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Codan part number 15-04083, Issue 1, June 1997



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1 About this manual

This manual describes how you set up your Codan HF SSB Transceiver 9780. You should refer to this manual when you want to:

- set up the transceiver for the first time
- use Setup and Link Setup modes
- understand display messages
- use options or ancillary equipment with the transceiver

This issue of the manual incorporates operating information for software versions from:

- transceiver (main) 4.00
- head (control) panel 4.00

The manual contains the following chapters:

Chapter 1 explains how to use the manual.

Chapter 2 explains how to install your transceiver and connect the components that make up your station.

Chapter 3 explains the setup options for your transceiver.

Chapter 4 describes Link Setup mode procedures.

Chapter 5 lists all information and error messages that may be displayed on the transceiver.

Chapter 6 describes Single and Multi-access modes.

Chapter 7 covers technical information about the connector pin arrangements and ancillary equipment settings.

Chapter 8 contains the specifications of the 9780 transceiver.

Chapter 9 lists the options and accessories available for the 9780 transceiver.

There is an index at the end of this manual.

Standards and icons

The following standards and icons are used in this guide:

This typeface **Means**

Bold the name of a button, knob or LED and a segment of text from the display

Italic a cross-reference or text requiring emphasis

This icon **Means**



A step within a task



Warning: It is possible that you will seriously damage yourself or the equipment



Caution: Proceed with caution as your actions may lead to loss of data, privacy or signal quality



Note: The text provided next to this icon may be of interest to you

This text contains cross-references to sections within this book and other books.

A cross-reference to text within the same task will consist of the subheading of the step to which you are referring, e.g. repeat the steps from Installing the brackets.

A cross-reference to a different task or topic will consist of the page number, followed by the subheading of the task or topic to which you are referring, e.g. see page 4-5, *Entering Link Setup mode*.

When a function button is referred to, the name of the button will be stated followed in brackets by the function given in the relevant field of the display, e.g. **F2(ENTER)** or **F2(PROG)**.

Definitions

Acronyms and abbreviations

This term	Means
AM	amplitude modulation
BBRAM	battery backup random access memory
D	diagnostics
EEPROM	electrically erasable programmable read only memory
EPROM	erasable programmable read only memory
ES	emergency selcall
FSK	frequency shift keying
HF	high frequency
ID	identification number
LCD	liquid crystal display
LSB	lower sideband
LU	choice of upper or lower sideband
NP	not protected
P	protected
PA	power amplifier
PIN	personal identification number
PSTN	public switched telephone network
PTT	press-to-talk
RAM	random access memory
RDD	radphone direct dial

This term	Means
RTC	real time clock
Rx	receive
S	selcall
SEE	see SEEPROM
SEEPROM	serial electrically erasable programmable read only memory
SLO	selcall lockout
SSB	single sideband
ST	selcall/telcall
Tx	transmit
TxD	transmit frequency programming disabled
TxE	transmit frequency programming enabled
USB	upper sideband
VCO	voltage controlled oscillator

Glossary

This term	Means
address	This is the number of your transceiver. It is the radio equivalent of a telephone number. With Option S or ST, if someone wants to call you directly, they enter this number and send the call. This term is used interchangeably with ID.
automatic tuning whip antenna	This is a whip antenna designed for use with multi-channel transceivers. It uses a micro-controlled stepper motor to give continuous tuning over the operating frequency range of the transceiver.
broadband antenna	This is an antenna that is capable of receiving and sending a range of frequencies without having to tune the antenna each time the frequency changes.
channel	A label for a frequency.
channel comment	This is an optional description of the use of a channel. It appears at the top of the display for Channel mode.
channel frequency	This is the frequency of the selected channel.
channel number	This is the identification number given to a channel.
control cable	A cable connecting two items of equipment that allows control information to be passed between the equipment.
extended control head	A control device that is remotely attached to the transceiver unit. It performs exactly the same function as the front control panel of the transceiver unit. Its primary use is in situations where the control device and transceiver unit cannot be located together.

This term	Means
fixed base station	This is a permanent station. It cannot be moved without some preparation. Its antenna may be a broadband antenna.
frequency	The frequency of a radio wave is the number of oscillations per second of the generated or received signal.
front panel	A control device that is attached directly to the transceiver unit.
FSK calibration	Frequency Shift Keying is the modulation technique used in making selcalls and telcalls.
ID	<p>This is the number of your transceiver. It is the radio equivalent of a telephone number. With Option S or ST, if someone wants to call you directly, they enter this number and send the call. This term is used interchangeably with address.</p> <p>ID also refers to the 14 digit identification number of your transceiver.</p>
Link Setup mode	This is a special mode that is accessed by repositioning a link within your transceiver. It provides access to setup functions that are only used in special circumstances.
mobile station	This is a station that can function while it is mobile or can readily be moved.
network	This consists of two or more stations that communicate on the same frequencies.
Setup mode	This mode allows you to set up your transceiver according to your requirements.
station	A station consists of a power supply, a transceiver, an antenna, ancillary equipment and appropriate connecting cables.

Units

Measurement	Unit	Abbreviation
Current	amp	A
Distance	metre	m
Frequency	hertz	Hz
Power	watt	W
Power ratio	decibel	dB
Voltage	volt	V

Unit multipliers

Unit	Name	Multiplier
M	mega	10^6
k	kilo	10^3
d	deci	10^{-1}
c	centi	10^{-2}
m	milli	10^{-3}
μ	micro	10^{-6}

About this issue

This is the first issue of the HF SSB Transceiver 9780 Reference Manual.

Associated documents

This reference manual is one of a series of publications related to the HF SSB Transceiver 9780. Other associated documents are:

- HF SSB Transceiver 9780 User Guide (Codan part number 15-04082)
- HF SSB Transceiver 9780 Quick Reference Card (Codan part number 06-01884)
- HF SSB Transceiver 9323/9360/9390/9780 Technical Service Manual (Codan part number 15-02051)

2 Installation

This chapter describes how to install your transceiver and connect the components that make up your station. It covers:

- type of station (2-2)
- mounting the transceiver (2-6)
- mounting the control head and loudspeaker (2-9)
- power supply (2-12)
- grounding (2-13)
- ancillary equipment (2-14)

On receiving your transceiver, check the contents against the packing list. Make sure that nothing is missing before you start installing the transceiver.

We recommend that the equipment is installed by qualified and experienced personnel. The procedures in this chapter are not comprehensive, and are intended only as a guide.

We recommend that only Codan approved service agents perform maintenance on the transceiver.

Type of station

There are two versions of the transceiver. The front control version has the controls on the front panel of the transceiver. The extended control version has the controls on a separate control head. The extended control head may be used in situations where there is not enough room to install the transceiver unit, e.g. in the cabin of a car. In such situations, the transceiver unit may be located in the boot.

There are two types of station:

- fixed base station
- mobile station

Fixed base station

A fixed base station 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 via a coaxial cable.

