications.	Must be positioned at right angles to the desired direction of communication. Due to its large size, it requires a large area for installation.

Long wire antenna

Description

The long wire antenna is suitable for multi-frequency operation using an antenna tuner in most transceiver systems. It is approximately 20 m (22 yd) in length.

Where used

The long wire antenna is used on buildings or open ground. It is ideal for field crews who require an antenna that can be quickly and easily installed at temporary sites. It may also be used in permanent installations where space is limited.

Installation

The long wire antenna is designed for permanent or temporary fixed station installations. It requires at least one mast and sufficient space for installation.

Advantages and limitations

Table 10: Advantages and limitations of the long wire antenna

Advantages	Limitations
Wide range of operating frequencies. Large in size, therefore, is more efficient.	Must be positioned at right angles to the desired direction of communication. Due to its large size, it requires a large area for installation. The length of the wire may be too long for some operating frequencies and tuners. Under these conditions, the length of the wire must be reduced according to the recommendations provided in the handbook for the tuner. If you require further assistance, contact your Codan representative.

Quick-to-erect dipole antenna

Description

The quick-to-erect dipole antenna is lightweight and portable. The antenna is designed for sky-wave communications over medium to long distances.

Each half of the antenna is marked in 0.5 MHz spacings wound onto the winding spool/ insulator. These elements unwind to the marker that indicates the frequency in use and clips into the slot provided on the insulator assembly. The remaining wire is short circuited on the reels.

Where used

The quick-to-erect dipole antenna is primarily used with manpack or portable HF systems.

Installation

The quick-to-erect dipole antenna is designed for temporary installations. The antenna is usually suspended between two trees or lightweight masts by terylene halyard tails with lead-weighted ends, which are supplied with the kit.

Advantages and limitations

Table 11: Advantages and limitations of the quick-to-erect dipole antenna

Advantages	Limitations
Easy and quick to install. Lightweight and portable.	Must be positioned at right angles to the desired direction of communication. Single operating frequency.

Installing the transceiver

NOTE All antennas are supplied completely assembled and ready for installation.

On receiving your NGT Transceiver, check the contents against the packing list. Make sure that all equipment itemised on the packing list is present before you start installing the system.

Open each packing case and examine the contents for signs of damage. If you notice any damage, contact Codan immediately. Failure to contact Codan before returning the unit may result in any warranty being void.

We recommend that the equipment is installed by qualified and experienced personnel, to the relevant standards and approvals.

WARNING While the following information is intended to assist with installation in a vehicle, it is the purchaser's responsibility to ensure that the mounting cradle is installed with due regard to vehicle-occupant safety, particularly in the event of a vehicle accident. Codan accepts no responsibility or liability in the event of injury to vehicle occupants or any other damage due to insecure or otherwise unsafe or inappropriate installation of the mounting cradle.

NOTE Unused connectors on the junction box (if fitted) and RF unit must be covered with the protective caps supplied to prevent electrostatic discharge passing through your NGT equipment.

Positioning the transceiver

When choosing a location for the components of the transceiver system, you should be aware of the environmental ratings of each item of equipment as set out on page 335, *Specifications*. They must be mounted in a suitable position that:

- provides physical protection to the transceiver and its cables, for example, avoid floor mounting where the transceiver and cables may be subjected to accidental contact
- allows easy access to the controls
- allows a free flow of air through the rear cooling fins to dissipate heat generated by the transceiver
- does not expose the unit to direct sunlight
- does not expose the unit to water ingress
- will not cause injury to motor-vehicle occupants if an accident occurs, for example, *do not* mount the transceiver overhead
- minimises vibration and shock
- ensures correct connection and operation
- allows easy maintenance

WARNING The units of the mobile station should only be mounted on structural components of the vehicle body and not to dress panels. The areas used for mounting may require reinforcement.

Mounting positions that are recommended in a mobile installation include:

- the transmission hump
- in place of the glove box
- behind the seat
- under the dashboard (if safe)

WARNING Do not mount the transceiver on a cargo barrier as this may void the vehicle manufacturer's warranty.

The mounting position must ensure sufficient cable length is provided to allow the removal of the equipment from the cradle with the various cables connected.

Positioning the control devices

The control devices and speaker must be in a position that:

- is near the operating position
- is clear of other controls
- is not dangerous
- considers cable routing

Positioning the antenna

WARNING The antenna should be installed by a suitably qualified technician, to the relevant standards and approvals.

NOTE Correct installation of the antenna provides efficient operation over the frequency range of the transceiver. It ensures the antenna provides maximum output power during transmission and clear reception of weak signals.

Mobile antenna

For information on positioning a mobile antenna, see the documentation provided with the antenna.

Fixed antenna

Position the antenna:

- next to the antenna feed point
- free from obstructions such as buildings, trees and vegetation
- at right angles to the desired direction of communication
- away from any other antenna system

NOTE The transceiver and antenna do not have to be positioned close to each other if connected by coaxial cable. The transceiver and the feed point of the antenna can be up to 20 m (22 yd) apart before heavier low-loss coaxial cable, such as RG213, is necessary.

Horizontal wire antennas, including the dipole, broadband and long wire antennas, have maximum radiation along their length. Radiation is lowest at the ends of the antenna. Therefore, position these antennas at right angles to the desired direction of communication.

Vertical antennas, such as the vertical whip antenna, have an omnidirectional radiation pattern. Therefore, the direction that vertical antennas face is not important as the radiation pattern is generally equal in all directions.

Positioning the tuner (fixed station only)

Due to high voltages on the antenna, position the tuner so that the antenna-to-tuner connection is isolated from accidental contact with conducting surfaces.

WARNING It is essential that the antenna be positioned at least 50 mm (2 in) from a conducting surface.

CAUTION Avoid kinks in the lead-in wire of the antenna.

Grounding the transceiver

A good ground (RF earth) is essential for efficient operation of the fixed station. The transceiver chassis should be connected to the ground via the earth screw on the rear panel of the transceiver. Use a copper braid of at least 12 mm (½ in) width to connect the transceiver to the earthing point.

NOTE Keep the earth braid as short as possible.

All individual units in a fixed station should be earthed to prevent RF interference corrupting the data and audio circuits. Equipment that requires earthing has an earth screw fitted. To achieve good earthing, connect separate earth braids to the earth screws on each piece of equipment and connect them back to the same earthing point.

NOTE Ideally, all earth braids should connect directly back to a single point to prevent earth loops.

An adequate earthing system is necessary for:

- electrical safety
- static drain
- noise reduction

Electrical safety (AC mains supply only)

To provide electrical safety to the fixed station see page 45, *Wiring techniques (AC mains supply only)*.

Static drain

In some cases, wind-driven particles, such as dry sand, may charge the transceiver and ancillaries to very high voltages above earth. Usually the low-impedance protective earth connection prevents high voltages from building up. In the event that the protective earth is disconnected or does not exist, as for a solar-powered fixed installation, these high voltages may occur.

If the voltage of the electrostatic charge becomes sufficiently high, a flashover could occur between the charged parts and earth. The energy released at flashover depends upon the voltage of the charged parts to earth. This energy generates a steep wave front, which may cause failure in the front end of the transceiver or result in damage elsewhere.

WARNING A flashover may result in the failure of the basic insulation of a mains-energised transceiver supply, causing an extreme safety hazard. To avoid a flashover, ensure that the transceiver is correctly earthed.

Noise reduction

In some cases, noise can be reduced by direct earthing of the case of the transceiver to ground. If an improvement is noticed, the existing functional RF earth may be inadequate and needs to be improved.

Where the antenna and transceiver must be installed in close proximity, direct earthing of the transceiver may be necessary to eliminate RF feedback.

Grounding the antenna

Grounding a mobile antenna

For information on grounding a mobile antenna, see the documentation provided with the antenna.

Grounding a fixed antenna

Requirements of the earth plane (or ground) depends upon the type of antenna selected (see page 33, *Types of fixed antennas*) and the location of the antenna, that is, on open ground or on a roof-top.

When installing an antenna on open ground, ground conductivity is often insufficient to provide adequate earthing, especially on well-drained sandy, rocky or loamy soils. An earth plane should be used to provide adequate earthing of the antenna. For a vertical antenna, an efficient earth plane is provided by a counterpoise consisting of at least four radials extending from the base of the antenna. The radials should be buried approximately 10 cm (4 in) below the surface. An earth mat for an antenna mounted on open ground can be supplied by Codan (Codan part number 15-00158).

When installing an antenna on roof-tops where there is no existing earth plane, an earth plane should be installed. The earth plane should be a conducting surface extending several wavelengths in all directions around the antenna. This can be provided by placing a screen of wire mesh or similar material over the roof of the building. Usually, a counterpoise system is used to provide an efficient earth plane. For example, the counterpoise system for a vertical antenna should consist of at least 8 to 10 radials bonded together at the base of the antenna. A radial earth plane for an antenna mounted on the roof-top of a building can be supplied by Codan (Codan part number 15-00159).

If an earth plane, such as a counterpoise, cannot be provided for the antenna, an earth wire connected to a suitable earth stake can be used, but with reduced efficiency.

NOTE As the earth wire forms part of the antenna system, any resistance in the earthing network reduces the efficiency of the antenna.

CAUTION The ground connections are subject to corrosion and oxidation. All joints must be clean, and the hardware adequately tightened. The joints can be protected by the application of silicone grease. In severe conditions, joints should be covered with self-amalgamating tape followed by a layer of good quality UV-stable PVC tape.

CAUTION RF earthing should not be relied upon to provide protective earthing. It can fail upon the removal of one of the interconnecting links. A separate wire should always be connected to the item you want to protect.

Grounding the tuner (fixed station only)

The ground system is a key part of the overall antenna system. An inefficient ground system is a primary cause of poor performance and difficulty in adjusting the tuner.

The ground system should be connected to the earth stud on the tuner by a heavy copper wire or braid. The connection from the tuner to the ground must be a small percentage of the total length of the antenna, that is, the earth braid must be kept as short as possible.

CAUTION Do not use a ground strap that exceeds 1.5 m (5 ft).

In areas of good ground conductivity, an effective ground can be established with an earth spike. The spike should be approximately 3 m (10 ft) in length and should be installed as close as possible to the tuner. It may be necessary to use several earth spikes bonded together to improve the ground contact.

Connecting the antenna to the transceiver

A vehicle antenna is a tuned antenna, and therefore, must be connected to the transceiver using 50 Ω coaxial cable. Type RG58 cable is normally used. The cable should be as far as possible from other vehicle wiring, especially high-voltage ignition wiring.

In addition to an RF coaxial cable connection, an automatic tuning whip antenna also requires a control cable to be connected to the transceiver.

The cables are supplied in standard lengths with the appropriate connectors fitted at either end.

Connecting the tuner to the antenna (fixed station only)

When routing the antenna wire to the tuner:

- keep the length of the antenna wire inside the building to a minimum and away from metal objects
- a minimum hole diameter of 100 mm (4 in) is necessary for wiring that passes through a wall or roof, and the wiring should pass through the centre of this hole using a grommet or other suitable insulator
- wiring must not come into contact with guttering, eaves etc, upon entering or leaving a building

Power supply

WARNING All installations should be checked by a qualified technician before power is applied to the transceiver.

Power can be provided by either:

- a suitable transceiver supply connected directly to the AC mains (fixed station only)
- a 12 V DC battery (mobile or fixed stations)

CAUTION Ensure that the power supply to operate your station is 12 V DC.

AC mains supply

Codan provides a 3020 Transceiver Supply, which can be used with transceivers operating on speech and data communications.

CAUTION If the distance between the transceiver supply and the transceiver requires the cable to be extended, the cable size may need to be increased to minimise voltage drop (see page 48, *Connecting the AC mains supply*).

Battery power supply

Batteries need to be well-charged and in good condition to ensure effective operation. Poor condition of the battery usually leads to poor performance of your station. This includes reduced power output and signal distortion during transmission.

If use of a mobile transceiver results in a heavy drain on the vehicle battery, a two-battery system can be used. Generally the vehicle alternator and charge system copes with the extra battery, however an isolation circuit should be provided between the batteries.

Checking the battery

It is important to maintain the condition of the battery to ensure that it is in suitable working order.

Table 12: Battery maintenance

Check for...	**Comment**
Correct charge	Use a multimeter or a hydrometer to check the charge condition of the battery.
Water level in cells	The plates should be sufficiently covered with electrolyte. Add clean distilled water if the electrolyte is below the top of the plates. *Never* overfill cells as this causes corrosion.
Corrosion-free terminals	Where there is corrosion on the terminal posts, the whole area should be neutralised and cleaned. This can be achieved using a wire brush, paint scraper, and a solution of water and baking soda. WARNING Any cleaning of the terminals should be done in a well-ventilated area using the appropriate personal protective equipment.
Tight electrical connections	Check for defective cables, loose connections, corrosion, cracked cases or covers, loose hold-down clamps, and deformed or loose terminal posts.

Power supply factors

Voltage drop

The most common causes of voltage drop along a cable are:

- the diameter of the wire is too thin
- the length of the cable is too long

The average current consumption of a transceiver is low except during transmission of voice and data peaks, where high current is needed for short intervals. The power supply cable needs to be sufficiently heavy to supply these current peaks without excessive voltage drop (see page 46, *Power and control cabling*).

Incorrect wiring techniques, including poor choice of connection points and incorrect use of terminal lugs, can also cause a voltage drop.

Fuse protection (battery supply only)

An external fuse must be fitted in the active wire as close as possible to the battery to ensure there is no risk of fire if the cable is damaged. The fuse must be of a type that has a low voltage drop at peak currents (see page 49, *Protecting the cables*).

NOTE A 32 A cartridge fuse (Codan part number 15-00711) is recommended.

Noise interference

The transceiver has noise-rejection circuitry and, provided correct power cable connection and routing are established, noise interference via the power cable is kept to a minimum (see page 47, *Connecting the battery supply*).

Wiring techniques (AC mains supply only)

Correct wiring techniques can reduce voltage drop. These include choosing good connection points and using terminal lugs correctly.

For correct wiring techniques when connecting the transceiver supply see page 48, *Connecting the AC mains supply*.

WARNING It is essential for every mains-energised installation to have an effective connection to the protective earth of the power distribution system in case the basic insulation fails.

WARNING Without protective earthing, dangerous voltages may be applied to accessible metal parts.

A 3-wire mains cord has an earth wire that provides an effective earth, and is therefore electrically safe. A 2-wire mains cord lacks a protective earth wire, so one must be established by bonding the transceiver supply to an earth stake driven into the ground, or to some other low-impedance earth connection.

Installing the cables

WARNING *Do not* cut the control, coaxial or speaker cable. If the cables are too long, gather the excess neatly and secure it out of the way.

CAUTION Large magnetic fields can be generated along the power cable during transmission and these fields may be coupled into the control cabling. Failure to keep these cables separated causes distortion of the transmitted signal.

The cabling must be in a position that:

- is away from operator's feet
- is secured and concealed as much as possible
- ensures the control cables are separated from the DC power cable by at least 200 mm (8 in), except over short distances where they may pass through the same hole in a bulkhead
- is secured behind protective metalwork (only if the cables run under the vehicle)

Keep cables in the engine compartment away from:

- heat, for example, exhaust, air-conditioning systems, and water pipes
- oils and corrosive liquids, for example, engine oil, battery fluid, and brake fluid

Connecting the power supply

Power and control cabling

The connection from the transceiver is made directly to the battery/power source via a twin core cable.

The cable should:

- be of adequate electrical capacity
- be fused in the positive leg at or near the battery terminal
- not be used to provide power connections to any other equipment

The cable from the battery must be able to carry the full supply current, so it must be of correct size. As the distance between the transceiver and the battery increases, the cross-sectional area of the cable must increase proportionally to minimise the voltage drop. For example, a 100 W transceiver positioned 2 m (2 yd) away from the battery requires a cable with a cross-sectional area of approximately 4 mm^2 (11 AWG), whereas a transceiver 5 m (5 yd) away from the battery requires a cable with a cross-sectional area of approximately 10 mm^2 (7 AWG).

A heavy-duty power cable is supplied with the vehicle-mounting cradle for mobile stations. This cable minimises the voltage drop between the battery and transceiver during transmission (see page 45, *Voltage drop*).

CAUTION If you use a thinner cable than this, voltage drop may occur, which may affect signal quality.

Connecting the battery supply

To connect the battery supply:

- ❑ Connect the red positive and black negative wires from the power cable of the transceiver to the positive and negative terminals of the battery, respectively.
- ❑ Fit a suitable fuse as near as practicable to the positive side of the battery connection.

  NOTE A 32 A cartridge fuse (Codan part number 15-00711) is recommended.

- ❑ In a mobile installation, route the power cable away from other vehicle wiring, including high-voltage ignition wiring between the spark plugs, distributor and coil. Ensure the power cable does not run together with, or parallel to, the control cables for any long distance.

  NOTE Where wiring passes through any bulkhead, provide appropriate grommets to prevent insulation being cut.

- ❑ Terminate the transceiver power cable with connector lugs.
- ❑ Secure the power cable using cable ties.
- ❑ Test that the power supply and transceiver work correctly.

Using a terminal block

A terminal block can be fitted where heavy cables are used for long cable runs, or where the tools or materials may not be available to re-terminate the transceiver power supply connector. The terminal block is fitted next to the transceiver to connect the cable from the battery to the transceiver power cable. The length of the cable between the terminal block and the transceiver should not exceed 500 mm (20 in) so that voltage drop is minimised.

To fit the terminal block:

- ❑ Cut the connector from the end of the battery cable.
- ❑ Strip 10 mm (½ in) of the insulation from the cable.
- ❑ Insert the cable into the terminal block, ensuring the screws of the terminal block are completely undone before inserting the wires.

  NOTE Observe correct polarity.

  NOTE Ensure there are no stray wires.

- ❑ Turn the screws into place.

Connecting the AC mains supply

To connect the AC mains supply:

- ❑ Fit the plug from the transceiver supply into the AC mains socket.

  NOTE The transceiver supply converts the AC power supply to DC.

- ❑ Connect the transceiver supply to the transceiver via the DC power leads.

  NOTE Ensure the transceiver is grounded correctly (see page 40, *Grounding the transceiver*).

Most Codan power supplies can use an external battery as an alternative power supply in the event of an AC mains failure. Codan recommends the use of the Standby Battery Cable Kit (Codan part number 15-00702) for easy and correct installation of the standby battery. The cable from this battery must be able to carry the full supply current, so it must be of correct size (see page 46, *Power and control cabling*).

Protecting the cables

Physical protection

Protect all the cables from sharp edges and mechanical abrasions. Cables that pass through body panels or internal bulkheads must be protected by grommets. Holes in the bulkhead need only be large enough to allow the end of the cable with the smaller connector to pass through. Removing a connector should be a last resort. Externally, the cable and connectors need to be weatherproofed using self-amalgamating rubber tape.

CAUTION Removal of factory-fitted connectors may cause cable or connector faults.

CAUTION Crimp-style coaxial connectors for vehicle installations should be avoided because they are susceptible to mechanical damage and are not weatherproofed.

NOTE Any cabling under carpet or floor mats should be clear of foot traffic.

Electrical protection

The transceiver is provided with adequate internal protection. The transceiver supply is also fitted with adequate protection.

In a vehicle-battery supply installation, we recommend that a suitable cartridge fuse (32 A, Codan part number 15-00711) is fitted in the positive wire, close to the battery. This protects the power cable from risk of fire if damaged insulation should touch surrounding metalwork or the vehicle chassis.

As the fuse is not included to protect the transceiver circuits, it should be of large physical and electrical size to eliminate the possibility of voltage drops across the fuse.

WARNING Do not use normal glass in-line automotive fuses.

Radio frequency interference (mobile stations only)

Types of noise

Engine noise and electrical accessories often cause RF interference.

Noise interference can be:

- induced into and carried along the cables to the transceiver
- radiated from the noise source and picked up at the antenna

Table 13: Noise source and type

System	Noise source	Noise type
Ignition	Ignition	Distributor and spark plug leads
Battery charging	Alternators	Diode switching and brushes
Other	Brakes and bearings	Static discharge
	Mechanical voltage regulators	Contact arcing
	Oil pressure sender	Contact arcing
	Tachometer	Impulse
	Winches	Motor brushes
	Wipers and fan motors	Motor brushes

Noise from the ignition system

The ignition system of a petrol motor vehicle is often a major noise source.

High-voltage wiring

All high-voltage wiring from the ignition coil to the spark plugs should be:

- as short as possible
- clean
- as close to the engine block as possible
- of a suppressed type

Low-voltage wiring

The low-voltage wiring from the coil to the contact-breaker points on the distributor must:

- be as short as possible
- not be included with other wires in a harness or loom

This wire must be shielded if it is greater than 300 mm (12 in) long (see page 53, *Noise suppression*). A suitable shield can be provided by a twin flex or ‘figure eight’ cable (consisting of two conductors).

Shielding is achieved by:

- connecting each end of one of the conductors to a good earth
- connecting the other conductor in place of the original wire

Coil-to-battery wiring

A low-pass filter, such as a Marine Technology type MAR-ACE, should be fitted at the coil end of the battery wire. The earth connection of the filter should be short and bonded to the coil body.

Noise from the battery-charging system

Alternator/generator-to-battery wiring

A low-pass filter, such as a Marine Technology type MAR-60A (up to 60 A), should be fitted to the main battery lead at the alternator to minimise noise. The filter must be rated for the maximum current available from the charging system. The earth lug of the filter should attach to the alternator body or the engine block.

Alternator-to-regulator control wire

The alternator-to-regulator control wire carries switching pulses that often contribute noise to the receiver.

WARNING Suppression via capacitors or filters is not an option because it may cause damage to the regulator.

To minimise noise:

- separate the regulator control wire from all other wiring
- keep the wiring as short as possible

If the wiring is longer than approximately 300 mm (12 in), it should be shielded.

Other regulator wires

These wires are usually suppressed using good low-inductance bypass capacitors. A Marine Technology type MAR-ACE filter is appropriate. These capacitors must be connected to the wires that are to be suppressed and to the chassis via very short leads.

Other noise sources

Engine instrumentation

Certain types of oil pressure sensors and voltage regulators used in instrument systems contain a vibrating or thermal cycling contact. These devices can only be suppressed by isolating and screening the wiring (see page 51, *Alternator-to-regulator control wire*). Disc ceramic capacitors with short leads, protected with insulating sleeving, are often used. If these capacitors are used, values less than 1 nF should be used to prevent damage to instrument contacts.

Electric motors

Small electric motors can usually be suppressed with capacitors. Larger motors may require a better filter as mentioned above.

NOTE Atmospheric and solar noise conditions may be more responsible for poor signal reception than any locally generated noise.

Noise suppression

Noise interference is suppressed by:

- shielding/screening, for example, the addition of a physical metallic shield between a noise source and the transceiver
- decoupling to ground, for example, a filter capacitor on the alternator
- providing RF filtering
- maintaining all electrical equipment and connections
- re-routing wiring, for example, separating the antenna feed wire from the battery cable

Most commercial and passenger vehicles are not easily suppressed for noise at radio frequencies. Since shielding of existing cables and devices such as spark plugs is neither practical nor viable for general vehicle installations, RF filtering is the preferred option.

RF filtering involves:

- preventing the noise from being generated
- minimising the noise radiated by the wiring connected to the noise source

An interference suppression kit is available from Codan (Codan part number 15-00704). It contains filters, suppressing capacitors, earth straps and fitting instructions.

The process of eliminating signal interference is by:

- identifying the noise source(s) by noting the difference in the noise levels in the receiver with the motor and accessories switched off then on
- working on each source individually until an acceptable level of suppression is achieved

Alternatively, disconnect all possible sources of noise then replace and suppress them in turn.

Most suppression is carried out using some type of RF filtering. All suppressor devices must be fitted at the source of the interference in order to be effective.

Tuning the mobile antenna

Mobile antennas have a relatively narrow bandwidth. This is not important for automatic tuning antennas as they can be tuned at any exact frequency, but a pre-tuned multi-tap antenna can only be used over a small range of frequencies at each tap. Multi-tap antennas are accurately tuned at each tap point for a standard vehicle, which is usually a long wheelbase 4WD.

Tuning the tapped whip antenna

To tune the tapped whip antenna:

- ❑ Wind the antenna lead evenly along the length of the antenna whip.
- ❑ Place the antenna lead into the tap point corresponding to the channel frequency on which you want to transmit.
- ❑ On the transceiver, scroll to the channel on which you want to transmit, then press PTT to tune.

  If tuning fails see page 55, *Troubleshooting the installation*.

Tuning the automatic tuning whip antenna

To tune the automatic tuning whip antenna:

- ❑ Scroll to the channel on which you want to transmit, then press PTT to tune.

Troubleshooting the installation

Common problems caused by incorrect installation are listed in Table 14.

WARNING Before using the antenna system see the safety information provided on page 439, *Radiation safety*.

WARNING Poor installation can damage the antenna such that a replacement is needed.

Table 14: Possible faults in the installation

Symptoms	Possible causes	Action
Antenna detunes	Inadequate support of the antenna	Ensure the antenna has adequate support so that it *does not* sway or sag. If required, use antenna supports such as guyed masts (see page 30, *Antenna supports in a fixed station*).
Antenna fails to tune certain channels or frequencies	The antenna and/or tuner may not be earthed correctly	Improve the earth connection (see page 41, *Grounding the antenna* and page 42, *Grounding the tuner (fixed station only)*). Ensure a good earth connection to the vehicle body is provided by an earth braid or copper strap, keeping it as short as possible. Check the vehicle earth on metal areas close to the antenna and rectify if necessary, for example, the bonnet of the vehicle may be isolated from the main vehicle earth. If the problem persists, shorten or lengthen the coaxial cable between the antenna and the transceiver by approximately 1 m (1 yd). Check that the problem does not move to other channels.
	Incorrect positioning of the antenna	Check that the position of the antenna corresponds to the desired direction of communication. The antenna must also be positioned away from trees, buildings etc, which provide a shielding effect and diminish the efficiency of the antenna. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power (see page 59, *Standing wave ratio*).
	Inadequate support of the antenna	Ensure the antenna is adequately supported, so that it *does not* sway or sag. If required, use antenna supports such as guyed masts (see page 30, *Antenna supports in a fixed station*).
	The antenna may have been tuned without the whip in place	Ensure the whip is in place before tuning.

Table 14: Possible faults in the installation (cont.)

Symptoms	Possible causes	Action
Antenna tunes when stationary, but fails when mobile	Incorrect positioning of the antenna on the vehicle	Ensure correct installation and tuning procedures are followed. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power (see page 59, *Standing wave ratio*). Carry out all testing in the open, away from trees and buildings etc. Leaning the antenna away from the bodywork sometimes assists in tuning. Check that the problem does not move to other channels.
Distortion of the transmit audio signal	Inadequate earthing of the transceiver to the vehicle chassis	Improve the earth of the transceiver by connecting an earthing strap (braid or copper strip) from the earth screw of the transceiver to the vehicle chassis, keeping the strap as short as possible (see page 40, *Grounding the transceiver*).
Noise interference	Noise interference by other equipment	Identify the source of interference by switching off other equipment. If possible, move the transceiver and/or antenna away from the noise source.
	Inadequate earthing of the transceiver	Improve the earth of the transceiver by connecting an earthing strap (braid or copper strip) from the earth screw of the transceiver to the earthing point, keeping the strap as short as possible (see page 40, *Grounding the transceiver*).
No power	The internal fuse of the transceiver has blown	Replace the fuse.
	Poor connections	Check that the battery is connected correctly to the transceiver.
	Power not switched on	Check that the AC mains supply and the transceiver supply are both switched on.
	Battery not supplying the correct voltage, or is in poor condition	Check battery supply (see page 44, *Checking the battery*).
	Incorrect cable connections	Check that the AC mains outlet, the transceiver supply, and the transceiver are connected correctly.
	Faulty cables and/or connectors	Check that the cables and connectors between all items of equipment are securely connected and not damaged. If the cables or connectors are faulty, contact your Codan representative.

Table 14: Possible faults in the installation (cont.)

Symptoms	Possible causes	Action
Poor radiation efficiency	Poor installation	Improve the earth connection (see page 41, *Grounding the antenna*).
	Incorrect positioning of the antenna	Check the position of the antenna, ensuring that the vehicle body is not acting as a shield. Check that the position of the antenna corresponds to the desired direction of communication. The antenna must also be positioned away from trees, buildings etc, which provide a shielding effect and diminish the efficiency of the antenna. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power (see page 59, *Standing wave ratio*). If the problem persists, check the antenna length (for long wire antennas), the length of the antenna feed wire, and the conductivity of the grounding system. Alter these slightly in an attempt to achieve better tuning. Check that the problem does not move to other channels.
	The antenna and/or tuner may not be earthed correctly	Improve the earth connection (see page 41, *Grounding the antenna* and page 42, *Grounding the tuner (fixed station only)*).
SWR is bad	The SWR measurement may have been performed at the RF unit rather than at the antenna	Ensure the SWR meter is connected to the coaxial line at the base of the antenna to achieve an accurate reading (see page 59, *Standing wave ratio*).
	The antenna may not be positioned correctly	Check the position of the antenna, ensuring that the vehicle body is not acting as a shield. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power (see page 59, *Standing wave ratio*). Check that the position of the antenna corresponds to the desired direction of communication. The antenna must also be positioned away from trees, buildings etc, which provide a shielding effect and diminish the efficiency of the antenna. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power (see page 59, *Standing wave ratio*).
	Faulty coaxial cable or control cable	Replace faulty cables.
	The antenna and/or tuner may not be earthed correctly	Improve the earth connection (see page 41, *Grounding the antenna* and page 42, *Grounding the tuner (fixed station only)*).

Table 14: Possible faults in the installation (cont.)

Symptoms	Possible causes	Action
Transceiver is not responding to instructions	The transceiver may not be connected correctly	Check that the cables and connectors between all items of equipment are securely connected and not damaged.
	Faulty cables and/or connectors	Check that the cables and connectors between all items of equipment are securely connected and not damaged.
Tuning fails	Inadequate earthing	Antenna mounting bracket should be welded or bolted directly to the chassis. All paint should be cleaned from mating surfaces. The earth braid provided should be connected to an independent grounding point going to the bodywork of the vehicle, or to the battery negative if possible. Improve the earth of the transceiver by connecting an earthing strap (braid or copper strip) from the earth screw of the transceiver to the earthing point, keeping the strap as short as possible (see page 40, *Grounding the transceiver*).
Voltage drop in the fuse, the control leads, or the battery	Voltage less than 12 V DC	Check the voltage; it must be greater than 12 V DC on transmit.

Testing the installation

Following correct installation, the station should be tested for correct operation prior to use in the HF network.

Testing involves:

- measuring the SWR
- carrying out station-to-station on-air testing

Standing wave ratio

WARNING Before using the antenna system see the safety information provided on page 439, *Radiation safety*.

An SWR meter measures the forward and reflected powers between a transceiver and its antenna load, and represents these in a ratio called the SWR. To ensure correct installation, the power and SWR assessment should be performed with the transceiver working in its normal antenna system. Press **TUNE** to see the SWR, then press PTT to manually tune the antenna.

If the impedance of the antenna is equal to 50 Ω, no power is reflected. This is the ideal situation, which gives an SWR reading of 1:1. An SWR equal to or lower than 1.8:1 is acceptable. If the SWR is greater than 1.8:1, the ALC circuitry in the transceiver reduces the output power. With some combinations of frequencies and antenna design, it may not be possible to achieve the desired figure on all channels.

CAUTION The SWR should never rise above 2:1.

Using SWR to test the installation

To test the installation:

- ❑ Select the highest operating frequency of the transceiver.
- ❑ Connect the SWR meter to the coaxial line at the base of the antenna.
- ❑ Tune the antenna.

  If the antenna installation parameters are within the satisfactory operating range, tuning will be successful and the SWR reading will be less than 2:1.
- ❑ Select the lowest operating frequency of the transceiver, then repeat the test.
- ❑ If a particular channel frequency does not tune, check the:
  - length of the antenna (for long wire antennas)
  - conductivity of the grounding system
  - orientation of the antenna

  Alter these slightly in an attempt to achieve better tuning.

On-air testing

On-air testing gives a better indication of antenna operation, particularly if the operator is familiar with the signal strengths normally received within a network. Certain types of test calls can be used to test the installation.

With on-air testing, the difference in equipment between stations must be taken into account when determining the quality of the transmission. For example, a 100 W fixed station may be in contact with another fixed station using a full-size antenna and high-power transceiver. Fixed stations sometimes use split sites, where the receivers are located in a noise-free area, therefore, signal quality is improved because noise interference is minimised.

5 Operating the transceiver

This section contains the following topics:

Switching on the transceiver

To switch on the transceiver:

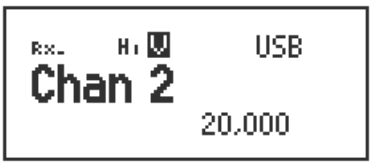
- ❑ Press ⏻.

  The Codan logo screen is displayed.

- ❑ If you are prompted to enter a password, enter your user or administrator (admin) 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. If you have forgotten your password see page 353, *Forgotten passwords*.

  The welcome screen (if set) is briefly displayed, then the home screen is displayed. For example:



  The default home screen is the channel screen in the Channel List. If another screen is set as the home screen, it is displayed instead. For more information on the home screen see page 103, *Setting the home screen*.

NOTE If there are no channels programmed into the transceiver, **Free Tune** is displayed.

Switching off the transceiver

To switch off the transceiver:

- ❑ *Hold down* ⏻ for 2 seconds, then release.

  The transceiver is switched off.

The handset screen

NOTE

In the following example, you must log in as administrator to see the Main Menu (see page 120, *Logging in to admin level from user level* and page 96, *The Main Menu*).

The screen on the handset consists of three lines.

Figure 8: The handset screen

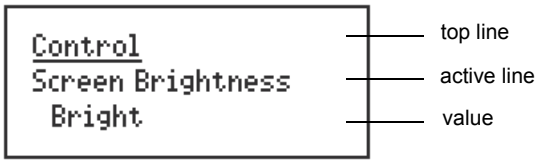
The information displayed on the top line depends on the task you are performing. It can display:

- the name of the list, entry or setting you are in
- the Find prompt when you press

The middle line is called the active line. You can use this line to indicate the list or entry you want to select, to enter text, and to change the value in a setting.

The bottom line is used when a list is displayed to show either the next item in the list (Figure 8), or the value in the first or only setting for the entry (Figure 9). When a value is displayed, it is indented under the name of the entry to which it applies. In Figure 9 the value indicates that the Screen Brightness is set to Bright.

Figure 9: The handset screen displaying a value



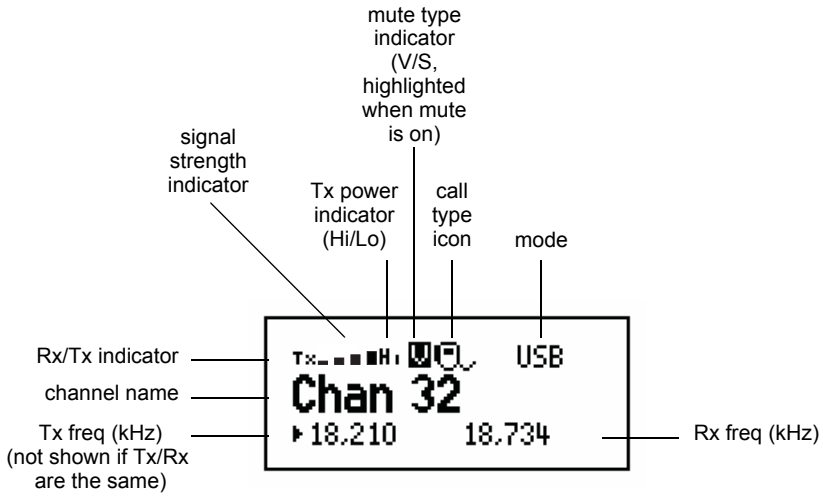
The handset screen also displays information screens such as the channel screen in the Channel List, and the time screen in the Control List.

The channel screen

The channel screen is the screen that is displayed when you open the Channel List. It displays:

- the name of the currently selected channel
- a bar graph that indicates the signal strength on receive and the output power on transmit
- the transmit power level indicator
- the mute type indicator
- the call type icon
- the mode
- the transmit and receive frequencies, if applicable
- an arrow that indicates whether the transceiver is receiving or transmitting

Figure 10: The channel screen in the Channel List



If the transmit and receive frequencies are the same, the frequency is only displayed in the receive frequency position on the right side of the screen, and the Rx indicator arrow is not used. The Rx/Tx indicator shows whether the transceiver is receiving or transmitting.

Your transceiver has the option of selecting high or low power. When low power is selected, **Lo** is displayed to the right of the signal strength indicator (see Figure 10). When high power is selected, **Hi** is displayed in this location.

While a call is being established, the transceiver shows that calling activity is in progress by flashing in place of the scan indicator (see Figure 11). During a call, these indicators are replaced with an icon showing the type of call being sent or received (see Figure 10). These call type icons are listed in Table 22 on page 167.

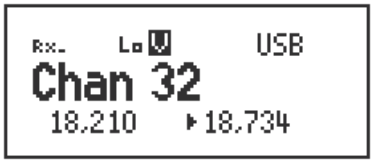
When the transceiver is scanning, the channel screen is replaced by the scanning screen (see Figure 11).

Figure 11: The scanning screen

Selecting a channel

To select a channel:

- ❑ Press ✕ or **VIEW** until the channel screen is displayed.
- ❑ If the transceiver is scanning, press **SCAN** to switch off scanning.



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

  The channel is selected.

NOTE

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.

You can also use the Find feature to find a channel (see page 80, *Finding words and values*).

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

Entering and editing text

There are several situations in which you may be prompted to enter or edit text, for example, when you enter the address of a station you want to call, when you select a setting in which text is required, or when you create an entry in a list. The numeric keypad on the handset is context sensitive so that, in these situations, you can use the numeric keys to enter letters, numbers and symbols.

The editable screens

A screen in which you can enter or edit text has a question mark at the end of the title line and a character/case indicator at the bottom right of the screen.

Figure 12: Editable screen showing upper-case text entry

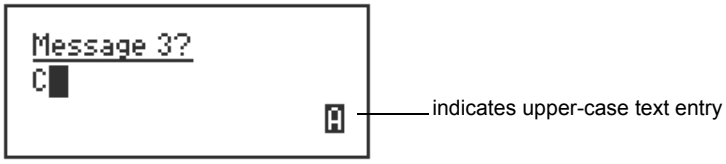


Figure 13: Editable screen showing lower-case text entry

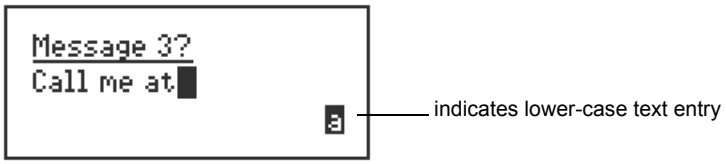


Figure 14: Editable screen showing numeric text entry

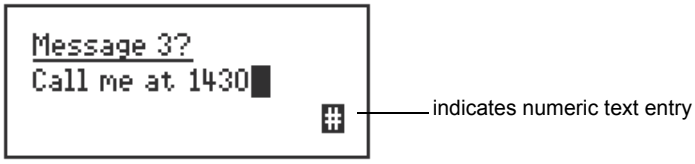


Figure 15: Editable screen showing slider

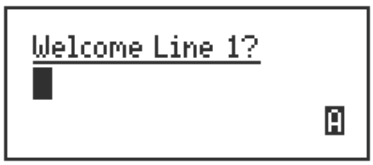
Editing a screen

NOTE — In the following example, you must log in as administrator to see the Welcome Text entry in the Control List (see page 120, *Logging in to admin level from user level*).

To gain access to an editable screen:

- ❑ *Hold* ✓.

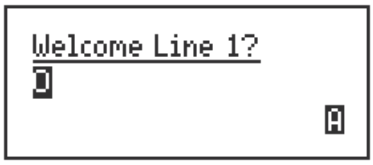
  A question mark is displayed at the end of the heading to show that you can now enter and/or edit text in the setting.



Entering text

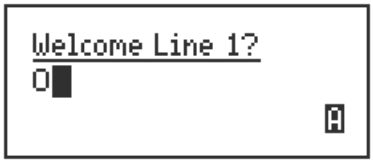
To enter text in an editable screen:

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

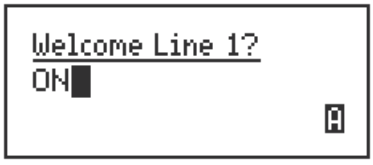


NOTE — You can also *hold* the key until the letter you want is displayed, then release the key.

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

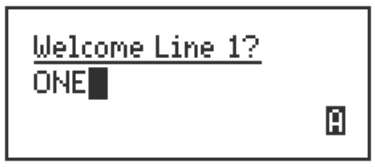


...then press the key repeatedly until the letter you want is displayed.



- ❑ 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 numeric 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** to **a** to **#**.

NOTE When you are prompted to enter a call address, the types of 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.

Deleting text

To delete text:

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

Entering special characters in messages and names

To enter a special character:

- ❑ Use ◣ or ◥ to move the cursor to the point where you want to insert a special character, then press ✱ repeatedly until the symbol you want is displayed.

NOTE

The special characters that are available are:

. , ’ ? ! & # $ * ( ) - + /

NOTE

Make sure that **A** or **a** is displayed at the bottom right of the screen before you press ✱, otherwise you will enter a decimal point.

To enter one of an extended range of special characters:

- ❑ Use ◣ or ◥ to move the cursor to the point where you want to insert a special character.
- ❑ Press 🔍 to enter the special character mode.
- ❑ Use ◣ or ◥ to scroll through the rows of character choices.

NOTE

The characters that are available are:

space , . ; ? : " ‘ ’ / ! @ # $ % ^ & * ( ) _ - + = | \ ~ < > { } [ ] 0 1 2 3 4 5 6 7 8 9
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z

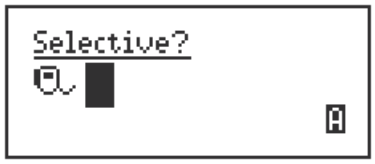
- ❑ When the character you want to insert appears in the selected row, use **1** or **3** to scroll left or right respectively until the character is highlighted, then press ✓.

Entering text in an ALE call address

NOTE — If the FED-STD-1045 ALE/CALM option is installed in your transceiver, the * key may be used to enter the global ALL address syntax (@?@) easily.

To enter the global ALL address syntax:

- ❑ Ensure that you are in an editable call address screen in which you can enter upper-case letters (**A**).



- ❑ Press * to enter @?@.

Saving text changes

To save the changes you have made in an editable screen:

- ❑ Press ✓.

  The question mark is removed from the heading.

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

Quick Start

Quick Start provides a simple way of:

- adding channels
- assigning channels to a scan list
- setting the time and date
- setting the self address of your station
- adding, changing or deleting entries from lists

Quick Start is available if your transceiver has not been programmed with a profile, or contains only one station self address and network names from this default list:

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

Quick Start is accessed via the 🔍 key. Standard List Manager functions as described on page 99, *The List Manager* are accessed through the Advanced... entry in the List Manager when Quick Start is available. When Quick Start is disabled by entering a non-default network name or by entering more than one station self address, all List Manager functionality is accessed directly by *holding* the 🔍 key.

In countries that do not permit programming of transmit frequencies using the handset, you are not able to add channels using Quick Start; this is achieved using NSP.

NOTE You can set up Quick Start using configuration commands in the Message 10 entry in the Control List (see page 415, *Controlling access to the List Manager*).

Opening and closing Quick Start

To open Quick Start:

❑ *Hold* 🔍.

To close Quick Start:

❑ Press or *hold* ✕.

Adding/Editing a channel

NOTE

If you have option TxD installed, you are not able to program transmit frequencies.

If you have option TxP installed, the **Add/Edit channel** entry is not available.

To add or edit a channel:

- ❑ *Hold* 🔍 to open Quick Start.
- ❑ Scroll to **Add/Edit channel**, then press ✓.
- ❑ Enter the name of the channel you want to create, then press ✓.

  NOTE For help with entering text see page 66, *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/edit more channels in your transceiver, scroll to **Add/Edit channel**, then repeat this process.
- ❑ Press ✕ to 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:

- ❑ *Hold* 🔍 to 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.
- ❑ Press ✕ to 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:

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

  The display appears with a line under the year.
- ❑ 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.
- ❑ Press ✕ to 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 page 85, *Entering your station self address*.

To set your station self address:

- ❑ *Hold* 🔍 to open Quick Start.
- ❑ Scroll to **Set my address**, then press ✓.
- ❑ Enter your station self address (up to 10 digits for a Codan Selcall network and up to 15 upper-case/numeric characters for an ALE/CALM network), then press ✓.

  CAUTION If you intend to send calls to a station that is compatible with 4-digit self addresses only, you must set up a 4-digit self address.

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Press ✕ to 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:

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

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Scroll to the type of call you want to make, enter the station address 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 enter a message, press ✓.
- ❑ Scroll to the call system you want to use to make the call, then press ✓.
- ❑ If you selected **Phone?** or **No call type**, scroll to **<blank>** as the phone link 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**, then repeat this process.
- ❑ Press ✕ to close Quick Start, if required.

Deleting an entry

To delete addresses, channels or phone links:

- ❑ *Hold* 🔍 to open Quick Start.
- ❑ Scroll to **Delete...**, then press ✓.

  You can delete items from the Address/CallBk, Channel or Phone Link Lists.
- ❑ 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 from the scan list automatically.
- ❑ Press ✕ to close Quick Start, if required.

Muting the transceiver

NOTE — In the following discussion, you must log in as administrator to see the entries in the Control List (see page 120, *Logging in to admin level from user level*).

When the transceiver is set to a channel or is scanning channels, and mute is switched off, you hear noise on each channel. If you do not want to listen to this noise, you can silence the transceiver by switching mute on.

Mute automatically comes on when the transceiver starts scanning. You must set the Mute Scan entry in the Control List to:

- **Selcall** if you want the mute to open when a call addressed to your station is detected, or voice is detected on a channel in a voice network
- **Voice** if you want the mute to open when a voice signal is detected (you can alter the call detect time across Codan Selcall networks)
- **Scan for Voice** if you want the mute to open when a voice signal is detected on any network (the transceiver scans at a uniform rate across all networks)

If the scan is paused due to voice being detected, the length of time that the transceiver holds the pause is set in the Cfg Scan Voice Max Hold and Cfg Scan Voice Extend entries in the Control List. Scanning only resumes automatically if the transceiver is set to start scanning after a timeout period (see page 213, *Auto Resume entries*).

NOTE — For help with changing these entries in the Control List see page 190, *Entries in the Control List* and page 104, *Changing a setting in the Control List*.

Switching mute on or off

To switch mute on or off:

❑ Press **MUTE**.

A message is displayed briefly to inform you that mute has been switched on or off. The **V** or **S** on the channel screen is highlighted when mute is on.

Setting the mute type

To select the mute type:

❑ Press **V/S** to toggle the mute type between Selcall mute (**S**) and Voice mute (**V**).

NOTE — If you have the AES-256 digital voice encryptor fitted, an additional mute type of Digital Voice Only mute (**D**) is available. For more information see page 256, *Using digital mute*.

Scanning channels

If you intend to receive calls on several channel/modes, switch on scanning. When scanning is switched on, the transceiver selects each channel/mode in your network in quick succession to detect incoming calls. The channel/modes are scanned in a continuous cycle. Mute is switched on automatically. For more information on setting up a network to be scanned see page 136, *Scan Network*.

When the transceiver detects a call addressed to your station, it stops scanning and notifies you according to the type of call received (see page 184, *Receiving a call*). When you press **SCAN** to end the call, scanning resumes. If you do not press this key to end the call, or any other key within a pre-determined timeout, the transceiver automatically ends the call and resumes scanning (see page 213, *Auto Resume entries*).

When the transceiver detects voice, it notifies you according to the mute setting selected (see page 76, *Muting the transceiver*). If your transceiver is set to notify you when voice is detected, you can pause scanning, select the channel/mode on which the voice was heard, then resume scanning when required.

It is recommended that scanning is switched on when you are not using the transceiver to communicate.

Switching scanning on or off

To switch scanning on or off:

- ❑ Press **SCAN**.

  If a call is not in progress, scanning is toggled on or off.

  If a call is in progress, the call is ended and the transceiver begins scanning.

  NOTE

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

  If you press PTT while the transceiver is scanning, the scan is paused.

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 network or 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 speak, *hold down* PTT.
  - To resume scanning immediately, press ✓.

Using the microphone

The microphone is located at the top centre of your handset. When you talk into the microphone:

- hold the microphone side-on and close to your mouth
- *hold down* PTT
- speak clearly at your normal volume and rate
- use the word ‘over’ to indicate that you have finished speaking, then release PTT (the transceiver may be set up to transmit a short beep when you release PTT)
- remember that your conversation can be monitored by anyone tuned to your transmit frequency

If PTT is held continuously for a certain length of time, the system stops transmission, switches to receive and displays an error message on the handset. This ensures that, even if the PTT button is being held down accidentally (because, for example, you are sitting on the handset), power consumption is minimised and the transceiver is ready to receive calls.

You can set the length of time the system waits before it cuts transmission, or switch this feature off, by using the PTT Cutout Time entry in the Control List (see page 190, *Entries in the Control List*).

Finding words and values

NOTE In the following examples, you must log in as administrator to see the Main Menu (see page 120, *Logging in to admin level from user level*).

Scrolling through lists, entries and settings is one way to find items. The Find feature, however, may help you find them faster.

There are two types of searches you can perform to find specific items. You can:

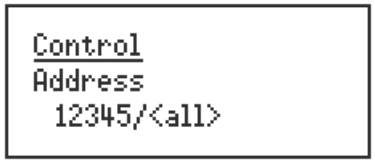
- search for any word in the Main Menu or in an entry in a list that begins with a specific character (for example, find all the entries in the Control List that contain the word ‘beep’, such as Key Beep and PTT Beeps)
- search for a value in a setting (for example, find all the channels in the Channel List with a receive frequency of 13000 kHz)

Finding a word

To find any word in the Main Menu or in the name of an entry:

❑ From **Main Menu**, scroll to the list in which you want to search, then press ✓.

The first entry in the list is displayed. For example:



❑ Press 🔍 once.

The Find prompt is displayed on the top line.

NOTE For help with finding a value see page 81, *Finding a value*.

❑ Enter the first character of the word you want to find.

The first item that contains a word beginning with this character is displayed.

If there aren't any words that begin with this character, the character is deleted and an error beep is made.

NOTE

To refine your search, enter more characters in the word you want to find.

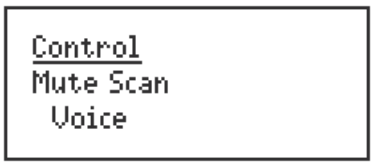
To backspace over text, press ✕.

- ❑ Scroll through the list until the item you want is displayed on the active line.

NOTE

If the list doesn't scroll, then there is only one word that matches the characters you entered.

- ❑ Press ✓ to exit Find at the entry.



Finding a value

NOTE

You cannot use this type of search in the Main Menu or in the Control List.

To find a value that begins with a specific digit:

- ❑ From **Main Menu**, scroll to the list in which the value is stored, then press ✓.
- ❑ Press 🔍 twice.

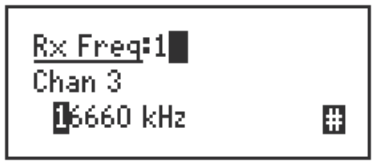
The Find prompt is displayed on the top line with the name of the first setting in the entry. For example:

NOTE

The search for a value is conducted in the setting displayed. To search for a value in a different setting, press 🔍 until that setting is displayed.

- ❑ Enter the first digit of the value you want to find.

  The first entry that contains a value beginning with this digit is displayed, and the value is displayed beneath it.

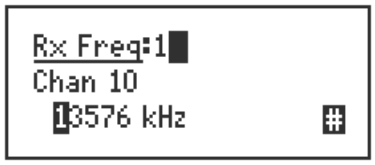


  If there aren't any values that begin with this digit, the digit is deleted and an error beep is made.

  NOTE — To refine your search, enter more digits in the value you want to find.

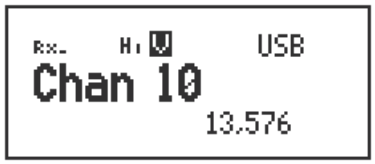
  To backspace over text, press ✕.

- ❑ Scroll through the entries until the one you want is displayed.



  NOTE — If the list doesn't scroll, then there is only one value that matches the digits you entered.

- ❑ Press ✓ to exit Find at the entry.



  NOTE — If you are in the Channel List, the transceiver selects this channel.

Setting the basics

Setting the time and date

NOTE In the following discussion, you must log in as administrator to see the Main Menu (see page 120, *Logging in to admin level from user level*).

When the transceiver leaves the factory it is set to UTC time with a time zone offset of zero. To set your local time and date you must enter your time zone offset from UTC time, then adjust the local time and date if necessary. This feature is useful if you have a network that spreads over several time zones, or you need to time stamp your transmissions according to the current time at longitude zero.

Setting the time zone offset

To set your time zone offset from UTC time:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Time...**, then press ✓.
- ❑ Scroll to **Zone Offset**, then *hold* ✓.

- ❑ Scroll to the correct time zone offset for your location, then press ✓.
- ❑ Press ✕ until **Main Menu** is displayed.

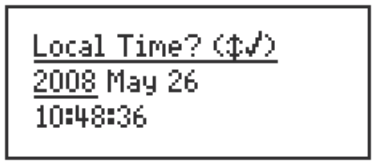
Adjusting the local time and date

If the local time and date are not correct after setting your time zone offset from UTC time, adjust the local time and date.

To adjust the local time and date:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Time...**, then press ✓.
- ❑ Scroll to **Local**, then *hold* ✓.

  The cursor is placed under the year.



- ❑ Scroll through the values until the one you want is displayed, then press ✓ to go to the next setting.

  To go to the previous setting, press ✕.
- ❑ Repeat the previous step until the date and time are correct.
- ❑ Press ✓ after setting the seconds to save your changes.
- ❑ Press ✕ until **Main Menu** is displayed.

Displaying the local time and date

NOTE

In the following discussion, you must log in as administrator to see the Main Menu (see page 120, *Logging in to admin level from user level*).

To display the local time and date:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Time...**, then press ✓.
- ❑ Scroll to **Screen**, then *hold* ✓.

  The time screen is displayed.

- ❑ Press ✕ until **Main Menu** is displayed.

Entering your station self address

NOTE

In the following discussion, you must log in as administrator to see the entries in the Control List (see page 120, *Logging in to admin level from user level*). If you want to view a self address when you switch on your transceiver see page 229, *Welcome text*.

Your station self address is the address used by other stations to call you, and it is sent when you make calls to identify you as the caller. You can enter up to 10 self addresses for your NGT *AR*, *SR*, or *AR Voice* Transceiver, or 3 self addresses for your NGT *VR* Transceiver. This section explains how to enter, edit and delete station self addresses.

Entering a self address

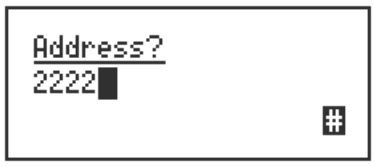
To enter your station self address:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Address**, then press ✓.

  If a self address has not yet been entered, the List Manager is displayed.

  If one or more self addresses have already been entered, the screen displays the first self address. *Hold* 🔍 to open the List Manager.

- ❑ Scroll to **Add item**, then press ✓.
- ❑ Enter the self address of your station. For example:



If you are entering a self address to be used in:

- a Codan Selcall network, enter up to 10 digits
- an ALE/CALM network, enter up to 15 upper-case/numeric characters, or a combination of both

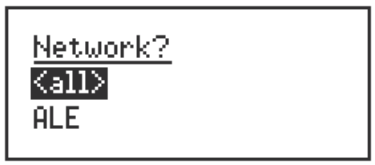
CAUTION If you intend to send calls to a station that is compatible with 4-digit self addresses only, you must set up a 4-digit self address.

NOTE For help with entering text see page 66, *Entering and editing text*.

NOTE Do not enter a self address that ends with one or more zeros. Zeros are used to indicate that calls are to be made to groups of stations in a Codan Selcall network (see page 170, *Group calls in a Codan Selcall network*).

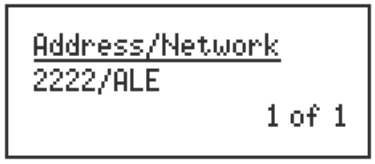
- ❑ Press ✓.
- ❑ Scroll to the network in which you want to use this self address, then press ✓.

  To use the self address in all networks, scroll to **<all>**, then press ✓.



The self address is created and the List Manager remains open.

- ❑ If you want to view the self address you have created, press ✗ to close the List Manager.



