Codan Part No. 15-04059 Issue 1, August 1994

Contents

4. Using the transceiver 4-1

List of drawings

1. About this handbook

Who should use this handbook

This handbook is written for the person who installs and operates the Codan 8528 International transceiver.

Icons and standards

The following icons and standards have been used throughout this handbook.

This icon…	Means…
	a reference to other sections within the user guide or related documentation.
	a note or reminder.
	a warning. If you do not observe the warning, you may damage yourself or the equipment.
	example of a button on the transceiver.
❑	the end of a section.

Glossary

AD	Antenna Driver
ARQ	Automatic Repeat Request
FEC	Forward Error Correction
LCD	Liquid Crystal Display
LSB	Lower Side Band
PIN	Personal Identification Number
PS	Miscellaneous facilities
PTT	Press To Talk
R	Remote
Rx	Receive
Tx	Transmit
USB	Upper Side Band

2. Overview

Your 8528 International HF SSB transceiver employs the latest concepts in design and reliability for long range communications. It has been designed for 12V DC operation in fixed base and mobile installations.

There are two versions of the transceiver; one with front panel control and the other with extended control. The extended control unit consists of a transceiver and a separate control head which can be located up to 100 metres away from the transceiver.

The control head can also be used as an accessory with the front panel control version to enable local and extended control of the transceiver.

You operate the transceiver through the front control panel, or control head, which contains sealed membrane switches (or buttons) and a liquid crystal display (LCD). The LCD shows the selected channel number along with the transmit and receive frequencies. Messages about the operation of the transceiver are also displayed.

This issue of the handbook covers EPROM version 5.4 of the 8528 International HF SSB transceiver. Continual research and development may lead to later versions being released in the future.

The main facilities and features of the transceiver are:

- channels
- selective call
- scanning
- free tuning receiver
- tone calling
- telephone interconnect
- ARQ-FEC.

Channels

Your transceiver has a capacity of 250 channels, these cover:

- a transmit frequency range of 2 MHz to 24 MHz
- a receive frequency range of 0.25 MHz to 30 MHz.

A maximum of 151 transmit and receive channels can be pre-programmed in the factory, or by an authorised Codan dealer. You, as a user, can program the remaining 99 channels from the front panel as P-channels.

Selective call

This facility allows you to transmit a call to a single transceiver or a group of transceivers. You can also receive selective calls addressed to your station.

Your transceiver can store details of up to ten stations that have called you while your transceiver was left unattended.

Scanning

This facility scans selected channels for voice signals. You can program a maximum of 15 channels to be scanned in sequence for voice signals. A maximum of eight selective channels can be programmed and scanned.

Free-tuning receiver

Your transceiver can be used as a free-tuning receiver covering the world broadcast bands over the frequency range of 250 kHz to 30 MHz.

Tone calling

This facility allows you to send a tone call (two tones transmitted simultaneously) to signal another transceiver.

Telephone interconnect

A base transceiver can be connected to an IPC-500 telephone interconnect. This allows you to use your transceiver to make telephone calls using the public telephone system.

ARQ-FEC

For remote data transmission applications, your transceiver can be connected to a computer terminal and interface modem.

There are two types of transmission available:

- Automatic Repeat Request (ARQ)
- Forward Error Correction (FEC).

The transceiver and control head front panels

This section describes the physical appearance of the transceiver and control head front panels.

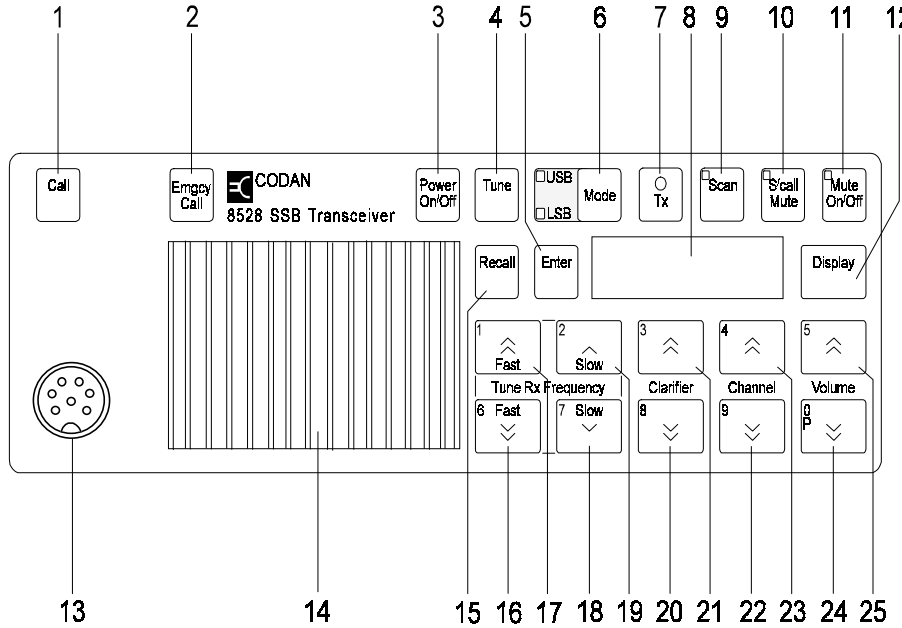


Figure 2.1 Front panel control transceiver

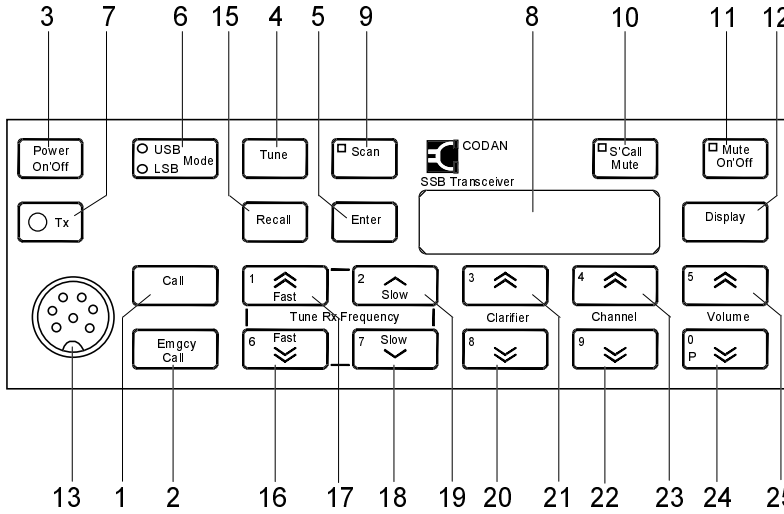
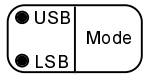
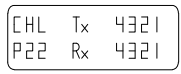
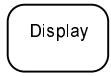
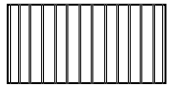
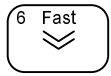
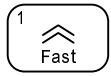
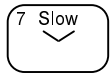
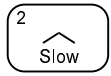
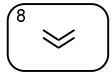
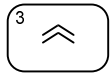
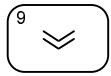
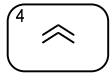
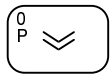
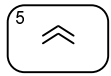


Figure 2.2 Extended control head transceiver

Item No.	Item	Function
1		Transmits either a selective call or tone call on the selected channel.
2		Transmits an emergency call to a base station.
3		Switches the transceiver on or off.
4		Transmits a carrier signal so that antenna tuners and automatic antenna systems can be tuned.
5		Saves user settings that control transceiver operation.
6		Selects USB or LSB mode. The indicators show which side band is selected.
7		The indicator is on when the transceiver is transmitting.
8		The transceiver display shows channel numbers, frequencies and messages regarding the operation of the transceiver.
9		Selects either channel or band scan. The indicator is on in scan mode.

Item No.	Item	Function
10		Mutes all audio until a selective call is received. The indicator is on when selective call mute is on.
11		Removes normal background noise when there is no voice signal. The indicator is on when mute is on. Switches selective call mute off.
12		Displays the options set for the selected channel. Displays information about received selective calls.
13		Microphone socket.
14		Loudspeaker.
15		Selects a specific channel when used with the numeric buttons. Dims the display and indicators when pressed twice within one second.
16		Reduces the programmed frequency in steps of 1 kHz. Keys in number 6.
17		Raises the programmed frequency in steps of 1 kHz. Keys in number 1.

Item No.	Item	Function
18		Reduces the programmed frequency in steps of 100 Hz. Keys in number 7.
19		Raises the programmed frequency in steps of 100 Hz. Keys in number 2.
20		Reduces the received audio frequency in steps of 10 Hz to help clarify the received speech. Keys in number 8.
21		Raises the received audio frequency in steps of 10 Hz to help clarify the received speech. Keys in number 3.
22		Selects the next lower channel. Keys in number 9.
23		Selects the next higher channel. Keys in number 4.
24		Decreases the audio volume. Keys in number 0 and letter P.
25		Increases the audio volume. Keys in number 5.

The transceiver and control head rear panels

This section describes the physical appearance of the transceiver and control head rear panels.

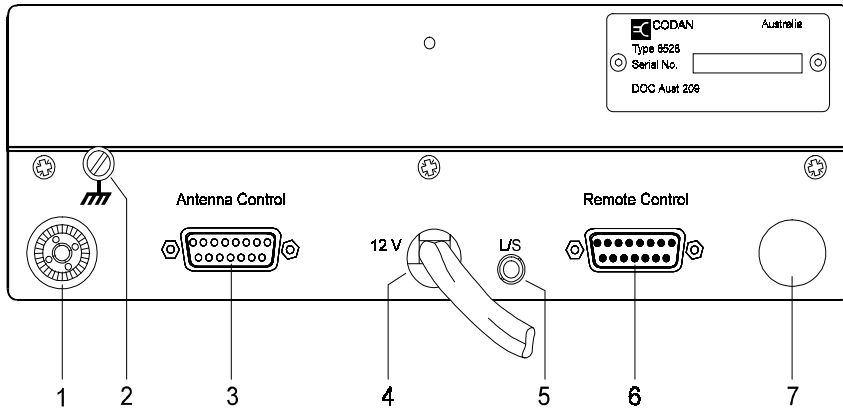


Figure 2.3 The transceiver rear panel

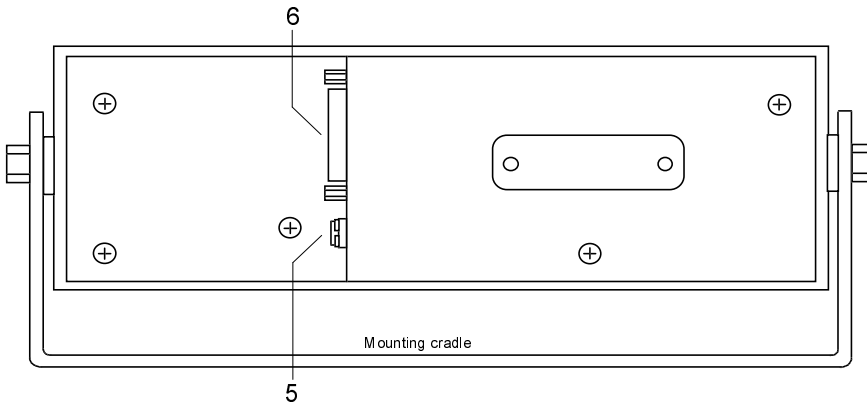
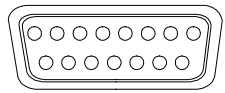
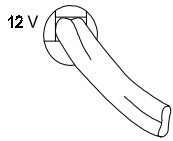
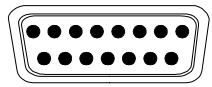


Figure 2.4 The extended control head rear panel

Item No.	Item	Function
1		Antenna socket.
2		Earth (ground) screw.
3		Automatic antenna control socket.
4		12V DC power lead.
5		External 8 ohm loudspeaker socket. You can still use the internal speaker with an external speaker connected.
6		Remote control unit socket.
7		External alarm, battery power output and the miscellaneous facilities socket position.

❑

3. Installation

Before installation, check the contents against the packing list to ensure that no parts are missing.

The following notes are a guide to installation but are not intended to be comprehensive. It is recommended that installation is carried out by qualified and experienced personnel.

There are two types of installation:

- fixed base station
- mobile.

Fixed base station

The fixed base station installation typically consists of an AC power supply connected directly to the mains. DC output from the power supply is connected to the transceiver, which in turn is connected to an antenna.

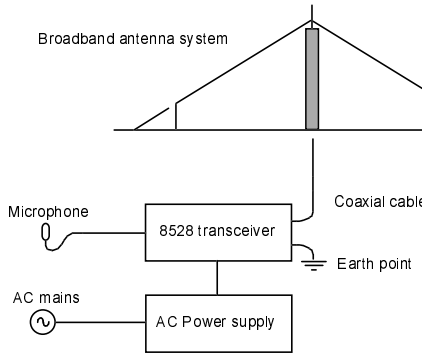


Figure 3.1 Typical fixed base station installation

Mobile

The mobile installation typically consists of a 12V DC power supply (battery) connected to the transceiver. The transceiver is connected to the antenna by a coaxial cable and control cable for auto-tuning antennas.

Installations can be front control transceivers or extended control transceivers which include a separate control head and speaker.

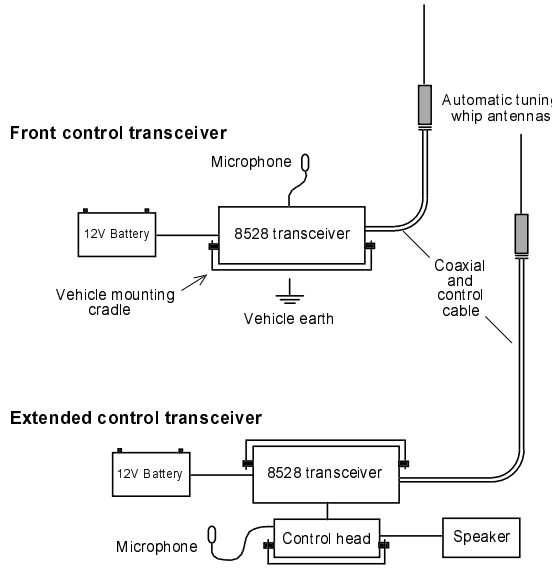


Figure 3.2 Typical mobile installation

❑

Mounting the transceiver

In mobile installations, the transceiver must be mounted in a position that will not cause injury in the event of an accident.

Mount the transceiver and control head in a position that allows:

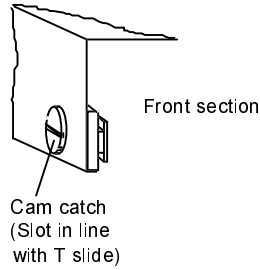
- easy access to the control panel
- a free flow of air through the rear cooling fins.

There are two types of mounting cradle that you can use to install your transceiver:

- code 117 mounting cradle—front entry
- code 118 mounting cradle—top/bottom entry.

Both types of cradle are supplied with a 6-metre DC power cable. Determine the mounting position to best suit your needs.

Code 117 mounting cradle—front entry

Step	Action
1.	The cradle can support the transceiver from above or below permitting roof or floor mounting. Secure the mounting cradle into position with the rotating cam catches to the front. Ensure there is sufficient space at the rear of the cradle to take the transceiver heatsink and connectors.
2.	Align both cam catch slots with the T-section slides. 
3.	Insert the transceiver side rails into the T-section slides. Push the transceiver fully into the cradle.
4.	Apply gentle pressure to the front panel of the transceiver. Lock into the cradle by turning the cam catches one quarter of a turn in either direction with a suitable tool or small coin.

Code 118 mounting cradle—top/bottom entry

Step	Action
1.	Secure the mounting cradle into position with its spring clips nearest the front. Ensure there is sufficient space at the rear of the cradle to take the transceiver heatsink and connectors.
2.	Remove the front and rear fixing screws of the transceiver side rails (leave the centre screw).
3.	Use the adaptor plates to attach the transceiver to the cradle. Secure the adaptor plates flush to the transceiver side rails with the new screws provided. Fit an 'O' ring over each projecting stud. The adaptor plates projecting studs fit into the slides in the cradle.
4.	Insert the transceiver adaptor plate studs into the cradle slides and push fully into the cradle.
5.	Secure the transceiver into the cradle with the spring clips.

❑

Mounting the extended control head

Make sure that the control head is connected to the transceiver before applying power.

Failure to connect the control head to the transceiver before applying power may**:**

- damage the transceiver
- blow the internal fuse
- stop the control head from working.

If the control head stops working, disconnect the power from the transceiver, reconnect the power and switch on again.

Step	Action
1.	Remove the two cradle screws and washers securing the mounting cradle to the control head.
2.	Secure the mounting cradle in position. Ensure there is space at the rear of the brackets for the control cable.
3.	Secure the control head to the mounting cradle with the two screws and washers.
4.	Mount the transceiver (see *Mounting the transceiver* on page 3-3).

Step	Action
5.	Connect the interface cable between the control head and transceiver. Ensure the cable connectors are securely fastened to the control head and transceiver. The extended control head is supplied with a 6-metre cable. To enable correct installation, the cable has different connectors at each end—thumb screw fixings to the transceiver. If necessary, remove the cover from one connector to pass the cable through restricted openings. Gather any excess cable neatly at one point.
6.	Connect the extension speaker cable to either the control head or the transceiver.

❑

Power supply

Ensure that the power supply for your transceiver is 12V DC. Transceiver series 8528H operating with the 400 watt PA (type 4404) needs a 24V DC supply.

You can use a 12V battery for mobile installations or a suitable AC power supply for base station installations.

A qualified technician should check the installations before power is applied to the transceiver.

A heavy duty 6-metre power cable is supplied with the mounting cradle for mobile installations. It is designed to minimise the voltage drop between the battery and transceiver during transmission. Use of a smaller core cable is not recommended.

Protect all cables from sharp edges and mechanical abrasions.

For mobile installations, a suitable cartridge fuse (32 Amp-accessory code 711) should be fitted in the active wire close to the battery. This protects the power cable from the risk of fire should damaged insulation touch the vehicle chassis. Normal glass in-line automotive fuses are not recommended. The transceiver is fitted with adequate internal protection.

Connect the power cable between the transceiver and the battery or the transceiver and AC power supply.

In extended control installations where the power and control cables are long and follow a common path, separate the cables by at least 200 mm. Failure to observe this will cause distortion of the transmitted audio signals.

You can, however, bring the cables together for short distances, for example, to pass through the same hole in a bulkhead.

❑

Grounding

In all installations an adequate ground, or earth, is essential for correct transceiver operation. A chassis ground or earthing position is provided on the rear panel of the transceiver.

The control head should also be earthed.

In fixed installations, install an earth cable between the transceiver ground screw and an earth point. Use copper braid or heavy duty cable.

Antennas and antenna tuners

Correct installation of the antenna and antenna tuner is important for good transceiver operation.