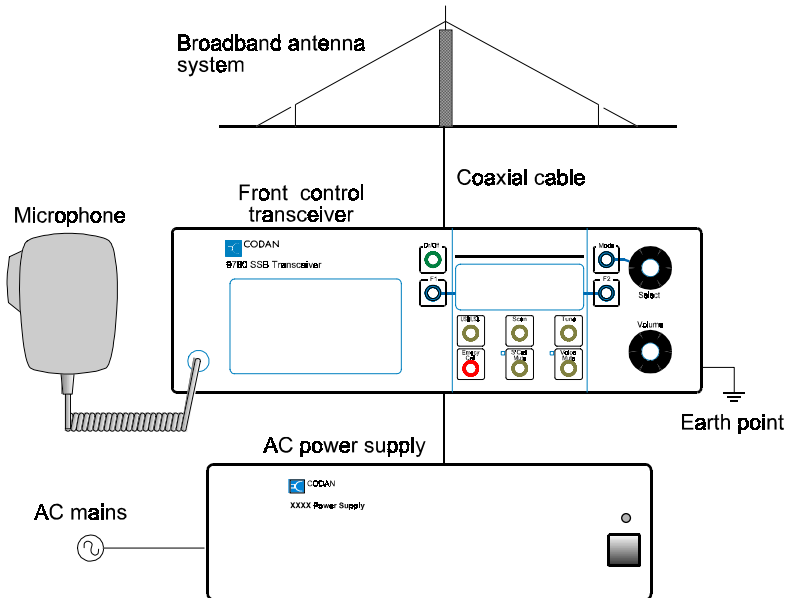


Figure 2-1: A typical fixed base station

Mobile station

A mobile station typically consists of a 12 V DC power supply (battery) connected to the transceiver. The antenna is connected to the transceiver by coaxial cable. Automatic tuning antennae are also connected to the transceiver by a control cable.

The control head and microphone should be mounted in such a way as to be easily accessible to the operator.

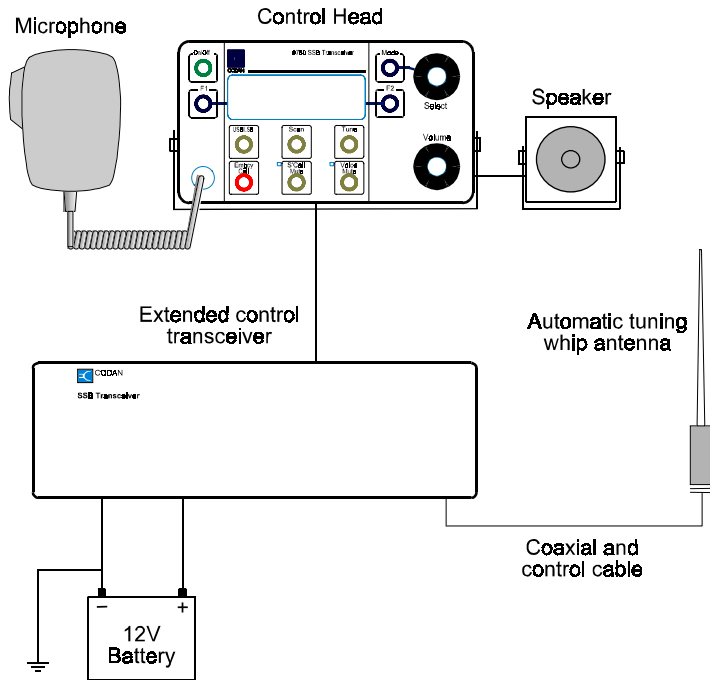


Figure 2-2: A typical mobile station

Where cables must pass through bulkheads with sharp edges, the insulation of the cables should be protected by grommets. Holes in the bulkhead need only be large enough to allow the end of the cable with the smaller connector to pass through (for example, the control cable between the control head and the transceiver).

If the battery supply and control head cables are long and follow a common path, keep the cables separated by a minimum of 200 mm. The cables can be closer together for short distances, for example, to pass through the same hole in the bulkhead.



Failure to keep the cables separated will cause distortion of the transmitted audio signals.

Mounting the transceiver

The transceiver must be mounted in a position that:

- allows easy access to the controls (front control only)
- allows a free flow of air through the rear cooling fins
- is not exposed to direct sunlight
- will not cause injury to motor vehicle occupants if an accident occurs (mobile installations only)

Two types of mounting cradles can be used to mount your transceiver:

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

You must determine the mounting position to best suit your needs.

Both types of cradle are supplied with six metres of DC power cable.

Code 117 mounting cradle—front entry

This cradle is suitable for locations where there is enough space available to slide the transceiver in and out.

Mounting the cradle

- Secure the mounting cradle in position with the rotating cam catches to the front.

Ensure there is sufficient space at the rear of the cradle to clear the transceiver heat sink and connectors. Approximately 20 cm is required. You will need at least 21 cm in front the cradle so that you can slide the transceiver into the cradle.

- Align both cam catch slots with the T-section slides (see Figure 2-3).

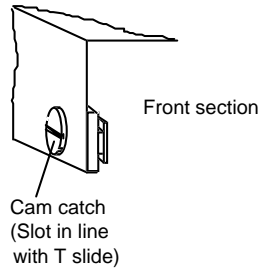


Figure 2-3: Cam catch slots

- ❑ Insert the transceiver side rails into the T-section slides and push the transceiver fully into the cradle.
- ❑ Apply gentle pressure to the front of the transceiver and lock it into the cradle by using a flat blade screwdriver or coin to turn the cam catches one quarter of a turn in either direction.

Code 118 mounting cradle—top/bottom entry

Mounting the cradle

- ❑ 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 heat sink and connectors.

- ❑ Remove the front and rear fixing screws of the transceiver side rails, leaving the centre screw untouched.
- ❑ Fit the supplied adaptor plates to the transceiver side rails to secure the transceiver to the cradle.

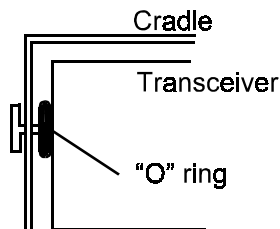


Figure 2-4: Position of "O" ring

Secure the adaptor plates flush to the transceiver side rails with the new screws provided and fit one "O" ring over each projecting stud. The projecting studs on the adaptor plates fit into the slides in the cradle.

- Insert the transceiver adaptor plates into the cradle slides and push fully into the cradle.
- Secure the transceiver into the cradle with the spring clips.

Mounting the control head and loudspeaker



Make sure that the transceiver is disconnected from the DC power source before connecting the control head to the **Remote Control** connector on the transceiver.

Select a suitable location to mount the control head and loudspeaker. Avoid places exposed to direct sunlight such as a car dashboard close to the windscreen.