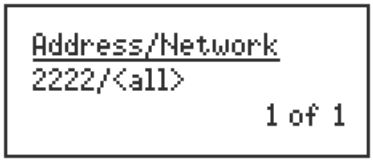
- ❑ Press ✗ until **Main Menu** is displayed.

Editing a self address

To edit a station self address:

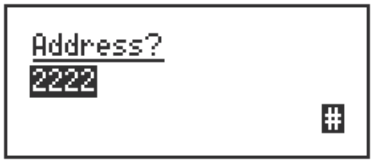
- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Address**, then press ✓.

  If there is more than one self address, scroll to the self address you want to edit.



- ❑ *Hold* ✓ to edit the self address.

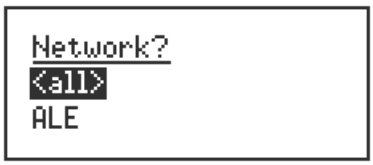
  The self address is displayed.



- ❑ Edit the self address as required, then press ✓.

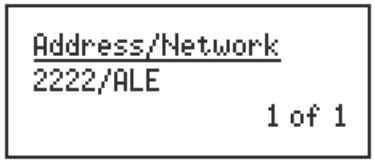
  NOTE For help with entering text see page 66, *Entering and editing text*.

  The network is displayed.



- ❑ Do one of the following:
  - To change the network, scroll to the network you want, then press ✓.
  - To use the self address in all networks, scroll to **<all>**, then press ✓.
  - If you do not want to change the network, scroll to the original network, then press ✓.

  The new details are saved.

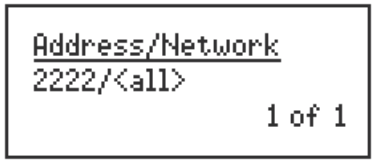


- ❑ Press ✕ until **Main Menu** is displayed.

Deleting a self address

To delete a station self address:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Address**, then press ✓.
- ❑ Scroll to the self address you want to delete.



- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Delete item**, then press ✓.

  The transceiver asks you to confirm that you want to delete the item.
- ❑ Press ✓.

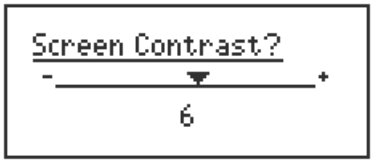
  The item is deleted and the List Manager remains open.
- ❑ Press ✕ until **Main Menu** is displayed.

Changing the screen contrast

To change the contrast of the screen:

- ❑ Press ⓘ + **9** to access the Screen Contrast entry in the Control List.

  The Screen Contrast slider screen is displayed.



- ❑ Use ◣ or ◥ to increase or decrease the contrast, then press ✓.

Changing the screen brightness

To change the brightness of the screen:

- ❑ Press ⓘ + **0** to access the Screen Brightness entry in the Control List.
- ❑ Scroll through the values until the one you want is displayed on the active line, then press ✓.

Using hot keys

Hot keys on the handset are keys that perform special tasks in addition to their normal functions. Table 3 on page 23 lists the standard hot keys on the handset and the tasks you can perform with them.

Generally, pressing the hot key a second time exits from the hot key activity. For example, pressing **CLAR** allows the clarifier to be edited. Pressing **CLAR** again exits the editing mode and returns you to the screen from which you began.

All the keys on the desk console are hot keys. Table 4 on page 25 lists the standard functions they perform.

NOTE — If you want the user to be able to access an entry in the Control List so that they can change the value, you should set up a hot key that accesses the entry (see page 293, *Creating a macro and assigning it to a hot key*).

To use a hot key on any of the handset or desk console keys:

- ❑ Press the hot key.

  NOTE — If the key can perform more than one hot key task, a list of the tasks is displayed. Press the key repeatedly to scroll through the tasks. When the task you want to perform is displayed, press ✓.

  NOTE — Some hot keys perform a different function if they are *held*.

  NOTE — Some keys may require you to select a value from a list or enter text before the task is completed.

  The task is performed.

Tuning the antenna

WARNING Before using the antenna system see the safety information provided on page 439, *Radiation safety*.

Automatic tuning

If the transceiver is connected to an automatic tuning antenna, it tunes the antenna automatically when required.

To tune the antenna when you select a channel:

- ❑ Select a channel in the Channel List (for help see page 65, *Selecting a channel*).
- ❑ Press then release PTT.

  A message is displayed to inform you that tuning has begun, and the transceiver makes a series of short beeps. Tuning typically takes 1 to 2 seconds.

  If tuning fails, a message is displayed to inform you of this, and the transceiver makes an error beep. You may need to manually tune the antenna (see page 92, *Manual tuning*).

Removing the tuning message

To remove the tuning message before tuning is complete:

- ❑ Press ✕.

  The beeps continue until tuning is complete.

Aborting automatic tuning

To abort automatic tuning:

- ❑ Press PTT.

  A message is displayed to inform you that tuning has been aborted, and the transceiver makes an error beep.

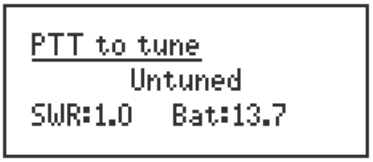
Manual tuning

You may need to manually tune the antenna if you are receiving on a new channel, or if you want to check the SWR value for the antenna.

To manually tune the antenna:

- ❑ Press **TUNE**.

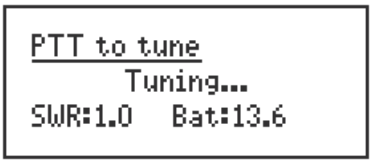
  The **PTT to tune** screen is displayed with the SWR and battery voltage on the bottom line. For example:



NOTE — If you do not press PTT within 30 seconds you are returned to the screen from which you began.

- ❑ *Hold down* PTT to tune the antenna.

  Tuning... is displayed, and the transceiver makes a series of short beeps.



NOTE

An SWR of less than 2:1 is acceptable.

If a message is displayed while you are tuning, you can remove it by continuing to *hold down* PTT and pressing ✕.

If PTT is held for more than 2 minutes, tuning is automatically aborted. The transceiver displays a message to inform you of this, makes an error beep, and returns you to the screen from which you began.

- ❑ Release PTT to stop tuning.

  The beeps cease and you are returned to the screen from which you began.

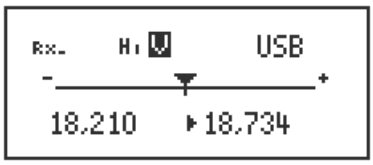
Using the clarifier

The clarifier is a feature that enables you to adjust the receive frequency to compensate for any frequency offset between your transceiver and the remote transceiver, thus improving the quality of received voice.

To use the clarifier:

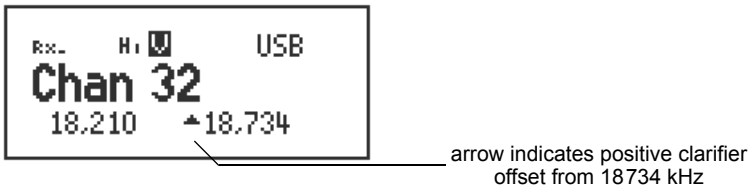
- ❑ Press **CLAR**.

  The Clarifier slider is displayed in the channel screen.



- ❑ Use ◣ or ◥ to increase or decrease the pitch of the received voice, then press ✓ or **CLAR**.

  If you select a positive clarifier offset from the frequency, the Rx indicator changes to an up arrow. If you select a negative clarifier offset from the frequency, the Rx indicator changes to a down arrow. For example:



NOTE When you select another channel/mode the clarifier is reset to the centre point.

Reducing background noise with *Easitalk*™

The *Easitalk*™ feature enables you to reduce the level of background noise that is present when you listen to a channel.

If *Easitalk*™ is active when the transceiver begins scanning, it is automatically switched off. It is switched on again when scanning pauses or stops.

NOTE

Easitalk™ uses one of three DSP algorithms to reduce the background noise. Depending on the conditions, you may need to change the algorithm in the Cfg Easitalk entry in the Control List. If you intend to change the algorithm regularly, set up a hot key to go to the next algorithm value in the Cfg Easitalk entry in the Control List (see page 344, *Example 5: changing a value to the next value in a list*).

To switch *Easitalk*™ on or off:

❑ Press **EASITALK**.

The Easitalk entry in the Control List is displayed and the value is automatically toggled on or off.

After about 2 seconds you are returned to the screen from which you began.

NOTE

Easitalk™ is not available if the CES-128 voice encryptor feature is active.

6 Using lists

This section contains the following topics:

The Main Menu

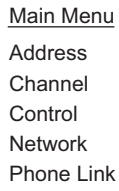
NOTE In the following discussion, you must log in as administrator to see the Main Menu (see page 120, *Logging in to admin level from user level*).

All the details required to operate the transceiver, such as the self address of your station and the channels and networks you use, are stored in lists. Each list relates to a particular area of the transceiver's operation. The lists containing information specific to the operation of your transceiver are:

- the Address List, which stores the details of stations you often call
- the Channel List, which stores the details of the channels you use
- the Control List, which stores the settings that control the way the transceiver operates, for example, the brightness and contrast of the handset screen, the time and date, passwords, and your station self address
- the Network List, which stores information about the networks you use and the channels used in each network
- the Phone Link List, which stores the details of telecommunication stations you contact to make telephone calls from the transceiver

The lists are displayed in the Main Menu without the word 'list' after them.

Figure 16: The contents of the Main Menu



Entries, settings and values

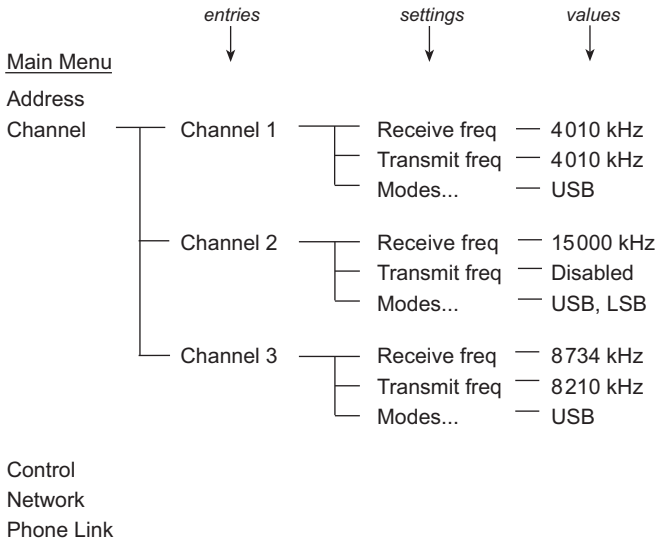
Each list contains entries. The entries in the Address List are the names of the stations you often call, for example, ‘Home’, ‘Work’. The entries in the Channel List are the names of the channels you use, for example, ‘Channel 1’, ‘Channel 2’.

You can add entries to each list except the Control List.

Each entry has one or more settings. For example, the entries in the Channel List are the channels that you use, and each entry has a setting for the receive and transmit frequencies, and the modes that can be used with the channel.

Each setting has a value. For example, the value for the Receive freq setting in the Channel List is the receive frequency of the channel in kilohertz.

Figure 17: Examples of entries, settings and values



Selecting a list

NOTE

In the following example, you must log in as administrator to see the Main Menu (see page 120, *Logging in to admin level from user level*).

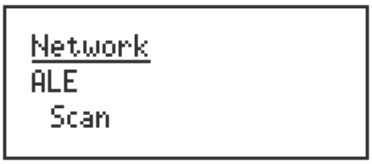
To select a list from the Main Menu:

- ❑ Press ✕ until **Main Menu** is displayed.

- ❑ Scroll through the Main Menu until the list you want to select is displayed on the active (middle) line. For example:

- ❑ Press ✓.

  The name of the list is displayed on the top line and the first entry is displayed on the active line. You can now scroll through the entries.



- ❑ Press ✕ until **Main Menu** is displayed.

The List Manager

The List Manager is a collection of tools that enable you to perform various tasks on lists, entries and settings. These tasks include:

- creating, copying, renaming and deleting entries
- saving information from a call log into the Address List
- setting the home screen
- changing the way lists, entries and settings are displayed
- preventing information from being edited and/or displayed (hiding and locking)
- creating macros and hot keys
- logging in as an administrator

The tools in the List Manager are displayed as entries. You can scroll through them and select them the same way you scroll through entries in lists. The entries in the List Manager vary according to the list, entry or setting you were on when you opened it: only entries relevant to that item are displayed. Table 15 on page 100 lists the entries in the List Manager and their functions.

NOTE You can set up the List Manager using configuration commands in the Message 10 entry in the Control List (see page 415, *Controlling access to the List Manager*).

Using the List Manager

The entries in the List Manager are covered in detail in this section. The basic steps for using them are the same.

To use an entry in the List Manager:

- ❑ Go to the list, entry or setting in which you want to use the List Manager.
- ❑ *Hold* 🔍 to open the List Manager.

  If Quick Start is enabled, scroll to **Advanced...**, then press ✓.
- ❑ Scroll through the entries until the one you want to select is displayed on the active line.
- ❑ Press ✓.

  When the task is completed, the List Manager remains open.

Entries in the List Manager

Table 15: List Manager entries and their functions

Entry		Enables you to...
Create entry		Create an entry in a list.
Copy entry		Copy an entry in a list.
Rename entry		Rename an entry in a list.
Delete entry		Delete an entry from a list.
Set marker		Set a marker on an entry in a list so that the next time you open the list, it is opened to this entry.
Add item		Add: • a mode to a channel in the Channel List • a channel/mode to a network in the Network List • your station self addresses to the Address entry in the Control List
Delete item		Delete: • a mode from a channel in the Channel List • a channel/mode from a network in the Network List • your station self addresses from the Address entry in the Control List
Save to Address		Save call information from a call log into an entry in the Address List.
Save Waypoint		Save GPS information into an entry in the Address List.
Display options...	Group entries?	Group entries in a list.
	Ungroup entries?	Ungroup entries in a list.
	Show settings?	Display the first setting of an entry under the name of the entry.
	Hide settings?	Display the next item in a list under the name of an entry.
	Full view?	Show the lock and hide icons at the top right of the screen and display entries marked as hidden.
	Normal view?	Remove the lock and hide icons at the top right of the screen and hide entries marked as hidden.

Table 15: List Manager entries and their functions (cont.)

Entry		**Enables you to...**
Macros...	Create macro	Create a macro.
	Copy macro	Copy a macro.
	Move macro	Move a macro from one key to another, or from one position to another on the same key.
	Add to macro	Create a macro then add it to the end of an existing macro.
	Join macros	Join two existing macros.
	Rename macro	Rename a macro.
	Delete macro	Delete a macro.
Config...	Set home screen	Set the home screen.
	Lock?	Prevent users from editing lists, entries and settings by locking items at user level.
	Unlock?	Unlock lists, entries and settings that have been locked at user level.
	Hide?	Prevent users from displaying lists, entries and settings in normal view by hiding items at user level.
	Show?	Display lists, entries and settings, which have been hidden at user level, in normal view.
	Locks off?	Switch off all locks set at user level until the Locks on? entry is used, or the transceiver is switched off then on again.
	Locks on?	Switch on all locks set at user level.
	Admin login	Gain access to the Admin... group of entries in the List Manager.
Built-in test	Select test?	Select a built-in test from a range of automatic, startup and user tests.
Admin...	Admin lock?	Prevent users from editing lists, entries and settings by locking items at admin level.
	Admin unlock?	Unlock lists, entries and settings locked at admin level.
	Admin hide?	Prevent users from displaying lists, entries and settings by hiding items at admin level.
	Admin show?	Display lists, entries and settings hidden at admin level.
	Locks off?	Switch off all locks set at admin level until the Admin... Locks on? entry is used, or the transceiver is switched off then on again.
	Locks on?	Switch on all locks set at admin level.
	Admin logout?	Log out of admin level.

NOTE The Admin... group of entries enables the administrator to restrict user access to information in the transceiver.

Setting a marker

Markers are like bookmarks: if you want to display a particular entry each time you open a list, set a marker on that entry. For example, if you often use a particular entry in the Address List, set a marker on that entry so that the entry is displayed each time you open the Address List.

To set a marker:

- ❑ Go to the list or entry on which you want to set a marker.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Set marker**, then press ✓.

  The marker is set and the List Manager closes.

To move a marker to another entry, repeat the steps above.

NOTE If you want a list to open at the first entry, set the marker on the first entry in the list.

Setting the home screen

The home screen is the screen that can be displayed quickly, regardless of the list you happen to be in. It is displayed after you:

- switch the transceiver on
- *hold* ✕ from any location

The default home screen is the Channel List, but almost any screen can be used as a home screen. If you want to see the current time, make the time screen the home screen.

When you set the home screen, values are not recorded. For example, if you make the Channel List the home screen, it displays the currently selected channel, not the channel that was selected when you set the home screen.

Setting the home screen

To set the home screen:

❑ Go to the screen you want to make the home screen.

NOTE If you want to make a screen in the Control List the home screen, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

❑ *Hold* 🔍 to open the List Manager.

❑ Scroll to **Config...**, then press ✓.

❑ Scroll to **Set home screen**, then press ✓.

The home screen is set and the List Manager remains open.

Displaying the home screen

To display the home screen from any location:

❑ *Hold* ✕.

NOTE If you are editing a setting, *holding* ✕ cancels your changes and exits the setting. *Holding* ✕ again displays the home screen.

❑ To return to the channel screen, press **VIEW**.

Changing a setting in the Control List

NOTE In the following example, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

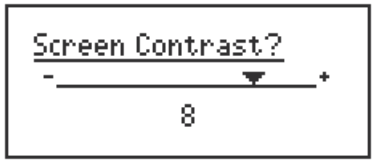
Most of the entries in the Control List contain a single setting with a choice of values. The steps in this section show you how to change the values in these settings. The Address entry, which contains multiple settings, is covered on page 85, *Entering your station self address*.

To change a setting in the Control List:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Go to the entry in which the setting you want to change is stored, then *hold* ✓.

  NOTE Scroll to the entry or use the Find feature (for help see page 80, *Finding words and values*).

  A question mark is displayed at the end of the heading to show that you can now edit the setting. For example:



- ❑ Scroll to the value you want (if it is a slider screen or a list) or enter text (for help see page 66, *Entering and editing text*).

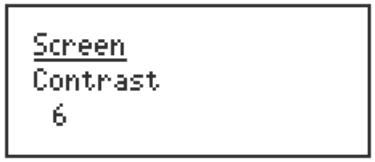
  If you do not want to save the change you made and you are in a setting where you can:

  - select a value from a list or slider screen, press ✕ or PTT
  - enter and delete text, *hold* ✕ or press PTT

  The change is discarded and the setting is closed.

- ❑ Press ✓.

  The question mark is removed.



- ❑ Press ✕ until **Main Menu** is displayed.

Making changes to all other lists

NOTE In the following examples, you must log in as administrator to see the lists (see page 120, *Logging in to admin level from user level*).

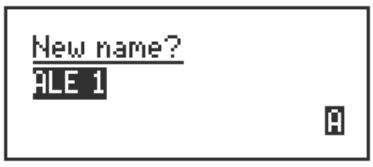
The following steps can be used to make changes in every list except the Control List (see page 104, *Changing a setting in the Control List*).

Creating an entry in a list

To create an entry in a list:

- ❑ Select the list in which you want to create an entry.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Create entry**, then press ✓.

  The transceiver suggests a name for the new entry based on the name of the entry you were on. For example:



- ❑ Enter the name you want to use for the new entry.

  The name must be unique to the list that you are in.

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Press ✓.

  The transceiver prompts you to enter settings for the entry.

For information on settings in the...	See...
Channel List	page 128
Network List	page 136
Phone Link List	page 148
Address List	page 153

  The new entry is created and the List Manager remains open.

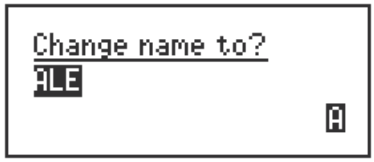
- ❑ If you want to view the entry you have created, press ✕ to close the List Manager.

Renaming an entry in a list

To rename an entry in a list:

- ❑ Go to the entry you want to rename.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Rename entry**, then press ✓.

  The transceiver displays the existing name of the entry for editing.



- ❑ Enter the new name you want to use for this entry.

  The name must be unique to the list that you are in.

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Press ✓.

  The entry is renamed and the List Manager remains open.

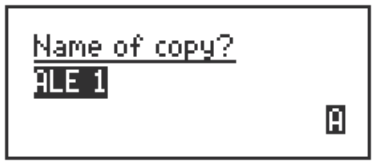
- ❑ If you want to view the entry you have renamed, press ✕ to close the List Manager.

Copying an entry in a list

To copy an entry in a list:

- ❑ Go to the entry you want to copy.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Copy entry**, then press ✓.

  The transceiver suggests a name for the new entry based on the name of the entry you were on.



- ❑ Enter the name you want to use for the copy of this entry.

  The name must be unique to the list that you are in.

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Press ✓.

  A copy of the original entry, with the new name, is created and the List Manager remains open.

- ❑ If you want to view the entry you have created, press ✕ to close the List Manager.

Editing an entry in a list

To edit an entry in a list:

- ❑ Go to the entry you want to edit.
- ❑ Press ✓ to view the settings for the entry.
- ❑ Scroll to the setting you want to edit, then *hold* ✓.

For information on settings in the...	See...
Channel List	page 128
Network List	page 136
Phone Link List	page 148
Address List	page 153

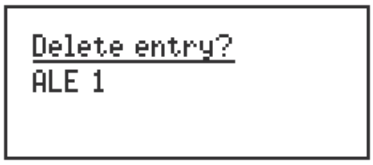
- ❑ When you have edited the settings, press ✕ until you return to the entry.

Deleting an entry from a list

To delete an entry from a list:

- ❑ Go to the entry you want to delete.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Delete entry**, then press ✓.

  The transceiver asks you to confirm that you want to delete the entry.



- ❑ Press ✓.

  The entry is deleted and the List Manager remains open.

Saving call log information to the Address List

NOTE You can save call log information to the Address List if Option GPS Enable is installed.

If you receive a call from another station, or make a new call to another station, an entry is recorded in the Calls In Log or Calls Out Log respectively. You can save this information to the Address List using the List Manager, then use this entry for subsequent calls. If the received call contains GPS information, this can also be saved. When you access this entry in the Address List, and you have a valid GPS location entered for your station, the distance and bearing to the remote location is displayed.

NOTE Automatic distance and bearing calculations only occur when Option GPS Enable is installed.

If a call is received from a station that has an entry in the Address List, the name of this entry is used to identify the incoming call.

To save call log information to the Address List:

- ❑ Press **#** once to go to the Calls Out Log, or twice to go to the Calls In Log.
- ❑ Go to the entry you want to save to the Address List.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Save to Address**, then press ✓.

  The transceiver suggests a name for the entry, based on any name associated with the caller address.

- ❑ Enter the name of the entry, then press ✓.

  NOTE For help with entering text see page 66, *Entering and editing text*.

  If you enter a name that is already used in the Address List, and you want to replace the contents of this entry, press ✓.

❑ Scroll to one of the following options, then press ✓.

Option	Action	Use
Address+Position	Creates an entry for a Selective call to the address provided. The position is saved as a message.	When you return to this entry, the distance and bearing to this location are displayed. To make a Selective call to this station, press **CALL**. To forward this position to a different station, *hold* **CALL**, scroll to **Message?**, enter the new address, then press **CALL**.
Position Only This Waypoint	Creates an entry for a Message call with a blank address. The position is saved as a message.	When you return to this entry, the distance and bearing to this location are displayed. To forward this position to a different station, press **CALL**, enter the new address, then press **CALL**.
Address Only	Creates an entry for a Selective call to the address provided.	To make a Selective call to this station, press **CALL**.

The entry in the Address List is created and the List Manager closes.

Saving GPS information to the Address List

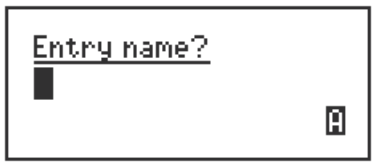
NOTE You can save GPS information to the Address List if Option GPS Enable is installed.

If you have a GPS receiver connected and configured to operate with your transceiver, you can record your current GPS information from the receiver as a waypoint in the Address List. For information on saving GPS information sent to you from another station see page 108, *Saving call log information to the Address List*. Any GPS information that is saved to the Address List displays the distance and bearing to this location from your transceiver's known location.

NOTE Automatic distance and bearing calculations only occur when Option GPS Enable is installed.

To save GPS information to the Address List:

- ❑ In any list other than the Address List, *hold* 🔍.
- ❑ Scroll to **Save Waypoint**, then press ✓.
- ❑ Enter the name of the entry, then press ✓.



NOTE For help with entering text see page 66, *Entering and editing text*.

If you enter a name that is already used in the Address List, and you want to replace the contents of this entry, press ✓.

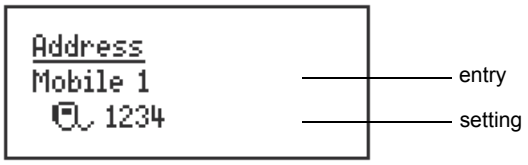
The entry in the Address List is created and the List Manager closes.

Hiding and showing settings

You can set up the transceiver to show the first setting for each entry in a list.

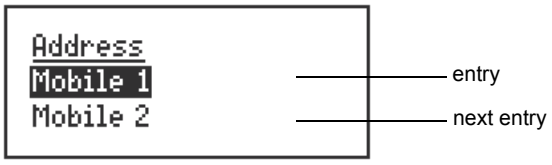
Figure 18 shows an entry (Mobile 1) in the Address List with the first setting for the entry (call type and address) displayed under it. The setting is indented to indicate that it belongs to the entry above it.

Figure 18: The Address List with settings shown



If you do not want the first setting to be displayed, you can hide it. The next entry in the list is displayed instead, as shown in Figure 19.

Figure 19: The Address List with settings hidden

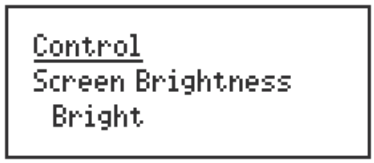


NOTE In the following examples, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

Hiding settings in a list

To hide settings in a list:

- ❑ Go to the list in which you want to hide settings. For example:



- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Display options...**, then press ✓.
- ❑ Scroll to **Hide settings?**, then press ✓.

  The settings are hidden and the List Manager remains open.

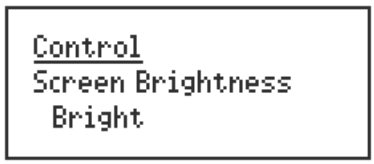
Showing settings in a list

To show settings in a list:

- ❑ Go to the list in which you want to show settings. For example:

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Display options...**, then press ✓.
- ❑ Scroll to **Show settings?**, then press ✓.

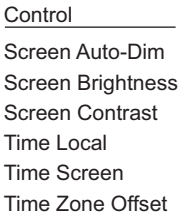
  The settings are shown and the List Manager remains open.



Grouping and ungrouping entries

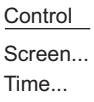
When entries in lists are ungrouped, they are displayed on a single level. When you scroll through the list, you scroll over each entry in it.

Figure 20: Ungrouped entries in a list



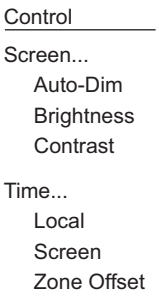
If you want to simplify your lists so that you do not have to scroll over each entry, you can group the entries. When you do this, a second level is created for groups of entries that begin with the same word. The word that is common to the group is displayed on the first level and is followed by an ellipsis (...) to indicate that there are entries beneath it.

Figure 21: Grouped entries in a list, level one



This reduces the number of items over which you have to scroll. The entries themselves are displayed on the second level.

Figure 22: Grouped entries in a list, levels one and two



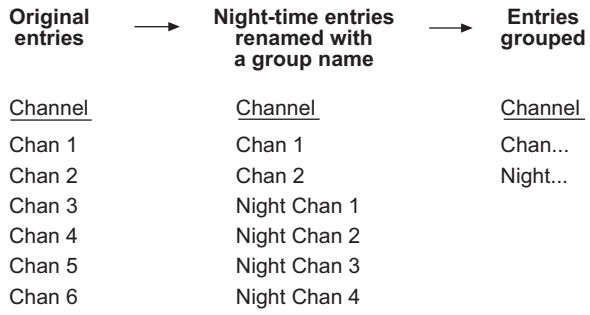
To display the entries on the second level you simply select the group name (for example, Screen...) on the first level. The entries can then be selected and edited in the same way as other entries.

The entries in the Control List have been named to take advantage of grouping. Related entries begin with the same word so that, grouped or ungrouped, they appear close to each other in the list (for example, Time Local, Time Screen, Time Zone Offset).

You cannot change the names of the entries in the Control List. You can, however, take advantage of grouping in other lists by creating or renaming your entries with group names.

For example, if you have a number of channels that you only use at night, you could rename them using a group name such as 'Night', then group the entries in the Channel List (see Figure 23). This saves your having to scroll over the night-time channels when you do not need to use them, and to limit your scrolling to within the group when you do.

Figure 23: Ungrouped and grouped entries



NOTE In the following examples, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

Grouping entries

To group entries:

- ❑ Open the list in which you want to group entries. For example:

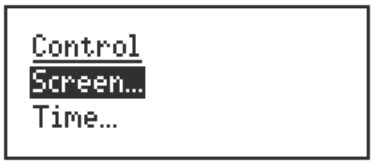
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Display options...**, then press ✓.
- ❑ Scroll to **Group entries?**, then press ✓.

  The entries are grouped and the List Manager remains open.

- ❑ If you want to view the grouped entries, press ✕ to close the List Manager.

  If you were on an entry with a group name when you opened the List Manager, the lowest level of that group is displayed when you exit the List Manager. The group name is displayed on the top line.

- ❑ To return to the top level of the group, press ✕ until the name of the list you are in is displayed on the top line.



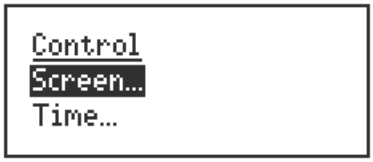
Ungrouping entries

There are two ways to ungroup entries in a list. If you want to temporarily ungroup the entries in a list, scroll to a grouped entry, then *hold* ✓. The entries remain ungrouped until you exit the list.

If you want the entries to be ungrouped each time you open the list, use the steps below.

To ungroup entries:

- ❑ Open the list in which you want to ungroup entries. For example:



- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Display options...**, then press ✓.
- ❑ Scroll to **Ungroup entries?**, then press ✓.

  The entries are ungrouped and the List Manager remains open.

- ❑ If you want to view the ungrouped entries, press ✕ to close the List Manager.

Selecting a grouped entry

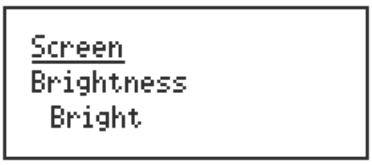
To select a grouped entry:

- ❑ Scroll to the grouped name, then press ✓.

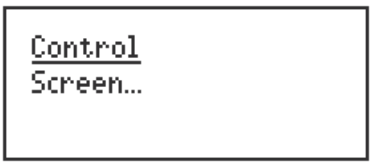
  The grouped name is displayed on the top line and the first entry is displayed beneath it.

NOTE If the settings are hidden, the next entry in the list is displayed on the bottom line instead of a setting.

- ❑ Scroll through the entries until the one you want is displayed on the active line.



- ❑ To return to the first level of the list, press ✕.

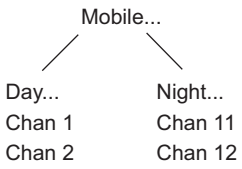


Locking and hiding grouped entries

Grouped entries can be locked and hidden. The process is the same as that for individual entries except that you start by going to the name of the group you want to lock or hide, not to a single entry.

For example, to lock all the channels in Figure 24 you would go to the group name Mobile... and lock it. To lock the night-time channels, you would go to the group name Night... For more information on locking and hiding entries see page 125, *Locking and unlocking information* and page 123, *Hiding and showing information*.

Figure 24: Locking and hiding grouped entries



Restricting access to information

Access to information in the transceiver can be restricted in two ways. You can lock lists, entries and settings to prevent them from being edited, and you can hide them to prevent them from being displayed.

For example, if you do not want users to change the transmit frequencies of channels in the transceiver, you can lock the settings in which these frequencies are stored. If you do not want users to see these frequencies, you can hide the settings.

User, admin and factory level

Lists, entries and settings can be locked and hidden at three levels—user, admin and factory level—and they can only be unlocked and displayed by someone logged in to the same or a higher level.

User level is the lowest and most general level. When you switch on the transceiver you are automatically logged in to this level. Items locked and hidden at this level can be unlocked and displayed by others logged in to this level or admin level. The user should be able to access all necessary information for the day-to-day operation of the transceiver at this level. By default, the user has access to the Channel and Address Lists.

Admin level is for use by system administrators. Items locked and hidden at this level can only be unlocked and displayed by others logged in to this level. This prevents users from being able to change and display these items. For details on admin level see Table 16 on page 119 and page 120, *Logging in to admin level*. By default, all lists are hidden at admin level however, this can be changed by the administrator to meet the user's requirements. If the administrator recognises that there is an entry in the Control List to which the user requires access, they can either unlock and show the entry at user level, or set up a hot key to access the entry (see page 293, *Creating a macro and assigning it to a hot key*).

Factory level is the highest level and is used by Codan to lock certain configuration settings in the Control List. Items locked at this level can be displayed by users and administrators but cannot be unlocked. You cannot log in to factory level.

Items can be locked at one level and hidden at another. For example, if you have access to admin level and do not want users to display the factory-locked configuration settings in the Control List, hide these settings at admin level.

Table 16 summarises the access restrictions you can place on items at user and admin level. Locking and hiding information is covered in more detail on page 125, *Locking and unlocking information* and on page 123, *Hiding and showing information*.

Table 16: Restricting access to information at user and admin levels

If you log in to user level...	You can... • lock and hide items at user level • unlock items that have been locked at user level • display items that have been hidden at user level You cannot... • unlock items that have been locked at admin or factory level • display items that have been hidden at admin or factory level
If you log in to admin level...	You can... • lock and hide items at user and admin level • unlock items that have been locked at user or admin level • display items that have been hidden at user or admin level You cannot... • unlock items that have been locked at factory level

Full and normal view

Full view is a feature that enables you to display items that have been hidden at the level into which you are logged, and to see the level at which items have been locked.

For example, if you have logged in as a user then switch to full view, information that is hidden at user level is displayed and icons at the top right of the screen indicate the level at which any items have been locked and hidden. When you switch to normal view, the hidden items and the icons are removed. Full and normal view are covered in more detail on page 122, *Displaying full and normal view*.

Logging in to admin level

Logging in to admin level gives you access to the Admin... group of entries in the List Manager (see Table 15 on page 100). These entries enable you to lock and hide information at admin level.

When you log in to admin level:

- all locked entries are temporarily unlocked
- full view is enabled

There are two ways you can log in to admin level. If you are prompted to enter a password when you switch on the transceiver, you can enter the admin password instead of the user password.

NOTE If you want to log in to admin level this way, make sure that a user and an admin password have been set in the Control List. When you switch on the transceiver, you are only prompted to enter a password if a user password is set.

You can also log in to admin level by logging in at user level then using the Admin login entry in the List Manager.

Logging in to admin level from user level

To log in to admin level from user level:

❑ *Hold* 🔍 to open the List Manager.

If Quick Start is enabled, scroll to **Advanced...** in the Quick Start menu, then press ✓.

❑ Scroll to **Config...**, then press ✓.

❑ Scroll to **Admin login**, then press ✓.

❑ Enter the admin password, then press ✓.

NOTE If an admin password has not been set in the Password Admin entry in the Control List, you can log in by simply pressing ✓.

You are logged in to admin level and the List Manager remains open.

❑ If you want to access the Main Menu, press ✕ until **Main Menu** is displayed.

Logging out of admin level

To log out of admin level:

- ❑ *Hold* 🔍 to open the List Manager.

  If Quick Start is enabled, scroll to **Advanced...**, then press ✓.
- ❑ Scroll to **Admin...**, then press ✓.
- ❑ Scroll to **Admin logout**, then press ✓.

  You are returned to user level and the List Manager remains open.

NOTE If you switch off the transceiver while you are logged in to admin level you are automatically logged out.

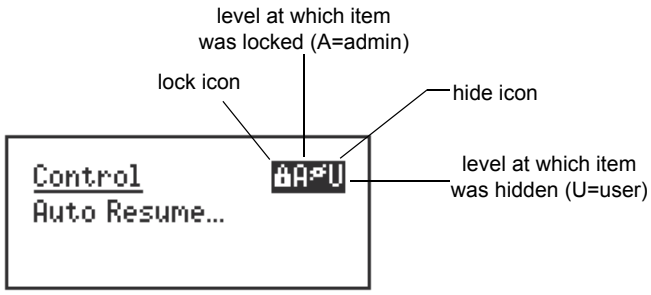
Displaying full and normal view

Full view is a feature that enables you to display any items that have been hidden at the level into which you are logged, and to see the level at which items have been locked.

When you switch to full view, icons are displayed at the top right of the screen to indicate whether an item is locked and/or hidden, and the level at which these restrictions were set (for more information on access levels see page 118, *Restricting access to information*). When you switch to normal view, the icons and any items that have been hidden are removed.

Figure 25 shows the handset screen in full view. The entry in this figure is locked at admin level to prevent it from being edited by users, and hidden at user level to prevent it from being displayed to users in normal view.

Figure 25: Full view



If you want to unlock an item that was locked at the same level as that into which you are logged, you do not need to switch to full view. For example, if you are logged in to user level and want to unlock an item locked at user level, you can do so in normal view.

If you want to be able to see an item that has been hidden in normal view, you must first switch to full view to display the item (with its hide icon), then use the Config... Show? entry in the List Manager. When you return to normal view, the item is displayed.

For more information on locking and hiding items at different levels see page 125, *Locking and unlocking information* and page 123, *Hiding and showing information*.

Switching between full and normal view

To switch between full and normal view:

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Display options...**, then press ✓.
- ❑ Scroll to **Full view?** or **Normal view?**, then press ✓.

  Full view or normal view is displayed and the List Manager remains open.

Hiding and showing information

If you want to prevent users from displaying information, in particular lists, entries and settings, you can hide these items. For example, to prevent users from displaying the transmit frequency of a channel, you can hide the setting in which the frequency is stored. You can also hide entries in lists to reduce the number of items over which you need to scroll. By default, all lists are admin hidden. Therefore, users cannot access configuration information in the transceiver unless the administrator shows this information at user level.

You can hide lists, entries and settings at one of two levels: user level and admin level (for more information see page 118, *Restricting access to information*). Table 17 summarises the effects of hiding information at these levels.

When you log in to admin level, full view is automatically enabled, so all items hidden at user or admin level are displayed.

CAUTION If a hot key has been created to display a hidden item, anyone can display the item by using the hot key. If the item is not locked, anyone can edit the item.

Table 17: Hiding items at user and admin levels

Hiding an item at...	**Means that...**
user level	• the item is hidden from anyone logged in to user level, in normal view • users can display the item by switching to full view • users can display the item in normal view by using the Config... Show? entry in the List Manager • the item is visible to anyone logged in to admin level, in normal or full view
admin level	• the item is hidden from anyone logged in to user level, in full or normal view • all items hidden at user or admin level are displayed automatically

Hiding or showing an item at user level

To hide or show a list, entry or setting at user level:

- ❑ Go to the list, entry or setting you want to hide or show.

NOTE — You may need to switch to full view to see the item (see page 122, *Displaying full and normal view*).

NOTE — If you want to hide a group of entries in a list, make sure that the entries in the list are grouped, then go to the name of the group you want to hide. For more information on grouping entries see page 113, *Grouping and ungrouping entries*.

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Config...**, then press ✓.
- ❑ Scroll to **Hide?** or **Show?**, then press ✓.
- ❑ Switch to normal view, if required.

The List Manager remains open.

Displaying an item hidden at user level

To display a list, entry or setting that is hidden at user level:

- ❑ Switch to full view (for help see page 122, *Displaying full and normal view*).
- ❑ Go to the list, entry or setting that was hidden.

NOTE — If the item is not displayed in full view, it has been hidden at admin or factory level.

Hiding or showing an item at admin level

To hide or show a list, entry or setting at admin level:

- ❑ Log in to admin level if you have not already done so (for help see page 120, *Logging in to admin level*).
- ❑ Go to the list, entry or setting you want to hide or show.

NOTE — If you want to hide a group of entries in a list, make sure that the entries in the list are grouped, then go to the name of the group you want to hide. For more information on grouping entries see page 113, *Grouping and ungrouping entries*.

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Admin...**, then press ✓.
- ❑ Scroll to **Admin hide?** or **Admin show?**, then press ✓.

The List Manager remains open.

Locking and unlocking information

If you want to prevent users from changing information, in particular lists, entries and settings, you can lock these items. For example, if you want to prevent users from changing the station self address of the transceiver you can lock the Address entry in the Control List. If you want to prevent users from changing any information in the Control List you can lock the entire list. In addition, locking items prevents them from being accidentally changed.

You can lock lists, entries and settings at one of two levels: user level and admin level (for more information see page 118, *Restricting access to information*). Table 18 summarises the effects of locking information at these levels.

When you log in to admin level, all locked items are temporarily unlocked.

Table 18: Locking items at user and admin levels

Locking an item at...	**Means that...**
user level	• anyone logged in to user level can unlock the item by using the Unlock? or Locks off? entries in the List Manager, then they can edit the item • anyone logged in to admin level can edit the item without unlocking it first
admin level	• the item cannot be edited by anyone logged in to user level • the item can be edited by anyone logged in to admin level

Locking or unlocking an item at user level

To lock or unlock a list, entry or setting at user level:

❑ Go to the list, entry or setting you want to lock or unlock.

NOTE — If you want to lock a group of entries in a list, make sure that the entries in the list are grouped, then go to the name of the group you want to lock. For more information on grouping entries see page 113, *Grouping and ungrouping entries*.

❑ *Hold* 🔍 to open the List Manager.

❑ Scroll to **Config...**, then press ✓.

❑ Scroll to **Lock?** or **Unlock?**, then press ✓.

The item is locked or unlocked and the List Manager remains open.

Locking or unlocking an item at admin level

To lock or unlock a list, entry or setting at admin level:

- ❑ Log in to admin level if you have not already done so (for help see page 120, *Logging in to admin level*).
- ❑ Go to the list, entry or setting you want to lock or unlock.

NOTE — If you want to lock a group of entries in a list, make sure that the entries in the list are grouped, then go to the name of the group you want to lock. For more information on grouping entries see page 113, *Grouping and ungrouping entries*.

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Admin...**, then press ✓.
- ❑ Scroll to **Admin lock?** or **Admin unlock?**, then press ✓.

  The item is locked or unlocked and the List Manager remains open.

Switching locks off or on at user level

If you need to edit a number of items that have been locked you may want to use the locks off feature. This switches off all the locks set at the level into which you are logged, so you do not have to unlock items individually. When you have edited the items you can reinstate all the locks in one step using the locks on feature.

NOTE — If you switch off the locks and switch off the transceiver, the locks are automatically reinstated.

To switch locks off or on at user level:

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Config...**, then press ✓.
- ❑ Do one of the following:
  - To switch locks off, scroll to **Locks off?**, then press ✓.
  - To switch locks on, scroll to **Locks on?**, then press ✓.

  The List Manager remains open.

7 The Channel List

This section contains the following topics:

About channels

A channel is a frequency or pair of frequencies to which a name is given, such as ‘Channel 1’, ‘4500’ and ‘Headquarters’. You must enter the details of at least one channel before you can make or receive a call. Channels are stored in the Channel List.

Settings in the Channel List

When you create a channel, you must enter:

- a name for the channel
- the receive and transmit frequencies of the channel, if applicable
- one or more modes to be used with the channel

Channel names

A channel name can consist of letters, numbers or a combination of both. Before you name any channels, consider using group names to make navigation in the Channel List easier (for more information see page 113, *Grouping and ungrouping entries*).

CAUTION

You should be aware of any restrictions placed on channel names in your transceiver when it is used with a Codan HF data modem, radio/telephone interconnect, or InterNav© software. See the documentation provided with this equipment.

Frequencies

The receive and transmit frequencies may be any frequencies within the HF range. However, the transmit frequencies can only be those allocated to you by the relevant government authority in your country.

Spectral regulations may require the TxD option to be installed in the transceiver. In this case, you cannot create channels with new transmit frequencies. You can, however, create receive-only channels, and channels with the same transmit frequency as an existing channel. If the TxP option is installed in the transceiver, you cannot create channels.

Modes

A mode specifies a combination of a sideband (for example, USB or LSB) and IF filter settings (that is, bandwidth and centre frequency). Each channel must have at least one mode. You may want to select several modes for each channel depending on the modes available to you.

When the standard IF filter is fitted, the allowable modes are USB and LSB. If a different filter is fitted, other modes are available. For example, if you have a narrow Morse filter fitted, USB CW and LSB CW are available.

Programming the Channel List

Creating a channel

This section covers creating a channel in a transceiver where receive and transmit frequencies can be entered.

NOTE If you are operating the transceiver in a country that has stringent licensing regulations, you may not be permitted to create channels with transmit frequencies.

NOTE If the TxD option is installed in the transceiver, there are restrictions on the frequencies you can enter.

NOTE If the TxP option is installed in the transceiver, you cannot create channels.

NOTE You may be permitted to create a channel in free tune. For more information see page 287, *Creating a channel in free tune*.

To create a channel:

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

  NOTE If the Channel List is empty, **Free Tune** is displayed.

- ❑ Use the List Manager to create an entry (for help see page 105, *Creating an entry in a list* and page 66, *Entering and editing text*).
- ❑ Enter the setting information provided in the following table as required, then press ✓ to enter the information.

If this prompt is displayed...	Do this...
Receive Freq	• use this frequency, or • enter a new receive frequency in kilohertz NOTE You can enter the frequency to three decimal places. Press * to enter a decimal point, then continue with entering the frequency.

If this prompt is displayed...	Do this...
Transmit Freq	• use this frequency, or • enter a new transmit frequency in kilohertz, or • disable the transmit frequency by pressing ✕ repeatedly until the setting is empty NOTE If the TxD option is installed in the transceiver, you cannot create channels with new transmit frequencies. You can however, create channels with the same transmit frequency as an existing channel, and you can disable transmit frequencies to create receive-only channels.
Mode	• enter a mode NOTE If multiple modes can be added to the channel, scroll to the new mode, then press ✓. If you do not want to add another mode, press ✕.

The new channel is created and the List Manager remains open.

❑ If you want to view the channel you have created, press ✕ to close the List Manager.

NOTE If you disabled the transmit frequency, dashes are displayed in place of the transmit frequency.

Renaming a channel

When you rename a channel, references to the channel in other lists are not automatically updated; you must go to the Address, Network and Phone Link Lists and update any references to the channel.

For example, if the channel you renamed is used in a network, go to the channel/mode list for the network, find the reference to the old channel name, then edit it so that the new name is displayed (for help see page 145, *Editing a network* and page 141, *Channel/Mode*). If you do not update the reference to the channel, the channel is not scanned when scanning is switched on.

Renaming a channel is a standard list function. For help see page 106, *Renaming an entry in a list*.

Copying a channel

Copying a channel is a standard list function. For help see page 106, *Copying an entry in a list*.

Editing a channel

Editing a channel is a standard list function. For help see page 107, *Editing an entry in a list*.

Deleting a channel

Deleting a channel is a standard list function. For help see page 107, *Deleting an entry from a list*.

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8 The Network List

This section contains the following topics:

About networks

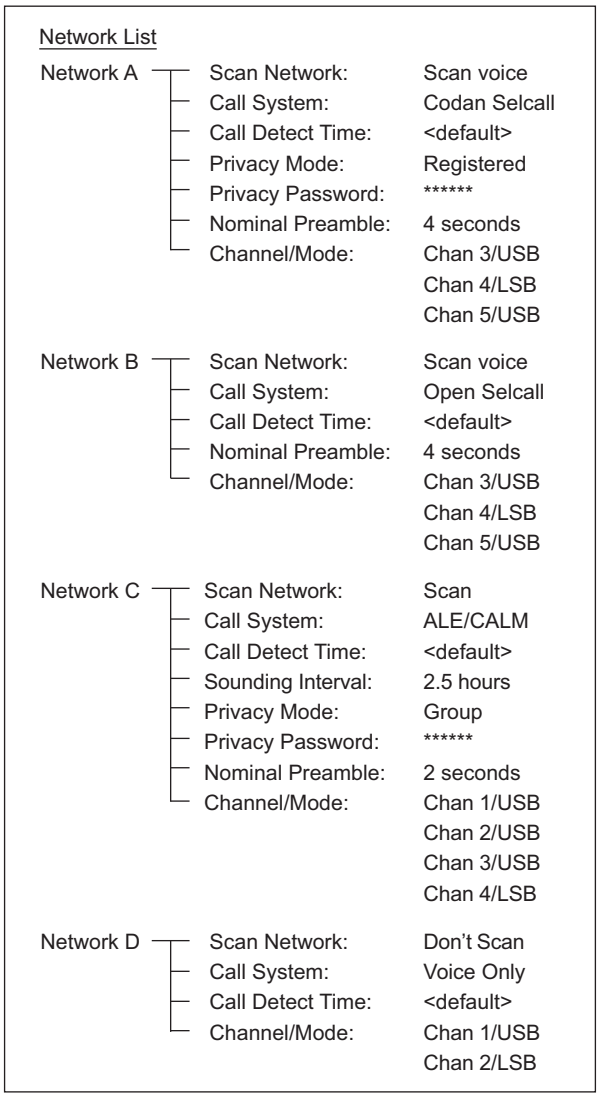
A network is two or more stations that use the same frequencies and call system to communicate. This simplifies communication because each station knows the method with which they can make and scan for incoming calls, and the frequencies they can use. Information about the networks you may use is stored in the Network List.

Networks are based on call systems. A call system is a method of making and receiving calls. For example, if you are in a network that uses the Codan Selcall or Open Selcall call system, you make calls by entering the address of the station you want to call, then selecting the channel/mode you want to use. When your call is detected by the receiving station, that station rings to alert the operator. In an ALE/CALM network, you make calls by entering the address of the station you want to call. The transceiver selects the best channel on which to make the call.

When you create a network, the transceiver prompts you to select a call system, then prompts you for further information based on your selection. Figure 26 shows an example of the information required to create networks based on the Codan Selcall, Open Selcall, ALE/CALM, and Voice Only call systems. This information is explained on page 136, *Settings in the Network List*.

NOTE The call systems from which you can select depend on the options installed in the transceiver.

Figure 26: An example of information stored in the Network List



Settings in the Network List

NOTE In the following discussion, you must log in as administrator to see the Network List (see page 120, *Logging in to admin level from user level*).

Network Name

CAUTION You should be aware of any restrictions placed on network names in your transceiver when it is used with a Codan HF data modem, a radio/telephone interconnect, UUPlus© software, or InterNav© software.

Scan Network

The Scan Network setting applies to all types of networks. It enables you to specify whether or not you want the channels in the network to be scanned when scanning is switched on. You can also set the transceiver to scan for voice in voice networks even when the Mute Type is set to **Selcall**.

NOTE The transceiver is able to scan a maximum of 100 channels at a time. If the total number of channels in all the networks you are scanning exceeds 100, only 100 of the channels are scanned. Other NGT Transceivers will scan up to the maximum number of channels supported by the type of transceiver.

Call System

The Call System setting applies to all types of networks. The call system is the method used by the network to make and receive calls, for example, Codan Selcall, Open Selcall, ALE/CALM, or Voice Only. The call systems from which you can select depend on the options installed in the transceiver.

If your network uses the Codan Selcall or Open Selcall call system, you can make calls by selecting an appropriate channel/mode then entering the address of the station you want to call. When your call is detected by the receiving station, that station rings to alert the operator. If your network uses the ALE/CALM call system, the transceiver can select the best channel/mode for you. If your network uses the Voice Only call system, you can make calls by selecting an appropriate channel/mode, then *holding down* PTT and speaking. You cannot enter the address of the station you want to call.

A Codan Selcall network can receive calls sent from a transceiver using the Open Selcall protocol. If you want to be able to make calls to transceivers that use the Open Selcall protocol, you must set up an Open Selcall network to use with these calls.

CAUTION Any station that is tuned to your frequency and has mute switched off can listen to your voice conversation.

Call Detect Time

The Call Detect Time setting applies to all types of networks. The call detect time is the length of time during scanning that the transceiver pauses on each channel in order to detect an incoming call. The call detect time is the inverse of the scan rate. For example, a call detect time of 0.2 s is equivalent to a scan rate of 5 channels/s. Codan HF transceivers can scan at up to 8 channels/s in an ALE/CALM network, hence the call detect time of 0.12 s.

You can set the call detect time to **<default>** or to a specific value. The default call detect time for each call system is shown in Table 19.

Table 19: Default call detect times

Call system	Default call detect time on each channel (s)
Codan Selcall	0.3
Open Selcall	0.3
ALE/CALM	0.12
Voice Only	0.5

There should be no requirement to change the call detect time from the default value. If you change the call detect time or change the number of channels in the network, you must recalculate the nominal preamble time, that is, the call detect time multiplied by the number of channels in the network (see page 139, *Nominal Preamble*).

NOTE You cannot set a call detect time that is lower than the default value.

CAUTION You should be aware of any restrictions placed on call detect times in your transceiver's networks when it is used with an HF Data Modem 3012. For more information see the *HF Data Modem 3012 Reference Manual*.

Sounding Interval

The Sounding Interval setting applies to ALE/CALM networks only. The sounding interval is the frequency with which the transceiver sends sounding signals to other stations to assess the quality of the channels in the network.

The recommended value is 5 hours. The longer the value, the longer the transceiver takes to update its channel quality information. If the value is set to 5 hours, the transceiver takes 5 days to completely update channel quality information. Longer sounding intervals decrease the interruptions on network channels.

NOTE Link quality information is also updated each time a call is made or received.

Privacy Mode

The Privacy Mode setting applies to Codan Selcall and ALE/CALM networks only. The privacy mode is the method used to encrypt the data content of calls between stations. If you select **Registered** or **Group**, you must enter an appropriate password into the Privacy Password setting.

Privacy mode...	Is used for...
Registered	encrypting Phone calls that you make when you have registered with a network that encrypts telephone numbers (you are provided with a password that you must enter into the Privacy Password setting)
Group	encrypting data in calls between two stations (you agree upon a password to enter into the Privacy Password setting)
None (lowest mode)	calls made under a Codan protocol, which uses special formatting

When you are setting up ALE/CALM networks, you should ensure that you set up networks with the same privacy mode for communication. If there is a mismatch in privacy modes, the receiving station uses the most suitable privacy mode out of the networks through which the call may be received.

For example, if an initiating station starts an ALE call containing data through a network that has its privacy mode set to **None**, and the receiving station determines that the address is valid in networks with the privacy mode set to **Group** or **None**, then it selects the network with the privacy mode set to **None** on which to establish the link.

However, if the receiving station determines that the address is available in a Group network only, it selects the Group network on which to establish the link. Data communications within this link are not successful because the initiating station does not have the password for the Group privacy mode at the receiving station.

If an initiating station starts an ALE call (without data), the receiving station determines in which networks the address is valid, selects a network with the lowest privacy mode available, then establishes the link. Data communications may proceed as per the privacy modes of the selected sending and receiving networks.

Privacy Password

The Privacy Password setting applies to Codan Selcall and ALE/CALM networks where the privacy mode is set to **Group** or **Registered**. The privacy password is the password that enables you to use the privacy mode mentioned above. It can be up to 15 characters long. With 93XX transceivers you can use up to 6 characters for the password.

Nominal Preamble

The Nominal Preamble setting applies to Codan Selcall, Open Selcall, and ALE/CALM networks only. The nominal preamble is the length of the preamble signal sent by the transceiver when you make a call. This is the signal for which other transceivers scan in order to detect your call.

The nominal preamble should be set to no less than the number of channels in the network multiplied by the call detect time (see page 137, *Call Detect Time* and Table 20). If you set the Nominal Preamble setting to **<default>**, the transceiver calculates the length of preamble at the time of the call, based upon the number of channels in the network (see Table 21).

Table 20: Nominal preamble times calculated from call detect time

Call system	Default call detect time on each channel (s) (from Table 19)	Nominal preamble time calculated and entered by system administrator for 10 channels in a network (s)
Codan Selcall	0.3	3
Open Selcall	0.3	3
ALE/CALM	0.12	1.2

Table 21: Default nominal preamble times

Call system	Default nominal preamble time on each channel (s)	Nominal preamble time calculated automatically by transceiver for 10 channels in a network (s)
Codan Selcall	0.6	6
Open Selcall	0.6	6
ALE/CALM	0.8	8

If you are calling a station that uses identical network information, the preamble of the initiating station matches the detection requirements of the receiving station.