To obtain the best performance and good radiation efficiency from your transceiver, consider the antenna and antenna tuner's:

- physical location
- distance from the transceiver
- earthing.

Follow the installation instructions provided with each antenna and antenna tuner to achieve the best possible performance.

4. Using the transceiver

This chapter tells you how to operate your transceiver. It covers:

- making calls
- receiving calls
- adjusting settings.

The displays in the procedures show examples of channel and frequency numbers. In each procedure select your own channel and frequency numbers as appropriate.

Unless otherwise stated, all procedures assume that:

- 12V DC power is supplied to the transceiver
- the transceiver has been switched on by pressing the front panel Power On'Off button.

☞ See *Switching the transceiver on or off* on page 4-2.

Switching the transceiver on or off

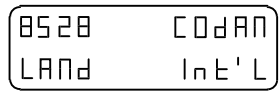
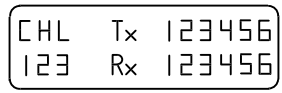
When you switch the transceiver on, the display usually shows the last settings before the transceiver was switched off. If a personal identification number (PIN) has been set for your transceiver, the display requests you to enter your PIN.

☞ See *Enter a PIN* in Chapter 12.

There are two ways of switching your transceiver on or off:

- switching on or off if no PIN has been set
- switching on or off if a PIN has been set.

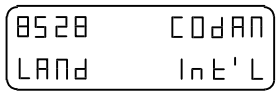
Switching on or off if no PIN has been set

Step	Action	Display	Remarks
1.	Ensure the transceiver is connected to the power supply.		
2.	To switch the transceiver on, press [Power On'Off]	For one second you see:  then you see the last channel and frequencies selected:  	The Mute and Mode indicators turn on. The transceiver is automatically set to the last channel and volume settings used.

Step	Action	Display	Remarks
3.	To switch the transceiver off, press Power On'Off		

Switching on or off if a PIN has been set

Do not forget your PIN, otherwise you will not be able to switch on your transceiver. If you forget your PIN, you will have to return your transceiver to Codan for them to delete the allocated number.

Step	Action	Display	Remarks
1.	Ensure the transceiver is connected to the power supply.		
2.	To switch the transceiver on, press Power On'Off	For one second:  then 	The Mute and Mode indicators turn on.

Step	Action	Display	Remarks
3.	Use the numeric buttons to enter your PIN.		The transceiver will not operate unless you enter the correct PIN.
4.	Press Enter		The transceiver is ready for use. It is automatically set to the last channel and volume settings used.
5.	To switch the transceiver off, press Power On'Off		

❑

The transceiver display

The display shows you the selected channel numbers, and the transmit and receive frequencies. It also shows messages to help you operate the transceiver.

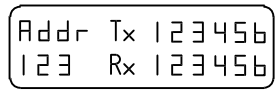
☞ See *Display messages,* Chapter 13 for a description of these messages.

The display and button legends of the control head are back-lit. You can adjust the display brightness.

☞ See *Dimming the display and indicators* on page 4-7.

This section explains what the option codes mean and how to reveal the option codes on the display.

The display contains two rows of information. Each row is split into three groups. What you see in each group depends on the transceiver mode selected. An example is shown below:

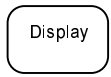
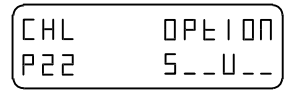


Option codes

Code	Description
S	Indicates that selective call is enabled for this channel.
t1-4	Indicates this channel has been programmed for tone calling. (Four tone pairs can be used, t1 to t4.)
L	Indicates that lower side band is enabled for this channel.
U	Indicates that upper side band is enabled for this channel.

Displaying the channel options

There are several options that you can select your transceiver to use. The display button allows you to view the options that have been selected (enabled) at the time of purchase.

Step	Action	Display	Remarks
1.	Press 	The option bar at the bottom right of the display indicates the options set for the current channel: 	The six spaces in the option bar contain either an option code or an underscore (_). An underscore indicates that no option has been set.

❑

Dimming the display and indicators

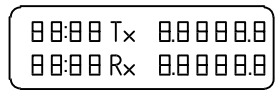
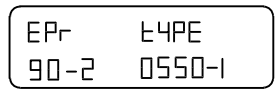
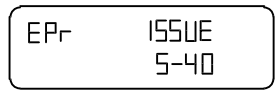
The backlit display and indicators are at maximum brightness when you switch the transceiver on. This procedure explains how to reduce the brightness.

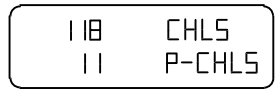
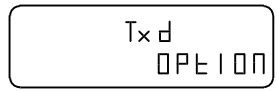
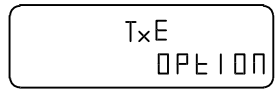
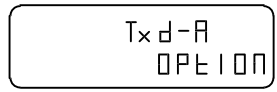
Step	Action	Display	Remarks
1.	Press [Recall] twice within one second		This reduces the brightness of the indicators and dims the display background lighting.
2.	To restore the brightness, press [Recall] twice within one second.		This restores both the display and indicators to their maximum brightness.

❑

Review the EPROM version and options

This procedure allows you to review the EPROM version and some of the options fitted to your transceiver.

Step	Action	Display	Remarks
1.	Ensure your transceiver is switched on.		
2.	Press and hold down Power On'Off	 At three second intervals the display changes:	Displays lamp test—all segments and indicators must be on.
			This shows the Program (EPROM) type number 90-20550-1. Some indicators turn off.
			Program (EPROM) issue number 5.4.

Step	Action	Display	Remarks
2. cont.			The top line shows the number of channels programmed by the factory or agent. This can be up to 151. The second line shows the number of channels programmed by the user. This can be up to 99 or 89 with telephone mode enabled.
		The following displays indicate some of the options fitted to your transceiver:	
			'd' indicates that the transceiver is inhibited from entering transmit frequencies from the front panel.
			'E' indicates that the transceiver is enabled for entering transmit frequencies from the front panel.
			'A' indicates that the transceiver is programmed for use on the amateur band.
			'H' indicates that the transceiver is set for use with an external power amplifier.
3.	Release Power On'Off		This switches off your transceiver.

❑

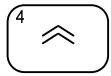
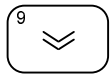
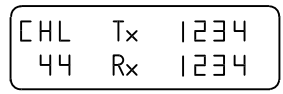
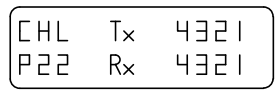
Selecting channels

You can select channels:

- using the Channel Up and Down buttons
- using the Recall button.

Using the Channel Up and Down buttons is simpler when you are changing to an adjacent channel. Using the Recall button is simpler when you are changing channels over a large range. There may be up to 250 channels available.

Using the Channel Up or Down buttons

Step	Action	Display	Remarks
1.	Press  or 	The channel number selected appears in the lower left hand corner of the display, and the transmit and receive frequencies to the right:  Channels you have programmed from the front panel have either an F or P in front of the number: 	Pressing these buttons moves to the next higher or lower channel. Keep the button pressed to move quickly through the channels. For details on F and P channels, see Chapters 6 & 7 respectively.

Using the recall button

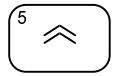
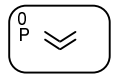
Step	Action	Display	Remarks
1.	Press Recall	rcl Tx 88888 ____ Rx 88888	
2.	If the channel was installed by the factory, press 2 ^ Slow If the channel was installed by you (F or P channels), press 0 P ⌄⌄ and 9 ⌄⌄	rcl Tx 88888 2 Rx 88888 rcl Tx 88888 P9 Rx 88888	This is an example of how to recall channel 2. For details on F and P channels, see Chapters 6 & 7 respectively. This is an example of how to recall channel P9.
3.	Press Enter	CHL Tx 4029 P9 Rx 4029	Recalls the channel you selected (P9 in this example). F numbers must If you enter an incorrect channel, the display shows 'NOT FOUND' and reverts to the next lowest programmed channel.

❑

Adjusting the volume

When the mute is on, pressing any of the volume control buttons opens the mute for approximately one second. This allows you to hear the background noise and helps you to select the correct level.

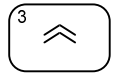
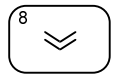
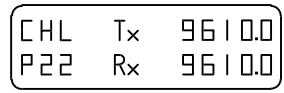
When you switch your transceiver on, the volume level is at the last used setting.

Step	Action	Display	Remarks
1.	To increase the volume, press  To decrease the volume, press 		You hear a 'pip' when the volume control has reached its operating limit.

❑

Using the clarifier

The clarifier buttons raise or lower the frequency in steps of 10 Hz. This allows you to fine tune the transceiver to obtain the best clarity for received voice calls.

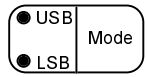
Step	Action	Display	Remarks
1.	Press  or 		Try both buttons to obtain the best clarity. You hear a 'pip' when the clarifier control has reached its operating limit. The clarifier resets to the mid range when you change channels or switch off.

❑

Changing the operating mode (USB–LSB)

Your transceiver has the facility to operate in either Upper Side Band (USB) or Lower Side Band (LSB) mode.

Unless otherwise advised, your transceiver is normally programmed to operate in the USB mode.

Step	Action	Display	Remarks
1.	To switch between USB or LSB, press 		Either the USB or LSB indicator turns on.

❑

Using the mute controls

There are two mute controls that inhibit background noise until a signal is received:

- Mute On'Off—inhibits background noise until a voice signal is received
- S'call Mute—inhibits background noise until your transceiver is selectively called.

Voice mute

Step	Action	Display	Remarks
1.	To switch mute on or off, press Mute On'Off		The indicator is on when mute is on. Mute inhibits background noise until a voice call is received.

Selective call mute

Step	Action	Display	Remarks
1.	To switch selective call mute on, press S'call Mute To switch selective call mute off, press Mute On'Off		The indicator is on when selective call mute is on. Selective call mute inhibits background noise until a selective call is received.

❑

Tuning the antenna

Before using the selected channel, the antenna must be tuned to the transmission frequency. The procedure used to tune the antenna depends upon the type of antenna you are using. This may be:

- an automatic tuning whip antenna
- a multi-frequency tapped whip antenna
- manual antenna tuner with antenna
- automatic antenna tuner with antenna.

The transceiver also has an auto tune facility which automatically tunes the antenna when you make a beacon, selective or emergency call. No message is displayed if auto tuning is successful. If auto tuning fails, the message 'tUNE FAIL' is displayed but the transceiver still makes the call.

Automatic tuning whip antenna

☞ For details, refer to your antenna handbook.

Step	Action	Display	Remarks
1.	Select the required channel.		See *Selecting channels* on page 4-10.

Step	Action	Display	Remarks
2.	Press Tune	If tuning was successful: TUNE PASS	The Tx indicator turns on. You hear 'pips' while the antenna is tuning (this can take a few seconds). Once tuned successfully you hear two high pitched 'pips'.
		If tuning was unsuccessful: TUNE FAIL	You hear two low pitched tones.

Multi-frequency tapped whip antenna

☛ For details, refer to your antenna handbook.

Step	Action	Display	Remarks
1.	Select the correct tap on the antenna to match the transmit frequency.		The antenna either has the frequency printed next to the tap or a number that corresponds to a frequency on the list supplied with the antenna.

Manual antenna tuner with antenna

For details, refer to your antenna tuner handbook.

Step	Action	Display	Remarks
1.	Select the required channel.		See *Selecting channels* on page 4-10.
2.	Press and hold down Tune while adjusting the antenna tuner.		

Automatic antenna tuner with antenna

There are two models of Codan automatic antenna tuners: the 4203 and the 9103. Only the 4203 displays messages on the transceiver.

For details, refer to your antenna tuner handbook.

Step	Action	Display	Remarks
1.	Select the required channel.		See *Selecting channels* on page 4-10.

Step	Action	Display	Remarks
2.	Press Tune	If tuning on model 4203 was successful: TUNE PASS	The Tx indicator is on. You hear 'pips' while the antenna is tuning (this can take a few seconds). Once tuned successfully, you hear two high pitched 'pips'.
		If tuning on model 4203 was unsuccessful: TUNE FAIL	You hear two low pitched tones.
		For the 9103, the display is unchanged throughout this procedure.	

❑

Tune receive only mode

Your transceiver can be tuned to receive frequencies in the range 0.25 MHz to 30 MHz.

Due to internally generated signals, it is difficult to receive on and near frequencies 6599, 9998, 13199, 19

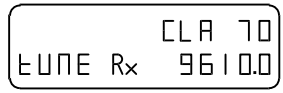
While you are in tune receive mode you cannot receive selective calls or tone calls.

If the transceiver is used with an automatic antenna tuning system, press the Tune button to improve reception. If the transceiver is used with a manual tuner, set the tuner controls to the Scan settings. This is also recommended for transmit inhibit channels.

The procedures below cover the two methods of changing the receiver frequency, and how to store a receive only frequency:

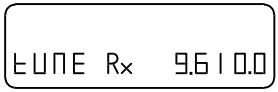
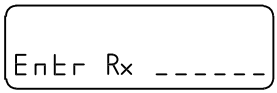
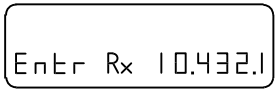
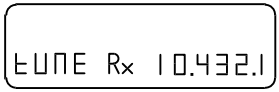
- using the Tune Rx Frequency ⩓ or ⩔ button (for small changes in frequency)
- selecting the desired frequency (for large changes in frequency)
- storing a tuned receive only frequency.

Using the Tune Rx Frequency ⩓ or ⩔ button

Step	Action	Display	Remarks
1.	Press and hold down any Tune Rx Frequency button.		The display scrolls through the numbers until you release the button. Use the Fast buttons for coarse tuning (1 kHz steps) and the Slow buttons for medium tuning (100 Hz steps). For fine tuning, use the Clarifier ⩓ and ⩔ buttons to make adjustment in 10 Hz steps.
2.	To exit this mode, press the Channel ⩓ or ⩔ button, the Display button, or the PTT button on the microphone.		

Selecting the desired frequency

This procedure allows you to select a frequency. Once you have selected a frequency, you can store the frequency as a P-channel or exit this facility.

Step	Action	Display	Remarks
1.	Press any Tune Rx Frequency button.		The display shows the last selected channel.
2.	Press Enter		Your next action must start within 60 seconds.
3.	Enter the frequency number using the numeric buttons.		The decimal point is automatically inserted. This shows the example of typing in 104321.
4.	Press Enter If required, fine tune reception using the Tune Rx Frequency buttons.		The transceiver now receives this frequency. After pressing the

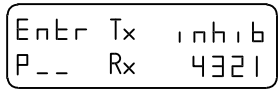
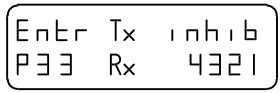
Step	Action	Display	Remarks
5.	If you wish to store this selection as a P-channel, see *Storing a tuned receive only frequency* on page 4-24.		
6.	To exit this mode, press the Channel ⋀⋀ or ⋁⋁ button, the Display button, or the PTT button on the microphone.		

Storing a tuned receive only frequency

You can store a tuned receive only frequency as a personal channel number in the range P1 to P99. You can then select this frequency using the procedure described in *Selecting channels* on page 4-10.

To store a tuned receive only frequency, the transceiver must be in tune receive only mode.

☛ See *Selecting the desired frequency* on page 4-22.

Step	Action	Display	Remarks
1.	Press the Enter button twice in rapid succession. Enter		
2.	Use the numeric buttons to enter your channel number between 1 and 99.		The P is automatically inserted. This is an example for number P33.
3.	Press Enter		The frequency is now stored as channel P33. The transceiver returns to normal operating mode.

❑

Transmitting

It is important when transmitting to use the microphone to its best advantage. By following the notes under *Using the microphone* you will obtain the best transmitting results. This section covers two topics:

- using the microphone
- transmitting a message.

Using the microphone

To connect the microphone to the transceiver, push the microphone plug gently into the microphone socket and fasten the locking ring finger tight. Do not over-tighten.

When using the microphone:

- hold the microphone side-on and close to your mouth
- press and hold down the PTT (press to talk) button
- at the start of transmission state the call sign of the person you are calling and your own call sign
- speak clearly at normal volume and rate
- do not use abusive language, remember others may be listening to your conversation and it can offend
- say the word 'over' to indicate you have finished speaking and release the PTT button.

The transceiver has a timeout facility that stops the transmission after a pre-set period. This prevents problems occurring if you have jammed the PTT button down.

To change the timeout period see *Changing the set-up options*, Chapter 12.

Transmitting a message

Step	Action	Display	Remarks
1.	Select a channel for transmission.	The display shows the channel number and the transmit (Tx) and receive (Rx) frequencies.	See *Selecting channels* on page 4-10.
2.	Check the display to see if the channel transmit frequency is enabled.	CHL Tx 4321 P22 Rx 4321 If the display shows 'inhib', the channel frequency is for receive only purposes: CHL Tx inhib P15 Rx 3600	If the channel is enabled, continue with step 3. If not and the display shows 'inhib', you will have to select another channel on which to transmit.
3.	Tune the antenna.		See *Tuning the antenna* on page 4-16.
4.	Listen and check that the channel is free from traffic.		
5.	Press the PTT button on the microphone and start talking.		The Tx indicator flashes during transmission.

❑

5. Using selective call

Selective call allows you to call an individual transceiver or a group of transceivers. This can be likened to a normal telephone system where the called station has a unique calling address or number.

Selective call also allows you to call a group of stations.

Each transceiver has its own identification number. The identification number is a four digit code that is either:

- programmed into the transceiver using the front panel buttons
- pre-set at the factory.

The selective call feature operates by the transmission and reception of coded signals. These signals contain the identification number of the transceiver being called (the called address) and the number of the transceiver making the call (the self-identification).

All 8528 International transceivers can make and receive selective calls.

The displays in the procedures show examples of channel and frequency numbers. In each procedure select your own channel and frequency numbers as appropriate.

Selective call terms

The following selective call terms are used:

This term…	Means…
Beacon call	A call used to check signal conditions.
Called address	The four digit identification number of the transceiver being called.
Decoding	Receiving and translating the encoded message.
Encode	The translation of the identification number and instructions into a coded message for transmission.
Group call	A call to all transceivers within a selected group. For example, a call using the identification address 0200 (group call) is received by all transceivers whose identification address falls in the two hundred digit range (0201 to 0299).
Preamble	Part of the coded selective call message structure which is transmitted when you press the Call button. The message contains the preamble tone which precedes the called address and the self-identification address codes.
Programming	Setting up the identification addresses in the transceiver.