Connecting the cables to the control head

The control head comes fitted with the loudspeaker and control head cables connected however, you may need to adjust the cable path to suit your requirements.

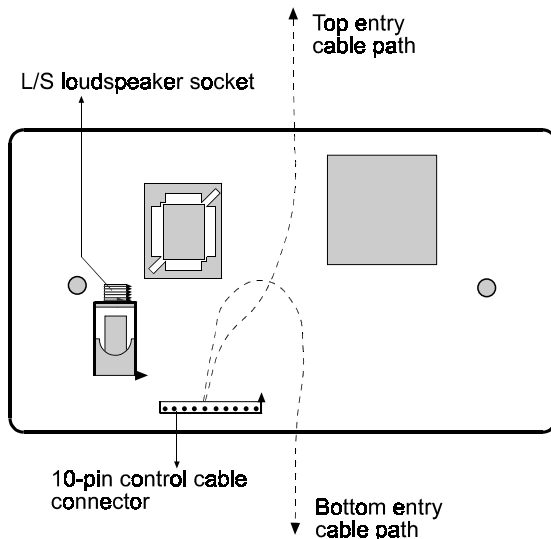


Figure 2-5: Rear view of control head without cover

- Remove the two screws on the rear of the control head and remove the cover.

Figure 2-5 shows the rear of the control head with the cover removed.

- Feed the loudspeaker cable through the foam grommet near the control head end of the control cable.
- Place the foam grommet into the slot on the rear cover.
- Position the cable as shown in Figure 2-5 to ensure that the cover will not pinch the cable.
- Replace the rear cover of the control head and its two screws carefully.



The rear cover of the control head can be rotated to give you either top or bottom entry of the cables.

Installing the mounting brackets

The loudspeaker and the control head have similar mounting brackets. The procedure for installing them is the same.

Installing the brackets

- Remove the two cradle screws and washers securing the mounting cradle to the equipment.
- Secure the mounting cradle into position.
Ensure that there is sufficient space at the rear for the cables.
- Secure the equipment to the mounting cradle with the two screws and washers.

Installing the cables

- Plug in the control cable at the **Remote Control** connector on the transceiver, ensuring that it is securely fastened.



The control cable is six metres long. *Do not* cut the control or loudspeaker cable. If either cable is too long, gather the excess neatly and secure it out of the way.

In extended control installations, where the battery supply and control head cables are long and follow a common path, keep the cables separated by a minimum of 200 mm. The cables can be closer together for short distances, for example, to pass through the same hole in the bulkhead.



Failure to keep the cables separated will cause distortion of the transmitted audio signals.

Connecting the microphone

- Gently rotate the plug in the microphone socket until the pins locate.
- Push the plug home and fasten the locking ring until finger-tight.

Do not over-tighten.

Power supply

Power can be provided by either a 12 V battery (for mobile stations) or a suitable power supply connected directly to the mains (for fixed base stations).

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

Connect the power cable between the transceiver and the battery or the AC power supply. Make sure the transceiver is grounded correctly (see page 2-13, *Grounding*).

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

Power cable for mobile stations

A heavy duty six metre length of power cable is supplied with the vehicle mounting cradle for mobile stations. This cable minimises the voltage drop between the battery and transceiver during transmission. Do not use a thinner cable than this.

Protecting the cables

Protect all cables from sharp edges and mechanical abrasions.

We recommend that a suitable cartridge fuse (32 Amp—accessory code 711) is fitted in the active wire, close to the battery. This will protect the power cable from risk of fire if damaged insulation touches the vehicle chassis. Do not use normal glass in-line automotive fuses. The transceiver is fitted with adequate internal protection.

Grounding

A good ground (RF earth) is essential for efficient transceiver operation. A chassis ground is provided on the rear panel of the transceiver.

Use a copper braid of at least 12 mm width to ground the transceiver. Use a length of braid that is just long enough to connect the transceiver to the earthing point.

The control head may also require earthing to prevent RF interference corrupting its data and audio circuits. To do this, check that the mounting bracket is earthed by ensuring that the screws holding the mounting bracket are not insulated. It may be necessary to remove paint from around the mounting screws to ensure a good contact.

Ancillary equipment

A range of ancillary equipment is available for use in conjunction with the transceiver. For details, see page 9-1, *Accessories*.

Antenna and antenna tuner

The antenna and antenna tuner must be correctly installed for good transceiver operation.

To obtain optimal performance and good radiation efficiency from your transceiver, the antenna system must be:

- located in a position that ensures the signal is not subject to interference (for example, it should be located on top of a building or clear of the body of a vehicle)
- properly grounded

It is important to follow the installation instructions provided with each antenna and antenna tuner to achieve the best possible performance.

3 Setting up the transceiver

This chapter describes how to use the Setup mode of your transceiver. It includes:

- the Setup mode menu tree (3-2)
- using setup procedures (3-3)

The procedures available are listed alphabetically later in this chapter. Many are described in detail in the *HF SSB Transceiver 9780 User Guide*.

You can only use procedures listed here if they are standard for the HF SSB Transceiver 9780 or if they correspond to options fitted and enabled on your transceiver.

Contact your Codan representative if you want to use some of the options you do not currently have enabled.