CAUTION

If the nominal preamble for an ALE/CALM network is set to **<default>** *and* a channel is manually selected for the call, no preamble is sent when the call is made.

If you intend to manually select channels to call scanning stations, then a non-default nominal preamble should be set.

You may need to adjust the nominal preamble from the default value if:

- the transceivers are not scanning identically
- the transceivers are scanning multiple networks
- more than 10 channels are included in the network being scanned
- there is low channel availability due to a poor signal-to-noise ratio, interference, or high traffic (that is, frequent pausing)
- there are transceivers in the network that are also scanning for voice

If a transceiver you want to call scans multiple networks, the preamble can be increased to the time it takes that transceiver to scan all of its channels. The nominal preamble must be set according to the transceiver in the communication network with the slowest scan cycle.

For Codan Selcall or Open Selcall networks with more than 10 channels in the network, the nominal preamble for each channel may be set to 0.3 s.

For ALE/CALM networks using Codan HF transceivers that are scanning identically, the nominal preamble for each channel may be reduced to 0.15 s.

NOTE The default nominal preamble for each channel in an ALE/CALM network (see Table 21 on page 139) complies with MIL-STD-188-141B ALE, and represents two ALE words (0.784 s).

Channel/Mode

The Channel/Mode setting applies to all networks. This setting contains the channels and modes used by the network. The modes from which you can select are those specified for the channel in the Channel List.

Before you add channel/modes to a network, consider the following:

- While there is no limit to the number of channels you can add to a network, the transceiver only scans a maximum of 100 channels at a time. If the total number of channels in all the networks you are scanning exceeds 100, only 100 of the channels are scanned.
- If several modes can be used with one channel and you want the channel to be scanned using each mode, create several entries for the channel, one for each mode. For example, if you want to scan ‘Chan 1’ using modes USB and LSB, create the entries ‘Chan 1/USB’ and ‘Chan 1/LSB’.
- An easy way to add and maintain channels in a network is to use groups of channels. Only the group name is stored in the Network List so you can add and delete channels from the group in the Channel List without having to update the Network List each time. When the network is scanned, the transceiver scans whichever channels are in the group at the time. For more information see page 113, *Grouping and ungrouping entries*.
- When you add a group of channels to a network, you must select a mode for the group. The mode should be an allowed mode for all the channels in the group as the transceiver only scans the channels for which the mode is allowed.

  If the mode is not an allowed mode for one or more channels, these channels are listed in a message that is displayed when you switch scanning on. In this situation these channels are not scanned. To ensure that they are scanned, add them to the network individually.
- A network cannot be scanned unless there are channel/modes in it. However, you can still use the network to make calls. The channel/modes from which you can select are all those in the Channel List.
- If you rename a channel in the Channel List and that channel is used in a network, you must delete the channel from the network and if necessary add the new channel name to the network.
- If you make frequent and significant changes to the channels and networks in the transceiver, you may want to use NSP to maintain this information.

Special network names

Specifying a default network to use with !<network name>

When you make a call from the Channel List, the transceiver usually prompts you to select a network and channel for the call. To avoid the transceiver prompting you for a network or channel, the system administrator should set up a network with a leading '!' in the name, for example, **!AidNet**. The !<network name> should contain all of the channels that are programmed into the transceiver, thus avoiding any prompting for channels.

These networks enable the operator to make a call on any channel in the transceiver with minimal prompting by the transceiver.

Networks called *CALM, *Selcall and *Voice

These networks are used with Quick Start (see page 71, *Quick Start*).

Programming the Network List

NOTE In the following discussion, you must log in as administrator to see the Network List (see page 120, *Logging in to admin level from user level*).

Creating a network

When you create a network, the transceiver prompts you for various details. It is recommended that you read *page 136, Settings in the Network List* before you create a network.

To create a network:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Network**, then press ✓.
- ❑ Use the List Manager to create an entry (for help see page 105, *Creating an entry in a list* and page 66, *Entering and editing text*).
- ❑ Enter the setting information provided in the following table as required, then press ✓ to enter the information.

If this prompt is displayed...	**Do this...**
Scan Network?	• select whether the network is scanned or not NOTE If you want to scan a voice network for voice when the Mute Type is set to **Selcall**, select **Scan voice** (see page 76, *Muting the transceiver*).
Call System?	• select the call system you want to use
Call Detect Time?	• increase or decrease the call detect time, or • scroll to the far left of the line until **<default>** is displayed
Sounding Interval?	• select the value you want to use
Privacy Mode?	• select the mode you want to use
Privacy Password?	• enter the password you want to use with the privacy mode
Nominal Preamble?	• increase or decrease the nominal preamble time, or • scroll to the far left of the line until **<default>** is displayed

If this prompt is displayed...	Do this...
Channel?	• select the channel you want to use NOTE If the channel is in a group, scroll to the group name, press ✓, then scroll to the channel you want to use. If you want to use a group of channels, scroll to the group name, then *hold* ✓.
Mode?	• select the mode for the channel or group of channels you want to use
Add another Channel/ Mode?	• select the channel/mode you want to use NOTE If you do not want to add another channel/ mode, press ✕.

The new network is created and the List Manager remains open.

❑ If you want to view the network you have created, press ✕ to close the List Manager.

Renaming a network

When you rename a network, references to the network in other lists are not automatically updated; you must go to the Address entry in the Control List to update any of your station self addresses that use the network, and to the Address and Phone Link Lists to update any entries that use the network.

For example, if the network you renamed is used in an entry in the Address List, go to this entry, find the reference to the old network name, then change it so that the new name is displayed (for help see page 164, *Editing an entry in the Address List*). If you do not update the reference to the network, the transceiver prompts you to select a network each time you use the entry to make a call.

Renaming a network is a standard list function. For help see page 106, *Renaming an entry in a list*.

Copying a network

Copying a network is a standard list function. For help see page 106, *Copying an entry in a list*.

Editing a network

Editing a network is a standard list function. For help see page 107, *Editing an entry in a list*.

Deleting a network

Deleting a network is a standard list function. For help see page 107, *Deleting an entry from a list*.

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9 The Phone Link List

This section contains the following topics:

About phone links

A phone link is a connection to a station with a radio/telephone interconnect unit that can route Phone calls from HF transceivers to the public telephone network.

The addresses of the phone link stations you use, and the networks and channel/modes you use to make Phone calls, can be stored in the Phone Link List. If you want to be prompted for some of these details when you make a Phone call, you can leave the relevant settings in the Phone Link List blank. If you want to be prompted for all of these details, leave the Phone Link List blank.

Settings in the Phone Link List

NOTE In the following discussion, you must log in as administrator to see the Phone Link List (see page 120, *Logging in to admin level from user level*).

Address

The Address setting in a phone link is the address of the transceiver connected to the radio/telephone interconnect.

Network

The Network setting in a phone link identifies the network through which the call is made to the transceiver connected to the radio/telephone interconnect.

Channel/Mode

The Channel/Mode setting in a phone link identifies the channel/mode combination that is used to make a call to the transceiver connected to the radio/telephone interconnect.

Programming the Phone Link List

NOTE In the following discussion, you must log in as administrator to see the Phone Link List (see page 120, *Logging in to admin level from user level*).

Creating a phone link

To create a phone link:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Phone Link**, then press ✓.
- ❑ Use the List Manager to create an entry (for help see page 105, *Creating an entry in a list* and page 66, *Entering and editing text*).
- ❑ Enter the setting information provided in the following table as required, then press ✓ to enter the information.

If this prompt is displayed...	Do this...
Address?	• enter the address of the phone link station, or • leave the address empty if you want to be prompted to choose an address when you make the call
Network?	• select the network in which you want to use this phone link, or • select **<blank>** if you want to be prompted to select a network when you make the call
Channel/Mode?	• select the channel/mode you want to use to make the call, or • select **<blank>** if you want to be prompted to select a channel/mode when you make the call

The new phone link is created and the List Manager remains open.

- ❑ If you want to view the phone link you have created, press ✕ to close the List Manager.

Renaming a phone link

When you rename a phone link, references to the phone link in the Address List are not automatically updated; you must go to the Address List and update any references to the phone link.

For example, if the phone link you renamed is used in an entry in the Address List, go to this entry, find the reference to the old phone link, then change it so that the new name is displayed (for help see page 164, *Editing an entry in the Address List*). If you do not update the reference to the phone link, the transceiver prompts you to select a phone link each time you use the entry to make a call.

Renaming a phone link is a standard list function. For help see page 106, *Renaming an entry in a list*.

Copying a phone link

Copying a phone link is a standard list function. For help see page 106, *Copying an entry in a list*.

Editing a phone link

Editing a phone link is a standard list function. For help see page 107, *Editing an entry in a list*.

Deleting a phone link

Deleting a phone link is a standard list function. For help see page 107, *Deleting an entry from a list*.

10 The Address List

This section contains the following topics:

About the Address List

The Address List is like any personal address book: it is a place to store the names and addresses of stations you often call. When you have entered the details of a station, calling the station becomes as simple as going to the entry for it, then pressing **CALL**.

If you want to be prompted to enter particular details at the time you make a call (for example, type a message or select a channel) you can leave the relevant settings blank. If you make several different types of calls to one address, you can create several entries with the same name and address but with different call types.

The Emergency 1 entry is stored in the Address List. This is the entry the transceiver calls when you *hold* ⚠. For more information see page 155, *Setting up the emergency key*.

The Address List may also be used to store various items of GPS information if you have Option GPS Enable installed. You can store GPS information about:

- your station, to provide a point of reference for automatic distance and bearing calculations
- other stations
- specific locations

This GPS information can be used as waypoints. When you review the Address List, an entry containing a waypoint displays the distance and bearing to the waypoint, relative to your own GPS location.

NOTE Automatic distance and bearing calculations only occur when Option GPS Enable is installed.

For information on making calls from the Address List and making calls using ⚠ see page 173, *Making a call*.

Settings in the Address List

CallType–Address

The call type is the type of call that you want to make to the station you want to call. For example, if you want to know where a mobile station is located, you send a Get Position call to the station. The Address setting is the address of the station you want to call.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Emergency, Message, Phone, Selective, or Send Position call type.

Message

The Message setting in the Address List entry is available when you select **Message?** as the call type (NGT *AR*, *SR*, and *AR Voice* Transceivers only). You can pre-store a standard message that is sent each time you make a call using this entry in the Address List. For example, you may need to notify your base station that you are shutting down for the day. Therefore, you would create an entry in your Address List to send a Message call (call type) to your base station (address) containing the message **Shut down**. The privacy mode and privacy password in the network used for the call specify how the data is transmitted, for example, plain or encrypted (see page 138, *Privacy Mode*).

The Message setting may also be used to store your GPS location if you have Option GPS Enable installed, but no GPS receiver. If you name this Address List entry **My GPS**, the transceiver reads the GPS information stored in the Message setting and uses it as a point of reference for automatic distance and bearing calculations. When you view an Address List or call log entry containing GPS information for a remote station or specific location, the transceiver automatically calculates, then displays, the distance and bearing to that remote GPS position.

NOTE Automatic distance and bearing calculations only occur when Option GPS Enable is installed.

A Message call closes the link as soon as the message is sent.

Phone Link

The Phone Link setting in an Address List entry is available when you select **Phone?** as the call type. It identifies the phone link station through which the call is made.

Network

The Network setting in an Address List entry identifies the network through which the call is made to the station you want to call.

Channel/Mode

The Channel/Mode setting in an Address List entry identifies the channel/mode combination that is used to make the call to the address given in the entry.

Setting up the emergency key

When you *hold* ⚠, the transceiver begins a call to the station specified in the Emergency 1 entry in the Address List. You can configure this entry to make any type of call available to you. Emergency and RFDS Emgcy calls trigger an emergency alert tone at the receiving station. The ⚠ key can be set up to call one or more stations in an emergency.

CAUTION You should pre-set all the settings in the Emergency entries so that the call is made automatically during an emergency without the transceiver prompting for information.

Calling one station in an emergency

To set up the ⚠ key to call one station in an emergency:

- ❑ Press **VIEW** until the Address List is displayed.
- ❑ Scroll to **Emergency 1**, then *hold* ✓.

NOTE If the Emergency 1 entry has been deleted, create a new entry and name it Emergency 1 (for help see page 163, *Creating an entry in the Address List*).

- ❑ Scroll to the setting that you want to set up, then *hold* ✓.
- ❑ Edit the details in each setting to suit the call you want to make (for help see page 107, *Editing an entry in a list*).

Calling several stations in an emergency

If you want to set up the ⚠ key to call several stations you can do so in two ways. You can:

- make one call to several stations simultaneously
- make several different types of calls in succession

Calling several stations simultaneously

If you want to call several stations simultaneously, set up the Emergency 1 entry in the Address List to make a call.

In an ALE/CALM network, calls to a group of stations can be made using the global ALL address syntax (@?@) through the Emergency, Message, Phone, Selective, or Send Position call type.

In a Codan Selcall network, calls to a group of stations can be made using a group selcall address through the Emergency, Message, or Selective call type. A group address is an address that ends in two or more zeros. For example, to call all stations with addresses that range from 1201 to 1299, you would enter **1200** as the address. To call all stations with addresses that range from 150001 to 159999, you would enter **150000** as the address.

Open Selcall supports group calls with 1 to 3 zeros in 4-digit addresses, and 1 to 4 zeros in 6-digit addresses.

To set up the ⚠ key to call several stations simultaneously:

- ❑ Press **VIEW** until the Address List is displayed.
- ❑ Scroll to **Emergency 1**, then *hold* ✓.

NOTE — If the Emergency 1 entry has been deleted, create a new entry and name it Emergency 1 (for help see page 163, *Creating an entry in the Address List*).

- ❑ Scroll to the CallType–Address setting, then enter the group selcall address.
- ❑ Scroll to the setting that you want to set up, then *hold* ✓.
- ❑ Edit the details in each setting to suit the call you want to make (for help see page 107, *Editing an entry in a list*).

Making several different types of calls

NOTE

This capability is available for use in Codan Selcall and Open Selcall networks, enabling you to make different types of calls, or even the same call type on several channels.

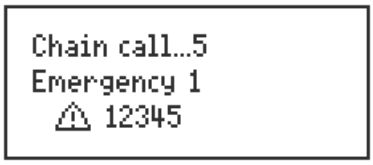
In ALE/CALM networks, the channel selection is typically done automatically, so it is not necessary to set up the Emergency entries in the Address List to make chain calls.

If you want to make several different types of calls in succession, you must create an entry in the Address List for each different type of call you want to make, and name the entries Emergency 1, Emergency 2, Emergency 3 and so on.

When you *hold* ⚠, the transceiver calls the station(s) specified in the Emergency 1 entry, then pauses for about 10 seconds. It then calls the station(s) in the Emergency 2 entry, and so on, until it calls the station(s) in the last Emergency entry. Calls made this way are referred to as chain calls.

When the transceiver pauses between calls it displays the seconds remaining in the pause at the top of the screen, as shown in Figure 27.

Figure 27: The handset screen during a chain call



You can terminate a chain call by pressing PTT. If you press PTT during:

- an Emergency or Selective call, you can continue with the current call but the chain call itself is terminated (that is, the transceiver does not call the *next* Emergency entry)
- a call in which data is being sent to another station (for example, a Message call), the current call and chain call are terminated

NOTE

If you want to make a call that sends data, and a call that enables you to speak to an operator, set up the Emergency entries to make the data call first: once you press PTT to speak to an operator, the chain call is terminated.

You can also terminate a chain call by pressing any key. The exceptions to this are:

- you can press ✕ to remove messages on the screen, and press 🔊 and 🔉 to adjust the volume at any time, without terminating the call
- if you are prompted to select and/or enter details about the call (for example, a channel/mode), you can press any keys required to enter these details without terminating the call

To set up the ⚠ key to call several stations in succession:

- ❑ Decide on the stations you want to call in an emergency, the type of call you want to make to each station, and the order in which you want to make the calls.
- ❑ Enter the details of the first call you want to make into the Emergency 1 entry (for help see page 107, *Editing an entry in a list*).
- ❑ Create an entry in the Address List, name it Emergency 2 and enter the details of the second call you want to make (for help see page 163, *Creating an entry in the Address List*).
- ❑ Create an entry for each subsequent call you want to make, naming the entries Emergency 3, Emergency 4 and so on.

  The number of Emergency entries you can create is limited by the number of entries you can store in the Address List.

Storing GPS information in the Address List

NOTE You can store GPS information in the Address List if Option GPS Enable is installed.

You can store GPS information in the Address List for the position of your station, remote stations, or other specific locations. You can receive this information via a call, then save it to the Address List, or you can enter your position information into an entry in the Address List manually. When you access this entry in the Address List, the distance and bearing to the location is displayed if your transceiver holds valid GPS information for its own position.

Often, fixed base stations do not have a GPS receiver fitted, as the position is static. If you know the GPS position of your fixed station, you can create a special entry in the Address List to store the information. This provides a reference point for automatic distance and bearing calculations to remote stations and specific locations.

NOTE Automatic distance and bearing calculations only occur when Option GPS Enable is installed.

Storing your GPS information in a transceiver

If your fixed base station does not have a GPS receiver, a special entry can be created in the Address List (called My GPS) to store your position information if Option GPS Enable is installed. The transceiver uses this information to provide distance and bearing readings to any GPS locations stored in the Address List or either of the call logs. To store GPS information in the Address List you may:

- save a position sent to you from a mobile station that is temporarily located at your fixed station
- create an entry in the Address List, then type in the location

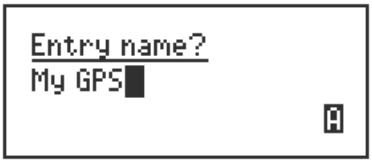
Saving your GPS information from a call log

To save your GPS information to the Address List:

- ❑ Make a Send Position call from a mobile station (with an enabled GPS receiver) that is located at your fixed station.
- ❑ Press **#** twice to go to the Calls In Log at your fixed station.
- ❑ Go to the entry containing the information from the Send Position call that you received above.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Save to Address**, then press ✓.

  The transceiver suggests a name for the entry, based on the caller address.

❑ Enter the text **My GPS** as the name for this entry.



NOTE For help with entering text see page 66, *Entering and editing text*.

❑ Press ✓.

If the My GPS entry in the Address List already exists, and you want to replace the contents of this entry, press ✓.

❑ Scroll to **Position Only**, then press ✓.

The entry in the Address List is created and the List Manager closes.

❑ Switch the transceiver off then on again to activate the new information in the My GPS entry in the Address List.

Entering GPS information in the My GPS entry in the Address List

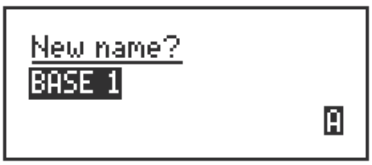
To create an entry in the Address List:

❑ Press **VIEW** until the Address List is displayed.

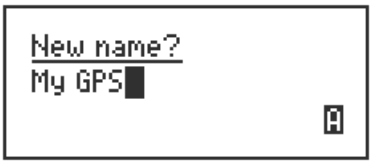
❑ *Hold* 🔍 to open the List Manager.

❑ Scroll to **Create entry**, then press ✓.

The transceiver suggests a name for the new entry based on the name of the entry you were on. For example:

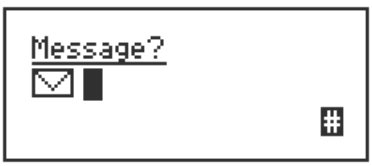


❑ Enter the text **My GPS** as the name for this entry.



❑ Press ✓.

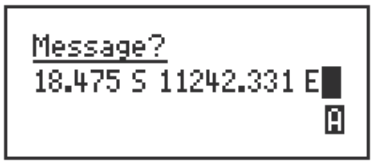
❑ Scroll to **Message?**, press ✕ repeatedly to delete the call address, then press ✓.



- ❑ Use one of the following example formats to enter your relevant GPS information.

Latitude (mandatory)	Longitude (mandatory)	Altitude, UTC, and type of reading (optional)
2418.475 S	11242.331 E	+12.5M 041725 (M)
2418.475S	11242.331E	

For example, enter **2418.475S 11242.331E**.

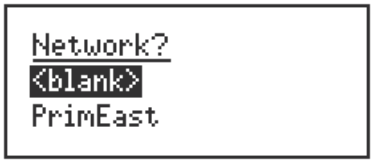


NOTE For help with entering text see page 66, *Entering and editing text*.

NOTE The space between the latitude/longitude number and the indicator is optional.

NOTE For more information on the type of reading see Table 27 on page 223.

- ❑ Press ✓.



- ❑ Scroll to **<blank>**, then press ✓.

  The entry is created and the List Manager remains open.

- ❑ Switch the transceiver off then on again to activate the new information in the My GPS entry in the Address List.

Saving GPS information

You may find it useful to save certain GPS information in your transceiver. For example, a mobile station could broadcast its GPS information from a particular situation (a road block or the site of an emergency), then this information may be saved to the Address List, thus providing access to distance and bearing information for the location (see page 108, *Saving call log information to the Address List*).

NOTE You can store GPS information in the Address List if Option GPS Enable is installed.

NOTE For more information on sending calls to several stations see page 170, *Group calls in a Codan Selcall network*.

Another use is saving a location as a waypoint in the Address List (for example, your campsite) so that you may return easily to it using the distance and bearing information relative to your current GPS receiver location. For more information see page 110, *Saving GPS information to the Address List*. For example, if you save the location of your campsite to the Address List with the name **Bob's campsite**, then decide that you would like to send Fred this information, all you need do is go to the Bob's campsite entry in the Address List, press **CALL**, enter Fred's address, then continue with the call. Fred receives a call titled **Bob's campsite** with distance and bearing information. If you want to encrypt your GPS information so that it may only be accessed by authorised users see page 138, *Privacy Mode*.

Programming the Address List

Creating an entry in the Address List

To create an entry in the Address List:

- ❑ Press **VIEW** until the Address List is displayed.
- ❑ Use the List Manager to create an entry (for help see page 105, *Creating an entry in a list* and page 66, *Entering and editing text*).
- ❑ Enter the setting information provided in the following table as required, then press ✓ to enter the information.

If this prompt is displayed...	**Do this...**
New name?	• enter a name for the new entry (for example, the name of the person or station you want to call using this entry)
<Call type>? and <Address>	• select the call type you want to use, or select **<No call type>** if you want to be prompted to select a call type when you make the call • enter the address to which you want to send the call, or leave the address empty if you want to be prompted to enter an address when you make the call NOTE If the call type is RFDS Emgcy, an address is not displayed: addresses are not required for these calls. NOTE If you selected **Phone?** as the call type, enter the telephone number you want to call. If you leave this setting empty, you are prompted for a telephone number when you make the call. NOTE For information on the address syntax for ALL calls see page 166, *ALL address syntax*.
Message?	• enter the message you want to send, or • leave the message empty if you want to be prompted to choose a stored message when you make the call (see page 169, *Message call*)
Phone Link?	• select the phone link station through which you want to make the call, or • select **<blank>** if you want to be prompted to select a phone link when you make the call

If this prompt is displayed...	Do this...
Network?	• select the network you want to use to make the call, or • select **<blank>** if you want to be prompted to select a network when you make the call
Channel/Mode?	• select the channel/mode you want to use to make the call, or • select **<blank>** if you want to be prompted to select a channel/mode when you make the call

The new entry is created and the List Manager remains open.

❑ If you want to view the entry you have created, press ✕ to close the List Manager.

Renaming an entry in the Address List

Renaming an entry in the Address List is a standard list function. For help see page 106, *Renaming an entry in a list*.

Copying an entry in the Address List

Copying an entry in the Address List is a standard list function. For help see page 106, *Copying an entry in a list*.

Editing an entry in the Address List

Editing an entry in the Address List is a standard list function. For help see page 107, *Editing an entry in a list*.

Deleting an entry in the Address List

Deleting an entry in the Address List is a standard list function. For help see page 107, *Deleting an entry from a list*.

11 Making and receiving calls

This section contains the following topics:

Calls you can make and receive

ALL address syntax

NOTE The global ALL address syntax may be used if the FED-STD-1045 ALE/CALM option is installed.

NOTE For information on entering text in a call address see page 70, *Entering text in an ALE call address*.

If you want to send an ALE call to all stations that are tuned to the same frequency in an ALE/CALM network or scanning the network, make a call through the Emergency, Message, Phone, Selective, or Send Position call type using the global ALL address syntax.

NOTE For information on these call types see page 166, *Call types*.

The ALL call does not specifically call any stations, and does not request any automatic responses from stations that enter the link. Stations can be configured to accept or to ignore ALL calls.

NOTE When you use the global ALL address syntax through the Selective call type, the call icon changes to the ALL call icon () when the call is started.

The global ALL address syntax is **@?@**. All stations detecting the call enter an ALE link with the initiating station, if enabled to do so.

Call types

There are 9 different types of calls available with an NGT Transceiver:

- Channel Test call
- Emergency call
- Get Position call (NGT *AR*, *SR*, and *AR Voice* Transceivers only)
- Get Status call
- Message call (NGT *AR*, *SR*, and *AR Voice* Transceivers only)
- Phone call
- RFDS Emgcy call (NGT *AR* and *AR Voice* Transceivers only)
- Selective call
- Send Position call (NGT *AR*, *SR*, and *AR Voice* Transceivers only)

The types of calls you can make and receive depend on the options installed in the transceiver.

Each call type has an icon associated with it that is displayed when you make and receive calls (see Table 22).

Table 22: Call types and icons

Call type	Icon
Channel Test	
Emergency	
Get Position	
Get Status	
Message	
Phone	
RFDS Emgcy	
Selective	
Send Position	

Each type of call is described below.

Channel Test call

If you want to test the suitability of a channel/mode before you use it to transmit voice or data, make a Channel Test call to a specific station.

In a Codan Selcall network, a Channel Test call sends a request to the station you want to call on the channel/mode you have selected. The receiving station automatically returns an audible test signal. The volume and clarity of this signal indicates the quality of the channel/mode.

You can also test channels once you have started a call (for more information see page 174, *Testing the quality of a channel in a Codan Selcall network*).

Emergency call

If you want to trigger an emergency alert tone at a particular station and speak with an operator, make an Emergency call. If Option GPS Enable is installed in the transceiver (and you have connected and configured a GPS receiver), your GPS position is automatically sent with the call. Emergency calls can be sent to several stations at once (see page 155, *Setting up the emergency key* and page 170, *Group calls in a Codan Selcall network*).

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Emergency call type to send a call to all stations using an ALE/CALM network and common channels.

Get Position call

NOTE You can make a Get Position call if Option GPS Enable is installed.

NOTE The success of your Get Position call depends upon the setting in the Cfg Respond GPS entry in the Control List of the transceiver you are polling and the privacy mode of the network you are using for the call (see page 195, *Cfg Respond GPS*).

NOTE If you send a Get Position call in an Open Selcall network, the transceiver you are polling must have the Cfg Respond GPS entry in the Control List set to **Always respond**.

If you want to obtain the GPS position of a specific station that has Option GPS Enable installed and has valid GPS information, make a Get Position call to that station. Get Position calls are automatically answered by the receiving station so an operator is not required to process the return call.

NOTE The transceiver uses GPS information from either a connected and configured GPS receiver, or from valid content in the My GPS entry in the Address List.

The information you receive from a Get Position call is displayed on the screen as it is received, if permitted, and is stored in the Calls In Log (see page 186, *The Calls In Log*).

Get Status call

NOTE The success of your Get Status call depends upon the setting in the Cfg Respond OTA entry in the Control List of the transceiver you are polling and the privacy mode of the network you are using for the call (see page 196, *Cfg Respond OTA*).

NOTE If you send a Get Status call in an Open Selcall network, the transceiver you are polling must have the Cfg Respond OTA entry in the Control List set to **Always respond**.

If you want to obtain information on the status of a transceiver at a specific station, such as the power output of the transmitter or the firmware versions installed, make a Get Status call to that station. Get Status calls are automatically answered by the receiving station so an operator is not required to process the return call.

The information you receive from a Get Status call is displayed on the screen as it is received, if permitted, and is stored in the Calls In Log (see page 186, *The Calls In Log*).

When you make a Get Status call you must specify the type of information you require: **Diagnostic**, **Configuration**, or **Other message**. This is described in detail on page 347, *Get Status calls*.

If the ALE Site Mgr entry in the Control List is set to **Auto**, **Manual** or **Restricted**, you have the option of broadcasting your site information to other stations, or requesting site information from other stations. For more information see page 352, *Broadcast Site and Request Site Get Status calls*.

Message call

If you want to send a text message to another station, make a Message call. You can enter a message at the time you make a call, store up to 10 messages in the Control List for later use, and store messages in the Address List as part of a pre-programmed Message call.

You may insert keywords into the message that are recognised and expanded by the transceiver when the call is sent (see page 171, *Recognised variable expansion*). You can also forward GPS information that has been saved in the Address List to other stations (see page 162, *Saving GPS information*).

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Message call type to send a call to a group of stations using an ALE/CALM network.

Message calls are automatically answered by a receiving station so an operator is not required to take any action. If you use the global ALE ALL address syntax with the Message call type, the ALE link terminates immediately after the message is sent. Messages you receive are displayed on the screen, if permitted, and stored in the Calls In Log (see page 186, *The Calls In Log*).

Phone call

If you want to call a telephone number from the transceiver, make a Phone call. Before you make a Phone call you must know the address of an HF telecommunication station through which your call can be routed to the public telephone network.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Phone call type to send a call to a group of HF telecommunication stations using an ALE/CALM network.

RFDS Emgcy call

NOTE You cannot use the global ALL address syntax with an RFDS Emgcy call.

If you want to trigger an emergency alert tone at an RFDS station, make an RFDS Emgcy call. RFDS Emgcy calls are made on channels reserved for emergency RFDS calls using specific RFDS networks.

Selective call

If you want to speak with an operator at a particular station, make a Selective call. When the station receives the call, the transceiver sounds an alert tone similar to a telephone to notify the operator. Selective calls can be heard by any station tuned to or scanning your current channel with their mute switched off. However, only the transceiver at the station to which the call is addressed will sound an alert tone.

Selective calls can be made to several stations at once (see page 170, *Group calls in a Codan Selcall network*).

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Selective call type to make a voice call to a group of stations using an ALE/CALM network.

Send Position call

NOTE You can make a Send Position call if Option GPS Enable is installed, and your GPS information is valid.

If you want to send your GPS information to another station, make a Send Position call.

NOTE The transceiver sends GPS information from either a connected and configured GPS receiver, or from valid content in the My GPS entry in the Address List.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Send Position call type to send a position to a group of stations using an ALE/CALM network.

Send Position calls are automatically answered by any receiving stations so an operator is not required to take any action. If you use the global ALL address syntax with the Send Position call type, the ALE link terminates immediately after the GPS position is sent. GPS positions you send are stored in the Calls Out Log (see page 181, *The Calls Out Log*).

Group calls in a Codan Selcall network

Emergency, Message and Selective calls can be made to a group of stations simultaneously by using a Codan Selcall network and a group address.

A group selcall address is an address that ends in two or more zeros. For example, to call all stations with addresses that range from 1201 to 1299, you would enter **1200** as the address. To call all stations with addresses that range from 150001 to 159999, you would enter **150000** as the address.

Recognised variable expansion

The variables listed in Table 23 may be added in a Message call. These variables are recognised by the firmware in the NGT Transceiver. The firmware expands the variable by inserting the current information associated with the variable into the message.

NOTE $GPS and $GPS+ variables require Option GPS Enable to be installed.

Table 23: Recognised variables and their associated information

Keyword	**Function when used in a message**
$DATE	Inserts the current date in the following format: <name of day> <month> <day> <year>
$GPS	Inserts the current valid GPS position in the following format: <latitude> <longitude> NOTE Latitude and longitude are expressed in degrees, minutes, and fraction of minutes, with a direction of N/S or E/W. NOTE If you enter text before $GPS, this is sent as a header for the GPS information stored in the Calls In Log.
$GPS+	Inserts the current valid GPS position in the following format: <latitude> <longitude> <altitude> <UTC> (<type of reading>) NOTE Latitude and longitude are expressed in degrees, minutes, and fraction of minutes, with a direction of N/S or E/W. NOTE If you enter text before $GPS+, this is sent as a header for the GPS information stored in the Calls In Log.
$TIME	Inserts the local time of the transceiver in the following format: <hh>:<mm>:<ss>
$TZ	Inserts the time zone offset stored in the transceiver in the following format: <time zone offset>
$VER	Inserts the current version of the junction box or RF unit firmware in the following format: <version number>

If you enter the following message...

$GPS+

...the receiving station displays the current GPS information for the sending station. For example:

89°58.041 N 138°41.234 E +0.0M 101622 (A)

NOTE For help on entering **$** see page 69, *Entering special characters in messages and names*.

NOTE The transceiver checks the length of the expanded message before transmission. If you receive an error stating that the message is too long, review the message and shorten the message as required.

Making a call

Listen Before Transmit Mode

NOTE — If you change the setting in the Cfg LBT Mode entry in the Control List, you must switch the transceiver off then on again for the change to take effect.

The NGT Transceiver is capable of listening to a channel before initiating a call on the channel. If the Cfg LBT Mode in the Control List is enabled, the transceiver detects whether or not there is traffic on the selected channel. The transceiver listens on a channel for the length of time specified in the Cfg LBT Period entry in the Control List. If there is traffic on the channel, the transceiver reports that the channel is occupied.

The Cfg LBT Mode may be set to **Enabled**, **Override allowed**, or **Disabled**.

When the Cfg LBT Mode is set to **Enabled** *and* the transceiver detects that the channel tried is occupied, it prompts you to try the call again. You can:

- press **CALL** to try the call again using LBT
- press 🔍 to select a new channel, then press **CALL** to make a call on this channel using LBT

NOTE — If only one channel was tried and found to be occupied using LBT, you can listen for traffic on the channel then, if clear, override LBT by *holding* **CALL**.

When the Cfg LBT Mode is set to **Override allowed** *and* the transceiver detects that the channel tried is occupied, it prompts you to try the call again. You can:

- press **CALL** to try the call again using LBT
- *hold* **CALL** to try the call again without LBT (send the call regardless of any detected traffic)
- press 🔍 to select a new channel, then press **CALL** to make a call on this channel using LBT
- *hold* 🔍 to select a new channel and try the call on this channel without LBT (send the call regardless of any detected traffic)

Calls using the Emergency call type or calls made through the ⚠ key override the LBT Mode if it is enabled at either level. For more information see page 155, *Setting up the emergency key*.

When the Cfg LBT Mode is set to **Disabled** the transceiver does not test the channel.

Testing the quality of a channel in a Codan Selcall network

If you want to test the quality of a particular channel/mode in a Codan Selcall network before you use it to transmit voice or data, you can do so in two ways. You can:

- start making a call then, when prompted to select a channel/mode, test one or more channel/mode combinations
- make a Channel Test call to test conditions before you make the final call

Testing a channel as part of a call in a Codan Selcall network

NOTE This is the recommended method of making a Channel Test call.

To test a channel/mode as part of a call:

- ❑ Start the call using your preferred method.

  For example, go to the Address List, then select the entry for the station you want to call.
- ❑ When the transceiver prompts you to select a channel/mode, scroll to the channel/mode you want to test, then *hold* **CALL**.
- ❑ Listen for the revertive signal from the other station.

  The volume and clarity of the signal indicates the quality of the channel/mode. You may need to try another channel.
- ❑ When you have found a suitable channel/mode, press **CALL** to continue the call.

Making a Channel Test call in a Codan Selcall network

To make a Channel Test call in a Codan Selcall network:

- ❑ Press **CALL**.
- ❑ Type the address of the station you want to call, scroll to **Channel Test?** for the call type, then press ✓.
- ❑ Scroll to the Codan Selcall network in which you want to make the call, then press ✓.
- ❑ Scroll to the channel/mode you want to test, then press **CALL**.
- ❑ Listen for the revertive signal from the other station.

  The volume and clarity of the signal indicates the quality of the channel/mode.

Using multiple addresses for calls in an ALE/CALM network

When a call is made in an ALE/CALM network, LQA information is stored or updated in the LQA database of the transceiver. If you make a call to a number of addresses using automatic channel selection, you can use the syntax of the address to determine how the LQA information is used.

If the self addresses of the called stations are separated by a colon, for example, BOB:SAM or 1562:1569, the call is sent to the station on the channel that has the best LQA data associated with it. If the attempt at the first address fails, then the call is sent to the station on the channel with the next best LQA data, and so on.

Other ways to make calls

Making a new call

Making a new call is as simple as pressing **CALL**, typing the address of the station you want to call, then following the prompts. You can make a new call at any time.

Returning a call

The details of the calls you receive are stored in the Calls In Log. Up to 20 calls can be stored at a time and you can return any of these calls directly from this log.

When you return a call from the Calls In Log, you can either use as many details of the original call as possible, or review all details and select new details if necessary.

For more information on the log see page 186, *The Calls In Log*.

Repeating a call

The details of the calls you make are stored in the Calls Out Log. Up to 20 calls can be stored at a time and you can repeat any of these calls directly from this log.

When you repeat a call from the Calls Out Log, you can either use as many details of the original call as possible, or review all details and select new details if necessary.

For more information on the log see page 181, *The Calls Out Log*.

Making a call from the Phone Link List

If you make frequent Phone calls from the transceiver you may want to make them from the Phone Link List. When you begin a call from this list, the call type is always Phone (so you don't have to scroll to it), and you are not prompted to select a phone link; the call uses the entry you were on when you began the call.

You may be prompted to select certain details about the call depending on the configuration of the transceiver.

Making a voice call

The simplest type of call is a voice call. To make a voice call you:

- select a channel and mode
- press PTT to tune the antenna, if required
- wait until the channel is clear of voice and data traffic
- *hold down* PTT and begin speaking

Your call can be heard by any station tuned to or scanning this channel with their mute switched off, and the Mute Scan entry set to **Scan for Voice** or **Voice**.

Calling methods

To make any type of call to a specific station:

❑ Decide on the method you want to use to make the call, then use the information in the following table to start the call.

NOTE For help with entering text see page 66, *Entering and editing text*.

If you want to...	Do this...
make a call from the Address List	• go to the entry you want to call in the Address List • to make the call using the pre-programmed information, press **CALL**, or • to review all details and/or select new ones, *hold* **CALL**
make a call in an emergency	• *hold* ⚠ for at least 2 seconds to make the call using the pre-programmed information (see page 155, *Setting up the emergency key*).
make a new call	• press **CALL** • select the call type you want to use • enter the address (including @?@ for a global ALL call) of the station(s) you want to call, or if you are making a Phone call, enter the phone number you want to call • press **CALL**
return a call	• press **CALL LOGS** twice to open the Calls In Log • go to the call you want to return • to use as many details from this call as possible, press **CALL**, or • to review all details and/or select new ones, *hold* **CALL**
repeat a call	• press **CALL LOGS** to open the Calls Out Log • go to the call you want to repeat • to automatically repeat this call, press **CALL**, or • to review all details and/or select new ones, *hold* **CALL**
make a Phone call from the Phone Link List	• go to the phone link through which you want to make this call • press **CALL** • enter the telephone number you want to call • press **CALL**

NOTE You may be prompted for details about the call depending on the method you chose to make the call, the call type you selected, and the configuration of the transceiver.

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

If this prompt is displayed...	**Do this...**
Select link	• select the phone link station through which you want to make the Phone call
Phone link addr?	• enter the address of the phone link station through which you want to make the Phone call (including @?@ for a global ALL call)
Select msg	• select the message you want to use NOTE For help on editing a message see page 226, *Messages entry*.
Status type?	• select the type of status information you want to retrieve from the remote station, or • select **Other message** to enter an over-the-air command into a Message entry NOTE For more information on the types of status information you can retrieve see page 347, *Get Status calls*. NOTE If the ALE Site Mgr entry is set to **Auto**, **Manual** or **Restricted**, you can make other types of Get Status calls. For more information see page 352, *Broadcast Site and Request Site Get Status calls*.
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

If this prompt is displayed...	Do this...
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 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 In a Codan Selcall network, you can test the quality of the selected channel by sending a Channel Test call (see page 174, *Testing a channel as part of a call in a Codan Selcall network*).

❑ If LBT Mode is set to **Enabled** or **Override allowed**, you may be prompted to try the channels again. Use the information in the following table to answer the prompt.

If this prompt is displayed...	Do this...
Chan busy: Try again? All|<N> chans busy: Try again?	**If Cfg LBT Mode is set to Enabled:** • press **CALL** to try the call again using LBT • press 🔍 to select a new channel, then press **CALL** to make a call on this channel using LBT NOTE If only one channel was tried and found to be occupied using LBT, you can listen for traffic on the channel then, if clear, override LBT by *holding* **CALL**. **If Cfg LBT Mode is set to Override allowed:** • press **CALL** to try the call again using LBT • *hold* **CALL** to try the call again without LBT (send the call regardless of any detected traffic) • press 🔍 to select a new channel, then press **CALL** to make a call on this channel using LBT • *hold* 🔍 to select a new channel and try the call on this channel without LBT (send the call regardless of any detected traffic)

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

❑ To complete the call, use the information in the following table.

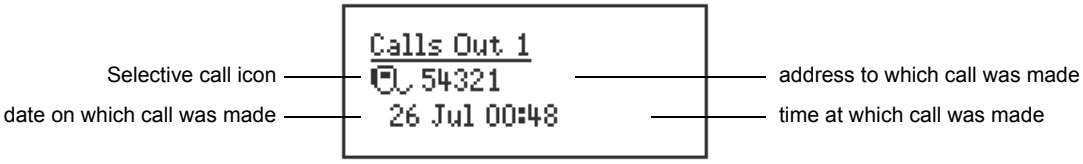
If you are making a...	Do this...
Channel Test call	• listen for the revertive signal NOTE The call is ended automatically but can be aborted by pressing PTT or **SCAN**.
Emergency call Selective call	**In an ALE/CALM network:** • wait until a message informs you that the call has been successful • *hold down* PTT then speak, releasing PTT when you have finished speaking • press **SCAN** to end the call and resume scanning **In a Codan 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, releasing PTT when you have finished speaking • press **SCAN** to end the call and resume scanning
Get Position call Get Status call Message call Send Position call	• wait until a message informs you that the call has been completed NOTE The call is ended automatically but can be aborted by pressing PTT or **SCAN**.
Phone call	• wait until you hear a reply from the person you called • *hold down* PTT then speak, releasing PTT when you have finished speaking • press **SCAN** to end the call **In an ALE/CALM network:** The transceiver resumes scanning. **In a Codan Selcall network:** The transceiver prompts you to send a hangup signal. If you want to send a hangup signal, press ✓. If the other party has sent a hangup signal via the phone line, press ✕. The transceiver resumes scanning.
RFDS Emgcy call	• wait until you hear a reply from RFDS personnel • *hold down* PTT then speak, releasing PTT when you have finished speaking • press **SCAN** to resume scanning

The Calls Out Log

When you make a call, an entry for the call is created in the Calls Out Log. The entry lists:

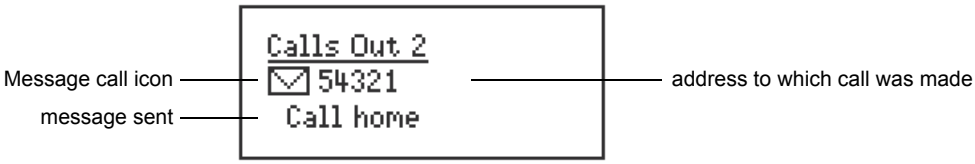
- the type of call that was made
- the address to which the call was made
- the message or position that was sent if the call was a Message, Get Status or Send Position call
- the time at which the call was made
- the self address from which the call was made
- the network in which the call was made
- the channel/mode on which the call was made
- the phone link that was used, if the call was a Phone call

Figure 28: The Calls Out Log showing a Selective call made



If you make a Message, Get Status or Send Position call, the information sent is displayed instead of the date and time.

Figure 29: The Calls Out Log showing a Message call made



Up to 20 calls can be stored at one time and you can repeat any of these calls directly from the log (see page 183, *Repeating a call from the Calls Out Log*).

The calls are listed in the order in which they were made with the most recent call at the top of the list. If you make two or more calls with the same call type and address (and message or GPS position, if applicable), only the most recent call is kept in the log.

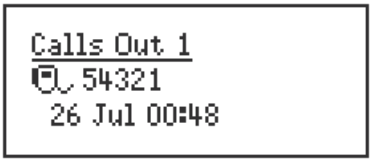
If you make a Get Position or Get Status call, an entry for the call is created in the Calls Out Log, and the information that is sent to you by the other station is stored in an entry for the call in the Calls In Log (see page 186, *The Calls In Log*).

Displaying an entry in the Calls Out Log

To display an entry in the Calls Out Log:

- ❑ Press **CALL LOGS** to open the Calls Out Log.

  The details of the last call sent are displayed.



- ❑ Scroll through the entries.
- ❑ To display more information about an entry, press ✓.
- ❑ Scroll through the settings.
- ❑ Press ✕ to return to the entry.
- ❑ Press ✕ to close the Calls Out Log and return to the screen from which you began.

Repeating a call from the Calls Out Log

To repeat a call from the Calls Out Log:

- ❑ Press **CALL LOGS** to open the Calls Out Log.
- ❑ Scroll to the call you want to repeat.
- ❑ Do one of the following:
  - Press **CALL** to automatically repeat the call.
  - *Hold* **CALL** to review all details and/or select new ones.

Deleting an entry from the Calls Out Log

To delete an entry from the Calls Out Log:

- ❑ Press **CALL LOGS** to open the Calls Out Log.

  The details of the last call sent are displayed.
- ❑ Scroll to the entry you want to delete.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Delete entry**, then press ✓.

  The transceiver asks you to confirm that you want to delete the entry.
- ❑ Press ✓.

  The entry is deleted and the List Manager remains open.
- ❑ Press ✕ repeatedly to return to the screen from which you began.

Receiving a call

There are two ways you can receive a call. You can listen to a channel and respond when you hear a voice, or you can wait until an alert tone notifies you of a call addressed to your station. This section covers receiving calls addressed to your station.

When you receive a call addressed to your station, the transceiver sounds an audible alert tone, displays an incoming call screen, if permitted, and creates an entry in the Calls In Log.

NOTE

These events do not occur when you receive a Channel Test, Get Position, or Get Status call as the transceiver automatically responds to these calls.

NGT Transceivers cannot respond to RFDS Emgcy calls.

The call alert

The call alert varies according to the type of call received. For Message, Phone, Selective and Send Position calls it continues for about 10 seconds, then changes to a series of pips until you press a key. For Emergency calls it continues for 5 minutes then changes to a series of pips.

Table 24: Call types and alert tones

Call type	**Alert tone sounds like...**
Emergency	heehaw, heehaw, heehaw
Message	pip, pip, pip, pip, pip
Phone	a telephone ringing
Selective	a telephone ringing
Send Position	pip, pip, pip, pip, pip
Group calls: Emergency calls all other calls	 heehaw, heehaw, heehaw beep, beep, beep, beep, beep, beep

NOTE

If you want to switch off the audible alert tone when a call is received, set the Cfg Alert Tones entry in the Control List to **Disabled** (see page 120, *Logging in to admin level from user level* and page 190, *Entries in the Control List*).

The incoming call screen

The incoming call screen displays:

- the type of call being received
- the address of the station making the call
- the date and time at which the call was received
- the message, GPS position or status information, if sent
- the call count number

NOTE

If you want to switch off the audible alert tone when a message is received, set the Cfg Alert Tones entry in the Control List to **Disabled** (see page 120, *Logging in to admin level from user level* and page 190, *Entries in the Control List*).

NOTE

If you want to prevent a message being displayed when it is received, set the Cfg Incoming Msg entry in the Control List to **Just log** (see page 120, *Logging in to admin level from user level* and page 190, *Entries in the Control List*).

Figure 30: An incoming call screen for a Selective call

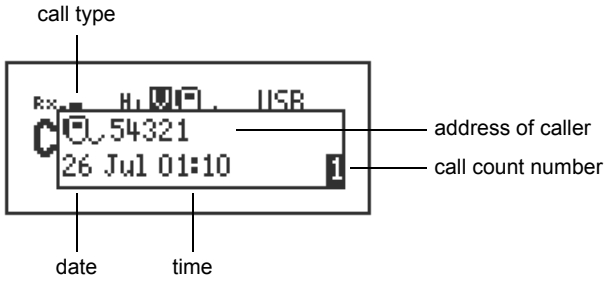
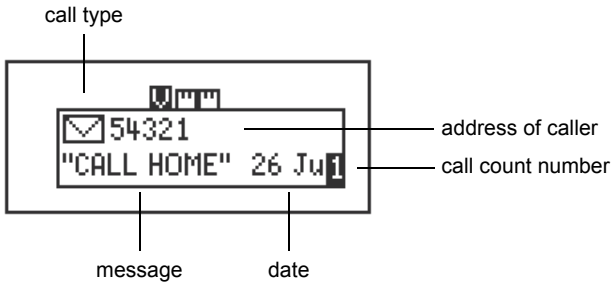


Figure 31: An incoming call screen for a Message call



If you receive one or more calls while the transceiver is unattended, the incoming call screen displays the details of the most recent call. The call count number at the bottom right of the screen indicates the number of calls received since the first call (see Figure 30).

To remove the incoming call screen:

❑ Press ✕.

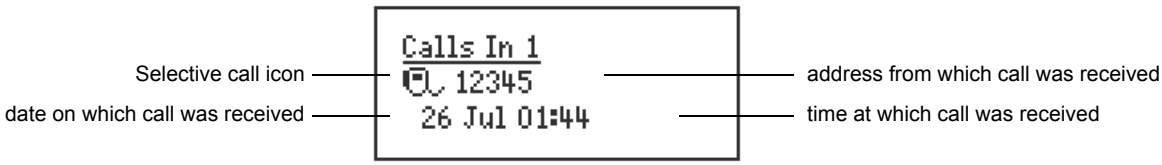
The Calls In Log

When you receive a call, an entry is created in the Calls In Log. The entry lists:

- the type of call received and the address of the caller
- the message, GPS position or status information received if the call was a Message, Get Position, or Get Status call
- the time at which the call was received
- the self address to which the call was sent
- the network in which the call was received
- the channel/mode on which the call was received
- the phone link that was used, if the call was a Phone call

NOTE Entries are not created for Channel Test, Get Position, and Get Status calls.

Figure 32: The Calls In Log showing a Selective call received



If you receive a Message or Send Position call, or you have made a Get Position or Get Status call, the information received is displayed instead of the date and time.

NOTE If you have Option GPS Enable installed, and you have a valid GPS position, the distance and bearing to the received GPS location is automatically calculated and displayed (see page 225, *Showing distance and bearing*).

Figure 33: The Calls In Log showing a Message call received

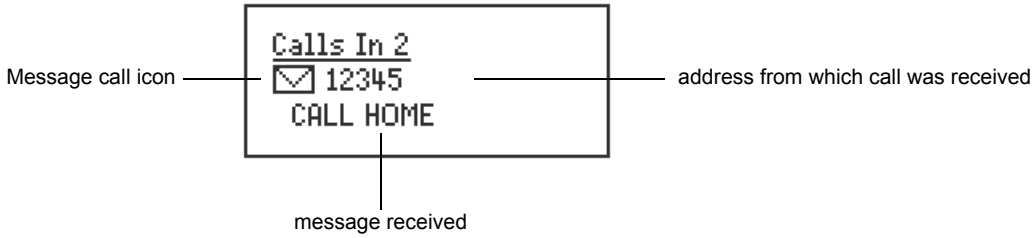
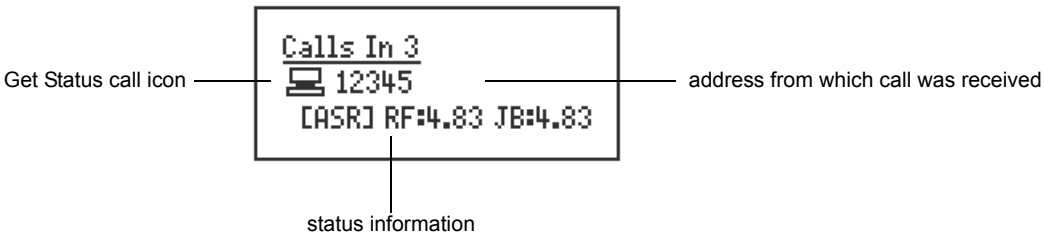


Figure 34: The Calls In Log showing a Get Status call received



Up to 20 calls can be stored at a time and you can return any of these calls directly from the log (see page 187, *Returning a call from the Calls In Log*).

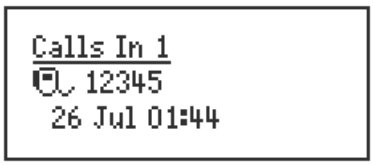
The calls are listed in the order in which they were received with the most recent call at the top of the list. If you receive two or more calls with the same call type and address (and message or GPS position, if applicable), only the most recent call is kept in the log.

Displaying an entry in the Calls In Log

To display an entry in the Calls In Log:

- ❑ Press **CALL LOGS** twice to open the Calls In Log.

  The details of the last call received are displayed.



- ❑ Scroll through the entries.
- ❑ To display more information about an entry, press ✓.
- ❑ Scroll through the settings.
- ❑ Press ✕ to return to the entry.
- ❑ Press ✕ to close the Calls In Log and return to the screen from which you began.

Returning a call from the Calls In Log

To return a call from the Calls In Log:

- ❑ Press **CALL LOGS** twice to open the Calls In Log.
- ❑ Scroll to the call you want to return.
- ❑ Do one of the following:
  - Press **CALL** to use as many details from this call as possible.
  - *Hold* **CALL** to review all details and/or select new ones.

Deleting an entry from the Calls In Log

To delete an entry from the Calls In Log:

- ❑ Press **CALL LOGS** twice to open the Calls In Log.

  The details of the last call received are displayed.
- ❑ Scroll to the entry you want to delete.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Delete entry**, then press ✓.

  The transceiver asks you to confirm that you want to delete the entry.
- ❑ Press ✓.

  The entry is deleted and the List Manager remains open.
- ❑ Press ✕ repeatedly to return to the screen from which you began.

12 The Control List

This section contains the following topics:

Entries in the Control List

The entries in the Control List enable you to customise the transceiver and control the way it operates. The entries vary according to the model of the transceiver and the options installed in it. Table 25 provides a complete list of the entries in the Control List that can be changed at user and admin level. Some of the entries are covered in more detail in the sections after the table.

NOTE

The Control List is admin hidden, by default. You are only able to access the Control List to view and/or change entries by logging in to admin level (see page 120, *Logging in to admin level from user level*). If the user needs to access any entries in the Control List, the administrator should set up hot keys to these entries (see page 293, *Creating a macro and assigning it to a hot key*).

CAUTION

Some entries in the Control List alter the configuration of the transceiver, for example, RS232 9way Mode and RS232 15way Mode. If your transceiver does not respond as expected after an entry in the Control List has been altered, switch the transceiver off then on again.