This term…	Means…
Revertive Signal	A signal automatically transmitted back from the receiving transceiver to indicate message received and decoded satisfactorily. This signal is not transmitted for group calls.
Selective beacon call	A call used to check signal conditions to a selected station.
Selective call encode only	The transceiver can only transmit a selective call (cannot receive). There are two operating conditions that apply: • front panel entry • pre-set controls.
Selective call encode/ decode	The transceiver can transmit and receive a selective call. There are two operating conditions that apply: • front panel entry • pre-set controls.
Selective call lockout	Selective call lockout prevents the user from transmitting a selective or beacon call if the transceiver detects that another station is making a call. This reduces call interference between stations and increases the chance of success when the selective or beacon call is transmitted. Selective call lockout does not apply to emergency calls.

This term…	Means…
Self-identification	The four digit identification number of the calling transceiver.
Station	The location of a transceiver, either mobile or fixed based.

Setting up selective call

Before you make a selective call, you need to set up:

- the preamble time period
- the called address
- the self-identification address
- selective call lockout on/off
- beacon mode on/off.

You may cancel the set-up procedure at any time by switching the transceiver off (press the Power On/Off button). Switching the transceiver off stores any changes you have made to these settings.

Once you have started a procedure, skip through unwanted features by repeatedly pressing the Call button. In each step you must enter information within 60 seconds of pressing the Enter button, otherwise the transceiver reverts back to normal mode.

Do not use identification addresses ending in ‘00’ and ‘99’ as they are used for the group call and beacon facilities.

Setting the preamble time period

A long preamble is required when scanning selective calls. The reason for a long preamble is that during scanning the preamble has to be present throughout the time it takes to scan all eight selective call channels.

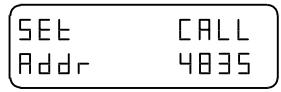
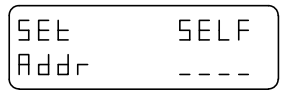
Step	Action	Display	Remarks
1.	Ensure your transceiver is switched off.		
2.	Press and hold down Call and press Power On'Off	SEt CALL LONG	Hold the Call button down for three seconds. This turns on the transceiver in preamble set-up mode.
3.	Press any numeric button to set the preamble length.	SEt CALL LONG or SEt CALL Short	Pressing a numeric button switches between a long and short preamble.
4.	Press Enter	SEt CALL Addr ____	This completes the setting.

Setting the fixed called address

You can enter the called address by:

- using the procedure below (fixes the called address so that it is not easily changed)
- using the procedure on page 5-16, *Transmitting a selective call*, (Open access selective call) which allows the address to be entered from the front panel making it easy to change the called address.

Setting a fixed called address changes the operation of the Call button—pressing the Call button automatically sends the programmed address. Open access selective calling is disabled.

Step	Action	Display	Remarks
5.	Use the numeric buttons to enter the called address.		You can override an existing address by entering a new number. To delete an address, enter four zeros.
6.	Press Enter		This completes the setting. The next step must be completed within 60 seconds.

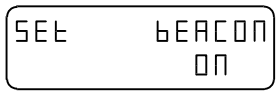
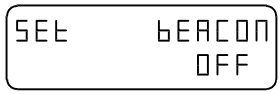
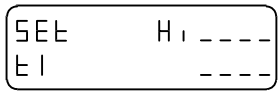
Setting the self-identification address

Step	Action	Display	Remarks
7.	Use the numeric buttons to enter the self-identification address.	SEt SELF Addr 4012	You can override an existing address by entering a new number. To delete an address, enter four zeros.
8.	Press Enter	SEt LocOut OFF	This completes the setting. The next step must be completed within 60 seconds.

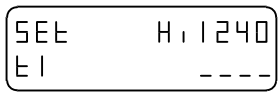
Enabling or disabling selective call lockout

Step	Action	Display	Remarks
9.	Press any numeric button if you want to change the on/off setting for selective call lockout.	Changes to: SEt LocOut On or SEt LocOut OFF	Selective call lockout prevents the user from transmitting a selective or beacon call if the transceiver detects that another station is making a call.
10.	Press Enter	SEt bEACON OFF	This completes the setting. The next step must be completed within 60 seconds.

Enabling or disabling beacon mode

Step	Action	Display	Remarks
11.	Press any numeric button if you want to change the on/off setting for beacon mode.	Changes to:  or  	For details, see *Using the beacon feature* on page 5-29.
12.	Press Enter	 	This completes the setting. For more information on tone calling, see *Using the tone call mode* in Chapter 8.

Setting tone calls

Step	Action	Display	Remarks
13.	No action.	 	This procedure is covered in *Setting up tone call* in Chapter 8.
14.	Press Power On'Off		This turns your transceiver off and registers all the new selective call settings.

❑

Checking if a channel is enabled for selective call

A channel must be enabled for the selective call facility to operate.

If the channel you wish to use has not been enabled, see *Enabling a channel for selective call* on page 5-13.

Step	Action	Display	Remarks
1.	Press and hold down Display	CHL OPTION 88 S__U__	An S in the left hand position of the options bar indicates that the channel is enabled for selective calling.
2.	Release Display	The original display returns in one second.	

Selective call mute enable or inhibit

This procedure enables or inhibits the operation of the S'call Mute button. When S'call Mute is inhibited, you cannot operate selective call mute.

Step	Action	Display	Remarks
1.	Turn the transceiver off and move the front panel link to position 1.		Before moving the link, note its position. See *Changing the position of the front panel link* in Chapter 12.
2.	Press and hold down S'call Mute and press Power On'Off	Hold down the S'call Mute button until the display shows: SEt S-CALL EnAbLE	
3.	To change the enable/inhibit setting, press S'call Mute	SEt S-CALL inhib	
4.	Press Power On'Off		The transceiver is now switched off.

Step	Action	Display	Remarks
5.	Return the front panel link to its original position (E or F).		See *Changing the position of the front panel link* in Chapter 12.
6.	Replace the cover before switching on your transceiver.		

❑

Enabling a channel for selective call

This procedure enables an existing programmed channel for selective calling. It achieves this by copying an existing programmed channel to a P-channel.

This procedure is similar to *Enabling a channel for tone calling* in Chapter 8.

The displays in the procedures show examples of channel and frequency numbers.

Step	Action	Display	Remarks
1.	Use the Recall or Channel ⌃⌃ and ⌄⌄ buttons to find the channel you wish to enable.	CHL Tx 4321 29 Rx 4321	This is an example for channel 29. See *Selecting channels* in Chapter 4.
2.	Press Enter	Entr Tx ------ 29 Rx 4321	You hear a 'pip'.
3.	Press Enter	Entr Tx ------ 29 Rx 4321	You hear a 'pip'.
4.	Press Enter	Entr OPTION 29 ---U--	You hear a 'pip'. The display shows the options for the chosen channel.

Step	Action	Display	Remarks
5.	Press Call repeatedly until an S appears in the left hand position of the options bar.	Entr OPTION 29 S__U__	You hear a 'pip'.
6.	Press Enter	Entr Tx 4321 P__ Rx 4321	You hear a 'pip'.
7.	Use the numeric buttons to enter the 'P' channel number you wish to use.	Entr Tx 4321 P2 Rx 4321	The display automatically inserts a 'P' before the number.
8.	Press Enter	CHL Tx 4321 P2 Rx 4321 If the channel is already used, the display shows: Entr Tx 4321 USEd Rx 4321	

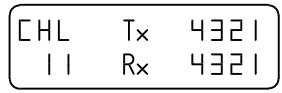
Step	Action	Display	Remarks
9.	If the channel is already used, enter another number or press the Enter button again to override the existing one.	The display reverts back to normal.	The information is either stored under an existing channel number, or you have created a new one.

❑

Transmitting a selective call

For selective call to operate you must have set your self-identification number.

See *Setting the self-identification address* on page 5-8.

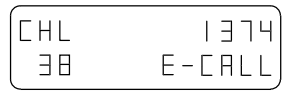
Step	Action	Display	Remarks
1.	Select the channel.		Ensure the channel is enabled for selective calls. Press the Display button to view the enabled options. If you need to enable the channel, see *Enabling a channel for selective call* on page 5-13.
2.	Press  to turn mute off.		The indicator turns off and you hear background noise.

Step	Action	Display	Remarks
3.	Press Call	CHL 11 CALL 1374	The screen displays the 4-digit address of the station you last called on this channel (1374 in this example). No address is displayed if this channel has never been used for making selective calls. If the address is correct, go to step 5.
4.	Use the numeric buttons to enter the address of the station you want to call.	CHL 11 CALL 1144	In this example, you are calling station 1144.
5.	Tune the antenna.		See *Tuning the antenna* in Chapter 4.
6.	Check that the channel is free from traffic.		Listen for approximately 10 seconds to ensure the channel is free. If the channel is busy, wait until the channel is free or try another channel.

Step	Action	Display	Remarks
7.	Press Call	If selective call lockout is on and another station is making a call: CALL LocOut bUSY	You hear two 'beeps' if the call fails because another station is making a call. Wait until the channel is free and try again. When the call starts, the Tx indicator turns on and you hear a 'warbling' sound for approximately 10 seconds.
8.	If the call is successful, you hear the short tones of the revertive signal after a few seconds.	CHL Tx 4321 11 Rx 4321	You hear nothing if this is a group call. You can now speak to the other station.

❑

Receiving a selective call

Step	Action	Display	Remarks
1.	No action—the transceiver automatically completes this event.	 When you receive a call, the display changes to show you the self-identification address of the calling station.	When you receive a call, tones are heard. You hear a series of three telephone rings for selective calls, and 16 short 'beeps' for group calls.
			If the incoming call is an emergency call (a special type of selective call) the display shows 'E-CALL'.

On receiving a call you can:

- answer it immediately (see *Answering a received call* on page 5-21)
- let the transceiver automatically store the caller's self identification number in memory to await your reply (see *Returning a received call* on page 5-22).

If your transceiver was unattended at the time the selective call was received, the caller's self identification number is stored in memory for you to review later.

See *Reviewing the list of received calls in memory* on page 5-24.

If you do not answer the call immediately, the call is stored in memory and the transceiver continues to emit a ‘pip’ every four seconds to indicate that a call has been received. If you wish to silence these ‘pips’, yet still retain the display, press the Display button.

If you only wish to receive selective calls, ensure that the S'call Mute button has been pressed to turn on selective call mute (button indicator on).

If the microphone PTT button is not pressed before the end of the tones:

- the called display remains on to indicate that a call was received
- a ‘pip’ is heard every four seconds
- the external alarm relay contacts close for approximately two minutes (see *Using the external alarm feature* on page 5-34).

❑

Answering a received call

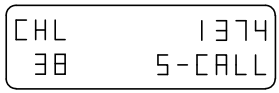
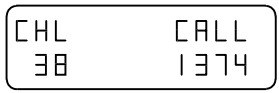
Use this procedure to answer a call while the transceiver is still producing the ringing tone.

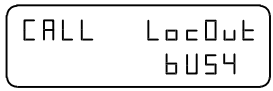
Step	Action	Display	Remarks
1.	No action.		The display shows the channel number and the identification address of the caller.
2.	Press the microphone PTT button twice.	The display either reverts back to the normal display or shows the details of the next (if any) unanswered call.	The first press of the PTT button cancels the call and the selective call mute. The second press of the PTT button allows you to transmit to the caller. Proceed to use the transceiver in the normal way.

❑

Returning a received call

Use this procedure to return a call that has been stored in the memory stack.

Step	Action	Display	Remarks
1.	Select the call you wish to return. If necessary, tune the antenna.		The display shows the channel number and the identification address of the caller. See *Reviewing the list of received calls in memory* on page 5-24.
2.	Press Call		The transceiver automatically selects the correct channel. The call details are deleted from memory, but the transceiver is ready to transmit.

Step	Action	Display	Remarks
3.	Check that the channel is free from traffic, then press Call	The display shows the details of the next unanswered call. If selective call lockout is on and another station is making a call: 	You hear two 'beeps' if the call fails because another station is making a call. Wait until the channel is free and try again. When the call starts, the Tx indicator turns on. The transceiver sends a selective call to the station that sent you the selective or emergency call. The caller details are deleted when you press the PTT button on the microphone.

❑

Reviewing the list of received calls in memory

Your transceiver can record up to 10 calls in memory from various stations. These may be on different channels if your transceiver is in scan mode.

Calls are recorded in a memory stack awaiting your review. If a station calls more than once on the same channel, your transceiver only records one call for all selective calls made and one call for all emergency calls made.

If more than 10 calls are made to your transceiver, the first stored call is deleted to make room for the latest call. Selective calls are deleted in preference to emergency calls.

Ensure your transceiver is not in scan mode before starting this procedure.

A permanent or brief loss of power to your transceiver will delete information stored in memory. Ensure you record or use all the information stored in the memory stack before switching off the transceiver.

If the transceiver power is lost momentarily (such as when starting the vehicle engine), the call memory is retained but the number is lost.

Switching the transceiver off using the Power On'Off button deletes all calls stored in the memory stack.

To review the list of received calls held in the memory, you can:

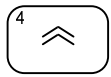
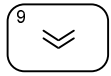
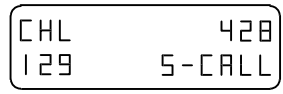
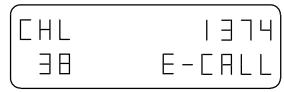
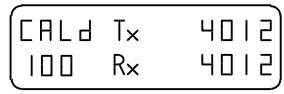
- use the Display button to review all calls in the memory
- use the Recall button to recall the called channel.

Reviewing calls held in memory

This procedure reviews all calls held in the memory in the order received. Ensure the transceiver is not in scan mode when reviewing the list of selective calls received.

If no calls have been made to your transceiver, the display continues to show both the channel and frequency numbers.

Step	Action	Display	Remarks
1.	No action.	If on the same channel used to call you (shows 'CALLEd'): CHL 428 129 CALLEd If scanning and not on the same channel used to call you (shows 'CALd'): CALd Tx 4012 100 Rx 4012	The last call recorded is shown.
2.	To view the calls held in memory, press Display twice within one second.	CHL 1374 38 S-CALL	The first station to call is displayed first. The display shows the caller's identification code (1374) and the channel used (38).

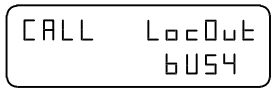
Step	Action	Display	Remarks
3.	To scroll up the list of received calls, press  To scroll down the list of received calls, press 	 	Example of a selective call from station 428 on channel 129. Example of an emergency call from station 1374 on channel 38.
4.	To return a call, see *Returning a received call* on page 5-22.		
5.	To delete a call, press the PTT button on the microphone.	The display shows the next caller's details.	When you press the PTT button, the identification number in the display is deleted from memory. You can then select, call or clear the remainder of the calls from memory.
6.	If you do not clear all the calls, the display shows 'CALd' until memory is empty.		

Step	Action	Display	Remarks
7.	Press Display	The standard display is shown.	This returns the transceiver to normal operation.

Recalling calls held in memory

Ensure the transceiver is not in scan mode when recalling a selective call held in memory.

Step	Action	Display	Remarks
1.	No action.	CALd Tx 4012 10 Rx 4012	
2.	Press Recall	rcl Tx 4012 ____ Rx 4012	
	then within one second, press Call	CHL 1374 100 CALLEd	Example of a selective call received from station 1374.

Step	Action	Display	Remarks
3.	Check that the channel is free from traffic, then press Call	The display shows the details of the next unanswered call. If selective call lockout is on and another station is making a call: 	You hear two 'beeps' if the call fails because another station is making a call. Wait until the channel is free and try again. When the call starts, the Tx indicator turns on. The transceiver sends a selective call to the station that sent you the selective or emergency call.
4.	Once the recalled channel has been cleared, repeat steps 2 and 3 to recall other calls held in memory.		

❑

Using the beacon feature

The beacon facility is used to check signal conditions between two transceivers fitted with selective call.

The beacon facility has two modes of operation:

- selective beacon mode
- base station (99) beacon mode.

A beacon signal consists of four long tones. Self-identification addresses ending in 99 should be avoided.

No alarm or call is recorded at the receiving transceiver, only the Tx indicator flashes.

If the receiving transceiver is in scan mode, scanning starts again immediately.

Normal selective call operation is not affected.

Selective beacon mode

With the beacon facility enabled on a transceiver, the transceiver transmits a beacon signal on receipt of a selective beacon call from another transceiver.

Both transceivers must be on the same channel, or the receiver of the selective beacon call must be scanning through the same channel.

Step	Action	Display	Remarks
1.	Ensure your transceiver is switched on.	The last channel selected is displayed.	
2.	Select the required test channel and tune the antenna.		See *Selecting channels* in Chapter 4.
3.	Press 		When this button is pressed, selective call mute is automatically switched off.
4.	Use the numeric buttons to enter the required selective call address number.		This allows you to send a selective call to a station whose address number is 1374.
5.	Check that the channel is free from traffic.		Listen for approximately 10 seconds to ensure the channel is free. If the channel is busy, wait until the channel is free or try another channel.

Step	Action	Display	Remarks
6.	Press Tune (beacon call button)	If selective call lockout is on and another station is making a call: CALL LocOut 6054	You hear two 'beeps' if the call fails because another station is making a call. Wait until the channel is free and try again. When the call starts, the Tx indicator turns on and you hear a 'warbling' sound for approximately 10 seconds.
7.	If the call is successful, you hear four long revertive tones.	CHL 6EACON 129 1374 Immediately the call ends, the display shows the last channel and transmit & receive frequencies used.	Compare the signal strength of these tones with those of other channels. Use the channel which had the strongest revertive tones.

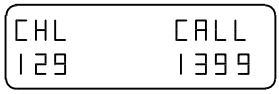
(99) beacon mode

The 99 beacon mode is recommended for use in base station applications and for those transceivers that use selective call but do not have the beacon mode facility.

With a base station enabled for beacon mode, the transceiver transmits a beacon signal on receipt of a selective call ending in 99.

The thousand and hundred digits of the address must be the same for both the beacon transmitting and receiving stations.

If mobile transceivers have beacon enabled, the first two digits of each mobile transceiver's self-identification address should be different so that they do not all transmit a beacon response together.

Step	Action	Display	Remarks
1.	Ensure your transceiver is switched on.	The last channel selected is displayed.	
2.	Select the required test channel and tune the antenna.		See *Selecting channels* in Chapter 4.
3.	Press [Call]		When this button is pressed, selective call mute is automatically switched off.
4.	Use the numeric buttons to enter the required selective call number. Use the first two digits of the stations self identification number and ensure the last two are 99.		This sends a signal to the base station enabled for beacon call, whose four digit self ident address begins with 13.

Step	Action	Display	Remarks
5.	Check that the channel is free from traffic.		Listen for approximately 10 seconds to ensure the channel is free. If the channel is busy, wait until the channel is free or try another channel.
6.	Press Call (beacon call button)	If selective call lockout is on and another station is making a call: CALL LocOut 6054	You hear two 'beeps' if the call fails because another station is making a call. Wait until the channel is free and try again. When the call starts, the Tx indicator turns on and you hear a 'warbling' sound for approximately 10 seconds.
7.	If the call is successful, you hear four long revertive tones.	CHL CALL 129 1399 Immediately the call ends, the display shows the last channel and transmit & receive frequencies used.	Compare the signal strength of these tones with those of other channels. Use the channel which had the strongest revertive tones.