Setup mode menu tree

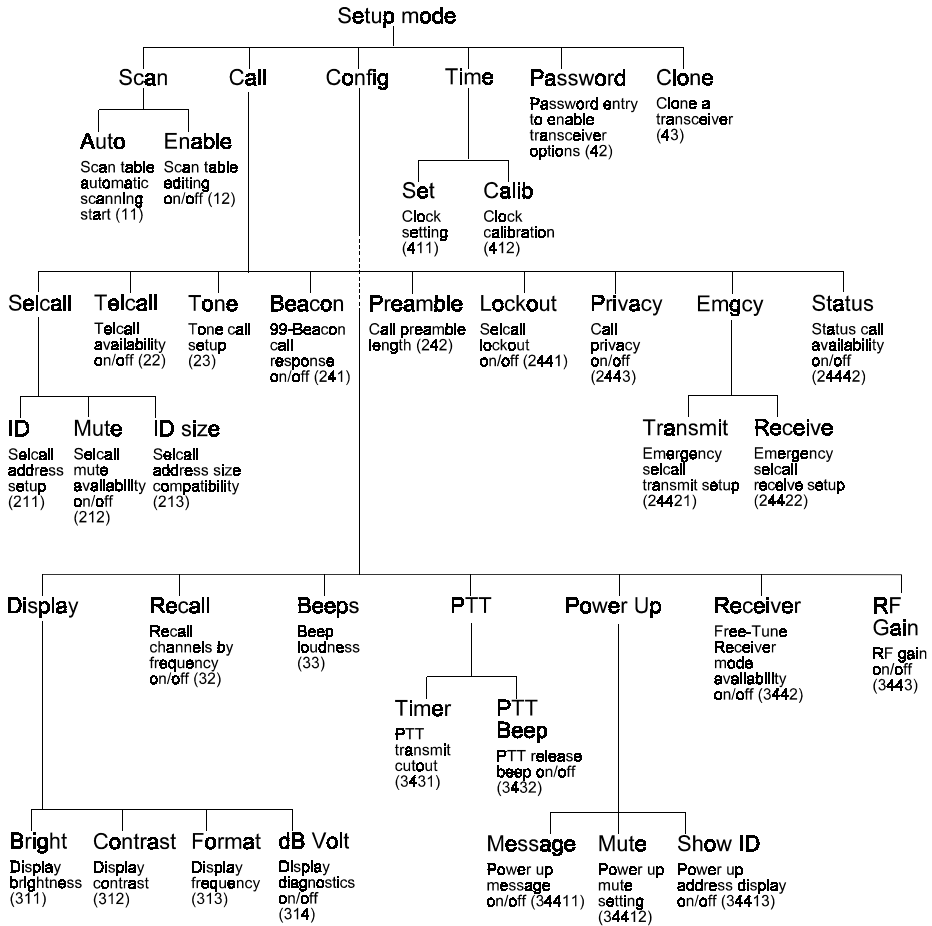


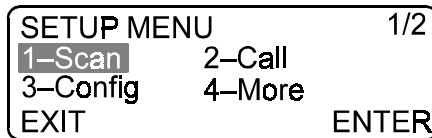
Figure 3-1: Setup mode menu tree

Starting setup procedures

You use Setup mode to set the transceiver options. Each procedure has an access code. This code is shown in parentheses below each option in Figure 3-1 and is provided with each option in Table 3-1. The access code is a shortcut to take you directly to the set up option you want.

Selecting Setup Mode

- Press **Mode** until the display for **SETUP MENU** appears.



- Select the Setup procedure you want, following Figure 3-1 as an aid to navigation through the menu structure.
- If you have Option S or ST fitted, continue from *Selecting a menu option using a keypad microphone (Option S and ST)*.
Otherwise, continue from *Selecting a menu option using a control panel*.

Selecting a menu option using a control panel

- Rotate **Select** to highlight the menu option you want.
For example, Emergency Receive is located under the Call menu, with an access code of 24422. If you want to access Emergency Receive, rotate **Select** to highlight option **2-Call** (see Figure 3-1).
- Press **F2(ENTER)** to select the highlighted menu option and advance to the next menu or option.
Repeat the last two steps, each time selecting the next number in the code. For example, you would select option **4-More** to proceed with the access code for Emergency Receive.

Press **F1(EXIT)** to return to the previous menu or option.

- ❑ Continue from *Completing the setup task*.

Selecting a menu option using a keypad microphone (Option S and ST)

- ❑ Enter the code associated with the setup procedure you want, using the keypad microphone.

For example, if you want to access Emergency Receive, enter 24422.

Completing the setup task

- ❑ Complete the setup task as detailed in the User Guide.

Escaping Setup Mode

- ❑ If you make a mistake and want to leave Setup mode without saving any changes, press **F1** or **PTT** repeatedly until the display for Channel mode appears.

Setup mode time-out

If you do not touch any button or knob for 60 seconds while in Setup mode, the transceiver automatically reverts to Channel mode.

If this happens while you are in the middle of a procedure, start the procedure again.

Setup procedures table

Table 3-1: Setup procedures

Procedure	Description	Menu	Code
Beep loudness	Changes the volume of transceiver beeps.	Config	33
Call preamble length	Sets the length of the preamble transmitted at the start of a selective call.	Call	242
Clock calibration	Calibrates the transceiver clock against an external standard.	Time	412
Clock setting	Sets the time and date of the transceiver clock.	Time	411
Clone a transceiver	Copies the settings from one transceiver to another by a process called cloning.	Clone	43
Display brightness	Changes the display brightness.	Config	311
Display contrast	Changes the display contrast.	Config	312
Display diagnostics	Switches the display of diagnostic information on or off.	Config	314
Display frequency	Sets the way the frequency is displayed for each channel.	Config	313
Emergency selcall receive setup	Sets up the transceiver for receiving emergency selcalls.	Call	24422
Emergency selcall transmit setup	Sets up the transceiver for sending emergency selcalls	Call	24421
Password entry to enable transceiver options	Enables transceiver options that are built into the transceiver and deletes forgotten PINs.	Passw'd	42

Procedure	Description	Menu	Code
Power up address display on/off	Selects whether or not your address, set up in selcall group 1, is briefly displayed when the transceiver is first switched on.	Config	34413
Power up message on/off	Allows you to set up a message that is displayed for several seconds when the transceiver is first switched on.	Config	34411
Power up mute setting	Selects the initial mute setting that is used when the transceiver is first switched on.	Config	34412
PTT release beep on/off	Switches PTT release beeping on or off.	Config	34412
PTT transmit cut out	Prevents the transceiver from being left in the transmit state by mistake by automatically reverting to receive state after the cut out time has elapsed.	Config	3431
Recall channels by frequency on/off	Selects whether or not you can recall channels or frequency.	Config	32
RF gain on/off	Switches the RF gain on or off.	Config	3443
Scan table automatic scanning start	Sets the time delay between finishing a call and resuming automatic scanning.	Scan	11
Scan table editing on/off	Switches scan table editing on or off.	Scan	12
Selcall address setup	Sets up your address for any of your transceiver's five selcall groups S1 – S5.	Call	211
Selcall address size compatibility	Selects the way you communicate with stations that are incapable of using addresses longer than four digits.	Call	213
Selcall lockout on/off	Switches selcall lockout on or off.	Call	2441

Procedure	Description	Menu	Code
Selcall mute availability on/off	Switches on or off the availability of selcall mute on the control panel (the S'call Mute button).	Call	212
Status call availability on/off	Switches on or off the ability to send the two types of status call—remote diagnostics call and remote config call.	Call	24442
Telcall availability on/off	Switches on or off the ability to send telcalls.	Call	22
Tone call setup	Sets up the high and low frequency pairs for any of the four tone call groups T1 – T4.	Call	23
99-beacon call response on/off	Switches on or off the ability to respond to received 99-beacon calls (selcalls ending in 99).	Call	241

Setting up the transceiver

4 Link Setup mode

Link Setup mode allows you to perform set up procedures that are not commonly used in the daily operation of your transceiver.

The topics covered in this chapter are:

- entering and leaving Link Setup mode (4-2)
- turning Setup mode availability on and off (4-5)
- setting up a Personal Identification Number (PIN) (4-6)
- controlling the antenna band or channel (4-8)
- resetting the transceiver to factory settings (4-11)

Entering and leaving Link Setup mode

Before you can use Link Setup mode you must re-position a link inside the transceiver.

See Figure 4-1 and refer to the instructions following.