Table 25: Entries in the Control List

Name of entry	Use this entry to...	Default
Address	Program up to 10 self addresses for your station and specify the network or networks in which you want to use them. The NGT *VR* Transceiver may have up to 3 self addresses. For more information on self addresses see page 85, *Entering your station self address*.	
ALE Accept ALL Call	Set whether or not your transceiver accepts ALL calls that it detects. For more information see page 206, *ALE Accept ALL Call*.	Enabled
ALE BER	Increase or decrease the value of the BER threshold used in BER testing. For more information see page 206, *ALE BER*.	12 errors
ALE Call Scan	Set whether or not your transceiver scans channels for incoming calls between a call attempt on each channel. If you want the transceiver to: • only scan the channels in the network through which the outgoing call is being made, select **Outgoing network** • scan all the channels in the networks that are set to be scanned, select **Scanned networks** • make outgoing calls without any scanning cycles between call attempts, select **Disabled** For more information see page 207, *ALE Call Scan*.	Disabled
ALE Call Scan Cycles	Set the number of scan cycles that the transceiver performs between call attempts when the ALE Call Scan entry is set to **Outgoing network** or **Scanned networks**.	1
ALE Call Threshold	Set the minimum score for a channel to be tried in ALE calls. For more information see page 207, *ALE Call Threshold*.	0%

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
ALE Call Weighting	Weight the LQA scoring of ALE channels for data or voice. For more information see page 208, *ALE Call Weighting*.	Mostly voice
ALE Golay	Set the value of the Golay threshold used in Golay testing. For more information see page 208, *ALE Golay*.	2
ALE Hangup ALL Call	Set whether or not the initiator of an ALL call can hang up the call to all linked stations. For more information see page 208, *ALE Hangup ALL Call*.	Enabled
ALE Hangup Phone Call	Set whether or not a member of an ALE link to an automated radio/telephone interconnect unit sends a link termination sequence when **SCAN** is pressed. For more information see page 208, *ALE Hangup Phone Call*.	Enabled
ALE Hangup Voice Call	Set whether or not a member of an ALE link sends a link termination sequence when **SCAN** is pressed. For more information see page 209, *ALE Hangup Voice Call*.	Enabled
ALE LQA Average	Select the way that LQA information is used when recording signal quality. For more information see page 209, *ALE LQA Average*.	Both
ALE LQA Clear	Clear the LQA information in the transceiver. For more information see page 209, *ALE LQA Clear*.	
ALE LQA Decay	Set the length of time it takes for LQA information to artificially decay, or switch off this feature. For more information see page 210, *ALE LQA Decay*.	15 days
ALE LQA Exchange	Set whether or not LQA information is exchanged between stations during each call so that the link quality can be assessed in both directions. For more information see page 210, *ALE LQA Exchange*.	On
ALE LQA Mapping	Set the mapping of LQA information according to its frequency. For more information see page 210, *ALE LQA Mapping*.	Frequency
ALE Retries	Set the number of times the transceiver retries a channel when attempting to establish an ALE link before trying the next best channel in the network. For more information see page 211, *ALE Retries*.	1
ALE Silent Mode	Prevent automatic ALE transmissions from the RF unit. For more information see page 211, *ALE Silent Mode*.	Off

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
ALE Site Mgr	Collect information on unknown ALE transceivers in the network. If you want the transceiver to: • only accept site information that is broadcast by other stations, select **Off** • accept, respond to, and automatically initiate requests for site information, select **Auto** • accept site information, respond to requests for site information, and allow manually initiated Broadcast Site and Request Site Get Status calls to other stations, select **Manual** • accept site information and allow manually initiated Broadcast Site and Request Site Get Status calls to other stations, but not respond to requests for site information, select **Restricted** For more information see page 211, *ALE Site Mgr*. NOTE If ALE Silent Mode is set to **On**, the transceiver will not respond automatically to requests from other stations for site information.	Off
Audio Volume	Set the audio volume of the transceiver.	8
Auto Resume Listen	Set the scan method used when scanning is switched on by the Auto Resume Mode entry. For more information see page 213, *Auto Resume entries*.	Leave as is
Auto Resume Mode	Set the action performed when the Auto Resume Time ends. For more information see page 213, *Auto Resume entries*.	Start scan
Auto Resume Time	Set the length of time after scanning stops that the transceiver performs the action set in the Auto Resume Mode entry. For more information see page 213, *Auto Resume entries*.	2 minutes
Cfg Alert Tones	Set whether or not the transceiver gives an alert tone (beep, or ring if an external alarm is connected) when it receives a message or a non-message call. If you want the transceiver to: • provide a local alert tone *and* external alarm when it receives any type of call, select **Normal** • provide a local alert tone but no external alarm when it receives a message call, select **Messages skip ext alarm** • not provide a local alert tone or external alarm when it receives a message call, select **Messages don't ring** • not provide a local alert tone or external alarm when it receives any type of call, select **Disabled**	Normal

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Cfg Auto Tune Mode	Set the Auto Tune Mode to suit the antenna. If you have: • a broadband antenna or an antenna that does not require a tuning cycle, select **None** • an antenna that uses a Codan antenna tuning interface (for example, 9350, 4203, 8558), select **Codan interface** • an antenna that does not conform to Codan's antenna tuning interface but provides automatic tuning capability (for example, 9103), select **SWR measurement** • a high-power amplifier with a broadband antenna or an antenna that does not require a tuning cycle, select **Amplifier** (NGT *AR* and *SR* Transceivers only) • a high-power amplifier with a tuner that does not conform to Codan's antenna tuning interface but provides automatic tuning capability, select **Amplifier with tuner** (NGT *AR* and *SR* Transceivers only) • an antenna that does not conform to Codan's antenna tuning interface but provides automatic tuning capability that is restricted to 10 W or less during tuning (for example, F2265A), select **Low power interface** (NGT *AR* and *SR* Transceivers only)	Codan interface
Cfg Call Status Time	Set the maximum length of time a receiving station has to respond to a Get Status call with the information you requested.	5 seconds
Cfg Chain Call Pause	Set the length of time the transceiver pauses between chained calls. For more information see page 157, *Making several different types of calls*.	10 seconds
Cfg Channel Scroll	Set the direction in which the ◣ key scrolls in the Channel List, that is, to the next channel or the previous channel. By default, pressing ◣ scrolls to the next highest number/next alphabetically sorted name in the Channel List, that is, 1-2-3-4 or Chan A-Chan B-Chan C-Chan D. If you want the ◣ key to scroll in the opposite direction, as it does in other lists in the transceiver, select **Go to prev chan**.	Go to next chan
Cfg Def Scrn Layout	Set the default screen layout for the Main Menu, logs and lists. If you want the active line to: • display a small font over three lines, select **3 line** • display a large font on the active line and a small font elsewhere, select **Big middle line** • display a small font over two lines, select **2 line**	3 line
Cfg Easitalk	Select a noise reduction algorithm.	Cepstral
Cfg Fast AGC	Switch fast automatic gain control on or off.	Disabled

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Cfg In Call Timeout	Set the length of time from the last key press on the handset after which incoming calls on the handset are hung up.	30 seconds
Cfg Incoming Msg	Set whether or not the transceiver displays a message to the operator when it is received. If you want to: • display messages and log them in the Calls In Log, select **Show and log** • prevent messages from being displayed, but still log them in the Calls In Log, select **Just log**	Show and log
Cfg LBT Data Sensitivity	Set the level of sensitivity to reduce false or weak detection of data signals when LBT is active. You may set the sensitivity level between –0.5 to +0.5 in steps of 0.002.	0
Cfg LBT Mode (RF unit/junction box firmware V4.00 or later)	Set whether or not the transceiver listens for calls and traffic on a channel before initiating a call. If you want to: • use LBT for every call, select **Enabled** • use LBT, with the option to override for every call, select **Override allowed** • disable LBT for all calls, select **Disabled** For more information on listening before transmitting see page 173, *Listen Before Transmit Mode*. For RF unit/junction box firmware earlier than V4.00, the LBT functionality is included with *Selcall Lockout*.	Override allowed
Cfg LBT Period	Set the length of time that the transceiver listens for calls and traffic on a channel before initiating a call.	2 seconds
Cfg LBT Waveforms	Set the waveform that LBT monitors. If you want to monitor: • voice calls made using a Voice Only call system, or any call to another station made using a Codan Selcall or ALE/CALM call system, select **Voice and calls** • voice calls made using a Voice Only call system, any call to another station made using a Codan Selcall or ALE/CALM call system, or any calls made via a data modem, select **Voice, calls and data**	Voice and calls

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Cfg Power Preference	Set the power preference to suit the power transmission level for your station. If you want to: • transmit with high power, select **High** • transmit with low power, select **Low** NOTE If you want to transmit at a medium power level that is half of the high power level see page 426, *Enabling medium power level*.	
Cfg PTT Beeps	Transmit astrotones when the PTT button is released during a call. This saves your having to say 'over' each time you release PTT.	On
Cfg PTT Cutout Time	Set the length of time after PTT is held down for the transceiver to cease transmission and switch to receive. This ensures that, even if PTT is held down accidentally (because, for example, you are sitting on the handset), power consumption is minimised and the transceiver is ready to receive calls. You can also use this entry to switch off this feature.	10 minutes
Cfg Respond GPS	Set the way in which the transceiver handles its response to a Get Position call sent through an ALE/CALM, Codan Selcall, or Open Selcall network. If you want to: • respond to a Get Position call regardless of the privacy mode of the network through which the call was made, select **Always respond** • respond in a proprietary Codan-encoded format to a Get Position call on a network with the privacy mode set to Registered, Group or None, select **To Codan requests** • respond to a Get Position call from another Codan HF transceiver on a network with the privacy mode set to Group and a common privacy key, select **To encrypted requests** • disable your response to any Get Position call, select **Never respond** NOTE The setting **To Codan requests** specifically excludes calls made using an Open Selcall network. NOTE You are still able to make Send Position calls if this entry is set to **Never respond**. NOTE To respond to Get Position calls made in an Open Selcall network, the Cfg Respond GPS entry must be set to **Always respond**.	Always respond

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Cfg Respond OTA	Set the way in which the transceiver handles its response to an OTA command sent through an ALE/CALM, Codan Selcall, or Open Selcall network. If you want to: • respond to an OTA command regardless of the privacy mode of the network through which the call was made, select **Always respond** • respond in a proprietary Codan-encoded format to an OTA command on a network with the privacy mode set to Registered, Group or None, select **To Codan requests** • respond to an OTA command from another Codan HF transceiver on a network with the privacy mode set to Group and a common privacy key, select **To encrypted requests** • disable your response to any OTA command, select **Never respond** For more information on OTA commands contact your Codan representative. NOTE The setting **To Codan requests** specifically excludes calls made using an Open Selcall network. NOTE To respond to Get Status calls made in an Open Selcall network, the Cfg Respond OTA entry must be set to **Always respond**.	To Codan requests
Cfg RF Pre-Amp	Switch the RF pre-amplifier on or off. To increase the receive sensitivity of the RF unit, select **On**. To reduce it, select **Off**.	On
Cfg Scan Voice Extend	Set the period of time that the transceiver holds the scan when voice is detected. The transceiver continues to extend by this amount each time voice is detected on the channel, up to the maximum hold period set in the Cfg Scan Voice Max Hold entry. If you do not want the transceiver to hold the scan after voice is detected, set this entry to **Disabled**.	5 seconds
Cfg Scan Voice Max Hold	Set the maximum length of time that the transceiver pauses on a channel after voice is detected. This entry overrides the extend function in the Cfg Scan Voice Extend entry.	5 seconds
Cfg Site Control (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Set whether the local RF unit is a master or a slave.	Master

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Cfg Site Mode (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Display or set the functionality of the local RF unit depending upon what is set in the Cfg Site Control, Cfg Site Options and Site Tx/Rx entries. The possible settings are: • **Not in use** • **Transceiver** • **Transmitter** • **Receiver**	Transceiver
Cfg Site Options (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Set the firmware to match the hardware capabilities of the local RF unit. The possible settings are: • **No Tx, No Rx** • **Tx and Rx** • **Tx Only** • **Rx Only**	Tx and Rx
Cfg TDM Mode (NGT *AR* and *SR* Transceivers only)	Set the ability of the RF unit to generate the TDM clock. Unless otherwise specified in installation instructions, this should always be **Master**.	Master
Cfg Tx Power	Set the maximum transmit power for the transceiver. If you are using the transceiver: • in a fixed or mobile situation, select **Maximum** • in a portable transceiver situation, select **50 W**	Maximum
Cfg Voice Privacy Code	Set the code that enables Private level scrambling between transceivers in a network. Enter a scrambling code between 1 and 32. If this Voice Encryptor option is installed, you will be able to select Private as default in the Secure Mode entry, if required.	1
Clarifier	Improve the quality of received voice by adjusting the frequency of the currently selected channel/mode to exactly match that of the received signal. You can also display the Clarifier screen by pressing **CLAR**.	
Current Baud Rate (NRI remote control systems, NGT *AR* and *SR* Transceivers only)	Display the current data rate between NGT remote interfaces. NOTE This entry is viewed via the Devices entry.	
Customer Device	Display the Codan type number of the device.	2010 or 2011
Customer Name	Display the ISO (sales order number) customer name.	
Customer Profile	Display the ISO customer profile.	
Customer Radio	Display the ISO transceiver type.	AR, SR, AR Voice, VR

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Customer Reference	Display the ISO customer reference.	
Devices	Do the following: • perform a built-in test in each device • display the serial number of each device • enter option codes • display the list of features installed and enabled in the transceiver • uninstall an RM50e HF Data Modem • display the firmware version in each device • display the product name of each device • rename the devices in the transceiver • gain access to the lists in each device For more information see page 214, *Devices entry*.	
Easitalk	Switch *Easitalk*™ on or off. You can also toggle *Easitalk*™ by pressing **EASITALK**.	On
Error Threshold (NRI remote control systems, NGT *AR* and *SR* Transceivers only)	Set an acceptable level of errors for data transfer between NGT remote interfaces. NOTE This entry is viewed via the Devices entry.	
Free Tune	Use the transceiver to tune to any frequency between 250 kHz and 30 MHz.	
GPS Error Time	Set the time the transceiver waits to receive updated GPS information before it displays an error message. The GPS Error Time entry is only active when Option GPS Enable is installed, and the RS232 [9way or 15way] Mode entry is set to **GPS**. NOTE You cannot make Send Position calls until the transceiver receives valid GPS information. If you send an Emergency call before valid GPS information is received, the message **No GPS data available** is sent with the call. If you receive a Get Position call, the same message is sent to the caller. When valid GPS data is received, a message is displayed on the handset to inform you of this.	10 minutes
GPS Screen	Display information about your GPS position. For more information see page 223, *GPS Screen entry*.	
Help Mode	Switch Help Mode on or off. When Help Mode is switched on, the handset screen displays a detailed description of the screen you are on. When Help Mode is switched off, the top line displays the standard description for the screen.	Off

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Inactivity Timeout (NRI remote control systems, NGT *AR* and *SR* Transceivers only)	Set the period of time after which the link between NGT remote interfaces will be terminated. NOTE This entry is viewed via the Devices entry.	
Key Beep	Switch key beeps on or off. When you press a key that is appropriate for the task you are performing, the transceiver makes a valid beep. When you press an inappropriate key, the transceiver makes an error beep. If key beeps are switched off, the transceiver still beeps when it transitions between certain modes, for example, logging out of admin level, and entering and exiting secure mode.	On
Key Hold Time	Set the length of time that a key must be held down for a *hold* action.	0.5 seconds
Key Repeat Rate	Set the speed with which the ◣, ◥, 🔊 and 🔊 keys repeat when they are held down.	0.2 seconds
Key Scroll Speed	Set the speed with which the characters on a key scroll when the key is held down.	1 second
Key Timeout	Set the time the transceiver waits between two presses of the same key to display the next character on the key. When this time elapses, the transceiver inserts the character displayed and moves the cursor to the next space.	1 second
Macro Pause	Set the pause time of macros that have been set to operate **Before pause** or **After pause**. The macro pause time is also the time that each step in a macro is displayed when the Macro Single Step entry is switched on. For more information on macros and hot keys see page 289, *Hot keys*.	3 seconds
Macro Single Step	Switch single-stepping through macros on or off. This enables you to debug macros by running them a step at a time. For more information on macros and hot keys see page 289, *Hot keys*.	Off
Manual Tune	Manually tune the antenna. You can also display the Manual Tune screen by pressing **TUNE**.	
Max Baud Rate (NRI remote control systems, NGT *AR* and *SR* Transceivers only)	Set the maximum possible rate for data transfer between NGT remote interfaces. NOTE This entry is viewed via the Devices entry.	
Messages	Store up to 10 messages for use in Get Status and Message calls. For more information see page 226, *Messages entry*.	
Min Baud Rate (NRI remote control systems, NGT *AR* and *SR* Transceivers only)	Set the minimum possible rate for data transfer between NGT remote interfaces. NOTE This entry is viewed via the Devices entry.	

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Mode	Change the mode used with the currently selected channel. You can also change the mode by pressing **MODE**. For more information on modes see page 233, *The Mode List*.	
Mute	Switch mute on or off. You can also toggle the mute on and off by pressing **MUTE**.	
Mute Scan	Set the type of mute selected when scanning starts. If you want mute to open when: • a selective call to your station is detected, or when voice is detected during scanning of channels in a voice network, select **Selcall** • voice is detected on a channel in a voice network, select **Voice** • voice is detected on a channel in any type of network, select **Scan for Voice** NOTE **Scan for Voice** slows the scanning rate across all networks and automatically reverts to **Voice** when scanning stops. NOTE You can toggle the current mute type to prevent mute opening on detected voice by pressing **V/S**. This does not change the stored setting.	Voice
Password Admin	Store a numeric password (up to 10 digits) for administrator access to the transceiver.	
Password User	Store a numeric password (up to 6 digits) for user access to the transceiver.	
Power Off	Switch off the transceiver.	
Retries (NRI remote control systems, NGT *AR* and *SR* Transceivers only)	Set the number of times that the NGT remote interfaces attempt to establish a link. NOTE This entry is viewed via the Devices entry.	

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
RS232 9way Mode (NGT *AR* and *SR* Transceivers only)	Set the mode in which the RS232 9-way serial port operates. If the port is: • not in use, select **None** • receiving GPS information, select **GPS** • controlling and monitoring the transceiver, select **CICS** • controlling the transfer of data between a computer and a modem over a remote control link, select **Modem Data** • controlling the transfer of data between a computer using 9102 software and a modem over a remote control link, select **PC Data** • receiving information from a radio/telephone interface, select **RTU Log**	None
RS232 9way Speed (NGT *AR* and *SR* Transceivers only)	Set the data rate of the RS232 9-way serial port on the junction box. NOTE The following combinations of data rates are not available: • 9-way 38400 b/s with 15-way 19200 b/s • 9-way 230400 b/s with 15-way 38400 b/s	9600
RS232 9way Startup (NGT *AR* and *SR* Transceivers only)	Set the serial commands you want to have performed by the 9-way port following power on, for example, setting the self address that will be used by CICS during transmissions, echo off etc. For more information see page 227, *RS232 Startup entries*.	

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
RS232 15way Mode (NGT *AR* and *SR* Transceivers only)	Set the mode in which the RS232 15-way serial port operates. If the port is: • not in use, select **None** • receiving GPS information, select **GPS** • controlling and monitoring the transceiver, select **CICS** • connected to a 9001/3012 modem, select **Fax/Data** • connected to a radio/telephone interconnect unit, select **3033/RTU–292** • connected to a single-tone low-rate FSK Pactor modem, select **Pactor 1** • connected to a split-site interface controller, select **Split-site** • connected to a multi-tone/PSK HAL or Clover modem, select **HAL/Clover** • connected to a non-Codan multi-tone modem, select **Modem Slow AGC** • connected to a non-Codan single-tone modem located in an area that is prone to frequent lightning strikes, select **Modem Fast AGC** (this may improve the performance) • connected to a multi-tone modem, or one that performs poorly using Modem Slow AGC or Modem Fast AGC, select **Modem Hold AGC**	None (*SR*), or GPS (*AR*)
RS232 15way Speed (NGT *AR* and *SR* Transceivers only)	Set the data rate of the RS232 15-way serial port on the junction box. NOTE The following combinations of data rates are not available: • 9-way 38400 b/s with 15-way 19200 b/s • 9-way 230400 b/s with 15-way 38400 b/s	9600 (*SR*), or 4800 (*AR*)
RS232 15way Startup (NGT *AR* and *SR* Transceivers only)	Set the serial commands you want to have performed by the 15-way port following power on, for example, setting the self address that is used by CICS during transmissions, echo off etc. For more information see page 227, *RS232 Startup entries*.	
RS232 Mode (NGT *AR Voice* Transceivers only)	Set the mode in which the RS232 6-way serial port operates. If the port is: • not in use, select **None** • receiving GPS information, select **GPS** • controlling and monitoring the transceiver, select **CICS**	None
RS232 Speed (NGT *AR Voice* Transceivers only)	Set the data rate of the RS232 6-way serial port.	9600
Scan	Switch scanning on or off.	

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Scan Allow	Enable or disable scanning.	Yes
Screen Auto-Dim	Set the time the transceiver waits after a key is pressed before switching off the backlighting on the handset screen. The backlighting is automatically switched on again when a key is pressed.	5 minutes
Screen Brightness	Set the brightness of the screen.	
Screen Contrast	Set the contrast of the screen.	
Screen Scroll Rate	Set the speed with which characters on the screen scroll when the line length exceeds the screen width.	0.8 seconds
Screen Scroll Step	Set the number of characters on the screen that scroll as a block when the line length exceeds the screen width.	2
Secure Index	Select the Corporate secure index.	
Secure Key	Set the CES secure key or AES secure key for a particular secure index.	
Secure Mode	Set the default secure mode of the CES-128 voice encryptor when you press **SEC**. If you want to: • use a secure key for encryption that is common to all Codan CES-128 voice encryptors, select **Global** • use a secure key for encryption that has been created for use in your organisation, select **Corporate**	Global
Selcall Lockout (RF unit/junction box firmware earlier than V4.00)	Switch selcall lockout on or off. Selcall lockout prevents calls from being made when the transceiver detects that another station is sending a call on the same channel. For RF unit/junction box firmware V4.00 or later, this functionality is included with *Cfg LBT Mode*.	
Site Config Master Site Config Slave1 ... (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Select a site and view or set up the system. This entry maps to the *Cfg Site Control*, *Cfg Site Mode*, *Cfg Site Options* and *Cfg Auto Tune Mode* entries in the Control List of the transceiver at the selected site.	
Site Equalise (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Start the automatic equalisation process between the current site and a selected site (or all sites), or reset the equalisation values at the local site to their default settings.	

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Site Info Master Site Info Slave1 ... (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Display the following information about the currently selected site: • **Site Name** • **Voltage** • **Temperature** • **RFU version** • **JB version** • **RC version**	
Site Link Slave1 Site Link Slave2 ... (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Display the following line status and equalisation values for the selected link: • **Status** • **Local/Remote Result** • **Local/Remote Equalise** • **Local/Remote Gain** • **Local/Remote Threshold**	
Site Rx (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Set the receive site for the system by changing the setting in the Cfg Site Mode entry as required at all sites.	
Site Tx (Split-site remote control systems, NGT *AR* and *SR* Transceivers only)	Set the transmit site for the system by changing the setting in the Cfg Site Mode entry as required at all sites.	
Time Local	Set the local date and time. For more information see page 83, *Setting the time and date*.	
Time Screen	Display the current date and time. For more information see page 83, *Setting the time and date*.	
Time Zone Offset	Set the difference between the time displayed on the date/time screen and UTC. For more information see page 83, *Setting the time zone offset*.	0 hours
Update Main Menu	Refresh lists in the Main Menu. This may be required if devices are added or removed after the transceiver is switched on.	
Welcome Screen	Display the welcome screen. This screen is briefly displayed when the transceiver is switched on.	

Table 25: Entries in the Control List (cont.)

Name of entry	Use this entry to...	Default
Welcome Text	Store up to three lines of text to be displayed on the welcome screen. If all three lines of text are blank, the welcome screen is not displayed when the transceiver is switched on. If you want to display a self address following power on, or set the transceiver to beep when it enters this screen, you can enter a keyword into the welcome text (see page 229, *Welcome text*).	

ALE entries

NOTE You must have the FED-STD-1045 ALE/CALM option installed to use the ALE entries in the Control List.

NOTE In the following discussion, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

NOTE The initial values that are set in your transceiver by Codan should provide good performance.

CAUTION Do not attempt to change the ALE settings in the Control List unless you are familiar with ALE operation. For more information on ALE, refer to FED-STD-1045 ALE.

ALE Accept ALL Call

ALL calls are not addressed to a specific station. If your station detects a call with a global ALL address syntax, it enters the linked state and alerts the operator. If you do not want to receive global ALL calls, disable this feature.

ALE BER

ALE control information is sent and received in blocks of data called ALE words. Each word is sent three times to reduce the effects of fading, interference and noise. When the words are decoded, the transceiver records the number of errors that occurred in the transmission.

The number of errors indicates the quality of the channel used. A bit error rate of 0 indicates perfect reception. A bit error rate of 48 indicates that all bits of the ALE word were bad.

The ALE BER entry enables you to specify the number of errors you will tolerate in this test, which indicates the quality of the channels on which you are prepared to accept calls. Also see page 208, *ALE Golay*.

CAUTION It is recommended that this entry is not altered from the factory setting.

ALE Call Scan

The ALE Call Scan entry enables you to set whether or not your transceiver performs a scan cycle between call attempts. When this entry is set to **Disabled**, the normal ALE calling sequence is used, that is, the transceiver attempts a call on the first channel in accordance with its settings for LBT and number of retries, then tries the next channel, and so on until the call is successful. The transceiver may miss incoming calls during this outgoing call activity. When the ALE Call Scan entry is set to **Outgoing network**, the transceiver performs a scan cycle between call attempts, scanning the channels in the network through which the call is being made. When the ALE Call Scan entry is set to **Scanned networks**, the transceiver performs a scan cycle between call attempts, scanning the channels in all the networks in the transceiver that are set to be scanned. Following the scan cycle, the transceiver checks if the channel for the call attempt is unoccupied, and if so, attempts the call. If the call is not successful, the transceiver performs another scan cycle, then either retries the same channel (depending on the value set in ALE Retries), or moves to the next channel.

ALE Call Scan Cycles

The ALE Call Scan Cycles entry sets the number of times the transceiver cycles through scanning the channels in the selected network(s) between call attempts.

ALE Call Threshold

When the quality of a channel is tested it is given an LQA score. This score is based on the results of local and remote measurements for BER and SINAD, and on the call weighting value set in the ALE Call Weighting entry.

NOTE If the ALE LQA Exchange entry is set to **Off**, remote measurements are not used.

Generally, a score of 25% indicates the minimum acceptable standard for voice communication. A score of 50% or higher indicates a good channel. The ALE Call Threshold entry enables you to set:

- the minimum score a channel must achieve for it to be tried in ALE calls
- the minimum acceptable standard for the channel at the time when a link is being established

The transceiver attempts to make calls on channels for which there is no score, but only after channels with a score above the threshold have been tried. If there are no channels that meet the ALE Call Threshold, the call is retried on the channels that provided the best response during the first attempt.

ALE Call Weighting

When the quality of a channel is tested it is given an LQA score. The ALE Call Weighting entry enables you to weight the scoring process according to the use of the transceiver. For example, if the transceiver is used to make voice calls, you would select **Mostly voice**. When **Lowest acceptable** is selected, the transceiver attempts a call on the channel with the lowest frequency (with an LQA score above the set threshold), then attempts the channel with the next higher frequency and LQA score etc, until a link is established. In some situations where propagation distances may be less than a few hundred kilometres, weighting the LQA scores in this way increases their effectiveness.

ALE Golay

ALE control information is sent and received in blocks of data called ALE words. After a word is received, BER tested and accepted, the transceiver performs a Golay test to check it for errors, and correct it if necessary.

The number of error bits per word indicates the quality of the channel used to transmit the word. Golay testing can detect and correct up to three error bits per ALE word. It can also detect four error bits, but is not guaranteed to correct all four. Note that excessive errors can sometimes create false readings.

The ALE Golay entry enables you to specify the number of errors you will tolerate and correct in this test, which indicates the quality of the channels on which you are prepared to accept calls. Also see page 206, *ALE BER*.

CAUTION It is recommended that this entry is not altered from the factory setting.

ALE Hangup ALL Call

During an ALL call, a link is established implicitly without the receiving stations responding to the initiating station. When the ALE Hangup ALL Call entry is set to **Enabled**, the initiating station sends a link termination sequence when **SCAN** is pressed. All stations that entered the link hang up the link and return to scanning when they receive this sequence.

ALE Hangup Phone Call

During any ALE Phone call, a link is established between the initiating station and the station with an automated radio/telephone interconnect unit, for example, a Codan 3033 Telephone Interconnect. When the ALE Hangup Phone Call entry is set to **Enabled**, all stations receive a link termination sequence when **SCAN** is pressed at one of the stations. All stations that entered the link hang up the link and return to scanning when they receive this sequence. This setting may be required in ALE/CALM networks with an automatic interconnect unit. If the ALE Hangup Phone Call entry is set to **Disabled**, a link termination sequence is not sent when **SCAN** is pressed at any of the stations in the link. In this case, a hangup sequence must be sent separately to the radio/telephone interconnect unit to clear the telephone line, or it hangs up after a timeout period is exceeded.

ALE Hangup Voice Call

During any ALE call, a link is established between the initiating and receiving stations. When the ALE Hangup Voice Call entry is set to **Enabled**, all stations receive a link termination sequence when **SCAN** is pressed at one of the stations. All stations that entered the link hang up the link and return to scanning when they receive this sequence. If the ALE Hangup Voice Call entry is set to **Disabled**, a link termination sequence is not sent when **SCAN** is pressed at any of the stations in the link. In this case, only this station ends its link.

ALE LQA Average

When the transceiver periodically tests the quality of the channels in your network, it stores the results for future use. The transceiver uses an averaging method to reduce the effect that the new reading may have on the current channel values.

The ALE LQA Average entry enables you to select the averaging method used. If you want to:

- disable the averaging feature and replace the old results with the new results, select **New**
- retain 75% of the old results and 25% of the new, select **Mainly old**
- retain 87.5% of the old results and 12.5% of the new, select **Old**
- replace the old results with the average of the old and new results, select **Both**

ALE LQA Clear

The ALE LQA Clear entry clears the LQA information in the transceiver. If you want to:

- clear the LQA information only from all sites, but retain the ALE address information, select **Clear site quality**
- remove all of the ALE addresses and associated LQA information from the transceiver, select **Remove all sites**
- refresh the list of ALE addresses held in the LQA information when the associated device has been removed permanently from the transceiver system, select **Refresh addresses**

If a large amount of information is stored in the transceiver, any of these actions may take a few minutes. If a significant change has occurred to the transceiver, the ALE LQA information adapts more rapidly to the new environment if the information is cleared.

ALE LQA Decay

When your transceiver periodically records the quality of the channels in your network, it stores the results for future use. Several factors can affect the accuracy of these results including:

- an insufficient number of ALE sounding transmissions being made in your network
- an insufficient number of ALE calls being made (which prevents the transceiver from exchanging channel quality information with other transceivers)
- stations moving their location
- antenna loading, nearby physical structures, and local noise for stations mounted in vehicles

These factors can lead to the deterioration of good channels going unnoticed. To avoid this, use the ALE LQA Decay entry to artificially decay channel quality information over time. This forces the transceiver to continually work against the artificial decay to maintain an accurate picture of channel quality that does not overestimate actual conditions.

For mobile stations the recommended decay period is 1 to 4 days. For base stations the recommended decay period is 15 to 30 days.

If you do not want to use this feature, select **Disabled**.

ALE LQA Exchange

If you want the transceiver to send and receive LQA information to and from other stations during calls, set the ALE LQA Exchange entry to **On**.

If the ALE LQA Exchange entry in your transceiver is set to **Off**, it does not request LQA information from other stations. Your transceiver receives any LQA information sent from the other station.

NOTE When the ALE LQA Exchange entry is set to **On**, it increases the length of time it takes to establish a call by approximately 4 seconds for every 10 channels on which the call is tried.

NOTE Exchange of LQA information may affect interoperability with non-Codan HF transceivers. If interoperability is affected, set the ALE LQA Exchange entry to **Off**.

ALE LQA Mapping

The ALE LQA Mapping entry determines the method by which the LQA information is stored within the transceiver, that is, according to frequency or channel name.

ALE Retries

When you make a call in an ALE/CALM network, the transceiver attempts to establish an ALE link with the other station on the best available channel. If you want the transceiver to retry each channel before trying the next best channel in the network, set the number of retries you want in the ALE Retries entry. The transceiver can retry channels up to five times. If you do not want the transceiver to retry channels, set the ALE Retries entry to zero.

ALE Silent Mode

The ALE Silent Mode entry disables automatic ALE transmissions from the transceiver. When ALE Silent Mode is set to **On**, you can send ALE calls but not receive them, and the transceiver receives sounding signals but does not send them. When ALE Silent Mode is set to **Off**, the transceiver operates as a normal ALE station.

ALE Site Mgr

The ALE Site Mgr entry enables the transceiver to collect information on other transceivers with which it communicates. The following information may be gathered, depending on your setting for the ALE Site Mgr:

- the ESN of the transceiver
- any other station self addresses stored in that transceiver that are associated with ALE/CALM networks
- the tuning time of the transceiver's antenna

It requests this information up to three times when the ALE Site Mgr entry is set to **Auto**, and only Codan HF transceivers in which the FED-STD-1045 ALE/CALM option is installed can respond. The self addresses and related LQA information for a remote transceiver is stored at one point in the LQA database of the local transceiver.

The ALE Site Mgr may be set as described in Table 26.

NOTE If the ALE Silent Mode is set to **On**, your transceiver does not initiate or respond *automatically* to requests for site manager information.

NOTE Regardless of the setting below, your transceiver always updates the site manager information that is broadcast from other stations.

Table 26: Settings for the ALE Site Mgr

Setting	Description
Auto	Your transceiver *automatically* initiates requests for site manager information from unknown addresses with which it links. Your transceiver broadcasts its self addresses *automatically* in response to requests from other stations. Your transceiver broadcasts its self addresses when it receives a Request Site Get Status call from another station. Your transceiver broadcasts its self addresses when you make a Broadcast Site Get Status call. Your transceiver requests site information from other stations when you make a Request Site Get Status call.
Manual	Your transceiver broadcasts its self addresses *automatically* in response to requests from other stations. Your transceiver broadcasts its self addresses when it receives a Request Site Get Status call from another station. Your transceiver broadcasts its self addresses when you make a Broadcast Site Get Status call. Your transceiver requests site information from other stations when you make a Request Site Get Status call.
Restricted	Your transceiver broadcasts its self addresses when you make a Broadcast Site Get Status call. Your transceiver requests site information from other stations when you make a Request Site Get Status call.
Off	Your transceiver does not respond to requests for site manager information. You cannot broadcast your site manager information to other stations. You cannot request site manager information from other stations.

NOTE

If your network consists of only a few Codan HF transceivers with the FED-STD-1045 ALE/CALM option installed and many other transceivers, you may want to set the ALE Site Mgr entry to **Off** or **Manual** to reduce network traffic.

The information collected:

- enables your transceiver to optimise calls to the other transceiver by adjusting the time taken to wait for the antenna to tune
- enables you to set a longer sounding interval

If you want to be able to view the site manager information for your transceiver, or another station, see page 430, *Enabling access to site manager information*.

Auto Resume entries

NOTE In the following discussion, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

The auto resume entries—Auto Resume Time, Auto Resume Mode and Auto Resume Listen—enable you to set the transceiver to automatically begin a task when scanning is switched off and there has been no PTT, channel change, scan on/off, mute on/off, or call sending activity for a certain length of time.

Use the Auto Resume Time entry to specify the time you want the transceiver to wait since the last key was pressed, before it begins the task. You can select from 1 to 20 minutes.

Use the Auto Resume Mode entry to specify the task that is performed after the time period. If you:

- want the transceiver to start scanning, select **Start scan**
- want the transceiver to close the link to end any call in progress and, if it was scanning prior to the call, resume scanning, select **Close link**
- do not want the transceiver to resume scanning, select **Off**

If you select **Start scan** as the value in the Auto Resume Mode entry, use the Auto Resume Listen entry to specify the scan method you want to use. If you want the transceiver to:

- scan according to the value set in the Mute Scan entry, select **Leave as is**
- scan for voice and calls addressed to your station, select **Voice and calls**
- scan only for calls addressed to your station, select **Calls only**

NOTE If the scan method is altered by the user, the transceiver returns to the scan method specified in the Auto Resume Listen entry following the time that is specified in the Auto Resume Time entry.

Devices entry

NOTE In the following discussion, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

The Devices entry in the Control List enables you to display information specific to the devices in the transceiver, for example, the junction box and RF unit. For each device you can display the:

- list of built-in tests
- ESN
- features installed and enabled in the device
- version of firmware installed
- product name
- lists stored in the device

You can also use the Devices entry to install new options and to rename the devices. Figure 35 and Figure 36 show the type of information that you can display about each device and the lists that are stored in each device (for more information about the lists stored in each device see page 221, *Accessing lists from the Devices entry*).

Figure 35: The Devices entry in the Control List (NGT *AR* and *SR* Transceivers only)

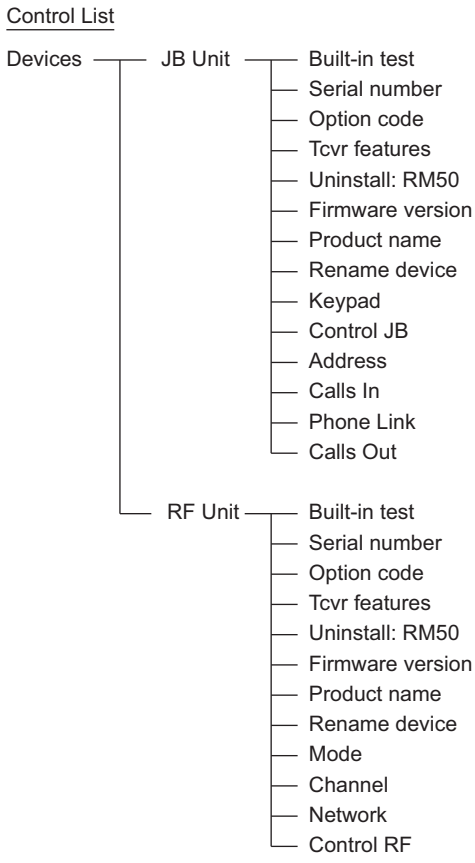
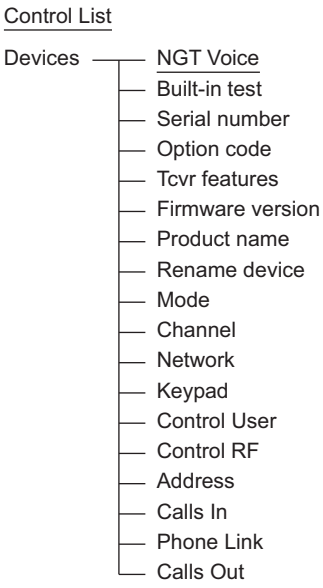


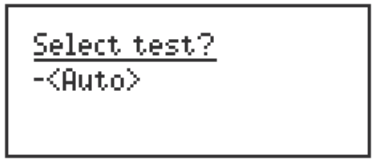
Figure 36: The Devices entry in the Control List (NGT *AR Voice* and *VR* Transceivers only)



Selecting a built-in test

To select a built-in test:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to **Built-in test**, then press ✓.



The hyphen next to the test name, in this case **<Auto>**, indicates that the test has not been run in this session of testing.

- ❑ Scroll to the test that you want to perform, then press ✓.

  When the test is in progress, the hyphen is replaced by a large dot.

  When the test is completed, the hyphen is replaced by a ✓ or a ✕ to show that the test has passed or failed respectively.

Displaying the electronic serial number of a device

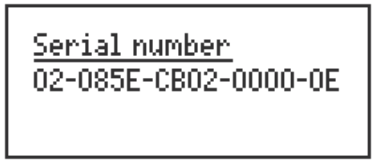
To display the electronic serial number of a device:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to the device for which you want to display the ESN, then press ✓.

NOTE The LED on the front panel of a device flashes green/red to show that this is the device you have selected.

- ❑ Scroll to **Serial number**, then press ✓.

  The ESN for the device is displayed and scrolls across the screen.



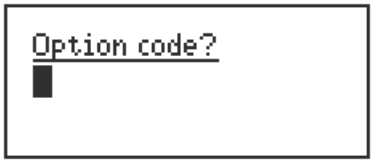
Installing an option in the transceiver

When you purchase an option for your transceiver (such as Option GPS Enable) you receive a 16-character option code and details of the device in which the option is to be installed. To install the option, you must enter the option code into the correct device using the Devices entry in the Control List.

To install an option in the transceiver:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to the required device, then press ✓.
- ❑ Scroll to **Option code**, then press ✓.

  The option code screen is displayed.



- ❑ Enter the code, then press ✓.

  NOTE The transceiver automatically adds a dash after every four digits.

  The option is installed.

  NOTE Depending on the option you installed, a message may be displayed that asks you to restart the transceiver.

Displaying the options installed in your transceiver

The transceiver provides a summary of the firmware and hardware options installed in your transceiver.

To view the list of options in the transceiver:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to the required device, then press ✓.
- ❑ Scroll to **Tcvr features**, then press ✓.

  The list of options that are fitted and enabled in the transceiver is displayed.

  Any of the following options may be displayed:

  - AES-256 Voice
  - AES-256 RM50 <firmware version>[✓]
  - CES-128 Voice
  - Internal Voice
  - Private Voice
  - FED-STD-1045 ALE
  - GPS options
  - Amateur Mode
  - Filter 2
  - TxD or TxP or TxE
  - Max Pwr <nn> W

Uninstalling the RM50e HF Data Modem (NGT *AR* and *SR* Transceivers only)

If the RM50e HF Data Modem is no longer being used and you want to physically remove it from the system, you also need to remove it from the memory of the transceiver.

To remove the RM50e from the memory of the transceiver:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Select **JB Unit** or **RF Unit**, then press ✓.

  NOTE — The LED on the front panel of a device flashes green/red to show that this is the device you have selected.

- ❑ Scroll to **Uninstall: RM50**, then *hold* ✓.

  A pop-up showing **Modem info: Removed: RM50** is displayed.
- ❑ Press ✕ until **Main Menu** is displayed.

Displaying the firmware version of a device

If you need to check the firmware version of a device, use the Firmware version setting under the Devices entry in the Control List.

To display the firmware version of a device:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to the device for which you want to display the firmware version, then press ✓.

  NOTE — The LED on the front panel of a device flashes green/red to show that this is the device you have selected.

- ❑ Scroll to **Firmware version**, then press ✓.

  The firmware version is displayed.

Displaying the product name of a device

To display the product name of a device:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to the device for which you want to display the product name, then press ✓.

NOTE The LED on the front panel of a device flashes green/red to show that this is the device you have selected.

- ❑ Scroll to **Product name**, then press ✓.

  The product name is displayed.

Renaming a device

The devices in the transceiver are shipped with standard names, that is, JB Unit and RF Unit. If you have more than one type of unit in a transceiver system, you may want to rename the similar devices to distinguish between them. Use the Rename device setting under the Devices entry in the Control List.

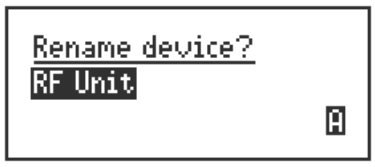
To rename a device:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to the device you want to rename, then press ✓.

NOTE The LED on the front panel of a device flashes green/red to show that this is the device you have selected.

- ❑ Scroll to **Rename device**, then *hold* ✓.

  The name of the device is displayed.



- ❑ Enter a new name for the device, then press ✓.

NOTE For help with entering text see page 66, *Entering and editing text*.

Accessing lists from the Devices entry

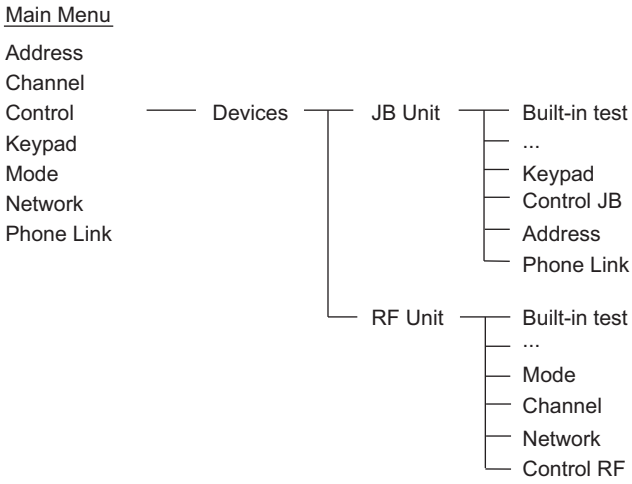
NOTE — In the following discussion, you must log in as administrator to see the Main Menu and Control List (see page 120, *Logging in to admin level from user level*).

The lists in the transceiver are physically stored in the devices that use them. The Address, Keypad and Phone Link Lists are stored in the junction box. The Channel, Mode and Network Lists are stored in the RF unit. A Control List is stored in each unit. There are no lists in the handset.

NOTE — All lists are stored in the RF unit for the NGT *AR Voice* and *VR* Transceivers.

You can access all the lists through the Main Menu. You can also access them through the Devices entry in the Control List where they are listed under the device in which they are stored (see Figure 37). In the Main Menu, the Control List from each device is combined into one large list.

Figure 37: Lists as they are displayed in the Main Menu and under the Devices entry in the Control List



NOTE — The entries under JB Unit and RF Unit are merged into one list in the NGT *AR Voice* and *VR* Transceivers, as shown in Figure 36 on page 215.

Displaying a list using the Devices entry

To display a list using the Devices entry in the Control List:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Scroll to the device in which the list you want is stored, then press ✓.

NOTE The LED on the front panel of a device flashes green/red to show that this is the device you have selected.

- ❑ Scroll to the list you want, then press ✓.

NOTE If the list is not displayed it may be hidden at user or admin level. Switch full view on, and/or log in to admin level to display the list (for help see page 122, *Displaying full and normal view* and page 120, *Logging in to admin level*).

You may view and edit entries and settings in the list while it is displayed.

Displaying and editing channels using the Devices entry

When you access the Channel List from the Main Menu, the transceiver selects each channel as you scroll to it. If you access the Channel List through the Devices entry, you can display and edit the channels without stopping channel scanning.

GPS Screen entry

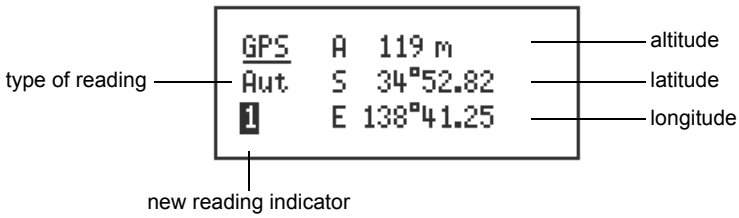
NOTE The GPS Screen entry is only displayed if Option GPS Enable is installed in the transceiver. NGT *VR* Transceivers do not support Option GPS Enable.

NOTE The GPS receiver should be pointed toward the sky and should not be shadowed by overhead obstructions.

The GPS Screen entry in the Control List enables you to display your current GPS position. Press **9** to access the GPS screen.

You can configure the GPS receiver to report in metric or imperial units using the Cfg Units entry in the Control List. You can also use a special configuration command in the Message 10 entry that provides GPS readings in degrees, minutes and seconds (see page 428, *Enabling GPS format options*).

Figure 38: The GPS Screen entry in the Control List



NOTE GPS receivers sometimes take time to acquire an altitude reading that is accurate. You may find that the altitude reading fluctuates for the first few readings.

Table 27 explains the abbreviations for each type of reading you may receive. This information is provided by the GPS receiver. In normal situations, you only see automatic readings.

The new reading indicator is a number that increments each time a new reading is received. Each increment confirms that your GPS receiver is functioning correctly. The indicator cycles from 1 to 9.

Table 27: Types of readings on the GPS screen

Abbreviation		Description
On GPS screen	**In message text**	
Aut	A	Automatic reading
Bad	N	Bad reading
Dif	D	Differential reading
Est	E	Estimated reading
Man	M	Manual reading

NOTE For information on GPS readings refer to the documentation provided with your GPS receiver.

Setting up the transceiver

NOTE The NGT Transceiver is compatible with NMEA format 0183 V2.00. It accepts and processes the following GPS receiver input sentences: RMC, GLL, and GGA.

NOTE In the following discussion, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

Before you display the GPS screen, make sure that the GPS receiver is correctly connected to the transceiver and Option GPS Enable is installed.

Ensure that:

- the GPS receiver is connected correctly to the transceiver (usually to the 15-way connector on the junction box or the 6-way connector on the 2011 RF Unit)
- the value in the corresponding RS232 Mode entry in the Control List is set to **GPS**
- the data rate in the corresponding RS232 Speed entry in the Control List is set to the correct rate for the GPS receiver (typically 4800 b/s)

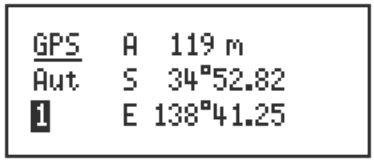
NOTE If you change the mode and/or data rate in the Control List, switch the transceiver off then on again for the changes to take effect.

Displaying the GPS screen

To display the GPS screen:

❑ Press **9**.

The GPS screen is displayed. For example:



NOTE If **no data** is displayed on the GPS screen, the transceiver has not received any valid GPS data. Check that the GPS receiver is connected correctly to the transceiver, and that the mode and speed for the corresponding serial port have been set correctly (see page 224, *Setting up the transceiver*).

NOTE If you want to view GPS readings in seconds rather than decimal minutes, use the **#$! GPSS** command in the Message 10 entry (see page 428, *Enabling GPS format options*).

❑ Press **9** to return to the screen from which you began.

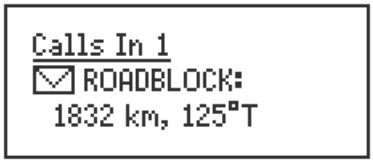
Showing distance and bearing

NOTE Automatic distance and bearing calculations only occur when Option GPS Enable is installed.

To show the distance and bearing to a remote transceiver from your current valid GPS position:

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

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



CAUTION You must have valid GPS information stored in your transceiver from either of the following sources:

- a connected GPS receiver, or
- the My GPS entry in the Address List (if you don't have a GPS receiver connected)

CAUTION If you don't have a GPS receiver connected and are using the My GPS entry in the Address List to enable the distance and bearing display, you should set the GPS Error Time entry in the Control List to **Off**.

Messages entry

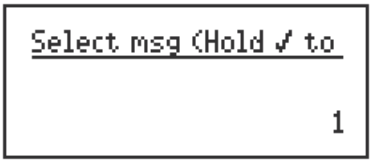
You can store up to 10 messages in the Messages entry for use in Message calls. When you make one of these calls, you can scroll through these messages, then select and/or edit the one you want to send.

NOTE If a Message entry is locked at admin level, you are not able to edit the message during a call.

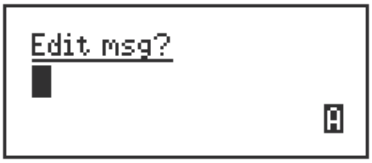
NOTE The Message 10 entry is a special entry that accepts configuration commands. For more information on using this entry see page 411, *Controlling user access*.

To pre-type and store a message:

- ❑ Press **CALL**.
- ❑ Scroll to **Message?**, then press ✓.



- ❑ Scroll to the setting in which you want to enter your message, then *hold* ✓.



- ❑ Enter the message, then press ✓.

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Press ✕ or PTT to cancel the call.

RS232 Startup entries

NOTE In the following discussion, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

The RS232 Startup entries are used to store CICS commands that configure the serial ports for use when the transceiver is switched on, for example, self addresses. If you are entering CICS commands into these entries using the handset, there is a limit of 199 characters. For information on CICS commands see page 355, *Operating the transceiver from a computer*. When commands are entered into the RS232 Startup entry, the transceiver grants these commands admin access, therefore, you can use the RS232 Startup entry to enter CICS commands that normally required admin login through CICS.

There is a group of special commands that are only used in the RS232 Startup entry.

Table 28: Special commands for the RS232 Startup entry

Command	**Function**
DELSTARTUP	Deletes the contents of the RS232 Startup entry when the command is read. This command is used to prevent read-back of secure keys that have been entered using the RS232 Startup entry. The command must be located at the end of the RS232 Startup entry.
SECURE ALWAYS	Starts the CICS interface session in secure mode. Secure remains on during scanning, and cannot be switched off at user level.
SECURE KEY	Enters multiple secure keys in the format `secure key [#n] [<key>]`. For more information see page 380, *secure command* and page 249, *Creating a text file containing CES secure keys*, or page 263, *Creating a text file containing AES secure keys*.
SECURE STICKY [ENABLE|DISABLE]	Starts the CICS interface session in the secure mode determined by the Message 10 setting, but permits scanning during secure mode in the CICS session.

NOTE CICS is available with NGT *AR*, *SR*, and *AR Voice* Transceivers only.

Entering a serial command into a startup entry

To enter commands into a startup entry:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **RS232...**, then press ✓.
- ❑ Select the RS232 port for which you want to enter a command, scroll to **Startup**, then press ✓.

  If a serial command has not yet been entered, the List Manager is displayed.

  If one or more commands have already been entered, the screen displays the first command. *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Add item**, then press ✓.
- ❑ Enter the command, then press ✓.

  NOTE For help with entering text see page 66, *Entering and editing text*.

  The new command is stored and the List Manager remains open.
- ❑ If you want to view the command you have stored, press ✕ to close the List Manager.
- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Switch the transceiver off then on again to activate the command.

Editing a serial command in a startup entry

To edit an existing command in a startup entry:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **RS232...**, then press ✓.
- ❑ Select the RS232 port in which you want to edit a command, scroll to **Startup**, then press ✓.
- ❑ Scroll to the command you want to edit, then *hold* ✓.
- ❑ Edit the command, then press ✓.

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Switch the transceiver off then on again to activate the command.

Welcome text

Self addresses

If you want to view a self address in your transceiver during startup, you can programme the Welcome Text entry in the Control List with a keyword that displays the self address.

NOTE In the following table, n ranges from 1 to 10 (the maximum allowable number of self addresses for the transceiver).

NOTE The NGT *VR* Transceiver supports 3 self addresses.

Table 29: Keywords that display a self address

Keyword	Displays...
$IDn	The n^{th} self address. If the n^{th} self address does not exist in the transceiver, the transceiver leaves the welcome text blank at startup. If the transceiver does not have a self address programmed, **No self address** is displayed.
$IDn/	The n^{th} self address, if it exists, with the associated network. If the self address is valid for all networks, then the network names are not appended.
$IDn*	The n^{th} self address applying to all networks. If there is no self address applicable to all networks, the transceiver leaves the welcome text blank at startup.
$ID?	The self address used in the last call sent from this transceiver. This self address is used as the default for any future calls sent from this transceiver.

Beep

If you want the transceiver to emit a beep when any welcome text is displayed, you can programme the Welcome Text entry in the Control List with **$BEEP** anywhere in the lines of text.

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The Keypad List stores information about the keys on the handset and desk console and the events that occur when the keys are pressed.

NOTE The transceiver is shipped with the Keypad List hidden at admin level. To display the list see page 123, *Hiding and showing information*.

The Keypad List contains an entry for each key on the handset and desk console. Each entry stores a list of the macros assigned to the key, and a list of the upper-case, lower-case and numeric characters that you can enter using the key (see Table 30).

NOTE There are no entries for the **CALL**, , , , , , and keys as you cannot assign macros to these keys.

It also contains two entries that you can use to create and maintain macros. The Special entry contains a number of macros that you cannot create from the handset but can be copied and assigned to any key. The Unassigned entry is a place where you can store macros for which you have no immediate use. For more information on macros and the Special and Unassigned entries see page 289, *Hot keys*.

Table 30: Entries in the Keypad List

Name of key	Macros assigned to key	Upper case	Lower case	Numeric
#	Call Logs - Out	Toggles upper-case, lower-case and numeric text entry		
*	Easitalk	. , ’ ? ! & # $ * ( ) - + /	. , ’ ? ! & # $ * ( ) - + /	.
0	Channel Screen	0 space	0 space	0
1QZ	Manual Tune	QZ1	qz1	1
2ABC	Clarifier	ABC2	abc2	2
3DEF	Next Mode	DEF3	def3	3
4GHI		GHI4	ghi4	4
5JKL		JKL5	jkl5	5
6MNO		MNO6	mno6	6
7PRS	Mute Type	PRS7	prs7	7
8TUV	Secure	TUV8	tuv8	8
9WXY	GPS	WXY9	wxy9	9
Emergency	Call Emergency			
F1	Call Key			
F2	Scan Toggle			

Table 30: Entries in the Keypad List (cont.)

Name of key	Macros assigned to key	Upper case	Lower case	Numeric
F3	Next Mode			
F4	Mute			
Hang up	Scan Toggle			
Mute	Mute			
Power	Power Down			
Special	Power Down			
	Mute Type			
	Mute			
	Call Logs - Out			
	Call Logs - In			
	New Call			
	End Call			
	Call Key			
	Scan Toggle			
	Call Emergency			
	Secure			
Unassigned				

14 The Mode List

The Mode List stores information about the modes available in the transceiver. A mode is a set of parameters used with a channel consisting of a sideband and an IF filter, as shown in Table 31.

Table 31: Modes for NGT Transceivers

Name of mode	Used in...	Sideband	IF centre	IF width
USB	*AR*, *SR*, *AR Voice*, *VR*	USB	1 500 Hz	2 500 Hz
LSB	*AR*, *SR*, *AR Voice*, *VR*	LSB	1 500 Hz	2 500 Hz
AM	*SR*, *VR*	AM	1 500 Hz	2 500 Hz
USB CW	*SR*	USB	900 Hz	500 Hz
LSB CW	*SR*	LSB	900 Hz	500 Hz
AM CW	*SR*	AM	900 Hz	500 Hz
CW	*AR*, *SR*	N/A	0 Hz	Narrowest available, typically 500 Hz (if fitted) or 2 500 Hz
USB PT	*SR*	USB	1 700 Hz	500 Hz
LSB PT	*SR*	LSB	1 700 Hz	500 Hz

The modes from which you can select depend on the options installed in the transceiver. The Mode List is display-only: you cannot add, edit or delete modes from it.