❑

Using the external alarm feature

An external alarm facility is available through the external alarm socket on the rear panel (see Figure 2.3).

A pair of relay contacts are wired to the socket. These contacts can be used to operate an alarm bell or buzzer when a selective or emergency call is received. The alarm is continuous for selective calls and pulses on and off at a half second rate for emergency calls.

The relay contacts:

- have a rating of 50V DC, 1 Amp
- use pins 2 and 3 for the plug connections.

For further details on the socket, see Chapter 14.

These contacts must not be used to switch voltages greater than 50V, or loads that draw more than 1 Amp.

Testing the selective call functions

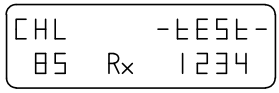
This is a special test mode which is not required for normal operations.

In this mode, the transceiver displays how it decodes and processes selective calls. It displays the addresses to which each selective call was sent and the self identification of the calling station.

No called alarms or revertives are generated unless the selective call is for your station. A revertive is a signal transmitted back from the receiving transceiver to indicate message received and decoded satisfactorily.

Ensure your transceiver is switched off before entering this mode.

Step	Action	Display	Remarks
1.	Press and hold down 2 Slow and press Power On'Off		Do not hold down the Power On'Off button, just the Slow button for five seconds.
2.	Press S'call Mute within 10 seconds of releasing 2 Slow	CHL 85 S-CALL _TEST_	

Step	Action	Display	Remarks
3.	No action.	After five seconds the display changes: 	The display only changes when a selective call is received.
4.	No action.		When a selective call is received, the display shows the called station identification address and the self identification address.
5.	To exit this mode, press 		You must switch your transceiver off and on again to clear this mode.

❑

6. Using the receiver in scan mode

In receiver scan mode your transceiver listens on selected channels for transmitted signals. Once a signal has been detected, the transceiver holds that channel for a pre-selected time before continuing the scan. This is determined at set-up.

In normal operating conditions, a maximum of 15 channels can be programmed to be scanned in sequence for audio (voice) signals. A maximum of eight selective call channels can also be included but must be programmed within the first eight entries.

The scanning facilities can only be used with a suitable antenna system. For land based installation, you need a broadband antenna. For mobile installations, you need a Codan automatic tuning whip antenna.

When scanning starts, the transceiver tunes the mobile auto whip antenna to an optimal position for all the channels in the scan program. This scan tuning minimises the time to tune the antenna to one of the scan channels when a call is received on that channel and a revertive signal needs to be sent.

It is assumed that before you use any of the procedures in this chapter, you have turned on the transceiver.

The displays in the procedures show examples of channel and frequency numbers. In each procedure select your own channel and frequency numbers as appropriate.

Scan mode terms

The following abbreviations are shown in the displays:

F	Frequency
L	Lower side band
LU	Lower and upper side band
U	Upper side band

Setting up scan mode

The scan program allows your transceiver to scan a selected number of frequencies. Your transceiver can run in normal or auto-scan mode. Auto-scan mode automatically puts the transceiver back into scan after five minutes of inactivity (such as no channel change, PTT, or tune).

These scan facilities have two options:

- Enable—scan programs can be entered and deleted from the front panel
- Inhibit—scan programs cannot be entered or deleted from the front panel.

Step	Action	Display	Remarks
1.	Press and hold down  and press 	Hold down the Scan button until the display shows: 	This turns on the transceiver in scan set-up mode.
2.	Press 		Each press of the Scan button scrolls to the next option. If this is the option you want, go to step 6.
3.	Press 		Switches to Auto option. If this is the option you want, go to step 6.

Step	Action	Display	Remarks
4.	Press Scan Pressing the Scan button again returns you to step 1.	SCAN prog Auto ENABLE	Switches from inhibit to enable. If you select automatic scanning, you can select selective call mute to be enabled as soon as you enter automatic scan mode. If you do not wish to select this option, go to step 6.
5.	Press S'call Mute		The indicator turns on. You have now selected selective call mute to be enabled as soon as you enter automatic scan mode.
6.	Press Power On'Off		The transceiver is now switched off.

❑

Programming the channels to be scanned

In normal operating conditions, a maximum of 15 channels can be programmed to be scanned in sequence for audio (voice) signals. Channels required to operate on a selective call must be programmed within the first eight entries.

Ensure your transceiver is switched on and scan program has been enabled.

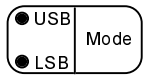
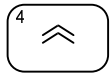
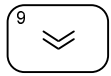
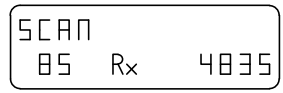
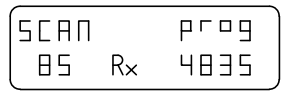
If an error is made, the programming mode must be switched off (follow step 4), and the procedure repeated.

If you try to program more than 15 entries, you hear a single low-pitched tone and the error message 'SCAN FULL' is displayed.

The channel entries can be reviewed while in scan programming mode. Use the channel ^ and v buttons to scroll through the channels. Any channel in the scan program is indicated by 'prog' on the display.

The scan program can be inhibited (see *Setting up scan mode* on page 6-3).

Step	Action	Display	Remarks
1.	Press [Enter] and then [Scan] within one second.	SCAN 85 Rx 4835	The Scan button indicator flashes. All previous channels programmed to be scanned are erased.

Step	Action	Display	Remarks
2.	To select the required mode, press 		Either the USB or LSB indicator turns on.
3.	To select the relevant channel, press  or 		See *Selecting channels* in Chapter 4. Channels required to operate on selective call must be enabled. See *Enabling a channel for selective call* in Chapter 5.
4.	Press 		The channel is programmed for scanning. Repeat this procedure until all channels you want to scan have been programmed.

Step	Action	Display	Remarks
5.	Press  and then  within one second.		The channels you have programmed are now registered within the transceiver.

❑

Receiving in scan mode

This section covers:

- start scanning
- stop scanning
- changing the scan mode
- selective call scanning.

Start scanning

You cannot transmit while the transceiver is in scan mode. If you attempt to transmit, you hear a single ‘pip’ and the error message ‘No Ptt Error’ is displayed.

If you need to transmit, you must stop the scanning operation.

Step	Action	Display	Remarks
1.	Press 	Displays ‘SCAN tUNE’ and performs scan tuning if an auto antenna is connected. The display shows details of each channel as it is scanned.	The Scan button indicator is on during scanning.

Stop scanning

Step	Action	Display	Remarks
1.	Press  or press the microphone PTT button twice.	The display shows the last channel scanned.	The Scan button indicator turns off. If you only press the PTT button once, 'NO PTT Error' is displayed for three seconds.

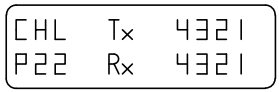
Changing the scan mode

There are three scan mode options which you can select by repeatedly pressing the Mute On'Off button while the transceiver is scanning:

- Continuous scanning—each channel is monitored for one second; scanning continues regardless of any audio signal being detected
- Pause scanning—scanning stops for five seconds when an audio signal is detected
- Hold scanning—scanning stops when an audio signal is detected and continues only when the signal ceases.

Scan modes operate for both voice and selective call reception.

The procedure below assumes that you are starting in Continuous scanning mode.

Step	Action	Display	Remarks
1.	Ensure the transceiver is in Scan mode.	 The display shows the frequencies as they are scanned.	The Scan button indicator is on in all scan modes. See *Receiving in scan mode* on page 6-8 You are in Continuous scanning mode and the Mute On'Off button indicator is off.
2.	To change to Pause scanning mode, press 		You hear a single 'pip' and the Mute On'Off indicator turns on.

Step	Action	Display	Remarks
3.	To change to Hold scanning mode, press 		You hear two ‘pips’ and the Mute On'Off indicator stays on.
4.	To change back to Continuous scanning mode, press 		You hear a single ‘pip’ and the Mute On'Off indicator turns off.

Selective call scanning

If selective call mute is enabled (see *Selective call mute enable or inhibit* in Chapter 5), you can select selective call scanning. In selective call scanning, scanning stops when a selective call for your station is detected.

Selective call scanning ensures that you are only alerted when the incoming calls are addressed to you.

This facility also allows the transceiver to store in memory the addresses of up to ten stations that may have tried to contact the transceiver whilst unattended. These addresses may have been transmitted over any of the programmed channels.

The first eight channels of the scan are used for selective call scanning.

For networks using this facility, it is important for the calling station to transmit a long preamble.

☞ For more details on selective calling, see *Using selective call,* Chapter 5.

The procedure below assumes that you are starting in Continuous scanning mode.

Step	Action	Display	Remarks
1.	Ensure the transceiver is in Scan mode.	CHL Tx 4321 P22 Rx 4321 The display shows the frequencies as they are scanned.	The Scan button indicator is on.
2.	To change to selective call scanning mode, press S'call Mute		On detection of a call, scanning stops to see if the call is for your transceiver.
		If you receive a selective call, the display changes: CHL 428 129 CALLEd	You hear three telephone rings followed by 'pips' every four seconds until you answer the call. Scanning resumes after 2½ minutes if you do not answer the call.
3.	To stop scanning, press Scan	CHL Tx 4321 P22 Rx 4321	The Scan button indicator turns off.

❑

Programming frequency band scan

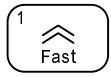
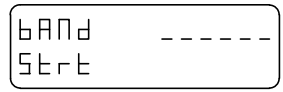
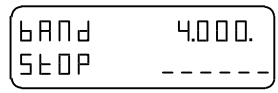
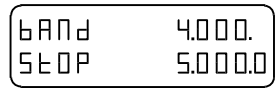
The band scanning facility enables the transceiver to scan between two programmed frequencies. You can program the frequency bands to suit your needs.

Up to 30 bands can be programmed into the transceiver and stored between channels P70 and P99.

There are two rates of scan available, fast and slow:

- fast scanning changes the frequency in ten 1 kHz steps per second
- slow scanning changes the frequency in ten 100 Hz steps per second.

Your transceiver must be switched on before starting this procedure.

Step	Action	Display	Remarks
1.	The following buttons must be pressed within one second. Press  then press any of the Tune Rx Frequency buttons, for example  , then press  	 	The Scan button indicator flashes. The next action must start within 60 seconds.
2.	Using the numeric buttons, enter the start frequency to the nearest 100 Hz.	 	This is an example of selecting a band scan to start at 4000 kHz.
3.	Press  	 	The decimal points are entered automatically.
4.	Enter the stop frequency to the nearest 100 Hz.	 	This is an example of selecting a band scan to stop at 5000 kHz.

Step	Action	Display	Remarks
5.	Press Enter	EntrOPTIONU_S	
6.	Press 2 Slow	EntrOPTIONU_S	'S' indicates the slow rate of scan (100 Hz steps).
	or 1 Fast	EntrOPTIONU_F	'F' indicates the fast rate of scan (1 kHz steps).
7.	If you need to change the sideband, press USB / LSB Mode	EntrOPTIONLU_F	Each press switches between upper side band (U), lower side band (L) and both side bands (LU).
8.	Press Enter	Entr 4000 F__ 5000	
9.	Enter the channel number you have selected.	band 4000 F88 5000 If the display shows either prog 'USEd', 'prog' 'inhib' or 'prog FULL' see the notes below.	Select a number between 70 and 99 (88 in this example). The 'F' is automatically entered.

Step	Action	Display	Remarks
10.	Press Enter	bAnd 4000 F88 5000	The Scan indicator light turns off. The frequency band has been selected. You can repeat the operation until all the channels are full.

If the display shows ‘prog USEd’, either enter another channel number or press the Enter button to overwrite the existing information.

If the display shows ‘prog inhib’, the scan facility is inhibited (see *Changing the set-up options,* Chapter 12).

If the display shows ‘prog FULL’, all 99 user program channels are used. Either press the Enter button to overwrite the existing information, or select a channel that you no longer require and press the Enter button.

For further details on these messages, see *Programming display messages* in Chapter 7.

Scanning frequency bands

The band scanning facility enables the transceiver to scan between two programmed frequencies.

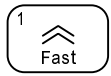
See *Programming frequency band scan* on page 6-13.

There are two rates of scan available, fast and slow:

- fast scanning changes the frequency in ten 1 kHz steps per second
- slow scanning changes the frequency in ten 100 Hz steps per second.

This procedure scans the frequency bands.

Step	Action	Display	Remarks
1.	Select the relevant programmed band scan channel between P70 and P99.		See *Selecting channels* in Chapter 4. Band scan channels are indicated as an 'F' number.
2.	Press Scan	bAnd F88 256789 The display shows the channel number and all the frequencies as the band is scanned continuously.	The Scan indicator turns on.

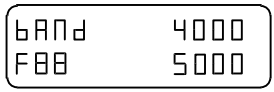
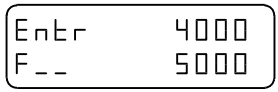
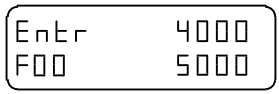
Step	Action	Display	Remarks
3.	To pause the scan, press any fast or slow Tune Rx Frequency button. For example, press 	The display shows the channel number and the current frequency.	To move between the frequencies, use any Tune Rx Frequency button.
4.	To resume scanning, press 	The display shows the channel number and all the frequencies as the band is scanned continuously.	The rate of scan is determined by whether you pressed the fast or slow button in step 3.
5.	To stop scanning, press 		The Scan indicator turns off.
6.	To restart normal scanning, select another non-band scanning channel and press 		See *Selecting channels* in Chapter 4.

❑

Deleting unwanted scan channels

The scan program can be locked to prevent changes being made. If changes are attempted on a locked channel, the display shows ‘prog inhib’.

☛ For details, see *Setting up scan mode* on page 6-3.

Step	Action	Display	Remarks
1.	Select the channel you wish to delete.		This is an example for channel 88. See *Selecting channels* in Chapter 4.
2.	Press Enter		
3.	Press twice 0 P		Two ‘0’s entered as a channel number deletes the information in the selected channel.
4.	Press Enter	The display shows the details of the next lowest channel.	

❑

7. Programming channels

Generally transceivers are supplied with an in-built facility (option TXD—Transmit Disabled), which prevents you from programming or changing transmit frequencies from the front panel. Under special circumstances, and where local licensing authorities permit, you may fit option TXE (Transmit Enable) which allows you to create or change the transmit frequencies of your transceiver.

Your transceiver can store up to 250 channels. A maximum of 151 transmit and receive channels can be pre-programmed by the factory or a Codan agent. The remaining 99 programmable channels (P-channels) can be set by you from the front panel.

Pre-programmed channels may be copied as P-channels and have their options modified, such as:

- S—selective call
- t—2-tone calls (four 2-tone calls)
- Upper Side Band (USB) or Lower Side Band (LSB).

The factory or agent programmed channels are stored in memory and can only be reprogrammed or deleted by the factory or agent. You can only create or change transmit frequencies if your transceiver has option TXE fitted.

P-channels are stored in memory but you can reprogram or delete them at any time.

The displays in the procedures show examples of channel and frequency numbers. In each procedure select your own channel and frequency numbers as appropriate.

Setting up the P-channel inhibit options

The programmable channel feature (P-channel) that you program from the front panel of the transceiver, has four inhibit options. Each option places different restrictions on the operator to prevent interference to the programmed channels.

The four options are:

- No inhibit (No inhib)—allows you to overwrite or delete P-channels from the front panel
- Standard inhibit (Std inhib)—inhibits you from overwriting and deleting P-channels, but allows you to program new P-channels
- Full inhibit (FULL inhib)—prevents the Enter button from working (which inhibits all P-channel programming) and the Tune Rx Frequency buttons are disabled
- Total inhibit (tOtAL inhib)—same as Full inhibit, plus the transmit and receive frequencies are not displayed.

Apart from 'No inhibit', the remaining options require an Inhibit link fitted to the microprocessor PCB. For further details, see *Inserting the microprocessor PCB link* in Chapter 12.

This section covers:

- checking if the inhibit link has been fitted to the PCB
- changing the inhibit options.

Checking if the inhibit link is fitted to the PCB

In this mode, all P-channels may be overwritten or deleted from the front panel. This facility is only available when there is no Inhibit link fitted to the microprocessor PCB.

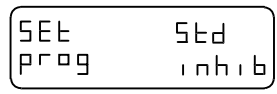
Step	Action	Display	Remarks
1.	Ensure that the transceiver is switched off.		
2.	Press and hold down Enter and press Power On'Off	Hold down the Enter button until the display shows: CHAN No prog inhib If there is an Inhibit link fitted, the display shows whichever inhibit has been selected.	This display confirms that no Inhibit link is fitted to your transceiver. The message means that there are no inhibits on P-channel programming.
3.	Press Power On'Off		The transceiver is now switched off.

Changing the inhibit options

Only qualified technicians should use this procedure.

This mode can only be entered if the Inhibit link is fitted across the number 2 pads on the microprocessor PCB and the front panel link is repositioned.

☛ See Chapter 12, *Inserting the microprocessor PCB link* and *Changing the position of the front panel link.*

Step	Action	Display	Remarks
1.	Turn the transceiver off and move the front panel link to position 1.		Before moving the link, note its position. See *Changing the position of the front panel link* in Chapter 12.
2.	Insert an Inhibit link across the number 2 pads on the microprocessor PCB.		See *Inserting the microprocessor PCB link* in Chapter 12.
3.	Press and hold down Enter and press Power On'Off	Hold the Enter button down until the display shows: 	This display shows your last setting, either 'Std', 'FULL' or 'tOtAL inhib'. Pressing the Enter button scrolls through the available options. If this is the option you want, go to step 6.

Step	Action	Display	Remarks
4.	Press Enter	SEt FULL prog inhib	Pressing the Enter button scrolls through the available options. If this is the option you want, go to step 6.
5.	Press Enter	SEt tOtAL prog inhib	If this is the option you want, go to step 6.
6.	Press Power On'Off		The transceiver is now switched off.
7.	Return the front panel link to its original position (E or F).		See *Changing the position of the front panel link* in Chapter 12. The Inhibit link stays in.
8	Replace the cover before switching on your transceiver.		

❑

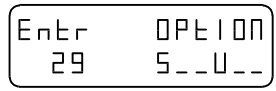
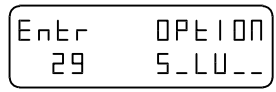
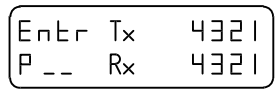
Copying channels to P-channels

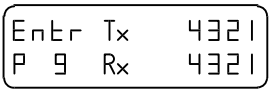
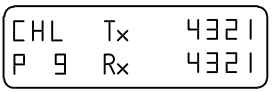
This facility allows you to copy the factory or agent pre-programmed channels already stored in memory and make them P-channels. This allows you to group the most commonly used channels which can save you time searching for them in the main program.

