

CODAN

**8580 Data Modem
User Guide**

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This User Guide has been prepared for

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This user
guide
explains:

About this guide

- how the Codan 8580 data modem works
 - how to set up a station using the 8580 modem
 - how to make and receive calls.
-

Who should use it

This guide is written for users of the 8580 modem who are **not** running 9102 Modem Controller Software.

This guide applies to version 1.21 and later of the 8580 modem EPROM. This software version is displayed on the terminal when you turn on the 8580 modem.

How to use it

This guide contains six chapters. You should read Chapter 1 and Chapter 2 before you start to use the 8580 modem.

Chapter 1 provides an overview of how the 8580 modem works.

Chapter 2 describes how to set up the station and prepare the 8580 modem for operation.

Chapter 3 describes how to make and receive calls.

Chapter 4 describes the settings that control operation of the 8580 modem. Refer to this chapter when you need to change settings.

Chapter 5 lists the commands that can be used from a dumb terminal when the 8580 modem is in 9102 mode. Refer to this chapter when using 9102 mode.

Chapter 6 explains what to do if something goes wrong.

The Appendix lists reference information and technical specifications.

Conventions and symbols used

In this guide, the following conventions are used:

- the Return key is the same as the Enter key
- type '?' means press the question mark key
- type Ctrl-D means hold down the Ctrl key and press D
- words in *italics* are messages and prompts that are displayed on the terminal.

Other documentation

For further information on character code standards, refer to the 'CCIR Recommendation 476-4 and 625 Direct-Printing Telegraph Equipment in the Maritime Mobile Service' publication.

For details on how to use the 8580 modem with Codan's 9102 Modem Controller Software, refer to the '9102 Modem Controller Software Handbook' (Codan part # 15-03015) included with the 9102 Modem Controller Software package.

About this guide

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This chapter provides an overview of the 8580 modem. It explains:

- what a modem does
- how the 8580 modem transmits information.

What a modem does

'Modem' is short for 'modulator-demodulator'. It is a device that modulates and demodulates signals.

A modem enables digital information, such as text entered on a keyboard, to be transmitted by a transceiver in the form of an audio signal.

The 8580 modem is designed to transfer data reliably and effectively over a high frequency (HF) channel.

The modem station

The modem station consists of:

- the terminal or computer
- the modem
- the transceiver.

You use the terminal or computer to type messages on the keyboard and view received messages on the screen.

The modem provides a link between the terminal or computer and the transceiver.

Types of call

There are two types of call. You can:

- make a selective call
- make a broadcast call.

Selective calls

In a selective or point-to-point call, you transmit information to a specific station.

To initiate the call, you specify the address of the other station. The other station has to be on standby, ready to receive your call.

Broadcasts

In a broadcast, you transmit to all stations that are on standby and tuned to your channel.

Transmission protocols

The method used by the transceiver to transmit and receive information is called the transmission protocol. By using standard protocols, modems are able to communicate with each other.

The 8580 modem handles three transmission protocols:

- Automatic Repeat reQuest (ARQ)
- SElective Forward Error Correction (SELFEC)
- Forward Error Correction (FEC).

ARQ

ARQ is the most common protocol used to make a selective call.

At the start of an ARQ call, both stations start phasing to establish the link.

The transmitting station sends characters in blocks of three. The transmitting station waits for the receiving station to acknowledge each block of three characters before it transmits the next block. While you are typing a message, the two transceivers are continually switching between transmit and receive.

ARQ allows the receiving station to check for transmission errors. If errors are found, the receiving station requests the transmitting station to resend the block.

It takes 70 milliseconds (ms) to send each character. The whole cycle takes 450 ms including all delay and transmission times. The time taken by the station to switch from receive to transmit is called the Press To Transmit (PTT) delay.

SELFEC

Like ARQ, SELFEC is used to make selective calls. Unlike ARQ, it only allows one way transmission.

SELFEC is a simpler protocol than ARQ since there is no feedback from the receiving station. Each character is transmitted twice. The receiving station can check for transmission errors but cannot request resending if errors are found.