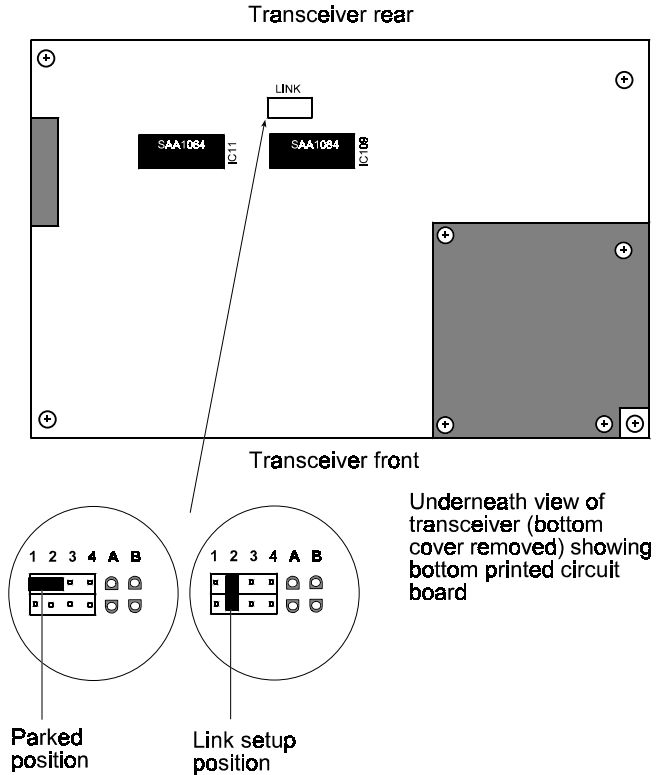


Figure 4-1: Moving the link for Link Setup mode

The link is in the parked position in normal operation and in link setup position in Link Setup mode.

Entering Link Setup mode

- Switch off the transceiver using **On/Off**.

It is not necessary to remove power from the transceiver.

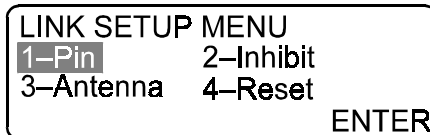
- Remove the screws on either side of the bottom cover and lift the cover off.
- Locate the link on the printed circuit board (see Figure 4-1) and move it to link setup position.

The link is a small connector that slides over two pins on the board. Pull it gently to move it.

- Switch on the transceiver.

There is no need to replace the bottom cover at this stage.

The changed link position is detected when the transceiver is first switched on. The Link Setup Menu appears.



If this menu does not appear, check that the link is pushed well down on the pins and is in the correct position. Use the **On/Off** button to switch the transceiver off then on again.

The transceiver is now in Link Setup mode. You can now follow any of the Link Setup procedures described in this chapter.

Escaping from procedures in Link Setup mode

If you make a mistake while using any Link Setup procedure and you want to escape, press **F1** on the control panel, or **PTT** on the microphone. This returns you to the start of Link Setup mode without saving any changes.

Returning to normal mode

When you have finished using Link Setup mode you should return the transceiver to normal operating mode.

- Switch off the transceiver.
- Return the link to the original parked position.
- Switch on the transceiver.

The normal Channel display should appear. If the Link Setup Menu is displayed again, check that the link is pushed down firmly on the pins and is in the correct position. Switch the transceiver off then on again.

Replacing the bottom cover

When the link is correctly seated:

- Switch off the transceiver.
- Replace the bottom cover and secure the screws.
- Switch on the transceiver.

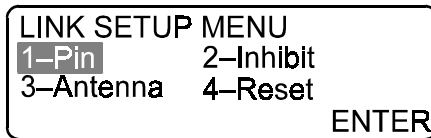
The transceiver is now ready to resume normal operation.

Turning Setup mode availability on and off

You can turn the availability of Setup mode off after your transceiver is set up. Denying casual access to setup mode safeguards against accidental deletion or modification of programmed information.

Entering Link Setup mode

- ❑ Enter Link Setup mode (see page 4-3, *Entering Link Setup mode*).



- ❑ Rotate **Select** to highlight option **2-Inhibit**.

You will see a display that is similar to the following.



- ❑ Rotate **Select** to highlight the option you want.

ENABLED You can alter the setup of your transceiver through Setup mode

DISABLED You cannot alter the setup of your transceiver through Setup mode

- ❑ Press **F2(ENTER)** to save your option and return to the Link Setup Menu.
- ❑ Exit Link Setup mode (see page 4-4, *Returning to normal mode*).

Setting up a PIN

This procedure is used to set, change or cancel a transceiver PIN. If a PIN is set, no one will be able to use the transceiver unless they know the PIN.

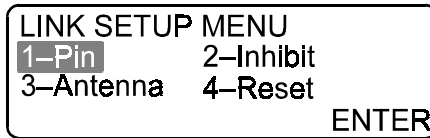
You must know the current PIN to be able to change or cancel use of a PIN.



Do not forget your PIN! If you do, you will have to obtain a password from Codan to delete the PIN.

Entering Link Setup mode

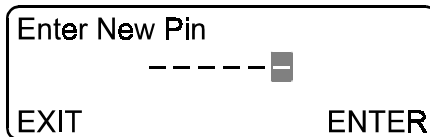
- ❑ Enter Link Setup mode (see page 4-3, *Entering Link Setup mode*).



Option **1-Pin** is already highlighted.

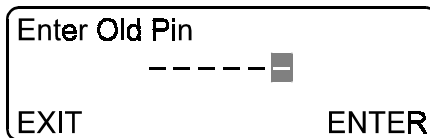
- ❑ Press **F2(ENTER)**.

If no PIN is set, you will see the following display.



Continue at *Setting a new PIN*.

If a PIN is currently set, you will see the following display.



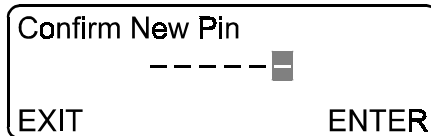
Continue at *Changing an existing PIN*.

Setting a new PIN

- Enter the new PIN of up to six digits (see HF SSB Transceiver 9780 User Guide Chapter 3, *Using **Select** and **Volume** to enter information* or use a numeric keypad if you have one).

If you want to cancel the use of the PIN, enter 0.

- Press **F2(ENTER)** to see the following display.



- Enter the new PIN again to confirm it.
- Press **F2(ENTER)**.

If the number is different the second time you enter it, the transceiver beeps and you will have to repeat the steps from *Setting a new PIN*.

The Link Setup Menu is displayed and the PIN is now in effect.

- Continue from *Returning to normal mode*.

Changing an existing PIN

- Enter the current PIN (see HF SSB Transceiver 9780 User Guide Chapter 3, *Using **Select** and **Volume** to enter information* or use a numeric keypad if you have one).

If you enter the wrong PIN the transceiver beeps and you will have to repeat the steps from *Changing an existing PIN*.