Ensure your transceiver is switched on before starting this procedure.

You need to complete each action within 60 seconds otherwise the procedure automatically aborts without any changes being made.

Step	Action	Display	Remarks
1.	Use the Recall or Channel ⌃ and ⌄ buttons to find the channel you want to copy.	CHL Tx 4321 29 Rx 4321	This is an example for channel 29. See *Selecting channels* in Chapter 4.
2.	Press Enter	Entr Tx ------ 29 Rx 4321	
3.	Press Enter	Entr Tx 4321 29 Rx ------	

Step	Action	Display	Remarks
4.	Press Enter		This allows you to select options.
5.	Press Call if you want to change the S, t1, t2, t3, t4 or blank option setting.		Each press of the button selects the next setting in the sequence: S/t1/t2/t3/t4/blank. Press the button repeatedly until the required option is displayed. See *Option codes in* Chapter 4.
6.	If you need to change the sideband, press USB / LSB Mode		Each press switches between upper side band (U), lower side band (L) and both side bands (LU).
7.	Press Enter		The 'P' is displayed ready for you to enter the channel number.

Step	Action	Display	Remarks
8.	Use the numeric buttons to enter your choice of channel number between 1 and 99.		This is an example for channel P9. If the display shows 'FULL', 'USEd' or 'inhib', see *Programming display messages* on page 7-16. Channels using different transmit and receive frequencies (2-frequency simple
9.	Press Enter		This registers the new channel in your transceiver.

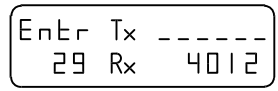
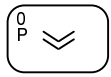
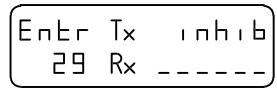
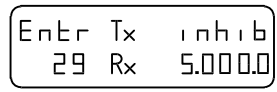
❑

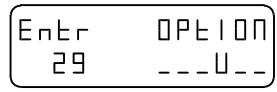
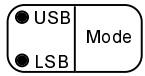
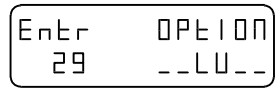
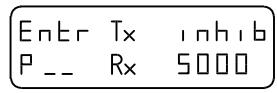
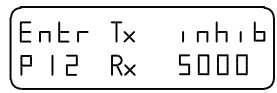
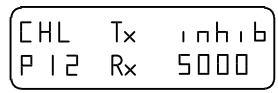
Creating receive only P-channels

All transceivers allow you to create or change the receive P-channels from the front panel.

Ensure your transceiver is switched on before starting this procedure.

You need to complete each action within 60 seconds otherwise the procedure automatically aborts without any changes being made.

Step	Action	Display	Remarks
1.	Press 		
2.	Press 		
3.	Use the numeric buttons to enter the receive frequency.	 If the display shows either the 'too hi' or 'too lo' error message, see *Programming display messages* on page 7-16.	The frequency must be entered to the nearest 100 Hz, between 250 kHz and 30 MHz. The display shows an example of 5 MHz.

Step	Action	Display	Remarks
4.	Press 		Defaults to the last channel setting.
5.	If you need to change the sideband, press 		Each press switches between upper side band (U), lower side band (L) and both side bands (LU).
6.	Press 		This registers the options you selected and allows you to enter a channel number. The 'P' is automatically entered.
7.	Use the numeric buttons to enter your choice of channel number between 1 and 99.		This is an example for channel P12. If the display shows 'FULL', 'USEd' or 'inhib', see *Programming display messages* on page 7-16.
8.	Press 		This registers the new channel in your transceiver. You can now continue with normal transceiver operations.

❑

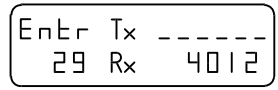
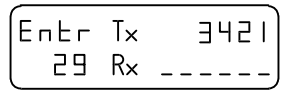
Creating transmit and receive P-channels

All transceivers allow you to create or change the receive P-channels from the front panel.

You can only use this procedure to create or change transmit P-channels from the front panel of your transceiver if it has option TXE fitted. Under special circumstances, and where local licensing authorities permit, option TXE (transmit enable) may be fitted to your transceiver. This option must be requested at the time of purchase.

Ensure your transceiver is switched on before starting this procedure.

You need to complete each action within 60 seconds otherwise the procedure automatically aborts without any changes being made.

Step	Action	Display	Remarks
1.	Press 		
2.	Use the numeric buttons to enter the transmit frequency.		This example is for transmit frequency 3421 kHz. The frequency must be entered to the nearest 100 Hz, between 2 MHz and 24 MHz.

Step	Action	Display	Remarks
3.	Press Enter		
4.	Either use the numeric buttons to enter the receive frequency or press Enter if the receive and transmit frequencies are the same.	Entr Tx 3421 29 Rx 3421 If the display shows either the 'too hi' or 'too lo' error message, see *Programming display messages* on page 7-16.	This example is for receive frequency 3421 kHz. The frequency must be entered to the nearest 100 Hz, between 2 MHz and 24 MHz.
5.	Press Enter	Entr OPTION 29 ___U__	Defaults to the last channel setting.
6.	If you need to change the sideband, press USB / LSB Mode	Entr OPTION 29 __LU__	Each press switches between upper side band (U), lower side band (L) and both side bands (LU).

Step	Action	Display	Remarks
7.	Press Enter	Entr Tx 3421 P__ Rx 3421	This registers the options you selected and allows you to enter a channel number. The 'P' is automatically entered.
8.	Use the numeric buttons to enter your choice of channel number between 1 and 99.	Entr Tx 3421 P12 Rx 3421	This is an example for channel P12. If the display shows 'FULL', 'USEd' or 'inhib', see *Programming display messages* on page 7-16.
9.	Press Enter	Entr Tx 3421 P12 Rx 3421	This registers the new channel in your transceiver. You can now continue with normal transceiver operations.

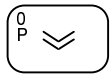
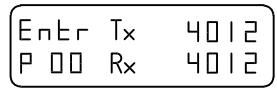
❑

Deleting unwanted P-channels

Ensure your transceiver is switched on before starting this procedure.

You need to complete each action within 60 seconds otherwise the procedure automatically aborts without any changes being made.

Step	Action	Display	Remarks
1.	Use the Recall or Channel ⌃⌃ and ⌄⌄ buttons to find the channel you want to delete.	CHL Tx 4012 P 9 Rx 4012	This is an example for channel P9. See *Selecting channels* in Chapter 4.
2.	Press Enter	Entr Tx ------ P 9 Rx 4012	
3.	Press Enter	Entr OPTION P 9 ---U--	The enter button scrolls through the options.
4.	Press Enter	Entr Tx 4012 P-- Rx 4012	

Step	Action	Display	Remarks
5.	Press twice 		Two zeros entered as a channel number erase the information in that channel.
6.	Press 	The transmit and receive frequencies of the next lowest channel.	If the display shows 'inhib', see *Programming display messages* on page 7-16.

❑

Programming display messages

Whilst programming channels, the display may show the following messages:

- inhibit (‘inhib’)
- used (‘USEd’)
- full (‘FULL’)
- too hi or too low (‘too hi’, ‘too lo’).

Inhibit (‘inhib’)

P-channels can be protected from being accidentally deleted or overwritten by soldering a link on the microprocessor PCB. (See *Inserting the microprocessor PCB link* in Chapter 12.)

If you try to delete or overwrite a channel with the link installed, the display shows ‘inhib’ when you press the Enter button. Try using another channel number to store your selection.

Used (‘USEd’)

If the display shows ‘USEd’, the channel number you selected is already being used and the overwrite protection link is not installed (see *Inhibit*, above). Either enter another channel number or overwrite the existing channel number by pressing the Enter button again.

If the overwrite protection link is not installed, pressing the Enter button again erases the frequency set for this channel number.

Full ('FULL')

If the display shows 'FULL', all 99 P-channels have been used.

If the overwrite protection link is not installed, pressing the Enter button again erases the frequency set for this channel number.

Select a channel number you no longer need, and overwrite that number by pressing the Enter button again.

If the overwrite protection link is installed, it will have to be removed before you can save your new channel selection. (See *Inserting the microprocessor PCB link* in Chapter 12.)

Too high or too low ('too hi' or 'too lo')

If you try to program a frequency outside the range of 250 kHz to 30 MHz, the transceiver displays the error message 'too hi' or 'too lo'. To overcome this problem, reprogram another frequency within the transceivers range.

❑

Setting up temporary channels

During any channel programming operation, copying or creating a P-channel, you can press the Enter button instead of entering a channel number. This creates a temporary channel which is not saved when you switch off the transceiver.

❑

8. Using tone call

The tone call facility provides stations within a network to call (tone encode—TE) or be called (tone decode—TD) by other stations, using the transmission of tones.

Tone calls use two tones (High and Low) transmitted simultaneously to call another station. The tones used must be identical for both the transmitting and receiving transceivers.

The tones fit into two frequency bands, each with a High and Low tone, either 440 Hz or 360 Hz apart. Each of these bands must lie within the frequency range 850 Hz and 1500 Hz.

To receive a tone call your transceiver must have option TD fitted. To transmit a tone call, tone call must be enabled on the selected channel.

You cannot have the automatic tuning antenna (option AD) and 2-tone decoder (option TD) fitted to the same transceiver. Selective call and tone call cannot be enabled on the same channel.

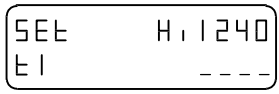
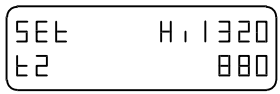
Tones t1 and t2 are given values in the factory. You can override these settings by using the following set-up procedure. To reinstate the original values, either enter '0' frequency or delete the latest channel information.

The displays in the procedures show examples of channel and frequency numbers. In each procedure select your own channel and frequency numbers as appropriate.

Setting up tone call

This procedure is similar to setting up for selective calls. Once in set-up mode, you can skip through the non-important steps by pressing the Enter button.

Step	Action	Display	Remarks
1.	To enter set-up mode, press and hold down [Call] and press [Power On'Off]	SEt CALL LONG	Hold down the Call button for three seconds. This turns on the transceiver in preamble set-up mode.
2.	Press [Enter]	SEt CALL Addr ____	This set-up is not required.
3.	Press [Enter]	SEt SELF Addr ____	This set-up is not required.
4.	Press [Enter]	SEt bEACON ON	This set-up is not required.
5.	Press [Enter]	SEt Hi ____ tI ____	This allows you to enter the tone calling frequencies.

Step	Action	Display	Remarks
6.	Use the numeric buttons to enter the t1 Hi tone frequency.	 If you enter an incorrect frequency, the display shows an error. For details, see *Display messages*, Chapter 13.	Entering a new number overrides an existing frequency. You can set t1, t2, t3 or t4. The t1 & t2 frequencies are pre-set in the factory but you can change these settings. Each tone setting has a high and low frequency.
7.	Press Enter		This sets the new t1 Hi tone frequency and allows you to set the t1 Low tone frequency. You must complete the next step within 60 seconds.
8.	Use the numeric buttons to enter the t1 Low tone frequency.		Entering a new number overrides an existing frequency.
9.	Press Enter		This sets the new t1 Low tone frequency and allows you to set the next tone pair t2. You must complete the next step within 60 seconds.

Step	Action	Display	Remarks
10.	Steps 6 to 9 are repeated by the transceiver for t2, t3 and t4.		The display shows the same as in steps 6 to 9, except for the tone and frequency numbers. When all four tone pairs are recorded, the display returns to the first set-up option.
11.	Press Power On'Off		This turns your transceiver off and registers all the new tone call settings.

❑

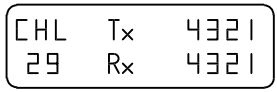
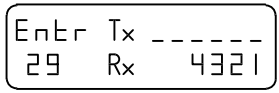
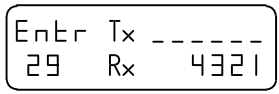
Enabling a channel for tone calling

This procedure enables a channel for tone calling. Initially, you need to select a channel frequency you want to enable, and then choose a tone call pair for that frequency.

You can copy this information into the P-channel program.

This procedure is similar to *Enabling a channel for selective call* in Chapter 5. Once in set-up mode, skip through the non-important steps by pressing the Enter button.

The displays in this section vary depending on the channel you select (ie, the word inhibit may be replaced with a frequency number).

Step	Action	Display	Remarks
1.	Use the Recall or Channel ^^ and vv buttons to find the channel you wish to enable.		This is an example for channel 29. See *Selecting channels* in Chapter 4.
2.	Press Enter		You hear a 'pip'.
3.	Press Enter		You hear a 'pip'.

Step	Action	Display	Remarks
4.	Press Enter	Entr OPTION 29 ___U__	You hear a ‘pip’.
5.	Press Call repeatedly until a ‘t’ and the required tone pair appear in the left hand two spaces of the options bar.	Entr OPTION 29 t1_U__	This is an example for tone pair t1. You hear a ‘pip’.
6.	Press Enter	Entr Tx 4321 P__ Rx 4321	You hear a ‘pip’.
7.	Use the numeric buttons to enter the channel number you wish to use.	Entr Tx 4321 P2 Rx 4321	The display automatically inserts a ‘P’ before the number.

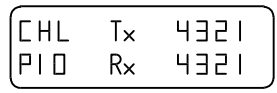
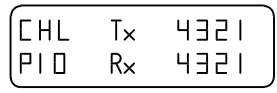
Step	Action	Display	Remarks
8.	Press Enter	CHL Tx 4321 P2 Rx 4321 If the channel is already used: EntEr Tx 4321 USEd Rx 4321	
9.	If the channel is already used, either enter another number or press the Enter button again to override the existing one.	The display reverts back to normal.	The information is either stored under an existing channel number, or you have created a new one.

❑

Using the tone call mode

Before starting this procedure, ensure mute is off (Mute On'Off button indicator off) and the antenna is tuned to the selected frequency.

Transmitting a tone call

Step	Action	Display	Remarks
1.	Use the channel buttons or Recall button to select the channel you wish to use.		Ensure the channel you select is enabled for tone call. To check, press the Display button.
2.	Ensure that the channel is free from traffic.		Listen for approximately 10 seconds.
3.	Press and hold down  for approximately 10 seconds.	If the channel you selected was not enabled: 	When the call starts, you hear a tone and the Tx indicator turns on. You hear a low pitched tone and the call is not transmitted. Try another channel.
4.	Start talking when contact has been established.		

Receiving a tone call

To receive a tone call your transceiver must be fitted with option TD.

Step	Action	Display	Remarks
1.	No action.	On receiving a tone call: CHL TonE 129 CALLEd	You hear two sets of three short ‘pips’ followed by a ‘pip’ every four seconds. You can cancel the ‘pips’ by pressing the microphone PTT button.
2.	Start talking to the caller.		

❑

9. Making a telephone interconnect call

If the base station transceiver is linked to an IPC-500 telephone interconnect unit (Figure 9.1), it can make and receive telephone calls through the public switched telephone network (PSTN).

Using the selective call facility on your outstation transceiver to signal the base station telephone interconnect, you can dial any telephone number of up to 16 digits. The number is sent as part of the selective call signal.

Your outstation transceiver can store up to 10 pre-programmed telephone numbers which can be recalled for 'abbreviated dialling'. Your outstation transceiver can receive a selective call containing a telephone number. This can be stored and reviewed later.

When the telephone mode is enabled, P-channels P90 to P99 are used for storage of telephone numbers with the base station telephone interconnect facility. These channels are no longer available for general use with channel frequencies.

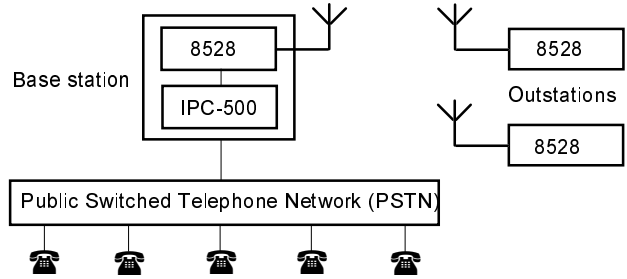
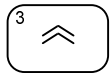
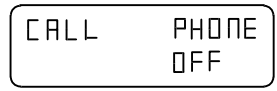
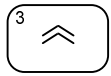
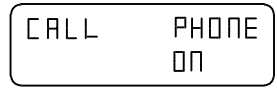


Figure 9.1 Telephone interconnect block diagram

Enabling the telephone mode

You can only make telephone calls from your outstation transceiver if telephone mode is enabled. You can still use all the transceiver's functions while this mode is enabled.

Step	Action	Display	Remarks
1.	To enter phone mode, press and hold down  and press 	Hold down the number 3 button until the display shows: 	This turns on the transceiver in phone set-up mode.
2.	To switch between on and off, press 		Continually pressing the number 3 button switches telephone mode on and off.
3.	Switch the transceiver off at your desired setting, or press 		This sets the telephone mode you require.

❑

Making a telephone call

This procedure makes a telephone call from your outstation transceiver to the base station transceiver IPC-500 system.

Ensure your transceiver is switched on before starting this procedure.

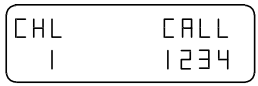
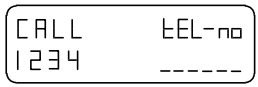
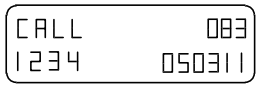
Ensure the antenna is tuned on the selected channel (see *Tuning the antenna* in Chapter 4).

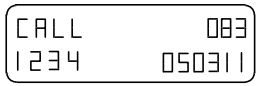
Before making a telephone call, it is often beneficial to make a beacon call to assess the best channel to use (see *Using the beacon feature* in Chapter 5).

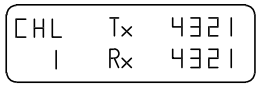
If you enter a wrong number, you can reset by pressing the Display button.

When you have finished making a call, you must disconnect the call line (see *Sending a disconnect message* on page 9-7).

Step	Action	Display	Remarks
1.	Use the Channel buttons or Recall button to select the channel you wish to use.	CHL 1 Tx 4321 Rx 4321	This is an example for channel 1. See *Selecting channels* in Chapter 4. Ensure the channel is enabled for selective call.
2.	Press Call	CHL 1 CALL ----	You must start the next action within 60 seconds.

Step	Action	Display	Remarks
3.	Use the numeric buttons to enter the required selective call address.		This is the self identification number of the base IPC-500 telephone interconnect you are using. See *Using selective call*, Chapter 5.
4.	Press Enter		
5.	Use the numeric buttons to enter the telephone number you wish to call.		This example number is 08 305 0311. Numbers wrap around in the display from the bottom to the top row, including the CALL area—16 digits.