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15 CES-128 voice encryptor option

This section contains the following topics:

Overview

NOTE To use the CES-128 voice encryptor, you must have the hardware option fitted and specific firmware programmed into the transceiver and enabled.

NOTE The CES-128 voice encryptor may be used in conjunction with the AES-256 digital data encryptor. The data is handled via an RM50e HF Data Modem. For more information see page 277, *Using the AES-256 digital data encryptor with a voice encryptor*.

NOTE Codan's Key Management Software may be used to generate secure keys and to fill the CES-128 voice encryptor.

The CES-128 voice encryptor is an optional feature that provides high-grade security for voice communications. This feature uses CES secure keys, secure modes, and PINs to provide various levels of secure communications.

In order to communicate securely between two stations, both stations must use the same channel frequency and secure key. The CES-128 voice encryptor may be programmed with multiple secure keys, any one of which may be selected. In addition to the secure keys, the CES-128 voice encryptor provides a PIN facility, which temporarily varies the level of security on the key for a private session.

For secure communications within your organisation you must set up secure keys in the Corporate secure indexes that are common to all transceivers in your organisation. If you need to have secure communications with other organisations operating the same type of equipment as yours, you can use the fixed Global secure key that is common to all CES-128 voice encryptors shipped from Codan. The Global secure key provides secure communications, however the security is less than that provided by a secure key in a Corporate secure index. The PIN facility may also be used with the Global secure key to increase the level of security.

The CES-128 voice encryptor remembers the last-used state if the transceiver is switched off then on again. The encryptor allows secure operation to remain on during scanning. Secure standby mode is permitted and remains on until * is pressed again (see page 246, *Using the CES-128 voice encryptor in standby mode*).

NOTE For firmware earlier than V5.11, you can use a special command in the Message 10 entry to ensure that the CES-128 voice encryptor remembers the last-used state if the transceiver is switched off then on again. This command also allows secure operation to remain on during scanning (see page 421, *Controlling access to CES-128 voice encryptor options*).

The CES-128 voice encryptor uses a Base secure key in secure index 0. This key, along with the selected secure key in a Corporate secure index, is used as the seed for the encryption algorithm. The Base secure key may only be changed using a CICS command (secure key #0 <key>). It cannot be programmed via the handset or via the Key Management Software. Changing the Base secure key changes the seed for the encryption algorithm. Transceivers must use the same Base secure key and secure key in a Corporate secure index for secure communication.

NOTE The factory-default Base secure key is 0. This key can only be set via CICS. For more information see page 380, *secure command*.

NOTE The Global secure key does not use the Base secure key in its encryption algorithm.

Using the CES-128 voice encryptor

Using the CES-128 voice encryptor

NOTE

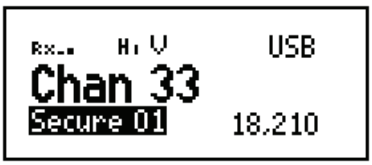
The default secure mode is Global, and the Secure Mode entry in the Control List is hidden at admin level. If you want to change the default secure mode to Corporate, log in to admin level and change the setting (see page 120, *Logging in to admin level* and page 104, *Changing a setting in the Control List*).

To use the CES-128 voice encryptor:

- ❑ Start a call (see page 177, *Calling methods*).
- ❑ Press **SEC**.

  The transceiver responds with two high short beeps, and displays **Go Secure** with the secure mode and Corporate secure index used. For example:

  If you are in the Channel List, the active CES-128 voice encryptor is indicated by the text **Secure** <**index**> highlighted at the bottom left of the channel screen. For example:

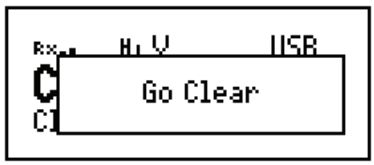


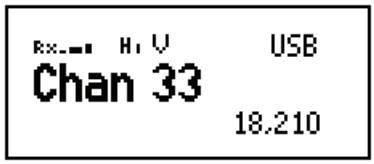
Switching off the CES-128 voice encryptor

To switch off the CES-128 voice encryptor:

- ❑ Press **SEC**.

  The transceiver responds with two low short beeps and displays **Go Clear**. For example:



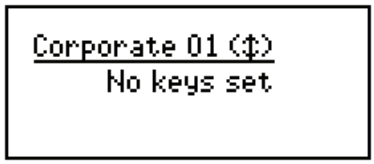


Creating a secure key in a Corporate secure index

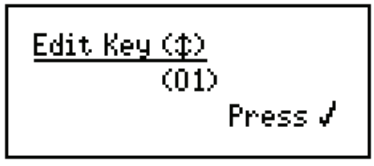
NOTE In the following discussion, you must log in as administrator to see the Edit Key entry (see page 120, *Logging in to admin level from user level*).

To create a secure key for Corporate secure index 01:

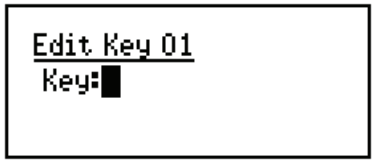
- ❑ *Hold* **SEC**.



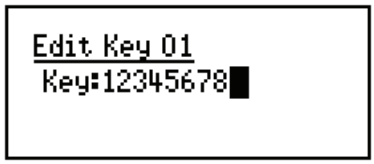
- ❑ Scroll to **Edit Key**.



- ❑ Press ✓.

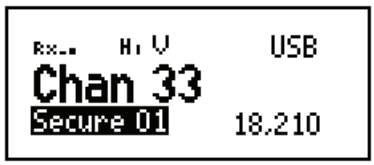


- ❑ Enter the secure key for Corporate secure index 01.



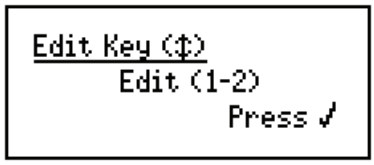
- ❑ Press ✓.

  The transceiver goes secure using the key that you entered.



To create a secure key for the next Corporate secure index:

- ❑ *Hold* **SEC**, then scroll to **Edit Key**.

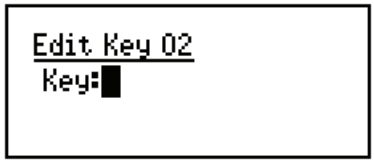


- ❑ Press ✓.

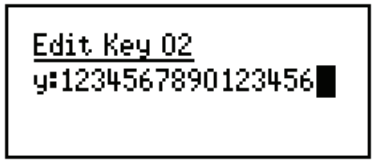
- ❑ Scroll to **Index:02 (New)**.

  The transceiver automatically assigns the next Corporate secure index number.

- ❑ Press ✓.

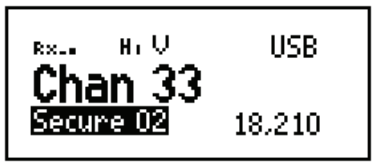


- Enter the secure key for the Corporate secure index shown.



- Press ✓.

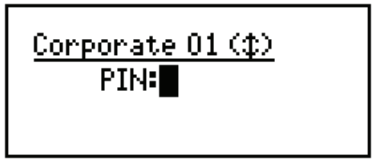
  The transceiver goes secure using the key that you entered.



Using a PIN for private communications within an organisation

To use the CES-128 voice encryptor with a PIN:

- ❑ Start a call (see page 177, *Calling methods*).
- ❑ *Hold* **SEC** to enter a PIN for the session.



- ❑ Enter the 4-digit PIN that you have agreed to use with others for this session, then press ✓.

CAUTION The PIN must be a number that both parties know and agree upon without mentioning it over the air.

The transceiver responds with two high short beeps, and displays **Go Secure** with the secure mode and Corporate secure index used, and **PIN** to indicate that a PIN is in use. For example:

If you are in the Channel List, the active CES-128 voice encryptor is indicated by the text **Secure** <**index**>**P** highlighted at the bottom left of the channel screen. For example:

Switching between Global and Corporate secure modes

Whenever you switch on the CES-128 voice encryptor it enters the secure mode that is set in the Secure Mode entry in the Control List. For help on changing the default secure mode see page 104, *Changing a setting in the Control List*.

By default, the Secure Mode entry in the Control List is admin hidden, so you cannot change between Global and Corporate mode unless you are logged in to admin level, or you show the Secure Mode entry at user level (see page 120, *Logging in to admin level* or page 111, *Hiding and showing settings*).

To switch between the Global and Corporate secure modes while using the CES-128 voice encryptor:

- ❑ *Hold* **SEC**.

- ❑ Use ◣ or ◥ to toggle between **Global** or **Corporate** <**nn**>.
- ❑ If you want to use a PIN, enter the 4-digit PIN that you have agreed to use with others for this session.
- ❑ Press ✓.

NOTE The default secure mode is not changed. Next time you switch on the CES-128 voice encryptor, the default secure mode is entered.

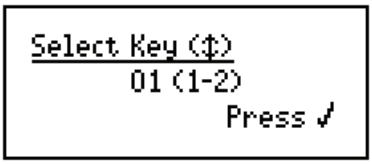
Switching between Corporate secure indexes

NOTE

The default secure mode must be set to Corporate (see page 104, *Changing a setting in the Control List*), and you must have at least two secure keys programmed into the transceiver in order to see the Select Key entry.

To switch between Corporate secure indexes while using the CES-128 voice encryptor:

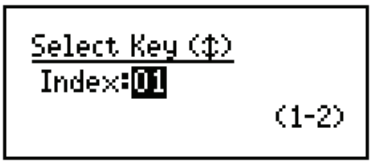
❑ *Hold* **SEC**, then scroll to **Select Key**.



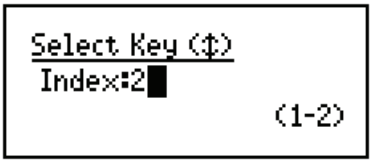
NOTE

The currently selected secure index is shown, followed in brackets by the range of Corporate secure indexes that are programmed with a secure key.

❑ Press ✓.

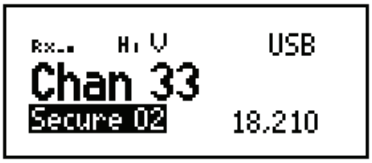


❑ Enter, or scroll to, the number of the Corporate secure index that you want to use.



❑ Press ✓.

The transceiver goes secure using the key that you selected.



Erasing all of the CES secure keys

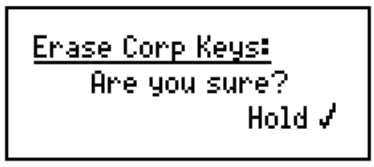
All of the secure keys in the Corporate secure indexes in the transceiver may be erased via a simple hot-key sequence.

NOTE If you want to disable this hot-key sequence see page 426, *Controlling access to erasing secure keys*.

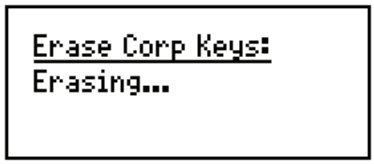
NOTE The Base secure key in secure index 0 is not erased.

To erase all secure keys:

- ❑ Press ⓘ + **SEC**.



- ❑ *Hold* ✓.



Using the CES-128 voice encryptor in standby mode

If you are operating in a communication network that has transceivers that use secure communications, non-secure communications, or both, then use the secure standby mode. When the CES-128 voice encryptor is in standby mode, you can hear all communications on the selected channel that are made by other transceivers in clear mode. If your transceiver detects an encrypted transmission from another station that is in secure mode, your transceiver will exit secure standby mode and go secure so that you can hear the secure, decrypted communication.

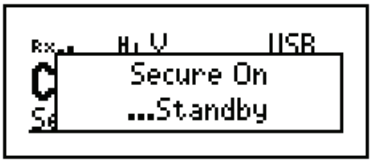
NOTE

Extra CES-128 voice encryptor features that affect operation during secure standby mode are available by using special commands in the Message 10 entry. For more information see page 421, *Controlling access to CES-128 voice encryptor options*.

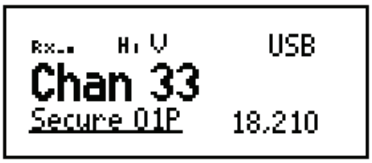
To enter standby mode:

- ❑ Press **SEC** to switch on the CES-128 voice encryptor, or *hold* **SEC** to enter a PIN.
- ❑ Press ***.

  The CES-128 voice encryptor switches to standby mode.



If you are in the Channel List, the CES-128 voice encryptor in standby mode is indicated by the text **Secure** <**index**>[**P**] underlined at the bottom left of the channel screen. For example:



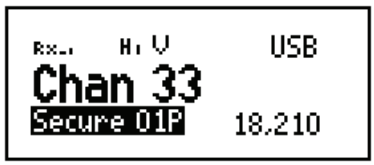
NOTE

The transceiver automatically switches from standby mode to secure mode if an encrypted transmission is received.

To exit standby mode:

- ❑ Press *.

  The CES-128 voice encryptor switches from standby mode.



Setting up the CES-128 voice encryptor

NOTE In the following discussion, you must log in as administrator to see the entries in the Control List (see page 120, *Logging in to admin level from user level*).

NOTE You may also use Codan's Key Management Software to generate CES secure keys and to fill the CES-128 voice encryptor.

Setting up the CES-128 voice encryptor for basic security use

To set up the CES-128 voice encryptor:

- ❑ Set up the secure keys, as required (see page 239, *Creating a secure key in a Corporate secure index*).
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Secure...**, then press ✓.
- ❑ Do the following, as required:
  - To allow Corporate secure mode only, admin lock and hide the Secure Mode entry in the Control List.
  - To prevent the user from changing the Corporate secure index, admin lock and hide the Secure Index entry in the Control List.
  - To prevent the user from changing the secure key in a Corporate secure index, admin lock and hide the Secure Key entry in the Control List.

  NOTE For information on locking and hiding information see page 125, *Locking and unlocking information* and page 123, *Hiding and showing information*.

- ❑ If you want users to be able to use a PIN, ensure that the PIN mode is enabled (see page 421, *Controlling access to CES-128 voice encryptor options*).

  Otherwise, disable the PIN mode.

Setting up the CES-128 voice encryptor for advanced security use

To set up the CES-128 voice encryptor:

- ❑ Set up the secure keys (see page 239, *Creating a secure key in a Corporate secure index* or see page 249, *Creating a text file containing CES secure keys*).
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Secure...**, then press ✓.
- ❑ Unlock and show the Secure Index entry in the Control List at user level so that the current Corporate secure index, as designated by the organisation, can be selected.

NOTE

For more information see page 125, *Locking and unlocking information*, page 123, *Hiding and showing information*, and page 343, *Example 4: displaying and/or changing a setting in the Control List*.

- ❑ If you want to change the Base secure key (secure index 0), and hence part of the seed for encryption for all secure keys, use CICS (see page 380, *secure command*).
- ❑ If you want to alter the encryption algorithm, contact your Codan representative.

Creating a text file containing CES secure keys

NOTE

You may also use Codan's Key Management Software to generate CES secure keys and to fill the CES-128 voice encryptor. This software provides enhanced security for the key set. This prevents the keys from being read by a text editor, and in some instances, prevents the key set from being programmed to unauthorised transceivers.

As a system administrator, you can program a group of secure keys into a transceiver by creating a text file containing the information, then sending this text file to the transceiver using a terminal-emulation program (see page 251, *Setting up communication with the computer* and page 252, *Programming the transceiver*).

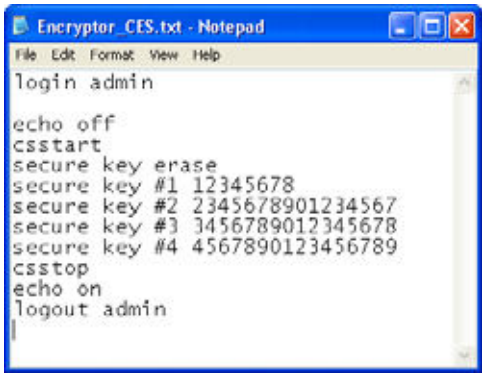
NOTE

You can send each line to the transceiver via a terminal-emulation program. You must be logged in to admin level to send certain `secure` commands from a computer to the transceiver (see page 120, *Logging in to admin level*). Alternatively, you can enter these commands into the RS232 Startup entry in the Control List (see page 227, *RS232 Startup entries*).

CAUTION

Codan recommends that the Base secure key and the secure keys for the Corporate secure indexes are not saved within the same file.

Figure 39: Example of a text file containing secure keys for Corporate secure indexes



NOTE You must enter a password to log in to admin level. If the transceiver does not use an admin password, leave a blank line in the text file so that an empty admin password is used.

NOTE The **echo off** command prevents the secure keys being written to the buffer of the terminal-emulation program.

CAUTION You must use a hard return at the end of each line, including the last line, so that the command is executed as it is sent to the transceiver.

To create a text file:

- ❑ Open a new text file in a text editor.
- ❑ Enter the secure key information.

  NOTE The secure keys must be entered in sequential index order.

  CAUTION To avoid the potential for overloading the input buffer in the transceiver, only prepare 25 CES secure keys in a text file at a time.

- ❑ Save the text file with an appropriate name.

Setting up communication with the computer

To set up a transceiver to communicate with the computer:

- ❑ Connect a standard serial cable between a COM port on the computer and the 9-way or 15-way connector on the junction box, or 6-way connector on the RF unit (NGT *AR Voice* Transceivers only).

  NOTE — Use cable 08-06360-002 for the 9-way connector, 08-06266-001 for the 15-way connector, or 08-06380-001 for the 6-way connector.

  NOTE — Use a USB-to-serial-port cable to create a COM port if your computer only has a USB port available. This cable may be ordered from Codan (Codan part number 78-01031).

- ❑ Check that:
  - the corresponding RS232 Mode entry for the connector is set to **CICS**, and
  - the corresponding RS232 Speed entry for the connector is set to **9600**

  NOTE — If you need to change either of these settings, restart the transceiver to activate the changes.

- ❑ Open a terminal-emulation program and set the following for the port connected to the transceiver:

Data rate	9600 b/s
Data bits	8
Parity	None
Stop bits	1
Flow control	None

- ❑ Type a simple command, for example, `secure on` or `scan`, and check that the transceiver responds.

Programming the transceiver

To program the transceiver with a text file containing secure keys:

- ❑ Send the file containing the secure keys as a *text* file to the transceiver.

  The transceiver is updated dynamically. You do not have to restart the transceiver.

  NOTE — If you have used the `csstart` and `csstop` commands, observe the value in the checksum displayed at the terminal. The checksum must be the same each time the same file is transferred to a transceiver.

  NOTE — If the file has not been transferred correctly, reduce the data rate for the COM port on the computer and the RS232 port on the transceiver to 2400 b/s.

- ❑ Check that the transceiver has received the secure keys by *holding* **SEC**, then scrolling to the Select Key entry to see that the number of available Corporate secure indexes matches the number of secure keys programmed in the text file.
- ❑ Program any other transceivers with the same text file, as required.
- ❑ Check that secure communication is possible between transceivers.
- ❑ If secure communication is not possible between the transceivers, re-program the Base secure key (secure key #0 <key>) with the key that you want to use across all transceivers that use the CES-128 voice encryptor.

16 AES-256 digital voice encryptor option

This section contains the following topics:

Overview

NOTE — To use the AES-256 digital voice encryptor, you must have the hardware option fitted and specific firmware programmed into the transceiver and enabled.

NOTE — The AES-256 digital voice encryptor may be used in conjunction with the AES-256 digital data encryptor. The data is handled via an RM50e HF Data Modem. For more information see page 277, *Using the AES-256 digital data encryptor with a voice encryptor*.

NOTE — Codan's Key Management Software may be used to generate secure keys and to fill the AES-256 digital voice encryptor.

The AES-256 digital voice encryptor is an optional feature that provides high-grade security for voice communications. This feature uses secure keys to provide secure communications. The digital encryption may be processed at 1200 or 2400 b/s. The display on the handset clearly indicates whether the transceiver is secure (**TEK** <**index**> <**1k2**|**2k4**>) or clear (**Clr Voice**).

NOTE — The prefix for the AES secure keys may be changed using the Key Management Software, or via CICS (see page 380, *secure command*).

In order to communicate securely between two stations, both stations must use the same channel frequency and secure key. The AES-256 digital voice encryptor may be programmed with multiple secure keys, any one of which may be selected. For secure communications within your organisation you must set up secure keys that are common to all transceivers in your organisation.

The AES-256 digital voice encryptor can use a key in secure index 0. This key may be programmed at any time, by any user. This key cannot be programmed by the Key Management Software. If all of the secure keys have been erased, the operator can enter a new key into secure index 0 for immediate secure communications.

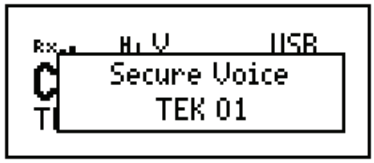
Using the AES-256 digital voice encryptor

Using the AES-256 digital voice encryptor

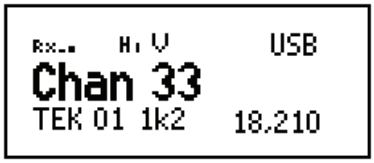
To use the AES-256 digital voice encryptor:

- ❑ Start a call (see page 177, *Calling methods*).
- ❑ Press **SEC**.

  The transceiver responds with two high short beeps, and displays **Secure Voice** with the secure index. For example:

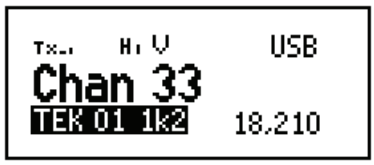


If you are in the Channel List, the active AES-256 digital voice encryptor is indicated by the text **TEK** <**index**> <**1k2**|**2k4**> at the bottom left of the channel screen. For example:



NOTE If you are using a user-defined prefix for the AES secure key, this is displayed instead of **TEK**.

When a digitally encrypted signal is transmitted or received, the secure index and the data rate are highlighted.

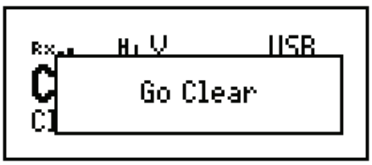


Switching off the AES-256 digital voice encryptor

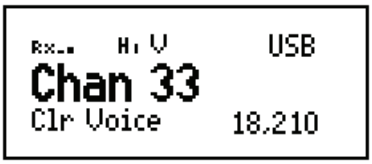
To switch off the AES-256 digital voice encryptor:

- ❑ Press **SEC**.

  The transceiver responds with two low short beeps and displays **Go Clear**. For example:



  The channel screen displays that the transceiver is no longer secure (**Clr Voice**).



Using digital mute

When the AES-256 digital voice encryptor is switched on, you have the option of selecting Voice mute (**V**), Selcall mute (**S**), or Digital Voice Only mute (**D**). Digital Voice Only mute enables digitally encrypted voice to be processed through to the user. Voice mute enables all clear and encrypted voice detected at your station to be processed, and Selcall mute enables clear and encrypted voice that is directed to your station to be processed.

Changing the data rate

The data rate affects the speed with which digitally encrypted transmissions are sent. The data rate is shown as either 1k2 (1200 b/s) or 2k4 (2400 b/s) in the centre of the screen. Select 1k2 as the data rate in the first instance, then if good HF propagation conditions exist, the 2k4 rate may be selected.

To change the data rate:

- ❑ *Hold* **SEC**.

  The currently unused data rate is highlighted.

- ❑ Do one of the following:
  - To change to the new rate, press ✓.
  - To leave the data rate as is, press ✕.

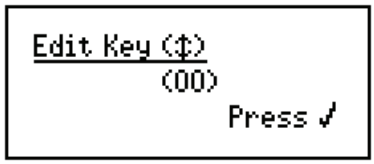
Creating a secure key in a secure index

NOTE

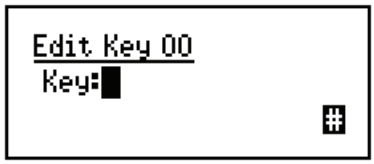
You are able to create or edit the key in secure index 00 at any time. To create or edit keys in other secure indexes you must log in as administrator (see page 120, *Logging in to admin level from user level*).

To create a secure key for secure index 00:

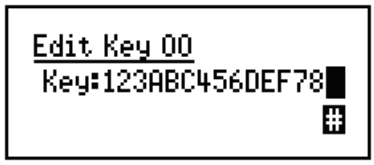
- ❑ *Hold* **SEC**, then scroll to **Edit Key**.



- ❑ Press ✓.

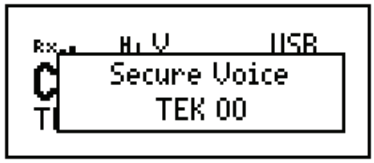


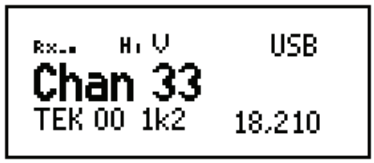
- ❑ Enter the secure key for secure index 00.



- ❑ Press ✓.

  The transceiver goes secure using the key that you entered.



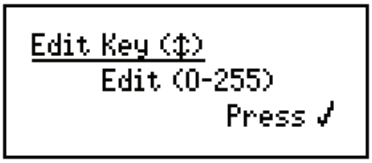


NOTE

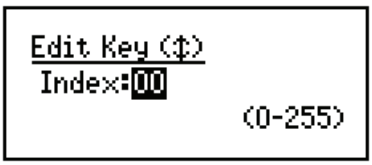
If the selected secure index is between 0 and 99, the index is shown as a 2-digit number.

To create a secure key for another secure index:

❑ *Hold* **SEC**, then scroll to **Edit Key**.



❑ Press ✓.

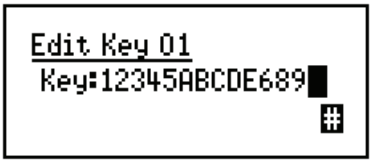


NOTE The currently selected secure index is highlighted.

❑ Scroll to the secure index in which you want to create a new key.

❑ Press ✓.

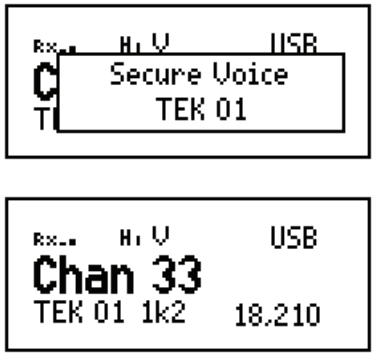
❑ Enter the secure key for the secure index shown.



NOTE The AES secure key may contain up to 64 hexadecimal digits. The transceiver automatically places zeros in keys that are shorter than this.

- Press ✓.

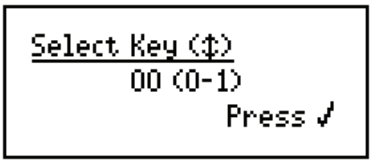
  The transceiver goes secure using the key that you entered.



Switching between secure indexes

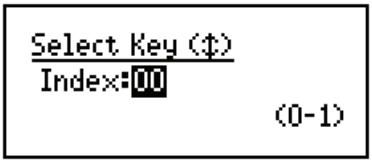
To switch between secure indexes while using the AES-256 digital voice encryptor:

- ❑ *Hold* **SEC**, then scroll to **Select Key**.

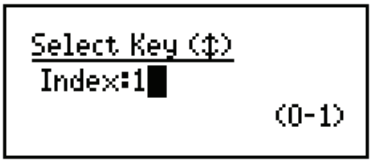


NOTE — The currently selected secure index is shown, followed in brackets by the range of secure indexes that are programmed with a secure key.

- ❑ Press ✓.

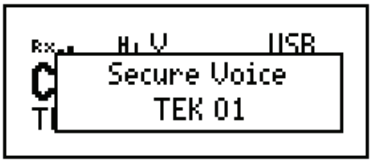


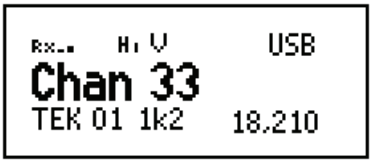
- ❑ Enter, or scroll to, the number of the secure index that you want to use.



- ❑ Press ✓.

  The transceiver goes secure using the key in the secure index that you selected.





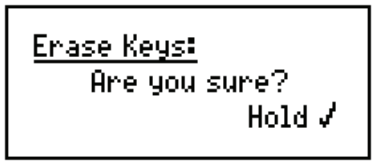
Erasing all of the AES secure keys

All of the secure keys in the transceiver may be erased via a simple hot-key sequence.

NOTE If you want to disable this hot-key sequence see page 426, *Controlling access to erasing secure keys*.

To erase all secure keys:

- ❑ Press ⓘ + **SEC**.



- ❑ *Hold* ✓.

Setting up the AES-256 digital voice encryptor

NOTE In the following discussion, you must log in as administrator to see the entries in the Control List (see page 120, *Logging in to admin level from user level*).

Setting up the AES-256 digital voice encryptor for basic security use

To set up the AES-256 digital voice encryptor:

- ❑ Set up the secure keys, as required (see page 257, *Creating a secure key in a secure index*).
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Secure...**, then press ✓.
- ❑ Do the following, as required:
  - To prevent the user from changing the secure index, admin lock and hide the Secure Index entry in the Control List.
  - To prevent the user from changing the secure key in a secure index, admin lock and hide the Secure Key entry in the Control List.

NOTE For information on locking and hiding information see page 125, *Locking and unlocking information* and page 123, *Hiding and showing information*.

Creating a text file containing AES secure keys

NOTE

You may also use Codan's Key Management Software to generate secure keys and to fill the AES-256 digital voice encryptor. This software provides enhanced security for the key set. This prevents the keys from being read by a text editor, and in some instances, prevents the key set from being programmed to unauthorised transceivers.

As a system administrator, you can program a group of secure keys into a transceiver by creating a text file containing the information, then sending this text file to the transceiver using a terminal-emulation program (see page 264, *Setting up communication with the computer* and page 265, *Programming the transceiver*).

NOTE

You can send each line to the transceiver via a terminal-emulation program. You must be logged in to admin level to send certain `secure` commands from a computer to the transceiver (see page 120, *Logging in to admin level*). Alternatively, you can enter these commands into the RS232 Startup entry in the Control List (see page 227, *RS232 Startup entries*).

Figure 40: Example of a text file containing AES secure keys

NOTE

You must enter a password to log in to admin level. If the transceiver does not use an admin password, leave a blank line in the text file so that an empty admin password is used.

NOTE

The **echo off** command prevents the secure keys being written to the buffer of the terminal-emulation program.

CAUTION

You must use a hard return at the end of each line, including the last line, so that the command is executed as it is sent to the transceiver.

To create a text file:

- ❑ Open a new text file in a text editor.
- ❑ Enter the secure key information.

CAUTION To avoid the potential for overloading the input buffer in the transceiver, only prepare 12 AES secure keys in a text file at a time.

- ❑ Save the text file with an appropriate name.

Setting up communication with the computer

To set up a transceiver to communicate with the computer:

- ❑ Connect a standard serial cable between a COM port on the computer and the 9-way or 15-way connector on the junction box, or 6-way connector on the RF unit (NGT *AR Voice* Transceivers only).

NOTE Use cable 08-06360-002 for the 9-way connector, 08-06266-001 for the 15-way connector, or 08-06380-001 for the 6-way connector.

NOTE Use a USB-to-serial-port cable to create a COM port if your computer only has a USB port available. This cable may be ordered from Codan (Codan part number 78-01031).

- ❑ Check that:
  - the corresponding RS232 Mode entry for the connector is set to **CICS**, and
  - the corresponding RS232 Speed entry for the connector is set to **9600**

NOTE If you need to change either of these settings, restart the transceiver to activate the changes.

- ❑ Open a terminal-emulation program and set the following for the port connected to the transceiver:

Data rate	9600 b/s
Data bits	8
Parity	None
Stop bits	1
Flow control	None

- ❑ Type a simple command, for example, `secure on` or `scan`, and check that the transceiver responds.

Programming the transceiver

To program the transceiver with a text file containing secure keys:

- ❑ Send the file containing the secure keys as a *text* file to the transceiver.

  The transceiver is updated dynamically. You do not have to restart the transceiver.

  NOTE — If you have used the `csstart` and `csstop` commands, observe the value in the checksum displayed at the terminal. The checksum must be the same each time the same file is transferred to a transceiver.

  NOTE — If the file has not been transferred correctly, reduce the data rate for the COM port on the computer and the RS232 port on the transceiver to 2400 b/s.

- ❑ Check that the transceiver has received the secure keys by *holding* **SEC**, then scrolling to the Select Key entry to see that the number of available secure indexes matches the number of secure keys programmed in the text file.
- ❑ Program any other transceivers with the same text file, as required.
- ❑ Check that secure communication is possible between transceivers.

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17 AES-256 digital data encryptor option

This section contains the following topics:

Overview

NOTE To use the AES-256 digital data encryptor, you must have an RM50e HF Data Modem installed in your transceiver system and specific firmware programmed into the transceiver and enabled.

NOTE The AES-256 digital data encryptor may be used in conjunction with the AES-256 digital voice encryptor or the CES-128 voice encryptor. For information see page 277, *Using the AES-256 digital data encryptor with a voice encryptor*.

NOTE Codan's Key Management Software must be used to generate secure keys and to fill the AES-256 digital data encryptor.

The external RM50e HF Data Modem is an optional feature that provides high-grade, AES-256 digital encryption for data communications. It must be used in conjunction with the RC50-C HF Email Gateway software. The data modem is capable of high-speed data transfer at speeds of up to 9600 b/s and supports MIL-STD-188-110 A/B and STANAG 4539 waveforms. For more information on setting up and using RC50-C with your email application, see the documentation provided on the RC50-C HF Email Gateway software CD.

For information on connecting the transceiver, data modem and computer, see the *RM50e HF Data Modem Operator Guide*. The data modem detects whether or not a computer is connected.

The data modem switches to power-save mode if:

- a computer is not detected
- the cable between the computer and data modem is disconnected
- the RC50-C HF Email Gateway software is shut down

NOTE The cable requires a specific driver to be installed on the computer. A driver is available on the RC50-C Installation CD or from www.ftdichip.com/Drivers/VCP.htm. Select the latest Windows®-certified driver that is suitable for your computer.

The AES-256 digital data encryptor uses secure keys to provide secure communications. The display on the handset clearly indicates whether the transceiver is secure (**TEK** <**index**> **Dat**) or clear (**Clr Data**).

NOTE The prefix for the AES secure keys may be changed using the Key Management Software, or via CICS (see page 380, *secure command*).

In order to communicate securely between two stations, both stations must use the same channel frequency, mode and secure key. The AES-256 digital data encryptor may be programmed with multiple secure keys, any one of which may be selected. For secure communications within your organisation you must set up secure keys that are common to all transceivers in your organisation.

The AES-256 digital data encryptor can use a key in secure index 0. This key may be programmed at any time, by any user. This key cannot be programmed by the Key Management Software. If all of the secure keys have been erased, the operator can enter a new key into index 0 for immediate secure communications.

Setting up the transceiver

To set up the transceiver:

- ❑ Switch on the transceiver.
- ❑ Access the Control List in the transceiver.
- ❑ Set the RS232 Mode entry to **Modem Hold AGC**, and the RS232 Speed entry to **9600**.
- ❑ Check that the names of ALE/CALM networks in the transceiver match the **HF Network** names set in the RC50-C HF Email Gateway software.
- ❑ Switch off the transceiver.

Installing the driver for the cable

To install the driver for the cable:

- ❑ Insert the RC50-C Installation CD into the CD drive of the computer to which the cable is connected.
- ❑ Click on **Install RC50-C**.

  The driver comes packaged with the software. It remains present even if RC50-C is uninstalled.
- ❑ If the driver provided on the RC50-C Installation CD is not suitable for your computer, do the following:
  - Download a suitable Windows®-certified driver from www.ftdichip.com/Drivers/VCP.htm.
  - Double-click on the self-extracting .exe file.

NOTE Some older drivers are delivered as a zip file. Extract the files (using folder names) from the zip file. Right-click on the **ftdibus.inf** file, then select **Install**.

Connecting the data modem, computer and transceiver

For detailed information on connecting your NGT *AR* or *SR* Transceiver to the data modem, see the *RM50e HF Data Modem Operator Guide*.

Once connected, you may program secure keys to the data modem using the Key Management Software. For more information see the documentation provided on line with the software.

Using the AES-256 digital data encryptor

Using the AES-256 digital data encryptor

To use the AES-256 digital data encryptor:

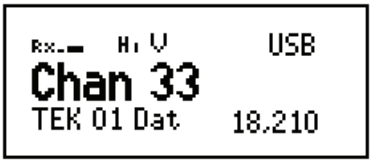
- ❑ Launch the RC50-C HF Email Gateway software to activate the RM50e HF Data Modem.

  The transceiver responds with a beep and displays **Modem info: Connected**.

- ❑ Press **SEC**.

  The transceiver responds with two high short beeps, and displays **Secure Data** with the secure index used. For example:

If you are in the Channel List, the active AES-256 digital data encryptor is indicated by the text **TEK** <**index**> **Dat** at the bottom left of the channel screen. For example:



NOTE If you are using a user-defined prefix for the AES secure key, this is displayed instead of **TEK**.

When a digitally encrypted signal is transmitted or received via the data modem, the index is highlighted. The current transmit or receive data rate is indicated on the right-hand side of the secure index.

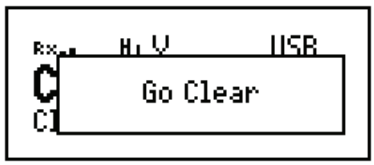
NOTE If the transceiver is not in secure mode when a signal is transmitted or received via the data modem, **TEK**<**index**> is replaced by **Clr**.

Switching off the AES-256 digital data encryptor

To switch off the AES-256 digital data encryptor:

❑ Press **SEC**.

The transceiver responds with two low short beeps and displays **Go Clear**. For example:



The channel screen displays that the transceiver is no longer secure (**Clr Data**).

Creating a secure key in a secure index

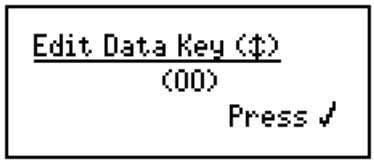
You are able to create or edit the key in secure index 00 at any time when the data modem is active.

NOTE

By default, the Secure Key entry is admin hidden. To create or edit keys in other secure indexes you must log in as administrator (see page 120, *Logging in to admin level from user level*). If you want to enable user access to creating and editing keys in other secure indexes, you must show the Secure Key entry at user level.

To create a secure key for secure index 00:

❑ *Hold* **SEC**, then scroll to **Edit Data Key**.

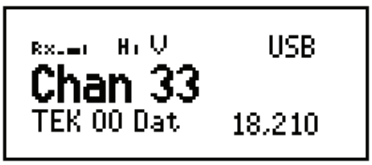


❑ Press ✓.

❑ Enter the secure key for secure index 00.

❑ Press ✓.

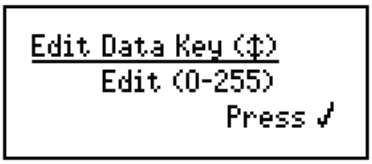
The transceiver goes secure using the key that you entered.



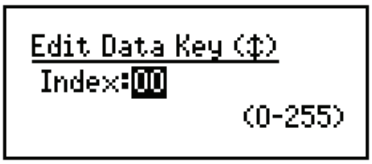
NOTE When there are less than 100 AES secure keys in the transceiver, the index is shown as a 2-digit number.

To create a secure key for another secure index:

❑ *Hold* **SEC**, then scroll to **Edit Data Key**.



❑ Press ✓.

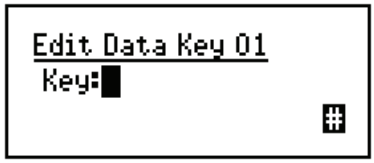


NOTE The currently selected secure index is highlighted.

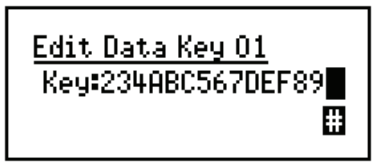
❑ Scroll to the index that you want to program with a secure key, for example **Index:01 (New)**.

NOTE If the index is empty it has **(New)** after the number of the index.

- ❑ Press ✓.



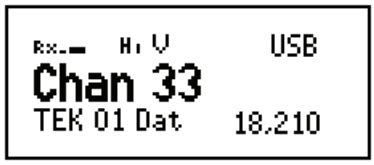
- ❑ Enter the secure key for the secure index shown.



NOTE The AES secure key may contain up to 64 hexadecimal digits. The transceiver automatically places zeros in keys that are shorter than this.

- ❑ Press ✓.

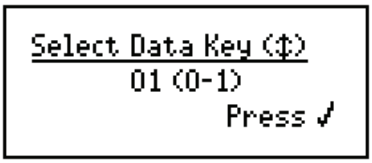
The transceiver goes secure using the key that you entered.



Switching between secure indexes

To switch between secure indexes while using the encryptor:

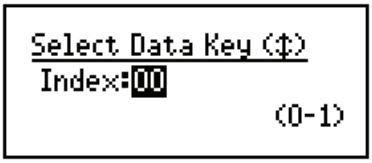
- ❑ *Hold* **SEC**, then scroll to **Select Data Key**.



NOTE The currently selected secure index is shown, followed in brackets by the range of secure indexes that are programmed with a secure key.

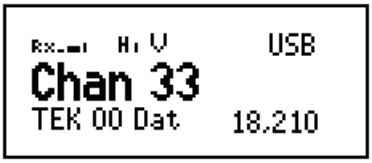
- ❑ Press ✓.

- ❑ Enter, or scroll to, the number of the secure index that you want to use.



- ❑ Press ✓.

  The transceiver goes secure using the key in the secure index that you selected.



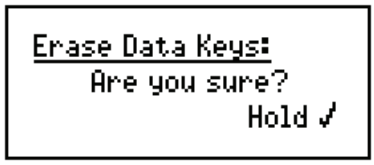
Erasing all of the AES secure keys

All of the secure keys in the transceiver may be erased via a simple hot-key sequence.

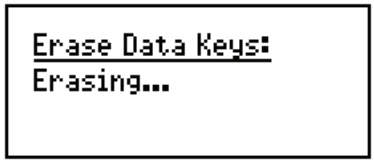
NOTE If you want to disable this hot-key sequence see page 426, *Controlling access to erasing secure keys*.

To erase all secure keys:

- ❑ Press ⓘ + **SEC**.



- ❑ *Hold* ✓.



NOTE If a voice encryptor option is also installed, you are asked if you want to **Erase Vce&Data Keys**.

Setting up the AES-256 digital data encryptor

NOTE In the following discussion, you must log in as administrator to see the entries in the Control List (see page 120, *Logging in to admin level from user level*).

Setting up the AES-256 digital data encryptor for basic security use

NOTE By default, the Secure Key entry is admin hidden.

To set up the encryptor:

- ❑ Set up the secure keys, as required (see page 271, *Creating a secure key in a secure index*).
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Secure...**, then press ✓.
- ❑ Do the following, as required:
  - To prevent the user from changing the secure index, admin lock and hide the Secure Index entry in the Control List.
  - To prevent the user from changing the secure key in a secure index, admin lock and hide the Secure Key entry in the Control List.

NOTE For information on locking and hiding information see page 125, *Locking and unlocking information* and page 123, *Hiding and showing information*.

Using the AES-256 digital data encryptor with a voice encryptor

The AES-256 digital data encryptor may be used simultaneously with the AES-256 digital voice encryptor option or the CES-128 voice encryptor option. When a voice encryptor option and the digital data encryptor option are available, both are activated simultaneously via the **SEC** key.

Using the AES-256 digital data encryptor with the AES-256 digital voice encryptor

When you use the AES-256 digital voice and data encryptor options together, they provide security using the same secure key. When programming the devices with secure keys either via KMS or the handset, ensure that RC50-C HF Email Gateway is launched and the data modem is active. This maintains secure key information across the devices.

Using the AES-256 digital data and voice encryptors

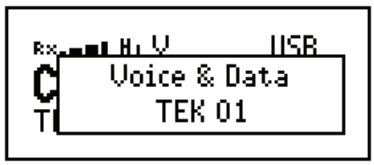
To use the AES-256 digital data and voice encryptors:

- ❑ Launch the RC50-C HF Email Gateway software to activate the RM50e HF Data Modem.

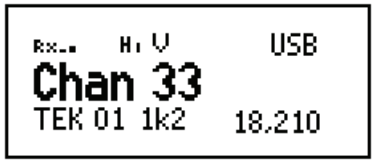
  The transceiver responds with a beep and displays **Modem info: Connected**.

- ❑ Press **SEC**.

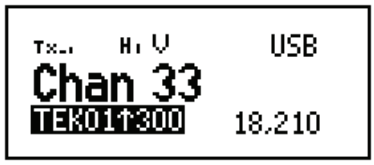
  The transceiver responds with two high short beeps, and displays **Voice & Data** with the secure index used. For example:



If you are in the Channel List, the active AES-256 digital voice encryptor is indicated by the text **TEK** <**index**> <**1k2**|**2k4**> at the bottom left of the channel screen. For example:



When the data modem is sending or receiving data, the status of the data transfer is shown. For example:



NOTE If you are using a user-defined prefix for the AES secure key, this is displayed instead of **TEK**.

NOTE If you want to select a different secure key see page 274, *Switching between secure indexes*.

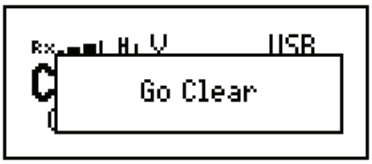
NOTE If the screen displays <**Voice prefix**|->/<**Data prefix**|-> <**available key range**> during key selection or editing, this indicates that some keys may have been programmed via the handset and some via KMS/KFS. If this is not what you expect to see, reprogram the key set file using KMS/KFS.

Switching off the AES-256 digital data and voice encryptors

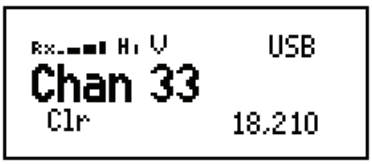
To switch off the AES-256 digital data and voice encryptors:

- ❑ Press **SEC**.

  The transceiver responds with two low short beeps and displays **Go Clear**. For example:



  The channel screen displays that the transceiver is no longer secure (**Clr**).



Using the AES-256 digital data encryptor with the CES-128 voice encryptor

When you use the AES-256 digital data encryptor and CES-128 voice encryptor together, they provide security using different types of keys. These keys may be selected and edited independently. When selecting or editing these keys via *hold* **SEC**, the options are clearly labelled with **Select Voice Key** and **Select Data Key**, and so on.

Both encryptor options are activated simultaneously via the **SEC** key.

For information on how to...	**See...**
Select a data key	page 274, *Switching between secure indexes*
Select a voice key	page 244, *Switching between Corporate secure indexes*
Edit a data key	page 271, *Creating a secure key in a secure index*
Edit a voice key	page 239, *Creating a secure key in a Corporate secure index*

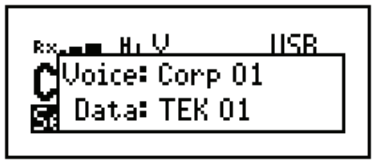
NOTE To create or edit keys in other secure indexes you must log in as administrator (see page 120, *Logging in to admin level from user level*).

When programming the devices with secure keys either via KMS or the handset, ensure that RC50-C HF Email Gateway is launched and the data modem is active. This maintains secure key information across the devices.

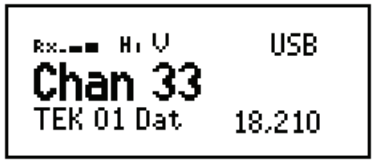
Using the AES-256 digital data encryptor with the CES-128 voice encryptor

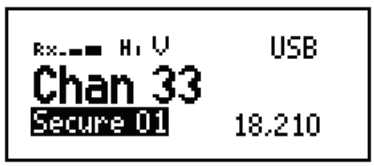
To use the AES-256 digital data and CES-128 voice encryptors:

- ❑ Press **SEC**.

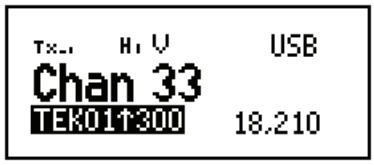


If you are in the Channel List, the active AES-256 digital data encryptor is indicated by the text **TEK** <**index**> **Dat** at the bottom left of the channel screen. The active CES-128 voice encryptor is indicated by the text **Secure** <**index**>[**P**] highlighted at the bottom left of the channel screen. These screens alternate. For example:





When the data modem is sending or receiving data, the status of the data transfer is shown. For example:

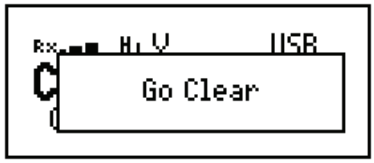


Switching off the AES-256 digital data and CES-128 voice encryptors

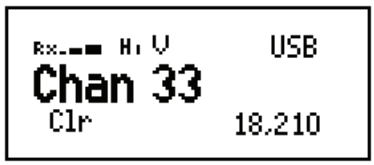
To switch off the AES-256 digital data and CES-128 voice encryptors:

- Press **SEC**.

  The transceiver responds with two low short beeps and displays **Go Clear**. For example:



  The channel screen displays that the transceiver is no longer secure (**Clr**).



Operating the data modem

For information on operating the RM50e HF Data Modem with the RC50-C HF Email Gateway software, see the documentation provided with this software.

Uninstalling the data modem

NOTE In the following discussion, you must log in as administrator to see the entries in the Control List (see page 120, *Logging in to admin level from user level*).

If the RM50e HF Data Modem is no longer being used, and you want to remove it physically from the system, you may also want to remove it from the memory of the transceiver. The address of the modem remains in the transceiver and is used during soundings. If the modem is being permanently removed and you do not want to continue with soundings to this address, you must refresh the addresses in the site manager information.

To remove the RM50e from the memory of the transceiver:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Devices**, then press ✓.
- ❑ Select **JB Unit** or **RF Unit**, then press ✓.

  NOTE The LED on the front panel of a device flashes green/red to show that this is the device you have selected.

- ❑ Scroll to **Uninstall: RM50**, then *hold* ✓.

  A pop-up showing **Modem info: Removed: RM50** is displayed.
- ❑ Press ✕ until **Main Menu** is displayed.

To remove the RM50e from the site manager information:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **ALE LQA Clear**, then *hold* ✓.
- ❑ Scroll to **Refresh addresses**, then press ✓.
- ❑ Press ✕ until **Main Menu** is displayed.

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18 Using the transceiver in free tune and Amateur Mode

This section contains the following topics:

Using the transceiver in free tune

NOTE

In the following discussion, you must log in as administrator to see the Control List (see page 120, *Logging in to admin level from user level*).

The transceiver can be used as a free-tune receiver. This enables you to tune to any frequency within the transceiver's operating range of 250 kHz to 30 MHz. In some circumstances, the options installed on your transceiver may enable you to transmit while free tuning, for example, the Amateur Mode option enables you to transmit during free tune when tuned to amateur band frequencies (see Table 32 on page 288).

Entering a specific free-tune frequency

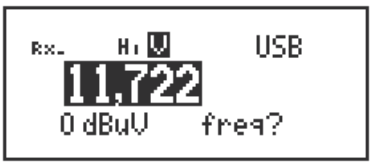
To enter a specific frequency:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Free Tune**, then press ✓.

NOTE

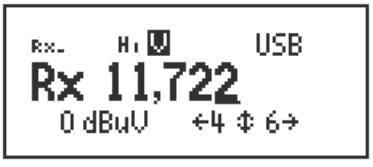
If you intend to use this feature regularly, set up a hot key on the **4** key to *take* you to the Free Tune entry in the Control List, then *wait* for you to act. The hot key enters Free Tune with the cursor in the same position as when the hot key was created. For information on setting up the hot key see page 342, *Example 3: accessing the Free Tune screen*.

- ❑ Press 🔍.



- ❑ Enter a new frequency or edit the existing frequency as required, then press ✓.
- ❑ Do one of the following:
  - To exit to the screen from which you began, press ✕.
  - To return to the Main Menu, press ✕ until **Main Menu** is displayed.
  - To exit free-tune receive, go to the Channel List and select another channel (for help see page 65, *Selecting a channel*).

  If you re-enter Free Tune prior to selecting another channel in the Channel List, the selected frequency is the same as that last used.



Tuning to a free-tune frequency

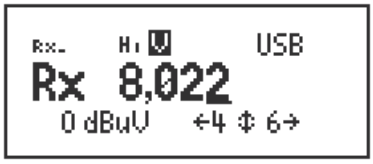
To tune to a frequency:

- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Free Tune**, then press ✓.

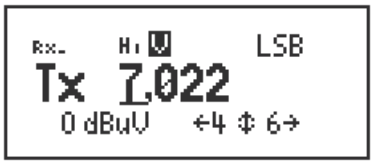
NOTE

If you intend to use this feature regularly, set up a hot key on the **4** key to *take* you to the Free Tune entry in the Control List, then *wait* for you to act. The hot key enters Free Tune with the cursor in the same position as when the hot key was created. For information on setting up the hot key see page 342, *Example 3: accessing the Free Tune screen*.

The transceiver tunes to the frequency that was currently selected in the Channel List and the cursor is placed under the last digit.



If you are able to transmit during Free Tune, the Rx is replaced by a Tx within the amateur band frequencies, as shown below. For information on amateur band frequencies see Table 32 on page 288.

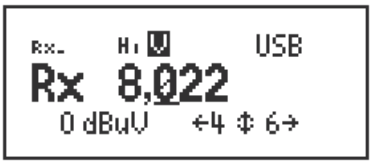


The **4** and **6** keys on the keypad can now be used as left/right scroll keys, as indicated on the Free Tune screen.

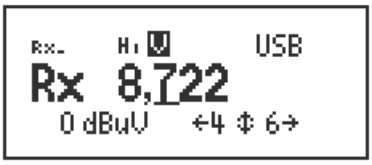
NOTE

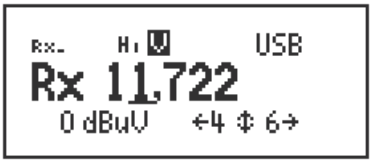
Press **6** repeatedly to insert a decimal point and enable the frequency to be tuned to two decimal places (0.01 kHz).

- ❑ To increase or decrease the frequency by units of one, ten, one hundred and so on, move the cursor to the appropriate position...



...then press the ◣ and ◥ keys. The transceiver tunes to the new frequency.





- ❑ Do one of the following:
  - To exit to the screen from which you began, press ✕.
  - To return to the Main Menu, press ✕ until **Main Menu** is displayed.
  - To exit free-tune receive, go to the Channel List and select another channel (for help see page 65, *Selecting a channel*).

  If you re-enter Free Tune prior to selecting another channel in the Channel List, the selected frequency is the same as that last used.

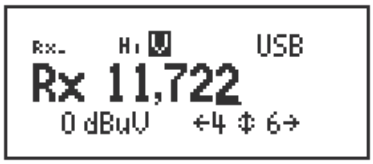
Creating a channel in free tune

While in free tune, you may decide that you want to create a channel on a frequency to which you have free tuned. The channel may then be selected easily from the Channel List.

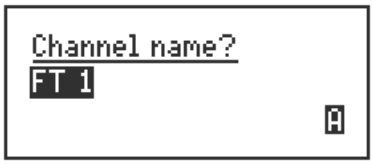
NOTE This feature may be disabled (see page 420, *Controlling access to creating a channel in free tune*).

To create a channel:

- ❑ Tune to the channel that you want to use (see page 284, *Using the transceiver in free tune*).



- ❑ *Hold* ✓.



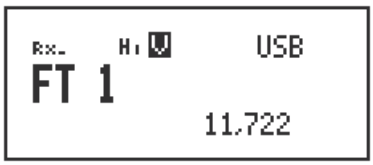
- ❑ Enter the name you want to use for the channel.

  The name must be unique to the Channel List.

  NOTE For help with entering text see page 66, *Entering and editing text*.

- ❑ Press ✓.

  The channel is created.



Using the transceiver in Amateur Mode

If you have the Amateur Mode option enabled in your transceiver, you are able to transmit on the amateur band frequencies shown in Table 32. You are not able to transmit on frequencies outside of these bands using Free Tune Mode. You may be able to transmit on pre-configured channels outside the amateur band frequencies.

Table 32: Amateur band frequencies

Frequency (MHz)
1.8 to 2.0
3.5 to 4.0
7.0 to 7.3
10.1 to 10.15
14.0 to 14.35
18.0 to 18.2
21.0 to 21.45
24.8 to 25.0
28.0 to 29.7

Amateur Mode uses the frequency entered on the Free Tune screen. For information on using the Free Tune screen see page 284, *Using the transceiver in free tune*. When you want to transmit on the selected frequency, press PTT to tune the antenna.