FEC

FEC is used to make a broadcast. The message is received by all stations on standby tuned to your channel.

Like SELFEC, transmission is one way and each character is transmitted twice.

Transmission reliability

During an ARQ call

ARQ is the most reliable way to send messages. Characters are displayed on your screen after they have been acknowledged by the receiving station. You know the receiving station is displaying your message as you type.

The ARQ protocol handles all transmission errors.

In an ARQ call:

1. If an isolated transmission error occurs, the receiving station requests the character to be resent.
2. If transmission errors occur repeatedly for 16 seconds, both stations discontinue the call and return to phasing in an attempt to reconnect the link.
3. If reconnection is not achieved within a further 16 seconds, both stations abort phasing and enter standby.

During a SELFEC call

In a SELFEC call, there is no way of knowing if your message is being received since there is no feedback from the receiving station.

The SELFEC protocol detects transmission errors but does not request retransmission. The 8580 modem has a feature that stops the station from receiving further information if there are too many transmission errors. Characters received in error are not displayed.

In a SELFEC call:

1. If the number of transmission errors exceeds the number allowed, the 8580 modem of the receiving station stops receiving and ends the call.

Unaware of this termination, the transmitting station continues to send.

2. The 8580 modem of the receiving station switches to standby, ready to receive the next call.

During an FEC broadcast

The 8580 modem handles FEC broadcast transmission errors in a similar way to SELFEC call transmission errors. There is one difference. The synchronising signals included in an FEC broadcast allow the receiving station to attempt to restart receiving information.

In an FEC broadcast:

1. If the number of transmission errors exceeds the number allowed, the 8580 modem of the receiving station stops receiving information and rephases to the synchronising signals.

Unaware of this termination, the transmitting station continues to send.

2. As soon as the 8580 modem of the receiving station detects the synchronising signals from the transmitting station, the receiving station starts receiving information again.

Synchronising signals are sent approximately every 15 seconds during an FEC broadcast.

The 8580 modem character set

The 8580 modem handles the same characters as a telex machine. The character set includes upper case letters of the alphabet, numbers or figures, and symbols.

The 8580 modem lets you change some of the characters. See 'The character set' on page 56 in the Appendix.

Controlling the 8580 modem during a call

Special combinations of characters control the operation of the 8580 modem during a call.

<i>Characters</i>	<i>Operation</i>
+	Changes the direction of transmission in an ARQ call. This is equivalent to 'Over to you' or 'Go ahead' in voice communications. The transmitting or receiving station can change the direction of transmission at any time during the call.
++	Ends a call. In an ARQ call, enter '++' while you are transmitting. Both stations then switch to standby.
Ctrl-D	Ends a call in the same way as '++'.

<i>Characters</i>	<i>Operation</i>
\$	<p>This is the answerback request character. It is only used in an ARQ call.</p> <p>To request the receiving station to send you its answerback message, enter '\$' while you are transmitting. See '3> Edit internal answerback' on page 38 for details on setting your answerback message.</p> <p>You can use the answerback feature to double check that the link is functioning correctly.</p> <p>If your station is left unattended on standby, you can leave an answerback message to be read by any station that calls you.</p> <p>You can change the use of \$ as the answerback request character (see '4> Set character assignment' on page 39).</p>
!	<p>This character is only used to recover from transmission errors. It controls the shift between letters and figures in the character set.</p> <p>If numbers are displayed as letters or vice versa while receiving a message, enter '!'. </p>
Esc	<p>This character does one of the following:</p> <ul style="list-style-type: none"> • if a call is in progress, aborts the call • if the modem is in standby, returns to the command prompt • if the modem is in setup mode, aborts the current setting. <p>If you abort an ARQ call, the other station assumes that the broken link is due to an error. The other station starts phasing to try to re-establish the link.</p>

This chapter describes how to set up your station. It explains:

- the equipment you need
- the procedure to connect the units
- the operational modes of the 8580 modem
- the settings of the 8580 modem.