Step	Action	Display	Remarks
6.	Check the channel is free from traffic, then press Call		The Tx indicator turns on and you hear a 'warbling' sound for approximately 10 seconds as the transceiver sends your call. If the call is received successfully by the IPC-500, you hear a revertive tone followed by a pause while the number is dialled. Once the number has been dialled by the IPC-500, you hear the appropriate telephone network service tones.

Step	Action	Display	Remarks
7.	When the telephone subscriber answers, they hear a short pre-recorded message informing them that this is a radio telephone call. This is followed by a single tone of one second duration heard by both parties. You may now use the transceiver in normal communication mode.		The indicator flashes during talking. On completing the call, you must send a disconnect message (see *Sending a disconnect message* on page 9-7). You may now resume normal transceiver operation. The telephone number is erased from memory once power has been turned off.

❑

Sending a disconnect message

When a telephone call is made, a circuit is automatically established between your outstation transceiver and the telephone party that the base IPC-500 has dialled. When you finish a call, this call line must be disconnected. This is achieved by sending a disconnect message from your transceiver to the IPC-500.

This procedure assumes that the transceiver is switched on, still on the original channel, and the telephone conversation has been completed.

An alternative method of disconnection can be used by asking the telephone party to press '99' within two seconds on the DTMF telephone keypad.

Step	Action	Display	Remarks
1.	Press [Call]	CHL 1 / CALL 1234	This is an example for the last called number 1234 on channel 1.
2.	Press [Enter]	CALL 1234 / 083 050311	The last telephone number you called was 08 305 0311.
3.	Press [Display]	CALL 1234 / TEL-no ------	This deletes the last number.
4.	Press [Display]	CALL 1234 / dISCon TEL	You are now ready to send the disconnect message.

Step	Action	Display	Remarks
5.	Press Call		The Tx indicator turns on and you hear a ‘warbling’ sound for approximately 10 seconds as the transceiver sends your call. When you hear five long ‘beeps’ you know that the circuit has been disconnected. Your transceiver is now ready for normal operation.

❑

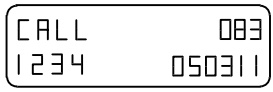
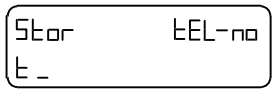
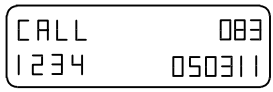
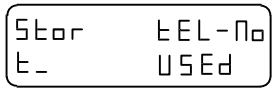
Storing a telephone number

This facility allows you to store up to 10 telephone numbers which can be re-called by entering a single code number (0 to 9) rather than a complete telephone number.

Ensure your transceiver is switched on and a selective call enabled channel has been selected before starting this procedure.

If you enter a wrong number, you can reset by pressing the Display button.

Step	Action	Display	Remarks
1.	Press Call	CHL 1 CALL ____	You must start the next action within 60 seconds.
2.	Use the numeric buttons to enter the required selective call address.	CHL 1 CALL 1234	This is the self identification number of the base IPC-500 telephone interconnect you are using. See *Using selective call*, Chapter 5.
3.	Press Enter	CALL 1234 TEL-no ______	

Step	Action	Display	Remarks
4.	Use the numeric buttons to enter the telephone number you wish to store.		This example number is 08 305 0311. Numbers wrap around in the display from the bottom to the top row, including the call area.
5.	Press Enter		You can store this telephone number as a single code number, t0 to t9.
6.	Use the numeric buttons to enter the code number you want, 0 to 9.		
	If the number you enter has already been used, the display will show 'USEd' and you will have to select another number.		
7.	Continually press Display until the display shows the original channel settings.		Your transceiver is ready for normal operation.

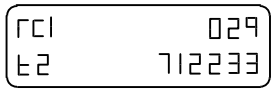
❑

Reviewing the stored telephone numbers

This facility allows you to review all the numbers you have stored.

Ensure your transceiver is switched on and a selective call enabled channel has been selected before starting this procedure.

Step	Action	Display	Remarks
1.	Press Call	CHL 1 CALL ____	You must start the next action within 60 seconds.
2.	Use the numeric buttons to enter the required selective call address.	CHL 1 CALL 1234	This is the self identification number of the base IPC-500 telephone interconnect you are using. See *Using selective call,* Chapter 5.
3.	Press Recall	rcl TEL-No t _	
4.	Press Recall	rcl 083 t1 050311 If there are no numbers stored: CALL NoTEL prog	The display shows you the number first stored. In this example the number is 08 305 0311.

Step	Action	Display	Remarks
5.	Keep pressing Recall to scroll through all the stored numbers.	 	This example is for number 02 971 2233. If you do not press the Recall button again, after one second the display changes to give you the option to call this number. See *Calling a stored telephone number* on page 9-13.
6.	Continually press Display until the display shows the original channel settings.		Your transceiver is ready for normal operation.

❑

Calling a stored telephone number

This procedure makes a telephone call to a number you have previously stored.

Ensure your outstation transceiver is switched on and a selective call enabled channel has been selected before starting this procedure.

Ensure the antenna is tuned on the selected channel (see *Tuning the antenna* in Chapter 4).

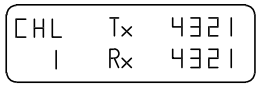
Before making a telephone call, it is often beneficial to make a beacon call to assess the best channel to use (see *Using the beacon feature* in Chapter 5).

If you enter a wrong number, you can reset by pressing the Display button.

When you have finished making a call, you must disconnect the call line (see *Sending a disconnect message* on page 9-7).

Step	Action	Display	Remarks
1.	Press [Call]	CHL 1 CALL ____	You must start the next action within 60 seconds.
2.	Use the numeric buttons to enter the required selective call address.	CHL 1 CALL 1234	This is the self identification number of the base IPC-500 telephone interconnect you are using. See *Using selective call*, Chapter 5.

Step	Action	Display	Remarks
3.	Press Recall	rcl tEL-no t _	
4.	Use the numeric buttons to enter the number you require between 0 and 9.	rcl 083 t1 050311 After one second the display changes: CALL 083 1234 050311	This example shows the recall number t1, and the telephone number to call as 08 305 0311.
5.	Check that the channel is free from traffic, then press Call	CALL 083 1234 050311	The Tx indicator turns on and you hear a 'warbling' sound for approximately 10 seconds as the transceiver sends your call. If the call is received successfully by the IPC-500, you hear a revertive tone followed by a pause while the number is being dialled. Once the number has been dialled by the IPC-500, you hear the appropriate telephone network service tones.

Step	Action	Display	Remarks
6.	When the telephone subscriber answers, they hear a short pre-recorded message informing them that this is a radio telephone call. This is followed by a single tone of one second duration heard by both parties. You may now use the transceiver in the normal communication mode.		The indicator light flashes during talking. On completing the call, you must send a disconnect message (see *Sending a disconnect message* on page 9-7). You may now resume normal transceiver operation.

❑

Deleting a stored telephone number

This procedure deletes a stored telephone number. Ensure your transceiver is switched on and a selective call enabled channel has been selected before starting this procedure.

As soon as you enter the number to be deleted, it is deleted immediately from memory without any warning. To prevent deleting numbers you need, ensure you make the correct choice first time. You do not get a second chance.

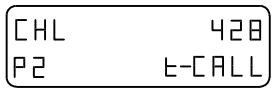
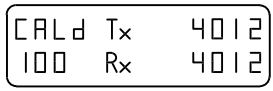
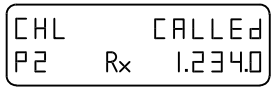
Step	Action	Display	Remarks
1.	Press Call	CHL 1 CALL ____	You must start the next action within 60 seconds.
2.	Use the numeric buttons to enter the required selective call address.	CHL 1 CALL 1234	This is the self identification number of the base IPC-500 telephone interconnect you are using. See *Using selective call*, Chapter 5.
3.	Press Enter	CALL 1234 TEL-no ______	If a telephone number is displayed, press the Display button to clear this number. This will have been the last number called.

Step	Action	Display	Remarks
4.	Press Enter	dEL tEL-no t _	
5.	Use the numeric buttons to enter the stored number you want to delete, 0 to 9.	CALL tEL-no 1234 ------	 To prevent deleting numbers you need, ensure you make the correct choice first time. You do not get a second chance.
6.	Continually press Display until the display shows the original channel settings.		Your transceiver is ready for normal operation.

❑

Received call messages

When a call has been received and decoded, the display shows the type of call received. The following examples show you the type of messages that are displayed.

This display…	Means…
	An ordinary (not telephone) selective call has been received from station 428 on channel P2.
	A telephone call from station 428 containing telephone number information has been received on channel P2.
	A call has been received on another channel. This example shows a call whilst the transceiver is on channel 100 and the channel frequencies.
	An ARQ call has been received on channel P2.

❑

Reviewing the list of received calls in memory

Your transceiver can record up to 10 calls in memory from various stations. These may be on different channels if your transceiver is in scan mode.

Calls are recorded in a memory stack awaiting your review. If a station calls more than once on the same channel, your transceiver only records one call for all selective calls made and one call for all emergency calls made.

If more than 10 calls are made to your transceiver, the first stored call is deleted to make room for the latest call. Selective calls are deleted in preference to emergency calls.

Ensure your transceiver is not in scan mode before starting this procedure.

A permanent or brief loss of power to your transceiver will delete information stored in memory. Ensure you record or use all the information stored in the memory stack before switching off the transceiver.

If the transceiver power is lost momentarily (such as when starting the vehicle engine), the call memory is retained but the telephone number is lost.

Switching the transceiver off using the Power On'Off button deletes all calls stored in the memory stack.

Step	Action	Display	Remarks
1.	Press Display twice within one second.	rcl Tx 4321 ---- Rx 4321 If any calls have been recorded: CHL 083 P1 050311 After one second: CALL 083 1234 050311 If no calls have been received, the normal channel display will remain.	The first call recorded is displayed first. In this example, a call was received on channel P1 from telephone number 08 305 0311. The display shows you the self identification address, 1234, of the station that called.
2.	To scroll up the list of received calls, press 4 ^^ To scroll down the list of received calls, press 9 vv	The display shows the next call, and after one second the self identification address of the caller.	
3.	Press Display to return to normal operation.		To reply to any of these calls, see *Returning a call* on page 9-21.

❑

Returning a call

This procedure returns a telephone call to one of the numbers recorded in the memory stack.

Ensure your transceiver is switched on before starting this procedure.

Ensure the antenna is tuned on the selected channel (see *Tuning the antenna* in Chapter 4).

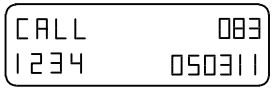
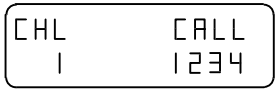
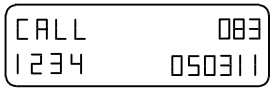
A permanent or brief loss of power to your transceiver will delete information stored in the memory stack. Ensure you record or use all the information stored in the memory stack before switching off the transceiver.

If the transceiver power is lost momentarily (such as when starting the vehicle engine), the call memory is retained but the telephone number is lost.

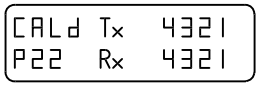
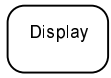
Switching the transceiver off using the Power On'Off button deletes all calls stored in memory.

Before making a telephone call, it is often beneficial to make a beacon call to assess the best channel to use (see *Using the beacon feature* in Chapter 5).

When you have finished returning calls, you must disconnect the telephone line (see *Sending a disconnect message* on page 9-7).

Step	Action	Display	Remarks
1.	Select the call you wish to make (see *Reviewing the list of received calls in memory* on page 9-19, steps 1 & 2).		This example shows the phone number 08 305 0311 and the self identification address 1234 of the caller.
2.	Press Call		The transceiver automatically selects the correct channel, and displays the self identification address (1234) of the caller.
3.	Press Enter		

Step	Action	Display	Remarks
4.	Check that the channel is free from traffic, then press Call		The Tx indicator turns on and you hear a 'warbling' sound for approximately 10 seconds as the transceiver sends your call. If the call is received successfully by the IPC-500 you hear a revertive tone followed by a pause while the number is being dialled. Once the number has been dialled by the IPC-500, you hear the appropriate telephone network service tones.

Step	Action	Display	Remarks
5.	When the telephone subscriber answers, they hear a short pre-recorded message informing them that this is a radio telephone call. This is followed by a single tone of one second duration heard by both parties. You may now use the transceiver in normal communication mode.	For any call that has not been returned: 	The indicator flashes during talking. The viewed call is deleted from the memory stack when you press the PTT button on the microphone. On completing the call, you must send a disconnect message (see *Sending a disconnect message* on page 9-7). You may now resume normal transceiver operation.
6.	Repeat steps 1 to 5 to clear all calls stored in the memory stack.		
7.	Press  to return the transceiver to normal operation.		

❑

10. Emergency calls

An emergency call is a special type of selective call. Emergency calls are made to stations in your communication network that have been set up to receive emergency calls.

This chapter describes how you can use your transceiver to:

- make emergency calls
- receive emergency calls.

The 8528 allows you to control how your station sends and receives emergency calls. You can set up your transceiver to:

- transmit an emergency call to a preset station address on two preset emergency channels when the Emgcy Call button is pressed
- transmit an emergency call to a preset station but allow you to select the channel at the time of making the call
- respond to all emergency calls on a channel being scanned
- respond to emergency calls sent to your station and two other preset station addresses.

It is recommended that stations in your network enable selective call lockout. Since selective call lockout applies to selective calls but not to emergency calls, there will be less chance of interference from other calls when an emergency call is being sent.

☞ See *Enabling or disabling selective call lockout* in Chapter 5.

Making emergency calls

You can make:

- an automatic emergency call
- a manual override emergency call.

In an automatic emergency call, the transceiver makes two calls to the emergency station on two preset emergency channels. You can interrupt the process and establish voice contact on either channel by pressing the PTT button on the microphone.

If only one preset emergency channel has been set, the transceiver tries to make the call once on that channel. If neither emergency channel has been set, the transceiver tries to make the call once using the channel currently selected at the time of making the call.

A manual override emergency call allows you to select which channel to use at the time of making the call. The transceiver tries to make the call once on the channel you select.

The transceiver automatically tunes the channel at the start of an emergency call. It sends the call even if automatic tuning fails.

Before you can make an emergency call, you must use the procedure below to set up the address of the emergency station (the emergency call address).

Setting up for sending emergency calls

This procedure sets up:

- the emergency call address
- emergency call channel one
- emergency call channel two.

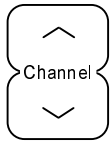
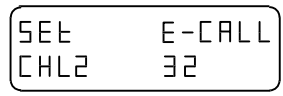
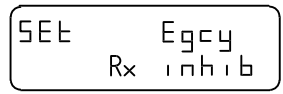
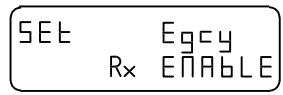
To change a setting, enter the value again. If the procedure ends before you press the Enter button to complete a step, all changes made in that step are lost.

This procedure ends when:

- you press the Power On'Off button
- you do not press any button for a minute (transceiver returns to normal operation mode).

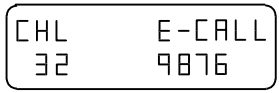
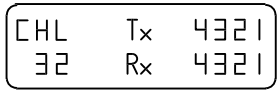
Step	Action	Display	Remarks
1.	Ensure that the transceiver is switched off.		
2.	Press and hold down [Emgcy Call] and press [Power On'Off]	If no emergency call address has been set, you see: SEt E-CALL Addr ____	The transceiver switches on in emergency set-up mode. The transceiver makes you enter your self-identification address if it has not already been set (see *Setting the self-identification address* in Chapter 5).

Step	Action	Display	Remarks
3.	Use the numeric keys to enter the emergency call address.	SEt E-CALL Addr 9876	In this example the emergency call address is 9876. If the address you enter ends in a double zero (group call), your call may be responded to by 100 transceivers.
4.	Press Enter	If emergency channel one is not set, you see: SEt E-CALL CHL1 ____	
5.	To select emergency channel one, press either the up or down arrow Channel	Example of channel 13 as emergency channel one: SEt E-CALL CHL1 13	Hold down the button to scroll the channel list. P-channels follow normal channels. To disable emergency channel one, scroll the channel list until '– – – –' is displayed. Use the Mode button if you want to change the sideband setting (USB or LSB indicator on) for this channel.
6.	Press Enter	If emergency channel two is not set, you see: SEt E-CALL CHL2 ____	

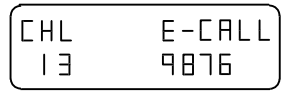
Step	Action	Display	Remarks
7.	To select emergency channel two, press either the up or down arrow 	Example of channel 32 as emergency channel two: 	Hold down the button to scroll the channel list. P-channels follow normal channels. To disable emergency channel two, scroll the channel list until '– – – –' is displayed. You cannot enter the same channel as emergency channel one. Use the Mode button if you want to change the sideband setting (USB or LSB indicator on) for this channel.
8.	Press 	Either:  or 	This saves any changes made in the previous step.
9.	Press 		The transceiver switches off.

Making an automatic emergency call

Step	Action	Display	Remarks
1.	Ensure the transceiver is switched on in normal operating mode.		
2.	Press and hold down Emgcy Call for two seconds.	The channel changes to emergency channel one: CHL 13 E-CALL 9876 While waiting for the emergency station to respond, you see: CHL 13 E-CALL 6054	The call fails and displays 'Not ENAbLE' if no emergency call address has been set. The transceiver 'beeps' while you hold down the Emgcy Call button. After two seconds, the transceiver auto tunes the antenna and sends the emergency call. The Tx indicator turns on.

Step	Action	Display	Remarks
3.	When you hear the emergency call revertive signal ('woop woop' sound) from the emergency station, press the PTT button on the microphone and talk.	The channel changes to emergency channel two:  While you are waiting for the emergency station to respond:  	If you do not press the PTT button within 10 seconds, the transceiver switches to emergency channel two, auto tunes the antenna and starts the call again.
4.	If you want to make voice contact but fail on both emergency channels, try making a manual override emergency call.		

Making a manual override emergency call

Step	Action	Display	Remarks
1.	Ensure the transceiver is switched on in normal operating mode.		
2.	Press and release 		The call fails and displays 'Not ENAbLE' if no emergency call address has been set. The channel changes to an emergency channel if one has been set: The transceiver emits warning 'beeps' for 30 seconds.
3.	Select the channel on which to make the emergency call during the 30 second period.		See *Selecting channels* in Chapter 4. If you need more time to find a suitable channel, press the channel up or down button to restart the 30 second period.

Step	Action	Display	Remarks
4.	Within the 30 second period, press and hold down  for two seconds to send the call.		The transceiver auto tunes the antenna and sends the emergency call on the channel you just selected. The Tx indicator turns on. If you do not press and hold down the Emgcy Call button to start the call within the 30 second period, no call is made and the transceiver reverts to normal operating mode.