19 Hot keys

This section contains the following topics:

About hot keys

If you want to automate some of the tasks you perform with the transceiver you can create hot keys on the handset and desk console to perform the tasks for you. For example, if you frequently call a particular station using an entry in the Address List you can create a hot key to select the Address List from the Main Menu, search for the entry, then make the call. Performing these tasks is then as simple as pressing the hot key.

Hot keys can be created to perform any task or series of tasks that involve using a list. These include:

- opening a list at a particular entry
- displaying the time screen in the Control List
- calling a specific station
- changing a setting

Table 3 on page 23 lists the standard hot keys on the handset. Table 4 on page 25 lists the standard hot keys on the desk console.

Creating a hot key is a simple process. The transceiver prompts you for information about the way you want the hot key to operate and puts this information into a macro. It then prompts you to press the key to which you want to assign the macro (that is, the key that you want to be the hot key for the task), then enter a name for the macro. Using the hot key is as simple as pressing the key.

Full-time and part-time hot keys

Any key can be used as a hot key except the **CALL**, ◣, ◥, ✓, ✕, 🔍, 🔊 or 🔊 key. If you want to be able to use a hot key at any time, regardless of any task you may be performing, use the **MUTE**, **SCAN**, ⚠, or ⏻ keys on the handset, or the F1 to F4 keys on the desk console. These keys can be used as full-time hot keys.

The remaining keys on the handset, that is, 0 to 9, ***** and **#**, can be used as part-time hot keys. They operate as hot keys at any time except when you are entering or editing text. In this situation they are used to enter characters and cannot be used as hot keys.

Table 33: Full-time and part-time hot keys

Full-time hot keys	Part-time hot keys	Keys that cannot be used as hot keys
MUTE **SCAN** ⚠ ⏻ F1 to F4 keys on desk console	1 TUNE QZ, 2 CLAR ABC, 3 MODE DEF 4 GHI, 5 JKL, 6 MNO 7 V/S PRS, 8 SEC TUV, 9 WXY * EASI TALK, 0 VIEW ␣, # CALL LOGS	**CALL** ◣ ◥ 🔍 ✓ ✕ 🔊 🔊 PTT button on handset and desk console

Assigning several macros to one key

Several macros can be assigned to one key. When you use a hot key to which several macros have been assigned, the list of macros is displayed so you can select the one you want, as shown in Figure 41.

Figure 41: Using a hot key to which several macros have been assigned

The order in which the macros are listed can be changed. When you assign a macro to a key you are prompted to select the position in the list in which you want to insert the new macro. You can also change the order after you have assigned the macro to a key by copying or moving the macro to and from the same or a different key. For more information see page 296, *Copying a macro* and page 297, *Moving a macro*.

NOTE

If a macro performs a different function when the hot key is *held*, for example, the Secure macro, you must press the hot key repeatedly until the macro is highlighted, then *hold* ✓ or *hold* the hot key to select the hold function for the key.

Automating several tasks with one macro

Macros can be created to perform two or more tasks in succession. For example, you can create a macro that selects a particular channel then makes a call, or one that displays your GPS position then sends that position to a particular station.

You can create a macro that performs several tasks by either joining two macros or adding to a macro. For more information see page 299, *Joining macros* and page 300, *Adding to a macro*.

Troubleshooting macros

If you need to troubleshoot your macros, the Macro Single Step entry in the Control List may help you. When this entry is switched on and you run a macro, each individual step in the macro is displayed on the screen. The length of time each step is displayed can be set using the Macro Pause entry in the Control List.

Storing macros

Macros are physically stored in the Keypad List. The Keypad List contains an entry for each key on the handset and desk console. When a macro is assigned to a key, it is stored in the Macro setting for the key.

If you do not want to assign a macro to a key because you have no immediate use for it, you can assign or move it to the Unassigned entry in the Keypad List for future use. You can do this by pressing ✓ when prompted to assign a macro to a key.

Ideas for creating macros

Before you create a macro you may want to read the examples provided on page 339, *Hot key examples* for ideas about the types of tasks you can automate and the options available to you.

Creating a macro and assigning it to a hot key

To create a macro and assign it to a hot key:

- ❑ Decide on the task you want the hot key to perform.
- ❑ Navigate to the list, entry or setting in which the task begins.

  For example, if the task is to open a list at a particular entry, navigate to that entry. If the task is to enter a particular value in a setting, navigate to the setting and enter the value.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Create macro**, then press ✓.

  The transceiver prompts you to select the action you want the macro to perform and/or the timing with which you want it to operate.

  NOTE The information for which you are prompted and the options from which you can select vary according to the list, entry or setting from which you began.

- ❑ If you are prompted to select the action you want the macro to perform, scroll to the option you want, then press ✓.

  Table 34 on page 294 explains each option.
- ❑ Scroll to the timing with which you want the macro to operate, then press ✓ (see Table 34).
- ❑ Press the key to which you want to assign the macro.

  To assign the macro to the Unassigned entry in the Keypad List, press ✓.

  You cannot assign the macro to the Special entry.

  The macros assigned to the key or entry are displayed. At the end of the list, or if there are no macros assigned to the key or entry, **<end>** is displayed.

  If you pressed the wrong key, press ✕ to go back a step, then press the key to which you want to assign the macro.
- ❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.

  To insert the macro at the end of the list, scroll to **<end>**, then press ✓.
- ❑ Type a name for the new macro, then press ✓.

  NOTE For help with entering text see page 66, *Entering and editing text*.

  The macro is created and assigned to the key. The List Manager remains open.

Table 34: Macro options

Option	Setting	Select this option if you want the macro to...
Macro action?	Go to this entry	Display the list or entry you were on when you created the macro.
	Go to marker	Display the list or entry on which a marker is set.
	Go to this chan	Select the channel you were on when you created the macro.
	Display chan	Display the currently selected channel.
	Go to this freq	Select the free-tune frequency and cursor position you were on when you created the macro.
	Display freq	Display the currently selected frequency in the Free Tune screen with the cursor position you were on when you created the macro.
	Set this value	Change the value in the setting you were on to the value that was displayed when you created the macro. For example, if you entered a value of 100 in the setting, then began creating the macro, the macro would set the value to 100.
	Set next value	Go to the setting you were on when you created the macro, then select the next possible value for the setting. For example, if the possible values for the setting are Off and On, and prior to running the macro the value was set to Off, the macro would set the value to On.
	Display value	Display the value in the setting you were on when you created the macro.

Table 34: Macro options (cont.)

Option	Setting	Select this option if you want the macro to...
Macro operates?	Immediately	Perform the task immediately without displaying the screen involved. For example, select a new channel without displaying the channel screen in the Channel List.
	Before pause	Perform the task immediately, save the new value if the macro changed a value, briefly display the screen involved, then return to the screen you were on when you pressed the hot key. For example, select a new channel, briefly display the channel screen in the Channel List, then return to the screen you were on when you pressed the hot key. NOTE To change the length of time the screen is displayed, use the Macro Pause entry in the Control List.
	After pause	Perform the task immediately, briefly display the screen involved, save the new value if the macro changed a value, then return to the screen you were on when you pressed the hot key. (If the macro changes a value, the pause gives you a chance to cancel the change before it is saved by pressing ✕.) For example, change a value in a Control List entry, briefly display the entry, save the change, then return to the screen you were on when you pressed the hot key. NOTE To change the length of time the screen is displayed, use the Macro Pause entry in the Control List.
	Wait	Perform the task immediately, then remain on the screen involved.

Copying a macro

Use the Copy macro entry in the List Manager to:

- copy a macro from one key and assign the copy to the same or a different key
- copy a macro from the Special or Unassigned entry in the Keypad List and assign it to a key

NOTE You cannot copy a macro to the Special entry in the Keypad List.

To copy a macro:

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Copy macro**, then press ✓.
- ❑ Do one of the following:
  - Press the key to which the macro you want to copy is assigned.
  - Press ✓ to go to the Unassigned entry.
  - Press ◥ to go to the Special entry.

  The macros assigned to the key or entry are displayed.

  If there are no macros assigned to the key or entry, **(none)** is displayed. Press ✕ to go back a step, then press the key to which the macro is assigned.
- ❑ Scroll to the macro you want to copy, then press ✓.
- ❑ Press the key to which you want to copy the macro.

  If you want to copy the macro to the Unassigned entry in the Keypad List, press ✓.

  The macros assigned to the key or entry are displayed. At the end of the list, or if no macros are assigned to the key or entry, **<end>** is displayed.

  If you pressed the wrong key, press ✕ to go back a step, then press the key to which you want to assign the macro.
- ❑ Scroll to the macro you want to have in the list immediately after the copied macro, then press ✓.

  To insert the macro at the end of the list, scroll to **<end>**, then press ✓.

  The macro is copied and the List Manager remains open.

Moving a macro

Use the Move macro entry in the List Manager to:

- move a macro from one key to another
- change the order in which macros are listed on a hot key
- move a macro to or from the Unassigned entry in the Keypad List

NOTE You cannot move macros to or from the Special entry in the Keypad List, but you can copy them and rename the copies if necessary.

To move a macro:

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Move macro**, then press ✓.
- ❑ Do one of the following:
  - Press the key to which the macro you want to move is assigned.
  - Press ✓ to go to the Unassigned entry.

  The macros assigned to the key or entry are displayed.

  If there are no macros assigned to the key or entry, **(none)** is displayed. Press ✗ to go back a step, then press the key to which the macro is assigned.
- ❑ Scroll to the macro you want to move, then press ✓.
- ❑ Press the key to which you want to move the macro.

  If you want to move the macro to the Unassigned entry in the Keypad List, press ✓.

  The macros assigned to the key or entry are displayed. At the end of the list, or if no macros are assigned to the key or entry, **<end>** is displayed.

  If you pressed the wrong key, press ✗ to go back a step, then press the key to which you want to assign the macro.
- ❑ Scroll to the macro you want to have in the list immediately after the moved macro, then press ✓.

  To insert the macro at the end of the list, scroll to **<end>**, then press ✓.

  The macro is moved and the List Manager remains open.

Renaming a macro

NOTE You cannot rename macros in the Special entry in the Keypad List, but you can copy them and rename the copies if necessary.

To rename a macro:

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Rename macro**, then press ✓.
- ❑ Do one of the following:
  - Press the key to which the macro you want to rename is assigned.
  - Press ✓ to go to the Unassigned entry.

  The macros assigned to the key or entry are displayed.

  If there are no macros assigned to the key or entry, **(none)** is displayed. Press ✕ to go back a step, then press the key to which the macro is assigned.
- ❑ Scroll to the macro you want to rename, then press ✓.

  The name is highlighted.
- ❑ Enter a new name for the macro, then press ✓.

  NOTE For help with entering text see page 66, *Entering and editing text*.

  The macro is renamed and the List Manager remains open.

Deleting a macro

To delete a macro:

- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Delete macro**, then press ✓.
- ❑ Do one of the following:
  - Press the key to which the macro you want to delete is assigned.
  - Press ✓ to go to the Unassigned entry.

  The macros assigned to the key or entry are displayed.

  If there are no macros assigned to the key or entry, **(none)** is displayed. Press ✕ to go back a step, then press the key to which the macro is assigned.
- ❑ Scroll to the macro you want to delete, then press ✓.

  The macro is deleted and the List Manager remains open.

Creating a macro to perform two or more tasks

If you want to create a macro that performs two or more tasks in succession you can do so by joining two macros or by adding to a macro.

For example, if you have created a macro to display the GPS Screen entry in the Control List and another to send your GPS position to a particular station, you can join them to create one macro. If you have created a macro that performs the first task, you can add to it by creating a macro to perform the second task, then add this macro to the first macro in one step.

Joining macros

Joining macros involves joining two existing macros. Before you begin you must consider the order in which you want the macros performed. The transceiver prompts you to select the macro you want performed first, then the macro you want performed second. It then makes a copy of the second and joins it to the end of the first. The new macro takes the name of the first macro. You can rename the macro if necessary (see page 298, *Renaming a macro*).

NOTE

You cannot join two macros if the first macro is assigned to the Special entry in the Keypad List. You can, however, make a copy of this macro, assign it to a key or to the Unassigned entry in the Keypad List, then join another macro to the copy (for help see page 296, *Copying a macro*).

To join two macros:

- ❑ Decide on the order in which you want the hot key to perform the macros.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Join macros**, then press ✓.
- ❑ Do one of the following to select the macro you want performed *first*:
  - Press the key to which the macro is assigned.
  - Press ✓ to go to the Unassigned entry.

  The list of macros assigned to the key or entry is displayed.

  If there are no macros assigned to the key or entry, **(none)** is displayed. Press ✕ to go back a step, then press the key to which the macro is assigned.
- ❑ Scroll to the macro you want performed *first*, then press ✓.
- ❑ Press the key to which the macro you want performed *second* is assigned.

  The list of macros assigned to the key or entry is displayed.

  If there are no macros assigned to the key or entry, **(none)** is displayed. Press ✕ to go back a step, then press the key to which the macro is assigned.

❑ Scroll to the macro you want performed *second*, then press ✓.

A copy of the second macro is joined to the end of the first macro. The new macro takes the name of the first macro. The List Manager remains open.

Adding to a macro

Adding to a macro involves creating a macro then adding it to the end of an existing macro in one step. The new macro takes the name of the first macro. You can rename the macro if necessary (see page 298, *Renaming a macro*).

NOTE — You cannot add to a macro if the macro is assigned to the Special entry in the Keypad List. You can, however, make a copy of this macro, assign it to a key or to the Unassigned entry in the Keypad List, then add to the copy (for help see page 296, *Copying a macro*).

To add to a macro:

❑ Navigate to the list, entry or setting in which the additional task begins.

For example, if the task is to open a list at a particular entry, navigate to that entry. If the task is to enter a particular value in a setting, navigate to the setting and enter the value.

❑ *Hold* 🔍 to open the List Manager.

❑ Scroll to **Macros...**, then press ✓.

❑ Scroll to **Add to macro**, then press ✓.

❑ If you are prompted to select the action you want the macro to perform, scroll to the option you want, then press ✓.

NOTE — The information for which you are prompted and the options from which you can select vary according to the list, entry or setting from which you began.

Table 34 on page 294 explains each option.

❑ Scroll to the timing with which you want the macro to operate, then press ✓ (see Table 34).

❑ Do one of the following:

- Press the key containing the macro to which you want to add this task.
- Press ✓ to go to the Unassigned entry.

The list of macros assigned to the key or entry is displayed.

If there are no macros assigned to the key or entry, **(none)** is displayed. Press ✗ to go back a step, then press the key to which the macro is assigned.

❑ Scroll to the macro to which you want to add the new task, then press ✓.

The new macro is added to the end of the existing macro. The new, combined macro takes the name of the existing macro. The List Manager remains open.

Special macros

The transceiver is shipped with 11 macros that cannot be recreated from the handset. These macros are assigned to the Special entry in the Keypad List and are listed in Table 35.

You cannot assign macros to, or delete macros from, the Special entry. You can, however, copy these macros from this entry and assign them to various keys or to the Unassigned entry in the Keypad List (for help see page 296, *Copying a macro*). You can then use the copy as you would any other macro.

The transceiver also has a number of macros that are assigned to hot-key sequences for convenience. These hot-key sequences are listed in Table 3 on page 23. The macros include:

- ⓘ + **0**
- ⓘ + **9**
- ⓘ + **SEC**

The macros associated with these hot-key sequences do not appear in the Special entry in the Keypad List.

Table 35: Macros assigned to the Special entry in the Keypad List

Name of macro	Description
Call Emergency	Begins a call to the Emergency 1 entry in the Address List. If there are other Emergency entries in the list (named Emergency 2, Emergency 3 and so on) the macro pauses for approximately 10 seconds after the first call has ended, then begins a call to the next Emergency entry. The transceiver calls each Emergency entry in sequence until the last entry is called, or you press PTT.
Call Key	Begins a call, enabling the user to enter call information when prompted. This macro is for use on the desk console.
Call Logs - In	Displays the Calls In Log and the Calls Out Log, then returns to the screen from which you began.
Call Logs - Out	Displays the Calls Out Log and the Calls In Log, then returns to the screen from which you began.
End Call	Ends a call if a call is in progress.
Mute	Toggles mute on or off.
Mute Type	Toggles between Selcall mute and Voice mute.
New Call	Displays the new call screen with the address and call type of the last call made.
Power Down	Switches off the transceiver.

Table 35: Macros assigned to the Special entry in the Keypad List (cont.)

Name of macro	Description
Scan Toggle	Ends a call if a call is in progress, or switches scanning on or off.
Secure	Toggles the attached encryption module on or off, if installed with specific firmware programmed and enabled in the transceiver.

20 Connectors

This section contains the following topics:

WARNING Only suitably qualified personnel should use the information contained in this section. Failure to observe this warning could result in damage to the transceiver.

RF unit connectors

Figure 42: Back panel of the 2010 RF Unit (NGT *AR* and *SR* Transceivers only)

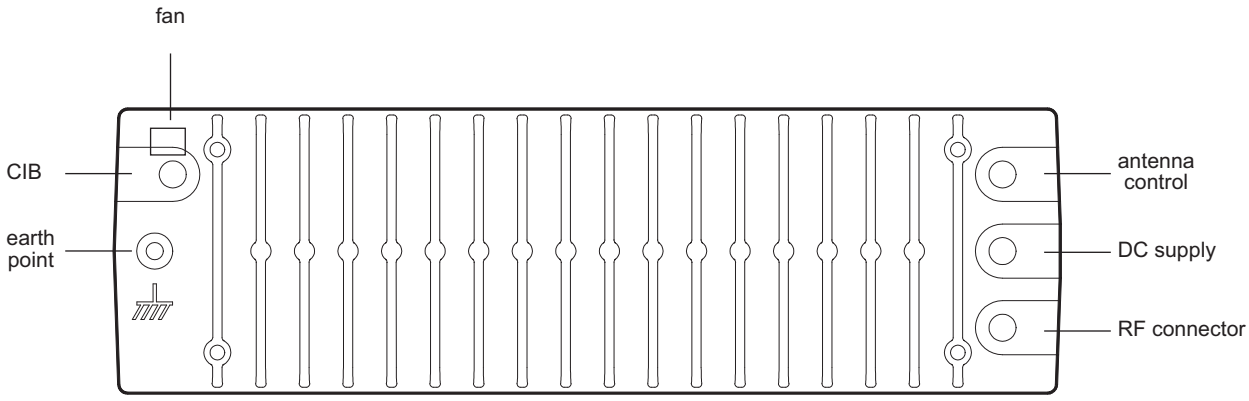
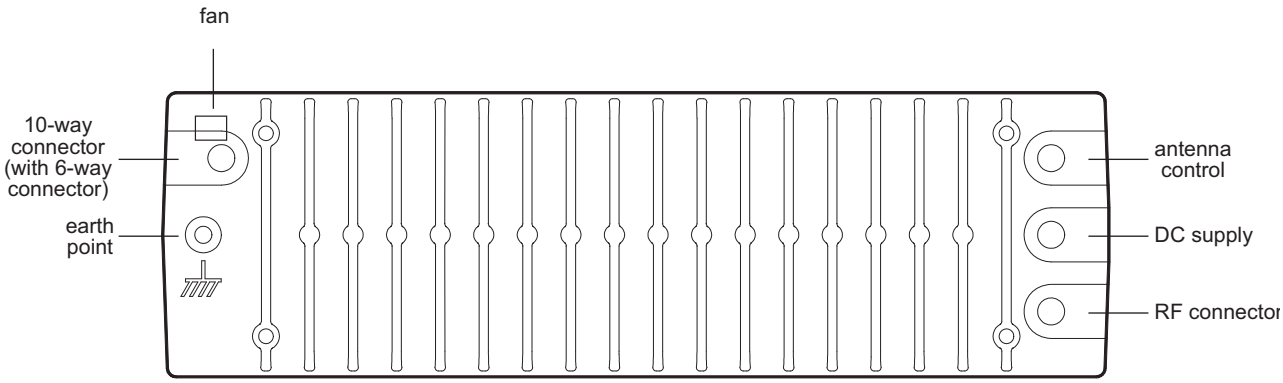


Figure 43: Back panel of the 2011 RF Unit (NGT *AR Voice* and *VR* Transceivers only)



NOTE In NGT *AR Voice* and *VR* Transceivers, the CIB connector is replaced by a 10-way connector on a flying lead. The handset and speaker cable attaches to this.

NOTE The 6-way connector is attached to the rear of the 10-way connector.

CIB connector (NGT *AR* and *SR* Transceivers only)

The CIB connector is a flying lead located on the left side of the back panel. The CIB™ is a proprietary Codan specification that uses a digital bus protocol and TDM audio bus to connect and communicate between Codan products. For more information about the CIB™ specification please contact your Codan representative.

The recommended maximum length of CIB cable is 30 m (33 yd). If you need a longer cable, contact your Codan representative. The maximum current that the CIB can supply to ancillary products is 2 A (nominal). Equipment connected to and powered by the CIB must operate between 10.8 and 16 V DC. Only Codan-supplied or approved cables should be used.

Figure 44: Front view of the CIB connector on the RF unit (NGT *AR* and *SR* Transceivers only)

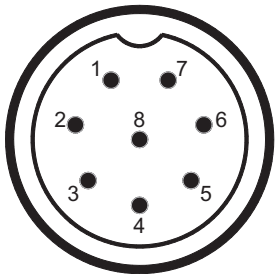


Table 36: Pinouts of the CIB connector on the RF unit (NGT *AR* and *SR* Transceivers only)

Pin no.	Function	Input/output	Signal level
1	Ground		0 V
2	System data	Input/output	1 to 5 V logic
3	System data	Input/output	1 to 5 V logic
4	Power on	Input	Momentary 0 V = PWR ON
5	+6 V standby	Output	+6 V
6	System audio	Input/output	5 to 10 V sync and TDM
7	System audio	Input/output	0 to 5 V sync and TDM
8	**A** rail protected (2 A)	Output	+13.6 V nominal

Antenna control connector

The antenna control connector is a flying lead located on the right side of the back panel. The antenna control connector connects to automatic tuning antennas and broadband antennas (no automatic tuning required). It supplies power to the antenna and transmits control signals to and from the antenna.

Figure 45: Front view of the antenna control connector on the RF unit

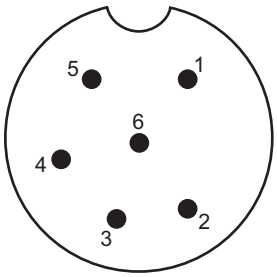


Table 37: Pinouts of the antenna control connector on the RF unit

Pin no.	Function	Input/output	Signal level
1	Tune in/out	Input/output	5 V logic, active low
2	Scan	Output	Active low (open collector)
3	Tuned in	Input	5 V logic
4	**A** rail protected (2 A maximum)	Output	+13.6 V nominal
5	External ALC input	Input	Control at 3.6 V
6	Ground		0 V

DC supply connector

The DC supply connector is located on the right side of the back panel. The DC supply connector supplies power to the transceiver system and ancillary products. Any piece of equipment connected to the CIB is powered through the DC supply connector.

Table 38: Pinouts of the DC supply connector on the RF unit

Pin	Function
+	+13.6 V nominal (10.8 to 16 V DC)
–	Ground

RF connector

The RF connector is a flying lead located on the right side of the back panel. It is used to connect to an antenna.

Fan connector

The fan connector is located at the top left of the back panel. The fan connector is used when additional cooling is required for the heatsink, for example, for continuous data communication.

Figure 46: Front view of the fan connector on the RF unit

Table 39: Pinouts of the fan connector on the RF unit

Pin no.	Function
–	0 V
+	+13.6 V nominal (when fan is activated)

10-way connector (NGT *AR Voice* and *VR* Transceivers only)

The 10-way connector is a flying lead located on the top left side of the back panel. It connects to either the handset and speaker cable (Codan part number 08-06022-001), or directly to the Code 766 Desk Console.

Figure 47: Front view of the 10-way connector on the RF unit (NGT *AR Voice* and *VR* Transceivers only)

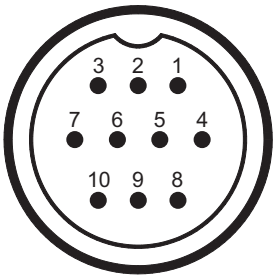


Table 40: Pinouts of the 10-way connector on the RF unit (NGT *AR Voice* and *VR* Transceivers only)

Pin no.	Function	Input/output	Signal level
1	Speaker audio +	Output	Approx. 12 V p–p at onset of clipping
2	Speaker audio –	Output	0 V
3	Microphone audio +	Input	Nominally 500 mV p–p to ground with normal speech
4	Microphone audio –	Input	Nominally 500 mV p–p to ground with normal speech
5	Handset data +	Input/output	1 to 5 V logic
6	Handset data –	Input/output	1 to 5 V logic
7	Power on	Input	Momentary 0 V = PWR ON
8	Standby power for handset	Output	+5 V standby power, or +9 V handset power
9	**A** rail protected (1 A nominal)	Output	+13.6 V nominal
10	Ground		0 V

6-way serial data connector (NGT *AR Voice* Transceivers only)

The 6-way connector is a flying lead located on the back of the 10-way connector.

The serial data (RS232) connector can be used for controlling and monitoring the transceiver, programming the transceiver settings, and sending and receiving message calls.

Figure 48: Front view of the 6-way connector on the RF unit (NGT *AR Voice* Transceivers only)

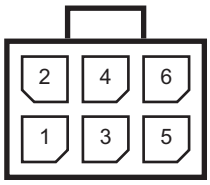


Table 41: Pinouts of the 6-way connector on the RF unit (NGT *AR Voice* Transceivers only)

Pin no.	Function	Input/output	Signal level
1	**A** rail protected (2 A)	Output	+13.6 V nominal
2	Ground		0 V
3	RS232 Tx data A	Output	RS232
4	RS232 Rx data A	Input	RS232
5	RS232 Tx data B	Output	RS232
6	RS232 Rx data B	Input	RS232

The serial data connector may be used in a number of modes:

None	to be used when no external device is connected to the transceiver
GPS	to receive GPS position information
CICS	to control and monitor the transceiver

When in CICS mode, the interface accepts any of the CICS commands as detailed on page 355, *Operating the transceiver from a computer*.

When in GPS mode, the interface accepts and processes GPS receiver input sentences (RMC, GLL, and GGA) defined by NMEA format 0183 V2.00. If the interface detects the RMC sentence, it ignores all data derived from any other type of sentence as the RMC sentence guarantees data validity via checksums.

The operating parameters of the serial data connector are set up in the RS232 Mode and RS232 Speed entries in the Control List.

NOTE

If these entries are not displayed in the Control List, they may have been hidden at user or admin level. For more information on displaying hidden entries see page 123, *Hiding and showing information*.

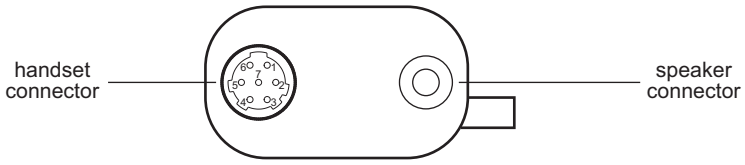
The operating parameters can be set to the following:

Data rate	300, 1200, 2400, 4800, 9600, 19200, 38400, 38400, 115200, 230400 b/s
Data bits	8
Stop bits	None
Parity	1

Handset and speaker connector (NGT *AR Voice* and *VR* Transceivers only)

The handset and speaker connector is part of the control cable (Codan part number 08-06022-001) that connects to the 10-way connector on the RF unit. This cable is not used with a Code 766 Desk Console.

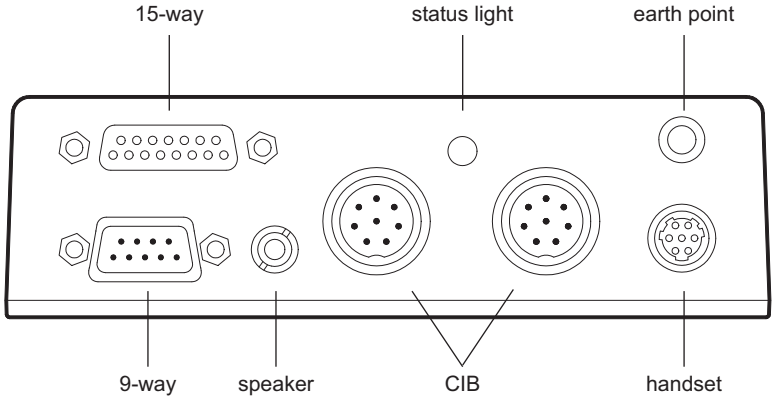
Figure 49: Front view of the handset and speaker connector attached to the RF unit (NGT *AR Voice* and *VR* Transceivers only)



The handset and speaker connector replaces the connectors on the junction box in NGT *AR Voice* and *VR* Transceivers. The pinouts for the handset and speaker connector are the same as the pinouts for the handset connector and the speaker connector on the junction box. This information is provided in Table 42 on page 312 and Table 44 on page 314 respectively.

Junction box connectors (NGT *AR* and *SR* Transceivers only)

Figure 50: Connector panel of the junction box (NGT *AR* and *SR* Transceivers only)



Handset connector (NGT *AR* and *SR* Transceivers only)

The handset interface has signals for:

- power to the handset
- a PWR ON request line wire to switch on the system
- the microphone audio
- communication between the handset and junction box

NOTE

For NGT *AR Voice* and *VR* Transceivers, this connector is combined with the speaker connector into the handset and speaker connector, which attaches to the 10-way connector on the rear of the 2011 RF Unit.

The same connector is used on the Code 766 Desk Console.

Figure 51: Front view of the handset connector on the junction box (NGT *AR* and *SR* Transceivers only)

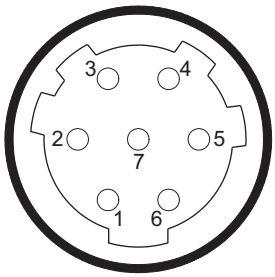


Table 42: Pinouts of the handset connector on the junction box (NGT *AR* and *SR* Transceivers only)

Pin no.	Function	Input/output	Signal level
1	Standby power for handset	Output	+5 V standby power, or +9 V handset power
2	Handset data	Input/output	1 to 5 V logic
3	Handset data	Input/output	1 to 5 V logic
4	Ground		0 V
5	Microphone audio	Input	Nominally 500 mV p–p to ground with normal speech
6	Microphone audio	Input	Nominally 500 mV p–p to ground with normal speech
7	Power on	Input	Momentary 0 V = PWR ON

CIB connectors (NGT *AR* and *SR* Transceivers only)

There are two CIB connectors on the junction box to enable daisy-chaining to other CIB equipment. The CIB™ is a proprietary Codan specification that uses a digital bus protocol and TDM audio bus to connect and communicate between Codan products. For more information about the CIB™ specification please contact your Codan representative.

The recommended maximum length of CIB cable is 30 m (33 yd). If you require a longer cable, contact your Codan representative. The maximum current that the CIB can supply to ancillary products is 2 A (nominal). Equipment connected to and powered by the CIB must operate between 10.8 and 16 V DC. Only Codan-supplied or approved cables should be used.

Figure 52: Front view of a CIB connector on the junction box (NGT *AR* and *SR* Transceivers only)

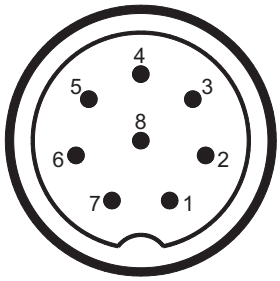


Table 43: Pinouts of the CIB connectors on the junction box (NGT *AR* and *SR* Transceivers only)

Pin no.	Function	Input/output	Signal level
1	Ground		0 V
2	System data	Input/output	1 to 5 V logic
3	System data	Input/output	1 to 5 V logic
4	Power on	Input	Momentary 0 V = PWR ON
5	+6 V standby	Output	+6 V
6	System audio	Input/output	5 to 10 V sync and TDM
7	System audio	Input/output	0 to 5 V sync and TDM
8	**A** rail protected (2 A)	Output	+13.6 V nominal

Speaker connector (NGT *AR* and *SR* Transceivers only)

The speaker should be 4 Ω with a power rating of 5 W.

NOTE

For NGT *AR Voice* and *VR* Transceivers, this connector is combined with the handset connector into the handset and speaker connector, which attaches to the 10-way connector on the rear of the 2011 RF Unit.

The same connector is used on the Code 766 Desk Console.

Table 44: Pinouts of the speaker connector on the junction box (NGT *AR* and *SR* Transceivers only)

Connection	Function
Tip	Speaker audio output
Sleeve	Ground

9-way serial data connector (NGT *AR* and *SR* Transceivers only)

The serial data (RS232) connector can be used for controlling and monitoring the transceiver, programming the transceiver settings, and sending and receiving message calls.

Figure 53: Front view of the 9-way serial data connector on the junction box (NGT *AR* and *SR* Transceivers only)

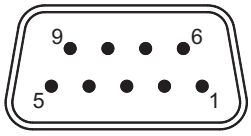


Table 45: Pinouts of the 9-way serial data connector on the junction box (NGT *AR* and *SR* Transceivers only)

Pin no.	Function	Input/output	Signal level
1	Not connected		
2	RS232 Rx data	Input	RS232
3	RS232 Tx data	Output	RS232
4	DTR	Output	RS232
5	Ground		0 V
6	DSR	Input	RS232
7	RTS	Output	RS232

Table 45: Pinouts of the 9-way serial data connector on the junction box (NGT *AR* and *SR* Transceivers only)

Pin no.	Function	Input/output	Signal level
8	CTS	Input	RS232
9	Not connected		

The serial data connector may be used in a number of modes:

None	to be used when no external RS232 device is connected to the transceiver
GPS	to receive GPS position information
CICS	to control and monitor the transceiver
Modem Data	to control the transfer of data between a computer and a modem over a remote control link
PC Data	to control the transfer of data between a computer using 9102 software and a modem over a remote control link
RTU Log	to receive radio/telephone interface information

When in CICS Mode, the interface accepts any of the CICS commands as detailed on page 355, *Operating the transceiver from a computer*.

When in GPS Mode, the interface accepts and processes GPS receiver input sentences (RMC, GLL, and GGA) defined by NMEA format 0183 V2.00. If the interface detects the RMC sentence, it ignores all data derived from any other type of sentence as the RMC sentence guarantees data validity via checksums.

The operating parameters of the serial data connector are set up in the RS232 9way Mode and RS232 9way Speed entries in the Control List.

NOTE If these entries are not displayed in the Control List, they may have been hidden at user or admin level. For more information on displaying hidden entries see page 123, *Hiding and showing information*.

The operating parameters can be set to the following:

Data rate	300, 1200, 2400, 4800, 9600, 19200, 38400 b/s
Data bits	8
Stop bits	None
Parity	1

15-way GPIO connector (NGT *AR* and *SR* Transceivers only)

The GPIO connector is used to interface a variety of third-party products such as morse keys, GPS units etc.

Figure 54: Front view of the 15-way GPIO connector on the junction box (NGT *AR* and *SR* Transceivers only)

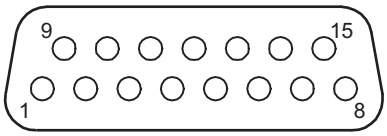


Table 46: Pinouts of the 15-way GPIO connector on the junction box (NGT *AR* and *SR* Transceivers only)

Pin no.	Function	Input/output	Signal level
1	RTS	Output	RS232
2	RS232 Rx data	Input	RS232
3	RS232 Tx data	Output	RS232
4	Ground		0 V
5	Tx audio (50 kΩ balanced)	Input	300 mV p–p ALC threshold
6	External alarm relay		Contacts rated 50 V, 1 A
7	External alarm relay		Closed for alarm
8	**A** rail	Output	+13.6 V nominal
9	CTS	Input	RS232
10	PTT	Input	5 V TTL logic active low
11	Morse	Input	5 V TTL logic active low
12	Spare	Input/output	5 V TTL logic
13	Spare	Input/output	5 V TTL logic
14	System audio	Output	1 V p–p (maximum load 1 kΩ)
15	Tx audio (50 kΩ balanced)	Input	300 mV p–p ALC threshold

NOTE External alarm relay is an internal link that may select normally open or normally closed. It can be configured to switch to ground or the **A** rail.

The following sections describe the function of the 15-way GPIO connector and corresponds to the information provided in Table 46.

Morse input

When a ground is detected on the morse input, the transceiver generates a morse tone on air. This functionality is typically provided with a morse key.

PTT

This function puts the transceiver into transmit mode and enables the audio transmit path via the GPIO connector (pins 5 and 15).

Q line

The Q line switches the transceiver between data and voice modes, and stops the transceiver from scanning. When the transceiver is in data mode, it uses slow AGC and an ALC that is suitable for data transmission.

If you want to use a data modem with the NGT Transceiver, set the RS232 15way Mode entry in the Control List to **Modem Slow AGC**, **Modem Fast AGC**, or **Modem Hold AGC**, as required for your modem (see Table 25 on page 190 and page 318, *Serial data*).

Relay contact

The relay can be wired by a user to ring a bell or to sound a car horn. If a voice call is received, the bell or horn sounds for 2 minutes. If it is an emergency call, it toggles on and off three times per second, continuing for 5 minutes. The contact can be configured via internal links to do one of the following in the case of an alarm:

- join pins 6 and 7 together, or
- switch pin 6 to ground, or
- switch pin 6 to battery volts (**A** rail)

NOTE The external alarm is not activated under certain settings of the Cfg Alert Tones entry in the Control List (see page 192, *Cfg Alert Tones*).

Serial data

The serial data (RS232) connector can be used for controlling and monitoring the transceiver, programming the transceiver settings, and sending and receiving message calls.

The serial data connector may be used in a number of modes:

None	to be used when no external RS232 device is connected to the transceiver
GPS	to receive GPS position information
CICS	to control and monitor the transceiver
Fax/Data	to be used with a 9001 or 3012 modem
3033/RTU–292	to be used with a radio/telephone interconnect unit
Pactor 1	to be used with a single-tone FSK Pactor modem
HAL/Clover	to be used with a multi-tone PSK HAL/Clover modem
Modem Slow AGC	to be used with a non-Codan multi-tone modem
Modem Fast AGC	to be used with a non-Codan single-tone modem
Modem Hold AGC	to be used with a multi-tone modem, or one that performs poorly using Modem Slow AGC or Modem Fast AGC

When in CICS mode, the interface accepts any of the CICS commands as detailed on page 355, *Operating the transceiver from a computer*.

When in GPS mode, the interface accepts and processes GPS receiver input sentences (RMC, GLL, and GGA) defined by NMEA format 0183 V2.00. If the interface detects the RMC sentence, it ignores all data derived from any other type of sentence as the RMC sentence guarantees data validity via checksums.

The operating parameters of the serial data connector are set up in the RS232 15way Mode and RS232 15way Speed entries in the Control List.

NOTE If these entries are not displayed in the Control List, they may have been hidden at user or admin level. For more information on displaying hidden entries see page 123, *Hiding and showing information*.

The operating parameters can be set to the following:

Data rate	300, 1200, 2400, 4800, 9600, 19200, 38400 b/s
Data bits	8
Stop bits	1
Parity	None

System power (A rail protected)

System power is switched off when the transceiver is switched off. Any load connected to this supply must be taken into account and be within the CIB™ specification.

Tx audio input

Audio input from external equipment, for example, data modems, is connected between pins 5 and 15 and is a balanced floating input. The input signal should be nominally 1 V p–p and not exceed 3 V p–p.

System audio output

This supplies raw audio (no Easitalk) from the receiver at a level of 1 V p–p when the RS232 15way Mode entry in the Control List is set for your particular modem, that is, **Fax/Data**, **Pactor 1**, **HAL/Clover**, **Modem Slow AGC**, **Modem Fast AGC**, or **Modem Hold AGC**. When the RS232 15way Mode entry in the Control List is set to **None**, **CICS**, **GPS** or **3033/RTU–292**, the audio output is determined by the Easitalk setting on the handset. It is unaffected by the volume control.

Desk console connectors

The NGT desk console (Codan part number 15-10471) contains a junction box. For junction box connector descriptions see page 311, *Junction box connectors (NGT AR and SR Transceivers only)*.

Headphone jack

The headphone jack comprises a 6.3 mm (¼ in) jack with 600 Ω nominal impedance.

Table 47: Pinouts of the headphone jack on the desk console

Connection	Function
Ring	Audio
Tip	Audio
Sleeve	Ground

Handset connector (Code 766 Desk Console only)

The rear panel of the Code 766 Desk Console has a handset connector. The details of this connector are provided in Table 42 on page 312.

10-way connector (Code 766 Desk Console only)

The 10-way connector on the Code 766 Desk Console is on a flying lead from the rear of the unit. This connector is used to connect the desk console to the 10-way connector from the RF Unit 2011. The details of this connector are provided in Table 40 on page 308.

21 System messages

This section lists the system messages that may be displayed on the handset of the transceiver, and a description of each message. For extended transceiver systems, refer to the troubleshooting information provided with the system.

Table 48: System messages

Message	Description
***** NSP *****	NSP is being used to upload or download information to the transceiver. Wait until NSP has finished. You may need to switch the transceiver off then on again.
Admin password incorrect	You have entered an incorrect admin password. Enter the correct password.
Administrator logged out	You have logged out of admin level and have returned to user level.
Antenna untuned	The antenna is no longer tuned. Tune the antenna.
BIT failed: <name of test and/or reason for failure>	The built-in test failed. Switch the transceiver off then on again. Repeat the test.
Call aborted	You have aborted the current call by pressing PTT while the call was being made.
Call already in progress	A call is currently in progress. End or abort the call before you start another.
Call completed	The call in which you were transferring data has been completed.
Call finished No GPS unit connected	You have sent a Get Position call to a remote transceiver that does not have a GPS unit connected.
Call error: call system not configured	The option for the call system with which you have attempted to make a call has not been installed in the transceiver. Select a network with a different call system or, if you know the option code for the call system, install it using the Option code setting under the Devices entry in the Control List (see page 217, *Installing an option in the transceiver*).
Call error: check cables then restart tcvr	An error has occurred in a device. Switch off the transceiver, check that the cables are connected correctly, then switch on the transceiver. If the problem persists, contact your Codan representative.
Call error: message too long	The message you have entered has too many characters. The permitted message length depends on the type of call system, the privacy mode selected, and the character set (see Table 59 on page 376). Reduce the length of your message.

Table 48: System messages (cont.)

Message	Description
Call error: **no GPS info to send**	You have attempted to make a Send Position call but the transceiver did not have any GPS information to send. This may be because the transceiver has not received any valid GPS data and/or because it has not been correctly configured to operate with a GPS receiver. Check that: • the cable between the GPS receiver and the transceiver is connected correctly • the value in the RS232 9way or 15way Mode entry in the Control List is set to GPS • the data rate in the corresponding RS232 9way or 15way Speed entry in the Control List is set to the correct data rate for the GPS receiver Try the call again.
Call error: **stop scan then retry**	An error occurred when the transceiver tried to stop scanning. Press **SCAN** to stop scanning, then try the call again.
Call failed: **auto timeout exceeded**	An automated part of a call took too long. The transceiver has ended the call.
Call failed: **could not connect**	The transceiver could not connect to the station you called because: • the station did not respond • the channel was of poor quality Try again later.
Call failed: **no response received**	The transceiver did not receive a response from the station you called. Try the call on a different channel.
Call finished: **No GPS unit connected**	The transceiver made a Get Position call to a remote transceiver that does not have a GPS receiver connected.
Call rejected: **check call details then retry**	The transceiver could not make the call because: • one or more details of the call were incorrect • the system was busy Check the details of the call and/or wait for 10 seconds before you try the call again.
Call sent <call type icon> <address>	The Emergency or Selective call you made in a Codan Selcall network has been sent to the other station. *Hold down* PTT then speak.
Call success <call type icon> <address>	The Emergency or Selective call you made in an ALE/CALM network has been automatically answered by the other station. *Hold down* PTT then speak.

Table 48: System messages (cont.)

Message	Description
Call type not installed: <call type icon>	The option to make this type of call has not been installed in the transceiver. Select a different call type or, if you know the option code for the call type, enter it using the Option code setting under the Devices entry in the Control List (see page 217, *Installing an option in the transceiver*).
Call warning: Message has been truncated to <maximum length for call system> **characters**	The message sent with the call is too long for the selected calling system. The transceiver has truncated the message to the maximum permitted for the calling system.
Calling... <call type icon> <address>	Your call has started. Wait for the next message.
Call trying <name of channel>/ <name of mode>	You have started a call in an ALE/CALM network. The transceiver is attempting to make the call on the channel/mode displayed.
Can't change frequency	You cannot edit frequencies in this transceiver.
Can't change mode	You cannot change the mode on the current channel for one of the following reasons: • The mode you want to set is not an allowed mode for the channel. Select another mode. • The channel/mode is locked. You may be able to unlock it if you are logged in at the same level. • The TxD option is installed in the transceiver which prevents you from changing modes on transmit channels. For more information contact your system administrator.
Can't change mode: channel has changed	The channel has been reprogrammed and the mode is no longer valid.
Can't change mode: tcvr is scanning	You cannot change the current mode because the transceiver is scanning. Press **SCAN** to stop scanning, then try again.
Can't clarify chan: tcvr is scanning	You cannot use the clarifier while the transceiver is scanning. Press **SCAN** to stop scanning, then try again.
Can't edit this item	You have used a macro to go to a setting that can no longer be edited. For example, you created a macro to go to the Message setting of an entry in the Address List. You then changed this entry to make a Selective call instead of a Message call. The message setting is no longer relevant to the entry so it is not displayed. When you use the macro, however, it still tries to go to this setting. To avoid this message, delete the macro.

Table 48: System messages (cont.)

Message	Description
Can't make Chan Test call <reason>	You have attempted to make a Channel Test call in a situation that does not allow it. These situations include making a Channel Test call: • in an ALE/CALM network • in a Voice Only network • using an ALL address syntax
Can't modify <name of macro> **macro**	You have attempted to modify a macro stored in the Special entry in the Keypad List. Make a copy of the macro first, assign the copy to a key or to the Unassigned entry in the Keypad List, then modify the copy.
Can't toggle scan: try again	An error has occurred while switching scanning on or off. Press **SCAN** to toggle scanning.
Can't tune: tcvr is scanning	You have attempted to manually tune the antenna while the transceiver is scanning. Press **SCAN** to stop scanning, then try again.
Chain call ended	You have ended a chain call by pressing a key.
Channel busy: <name of channel>/<name of mode>	The channel/mode on which you are attempting to make a call is busy.
Channel busy: Try again later	Your call cannot be made because the channel is busy. Wait for the channel to clear, or select a different channel, then try again.
Channel List is empty	There are no channels in the Channel List. Create one or more channels.
Channel not found: <name of channel>	The channel/mode on which you are attempting to make a call is in the channel/mode list of the network you are using, but it is not in the Channel List. Start the call again and select another channel/mode. To avoid this message, delete the channel/mode from the network.
Channel Test ...listen	Listen for the revertive from the station you called.
Channel Test sent...	Your Channel Test call has been sent. Wait for the revertive.
Data call started	An incoming or outgoing call using a modem has started.
Data changed by another user	Another user is changing the entries in the list. Exit from the list, wait for the user to finish changing the entries, then select the list again to update the entries.
Device error in <name of device>	An error has occurred in one of the transceiver's devices. Switch the transceiver off then on, then retry the task that caused the error.

Table 48: System messages (cont.)

Message	Description
Error reading <name of list/entry/device>	An error occurred when the transceiver tried to read the list, entry or device displayed. Switch off the transceiver, check that the cables are connected correctly, then switch on the transceiver. If the problem persists, contact your Codan representative.
Error reading an entry: skipping it	An error occurred when the transceiver tried to read an entry. Switch off the transceiver, check that the cables are connected correctly, then switch on the transceiver. If the problem persists, contact your Codan representative.
Error reading call type	An error occurred when the transceiver tried to read the call type of the outgoing call. Switch off the transceiver, check that the cables are connected correctly, then switch on the transceiver. If the problem persists, contact your Codan representative.
Error updating list: check cables then restart tcvr	An error occurred when the transceiver tried to update a list. Switch off the transceiver, check that the cables are connected correctly, then switch on the transceiver. If the problem persists, contact your Codan representative.
Error updating list: check setting value and length	An error occurred when the transceiver tried to update a list. Check the value of the setting or the length of a message before attempting to save the setting.
Firmware Error: <location> <reason>	The version of firmware programmed onto a PCB is unsuitable. Contact your Codan representative.
GPS position established	The transceiver is receiving valid GPS information.
Hardware Error: <location> <reason>	The hardware on a PCB is unsuitable for the firmware loaded. Contact your Codan representative.
Hangup sent ...listen	You have ended a Phone call. Listen for the revertive to confirm that the radio/telephone interconnect unit received your hangup signal.
High Power Only	You have attempted to change the transmit power level to one that is not permitted for the frequency selected.
Information sent...	The transceiver has sent the data in your Message or Send Position call.
Information sent ...listen	The transceiver has sent a message using an Open Selcall calling system. Listen for the revertive to confirm the receipt of the message at the remote station.
Invalid addr: <address>	The address you have entered has invalid syntax for an ALE global ALL call.
Invalid addr for call system: <self address of called station>	The self address of the station you are trying to call is not valid for the call system of the network you are using (for example, you are making the call in a Codan Selcall network but the address of the called station contains letters). Correct the address, or select a different network, then try again.

Table 48: System messages (cont.)

Message	Description
Invalid addr for call system: <your station self address>	The self address from which you want to make this call is not valid for the call system of the network you are using (for example, you are making the call in a Codan Selcall network but the self address for this network contains letters). Correct the self address, or select a different network, then try again.
Invalid mode: <channel/mode> **in** <network>	A channel in a network you are scanning has a mode that is no longer valid for it. This may be because: • the mode is not an allowed mode for the channel • the mode is no longer in the Mode List The channel/mode combination will not be scanned. To avoid this message, do one or more of the following: • go to the Channel List and modify the allowed modes for the channel • go to the Network List and modify the channel/mode list in the network • install the correct option for the mode
Invalid option code	You have entered an invalid option code. Enter the correct code.
Item already exists	You have attempted to add an item to a list that is identical to an existing item. Add a unique item.
Key <name of key> **is stuck**	A key on the handset is stuck down. Release the key.
Link quality <progress of clearing action>	You have selected to clear the ALE link quality analysis information from the transceiver and the progress of the clearing activity is displayed.
List is full	You have attempted to create an entry or add an item to a list that is full. Delete some entries/items.
Lists locked: Enter the Admin Password from the previous RF unit <serial number>	The junction box has been attached to a new RF unit. Enter the admin password from the RF unit to which the junction box was connected.
Lists locked: Set the same Admin Password on each JB. Last RF unit <serial number>	The junction boxes in your transceiver system have different admin passwords. Enter the same admin password on each junction box.
Lists unlocked	You have entered the correct admin passwords across all junction boxes and the lists are unlocked.

Table 48: System messages (cont.)

Message	Description
Locked entry **Locked list** **Locked setting**	You have attempted to edit a locked list, entry or setting. If the item was locked at the same access level in which you are currently logged, or at a lower level, you can unlock the item using the Unlock? entry in the List Manager. For example, if an entry was locked at user level and you logged in as a user, you can unlock the entry (see page 125, *Locking and unlocking information*).
Low battery	Battery voltage is very low. Recharge or replace the battery. If the transceiver is installed in a vehicle, start the vehicle to recharge the battery.
Low Power Only	You have attempted to change the transmit power level to one that is not permitted for the frequency selected, for example, a CB frequency.
Macro error: **recreate macro for** <name of macro>	An error occurred when the transceiver tried to create the macro. Create the macro again.
Macro memory **is full**	The memory storage for macros is full. You must delete one or more macros before you can create another.
Macro update needed **Delete a few unused macros to make room for new macros**	The macros programmed through NSP are inconsistent with the current version of junction box firmware, and the transceiver has insufficient memory space to update the macros. Delete one or two macros then switch the transceiver off then on again.
Macros updated **Reload Keypad List in NSP and save a new profile for use with version** <firmware version> **and higher**	NSP has downloaded an old set of macros that are inconsistent with the current version of junction box firmware. Load the new Keypad List from the transceiver into a new profile for use with this version of junction box firmware and higher.
Memory error: **Address List reset**	The Address List has been reset to its factory-default contents due to a memory error. If you created any entries in this list you must re-create them, as required, or reload the profile into the transceiver using NSP.
Memory error: **all lists reset**	Firmware in the transceiver has been upgraded. As the layout of data in each list has changed from the previous version of firmware, all lists have been reset to their factory-default contents. Re-create the entries and/or re-enter the values in each list, as required, or reload the profile into the transceiver using NSP.
Memory error: **Calls In Log reset**	The entries in the Calls In Log have been deleted due to a memory error.
Memory error: **Calls Out Log reset**	The entries in the Calls Out Log have been deleted due to a memory error.

Table 48: System messages (cont.)

Message	Description
Memory error: JB Control List reset	The junction box entries in the Control List have been reset to their factory-default settings due to a memory error. If you changed any values in these entries you must re-enter them, or reload the profile into the transceiver using NSP.
Memory error: Keypad List reset	The Keypad List has been reset to its factory-default contents due to a memory error. If you created any macros or modified any key assignments you must re-create and/or re-enter them, as required, or reload the profile into the transceiver using NSP.
Memory error: macros reset	The macro database has been reset to its factory-default contents due to a memory error. If you created any macros you must re-create them, as required, or reload the profile into the transceiver using NSP.
Memory error: one or more lists reset	Firmware in the transceiver has been upgraded. As the layout of data in some lists has changed from the previous version of firmware, some lists have been reset to their factory-default contents. Re-create the entries and/or re-enter the values in each list, as required, or reload the profile into the transceiver using NSP.
Memory error: Phone Link List reset	The Phone Link List has been reset to its factory-default contents due to a memory error. If you created any entries in this list you must re-create them, as required, or reload the profile into the transceiver using NSP.
Memory error: station addresses reset	Your station self addresses have been reset due to a memory error. Re-enter these self addresses, as required, or reload the profile into the transceiver using NSP.
Memory error: write failed	An error occurred when the transceiver tried to write to non-volatile memory. Retry the task that caused the error. If the problem persists, contact your Codan representative.
Modem Info: Connected|Disconnect| Timeout|No Response	An RM50e HF Data Modem has been detected, disconnected, become inactive due to no activity within a timeframe, or is not responding.
Mode not found: <name of mode>	The channel on which you are attempting to make a call is in the channel/mode list of the network you are using, but: • the mode is no longer an allowed mode for the channel • the name of the mode has changed in the Mode List Begin the call again and select another channel/mode. To avoid this message, modify the channel/mode setting for the entry you are using to make the call. You can also check the allowed modes for the channel in the Channel List and/or check the name of the mode in the Mode List.
Name already exists	You have attempted to create an entry in a list with the same name as an existing entry. Create an entry with a unique name.

Table 48: System messages (cont.)

Message	Description
Network not found: <name of network>	The network in which you have attempted to make a call is not in the Network List. Select another network. To avoid this message, change the network in the Address List entry in which this error occurred.
Network chan/mode list is empty	There are no channels in the channel/mode list of the network you are scanning. Enter some channels.
New option installed: restart tcvr	A new option has been installed in the transceiver. Switch the transceiver off then on for the option to take effect.
No data available	The information you requested from the other station is unavailable.
No mode for <name of channel>	There are no allowed modes for the channel. Go to the Channel List and select a mode for the channel.
No networks set to be scanned	You have switched scanning on but no networks have been set to be scanned. Go to the Network List, go to the network you want to scan, then change the value in the Scan Network setting from **Don't scan**.
No RFDS network in Network List	You have attempted to make an RFDS Emgcy call but there are no networks with a two-tone calling system in the Network List. Create a suitable network.
No tuner	The transceiver has attempted to tune the antenna, but there may be no tuner (the antenna may not require one), or the antenna may be faulty.
No valid GPS info within timeout period	No valid GPS information has been received within the time set in the GPS Error Time entry in the Control List.
No valid network in Network List	This message is displayed when: • the Network List is empty • the only network in the Network List is an RFDS network, and the call you are attempting to make is not an RFDS Emgcy call Create a suitable network in the Network List.
Not found: <name of entry>	A setting in this list refers to an entry in another list, but that entry is no longer there. Select a different entry or re-create the missing entry.
Not in Channel List: <name of channel>	One of the channels in the network you are scanning is not in the Channel List. Either remove the channel from the channel/mode list of the network, or re-create the channel in the Channel List.

Table 48: System messages (cont.)