What you will need

Terminal or computer

You can use:

- an IBM compatible personal computer with at least 640 Kbytes of RAM
- a dumb terminal capable of a transmission rate in the range 50–9,600 baud.

Transceiver

If you are using a Codan transceiver, it must have the 'PS' hardware option fitted.

If you are not using a Codan transceiver, the transceiver must:

- be rated for continuous wave (CW) transmission at its rated power including the antenna
- have a receive-to-transmit switching time (PTT delay) of 90 ms or less
- have its own interface cable to connect to the 8580 modem.

The smaller the PTT delay, the greater the operational range of the modem.

The maximum range of halfway around the world is achieved when the PTT delay is 18 ms or less. The range reduces by 300 kilometres for each additional 1 ms above 18 ms. For example, a transceiver with a PTT delay of 20 ms has a range 600 kilometres less than the maximum range.

Power supply

The Codan 8540B power supply supplies 12 volt DC to the transceiver and 8580 modem.

Optional 9102 Modem Controller Software

If you are using a computer, you can run special 9102 software to simplify 8580 modem operation. Refer to the '9102 Modem Controller Software Handbook' for details.

When using 9102 Modem Controller Software, the 8580 modem must be set as follows:

<i>Item</i>	<i>Setting</i>
Baud rate	2400
Parity	None
Number of stop bits	1
Number of data bits	8
Handshaking protocol	Xon/Xoff
Answerback request character	\$
Word wrap or Newline setting	Off

Station layout

You can set up:

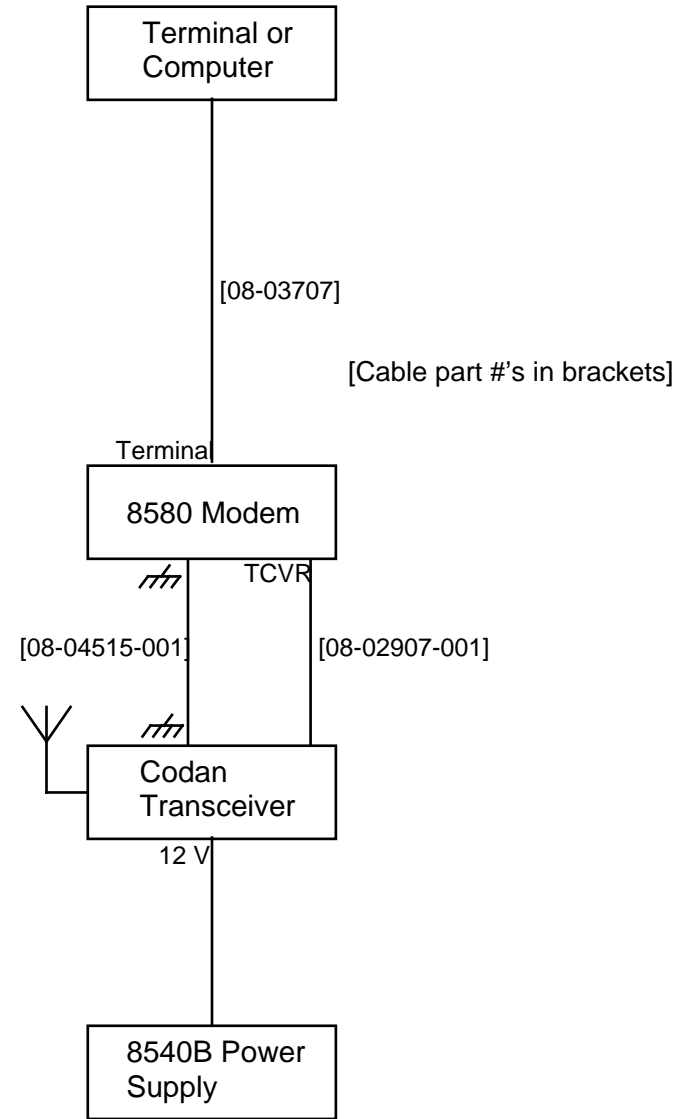
- a standard station
- a remote control station.