❑

Receiving emergency calls

You can set up your transceiver to receive or ignore incoming emergency calls.

It is recommended that only base stations are set to receive emergency calls as they have broadband antenna systems and the emergency revertive siren is instantaneous. If the station receiving the emergency call has an antenna system that needs to be tuned, there may be a delay of several seconds before the revertive signal can be sent.

Setting up for receiving emergency calls

This procedure sets up:

- the ‘emergency receive enable/inhibit’ setting
- the ‘all receive enable/inhibit’ setting
- addresses Id 1 and Id 2 additional to your own self identification address.

‘Emergency receive enable/inhibit’ controls whether the transceiver receives emergency calls. Select inhibit if you do not want your transceiver to respond to any incoming emergency calls.

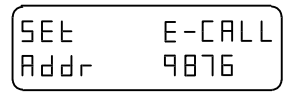
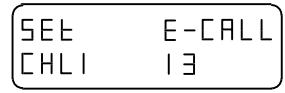
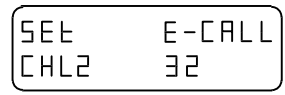
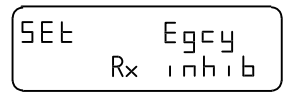
‘All receive enable/inhibit’ controls which emergency calls to respond to. If you select ‘all receive enable’, your transceiver will respond to all incoming emergency calls on the current channel, including emergency calls from stations with 6-digit addresses.

If you select ‘all receive inhibit’, your transceiver will only respond to emergency calls addressed to your station (self-identification address) and to two additional stations (Id 1 and Id 2 if set).

If the procedure terminates before you press the Enter button to complete a step, all changes made in that step are lost.

This procedure ends when:

- you press the Power On'Off button
- you do not press any button for a minute (transceiver returns to normal operation mode).

Step	Action	Display	Remarks
1.	Ensure that the transceiver is switched off.		
2.	Press and hold down [Emgcy Call] and press [Power On'Off]		The transceiver switches on in emergency set-up mode. Skip this step (covered in *Setting up for sending emergency calls* on page 10-3).
3.	Press [Enter]		Skip this step (covered in *Setting up for sending emergency calls* on page 10-3).
4.	Press [Enter]		Skip this step (covered in *Setting up for sending emergency calls* on page 10-3).
5.	Press [Enter]	If 'emergency receive inhibit' is set, you see: 	The transceiver will not respond to incoming emergency calls.

Step	Action	Display	Remarks
5. cont.		If 'emergency receive enable' is set, you see: SEt Egcy Rx ENAbLE	The transceiver will respond to incoming emergency calls.
6.	To change the 'emergency receive inhibit/ enable' setting, press any numeric button.		If you select 'emergency receive inhibit', go to step 14 to end the procedure.
7.	Press Enter	If 'all receive inhibit' is set, you see: SEt ALL Rx inhib	The transceiver will only respond to emergency calls addressed to this transceiver, Id 1 or Id 2.
		If 'all receive enable' is set, you see: SEt ALL Rx ENAbLE	The transceiver will respond to all emergency calls.
8.	To change the 'all receive inhibit/ enable' setting, press any numeric button.		If you select 'all receive enable', go to step 14 to end the procedure.

Step	Action	Display	Remarks
9.	Press [Enter]	If address Id 1 has not been set, you see: SEt Id-1 Addr ____	
10.	If you want to set Id 1, use the numeric keys to enter the address.	SEt Id-1 Addr 1234	In this example, Id 1 is station 1234.
11.	Press [Enter]	If address Id 2 has not been set, you see: SEt Id-2 Addr ____	
12.	If you want to set Id 2, use the numeric keys to enter the address.	SEt Id-2 Addr 5153	In this example, Id 2 is station 5153.
13.	Press [Enter]	SEt E-CALL Addr 9876	This saves any changes made in the previous step.
14.	Press [Power On'Off]		The transceiver switches off.

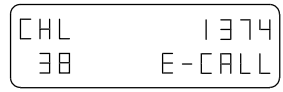
Receiving an emergency call

Your transceiver will respond to an incoming emergency call if you enabled your transceiver to receive emergency calls and the call address is your self-identification address, additional address Id 1, Id 2, or within the range of a 100's call.

☛ See *Setting up for receiving emergency calls* on page 10-10.

If you want to find out if you have received any emergency calls while your station has been unattended, see *Reviewing calls held in memory* in Chapter 5.

The transceiver can receive emergency calls from stations that have 6-digit addresses.

Step	Action	Display	Remarks
1.	The transceiver emits the two-tone emergency alarm.	Example of an emergency call from station 1374: 	If fitted, the external alarm also emits the emergency call tone (see *External alarm and battery power output socket (option PP)* in Chapter 14). If the call is from a station with a 6-digit address, address '0' is displayed.

Step	Action	Display	Remarks
2.	To turn off the emergency alarms, press the PTT button on the microphone.		After five minutes, alarms stop automatically. The transceiver emits 'called pips' every four seconds to indicate that a selective call has been received.
3.	If the transceiver is in scan mode, stop the scan and press Recall then Call		You need to stop scanning before you can respond to the caller.
4.	Press the PTT button on the microphone and talk to the caller.		

❑

11. Teletype, Fax and data

Your transceiver can operate with teletype ARQ-FEC data. Connecting your transceiver to a Codan HF data modem 8580 creates an HF SSB data station for remote data transmission and reception.

Your transceiver can also operate with the transmission and reception of Fax and high speed data when installed with a 9001 HF Fax and data interface or a 9002 HF data modem.

☞ For further details, refer to the Codan handbooks supplied with the equipment.

Terms	Description
ARQ	Automatic Repeat Request The receiving station commands the transmitting station when to transmit and repeat a packet of data. (This is known as hand shaking.)
FEC	Forward Error Correction Once the data link is established, the transmitting station transmits all the data. Any data error correction is carried out by the receiving computer.

To operate in teletype ARQ-FEC mode, your transceiver must have the following options installed:

Option	Description
F	Provides extra cooling to the heat sink fins to allow the transceiver to transmit data.
PS	Provides modem interconnect facility.

To operate in Fax and data mode, your transceiver must have the following options installed:

Option	Description
F	Provides extra cooling to the heat sink fins to allow the transceiver to transmit data.
PS	Provides modem interconnect facility.
DM	For operation with 9001 and 9002.

12. Changing the set-up options

Some of the set-up options in this chapter can be completed by the user. Others must only be carried out by qualified personnel, either at the Codan factory or by a Codan agent. A statement is made in the procedure whenever qualified personnel are required.

The displays in the procedures show examples of channel and frequency numbers. In each procedure select your own channel and frequency numbers as appropriate.

Set-up option links

Some of the set-up procedures may need a link to be moved inside the transceiver, while some need a link soldered inside the transceiver. The moveable link is called the front panel link (see Figure 12.1). The soldered link is called the microprocessor link (see Figure 12.2).

The front panel link

The front panel link is located on the front panel display printed circuit board (PCB) assembly.

On front panel control transceivers, the PCB (part number 08-03745-001) is located behind the numeric buttons and display. The link is located on a row of four horizontally mounted pins on the PCB (Figure 12.1), immediately behind the number 9 button.

On extended control transceivers, the PCB (part number 08-04666-001) is located inside the control head. The link is located on a row of four vertically mounted pins on the PCB (Figure 12.1), immediately behind the number 7 button.

The front panel link can fit into four positions on the PCB, only three of which are used:

2 not used

1 used for set-up options

F used for front panel control transceivers

E used for extended control head transceivers.

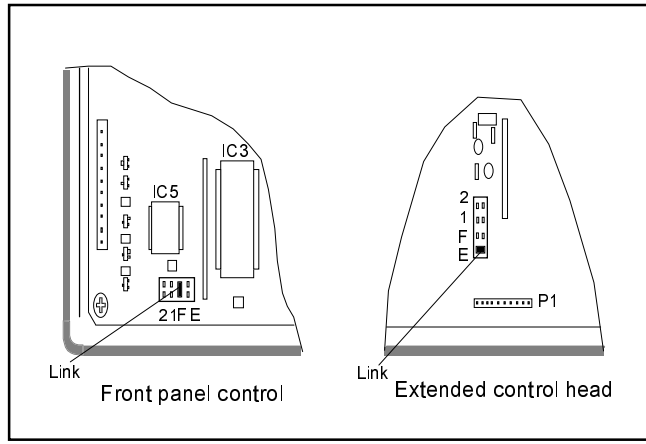


Figure 12.1 The front panel link

Changing the position of the front panel link

The front panel link is a black plastic moulding incorporating linked metal contacts. The contacts short together pins located on the front panel display PCB.

Extreme care should be taken when handling the transceiver to prevent damage to the components.

Step	Action
1.	Turn the transceiver off and disconnect the power.
2.	Remove either: • the bottom cover of front panel control transceivers • the control head rear panel of extended control head transceivers.
3.	Make a note of the position of the link (E or F). Move the front panel link from position F (front panel control) or E (extended control head) to position 1.
4.	Carry out the relevant set-up procedures.
5.	After completing the set-up procedures, turn the transceiver off and disconnect the power before returning the link to its original position.
6.	Replace the cover before reconnecting the power to your transceiver. Your transceiver is now ready for normal use.

The microprocessor PCB link

The microprocessor link is one that you will have to make and solder on the microprocessor PCB. The PCB (part number 08-03741-001) is positioned on the underside of the transceiver.

The link must only be soldered across the number 2 pads as shown in figure 12.2. This link (called the inhibit link) prevents you from changing the inhibit set-up options on P-channel programming.

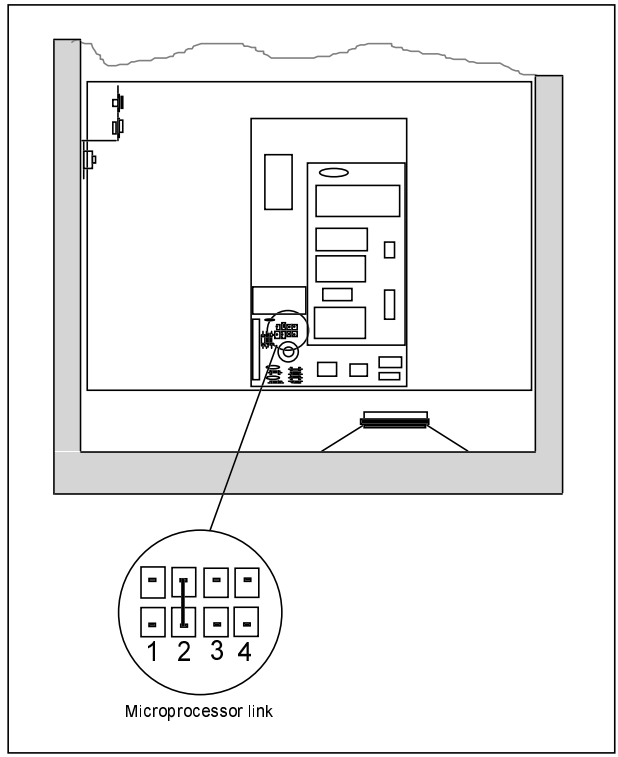


Figure 12.2 The microprocessor link

Inserting the microprocessor PCB link

Extreme care should be taken when handling the transceiver to prevent damage to the components.

This procedure must only be carried out by a qualified technician.

Step	Action
1.	Turn the transceiver off and disconnect the power.
2.	Lay the transceiver on its top with the front panel facing you.
3.	Remove the bottom cover of the transceiver.
4.	Locate the microprocessor PCB and the number 2 pads (see Figure 12.2). The link must only be fitted across the number 2 pads. Pads 1, 3 & 4 are not used.
5.	Solder a suitable piece of wire across the number 2 pads (the Inhibit link).
6.	Replace the cover before reconnecting the power to the transceiver. Your transceiver is now ready for normal use.

❑

Reviewing set-up options

This procedure displays the set-up options that have been enabled for the transceiver. You can review the set-up options at any time. This procedure does not require you to move or install links in your transceiver.

Step	Action	Display	Remarks
1.	Ensure your transceiver is off.		
2.	Press and hold down Display and press Power On'Off	Hold down the Display button until the display shows: 	The display starts with the scan set-up option.
3.	To scroll through the options, press Display	SCAN prog ENAbLE CHAN No inhib diSP S-CALL ENAbLE diSP CALL LONG diSP Addr CALL diSP Addr SELF diSP bEACON ON diSP t1 Hi Lo diSP t2 Hi Lo diSP t3 Hi Lo diSP t4 Hi Lo Ptt CutOut diSP bEEPS loud CALL PHONE OFF Ant Contrl CHAN or bANd	Each press of the Display button scrolls to the next option.

Step	Action	Display	Remarks
4.	To exit review mode and resume normal operations, press the PTT button.		

❑

PTT timer

The PTT timer stops the transceiver from being left on in the transmit state. If the transmit time exceeds the PTT timer setting, the transceiver reverts to receive mode and an error message is displayed.

The timer is set at the factory to 10 minutes. You may turn this facility off, or vary the time, in five minute intervals, between 5 and 35 minutes.

The PTT timer does not operate when operating through the option PS connector.

Step	Action	Display	Remarks
1.	Turn the transceiver off and move the front panel link to position 1.		Before moving the link, note its position. See *Changing the position of the front panel link* on page 12-3.
2.	Press and hold down Tune and press Power On'Off	Hold the Tune button down until the display shows: PtT CutOut 5	This turns on the transceiver in PTT timer set-up mode.

Step	Action	Display	Remarks
3.	To increase the time, press 1 Fast To decrease the time, press 6 Fast	PtT CutOut 25	The PTT timeout time can be changed from 5 to 35 minutes.
4.	Press Power On/Off		The transceiver is now switched off.
5.	Return the front panel link to its original position (E or F).		See *Changing the position of the front panel link* on page 12-3.
6.	Replace the cover before switching on your transceiver.		

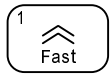
❑

Enter a PIN (Personal Identification Number)

If you set a PIN for the transceiver, you have to enter this PIN each time you switch the transceiver on. If you fail to enter the correct PIN, the transceiver automatically switches off.

It is important that every person who uses the transceiver knows the PIN. Alternatively, do not set a PIN.

Should you forget the PIN, you will have to return the transceiver to the factory.

Step	Action	Display	Remarks
1.	Turn the transceiver off and move the front panel link to position 1.		Before moving the link, note its position. See *Changing the position of the front panel link* on page 12-3.
2.	Press and hold down  and press 	Hold down the Tune Rx Fast button until the display shows: 	This switches on the transceiver in PIN set-up mode.
3.	Use the numeric buttons to enter your PIN.	The display shows the number you enter.	Select a number between 1 and 999999.

Step	Action	Display	Remarks
4.	Press Enter	OPTION SET-UP	Your PIN number has now been registered within the transceiver.
5.	Press Power On'Off		The transceiver is now switched off.
6.	Return the front panel link to its original position (E or F).		See *Changing the position of the front panel link* on page 12-3.
7.	Replace the cover before switching on your transceiver.		

❑

Changing or deleting a PIN

This procedure changes or deletes your PIN.

Step	Action	Display	Remarks
1.	Turn the transceiver off and move the front panel link to position 1.		Before moving the link, note its position. See *Changing the position of the front panel link* on page 12-3.
2.	Press and hold down 1 Fast and press Power On'Off	Hold down the Tune Rx Fast button until the display shows: EntrPIN _ _ _ _ _ _	This switches on the transceiver in PIN set-up mode.
3.	Use the numeric buttons to enter your existing PIN and then press Enter	EntrPIN 1234 SEtPIN _ _ _ _ _ _	This is an example of existing PIN number 1234. You may now change or delete the PIN.

Step	Action	Display	Remarks
4.	To insert a new PIN, use the numeric buttons and press Enter To clear a PIN, do not insert new numbers, just press Enter	The display shows the number you enter, or if you cleared the PIN: 	Select a number between 1 and 999999. A new PIN is now registered, or the old PIN has been cleared.
5.	Press Power On'Off		The transceiver is now switched off.
6.	Return the front panel link to its original position (E or F).		See *Changing the position of the front panel link* on page 12-3.
7.	Replace all covers before switching on your transceiver.		

❑

Power-on settings

There are two power-on settings that may be set at any time without the need to move or install any internal links. These are the default settings that will always be present when you switch on the transceiver:

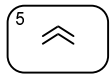
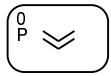
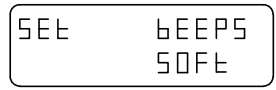
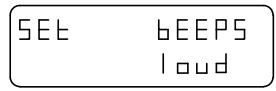
- Mute settings—allows you to select mute on/off and selective call mute on/off
- Beep volume—allows you to set the beep volume to either loud or soft.

Mute settings

Step	Action	Display	Remarks
1.	Press and hold down Mute On'Off and press Power On'Off	Hold down the Mute On'Off button until the display shows: SEt StArt StAtE	This switches on the transceiver in mute set-up mode.
2.	To change the mute on/off setting, press Mute On'Off		The Mute On'Off button indicator shows when mute is on.

Step	Action	Display	Remarks
3.	To turn on selective call mute, press  To turn off selective call mute, press 		The S'call Mute button indicator shows when selective call mute is on.
4.	Press 	Reverts to normal display showing channel and frequency numbers.	Your selection has been made and you can switch off the transceiver.

Beep volume

Step	Action	Display	Remarks
1.	Press and hold down  or  , and press 	Hold down either of the volume buttons until the display shows:  or 	This switches on the transceiver in beep volume set-up mode. The display shows the last beep volume setting.
2.	Press either volume button to switch between the beep volume settings.	The display switches between ‘SOFt’ and ‘loud’.	
3.	Press 	Reverts to normal display showing channel and frequency numbers.	Your selection has been made and you can switch off the transceiver.

❑

Clear all settings and P-channels

This procedure clears all settings (except the PIN) and P-channels automatically. Ensure your transceiver is switched off before starting this procedure.

Do not use this procedure if you require any of the P-channels. To restore the transmit frequencies may be extremely difficult.

Step	Action	Display	Remarks
1.	Turn the transceiver off and move the front panel link to position 1.		Before moving the link, note its position. See *Changing the position of the front panel link* on page 12-3.
2.	Press and hold down Recall and press Power On'Off	Hold down the Recall button until the display shows: PUSH CLEAr EntEr P-CHLS	This switches on the transceiver in 'clear all settings and P-channels' set-up mode.
3.	Press Enter and wait until the display shows 'dONE'.	-dONE-	All settings and P-channels have now been cleared. You can now switch off the transceiver.

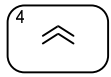
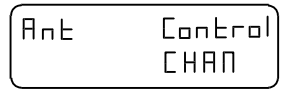
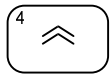
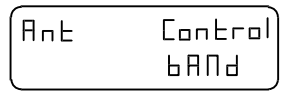
Step	Action	Display	Remarks
4.	Return the front panel link to its original position (E or F).		See *Changing the position of the front panel link* on page 12-3.
5.	Replace the cover before switching on your transceiver.		