Message	Description
Not in network: <channel/mode>	The channel/mode on which you have attempted to make a call is not in the network. For example, the Address List entry you are calling specifies the network in which the call is to be made, but the channel/mode is not in that network. Select a different channel/mode or network. This message may also be displayed when you are editing a channel/mode in the Address or Phone Link List and the channel/mode is not in the network specified. Select a different channel/mode or network.
Number too high	You have entered a number that exceeds the maximum value for the setting. Enter a lower number.
Number too low	You have entered a number below the minimum value for the setting. Enter a higher number.
Other tcvr ended call	The station you called has ended the call.
Position: <GPS position>	The transceiver has received the GPS position of the station you called.
Power fault on antenna	The antenna power has failed due to excessive current being drawn by the antenna. Check the antenna connectors. If the problem persists, check the antenna.
Power fault on antenna recovered	The power fault on the antenna is rectified.
Power fault on CIB	A short circuit has been detected on the CIB. Repair the short circuit.
Power fault on CIB recovered	The power fault on the CIB is rectified.
PTT aborted: confirmations lost	The device that was transmitting (for example, a modem) has been disconnected. Reconnect the device, then try the task again.
PTT aborted: timeout period exceeded	The transceiver has ceased transmission because the maximum transmission time set in the Cfg PTT Cutout Time entry in the Control List was exceeded. This may have occurred because you held down PTT for too long or made a long transmission using a modem. Release the PTT button if it is held down and/or increase the PTT cutout time if necessary.
PTT error: check firmware versions	You have attempted to PTT but an inconsistency between junction box and RF unit firmware exists. Check the firmware versions and reprogram as required.

Table 48: System messages (cont.)

Message	Description
PTT rejected from <location of PTT: reason>	The transceiver could not transmit from a specific location for the reason stated. The possible locations are the handset, desk console, morse key, GPIO port, CICS on the 9-way port, and CICS on the 15-way port. The possible reasons are that: • you are on a receive-only channel • the mode is not allowed for this channel • you are in the CB frequency range but are not on a specific CB channel • you are using a transceiver in which the channel programming option and the position of the TPE link does not permit transmission • the system is locked • the transceiver is scanning • the battery charge is low • the synthesiser is unlocked • the transceiver is tuning • the maximum transmission time set in the Cfg PTT Cutout Time entry in the Control List was exceeded
Read only entry **Read only list** **Read only setting**	You have attempted to edit a locked list, entry or setting. The item was locked at a higher access level than that into which you are logged. You cannot unlock it unless you log in to that higher level. For example, if an entry was locked at admin level and you have logged in as a user, you must log in as an administrator before you can unlock the entry.
Receive-only channel	You have attempted to transmit on a receive-only channel. Select a channel on which you can transmit.
RFDS called Wait for reply	You have made an RFDS Emgcy call. Wait for a response from RFDS personnel, *hold down* PTT, then speak.
Secure error: hardware fault	The transceiver has detected an error in the voice encryptor hardware. Switch off the transceiver, check that the cables are connected correctly, then switch on the transceiver. If the problem persists, contact your Codan representative.
Secure error: index key not set	You have selected a secure index that does not contain a CES secure key or an AES secure key.
Secure error: no keys set	No CES secure keys or AES secure keys have been programmed since the encryptor was installed. Program a CES secure key or an AES secure key (see page 239, *Creating a secure key in a Corporate secure index* or page 257, *Creating a secure key in a secure index* respectively).

Table 48: System messages (cont.)

Message	Description
Secure error: **try again**	The voice encryptor module has reset unexpectedly. Press **SEC** to enter secure mode.
Serial port <name of serial port> **baud rate is not available with current** <name of serial port> **baud setting** <new data rate>	You have changed the data rate of one serial port on the junction box but the combination of this data rate and that of the other serial port on the junction box is not supported (for example, 38400 b/s on the 9-way port and 19200 b/s on the 15-way port is not supported). The transceiver has automatically changed the data rate of the other serial port to create a valid combination.
Service option **enabled**	The service option in the transceiver is enabled. Contact your Codan representative to have this option disabled.
Settings **hidden in** <name of entry>	You have attempted to display the settings for an entry where all the settings have been hidden at user level. To display the settings, use the Full view? entry in the List Manager. To display the settings in normal view, use the Show? entry in the List Manager.
Status rcvd: <Get Status information>	The transceiver has received the Get Status information from the station you called.
Status rcvd: **Request queued. Please wait**	The remote transceiver has received the Get Status call and is preparing the response.
Synthesiser **lock error**	The frequency synthesiser has not locked on a frequency. Contact your Codan representative.
Synthesiser **lock recovered**	The frequency synthesiser can now lock on a frequency.
System busy	The system is busy. You do not have permission to override the current activity.
System busy **Hold ✓ to allow**	The system is busy. If you want to override the current activity, *hold* **✓.**
System error <error number>	A system error has occurred. The transceiver restarts automatically. Retry the task you were performing when the error occurred. If the problem persists, note the system error number in the message, then contact your Codan representative.
System locked	There is a lock on the system from PTT, scan, channel or mode change, or from a call. You do not have permission to break this lock.
System locked **Hold ✓ to unlock**	There is a lock on the system from PTT, scan, channel or mode change, or from a call. If you want to break the lock, *hold* **✓.**

Table 48: System messages (cont.)

Message	Description
Tcvr busy: retry in 10 seconds	The transceiver is busy. This may be because: • it is receiving an incoming call • it is processing a change made to your station self address • too many messages are being sent between units on the CIB Wait for 10 seconds, then try the task again.
Text too long	You have entered a line of text that is too long. Reduce the length of the text.
Too many chans for auto ALE call	The ALE/CALM network in which you are attempting to make a call contains more than 100 channels. The transceiver attempts to make the call on a maximum of 100 channels. To avoid this message and to ensure the transceiver uses all the channels in the network, go to the Network List and reduce the number of channels in the network to 100 or less.
Too many chans to scan	More than 100 channels are set to be scanned. The transceiver only scans 100 of them. In the Network List: • remove some channels from the channel/mode list of one or more of the networks that are set to be scanned • reduce the number of networks that are set to be scanned by changing the value of the Scan Network setting in one or more networks to **Don't scan**
Too many devices connected	The Main Menu is full because there are too many devices connected to the CIB. Switch the transceiver off, disconnect a device, then switch the transceiver on.
Tune aborted	Automatic tuning of the antenna was aborted because you pressed PTT during an automatic tuning cycle.
Tune antenna then retry call	Your call cannot be made until the antenna is tuned. Tune the antenna then try the call again.
Tune failed	The transceiver could not automatically tune the antenna.
Tune successful	The transceiver has tuned the antenna successfully.
Tuner timeout	Automatic tuning of the antenna has timed out because: • the transceiver could not tune the antenna within the specified timeout period • the tuner cable is not connected • the Cfg Auto Tune Mode is set incorrectly
Tuning...	The transceiver is automatically tuning the antenna.

Table 48: System messages (cont.)

Message	Description
Unknown error <error number>	The firmware versions in two of the transceiver's devices are incompatible. Contact your Codan representative.
Waiting for response	You have requested that information (such as a GPS position) be automatically sent to you from another station. The transceiver is waiting for a response from that station. Wait for the next message.

The following table shows typical values.

Table 49: Specifications for the NGT Transceiver

Item	Specification		
Channel capacity	NGT *AR*, *SR*, *AR Voice*:	400	
	NGT *VR*:	20	
Frequency range	Transmit:	1.6 to 30 MHz	
	Receive:	250 kHz to 30 MHz	
Operating mode	Single sideband (J3E) USB and LSB or switched USB/LSB, AM, H3E (optional)		
Transmitted power	NGT *SR*, *VR*:	High:	125 W (PEP)
		Low:	10 W (PEP)
	NGT *AR*, *AR Voice*:	High:	100 W (PEP)
		Low:	10 W (PEP)
Spurious and harmonic emissions	Better than 65 dB below PEP		
Receiver 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		
Selectivity	Greater than 70 dB at –1 kHz and +4 kHz reference suppressed carrier frequency USB		
	Pass Band:	–6 dB	300 to 2600 Hz
	Ripple:	2 dB p–p	500 to 2500 Hz
Frequency stability	±0.3 ppm	(–30 to +60°C)	
Supply voltage	12 V DC nominal, negative earth		
	Normal operating range:	10.8 to 16 V DC	
	Maximum operating range:	9 to 16 V DC	
	Reverse polarity protection provided		

Table 49: Specifications for the NGT Transceiver (cont.)

Item	**Specification**		
Overvoltage protection	Shutdown at 16 V DC (nominal) for duration of overvoltage		
Supply current	Receive (NGT *AR*, *SR*):	(no signal):	1 A
	Receive (NGT *AR Voice*, *VR*):	(no signal):	630 mA (nominal)
	Transmit:	J3E voice: J3E two tone:	8 A 9 to 16 A
Size	2010/2011 RF Unit (excluding vehicle mounting frame) 210 mm W × 270 mm D × 65 mm H (8.4 in W × 10.8 in D × 2.6 in H)		
	2020 Handset 65 mm W × 35 mm D × 130 mm H (2.6 in W × 1.4 in D × 5.2 in H)		
	Handset and speaker connector 42 mm W × 55 mm D × 22 mm H (1.7 in W × 2.2 in D × 0.9 in H)		
	2030 Junction Box (NGT *AR* and *SR* Transceivers only) 135 mm W × 106 mm D × 38 mm H (5.4 in W × 4.3 in D × 1.5 in H)		
Weight	2010/2011 RF Unit (excluding vehicle mounting frame) 3.3 kg (7.3 lb)		
	2020 Handset 0.3 kg (0.7 lb)		
	2030 Junction Box 0.4 kg (0.9 lb)		

Table 49: Specifications for the NGT Transceiver (cont.)

Item	**Specification**
Sealing	2010/2011 RF Unit IP52
	2020 Handset IP41
	Handset and speaker connector IP41
	2030 Junction Box IP41

NOTE Specifications are subject to change without notice or obligation.

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Appendix A Hot key examples

This section contains the following topics:

Example 1: selecting a specific channel

This example shows you how to create a macro to select a specific channel in the Channel List.

When you run this macro, the transceiver:

- opens the Channel List
- selects the channel specified in the macro
- briefly displays the new channel
- returns you to the screen you were on

To create this macro:

- ❑ Press **VIEW** until the channel screen is displayed.
- ❑ Scroll to the channel you want the macro to select.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Create macro**, then press ✓.

  The transceiver asks you to select the action you want the macro to perform.
- ❑ Scroll to **Go to this chan**, then press ✓.

  The transceiver asks you to select the timing with which the macro operates.
- ❑ Scroll to **Before pause**, then press ✓.

  NOTE — When you use a macro to select a channel, the channel is always selected before the channel screen is displayed. You can therefore select **Before pause** or **After pause**. The end result is the same.

- ❑ Press the key to which you want to assign the new macro.
- ❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.
- ❑ Type a name for the macro, then press ✓.

  The macro is created and assigned to the key, and the List Manager remains open.

Example 2: displaying an information screen

The time and GPS screens are information screens. You can view the information on these screens but you cannot change it. This example shows you how to create a macro to display the time screen in the Control List.

When you run this macro, the transceiver:

- goes to the Time Screen entry in the Control List
- briefly displays the current time and date
- returns you to the screen you were on

To create this macro:

- ❑ Log in to admin level (for help see page 120, *Logging in to admin level from user level*).
- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Time...**, then press ✓.
- ❑ Scroll to **Screen**, then press ✓.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Create macro**, then press ✓.

  The transceiver asks you to select the timing with which the macro operates.
- ❑ Scroll to **Before pause**, then press ✓.

  NOTE — This macro displays an information screen and does not change any values, so you can select **Before pause** or **After pause**. The end result is the same.
- ❑ Press the key to which you want to assign the new macro.
- ❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.
- ❑ Type a name for the macro, then press ✓.

  The macro is created and assigned to the key, and the List Manager remains open.

Example 3: accessing the Free Tune screen

The Free Tune screen is a special entry in the Control List that enables you to select any frequency within the transceiver's range. Once a frequency is selected you are able to receive a signal on this frequency, if there is one being transmitted. This example shows you how to create a macro to display the Free Tune screen in the Control List.

When you run this macro, the transceiver:

- goes to the Free Tune entry in the Control List
- displays the current frequency
- waits for you to enter a new frequency

To create this macro:

- ❑ Log in to admin level (for help see page 120, *Logging in to admin level from user level*).
- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Free Tune**, then press ✓.
- ❑ Position the cursor under the number that you are most likely to change while free tuning.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Create macro**, then press ✓.

  The transceiver asks you to select the action you want the macro to perform.
- ❑ Scroll to **Display freq**, then press ✓.

  The transceiver asks you to select the timing with which the macro operates.
- ❑ Scroll to **Waits**, then press ✓.
- ❑ Press the key to which you want to assign the new macro.
- ❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.
- ❑ Type a name for the macro, then press ✓.

  The macro is created and assigned to the key, and the List Manager remains open.

Example 4: displaying and/or changing a setting in the Control List

This example shows you how to create a macro to display and/or change a setting in the Control List. You can then change the value or press ✕ to leave it as it is. This example shows you how to create a macro to display the Cfg Alert Tones entry in the Control List, allowing you to change the value if required.

When you run this macro, the transceiver:

- goes to the Cfg Alert Tones entry in the Control List
- displays the current value
- waits for you to act

To create this macro:

- ❑ Log in to admin level (for help see page 120, *Logging in to admin level from user level*).
- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Cfg...**, then press ✓.
- ❑ Scroll to **Alert Tones**, then *hold* ✓.

  A question mark is displayed at the end of the top line to indicate that you can now change the value.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Create macro**, then press ✓.

  The transceiver asks you to select the action you want the macro to perform.
- ❑ Scroll to **Display value**, then press ✓.

  The transceiver asks you to select the timing with which the macro operates.
- ❑ Scroll to **Waits**, then press ✓.
- ❑ Press the key to which you want to assign the new macro.
- ❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.
- ❑ Type a name for the macro, then press ✓.

  The macro is created and assigned to the key, and the List Manager remains open.

Example 5: changing a value to the next value in a list

For many entries in the Control List, changing a value involves selecting a value from a short list of possible values. This example shows you how to create a macro to change the current value to the next value in one of these entries, whatever that value may be.

For entries where the values are **On** and **Off**, creating a macro to go to the next value means you can toggle the entry on and off using the same macro.

This example shows you how to create a macro to switch key beeps on or off.

When you run this macro, the transceiver:

- goes to the Key Beep entry in the Control List
- changes the value to the next value in the list (that is, from **On** to **Off**, or **Off** to **On**)
- saves the value

The timing with which this macro operates is immediate. This means that the macro operates in the background.

To create this macro:

- ❑ Log in to admin level (for help see page 120, *Logging in to admin level from user level*).
- ❑ Press ✕ until **Main Menu** is displayed.
- ❑ Scroll to **Control**, then press ✓.
- ❑ Scroll to **Key...**, then press ✓.
- ❑ Scroll to **Beep**, then *hold* ✓.

  A question mark is displayed at the end of the top line to indicate that you can now change the value.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Create macro**, then press ✓.

  The transceiver asks you to select the action you want the macro to perform.
- ❑ Scroll to **Set next value**, then press ✓.

  The transceiver asks you to select the timing with which the macro operates.
- ❑ Scroll to **Immediately**, then press ✓.

  If you want to briefly view the value to which the setting is changing, scroll to **Before pause**, then press ✓.
- ❑ Press the key to which you want to assign the new macro.
- ❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.
- ❑ Type a name for the macro, then press ✓.

  The macro is created and assigned to the key, and the List Manager remains open.

Example 6: opening a list at the marker entry

This example shows you how to create a macro to open a list at the entry on which a marker is set.

When you run this macro, the transceiver:

- opens the list
- goes to the entry on which the marker is set
- waits for you to act

To create this macro:

❑ Set a marker on the entry to which you want the macro to go (see page 102, *Setting a marker*).

If you have already set the marker, open the list in which the entry is stored.

❑ *Hold* 🔍 to open the List Manager.

❑ Scroll to **Macros...**, then press ✓.

❑ Scroll to **Create macro**, then press ✓.

The transceiver asks you to select the action you want the macro to perform.

❑ Scroll to **Go to marker**, then press ✓.

The transceiver asks you to select the timing with which the macro operates.

❑ Scroll to **Waits**, then press ✓.

❑ Press the key to which you want to assign the new macro.

❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.

❑ Type a name for the macro, then press ✓.

The macro is created and assigned to the key, and the List Manager remains open.

Example 7: making a call using a specific entry in the Address List

This example shows you how to create a macro to make a call using a specific entry in the Address List.

When you run this macro, the transceiver:

- opens the Address List
- goes to the entry specified in the macro
- begins a call to the address specified in the entry

The timing with which this macro operates is **Immediately**. This means that the macro begins the call without displaying the Address List entry first. The transceiver may, however, prompt you for information about the call depending on the details supplied in the entry.

To create this macro:

- ❑ Press **VIEW** until the Address List is displayed.
- ❑ Scroll to the entry you want the macro to call.
- ❑ *Hold* 🔍 to open the List Manager.
- ❑ Scroll to **Macros...**, then press ✓.
- ❑ Scroll to **Create macro**, then press ✓.

  The transceiver asks you to select the action you want the macro to perform.
- ❑ Scroll to **Go to this entry**, then press ✓.

  The transceiver asks you to select the timing with which the macro operates.
- ❑ Scroll to **Immediately**, then press ✓.
- ❑ Press the key to which you want to assign the new macro.
- ❑ Scroll to the macro you want to have in the list immediately after the new macro, then press ✓.
- ❑ Type a name for the macro, then press ✓.

  The macro is created and assigned to the key, and the List Manager remains open.

Diagnostic and Configuration Get Status calls

When you make a Get Status call, you need to specify the type of status information you want to retrieve from the remote station (see Table 52, Table 50 and Table 53). You are prompted by the transceiver to specify the type of information during the Get Status call.

Making a Codan Diagnostic Get Status call

Codan diagnostic information may only be retrieved from another transceiver by using a Get Status call in an ALE/CALM or Codan Selcall network. It contains the information listed in Table 50, or Table 51 for older Codan HF transceivers.

To obtain Codan diagnostic information:

- ❑ Press **CALL**.
- ❑ Type the address of the station you want to call, scroll to **Get Status?** for the call type, then press **CALL**.
- ❑ Scroll to **1: Diagnostic**, then press **CALL**.
- ❑ Scroll to an ALE/CALM or Codan Selcall network, then press **CALL**.
- ❑ Scroll to the channel/mode combination you want to use, then press **CALL**.

Table 50: Information retrieved in a Codan Diagnostic Get Status call made to a Codan HF transceiver

Information received	Description
RXnn.n	Battery voltage in receive
TXnn.n	Battery voltage in transmit
S1=nnn	Signal strength of received call (dBµV)
S2=nnn	Signal strength 2 seconds after call was received (dBµV)
SWRn.n	SWR of the antenna
Pnnn	Power output of the transmitter (W)
Tnn	Temperature (°C)

Table 51: Information retrieved in a Codan Diagnostic Get Status call made to a Codan 9323 or 9360 transceiver

Information received	Description
RX=nn.nV	Battery voltage in receive
TX=nn.nV	Battery voltage in transmit
S1=nnnµV	Signal strength of received call (dBµV)
S2=nnnµV	Signal strength 2 seconds after call was received (dBµV)
GAIN=nnn	RF gain on or off
SWR=n.n	SWR of the antenna
PWR=nnnW	Power output of the transmitter (W)

Making an open Diagnostic Get Status call

Open diagnostic information may only be retrieved from another transceiver by using a Get Status call in an Open Selcall network. It may contain all or part of the information listed in Table 52.

To obtain open diagnostic information:

- ❑ Press **CALL**.
- ❑ Type the address of the station you want to call, scroll to **Get Status?** for the call type, then press **CALL**.
- ❑ Scroll to **1: Diagnostic**, then press **CALL**.
- ❑ Scroll to an Open Selcall network, then press **CALL**.
- ❑ Scroll to the channel/mode combination you want to use, then press **CALL**.

Table 52: Information retrieved in an open Diagnostic Get Status call

Information received	**Description**
RXnn.n	Battery voltage in receive
TXnn.n	Battery voltage in transmit
S1=nn	Signal strength of received call
SWR=n.n	SWR of the antenna
Vn.nn	Transceiver power
Base|Mobile	Transceiver antenna type
FwrPower=nn	Forward power
RevPower=nn	Reflected power
Tcvr930|2000	Transceiver type
Vn.nn	Firmware version
T=nn	Temperature (°C)
ID=nnnnnn	Last Called ID

Making a Codan Configuration Get Status call

Codan configuration information may only be retrieved from another transceiver by using a Get Status call in an ALE/CALM, Codan Selcall, or Open Selcall network. It contains the relevant information listed in Table 53, or Table 54 for older Codan HF transceivers.

To obtain configuration information from a Codan HF transceiver:

- ❑ Press **CALL**.
- ❑ Type the address of the station you want to call, scroll to **Get Status?** for the call type, then press **CALL**.
- ❑ Scroll to **2: Configuration**, then press **CALL**.
- ❑ Scroll to the network you want to use, then press **CALL**.
- ❑ Scroll to the channel/mode combination you want to use, then press **CALL**.

Table 53: Information retrieved in a Codan Configuration Get Status call made to a Codan HF transceiver (firmware V4.10 or later)

Information received	**Description**
Codan transceiver type	Product type as held in the Customer Radio entry in the Control List
RF:n.nn JB:n.nn NRI:n.nn 2110:n.nn	Product name as held in the Devices entry in the Control List, followed by the firmware version number for the device

Table 54: Information retrieved in a Codan Configuration Get Status call made to a Codan 9323 or 9360 transceiver

Information received	**Description**
nnn-nnn/nn.nn	Main processor: last six digits of 90-20nnn-nnn firmware set number/firmware version number
nnn-nnn/n.nn	Control head: last six digits of 90-20nnn-nn firmware set number/firmware version number
TxD/TxE/TxP	Channel programming capability
S	Selcall option (S or SEL) installed
SLO	Selcall lockout option installed
GPS	GPS Enable option installed
ES	Emergency selcall option installed
ALE	ALE option installed
AM	AM option installed

Broadcast Site and Request Site Get Status calls

If the ALE Site Mgr entry in the Control List is set to **Auto**, **Manual** or **Restricted**, you have the option of broadcasting your site information to other stations, or requesting site information from other stations. If you want to view the site information from other stations, or for your own transceiver, see page 430, *Enabling access to site manager information*.

Making a Broadcast Site Get Status call

To manually broadcast the site manager information from your transceiver:

- ❑ Press **CALL**.
- ❑ Scroll to **3: Broadcast Site**, then press **CALL**.
- ❑ Scroll to the ALE/CALM network you want to use, then press **CALL**.
- ❑ Scroll to the channel/mode combination you want to use, then press **CALL**.

Making a Request Site Get Status call

To manually request site manager information from other stations:

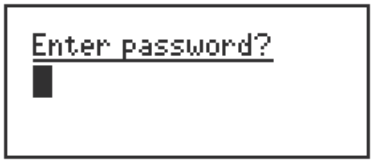
- ❑ Press **CALL**.
- ❑ Enter the address of the station from which you want to request site manager information.
- ❑ Scroll to **4: Request Site**, then press **CALL**.
- ❑ Scroll to the ALE/CALM network you want to use, then press **CALL**.
- ❑ Scroll to the channel/mode combination you want to use, then press **CALL**.

Appendix C Forgotten passwords

If you have forgotten your user password, contact Codan to obtain a code to erase your password. You will be asked to quote the ESN of the junction box or 2011 RF Unit.

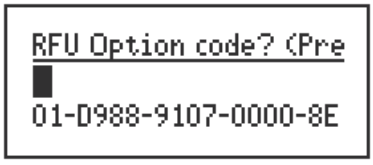
To obtain the required ESN and/or enter the code provided by Codan:

- ❑ Switch on the transceiver then wait until you are prompted to enter a password.



- ❑ *Hold* 🔍 to display the Option code screen.

  The ESN is displayed on the bottom line of the screen.



- ❑ Do one of the following:
  - To exit this screen and return to the Enter password screen, *hold* ✕.
  - To enter the code to erase your password, start typing. The transceiver automatically enters dashes in the appropriate places. When you have entered the code, press ✓. The password is erased and the home screen is displayed.

NOTE The ESN is displayed in a similar manner during Admin login.

NOTE Use the Password User or Password Admin entry in the Control List to enter a new password (for help see page 104, *Changing a setting in the Control List*).

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Appendix D Operating the transceiver from a computer

This section contains the following topics:

About CICS

NOTE CICS is not available with NGT *VR* Transceivers.

CICS is a set of commands that the transceiver understands. The commands are suitable for use from a computer. You can operate your transceiver with CICS instead of a handset. To use CICS you must connect your transceiver to a computer or personal organiser via an RS232 serial port (see page 361, *Setting up CICS*).

The NGT *AR*, *SR*, and *AR Voice* Transceivers operate with CICS V3.00 (or later). Older Codan HF transceivers operate with CICS V2. For information on the compatibility between the two versions see page 405, *Compatibility between CICS V2 and V3.00 (or later)*.

CICS V3.20 or later, includes the `lbt` command, which enables you to start the LBT process and override the global Cfg LBT Mode setting in the Control List of the transceiver during specific calls.

Using CICS

Entering commands

When you enter CICS commands you can enter up to 255 characters. Commands are processed when they are ended with an ASCII carriage return character. ASCII line feed characters are ignored. When echoing is on, a received carriage return character is echoed as the ASCII carriage return/line feed sequence (see page 369, *echo command*).

Structuring commands

Commands can include variables that are user-defined, for example, `gpsbeacon <self address of called station>[@<network>]`. Each command and variable is separated by a space or comma character. Variables inside single or double quotes are treated as a single variable. Space characters inside quoted text are treated as part of the text. Any user-defined variables that include a space character, such as a channel or network name, must have double quotes enclosing the variable.

Command line control commands

The **Backspace** key is used for basic editing in CICS. The use of other editing keys requires a VT100 terminal-emulation program. All other characters are echoed as they are.

Table 55 lists the keys that can be used to edit commands in CICS.

Table 55: Editing keys used in CICS

Keys	Action
Delete	Deletes the character above the cursor.
Backspace	Deletes the character to the left of the cursor.
Ctrl+A	Moves to the start of the line.
Ctrl+C	Aborts the current command.
Ctrl+E	Moves to the end of the line.
Ctrl+K	Deletes from the cursor to the end of the text.
Ctrl+R	Refreshes the input line.
Ctrl+U	Deletes the entire line of text entered.
↑	Moves up through the commands entered previously.
↓	Moves down through the commands entered previously.
→	Moves one character to the left.
←	Moves one character to the right.

Special characters

An equal sign (=) or a question mark (?) can be used to initiate an action, or request information (see page 406, *Using = and ?*).

Command prompt

CICS V3.00 (or later) has an optional prompt to enter commands, that is, >, which indicates that commands can be entered (see page 377, *prompt command*).

NOTE The command prompt is not shown if echo is off.

Addresses in commands

Addresses can be specified with or without a network (see page 409, *Using addresses with or without a network*). An address in an ALE/CALM network may be upper-case letters or digits, @ and ?. An address in a Codan Selcall network must be digits only.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the special ALE address syntax for global ALL calls (@?@) to send an ALL call through any of the existing call commands in CICS (`alecall`, `aletelcall`, `call`, `gpsposition`, `pagecall`, `selcall`). For more information see page 166, *ALL address syntax*.

ALE call options

When you make a call through CICS you can specify whether or not to override the global settings for the transceiver at the time of the call. For information on the correct syntax see Table 60 on page 391.

To...	Type...
Enable LBT for a call	`+lbt`
Disable LBT for a call	`-lbt`
Enable a scan cycle on all scanned networks between call attempts	`+scan`
Disable the scan cycle between call attempts	`-scan`

Recognised variable expansion

The variables listed in Table 56 may be added in a message. These variables are recognised by CICS V3.20 (or later) when they are enclosed in double quotes. CICS expands the variable by inserting the current information associated with the variable into the message.

NOTE $GPS and $GPS+ variables require Option GPS Enable to be installed.

Table 56: Variable expansion in a command

Keyword	Function when used in a call command
$DATE	Inserts the current date in the following format: <name of day> <month> <day> <year>
$GPS	Inserts the current valid GPS position in the following format: <latitude> <longitude>
$GPS+	Inserts the current valid GPS position in the following format: <latitude> <longitude> <altitude> <UTC>
$TIME	Inserts the current time in the following format: <hh>:<mm>:<ss>
$TZ	Inserts the time zone offset in the following format: <time zone offset>
$VER	Inserts the current version of the junction box firmware in the following format: <version number>

A typical use for the variable expansion feature is as follows:

Command typed at initiating station	Information displayed at receiving station
`pagecall BH "$GPS+"`	`PAGE-CALL: 'Ch 27980', 54321, BH, 26/04 04:50, "3459.490S 13842.370E +251.2M 105123 (A)"`

Sending and receiving calls

When you make calls using CICS commands, you do not need to use the `hangup` command when you are making successive calls, or using the `chan` or `scan` commands. For example, after sending a `gpsbeacon` command, CICS enables you to change the channel, then send another `gpsbeacon` command, without using the `hangup` command to close the existing link.

CAUTION

If a response is not received to a `gpsbeacon`, `gpsposition`, or `pagecall` command (for example, a `page call ack` to a `pagecall` command), you *must* use the `hangup`, `chan`, `scan` or `call` command to receive subsequent calls. Control software using these commands must take this into account.

Responses and outputs

CICS is an interface from which random outputs occur, for example, when calls are received. Additionally, depending on the configuration of the equipment, the order of responses to commands may change. Software operating on this interface must be able to adapt to these irregularities to enable correct system behaviour under all conditions. It is recommended that echo is switched off to avoid intermixing of the commands you enter with the responses from the system (see page 369, *echo command*).

Message length in a Message call

The permitted message length when making a Message call depends on the type of call system, the privacy mode selected, and the character set (see page 376, *pagecall command*).

Compatibility between CICS V2 and V3.00 (or later)

The compatibility issues between CICS V2 and V3.00 (or later) include:

- differences in how an action is initiated or information requested
- differences in how channel names are specified
- differences in how the scan channels are grouped, that is, in scan tables or networks
- use of upper-case or lower-case text
- use of quotation marks
- the specification of addresses with or without a network

The NGT *AR*, *SR*, and *AR Voice* Transceivers can be configured to support most control software that is compatible with CICS V2 (see page 405, *Compatibility between CICS V2 and V3.00 (or later)*).

Setting up CICS

Connecting a computer to a transceiver

To connect a computer to a transceiver:

- ❑ Connect a serial port (for example, COM1) on the computer to:
  - either serial port on the junction box (NGT *AR* and *SR* Transceivers only)
  - the 6-way connector on the 2011 RF Unit (NGT *AR Voice* Transceivers only)

Setting up a transceiver for CICS

NOTE The RS232 mode and speed entries available to you in the Control List depend upon the type of NGT Transceiver that you are using.

To set up a transceiver to be used with CICS:

- ❑ Make sure that the Control List settings for the serial port you are using have been set correctly. Check that:
  - the corresponding RS232 Mode entry is set to **CICS**
  - the corresponding RS232 Speed entry is set to the same rate as the computer

CAUTION If you change the settings in these entries you must switch your transceiver off then on again for the changes to take effect.

Setting up a computer for CICS

To set up a computer for use with CICS:

- ❑ Start a terminal-emulation program.
- ❑ Check the settings in the terminal-emulation program. Make sure that you:
  - select the serial port on the computer that is connected to the serial port on the transceiver
  - select the data rate that corresponds to the data rate set in the Control List of the transceiver
  - set data bits to 8
  - set parity to none
  - set stop bits to 1

Terms used in CICS and the NGT Transceiver

The terms used in several CICS commands differ from those used in the transceiver. Table 57 lists these commands and the equivalent NGT Transceiver terms.

Table 57: CICS commands and the equivalent NGT Transceiver terms

CICS commands	Equivalent term in the transceiver
`alecall`	Selective call using an ALE/CALM network
`aletelcall`	Phone call using an ALE/CALM network
`gpsbeacon`	Get Position call using an ALE/CALM or a Codan Selcall network
`gpsposition`	Send Position call using an ALE/CALM or a Codan Selcall network
`pagecall`	Message call using an ALE/CALM or a Codan Selcall network
`selbeacon`	Channel Test call using a Codan Selcall network
`selcall`	Selective call using a Codan Selcall network
`selfid`	Your station self address
`statuscall`	Get Status call using an ALE/CALM or a Codan Selcall network
`telcall`	Phone call using an ALE/CALM or a Codan Selcall network

CICS commands

This section covers the functions and syntax of the CICS commands. In this section:

- the function of each command is summarised in Table 58
- the syntax and detailed function of each command is summarised in Table 60 on page 391

Table 58: CICS commands and their functions

Commands	Function	See...
alecall	Makes a call to addressed stations using an ALE/CALM network	page 365
aletelcall	Makes a Phone call to addressed stations using an ALE/CALM network	page 366
call	Makes a call on the current channel using an ALE/CALM or a Codan Selcall network	page 367
chan	Controls the selection of channels in the transceiver	page 368
echo	Controls the echo state of the transceiver	page 369
freq	Displays the frequency of the current channel, or selects the channel by the frequency specified	page 370
gpsbeacon	Makes a Get Position call to an addressed station using an ALE/CALM or a Codan Selcall network	page 371
gpsposition	Makes a Send Position call to addressed stations using an ALE/CALM or a Codan Selcall network	page 372
hangup	Closes an active link between your transceiver and the station that you are calling	page 372
help	Displays the help available in CICS	page 373
lbt	Displays the global LBT Mode or monitors the current channel for the presence of data or voice	page 373
lock	Controls the lock status of the transceiver	page 374
mode	Controls the mode settings of the channels in the transceiver	page 375
mute	Controls the setting of the speaker mute in the transceiver	page 375
pagecall	Makes a Message call to addressed stations using an ALE/CALM or a Codan Selcall network	page 376
prompt	Controls the settings for the prompt on the command interface	page 377
ptt	Controls the settings for PTT	page 378
scan	Controls the settings for scanning in the transceiver	page 379
secure	Controls the voice encryptor status of the transceiver	page 380
selbeacon	Makes a Channel Test call to an addressed station using a Codan Selcall network	page 382

Table 58: CICS commands and their functions (cont.)

Commands	Function	See...
`selcall`	Makes a Selective call to an addressed station using a Codan Selcall network	page 383
`selfid`	Controls the list of self addresses used in CICS	page 384
`set`	Controls the gp settings in CICS	page 385
`sideband`	Controls the sideband setting for channels in the transceiver	page 386
`statusack`	Sends a response to a Get Status call	page 387
`statuscall`	Makes a Get Status call to an addressed station using an ALE/CALM or a Codan Selcall network	page 388
`statustime`	Sets the length of time a station has to respond to a Get Status call	page 389
`telcall`	Makes a Phone call to an addressed station using an ALE/CALM or a Codan Selcall network	page 390
`ver`	Displays the current version of CICS being used	page 390

alecall command

Use the `alecall` command to select the best channel on which to establish a link to addressed stations, then make a call on that channel.

To disconnect the link, either:

- use the `scan on` command to close the link and resume scanning (see page 379, *scan command*), or
- use the `hangup` command to terminate the link (see page 372, *hangup command*)

Syntax

NOTE

For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*

`alecall <address of called station>[@<network>] [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station you want to call.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the `alecall` command.

aletelcall command

Use the `aletelcall` command to select the best channel on which to establish a link to an addressed station, then make a telcall on that channel. A telcall is a call to a telephone number.

NOTE Before you can use the `aletelcall` command, you must know the address of a station with a radio/telephone interconnect unit through which your call can be routed to the public telephone network.

To disconnect the link, either:

- use the `scan on` command to close the link and resume scanning (see page 379, *scan command*), or
- use the `hangup` command to terminate the link (see page 372, *hangup command*)

Syntax

NOTE For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*

```
aletelcall <address of called station>[@<network>]
<telephone number> [from <self address>[@<network>]]
```

where:

`<address of called station>[@<network>]` is the address [and network] of the station with a radio/telephone interconnect unit.

`<telephone number>` is the telephone number to be dialled by the radio/telephone interconnect unit.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

call command

Use the `call` command to establish a voice link with another station on the current channel in an ALE/CALM or a Codan Selcall network.

Syntax

NOTE

For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*

`call <address of called station>[@<network>] [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station you want to call.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the `call` command.

chan command

Use the `chan` command to:

- display the current channel in the transceiver
- change to the channel specified

NOTE If you want to use the command to change to another channel, make sure that the channel is programmed into the transceiver's Channel List (see page 129, *Programming the Channel List*).

Syntax

`chan`

`chan <name>`

where:

`chan` displays the name of the current channel.

`<name>` changes to the channel specified, if the channel is programmed into the transceiver's Channel List. The name is case sensitive.

Compatibility with CICS V2

For the `chan` command to be compatible with transceivers using CICS V2, make sure that all the channel names in the transceiver are numerical.

Limitations

In CICS V3.00 (or later), channel names can be alphanumerical. In CICS V2 channel names must be numerical. CICS V2 treats channel '1' and channel '001' as the same channel: this is not the case with CICS V3.00 (or later).

echo command

Use the `echo` command to control the local behaviour of the CICS serial interface. Use it to:

- display the current echo state
- switch the echo state on and off

The default setting is echo on. With echo on, any character that is typed is echoed (mirrored) back to the screen. This corresponds to the use of full duplex mode in terminal settings. If you have an automated system, the recommended setting for the system is echo off, which corresponds to half duplex mode. This avoids intermixing echoes of the commands you enter and the responses from the system.

Syntax

```
echo
echo on
echo off
echo <text>
```

where:

`echo` displays the current echo state of the interface.

`on` enables echoing of characters entered.

`off` disables echoing of characters entered and generation of the command prompt.

`<text>` returns the text that you typed.

freq command

Use the `freq` command to:

- display the receive and/or transmit frequencies of the current channel in the transceiver
- select a channel by the receive frequency

NOTE Specify the frequency in kilohertz and use a decimal point (.) to specify a fraction part.

Syntax

`freq`

`freq <frequency>`

where:

`freq` displays the receive and/or transmit frequencies of the current channel.

`<frequency>` specifies a receive frequency value in kilohertz. The transceiver searches for a channel with this frequency. If an exact match cannot be found, the channel with the next higher receive frequency is selected.

Compatibility with CICS V2

CICS V2 does not accept a decimal point in the `freq` command. If you need to maintain compatibility with CICS V2 or less, do not enter a frequency with a fraction part.

Limitations

When you select a channel by frequency, `CHAN: <name>` is displayed when the transceiver changes the channel to match the frequency you requested. If the transceiver is already on a channel that matches this frequency, only the frequency is displayed.

gpsbeacon command

Use the `gpsbeacon` command to request the current GPS position of another station.

NOTE You can use the `gpsbeacon` command if Option GPS Enable is installed.

NOTE The transceiver of the receiving station *must* have Option GPS Enable installed. If it has not been installed or GPS data is unavailable, a message is displayed to inform you of this.

NOTE You cannot use the global ALL address syntax (@?@) with a `gpsbeacon` command due to collision of responses.

Syntax

NOTE For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*

`gpsbeacon <address of called station>[@<network>] [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station from which you want to receive a GPS position.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

gpsposition command

Use the `gpsposition` command to send your current GPS position to another station. The call is automatically answered by the receiving station.

NOTE You can use the `gpsposition` command if Option GPS Enable is installed.

Syntax

NOTE For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*

`gpsposition <address of called station>[@<network>] [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station to which you want to send your GPS position.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the `gpsposition` command.

hangup command

Use the `hangup` command to close an active link created by a call with another station. If the transceiver was scanning before the call was made, it resumes scanning once the link is terminated.

Syntax

`hangup`

help command

Use the `help` command to:

- display the categories of help available
- display command details within categories

Syntax

`help`

`help <category>`

where:

`help` displays the categories of help available.

`<category>` displays detailed help for the commands within the specified category.

lbt command

The `lbt` command is available with CICS V3.20 or later.

Use the `lbt` command to:

- display the global LBT Mode
- perform a check on the current channel for the presence of data or voice

Syntax

`lbt`

`lbt measure`

`lbt output`

`lbt output off|on`

`lbt override occupied`

`lbt override vacant`

where:

`lbt` displays the current LBT Mode.

`measure` checks the current channel for the presence of data or voice.

`output` displays the progress messages for LBT and whether the channel is occupied or vacant.

`output off|on` switches the progress messages for LBT off or on.

`override occupied|vacant` makes a call on a channel where LBT has detected that the channel is occupied or vacant.

lock command

Use the `lock` command to:

- display the current lock status of the transceiver
- set whether or not the transceiver is locked
- break or steal a lock from another interface

When a lock is on the transceiver, it only responds to the interface issuing the command, that is, CICS. When more than one lock is on, a single `lock off` command releases the entire system.

Syntax

```
lock
lock on
lock off
lock abort|break|steal
```

where:

`lock` displays the current lock state of the system.

`on` attempts to lock the system.

`off` releases the lock(s) on the system.

`abort` attempts to break a lock from another interface.

`break` releases this lock or another device's lock.

`steal` overrides normal locks, but not Emergency calls.

mode command

Use the `mode` command to:

- display the mode setting for the current channel
- set a new mode setting for the selected channel (depending on the modes permitted for that channel)

A mode is a type of reception or transmission you can use with a channel. It consists of a sideband, an IF centre and IF width. Most transceivers have modes such as USB and LSB. However, transceivers can be configured with additional modes available under different names.

NOTE The `mode` command and `sideband` command can be used interchangeably (see page 386, *sideband command*). If you are using CICS V3.00 (or later), the `mode` command is preferred.

Syntax

`mode`

`mode <name>`

where:

`mode` displays the mode of the current channel.

`<name>` sets the mode of the channel to the mode specified, but only if the mode is permitted for the channel.

mute command

Use the `mute` command to:

- switch mute for the speaker off
- select the type of signal that triggers the speaker mute

Syntax

`mute [off|voice|selcall]` reflects mode of speaker mute

where:

`mute` displays the status of the mute.

`off` switches off the mute so that all audio is heard.

`voice` sets that the mute will open when a voice signal is detected.

`selcall` sets that the mute will open when a call that is specifically addressed to this station is received.

pagecall command

Use the `pagecall` command to send a written message to another station. The receiving station automatically sends an acknowledgment response when the call is received.

NOTE The permitted message length depends on the type of call system, the privacy mode selected, and the character set (see Table 59).

Table 59: Variations in message length

Call system	Privacy mode	Character set	Maximum message length (number of text characters)
ALE/CALM	None	ASCII-256	64 to 84
ALE/CALM	Group	ASCII-256	50
ALE/CALM	Registered	ASCII-256	50
Codan Selcall	None	ASCII-127	64
Codan Selcall	Group	ASCII-256	64
Codan Selcall	Registered	ASCII-256	64
Open Selcall	N/A	ASCII-64	32

NOTE ASCII-64: This protocol uses all upper-case and numeric characters and some punctuation characters.

NOTE ASCII-127: This protocol uses all printable ASCII characters up to decimal 127.

NOTE ASCII-256: This protocol uses full binary encoding of all 8-bit characters.

Syntax

NOTE For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*
- recognised variables see page 358, *Recognised variable expansion*

`pagecall <address of called station>[@<network>] "<message>" [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station to which you want to send the message.

<message> is the written text message that is to be sent to the station. Use single or double quotes, or backslashes to recognise spaces in the message text (see page 408, *Using quotation marks*).

from <self address>[@<network>] is the self address [and network] you want to use for this call.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the pagecall command.

Compatibility with CICS V2

In CICS V3.00 (or later) the permitted message length depends on the type of call system, the Privacy Mode selected and the character set (see Table 59). In CICS V2 you can enter up to 64 text characters.

prompt command

Use the prompt command to:

- set the type of prompt that is displayed on the command interface
- disable the prompt output

Syntax

```
prompt
prompt time
prompt <text string>
prompt off
```

where:

prompt enables the prompt output on the command interface if it has been disabled previously, and displays the current prompt type. For example > or 00:07:49.001>.

time switches the prompt output to that of the time since the transceiver was last reset.

<text string> switches the prompt output to the text string entered.

off disables the prompt output on the command interface.

NOTE echo off disables the prompt. echo on enables the prompt without having to redefine it with the text string.

ptt command

Use the `ptt` command to:

- display the current PTT status of the transceiver
- switch between transmit and receive modes
- switch between voice and data modes

The `ptt` command operates for 30 seconds. If you require a longer PTT, repeat the `ptt on` command before the PTT times out.

Data Mode is the default mode when the transceiver is switched on, as PTT in CICS is generally only used with data applications.

Syntax

```
ptt
ptt on
ptt on voice
ptt on data
ptt on talk
ptt off
```

where:

`ptt` displays the current PTT state of the transceiver.

`on` switches the transceiver to transmit mode using the selected signal.

`off` switches the transceiver to receive mode using the selected signal.

`voice` switches the transceiver to send/receive optimised voice signals (fast ALC).

`data` switches the transceiver to send/receive optimised data signals (slow ALC).

`talk` switches the transceiver to send/receive compressed voice signals and holds the AGC during breaks in speech (available with CICS V3.20 or later).

scan command

Use the `scan` command to:

- display the current scanning state of the transceiver (if scanning is on, the name of the network being scanned is also displayed)
- control whether scanning is on or off
- specify the network to be scanned

NOTE Issuing a `scan on` command when a lock is on automatically unlocks the interface (see page 374, *lock command*).

Syntax

`scan`

`scan on`

`scan off`

`scan <network>`

where:

`scan` displays the current scanning state of the transceiver, that is, whether scanning is on or off.

`on` starts scanning all networks that are set to scan.

`off` stops scanning and enables channels to be changed manually.

`<network>` switches to the specified network and starts scanning that network.

Compatibility with CICS V2

In CICS V2, scan tables are used instead of networks. The scan tables are named with single numeric characters. To maintain compatibility with CICS V2 or less, networks must be named with single numeric characters.

secure command

NOTE The `secure` command is only available when an encryptor hardware option is installed, and specific firmware is programmed into the transceiver and enabled.

The `secure` command is available with CICS V3.10 or later.

Use the `secure` command to:

- activate the encryptor feature in the NGT Transceiver
- display the current secure state of the transceiver (Corporate, Global or Off, if applicable)
- display the number of CES secure keys or AES secure keys programmed
- select a Corporate secure index
- program a CES secure key and the Base secure key, or an AES secure key
- set the default secure mode
- erase all CES secure keys and AES secure keys

NOTE Some of the `secure` commands are only available at admin level in CICS.

Syntax

```
secure
secure corp [#nn] [<PIN>]
secure global [<PIN>]
secure index
secure mode
secure numkeys
secure off
secure on [PIN]
```

where:

`secure` displays the current encryptor state.

`corp [#nn] [PIN]` switches on Corporate secure mode at the specified index in the CES-128 voice encryptor, with or without a specified PIN, or switches on the AES-256 digital voice encryptor (PIN feature is not available).

`global [PIN]` switches on Global secure mode in the CES-128 voice encryptor, with or without a specified PIN.

`index` displays the currently selected secure index.

`mode` displays the currently selected secure mode.

`numkeys` displays the total number of CES secure keys or AES secure keys programmed into the transceiver.

`off` switches off the encryptor.

`on [PIN]` switches on the CES-128 voice encryptor using the secure mode set with the `secure mode corp` or `secure mode global` command at admin level.

The following `secure` commands are available following the `login admin` command:

`secure index [n]`

`secure key [#n] [<key>]`

`secure key erase`

`secure mode corp`

`secure mode global`

`secure name <nnnn>`

where:

`index` displays the current secure index.

`index [n]` selects the CES secure key or AES secure key in secure index #n.

`key [#n] [<key>]` sets the CES secure key or AES secure key for secure index #n. The CES secure key may be 8 digits for index 1 and 16 digits for indexes 2 to 98. #0 sets the Base secure key, which forms part of the seed used for the encryption algorithm for the CES-128 voice encryptor. The other part of the seed comes from the selected CES secure key.

CAUTION The secure indexes must be filled sequentially with CES secure keys.

`key erase` erases all CES secure keys and AES secure keys from the transceiver.

NOTE The Base secure key in secure index #0 of the CES-128 voice encryptor is not erased. The factory default is 0.

`mode corp` sets the default CES-128 voice encryptor mode to use the CES secure key in the currently selected Corporate secure index.

`mode global` sets the default CES-128 voice encryptor mode to use the Global secure key.

`name <nnnn>` sets the prefix for the secure index used with the AES-256 digital voice encryptor. It may be 0 to 4 characters. The name may only be set after the keys have been defined.

selbeacon command

Use the `selbeacon` command to test the quality of a selected channel before you use it to transmit voice or data. The command sends a request to the station you want to call on the channel you have selected. This receiving station automatically responds with an audible test signal. The volume and clarity of the returned signal indicates the quality of the channel.

NOTE You cannot use the global ALL address syntax (@?@) with a `selbeacon` command.

Syntax

NOTE For more information on address syntaxes see page 358, *Addresses in commands*.

`selbeacon <address of called station>[@<network>] [s] [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station you want to call.

`s` makes the call in Silent Mode.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

selcall command

Use the `selcall` command to make a Selective call to an addressed station.

NOTE You cannot use the global ALL address syntax (@?@) with a `selcall` command.

Syntax

NOTE For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*

`selcall <address of called station>[@<network>] [s] [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station you want to call.

`s` makes the call in Silent Mode.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

NOTE If the network specified is ALE/CALM, the call is an ALE call, and the ALE call options are available.

selfid command

A self address is an address for your station. Other stations can selectively call your station using your self address. You can set a number of self addresses for your station.

Use the `selfid` command to:

- display the current list of self addresses for the CICS interface
- create new self addresses for the CICS interface
- change the current self addresses for the CICS interface

The initial list of self addresses used by the CICS interface are those that currently exist in the Address entry in the Control List of the transceiver.

NOTE — Changing the list of self addresses used by the CICS interface does not affect the list of self addresses in the Address entry in the Control List of the transceiver. The changes are lost when the transceiver is switched off. If you want to retain a list of self addresses for use with CICS you can enter them using the RS232 9way or 15way Startup entries in the Control List of the transceiver (see page 227, *RS232 Startup entries*).

NOTE — The NGT *AR Voice* Transceiver does not have an RS232 Startup entry.

Syntax

```
selfid
selfid <self address>[, <self address>]
```

where:

`selfid` displays your current list of self addresses used by the CICS interface.

`<self address>` sets the self addresses for the CICS interface to the one or more addresses specified on the command line. The addresses can be simple or fully qualified, for example, `12359`, `12359@*SELCALL`, `RICKY`, or `RICKY@PRIMWEST`. If a network is not specified, the self address applies to all networks.

Compatibility with CICS V2

In CICS V2, self addresses must be specified without a network.

Limitations

The only calls displayed are those addressed to the list of self addresses used by the CICS interface. When the NGT Transceiver is switched on, all self addresses assigned to networks are added to the list of self addresses for CICS by default. When a self address is added through CICS, these default addresses are removed from the list and the new one is added.

If the Address entry in the Control List of the transceiver contains wildcard self addresses, for example, 12.., these are only used by CICS in 3033/RTU–292 mode.

set command

Use the `set` command to:

- display the current option(s) available
- change the setting of the GP input to lock or pause

When the GP port Q line input is asserted, scanning on the transceiver is stopped via a lock or a pause, as specified in this command.

Syntax

```
set
set gp lock
set gp pause
```

where:

`set` displays the options available.

`gp lock` causes the Q line to lock the scan when the input is asserted.

`gp pause` causes the Q line to pause the scan when the input is asserted (default).

sideband command

Use the `sideband` or `sb` command to:

- display the sideband for the current channel
- select the sideband for the current channel, if it is permitted for that channel

The sidebands are:

- USB
- LSB
- AM

NOTE The `sideband` and `mode` commands can be used interchangeably (see page 375, *mode command*). If you are using CICS V3.00 (or later), the `mode` command is preferred.

Syntax

```
sideband
sideband usb
sideband lsb
sideband am
sb
sb usb
sb lsb
sb am
```

where:

`sideband` or `sb` displays the sideband for the current channel.

`usb` selects USB for the current channel, if it is permitted for that channel.

`lsb` selects LSB for the current channel, if it is permitted for that channel.

`am` selects AM for the current channel, if it is permitted for that channel.

statusack command

The `statusack` command is used to send a reply to a Get Status call you have received. A status call acknowledgment response contains the status information requested. It is sent automatically if a status call requesting remote diagnostics (1) was sent (see page 388, *statuscall command*). The `statusack` command must be sent within the timeout period specified by the station that sent the call (see page 389, *statustime command*).

Syntax

`statusack <address of called station>[@<network>] "<message>"`

where:

`<address of called station>[@<network>]` is the address [and network] of the station that requested the status information.

`<message>` is the status information requested by the station that sent the status call. The message is sent within single or double quotes to allow the use of spaces in the message.

statuscall command

Use the `statuscall` command to obtain information on the status of a transceiver or attached equipment at another station. A status call is typically used to request information about a remote transceiver.

NOTE For a description of each type of status information see page 347, *Get Status calls*.

When you request status information, you must specify the type of information you require.

The receiving station automatically sends the status information requested. The receiving station is required to respond to a status call within the timeout period (see page 389, *statustime command*). If a response to a status call is not sent within the timeout period an error message is displayed.

NOTE You cannot use the global ALL address syntax (@?@) with a `statuscall` command due to collision of responses.

Syntax

NOTE For more information on address syntaxes see page 358, *Addresses in commands*.

```
statuscall <address of called station>[@<network>]
"<message>" [from <self address>[@<network>]]
```

where:

`<address of called station>[@<network>]` is the address of the station [and network] from which you require status information.

`<message>` is the number that corresponds to the type of status information that you request, that is, **0** for open diagnostics, **1** for Codan diagnostics, **2** for Codan configuration, or an over-the-air command.

NOTE If the ALE Site Mgr entry in the Control List is set to **Auto**, **Manual** or **Restricted**, additional types of Get Status calls are available:

- **3** for Broadcast Site
- **4** for Request Site

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

statustime command

Use the `statustime` command to specify the amount of time that the receiving station has to respond to a status call (see page 388, *statuscall command*). The response can be the requested information (`STATUSACK`), or a `STATUSNACK`.

NOTE

Be aware that the NGT Transceiver adds 45 seconds to the status time you have entered. For example, if you have entered 10 seconds for the statustime, the receiving station has 10 seconds to prepare the response and 45 seconds to send the call to the requesting station.

If a `statusack` response is not received on the CICS port of the receiving station within this time, a message is displayed to inform you of this.

You can use the `statustime` command to:

- display the current statustime
- set a new statustime

Syntax

`statustime`

`statustime <timeout value>`

where:

`statustime` displays the current timeout value (in seconds).

`<timeout value>` sets the time (in seconds) in which the receiving station has to respond to a `statuscall` command.

Limitations

The timeout value is local to this CICS interface.

telcall command

Use the `telcall` command to make a call to a telephone number.

NOTE Before you can make a Phone call you must know the address of a station with a radio/telephone interconnect unit through which your call can be routed to the public telephone network.

Syntax

NOTE For more information on:

- address syntaxes see page 358, *Addresses in commands*
- call options see page 358, *ALE call options*

`telcall <address of called station>[@<network>] <telephone number> [from <self address>[@<network>]]`

where:

`<address of called station>[@<network>]` is the address [and network] of the station with a radio/telephone interconnect unit.

`<telephone number>` is the telephone number to be dialled by the radio/telephone interconnect unit.

`from <self address>[@<network>]` is the self address [and network] you want to use for this call.

ver command

Use the `ver` command to display the version of CICS that is being used.

Syntax

`ver`

Summary of command syntax

Table 60: Summary of CICS command syntax

Command syntax	Function
`alecall <address of called station>[@<network>] [±lbt] [±scan] [from <self address>[@<network>]]`	Makes a call to addressed stations using any, or the specified, ALE/CALM network from the self address specified.
`aletelcall <address of called station>[@<network>] [±lbt] [±scan] <telephone number> [from <self address>[@<network>]]`	Makes a Phone call to addressed stations using any, or the specified, ALE/CALM network from the self address specified.
`call <address of called station>[@<network>] [±lbt] [±scan] [from <self address>[@<network>]]`	Makes a call to addressed stations using any, or the specified, ALE/CALM or Codan Selcall network from the self address specified.
`chan [<name>]`	Displays the current channel, or switches to the channel specified.
`echo [off|on|<text>]`	Displays the current echo status, or switches to half duplex mode (off) or full duplex mode (on, default).
`freq [<frequency>]`	Displays the common receive/transmit frequency or the separate receive and transmit frequencies (in kHz) for the current channel, or selects the channel that has the receive frequency specified (in kHz). If the channel with the exact receive frequency is not found, the channel with the next higher frequency is selected.
`gpsbeacon <address of called station>[@<network>] [±lbt] [±scan] [from <self address>[@<network>]]`	Makes a Get Position call to an addressed station using any, or the specified, ALE/CALM or Codan Selcall network from the self address specified.
`gpsposition <address of called station>[@<network>] [±lbt] [±scan] [from <self address>[@<network>]]`	Makes a Send Position call to addressed stations using any, or the specified, ALE/CALM or Codan Selcall network from the self address specified.
`hangup`	Closes an active link between your transceiver and the station that you are calling.
`help [<category>]`	Displays the categories of help available, or detailed help for the commands within the selected category.
`lbt [measure]`	Displays the current LBT Mode, or performs a check on the current channel for the presence of data or voice.
`lock [abort|break|steal|off|on]`	Displays the current lock status of the transceiver, attempts to break a lock, steals a lock, releases all locks, or sets a lock.