Standard station

Normally, the terminal or computer, 8580 modem and transceiver are set up at one location. The terminal or computer connects to the 8580 modem. The 8580 modem connects to the transceiver.

The diagram on the next page shows the layout for a standard station.

Standard Layout



Remote control station

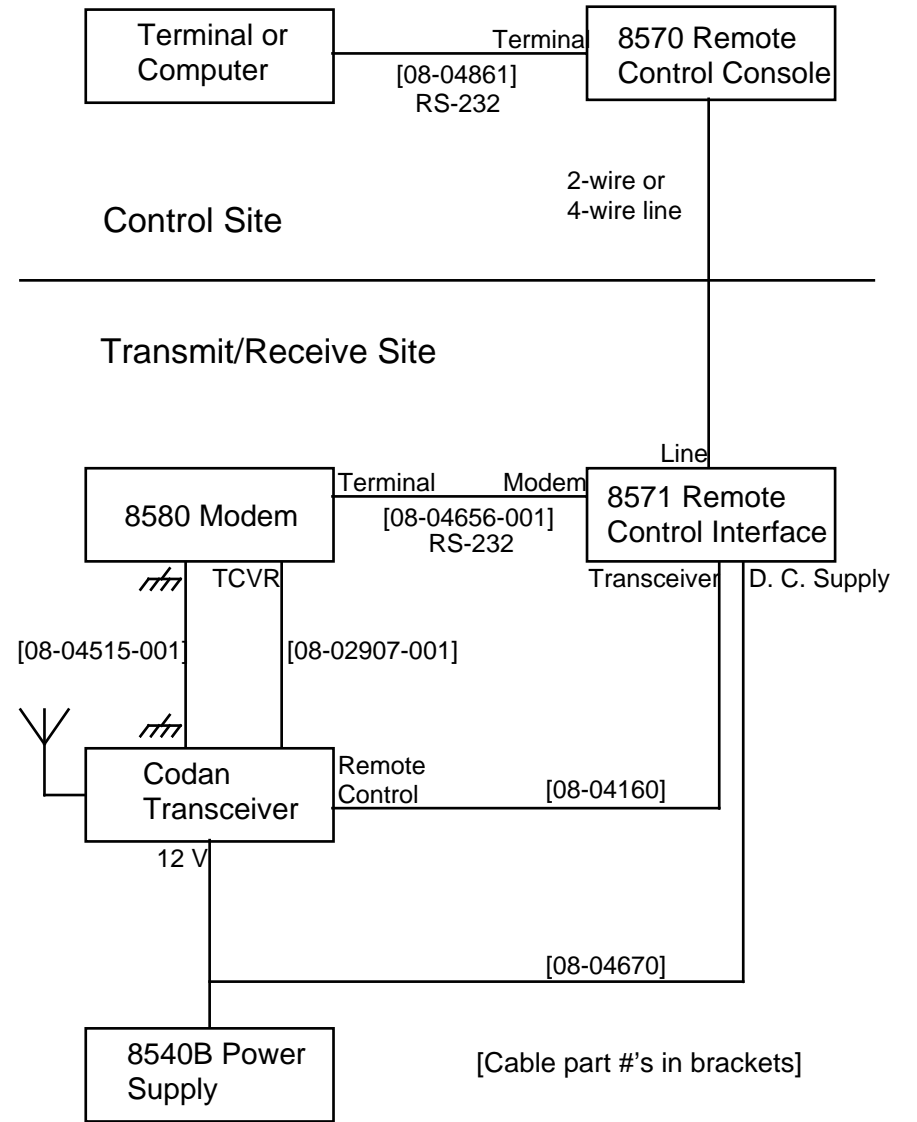
You can set up a remote station if the location of the transceiver is not ideal for transmitting.

A remote station allows you to operate the transceiver from a remote location. The remote station incorporates a remote control system that links the control and transmit/receive sites.