- Continue at *Setting a new PIN*.

Returning to normal mode

- Exit Link Setup mode (see page 4-4, *Returning to normal mode*).

Controlling antenna band and channel outputs

This procedure is used to control the output of switching signals at the **Antenna Control** connector on the back panel of the transceiver.

You only need to use this procedure if you are using the transceiver to control equipment such as a multiple antenna installation or a switchable multi-frequency antenna. If you are using an automatic tuning antenna, any settings made by this procedure are ignored.

You can select:

- **CHANNEL** if you want the transceiver to control equipment according to the single frequency of the current channel
- **BAND SET 1** or **BAND SET 2** if you want the transceiver to control equipment according to the operating frequency band of the supporting equipment (for example, add-on high power linear amplifiers)

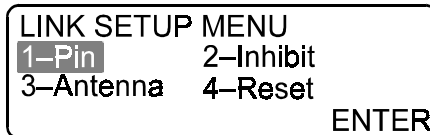


If you choose a setting that is incorrect for the PA you have connected to the system, you may damage the PA.

Setting the control options

Entering Link Setup mode

- Enter Link Setup mode (see page 4-3, *Entering Link Setup mode*).



- Rotate **Select** to highlight option **3-Antenna**.

- Press **F2(ENTER)** to see a display that is similar to the following.



- Rotate **Select** to highlight the option you want.

BAND SET 1 Controls equipment according to Band Set 1 frequencies (see Table 4-1)

BAND SET 2 Controls equipment according to Band Set 2 frequencies (see Table 4-1)

CHANNEL Controls equipment by channel frequency

Table 4-1: Selecting band sets

Outputs			Band set 1 frequency ranges	Band set 2 frequency ranges
4	2	1	(MHz)	(MHz)
L	L	L	<2	
L	L	H	2–2.99999	<2
L	H	L	3–3.99999	2.299999
L	H	H	4–5.99999	3–4.99999
H	L	L	6–8.99999	5–7.99999
H	L	H	9–12.99999	8–12.99999
H	H	L	13–19.99999	13–19.99999
H	H	H	20–30	20–30



Refer to Figure 7-2, *Antenna Control connector* for further information on these outputs. If you need further information, contact your Codan representative.

- Press **F2(ENTER)** to save your option and return to the Link Setup Menu.
- Exit Link Setup mode (see page 4-4, *Returning to normal mode*).

Resetting the transceiver to factory settings

This procedure is used to carry out up to three types of reset:

- delete all unprotected channels
- reset user settings to the factory default values
- reset user settings to the factory default values and delete all channels (full reset)

User settings

User settings include all settings in the transceiver except:

- channel information
- PIN
- transceiver options installed by Codan or enabled by password
- display brightness and contrast settings

Resetting some or all settings

Entering Link Setup mode

- Enter Link Setup mode (see page 4-3, *Entering Link Setup mode*).

```

LINK SETUP MENU
1-Pin      2-Inhibit
3-Antenna  4-Reset
ENTER
  
```

- Rotate **Select** to highlight option **4-Reset**.
- Press **F2(ENTER)** to see the following display.

```

Press F2 to:
Delete all
unprotected channels
EXIT      RESET
  
```

- ❑ Rotate **Select** to highlight the option you want.

Delete all unprotected channels	Deletes channels only if they are unprotected
Reset user settings to factory defaults	Resets user settings but has no effect on channels
Reset user settings, delete all channels	Full transceiver reset including deleting all channels



Use caution before deleting all channels, since this includes all your protected channels set up by Codan. If your transceiver is fitted with option TxD and you delete all channels, you will be unable to use the transceiver until your transmit channels are entered again by Codan.

If you do not want to reset your transceiver, press **F1(EXIT)**.

Resetting your transceiver

- ❑ Press **F2(RESET)** to see a display that is similar to the following.



- ❑ Press **F2(RESET)** to confirm that you want to reset your transceiver and return to the Link Setup Menu.
- ❑ Exit Link Setup mode (see page 4-4, *Returning to normal mode*).

5 Display messages

This chapter lists all messages you might encounter on the transceiver display. They include:

- transceiver status messages
- operator error messages
- system error messages

Some error messages are accompanied by one or more beeps.

Table 5-1: Display messages

Message	Meaning	Action
Antenna untuned	The auto tuner or antenna is not tuned.	Press Tune .
Auto-tuning	The antenna is being tuned automatically before transmission.	None.
Bad record type XX	Data was corrupted during XP programming.	Check the XP cables. Switch the transceiver off then on again. If the problem remains, contact your Codan representative.
Bad type/inst XX/XX	Internal data fault.	Switch the transceiver off then on again. If the problem remains, contact your Codan representative.
BGRAM Ck/Sum Err	Data in the battery backup RAM has become corrupted.	Contact your Codan representative.
BGRAM update failed	The transceiver cannot read/write data to the battery backup RAM.	Contact your Codan representative.

Message	Meaning	Action
BUSY—All Settings mode BUSY—Calling BUSY—Emergency call BUSY—Programming BUSY—Reviewing BUSY—Scan prog BUSY—Setting up	The transceiver is in Single-access mode.	Wait until the procedure is completed.
Call stack empty	There are no calls stored in the call memory.	Refer to the User Guide Chapter 8, <i>Reviewing calls held in memory</i> .
Channel not found	This channel number is not used.	Select a channel that exists.
Channel protected	The current channel is protected against change or deletion.	Contact your Codan representative if you need to change or delete this channel.
Channel space full	The maximum number of channels has been set up.	If you want to add channels, first delete channels that are not protected (NP) and not wanted. Refer to the User Guide Chapter 4, <i>Deleting a channel</i> . To delete protected channels with Option TxD, contact your Codan representative.

Message	Meaning	Action
Channel used	This channel already exists.	If you want to change its channel settings, continue the process. Refer to the User Guide Chapter 4, <i>Creating or editing a channel</i> .
Clarifier	Clarifier mode has been selected.	Use Select to clarify the signal. Refer to the User Guide Chapter 3, <i>Clarifying the received signal</i> .
Cloning failed	Cloning the transceiver has failed.	Check the programming cables. Switch the transceiver off and on again. Try cloning again. If the problems remains, contact your Codan representative.
Cloning finished	Cloning was completed successfully.	None.
Emergency abort	The emergency call was cancelled.	None.
Empty scan table	No channels have been set up in the selected scan table.	Refer to the User Guide Chapter 5, <i>Creating or editing a scan table</i> .
Error PIN mismatch	You entered a different number the second time you entered your new PIN.	Set up the PIN again (see page 4-6, <i>Setting up a PIN</i>).
Error: no self ID	Your address has not been set up.	Refer to the User Guide Chapter 8, <i>Setting up a selcall group</i> .
External RAM bad	The transceiver cannot read or write to parallel RAM.	Switch the transceiver off then on. If the problem remains, contact your Codan representative.