Table 60: Summary of CICS command syntax (cont.)

Command syntax	Function
`mode [<name>]`	Displays the mode of the current channel, or sets the mode of the current channel to that specified, if the mode is permitted for that channel.
`mute [off|voice|selcall]`	Displays the current status of the speaker mute. Sets mute to off, that is, all on-air noise is audible. Sets mute to voice or selcall. For more information on mute types see page 76, *Muting the transceiver*.
`pagecall <address of called station>[@<network>] [±lbt] [±scan] "<message>" [from <self address>[@<network>]]`	Makes a Send Position call to addressed stations using any, or the specified, ALE/CALM or Codan Selcall network from the self address specified. Your message must be written within double or single quotes. See Table 59 on page 376 for details on the message length.
`prompt [off|<text string>|time]`	Enables the prompt output on the command interface and displays the current prompt type, switches between a variable text string prompt or the time prompt (time since the transceiver was last reset), or disables the prompt.
`ptt [off|on] [data|voice|talk]`	Displays the current PTT state of the transceiver and places the transceiver into PTT for 30 seconds. Sets the PTT to: • receive mode (off) with a data, voice or talk signal • transmit mode (on) with a data, voice or talk signal
`scan [<network>|off|on]`	Displays the current scanning state of the transceiver, and if scanning is on, displays the names of networks that are currently being scanned. Switches scanning off or on. Switches to the network specified and begins scanning on that network.
`secure [corp [#<nn>]|global|off|on [PIN]]`	Displays the current state of the encryptor. Switches on CES Corporate/Global secure mode, or the default mode of the CES-128 voice encryptor (with or without a specified PIN). Switches on AES-256 secure mode (global and PIN are not applicable). Switches off the encryptor.
`secure index [n]`	Displays the current secure index or selects 1 of n different CES secure keys or AES secure keys. Requires login by administrator.

Table 60: Summary of CICS command syntax (cont.)

Command syntax	Function
`secure key [#n] [<key>]`	For CES-128 voice encryptors, sets the Base secure key (in secure index #0) or CES secure keys (in indexes #1 to #98). For AES-256 digital voice encryptors, sets the AES secure keys for indexes 1 to 255. Requires login by administator.
`secure key erase`	Erases all CES secure keys and AES secure keys in the transceiver. Requires login by administrator. NOTE The Base secure key is not erased from the CES-128 voice encryptor.
`secure mode [corp|global]`	Sets the default mode of the CES-128 voice encryptor (Corporate or Global). Requires login by administrator.
`secure numkeys`	Displays the total number of CES secure keys or AES secure keys programmed into the transceiver.
`selbeacon <address of called station>[@<network>] [±scan] [s] [from <self address>[@<network>]]`	Makes a Channel Test call to an addressed station using any, or the specified, Codan Selcall network from the self address specified.
`selcall <address of called station>[@<network>] [±lbt] [±scan] [s] [from <self address>[@<network>]]`	Makes a Selective call to an addressed station using any, or the specified, Codan Selcall network from the self address specified. If the network specified is ALE/CALM, the call is an ALE call, and the ALE call options are available.
`selfid [<self address>[, <self address>]]`	Displays the current list of self addresses used by CICS, or creates new self addresses for CICS.
`set [gp lock|pause]`	Displays the current operational settings for CICS, or locks or pauses a GP input.
`sideband [am|lsb|usb]` `sb [am|lsb|usb]`	Displays the sideband of the current channel, or changes the sideband of the current channel to AM, LSB or USB, *only* if permitted for that channel.
`statusack <address of called station>[@<network>] "<message>"`	Sends a response to a Get Status call with the status information requested.
`statuscall <address of called station>[@<network>] [±lbt] [±scan] "<message>" [from <self address>[@<network>]]`	Makes a Get Status call to an addressed station using any, or the specified, ALE/CALM or Codan Selcall network from the self address specified.
`statustime [<timeout value>]`	Displays the amount of time (in seconds) the receiving station has to respond to a Get Status call, or sets this time.

Table 60: Summary of CICS command syntax (cont.)

Command syntax	Function
`telcall <address of called station>[@<network>] [±lbt] [±scan] <telephone number> [from <self address>[@<network>]]`	Makes a Phone call to addressed stations using any, or the specified, ALE/CALM or Codan Selcall network from the self address specified.
`ver`	Displays the version of CICS being used.

CICS response messages

Table 61: CICS response messages

Response message	Description
ALE-LINK: <channel>, <caller address>, <self address>, <time>	An ALE link has been established.
ALE-LINK: FAILED	The ALE link between your transceiver and the station you are calling has failed because the outgoing call was not started or was aborted. This message is preceded by a message stating the reason for the failure.
CALL DETECTED	A call has been detected.
CALL FAILED	An outgoing call has not started or was aborted. This message is preceded by a message stating the reason for the failure.
CALL SENT	An outgoing call has been sent.
CALL STARTED	An outgoing call has been initiated.
CHAN: <name>	The transceiver has changed the channel to that specified. This message is only displayed when the system is not scanning. Names that include spaces are displayed within double quotes.
CICS: V<version number>	The current version status of CICS.
ECHO: OFF	Echo is switched off, that is, half duplex mode.
ECHO: ON	Echo is switched on, that is, full duplex mode.
EMERGENCY: <channel>, <caller address>, <address of called station>, <date> <time>[, <gps position>|NO GPS UNIT CONNECTED|NO VALID GPS POSITION]	An Emergency call has been received.
FREQ: xxxxx.x RX, INHIBIT TX	The receive frequency of the current channel. The transmit frequency is inhibited or it is a TxD channel.
FREQ: xxxxx.x RX, yyyyy.y TX	The receive and transmit frequencies (in kHz) of the current channel.
FREQ: xxxxx.x RX/TX	The receive and transmit frequencies (in kHz) of the current channel are the same.
GPS-POSITION: <channel>, <caller address>, <self address>, <date> <time>, <gps position>|NO GPS CONNECTED|NO VALID GPS POSITION	The GPS position of another station has been received.

Table 61: CICS response messages (cont.)

Response message	Description
LBT: ABORTED	The LBT measurement process has been aborted.
LBT: ALL CHANNELS BUSY	All of the channels tested for voice and data were busy. No call was sent.
LBT: DISABLED	The global LBT Mode is disabled.
LBT: ENABLED	The global LBT Mode is enabled.
LBT: OCCUPIED	The channel tested is occupied with traffic.
LBT: VACANT	The channel tested is clear of voice and data traffic.
LOCK	The GP input has been set to lock.
LOCK: ABORT	A lock is released from another interface.
LOCK: BUSY	The system is locked and cannot be used from this interface.
LOCK: OFF	The system is currently unlocked.
LOCK: ON	The system is currently locked.
MODE: <name>, <sideband>, <ifwidth>, <ifcentre>	The current mode of the channel.
MUTE: OFF|SELCALL|VOICE	The current status of the speaker mute.
NO EXTERNAL UNIT CONNECTED OR NO RESPONSE	A Get Status call has been sent to a transceiver that does not have the required equipment attached.
NO RESPONSE	A Get Status call has been sent and the receiving station has not responded to your request for information.
OK	The command has been accepted and is being processed. Normally displayed for any command that does not respond with some value immediately.
Options: gp	The options that can be changed by the user. You can change the setting of the GP input to lock or pause.
PAGE-CALL: <channel>, <caller address>, <self address>, <date> <time>, "<message>"	A Message call has been received.
PAGE-CALL-ACK: <channel>, <self address>, <caller address>, <date> <time>	An acknowledgment response to a Message call has been received.
PAUSE	The GP input has been set to pause.
PROMPT: <time>|<text string>	The mode of the current prompt has been requested.
PTT: OFF	PTT is currently off, that is, the local transceiver is in receive mode.

Table 61: CICS response messages (cont.)

Response message	Description
PTT: ON [, DATA|VOICE|TALK]	PTT is currently on, that is, the local transceiver is in transmit mode. Data is the default mode.
PTT: REJECTED	You cannot transmit.
SCAN: ALE, <network>[, <network>]	Scanning has started on the ALE/CALM networks specified.
SCAN: OFF	Scanning has stopped.
SCAN: ON, <network>[, <network>]	Scanning has started on the networks specified.
SECURE INDEX: <n>	The secure index of the CES secure key or AES secure key currently in use.
SECURE KEYS: Erased	The CES secure keys and AES secure keys have been erased.
SECURE MODE: CORP|GLOBAL	The current default setting of the voice encryptor.
SECURE NUMKEYS: <n>	The total number of CES secure keys and AES secure keys programmed into the transceiver.
SECURE: CORP|GLOBAL [PIN]	The current state of the voice encryptor.
SECURE: OFF	The current state of the voice encryptor.
SELCALL: <channel>, <caller address>, <self address>, <date> <time>	A Selective call has been received.
SELFID-LIST: <self address>[, <self address>]	The list of current self addresses used by the CICS interface.
SIDEBAND: AM|LSB|USB	The sideband for the current channel.
STATUS-ACK: <channel>, <caller address>, <self address>, <date> <time>, "<message>"	An acknowledgment response for a Get Status call has been requested and sent.
STATUS-CALL: <channel>, <caller address>, <self address>, <date> <time>, "<message>"	A request message for a Get Status call has been received.
STATUS-CALL-ACK: <channel>, <caller address>, <self address>, <date> <time>, "<message>"	An acknowledgment response for a Get Status call has been requested and sent.

Table 61: CICS response messages (cont.)

Response message	Description
`STATUSTIME: <n>`	The current timeout value, where *n* is the amount of time (in seconds) the receiving station has to respond to a Get Status call.
`TEL-CALL: <channel>, <caller address>, <self address>, <date> <time>, <telephone number>|DISCONNECTED`	A Phone call has been received or disconnected.

CICS error messages

Table 62: CICS error messages

Error message	Description
`ERROR: Admin access required`	The command that you entered requires an administrator login. Type `login admin`, then press **Enter**. Enter the admin password for the connected transceiver.
`ERROR: Bad command`	The syntax of the command entered is incorrect. Use the `help` command to look for the categories of available commands and use the `help <category>` command to get information on the available commands within a category. For information on CICS functionality use the `help cics` command.
`ERROR: Call failed`	The outgoing call has not started. This message is preceded by a message stating the reason for the failure. Check the address and use the `selbeacon` command to send a Channel Test call to the address of the called station. You may need to select another frequency.
`ERROR: Call reply error XXX`	There has been an internal problem making the call. Under normal conditions this error should not occur. Switch the transceiver off then on again.
`ERROR: Call type not allowed`	This type of call cannot be made. Check if the option associated with the call type is installed in the transceiver.
`ERROR: Channel not found`	The channel you entered is not programmed in the transceiver. Either program the channel into your transceiver, or select another channel for the call.
`ERROR: Citizen band frequency but not citizen band channel`	You are not permitted to transmit on this CB frequency as it does not correspond with a CB channel within the transceiver. Select another frequency.
`Error: Command failed`	The command you entered has failed. Check the syntax required for the command.
`ERROR: Data too long`	The message is too long. Shorten the message, or split the message over a number of calls. The maximum number of characters permitted in a call system is provided in Table 59 on page 376.
`ERROR: FROM selfid <self address> not valid`	The self address contains characters that are not permitted. Check that the self address is correct for the type of network in which it is being used (see page 85, *Entering your station self address*).

`ERROR: Internal error`
`ERROR: Internal error XXXX`
`ERROR: Internal get`
`ERROR: Internal set`
	Under normal conditions this error should not occur. It is an indication that something went wrong with internal processing. Contact your Codan representative.

`ERROR: Invalid address`	The address that you are using for the call contains characters that are not permitted, or the statusack has an invalid source address. Check all addresses for the call.

Table 62: CICS error messages (cont.)

Error message	Description
`ERROR: Invalid call options`	The call options that you have entered for the call: • do not match those allowed for the call system • have been repeated • are not recognised when inserted after a message
`ERROR: Invalid call type for network`	The call type used for the call is not supported by the network. Select a call type that is valid for the network, or select a different network.
`ERROR: Invalid call type or selfid for scanning networks`	You have started a call during scanning. CICS attempts to select the first suitable network, however in this case, there are no suitable networks. Do one of the following before making the call again: • switch off scanning • specify the network for the call • select a different call type • select a different self address
`ERROR: Invalid characters in selfid`	The self address contains characters that are not permitted. Check that the self address is correct for the type of network in which it is being used (see page 85, *Entering your station self address*).
`ERROR: Invalid destination address`	The address of the called station used is incorrect for the call type or network, for example, alpha characters in a Codan Selcall network. Correct the address of the called station and try the call again.
`ERROR: Invalid network name`	The name of the network used for the call does not exist or does not support the call type (see page 136, *Network Name*).
`ERROR: Invalid selfid for specified address`	The entry in the self address list is incorrect. Check that the self address and assigned networks in the self address list are correct.
`ERROR: Invalid selfid for specified network`	The self address contains characters that are not permitted by the network specified, for example, alpha characters in a Codan Selcall network. Correct the self address.
`ERROR: Invalid selfid network`	The network in the self address list is incorrect. The self address list has been updated with a network using the `selfid` command. The network specified does not exist. Select a valid network for the self address.
`ERROR: Invalid source address`	The self address used for the call has not been accepted. Check that the self address is correct for the network's call system.
`ERROR: LBT option not installed`	You have attempted to use LBT but it is not installed in your transceiver.
`ERROR: LBT wrong mode`	You have attempted to use LBT when the transceiver is unable to perform LBT, for example, when the transceiver is scanning.
`ERROR: Low battery voltage`	CICS has attempted a PTT and detected that the battery voltage is low. Recharge the battery.

Table 62: CICS error messages (cont.)

Error message	Description
`ERROR: Max index allowed is <n>`	You have attempted to set a secure index that is greater than `n`. Enter a secure index that is less than or equal to `n`.
`ERROR: Message too big`	The message length is too long. Shorten the message, or split the message over a number of calls. The maximum number of characters permitted in a call system is provided in Table 59 on page 376.
`ERROR: Mode is not allowed`	The mode is not permitted for the selected channel. Select another mode.
`ERROR: Mode not found`	The mode requested is not available on this transceiver. Select another mode.
`ERROR: Network in address not found`	The network used in the call address is not programmed in the Network List of the transceiver. Either program the network into your transceiver, or select another network for the call.
`ERROR: Network not found`	You have used the `scan [on|off|<network>]` command. The network specified is not programmed in the Network List of the transceiver. Repeat the `scan` command using `on`, `off` or a valid network name.
`ERROR: No active link`	You have used the `hangup` command, but no call is currently in progress.
`ERROR: No ale network`	You have used the `alecall` or `aletelcall` commands. The transceiver has searched for an ALE/CALM network but one was not found.
`ERROR: No call system for current channel`	You have made a call on the currently selected channel and mode (scan is off). No channel is specified in the call information. CICS has searched all networks for one that contains the currently selected channel and mode, but has not found a network. Select another channel and/or mode.
`ERROR: No channels found`	You have made a call on the currently selected channel (scan is off), but a channel cannot be selected because no channels are programmed or you were in free tune (see page 283, *Using the transceiver in free tune and Amateur Mode*). Exit free tune if required. Program some channels into your transceiver, or if not permitted to do so, contact your Codan representative.
`ERROR: No GPS unit connected`	You have sent GPS information in a call, however, the transceiver has detected that a GPS unit is not connected in the system. Check the cable connections to the GPS unit and that the corresponding RS232 Mode and Speed entries in the Control List are set correctly. Option GPS Enable must also be installed.
`ERROR: No key at this index`	You have selected a secure index that does not have a secure key. Select another secure index, or program a CES secure key or AES secure key for this secure index.

Table 62: CICS error messages (cont.)

Error message	Description
`ERROR: No link available`	There is no link available to the addressed station. This is caused by updates occurring in the RF unit, or an NRI link is being established. Wait a few minutes for the link to be established. If the link is still unavailable, try the call again.
`ERROR: No modes programmed`	No modes are programmed in the transceiver. Contact your Codan representative.
`ERROR: No modes with this sideband`	No modes are programmed with this sideband. Contact your Codan representative.
`ERROR: No network for selfid`	The command entered included a self address for which there is no suitable network, for example, the self address contained alpha characters but there is no ALE/CALM network.
`ERROR: No networks found`	You have set the transceiver to scan or are making a call while scanning is on, but the transceiver cannot find any networks that are set to be scanned. Change the Scan Network setting in each network that you want to scan (see page 143, *Programming the Network List*).
`ERROR: No response from RF unit`	There has been a problem making the call or requesting PTT such that there is no response from the RF unit. Check cable connections or allow time for an NRI link to be established. Wait for a minute or two for the RF unit to recover automatically.
`ERROR: No selfid`	You have made a call on the currently selected channel (scan is off) without specifying a network. The transceiver has located a network containing the channel, but no self address is set for this network. Select a different channel, select a self address to use with the network, or specify a network that has a valid self address in the call information.
`ERROR: No selfid for network`	The specified network does not have a self address. Check the command syntax and the self address list.
`ERROR: No valid GPS position`	The GPS position is either too old or not available yet. Check the cables connected to the GPS unit.
`ERROR: Not an ALE network`	The command entered requires an ALE/CALM network, but the network specified with the command is not an ALE/CALM network.
`ERROR: Not supported`	The request cannot be executed because the option is not installed in your transceiver. If you want to use the option, contact your Codan representative.
`ERROR: PTT active`	The transceiver is currently transmitting and prevents the command from being executed. For example, you are *not* able to change channels when the system is transmitting. Wait until the transceiver has completed the transmission, then send the new command.
`ERROR: PTT rejected`	PTT did not succeed. For more information see page 331, *PTT rejected from <location of PTT: reason>*.

Table 62: CICS error messages (cont.)

Error message	Description
`ERROR: Request failed`	The information requested cannot be retrieved from the RF unit. Check the cable connections.
`ERROR: Scan list empty`	The `scan on` command failed because no networks are set for scanning, these networks do not contain any channels, or the Scan Allow entry in the Control List is disabled. The `scan <network>` command failed because these networks do not contain any channels, or the Scan Allow entry in the Control List is disabled. Change the Scan Network entry to **Scan** (see page 136, *Scan Network*), add channels to the network if necessary, or enable the Scan Allow entry.
`ERROR: Scanning is on`	The system is currently scanning and cannot complete the command. Use the `scan off` command to switch off scanning, then try the new command again.
`ERROR: Secure is On`	The command you entered is not allowed while the encryptor is active. Use the `secure off` command to exit secure mode, then try the new command again.
`ERROR: Selfid list empty`	Your transceiver does not have any self addresses programmed.
`ERROR: Selfid list too long`	There are too many self addresses in the self address list. Delete self addresses until the list contains no more than 10 self addresses.
`ERROR: Selfid too long`	The self address or the total length of the self address and network name exceeds a specified limit for the call system used in the network. Shorten the length of the self address and/or the network name.
`ERROR: Sideband not allowed`	The sideband is not permitted for this channel. Select another mode.
`ERROR: Synthesiser is unlocked`	You cannot transmit while the synthesiser is unlocked. Switch the transceiver off then on again. If the error persists, contact your Codan representative.
`ERROR: System is busy`	There has been a problem making the call or updating the self address list. Wait for a few minutes, then repeat the command.
`ERROR: System locked`	The system is locked and the command cannot be executed. Wait for the lock to be released (for example, a data call ending), or to timeout, then try the command again.
`ERROR: Transceiver cut out`	The PTT has timed out according to the value set in the Cfg PTT Cutout Time entry in the Control List. If your transmission is long, set the Cfg PTT Cutout Time entry to **30 minutes**.
`ERROR: Transceiver is tuning`	The `PTT` command has been rejected because the transceiver is currently tuning. Wait until the transceiver completes the tuning cycle, then try the `ptt` command again.

Table 62: CICS error messages (cont.)

Error message	Description
`ERROR: Transmit inhibited`	You have tried to transmit on a receive-only channel. Select a channel that has a transmit frequency.
`ERROR: Tx disabled because of TPE link`	You are not permitted to transmit a signal due to the current position of the TPE link and the programming options installed in your transceiver. Contact your Codan representative.
`ERROR: Unable to send data`	There has been a problem sending data with the call. This message is preceded by a message stating the reason for the data not being sent. Refer to the description for the previous message to resolve the problem.
`ERROR: Unknown network name in selfid`	The network for the self address does not exist as the network may have been deleted after it was allocated to the self address. Program the network into the Network List in your transceiver, or edit the self address so that it uses a current network.
`ERROR: XR or VP not installed`	You have attempted to use a voice encryptor option that is not installed in your transceiver. If you want to use this option, contact your Codan representative.

Appendix E Compatibility between CICS V2 and V3.00 (or later)

NOTE CICS V2 is present in older Codan HF transceivers. CICS V3.00 or later is present in all NGT Transceivers.

There are a number of compatibility issues between CICS V2 and V3.00 (or later).

There are differences in:

- using = and ? to initiate a query or an action
- naming of channels
- selecting channels to be scanned
- using upper and lower-case text
- using quotation marks so spaces are recognised in text
- structuring IDs (self addresses)

For a brief outline of compatibility issues between CICS V2 and V3.00 (or later) see Table 63.

Table 63: Compatibility issues between CICS V2 and V3.00 (or later)

Feature	**CICS V2**	**CICS V3.00 (or later)**	**See...**
Use = and ? to initiate a query or an action	= defines an action. ? defines a query.	Commands followed by text characters are treated as actions. Commands entered on their own are treated as queries. NOTE = and ? still work.	page 406
Channel names	All channels must be named numerically.	Channels can be named alphanumerically.	page 407
Scanning	Scan tables are used.	Networks are used.	page 407
Text	All text is converted to upper-case letters unless it is within quotation marks, then the text remains as typed.	Text is recognised in upper-case or lower-case letters.	page 408
Use of quotation marks to recognise spaces in text messages	Only applicable when written messages are expected, for example, a message in a Message call. For spaces to be included in these messages, the text must be within *double* quotes.	Single or double quotes are applicable to any text.	page 408
Address	Addresses cannot be specified with a network.	Addresses can be specified with or without a network.	page 409

Using = and ?

CICS V2

CICS V2 uses an equal sign (=) and a question mark (?) to initiate an action or a query (see Table 64).

Table 64: Symbols used in CICS V2

Symbol	Meaning
=	Initiates an action, for example, CHAN=1 is used to switch to channel 1.
?	Requests information, for example, CHAN? is used to request the current channel number.

CICS V3.00 (or later)

CICS V3.00 does not use symbols to initiate an action or a query. It assumes that a command followed by text characters is an action, and any command alone is a query, as shown in the following example.

Command	Meaning	Function
`chan <name>`	Initiates a change in channel (action).	Changes to the channel specified.
`chan`	Querying the current channel (query).	Displays the current channel.

Compatibility between CICS V2 and V3.00 (or later)

For backwards compatibility, CICS V3.00 replaces any equal sign (=) and question mark (?) that is in the command line with a space, unless the symbol is preceded by a \, or it is within double quotes.

Using channel names or channel numbers

CICS V2

CICS V2 requires channel names to be numeric.

CICS V3.00 (or later)

CICS V3.00 responds to channel names that are numeric, alphabetic, or a mixture of both.

Compatibility between CICS V2 and V3.00 (or later)

For backwards compatibility you must name all channels numerically.

NOTE In CICS V3.00, a channel name such as ‘0001’ is not identical to ‘1’ as it is in CICS V2.

Using scan tables or networks

CICS V2

In CICS V2, up to three scan tables can be used to define the lists of channels to be scanned. The scan tables are identified by a single numeric character.

CICS V3.00 (or later)

In CICS V3.00, networks define the lists of channels to be scanned. Each network is identified by a name.

Compatibility between CICS V2 and V3.00 (or later)

For backwards compatibility the networks *must* be named with single numeric characters like the scan tables.

The `scan` command is compatible between CICS V2 and V3. It is used to start and stop scanning and to specify the network(s) or scan table to be scanned.

Using upper-case or lower-case text

CICS V2

CICS V2 converts all text characters into upper case except when they are within double quotes. In this case, the text characters remain as typed.

CICS V3.00 (or later)

CICS V3.00 does not convert text characters into upper case. All CICS commands are recognised in either upper case, lower case, or a mixture of upper and lower case.

Compatibility between CICS V2 and V3.00 (or later)

For backwards compatibility, type all text characters in upper case unless the text is within double quotes.

Using quotation marks

CICS V2

In CICS V2, double quotes can only be used to recognise spaces in an expected written message, such as a message in a Message call, for example, “`Hi Ricky`”.

CICS V3.00 (or later)

In CICS V3.00, spaces in text are recognised if the text is within single or double quotes, or the spaces are preceded by a backslash, for example, `Hi\ Ricky`.

NOTE Single and double quotes can be applied to any text.

Compatibility between CICS V2 and V3.00 (or later)

For backwards compatibility all messages must be within double quotes.

Using addresses with or without a network

CICS V2

In CICS V2, addresses cannot be specified with a network.

CICS V3.00 (or later)

In CICS V3.00, addresses can be specified with or without a network name attached. For example, an address can be `JOE`, or can be network-specific such as `RICKY@CODAN`. Specifying the network enables the transceiver to make the call using that particular network.

When using the global ALL address syntax (@?@) you can specify the address followed by the network. For example, a global ALL address syntax would be sent as `@?@@CODAN`.

Compatibility between CICS V2 and V3.00 (or later)

If an address has not been specified with a network, CICS must select a network.

NOTE If you have specified an alphanumeric address, for example, `FRED`, CICS will automatically select an ALE/CALM network to make the call.

When scanning is on, CICS selects the first network that:

- matches the type of call system you have selected, that is, if you are making an ALE call, the network selected will be an ALE/CALM network
- has the address you have specified

When scanning is off, CICS selects the network based on the following criteria:

- the network must have the current channel in it
- the address must be assigned to that network
- the network must match the call system you selected, that is, if you are making an ALE call, the network selected will be an ALE/CALM network

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Appendix F Controlling user access

This section contains the following topics:

Introduction

You can control user access to certain areas in the user interface for the NGT Transceiver by entering special configuration commands in the Message 10 entry in the Control List. These commands may prevent accidental changes to setup information, enable or disable certain features, hide or show information on a need-to-know basis, and set up how the transceiver operates when certain key sequences are used. Entering these commands into the Message 10 entry in the Control List in NSP enables you to set up this behaviour within the profile.

You can:

- control access to the List Manager in total, or allow/restrict access to certain functions (categories LMA, LM, see page 415, *Controlling access to the List Manager*)
- control access to the admin level (category BAL, see page 418, *Controlling access to admin level*)
- control access to the call types that can be used to make a call, except when they have been included in an Address List entry (categories ACT, BCT, see page 419, *Controlling access to call types*)
- control access to *holding* **CALL** and hence prevent changes to calling information (categories HCD, CTE, see page 420, *Controlling access to holding CALL*)
- control access to creating a channel in free tune (category FTCD, see page 420, *Controlling access to creating a channel in free tune*)
- control access to the CES-128 voice encryptor options (categories BSP[I], SOA|SOD|SOS, SS<D|R>, U, H, see page 421, *Controlling access to CES-128 voice encryptor options*)
- control access to the AES-256 digital voice encryptor options (categories SOA|SOD|SOS, U, H, R, D, see page 424, *Controlling access to AES-256 digital voice and data encryptor options*)
- control access to erasing secure keys via the ⓘ + **SEC** hot-key sequence (category DSE, see page 426, *Controlling access to erasing secure keys*)
- enable medium power level in the transceiver (category MPE, see page 426, *Enabling medium power level*)
- control interoperability of junction boxes and RF units (category APP, see page 427, *Enabling interchange of junction boxes and RF units that use admin passwords*)
- enable the automatic removal of an incoming call pop-up (category TIC, see page 427, *Enabling the automatic removal of the incoming call pop-up*)
- enable format options for GPS information (category GPS, see page 428, *Enabling GPS format options*)
- enable access to streamlined user interface options (category UI, see page 429, *Enabling user interface options*)
- enable access to viewing site manager information (category SMO, see page 430, *Enabling access to site manager information*)
- enable access to priority messaging options (category PM, see page 432, *Enabling priority messaging options*)
- enable access to external alarm options (category EA, page 434, *Enabling external alarm options (NGT AR and SR Transceivers only)*)

NOTE These configuration commands operate at the user level. If you are logged in to admin level you have full access to the above functions, regardless of the setting in the Message 10 entry.

Syntax for the Message 10 entry

The following rules apply to configuration commands used in the Message 10 entry in the Control List:

- All commands are case-sensitive.
- Commands must begin with the characters **#$!** followed by a space, for example, **#$! BSP**. If you do not use these characters, the transceiver reads any characters in the entry as a standard message.
- Category commands must be followed by a hyphen, then the specific commands, separated by commas. Each category and corresponding commands are separated by a space, for example:

  #$! LM-FV,UL BCT-M,GP FTCD SOS

Activating configuration commands in the Message 10 entry

After entering a configuration command in the Message 10 entry, you must switch your transceiver off then on again to activate the command.

The transceiver automatically locks and hides the Message 10 entry if the text in the entry begins with **#$!**.

NOTE If you remove a configuration command from the Message 10 entry under admin login, you should also unlock and show the Message 10 entry, if required.

Controlling access to the List Manager

You can specifically allow or restrict access to the List Manager. The configuration command for allowing access to the List Manager begins with **#$! LMA-**. The configuration command for restricting access to the List Manager begins with **#$! LM-**. Follow either of these commands with the codes you want to use from Table 65. Separate the commands with a comma.

CAUTION Do not use the LMA and LM commands at the same time.

Table 65: Codes for controlling access to the List Manager

Code	Individual codes	Description
Ad (Advanced)		Restricts access to the Advanced... features in the List Manager via the Quick Start menu, but provides the option of logging in to admin level. NOTE The action of this code is the same, regardless of whether it is used with the LMA or LM prefix.
AO (Administration Only)		Controls access to the List Manager at admin level only. NOTE The action of this code is the same, regardless of whether it is used with the LMA or LM prefix.
BIT (Built-in Test)		Controls access to built-in tests (see page 216, *Selecting a built-in test*).
Cfg (Config...)		Controls access to the Config... menu, that is, HP, UH, UL, and ULO. NOTE If you set Cfg, you do not need to set the individual codes within the menu.
	HP (Home Page)	Controls access to changing the home screen (see page 103, *Setting the home screen*).
	UH (User Hide)	Controls access to changing the hide or show status of an entry at user level (see page 123, *Hiding and showing information*).
	UL (User Lock)	Controls access to changing the locked or unlocked status of an entry at user level (see page 125, *Locking and unlocking information*).
	ULO (User Locks Off)	Controls access to toggling between locks off and locks on at user level (see page 126, *Switching locks off or on at user level*).

Table 65: Codes for controlling access to the List Manager (cont.)

Code	Individual codes	Description
Dsp (Display Options...)		Controls access to the Display Options... menu, that is FV, Grp, and SS. NOTE If you set Dsp, you do not need to set the individual codes within the menu.
	FV (Full View)	Controls access to toggling between full view and normal view (see page 122, *Displaying full and normal view*).
	Grp (Group)	Controls access to toggling between grouped and ungrouped entries (see page 113, *Grouping and ungrouping entries*).
	SS (Show Settings)	Controls access to toggling between hiding and showing settings for an entry (see page 111, *Hiding and showing settings*).
Ent (Entries)		Controls access to creating, renaming, copying, editing and deleting entries in any list using the List Manager, that is, ECp, ECr, EDe, ERe, ESA, and ESW. NOTE If you set Ent, you do not need to set the individual codes within the menu.
	ECp (Copy Entry)	Controls access to copying entries in any list using the List Manager (see page 106, *Copying an entry in a list*).
	ECr (Create Entry)	Controls access to creating entries in any list using the List Manager (see page 105, *Creating an entry in a list*).
	EDe (Delete Entry)	Controls access to deleting entries from any list using the List Manager (see page 107, *Deleting an entry from a list*).
	ERe (Rename Entry)	Controls access to renaming entries in any list using the List Manager (see page 106, *Copying an entry in a list*).
	ESA (Save to Address)	Controls access to saving call information to the Address List (see page 108, *Saving call log information to the Address List*).
	ESW (Save Waypoint)	Controls access to saving GPS information to the Address List (see page 110, *Saving GPS information to the Address List*).
Itm (Item)		Controls access to adding and deleting items to any list using the List Manager.
Mcr (Macro)		Controls access to creating, renaming, copying, moving, adding to, joining and deleting macros (see page 289, *Hot keys*).

Table 65: Codes for controlling access to the List Manager (cont.)

Code	Individual codes	Description
QS (Quick Start)		Controls access to the Quick Start menu, that is, QAd, QCB, QDe, QSA, QSC, QSL, and QST (see page 71, *Quick Start*). NOTE If you set QS, you do not need to set the individual codes within the menu.
	QAd (Quick Start Advanced)	Restricts access to the Advanced... features in the List Manager via the Quick Start menu, and does not provide the option of logging in to admin level. NOTE The action of this code is the same, regardless of whether it is used with the LMA or LM prefix.
	QCB (Quick Start Call Book)	Controls access to the call book in Quick Start (see page 74, *Adding/Editing an entry in the Address List or Call Book*).
	QDe (Quick Start Delete)	Controls access to deleting items from any menu in Quick Start (see page 75, *Deleting an entry*).
	QSA (Quick Start Set Address)	Controls access to setting your self address in Quick Start (see page 74, *Setting your station self address*).
	QSC (Quick Start Add/Edit Channel)	Controls access to adding and editing channels in Quick Start (see page 72, *Adding/Editing a channel*).
	QSL (Quick Start Scan List)	Controls access to adding channels to or deleting channels from the scan list in Quick Start (see page 73, *Setting up a scan list*).
	QST (Quick Start Set Time/Date)	Controls access to setting the time and date in Quick Start (see page 73, *Setting the time and date*).
SM (Set Marker)		Controls access to changing the marker on any list (see page 102, *Setting a marker*).

For example, if you want to allow access to using macros, creating entries in lists, and all display options, enter the following into the Message 10 entry:

#$! LMA-Mcr,ECr,Dsp

If you want to restrict access to all features in the List Manager, enter the following into the Message 10 entry:

#$! LM-AO

If you want to restrict access to full view and ungrouping entries that are already grouped, enter the following into the Message 10 entry:

#$! LM-FV,Grp

Controlling access to admin level

You can control access to admin level if an admin password has been set and you use the Block Admin Level (BAL) configuration command.

If you want to prevent entry to admin level when an admin password is set, enter the following into the Message 10 entry:

#$! BAL

CAUTION This command can only be removed from the Message 10 entry using NSP.

NOTE This command is effective only when an admin password is set in the transceiver.

Controlling access to call types

You can specifically allow or restrict access to call types. The configuration command for allowing access to call types begins with **#$! ACT-**. The configuration command for restricting access to call types begins with **#$! BCT-**. Follow either of these commands with the codes you want to use from Table 66. Separate the commands with a comma.

CAUTION Do not use the ACT and BCT commands at the same time.

NOTE Incoming calls to the handset and calling activity via CICS are not affected by the ACT/BCT configuration command.

Table 66: Codes for controlling access to call types from the handset

Code	Description
AL	ALL
CT	Channel Test
E	Emergency
GP	Get Position
GS	Get Status
M	Message
P	Phone
RFDS	RFDS Emergency
S	Selective
SP	Send Position

For example, if you want to allow access to using Selective call and Phone call types only, enter the following into the Message 10 entry:

#$! ACT-S,P

If you want to restrict access to using Message call and Get Position call types, enter the following into the Message 10 entry:

#$! BCT-M,GP

NOTE The CTE configuration command allows a Channel Test call using *hold* **CALL** during the Select chan/mode prompt, even when the Channel Test call type is blocked (see page 420, *Controlling access to holding CALL*).

Controlling access to *holding* CALL

When you *hold* **CALL**, you gain access to changing call details as you make a call. If you want to prevent the user from having access to networks and channels, use the Hold Call Disable (HCD) configuration command. If you still require the ability to perform a Channel Test call using *hold* **CALL** during the Select chan/mode prompt, use the Channel Test Enable (CTE) configuration command.

NOTE In firmware earlier than V4.00, this feature only disables Hold-Call when the call is made from the channel screen using a !default network.

If you want to disable the *hold* **CALL** function, enter the following into the Message 10 entry:

#$! HCD

If you want to disable the *hold* **CALL** function but still allow a Channel Test call using *hold* **CALL** during the Select chan/mode prompt, enter the following into the Message 10 entry:

#$! HCD CTE

Controlling access to creating a channel in free tune

When you *hold* ✓ while in free tune, you can create a channel on that frequency. If you want to prevent the user from creating channels in free tune, use the Free Tune Channel Disable (FTCD) configuration command.

If you want to prevent the user from creating channels in free tune, enter the following into the Message 10 entry:

#$! FTCD

Controlling access to CES-128 voice encryptor options

You can control access to a number of options of the CES-128 voice encryptor. The configuration command for controlling access to these options begins with **#$!** . Follow this command with the codes you want to use from Table 67. Separate the commands with a space.

Table 67: Codes for controlling access to CES-128 voice encryptor options (PIN and secure standby)

Code	Description
BSP (Block Secure PIN)	Prevents access to the secure PIN function and any other functions that are available when the user *holds* **SEC**. The function of *holding* **SEC** enters secure mode in the default setting.
BSPI (Block Secure PIN Index)	Prevents access to the secure PIN function when the user *holds* **SEC**. All other functions associated with *holding* **SEC** are available.
SSD (Secure Standby Disable)	Prevents access to secure standby mode (see page 246, *Using the CES-128 voice encryptor in standby mode*).
SSR (Secure Standby Receive)	Prevents use of PTT during secure standby mode. If PTT is pressed in secure standby mode, the transceiver returns to secure mode.

For example, if you want to disable the secure PIN function, enter the following into the Message 10 entry:

#$! BSP

If you want to disable the secure standby mode, enter the following into the Message 10 entry:

#$! SSD

The following commands, if used, must be entered in this order:

#$! SOA|**SOD**|**SOS**[**!**][**nn**][**Unn**][**H0**|**1**]

These commands are described in Table 68.

NOTE These commands are not separated by spaces or commas.

Table 68: Codes for controlling access to CES-128 voice encryptor options (secure on)

Code	Description
SOA (Secure On Always)	Enables secure mode permanently at user level. Once the transceiver enters secure mode, it remains in secure mode during scanning events. Secure standby mode is permitted, but is ended when PTT is pressed. NOTE If you set **SOA**, you do not need to set **SSR**. NOTE You can exit secure mode at admin level, if required.
SOD (Secure On Default)	Enables the default secure mode when the user presses or *holds* **SEC**. Secure standby mode is permitted. The transceiver exits secure mode when a call ends or during scanning, and does not automatically re-enter secure mode when a call starts, scanning ends, or the transceiver restarts. NOTE If you want to enable the default secure mode at startup, use the **SOD!** command.
SOS (Secure On Sticky)	Returns to the last-used secure on/off state when the transceiver is switched on. Secure mode may be entered or exited at any time. The transceiver remains in secure mode when a call ends or during scanning, if requested. Secure standby mode is permitted and remains on until * is pressed again. NOTE From firmware V5.11 or later, the SOS command is not required as this feature is now the default behaviour in the transceiver.
!	Enables automatic entry to secure mode on startup of the transceiver. For more information see page 423, *Automatic startup of secure mode*.
nn	Sets the length of time the transceiver enters secure standby, listens for revertives, then returns to secure mode. For more information see page 423, *Automatic standby for use with Codan Selcall*.
Unn (User-allowed Corporate indexes)	Provides the user with access to the first nn Corporate secure indexes if the Secure Index entry or Secure Key entry in the Control List is admin locked.
H (Hide Secure Status)	Sets whether the status of the CES-128 voice encryptor is displayed on the screen when the transceiver is not secure. By default, it is not displayed (H1). If you want **Clr Voice** to be displayed when secure is off, use H0.

For example, if you want to allow the user to edit the first four Corporate secure indexes and secure keys only, and the status of the CES-128 voice encryptor to be displayed, enter the following into the Message 10 entry:

#$! SOSU4H0

NOTE To limit the user to the number of indexes specified, the Secure Key and Secure Index entries in the Control List must be admin hidden. For more information see page 124, *Hiding or showing an item at admin level*.

Automatic startup of secure mode

If you want to ensure that your transceiver starts up in secure mode, regardless of the secure state when the transceiver was switched off, append **!** to the secure configuration command.

For example, if you want to restart the transceiver in secure mode, but be able to switch encryption on and off, enter the following in the Message 10 entry:

#$! SOD!

Automatic standby for use with Codan Selcall

If your HF communication network operates with the Codan Selcall call system, you will not hear revertives from the called station when secure mode is active. You can set a brief period following a call made in a Codan Selcall network during which the transceiver enters secure standby, listens for revertives, then returns to secure mode after any one of the following:

- the end of the period is reached
- you press PTT to begin transmission
- you receive encrypted audio from another station

The time required depends on the length of time the called station takes to tune the antenna, typically 12 to 15 seconds. You can use automatic secure standby with the SOA, SOS and SOD configuration commands and set the standby time in the range 0 to 99 seconds. The default setting is 12 seconds.

For example, if you want the transceiver to enter secure standby mode for 15 seconds following a call made using a Codan Selcall network, enter the following into the Message 10 entry:

#$! SOS15

NOTE If you want to include the automatic startup command (!), this must be included immediately after the secure mode command, followed by the standby period, for example **#$! SOS!15**.

Controlling access to AES-256 digital voice and data encryptor options

You can control access to a number of options of the AES-256 digital voice and data encryptors. The configuration command for controlling access to these options begins with **#$!** . Follow this command with the codes you want to use from Table 69. Separate the commands with a space.

These commands, if used, must be entered in the following order:

#$! SOA|**SOD**|**SOS**[**!**][**Unn**][**H0**|**1**][**T**][**R**[**L**][**n**]][**D**[**L**][**0**|**1**]][*]

Table 69: Codes for controlling access to AES-256 digital voice and data encryptor options

Code	Description
SOA (Secure On Always)	Enables secure mode permanently. The transceiver enters secure mode on startup, and remains in secure mode during scanning events. NOTE You can exit secure mode at admin level, if required.
SOD (Secure On Default)	Enables the default secure mode when the user presses or *holds* **SEC**. The transceiver exits secure mode during scanning and does not automatically re-enter secure mode when scanning ends. NOTE If you want to enable the default secure mode at startup, use the **SOD!** command.
!	Enables automatic entry to secure mode on startup of the transceiver. For more information see page 425, *Automatic startup of secure mode*.
Unn (User-allowed Indexes)	Provides the user with access to the first nn indexes and editing of the keys within, even if the Secure Key entry in the Control List is admin hidden.
H (Hide Secure Status)	Sets whether the status of the AES-256 digital voice and data encryptor is displayed on the screen when the transceiver is not secure. By default, it is displayed (H0). If you do not want **Clr Voice** to be displayed when secure is off, use H1.
T (Toggle Data Rate) (digital voice encryptor only)	Enables a short press of **SEC** to toggle between two or more data rates. NOTE If this is enabled, then *hold* **SEC** is required to exit secure.
R[L][n] (Data Rate) (digital voice encryptor only)	Enables the data rate to be locked (L), and the initial data rate to be set (n = 1, 2, 3 etc). If the data rate is locked, it is not displayed in the *hold* **SEC** menu, however, it may still be toggled with a short press if T is included in the configuration command.

Table 69: Codes for controlling access to AES-256 digital voice and data encryptor options (cont.)

Code	Description
D[L][0|1] (Digital Voice) (digital voice encryptor only)	Enables the digital voice mute setting, which may be off (0) or on (1) at startup. If L is included, the on/off setting cannot be changed.
*	Enables secure audio only to the GP port and the speaker. Mute cannot be switched off. Typically, this is used with the SOA command.

For example, if you want to lock the data rate at 1k2 with digital voice mute on and locked, enter the following into the Message 10 entry:

#$! <other commands>**RL2DL1**

If you want to ensure that secure audio always appears at the GP port and the speaker, regardless of the secure status of the encryptor, enter the following into the Message 10 entry:

#$! SOA*

Automatic startup of secure mode

If you want to ensure that your transceiver starts up in secure mode, regardless of the secure state when the transceiver was switched off, append **!** to the secure configuration command.

For example, if you want to restart the transceiver in secure mode, but be able to switch encryption on and off, enter the following in the Message 10 entry:

#$! SOS!

Controlling access to erasing secure keys

By default, the user can erase CES secure keys and AES secure keys using a hot-key sequence. A configuration command for controlling access to this hot-key sequence begins with **#$!** . Follow this command with the code from Table 70.

Table 70: Code for controlling access to erasing secure keys

Code	Description
DSE (Disable Secure Key Erase)	Prevents CES secure keys and AES secure keys from being erased during the ⓘ + **SEC** hot-key sequence (see page 245, *Erasing all of the CES secure keys* and page 261, *Erasing all of the AES secure keys*). NOTE The CES Global secure key and Base secure key are not erased during this hot-key sequence.

If you want to prevent CES secure keys and AES secure keys from being erased during the ⓘ + **SEC** hot-key sequence, enter the following into the Message 10 entry:

#$! DSE

Enabling medium power level

You can enable a medium power level in your transceiver. The medium power level is half of the maximum transmit power level. The configuration command for enabling the medium power level is **#$! MPE**.

NOTE The medium power level is available with firmware V4.93 or later, and requires PA PIC version 2.03 or later. For more information contact your Codan representative.

For example, if you want to be able to select the medium power level in the transceiver using the **Tx PWR** key, enter the following into the Message 10 entry:

#$! MPE

Enabling interchange of junction boxes and RF units that use admin passwords

Junction boxes and RF units use the built-in security of admin passwords, which control access to critical information held in the transceiver. When junction boxes and RF units are swapped, they remain fully functional however, if the junction box does not have the same admin password as the RF unit, it cannot have its setup changed and as such, is not fully interoperable.

If your organisation uses different passwords in each unit to improve security, full interoperability of junction boxes and RF units is achieved by using an admin password prefix of the same *n* numbers in all units, and using the admin password prefix (APP*n*) command.

If you want to use different admin passwords, but still maintain full interoperability of junction boxes and RF units, enter the following into the Message 10 entry:

#$! APPn

where:

n is the number of digits that are checked at the beginning of the admin password.

If the first *n* digits are the same, the units are fully interoperable.

Enabling the automatic removal of the incoming call pop-up

A pop-up message is displayed when you receive an incoming call. This message usually remains on the display until you acknowledge it by pressing ✓ or ✕. When you use the Timeout Incoming Call (TIC) configuration command, the incoming call pop-up is removed after 30 seconds.

For example, if you want to automatically remove all incoming call pop-ups after 30 seconds, enter the following into the Message 10 entry:

#$! TIC

Enabling GPS format options

You can set up how you want GPS information to be displayed in your transceiver. A configuration command for enabling these format options begins with **#$!** . Follow this command with the codes you want to use from Table 71.

Table 71: Codes for enabling GPS format options

Code	Description
GPSHA (GPS Hide Altitude)	Hides the altitude reading from the GPS information.
GPSS (GPS Seconds)	Displays the GPS information in degrees, minutes and seconds.

NOTE The default display of GPS information is degrees and decimal minutes.

For example, if you want to display GPS information in degrees, minutes and seconds, and hide the altitude reading, enter the following into the Message 10 entry:

#$! GPSS GPSHA

Enabling user interface options

You can enable extra options for the user interface that streamline the content of some screens under certain conditions. A configuration command for enabling these options begins with **#$! UI-**. Follow this command with the codes you want to use from Table 72. Separate the commands with a comma.

NOTE These user interface options are available from firmware V4.80 or later.

Table 72: Codes for enabling user interface options

Code	Description
CPBM (Call Prompt Bottom line Mode)	Displays the channel/mode prompt on separate lines so that the channel name and mode are visible together without the need for scrolling. NOTE This mode is not recommended if you have channels that use different transmit and receive frequencies.
CPSM (Call Prompt Skip Mode)	Prevents the display of the mode during outgoing calls if the mode for all channels in the network is common.
BT (Brief Titles)	Prevents scrolling of titles by using brief titles on prompting steps. Additional help text in a title is also hidden, unless Help Mode is switched on.
CF (Common Favourites)	Activates common user interface options that are applicable to general operation. CF activates CPBM, CPSM and BT.

For example, if you want to enable the Brief Titles and Call Prompt Skip Mode options, enter the following into the Message 10 entry:

#$! UI-BT,CPSM

If you want to enable Brief Titles, Call Prompt Skip Mode, and Call Prompt Bottom line Mode, enter the following into the Message 10 entry:

#$! UI-CF

Enabling access to site manager information

You can set up how you want site manager information to be displayed in your transceiver. By default, the site manager information cannot be accessed via the user interface. A configuration command for accessing this information begins with **#$! SMO-**. Follow this command with the codes you want to use from Table 73. Separate the commands with a comma.

NOTE You may choose to skip site information from certain ports because the peripheral device is connected intermittently.

Table 73: Codes for enabling access to site manager information

Code	Description
U (Skip UI)	Prevents site information being displayed or broadcast for addresses defined in the Addresses entry in the Control List.
1 (Skip CICS:1 for 15-way)	Prevents site information being displayed or broadcast for peripheral devices attached to the 15-way connector.
2 (Skip CICS:2 for 6/9-way)	Prevents site information being displayed or broadcast for peripheral devices attached to the 6/9-way connector.
A (Skip All)	Prevents site information from being displayed or broadcast across all interfaces.
C (Skip CICS:1/CICS:2)	Prevents site information from being displayed or broadcast for all peripheral devices.
F (Allow Jump to Site Screen)	Enables the user to press 🔍 to access the Site screen for the address specified in the CallType–Address prompt.
L (Allow Jump to Local Site Screen)	Enables the user to access the local site information by pressing 🔍 in the Site screen. NOTE F must be set.
Q (Allow Jump to ALE LQA Clear entry)	Enables the user to access the ALE LQA Clear entry in the Control List by pressing 🔍 in the Site or Local Site screens. Clearing information from the ALE LQA Clear entry may lengthen the time taken to establish a link in an ALE/CALM network. NOTE F must be set.
D0 to D9 (Delay Before Broadcast)	Delays the response to a Request Site Get Status call to allow for tuning at the remote site. The delay is in steps of 3 s, up to 27 s. The default setting is 10 s.

For example, if you want to display site manager information for all interfaces and sites by pressing 🔍 in the CallType–Address prompt, enter the following into the Message 10 entry:

#$! SMO- F,L

NOTE To view information for a specific remote station, enter the address of the station at the CallType–Address prompt, then press 🔍.

If you want to display site manager information for the UI only by pressing 🔍 in the CallType–Address prompt, and be able clear LQA information, enter the following into the Message 10 entry:

#$! SMO- 1,F,L,Q

Enabling priority messaging options

You can enable options for handling special priority messages. These priority messages may be classified as urgent or emergency, and differ from normal messages by the inclusion of **!** or **!!** respectively at the beginning of the message. A configuration command for enabling these options begins with **#$! PM-**. Follow this command with the codes you want to use from Table 74. Separate the commands with a comma.

NOTE These priority messaging options are available from firmware V4.91 or later.

Table 74: Codes for enabling priority messaging options

Code	Description
U (Urgent Message)	Raise a local alert tone and an external alarm when a message containing a leading **!** or **!!** is received, regardless of the local alert tone and external alarm settings (see page 192, *Cfg Alert Tones* and page 434, *Enabling external alarm options (NGT AR and SR Transceivers only)*). NOTE If the Cfg Alert Tones entry is set to **Disabled**, the transceiver does not raise a local alert tone or external alarm.
E (Emergency Message)	Raise a local alert tone and an external alarm when a message containing a leading **!!** is received, regardless of the local alert tone and external alarm settings (see page 192, *Cfg Alert Tones* and page 434, *Enabling external alarm options (NGT AR and SR Transceivers only)*). NOTE If the Cfg Alert Tones entry is set to **Disabled**, the transceiver does not raise a local alert tone or external alarm. The transceiver responds with an emergency alert tone, and an Emergency call icon appears in the incoming call pop-up. NOTE The Message call icon is used in the Calls In Log for an emergency message.
O (Encrypted Only)	If the message is encrypted using a Group or Registered privacy mode and password, and contains a leading **!** or **!!**, raise a local alert tone and an external alarm, regardless of the local alert tone and external alarm settings. NOTE If the Cfg Alert Tones entry is set to **Disabled**, the transceiver does not raise a local alert tone or external alarm. If the message is not encrypted using a Group or Registered privacy mode and password, the message is handled as a normal message.

For example, if you want to disable the alarm on normal messages, but want an urgent message (prefixed **!** or **!!**) to raise an alert tone and external alarm, enter the following into the Message 10 entry:

#$! PM-U

NOTE You must also set the Cfg Alert Tones entry appropriately (see page 192, *Cfg Alert Tones*).

If you want an emergency message (prefixed **!!**) to raise an emergency alert tone and external alarm only if it is encrypted, enter the following into the Message 10 entry:

#$! PM-E,O

Enabling external alarm options (NGT *AR* and *SR* Transceivers only)

You can enable options for the external alarm to suit the environment of the transceiver, and the type of call being received.

A configuration command for enabling these options begins with **#$! EA-**. Follow this command with the codes you want to use from Table 75. Separate the commands with a comma.

The external alarm relay normally reacts as follows:

- immediately, toggling three times per second during Emergency calls, continuing for five minutes
- after a 30 second delay, toggling briefly once every two seconds for messages, continuing for two minutes
- after a 30 second delay, remaining open for two minutes for all other calls

The external alarm can be varied according to:

- calls that contain messages (Message call, Send Position call, Get Position call, Get Status call)
- calls that do not contain messages (Selective call, Phone call, basic voice call)
- Emergency calls

NOTE These external alarm options are available from firmware V4.90 or later.

NOTE The external alarm options may be overridden by any external alarm requirements for the priority messaging options (see page 432, *Enabling priority messaging options*). These options may also override the setting in the Cfg Alert Tones entry in the Control List (see page 192, *Cfg Alert Tones*).

Table 75: Codes for enabling external alarm options

Code	Description
NV (Never With Voice)	The external alarm is not activated for any voice calls.
IV (Immediately With Voice)	The external alarm is activated immediately when a voice call is received. This may be useful when the transceiver is in a noisy environment and the external alarm activates a flashing light to notify the operator.
QV (Quickly With Voice)	The external alarm is activated after a short delay when a voice call is received. This may be useful when the transceiver is not closely monitored, but an operator is able to respond to a local alert tone within 10 seconds. If the call is not answered after this time, the external alarm is activated.

Table 75: Codes for enabling external alarm options (cont.)

Code	Description
NM (Never With Messages)	The external alarm is not activated for any message calls. NOTE Urgent and emergency messages still respond unless the Cfg Alert Tones entry is set to **Disabled**.
IM (Immediately With Messages)	The external alarm is activated immediately when a message is received. This may be useful when the transceiver is unattended, but the operator needs to know immediately that they have received any message.
NE (Never With Emergency)	The external alarm is not activated for Emergency calls. NOTE Emergency calls normally activate an immediate external alarm.
NA (Never With All)	The external alarm is not activated for any calls. NOTE Urgent and emergency messages still respond unless the Cfg Alert Tones entry is set to **Disabled**.
IA (Immediately With All)	The external alarm is activated immediately when any call is received.
NT (No Toggling)	The external alarm relay is activated and remains on for two minutes without toggling.

For example, if you want to enable the external alarm for voice calls immediately with no toggling, enter the following into the Message 10 entry:

#$! EA-IV,NT

If you want to enable the external alarm for message calls only, enter the following into the Message 10 entry:

#$! EA-IM,NE

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Appendix G 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 R&TTE Directive 1999/5/EC.

This section also contains the requirements for FCC compliance and C-tick.

European R&TTE Directive

The NGT Transceiver product range (2010 and 2011 RF Units) 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 CE0191 !, CE0191, CE !, 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 11, *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.

EMC 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.

EMC

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 must be connected at the AC mains supply outlet. The symbols shown in Table 76 are used to identify the earths on the equipment.

Table 76: 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-3).

The NGT *VR* Transceiver has been tested and certified to FCC Part 90 (FCC identifier code DYYNGT-11).

FCC Part 15 compliance

Any modifications made to the NGT *SR* or *VR* 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* or *VR* 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

C-tick approval

The NGT *AR* and *AR Voice* Transceivers meet the requirements of the Australian Communications and Media Authority: Radiocommunications (MF and HF equipment—Land Mobile Service) Standard 2003 (AS/NZS 4770).

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