The Codan 8570 Remote Control Console (RCC) controls the remote station from the control site. A physical line or UHF/VHF radio link connects the RCC to the Codan 8571 Remote Control Interface (RCI) at the transmit/receive site. The RCI controls operation of the 8580 modem and transceiver.

The diagram on the next page shows the layout for a remote control station.

Remote Control Layout



Setting up a standard station

Location

1. Site the units where the ambient temperature is within the range -30_C to +60_C.
2. Stack the units if you are using a Codan 8540B power supply and a Codan transceiver. Place the power supply at the bottom, the transceiver in the middle and the 8580 modem at the top.
3. Use a 3-unit module clamp (Codan code 122) to secure the units.

Do not obstruct the cooling fins on the transceiver.

Connecting the units

1. Use Codan cable 08-03707 to connect the terminal or computer to the 15-pin 'Terminal' socket of the 8580 modem.

If the terminal or computer has a 25-pin serial port connector, use the 9-25 way adaptor provided with the 8580 modem.
2. Use Codan cable 08-02907-001 provided with the 8580 modem to connect the 8-pin socket on the transceiver to the 8-pin 'TCVR' socket on the 8580 modem. Tighten the locking rings.
3. Use Codan earth braid 08-04515-001 to connect the earth symbol terminal on the transceiver to the earth symbol terminal on the 8580 modem.
4. Connect the power supply to the '12 V' socket on the transceiver.

If using another make of transceiver

1. Use a special interface cable to connect the transceiver to the 8580 modem.
2. Check if the 8580 modem receives its power supply from this cable. If not, connect the 8580 modem to the power supply using another cable.

Setting up a remote control station

Location

1. Site the units where the ambient temperature is within the range -30_C to +60_C.
2. Stack the units if you are using a Codan 8540B power supply and Codan transceiver. Place the power supply at the bottom. Add the 8571 Remote Control Interface, the transceiver and finally the 8580 modem.
3. Use a 4-unit module clamp (Codan code 123) to secure the units.

Do not obstruct the cooling fins on the transceiver.

Connecting the units

1. At the control site, use Codan cable 08-04861 to connect the terminal or computer to the 9-pin 'Terminal' socket of the 8570 Remote Control Console.

If the terminal or computer has a 25-pin serial port connector, use the 9-25 way adaptor provided with the 8580 modem.

2. At the transmit/receive site, use Codan cable 08-04656-001 to connect the 15-pin 'Terminal' socket on the 8580 modem to the 'Modem' socket on the 8571 Remote Control Interface.
3. Use Codan cable 08-02907-001 provided with the 8580 modem to connect the 8-pin socket on the transceiver to the 8-pin 'TCVR' socket on the 8580 modem. Tighten the locking rings.
4. Use Codan cable 08-04160 to connect the 'Transceiver' socket on the 8571 Remote Control Interface to the 'Remote Control' socket on the transceiver.
5. Use Codan earth braid 08-04515-001 to connect the earth symbol terminal on the transceiver to the earth symbol terminal on the 8580 modem.
6. Earth the power supply and the 8571 Remote Control Interface to the transceiver.
7. Plug the power supply into the Codan 08-04670 adaptor.
8. Plug the '12 V' socket of the transceiver into the other end of the adaptor.
9. Plug the free cable from the adaptor into the 'D. C. Supply' socket of the 8571 Remote Control Interface.

If using another make of transceiver

1. Use a special interface cable to connect the transceiver to the 8580 modem.
2. Check if the 8580 modem receives its power supply from this cable. If not, connect the 8580 modem to the power supply using another cable.

Modes

The 8580 modem has three modes:

- user mode
- 9102 mode
- setup mode.

When you turn on the 8580 modem, the name of the current mode is displayed on the terminal.

User mode

This is the normal way of operating the 8580 modem when you are not using 9102 Modem Controller Software.

In user mode, you respond to prompts that are displayed on the terminal by entering simple commands.