❑

Antenna select output

This procedure changes the output configuration of the antenna control connector to provide either channel or frequency band information. Generally, all transceivers are supplied with this facility set to channel ('CHAN').

Where special purpose external linear amplifiers are used and require frequency band selection, the transceiver must be set to 'bANd'.

Step	Action	Display	Remarks
1.	Turn the transceiver off and move the front panel link to position 1.		Before moving the link note its position. See *Changing the position of the front panel link* on page 12-3.
2.	Press and hold down  and press 		This turns on the transceiver in antenna select output mode.
3.	Press 		This changes the operating mode to frequency band selection. Repeated pressing of the ⩔ changes from channel to band control.

Step	Action	Display	Remarks
4.	Press 		The transceiver is now switched off.
5.	Return the front panel link to its original position (E or F).		See *Changing the position of the front panel link* on page 12-3.
6.	Replace the cover before switching on your transceiver.		

❑

13. Display messages

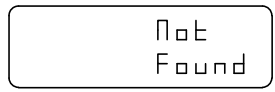
In addition to showing the normal channel information, the display is able to show messages indicating the results of an operation, such as an operator error or a system error.

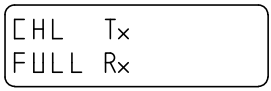
These error or fault messages are generally accompanied by one or more ‘beeps’.

If a transceiver fault is indicated, the transceiver must be switched off and tried again. If the fault re-occurs the transceiver must be sent to Codan, or a Codan agent, to have the fault rectified.

Messages are displayed for five seconds and then normal operation is resumed. Pressing any button or the microphone PTT button during this five second period immediately restores normal operation.

Messages and operator errors

No. of 'beeps'	Message displayed	Meaning
2		The automatic antenna has been satisfactorily tuned (not displayed after auto tuning).
2		The automatic antenna has failed to tune.
2		An attempt has been made to transmit before the automatic antenna has been tuned. Wait until the automatic antenna has tuned. If a fault exists, refer to the antenna handbook for details.
1		An attempt has been made to enter more than 15 channels in the scan program.
0		Displayed when programming scan and shows that a channel has been entered in the scan program.
1		Channel does not exist.

No. of 'beeps'	Message displayed	Meaning
1		An attempt has been made to transmit on a receive-only channel, or while the scan mode is selected. If the transceiver is scanning, press the Scan button to stop scanning. If the channel selected is a receive-only channel, select another channel.
1		An attempt has been made to select the scan mode while the transceiver is transmitting, or no channels have been entered in the scan program. Check that the program has scan channels, if not select another program.
1		An attempt has been made to program a receive frequency higher than 30,000 kHz or a tone frequency higher than 2800 Hz.
1		An attempt has been made to program a channel with a frequency lower than 250 kHz or a tone frequency of 300 Hz or lower.
0		All 99 P-channels are programmed.

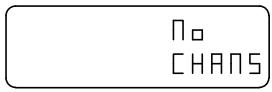
No. of 'beeps'	Message displayed	Meaning
1	CHL Tx USEd Rx	The nominated channel is already programmed.
1	prog inhib	There are four program inhibit options available. See *Programming channels*, Chapter 7.
1	Not ENABLE	An emergency call, tone call or a selective call has been attempted on a channel where that function has not been enabled.
1	No Rx tUNE	Full inhibit has been programmed.
2	Ptt Cutout	The microphone PTT has been active for a longer time period than set. See *Changing the set-up options,* Chapter 12.
1	CHL CALL 1 ____	A request for you to enter a selective call address.
1	CALL PHONE OFF	The telephone mode is off.

No. of 'beeps'	Message displayed	Meaning
0	CALL PHONE ON	The telephone mode is on.
2	CALL LocOut bUSY	A selective or beacon call has failed because selective call lockout is on and another station is making a call.
0	CHL E-CALL 38 bUSY	The transceiver is making an automatic emergency call.
1	CALL tEL-No 1234 ------	A request for you to enter a telephone number.
1	Stor tEL-No t_	A request for you to enter a code number for a particular telephone number.
1	dEL tEL-No t_	A request for you to enter a telephone number that you want to delete from memory.
1	CALL dISCON 1234 tEL	Indicates that you can send a disconnect telephone message to the call line between your transceiver and the base station
0	CHL 428 P2 CALLEd	An ordinary (not telephone) selective call has been received. This example shows a call received from station 428 on channel P2.

No. of 'beeps'	Message displayed	Meaning
0	CHL 428 P2 t-CALL	A telephone call has been received from station 428 containing telephone number information has been received on channel P2.
0	CALd Tx 4012 100 Rx 4012	A call has been received on another channel. Display shows call on channel 100 and frequencies.
0	CHL CALLEd P2 Rx 12.340	An ARQ call has been received. In this example, on channel P2 the frequency is 12.340 MHz.
1	CALL No tEL prog	Indicates that no telephone number has been stored.
1	Stor tEL-No t_ USEd	Tried to store a new phone number in a used position.
0	SEt StArt StAtE	Indicates that your transceiver is switched on in mute set-up mode.
1	Ant Control CHAN	Indicates that your transceiver is switched on in antenna select output mode.
1	Ant Control bAnd	Indicates that your transceiver is switched on in frequency band operation mode.

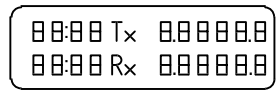
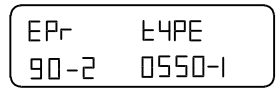
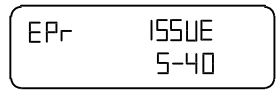
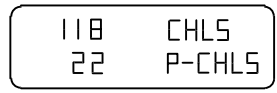
❑

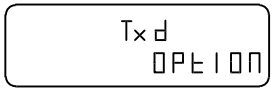
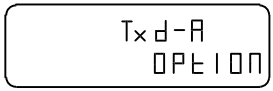
System errors

No. of 'beeps'	Message displayed	Meaning
3		Internal synthesizer is unlocked. All transmission is inhibited and the receiver is muted. Turn the transceiver off and then try again. If the problem persists, the transceiver must be returned for service.
2		The external tuner has not completed a tune operation within five minutes. Turn the transceiver off and then try again.
0		No channels have been programmed into the transceiver.

Reviewing the EPROM program content

With the transceiver on, press and hold down the Power On'Off button. A 'pip' is heard and the display shows the following test displays at three second intervals. On releasing the Power On'Off button the transceiver is turned off.

No. of 'beeps'	Message displayed	Meaning
0		Display lamp test—all segments and indicators must be on.
0		This shows the Program (EPROM) type number 90-20550-1. Some indicators turn off.
0		Program (EPROM) issue number 5.4.
0		The top line shows the number of channels programmed by the factory or agent. This can be up to 151. The second line shows the number of channels programmed by the user. This can be up to 99 or 89 with the telephone mode enabled.

No. of 'beeps'	Message displayed	Meaning
0		These displays indicate some of the options fitted to the transceiver.
		'd' indicates that the transceiver is inhibited from entering transmit frequencies from the front panel.
		'E' indicates that the transceiver is enabled for entering transmit frequencies from the front panel.
		'A' indicates that the transceiver is programmed for use on the amateur band.
		'H' indicates that the transceiver is set for use with an external power amplifier.

❑

14. Front and rear panel sockets

Only suitably qualified personnel should use the information contained in this chapter. Failure to observe the stated and implied criteria could result in damage to the transceiver.

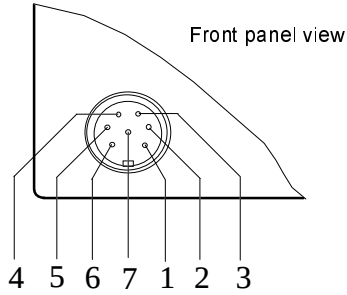
Details are provided on the following sockets:

- microphone socket
- external alarm and battery power output socket (option PP)
- miscellaneous facilities socket (option PS)
- miscellaneous facilities socket (option DM)
- antenna control socket
- remote control socket.

Microphone socket

This socket is located on the front panel of the transceiver. It is used to connect the microphone to the transceiver.

The transceiver speaker is controlled by a link in this plug. If the microphone is not connected to the transceiver, the internal speaker is disconnected.



Pin No.	Designation	Pin No.	Designation
1	PTT ground	**5**	Speaker connection
2	PTT (active low)	**6**	Audio output
3	Microphone input	**7**	Audio ground
4	Microphone ground		

If you wish to hear the transceiver speaker with the microphone disconnected, link pins 5 and 7.

❑

External alarm and battery power output socket (option PP)

This socket is located on the rear panel of the transceiver. It can be used to accommodate two facilities.

External alarm

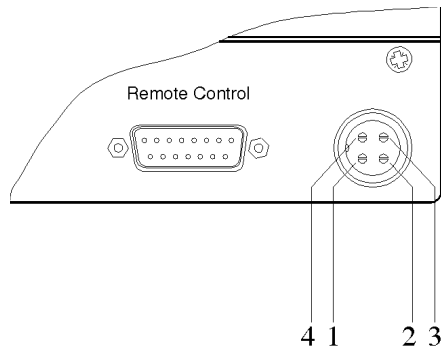
This facility allows an external alarm device to be connected to the transceiver. When a selective call is detected, internal relay contacts close across pins 2 & 3.

The contacts are rated for 1A at 50V DC.

Option PP—unswitched battery power source for external equipment

This facility allows an external device to be connected to, and draw power off, the transceiver. When the transceiver is switched off, the power source is still available at this socket.

This power source is unswitched battery voltage fused at 5 A.

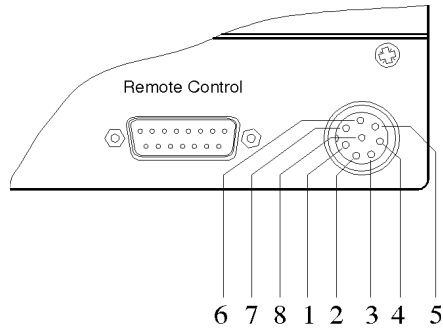


Pin No.	Designation	Pin No.	Designation
1	Battery voltage (+ve)	3	Relay contact
2	Relay contact	4	Ground

❑

Miscellaneous facilities socket (option PS)

This socket is located on the rear panel of the transceiver. If option PS is fitted to your transceiver, the external alarm and battery power output socket cannot be fitted.

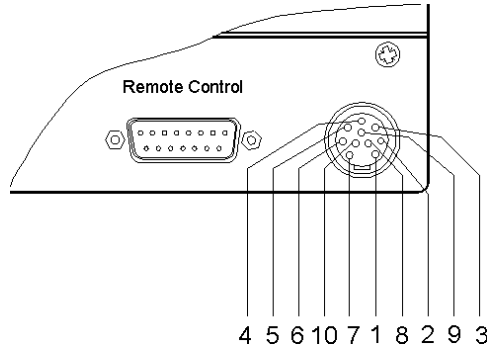


Pin No.	Designation	Pin No.	Designation
1	Ground	5	Alarm tones input
2	Rx output (1.5 Vpp)	6	PTT (active low)
3	Tx input	7	Scan (+10V output)
4	Quiet line (mute +10V)	8	Switched fused battery voltage

❑

Miscellaneous facilities socket (option DM)

This socket is located on the rear panel of the transceiver. If option DM is fitted to your transceiver, the external alarm and battery power output socket cannot be fitted.



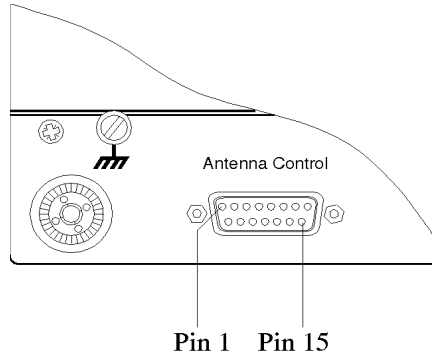
Pin No.	Designation	Pin No.	Designation
1	Ground	**6**	PTT (active low)
2	Rx output (1.5 Vpp)	**7**	Scan (+10V output)
3	Tx input	**8**	Switched fused battery voltage
4	Quiet line (mute +10V)	**9**	Unused
5	Alarm tones input	**10**	Unused

Antenna control socket

This socket is located on the rear panel of the transceiver, and allows you to connect an automatic tuning antenna to your transceiver.

There are two options available which determine the connections made to the pins on this socket:

- Standard—allows an automatic tuning antenna 9350, an 8551 antenna driver or 4203 and 9103 antenna tuner to be connected to the transceiver.
- Option AD—allows an 8558 automatic tuning antenna to be connected to the transceiver (fitting of this option is identified with a warning label fitted above the antenna control socket).



Antenna control—standard

Pin No.	Designation	Pin No.	Designation
1	Channel number Bit 3 (oc)	**9**	Channel number Bit 1 (oc)
2	Channel number Bit 4 (oc)	**10**	Channel number Bit 2 (oc)
3	N.C.	**11**	Tuned in (active low)
4	Tune in/out (active low)	**12**	Switched fused battery voltage
5	Scan (Active antenna, oc, active low)	**13**	Switched fused battery voltage
6	N.C.	**14**	Ground
7	N.C.	**15**	Ground
8	PTT out (+10V 1kΩ source)		

(oc) = Open Collector (Active high)

Antenna control—option AD

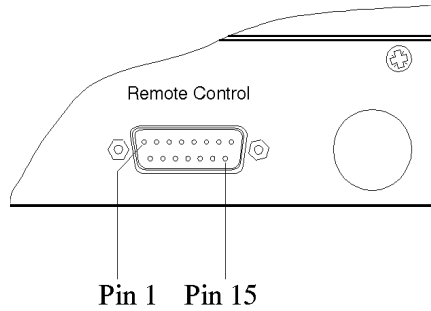
Pin No.	Designation	Pin No.	Designation
1	Channel number Bit 3 (oc)	**9**	Channel number Bit 1 (oc)
2	Channel number Bit 4 (oc)	**10**	Channel number Bit 2 (oc)
3	Disable (ground to disable)	**11**	Switched +12V Motor
4	Load	**12**	Switched fused battery voltage
5	+ 12V Scan	**13**	Switched fused battery voltage.
6	Motor phase 1 (oc)	**14**	Ground
7	Motor phase 2 (oc)	**15**	Motor phase 3 (oc)
8	Motor phase 4 (oc)		

(oc) = Open Collector (Active high)

Remote control socket

This socket allows the following peripherals to be connected to the transceiver:

- remote control head 8532
- 8571 Remote control interface
- IPC-500 telephone interconnect.



Pin No.	Designation	Pin No.	Designation
1	Loudspeaker	**9**	Ground
2	Remote PTT (active low)	**10**	Ground
3	Receiver audio input *	**11**	Transmit audio input (1.5V pp)
4	Power on (active low, pulse)	**12**	Receiver demodulator output (1.5V pp)
5	Data (I^2C Bus, 5V)	**13**	Receiver audio output *
6	Data line enable (I^2C Bus, 5V)	**14**	Interrupt (I^2C Bus, 5V)
7	Clock (I^2C Bus, 5V)	**15**	Switched fused battery voltage.
8	Transmit lamp		

* Special: Adjusted to suit attached equipment.

❑

15. Specification

Frequency range	Transmit: 2 to 24 MHz Receive: 250 kHz to 30 MHz
Channel capacity	250. Comprising 151 pre-programmed EPROM controlled channels and 99 front panel operator programmed channels.
Operating mode	Single sideband (J3E; USB–LSB).
Transmitted power output	125 watts (PEP). May be set to any output between 25 and 125 PEP.
Supply voltage	12V DC nominal, negative earth Normal operating range 10.5V to 15V DC Maximum operating range 9V to 16V DC Reverse polarity protection is provided.
Overvoltage protection	Shutdown at 16V DC (nominal) for duration of overvoltage.
Supply current	Receive (no signal): 0.4A Transmit J3E voice: 6A (average) J3E two tone: 9–12A
Size and weight	8528 transceiver 250 mm W x 320 mm D x 78 mm H; 3.3 kg (excludes vehicle mounting frame) 8532 control head 190 mm W x 50 mm D x 75 mm H; 0.4 kg (includes mounting bracket)

❑

16. Options and accessories

The following options and accessories are available for the 8528 transceiver.

Options

Code	Options
A	Fit amateur band transmit-receive facility (for licensed amateur radio operators). Note that option LU may also be required.
AD	Fit antenna driver interface for 8558 automatic tuning whip antenna.
DM	Fit data mode interface—for operation with 9001 and 9002.
F	Fit for continuous data transmission.
M	Fit morse facility.
PH	Fit headphone output (front control transceivers only).
*PP	Fit unswitched battery power output facility.
*PS	Fit miscellaneous facilities interface.
R	Fit extended/remote control interface (front control transceivers only).
SE	Program selective call encode (specify operating channels).
TD	Fit 2-tone decoder.
TE	Program 2-tone encode (specify frequencies and operating channels).
TXE	Enable front panel programming of transmit frequencies (where permitted by local licensing authorities).

* Combination of PP and PS is not admissible.

Accessories

Code	Accessories
112	Vehicle installation hardware kit.
117	Vehicle mounting cradle—front entry complete with DC power cable (6-metre). Note: this cradle is normally supplied with the extended control version of the 8528 International.
118	Vehicle mounting cradle—top or bottom entry complete with DC power cable (6-metre).
121	2-module clamp suitable for locking 8528 with another item of equipment having the same physical design.
122	3-module clamp suitable for locking 8528 with two other items of equipment having the same physical design.
123	4-module clamp suitable for locking 8528 with three other items of equipment having the same physical design.
164	Rack mounting frame (483 mm) for types 8528—iridescent grey.
602	Headphones complete with cable and connector.
641	Desk microphone complete with cable and connector.
649	Extension loudspeaker.
651PC	Program package—8525/8528. For use with IBM compatible PC.
652	Morse key complete with base, cable and connector.
654	Telephone handset complete with speaker switch, mounting cradle, cable and connector.
704	Vehicle interference suppression kit.
711	Bulkhead mounting fuse holder for transceiver DC power cord—supplied with 32 amp fuse.
712	32 amp fuse for code 711.
2036	Service manual for type 8525B/8528 series.
8532	Control head complete with 6-metre interface cable fitted with connectors and hand PTT microphone.

Power supplies and cables

Code	Power Supplies and Cables
508	Voltage regulator (24 to 12 volt operation).
702	Cable kit for float charging lead-acid storage battery for uninterrupted supply. Suitable for 9113 and 9114.
9113	Transceiver AC power supply, 13.8 volts 6 amps DC. Suitable for transceivers operating on speech only.
—	Adaptor cable for 9113 when used with 8525/8528 transceiver.
9114	Transceiver AC power supply, 13.8 volts 16 amps DC. Suitable for transceivers operating on speech and data.