Message	Meaning	Action
Frequency not found	No channel has been set up for this frequency.	If you want to receive on this frequency, refer to the User Guide Chapter 4, <i>Creating or editing a channel</i> or Chapter 11, <i>Using the transceiver as a free tune receiver</i> . If you want to send on this frequency and you do not have Option TxE, contact your Codan representative.
FSK calibration fail	The selcall decoder is not calibrated.	Switch the transceiver off then on. If the message reappears, contact your Codan representative.
I ² C bus error XXXX:XXXX	There is a major hardware fault on one of the I ² C bus lines.	Contact your Codan representative.
Intrnl Tmr Alloc Err	Internal timer allocation error.	Switch the transceiver off then on. If the problem remains, contact your Codan representative.
Is emergency channel	This is a digital emergency channel.	You can only delete this channel after removing it from the emergency call table (refer to the User Guide Chapter 6, <i>Setting up to send an emergency selcall</i>).
Low battery	The supply battery voltage has dropped below 10 volts.	Recharge or change the battery.

Message	Meaning	Action
No call available	Either selective calling has not been established or no selcall group is assigned to this channel.	For changing channel settings, refer to the User Guide Chapter 4, <i>Creating or editing a channel</i> . Select one of the selcall groups S1–S5. If the channel is protected, contact your Codan representative.
No channels fitted	No channels have been set up.	Contact your Codan representative.
No deflt rec for XX	The transceiver could not read a default record.	Switch the transceiver on then off. If the message reappears, contact your Codan representative.
No destination ID	No call address has been set up.	Refer to the User Guide Chapter 8, <i>Setting up a selcall group</i> .
No real time clock	The clock is faulty.	Contact your Codan representative.
No selcall send	This channel does not allow you to send selective calls.	Refer to the User Guide Chapter 4, <i>Creating or editing a channel</i> .
No tones programmed	No tone call frequencies have been set up.	Refer to the User Guide Chapter 11, <i>Setting up a tone call group</i> .
Not enabled	This option is switched off.	To switch the option on, refer to the relevant procedure in the User Guide.
Not tuned	The antenna has not been tuned.	Press Tune to tune the antenna.
Option not fitted	This option has not been enabled in the transceiver.	If you want this option, contact your Codan representative.

Message	Meaning	Action
Out of PA Range	A channel has a frequency outside the PA operating frequency band.	Contact your Codan representative.
Parallel EEPROM bad	Data in the parallel EEPROM has become corrupted.	Contact your Codan representative.
Program inhibited	The current channel is protected from deletion.	If you want to copy this channel to another channel number, refer to the User Guide Chapter 4, <i>Creating or editing a channel</i> . If you need help, contact your Codan representative.
PTT cutout	Transmission time has exceeded the set limit.	If you want to change the time limit, refer to the User Guide Chapter 11, <i>Enabling and setting the PTT transmit cutout time</i> .
PTT inhibited	The current channel is a receive-only channel.	Select another channel if you want to transmit.
Queue full	The internal task queue is full.	Switch the transceiver off then on. If the problem remains, contact your Codan representative.
RAM fault	The transceiver cannot read data from the parallel RAM.	Contact your Codan representative.
RTC Ck/Sum Err	The transceiver detected a real time clock checksum error.	Switch the transceiver off then on. If the problem remains, contact your Codan representative.
S'call mute disabled	Selcall mute availability is switched off.	To make selcall mute available, refer to the User Guide Chapter 8, <i>Enabling/Disabling selcall mute</i> .

Message	Meaning	Action
Scan abort	Scanning has stopped because PTT or another button was pressed.	If you want to return to Scan mode, press Scan .
Scan inhibited	Scan table editing is currently disabled.	To allow scan tables to be edited, refer to the User Guide Chapter 5, <i>Enabling/Disabling the editing of scan tables</i> .
Scan program full	This scan table is full because it contains the maximum (ten) channels.	Refer to the User Guide Chapter 5, <i>Creating or editing a scan table</i> .
Scan-tuning	The antenna is being tuned automatically before scanning begins.	None.
SEERAM Ck/Sum Err	Data in the serial EEPROM has become corrupted.	Contact your Codan representative.
Serial BBRAM bad	The transceiver cannot read or write reliably to the battery backup RAM when power is applied.	Contact your Codan representative.
Serial EEPROM fail XX	The transceiver detected an error in reading or writing data to the serial EEPROM.	Contact your Codan representative.
Telcall disabled	Sending telcalls from the transceiver is disabled.	To switch telcall availability on, refer to the User Guide Chapter 9, <i>Enabling/Disabling telcalls</i> .
Tone is disabled	You cannot send a tone call because no tone call group has been assigned to this channel.	To assign a tone call group to this channel, refer to the User Guide Chapter 4, <i>Creating or editing a channel</i> .
Transmit inhibited	The current channel is a receive-only channel.	Select a channel enabled for transmission.

Message	Meaning	Action
Tune abort	Antenna tuning has been cancelled because PTT has been pressed.	If necessary, tune the transceiver again.
Tune fail	Antenna tuning failed.	Check that the antenna position is acceptable (for example, not too close to buildings). Press Tune to tune the antenna again. If the problem remains, contact your Codan representative.
Tune pass	The antenna was successfully tuned.	None.
Tuner fault	The transceiver failed to tune the antenna within two minutes.	Check the installation (such as cables to the antenna tuner). Press Tune to tune the antenna again. If the problem remains, contact your Codan representative.
Tuning	The Tune button was pressed and the antenna is now being tuned.	None.
Unknown error: XX	The transceiver detected an unknown data error.	Contact your Codan representative.
Unlock error VCO1	VCO1 is unlocked.	Contact your Codan representative.
Unlock error VCO1 & 2	VCO1 and VCO2 are unlocked.	Contact your Codan representative.
Unlock error VCO2	VCO2 is unlocked.	Contact your Codan representative.
Value too high	The entered number is too large.	Enter the correct number.

Display messages

Message	Meaning	Action
Writing SEE defaults	Now re-programming serial EEPROM with default settings.	None.

6 Single and Multi-access modes

You can control the transceiver from more than one control panel if you have one or more control heads connected to your system.

The connected system operates in Multi-access or Single-access mode, as determined by which of the transceiver functions listed below is being used.

Emergency calls are not affected by operating modes. You can make an emergency call from any control panel at any time.

Multi-access mode

If you are performing any of the tasks listed below, your transceiver will automatically be in Multi-access mode. You can use any connected control panel to control the transceiver. The display on all connected control panels is the same.

Multi-access operating mode functions include:

- PTT voice calls
- scanning
- Channel mode when not calling
- Clarifier mode when not calling
- Free Tune Receiver mode
- Channel Options mode

If you operate between control panels, you must wait two seconds before controlling the transceiver from a new panel.

Single-access mode

If you are performing any of the tasks listed below, your transceiver will automatically be in Single-access mode. You can only control the transceiver from the control panel that initiated Single-access operating mode. No other control panel can be used until you initiate a Multi-access mode operation.

Single-access operating mode functions include:

- making a call (except voice and tone calls)
- creating and editing channels
- recalling channels
- creating and editing scan tables
- Setup mode
- View All Settings mode

Other control panels cannot be used until you return the transceiver to a Multi-access mode function. These control panels display a message indicating that the transceiver is busy.

The message indicates the transceiver operation:

- BUSY—All Settings mode
- BUSY—Calling
- BUSY—Emergency call
- BUSY—Programming (channel creation and editing)
- BUSY—Reviewing
- BUSY—Scan prog (scan table creation and editing)
- BUSY—Setting up (Setup mode)

Single-access mode has a 30 second time-out. A control panel left unattended in this mode will not stop other control panels from being used for longer than 30 seconds. When time-out occurs, the transceiver automatically returns to Channel mode.



The **PTT** buttons on the microphones are connected in parallel. When in Single-access mode, do not use the microphones of the other control panels.

7 Connectors



Only suitably qualified personnel should use the information contained in this section. Failure to observe this warning could result in damage to the transceiver.

The connectors covered in this chapter are:

- the **Microphone** socket
- the **Antenna Control** connector
- the **Remote Control** connector
- the loudspeaker **L/S** socket
- the **Ext Alarm** socket

Other connectors are:

- the **GP** connector—not used
- the **RS232** socket—not used

These connectors are not described in this chapter.

Microphone socket

The microphone socket is unmarked. It is located at the left of the control head or front panel.

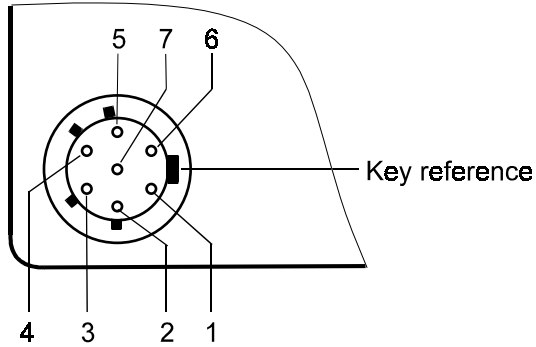


Figure 7-1: Microphone socket

Table 7-1: Microphone socket pins

Pin	Function
1	Loudspeaker audio output
2	Microphone input
3	Ground
4	Data in
5	PTT in (active low) and data out
6	Battery (switched)
7	Front panel speaker (ground return)

Antenna Control connector

The **Antenna Control** connector is located at the left of the back panel.

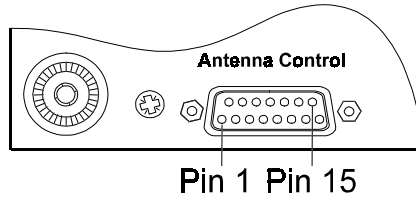


Figure 7-2: Antenna Control connector

Table 7-2: Antenna Control connector pins

Pin	Function	Pin	Function
1	Binary coded decimal channel 4	9	Binary coded decimal channel 1
2	Binary coded decimal channel 8	10	Binary coded decimal channel 2
3	Not used	11	Tuned in
4	Tune in and out (active low)	12	Battery (switched)
5	Scan antenna (active low)	13	Battery (switched)
6	Not used	14	Ground
7	Not used	15	Ground
8	PTT out (+10 V = Tx)		

Remote Control connector

The **Remote Control** connector is located at the right of the back panel.



Make sure that the transceiver is disconnected from the DC power source before connecting anything to the **Remote Control** connector.

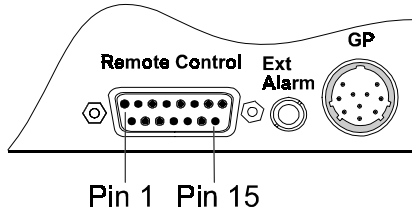


Figure 7-3: Remote Control Connector

Table 7-3: Remote Control connector pins

Pin	Function	Pin	Function
1	Speaker	9	Ground
2	Remote PTT	10	Ground
3	External audio input	11	Transmitter audio input
4	Power on	12	Receiver demodulated output
5	Data (I ² C bus, 5 V)	13	Receiver audio output
6	Not used	14	Interrupt (I ² C bus, 5 V)
7	Click (I ² C bus, 5 V)	15	Battery (switched)
8	Rx and Tx indicator		

Loudspeaker socket

The loudspeaker socket is labelled **L/S**. It is located at the middle of the back panel.

Table 7-4: Loudspeaker socket pins

Connection	Function
Tip	Speaker audio output
Sleeve	Ground

External alarm socket

The external alarm socket is labelled **Ext Alarm**. It is located at the right of the back panel.

Table 7-5: External alarm socket pins

Connection	Function
Tip	Relay switch contact
Sleeve	Relay switch contact (ground)

8 Specifications

Channel capacity	Up to 15 channels
Frequency range	Transmit: 2.25 to 30 MHz Receive: 250 kHz to 30 MHz
Operating mode	Single sideband (J3E; USB-LSB)
Transmitted power	125 watts (PEP)
Supply voltage	12 V DC nominal, negative earth Normal operating range 10.5 V to 15 V DC Maximum operating range 9 V to 16 V DC Reverse polarity protection provided
Over-voltage protection	Shut down at 16 V DC (nominal) for duration of over-voltage
Supply current	Receive (no signal): 0.75 A Transmit J3E voice: 6 A (average) J3E two tone: 9–12 A
Size and weight	HF SSB 9780 transceiver (excluding vehicle mounting frame) Dimensions: 250 mm wide x 320 mm deep x 78 mm high Weight: 3.3 kg 9782 control head (including mounting bracket) Dimensions: 140 mm wide x 40 mm deep x 80 mm high Weight: 0.4 kg

Specifications

9 Accessories

The following accessories are available for your transceiver:

Table 9-6: List of accessories

Code	Accessories
112	Vehicle installation hardware kit.
117	Vehicle mounting cradle—front entry. Supplied with six metre transceiver DC power cable. This cradle is normally supplied with the extended control version of the transceiver.
118	Vehicle mounting cradle—top or bottom entry. Supplied with six metre transceiver DC power cable.
121	2-module clamp suitable for locking the transceiver with another item of equipment having the same physical design.
122	3-module clamp suitable for locking the transceiver with two other items of equipment having the same physical design.
649	Extension loudspeaker.
704	Vehicle interference suppression kit.
711	Bulkhead mounting fuse holder for transceiver DC power cable—supplied with 32 Amp fuse.
712	32 Amp fuse for code 711.
2051	Service manual for this series of transceivers.

Code	Accessories
9782	Control head with hand PTT control microphone (keypad optional) and six metres of interface cable fitted with connectors for 9780 transceiver.

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