9102 mode

9102 mode allows you to operate the 8580 modem by entering 9102 commands from a dumb terminal. You do not need Codan's 9102 Modem Controller Software to run the 8580 modem in 9102 mode.

Unlike user mode, you need to know the names of commands.

9102 mode has two advantages over user mode. You can:

- use four, five or nine numbers as well as four or seven letters for the station address
- change some modem settings without having to switch to setup mode.

Setup mode

Setup mode allows you to change modem settings stored in memory of the 8580 modem. These settings control the way that the 8580 modem operates.

The settings:

- store call information such as your station address and answerback message
- control how the 8580 modem communicates with the terminal or computer
- control how the transceiver transmits signals.

Changing mode

Changing mode involves removing the cover of the 8580 modem and changing DIP switches on a printed circuit board.

To change mode:

1. Turn off the power to the 8580 modem.
2. Remove the two screws securing the top cover.
3. Slide the cover back until it clears the lip of the front panel.
4. Lift off the cover.

There is a block of eight DIP switches at the front right of the printed circuit board. These switches are numbered from 1 to 8. Switches 6 and 8 control the mode setting.

5. Change the mode as follows:

<i>Mode</i>	<i>Switches</i>
User	6 off 8 off
9102	6 on 8 off
Setup	8 on

6. Replace the cover.
7. Slide the cover forward until it slots under the lip of the front panel.
8. Replace the two screws at the back of the cover.
9. Turn on the 8580 modem.

The name of the current mode is displayed on the terminal.

Matching terminal and modem characteristics

For the 8580 modem to recognise what you type, the characteristics of the terminal must match those of the 8580 modem. Modem settings control 8580 modem characteristics.

Usually, you do not have to change the factory preset modem settings.

Factory settings

Factory preset modem settings for the 8580 modem are as follows:

<i>Item</i>	<i>Setting</i>
Baud rate	2400
Parity	None
Number of stop bits	1
Number of data bits	8
Handshaking protocol	Xon/Xoff

If necessary, change the terminal characteristics to match those of the 8580 modem.

You can also change 8580 modem settings to match those of the terminal. See Chapter 4, 'Modem settings' on page 33 for details.

Station addresses

In user mode, a short station address is four letters. A long station address is seven letters.

In 9102 mode, a short station address is four letters, four numbers or five numbers. A long station address is seven letters or nine numbers (see 'IDENT' on page 47).

Address of the station to be called

If you use a long address for the station you are calling in an ARQ call, the other station is automatically informed of your station address.

If you use a short address in an ARQ or SELFEC call, a station with a long address will respond if the first four letters match.

Your station address

To set your station address using setup mode:

1. Turn on the 8580 modem in setup mode.

The Main menu is displayed.

*1> Setup menu
2> Terminal menu
3> Test menu
4> List current settings
5> Save settings
6> Restore factory settings*

2. Type '1'.

The Setup menu is displayed.

*1> Set station address
2> Set PTT delay
3> Edit internal answerback
4> Set character assignment
5> Set tone frequencies
6> Set number of errors allowed
7> Scan check on/off
8> Main menu*

3. Type '1'.

The screen prompts you to enter your station address.

4. Type the four or seven letters of the station address and press the Return key.

5. Type '8'.

The Main menu is displayed.

1> Setup menu

2> Terminal menu

3> Test menu

4> List current settings

5> Save settings

6> Restore factory settings

6. Type '5'.

The 8580 modem saves the station address in memory so that it will not be lost when you turn off the 8580 modem.

7. Change the 8580 modem back to user mode.

3

Using the 8580 modem

This chapter explains how to make and receive calls in:

- user mode
- 9102 mode.

Making and receiving calls in user mode

Turning on the station

1. Turn on the terminal, the 8580 modem and the transceiver.

The screen displays:

RAM check OK.

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Calibrating....

user mode.

After three seconds, the 8580 modem enters standby, ready to receive calls initiated by other stations. The screen displays:

Now in standby.

Leaving standby to make a call

1. To leave standby, press the Escape key.

The user mode command prompt is displayed:

KEY1=ARQ2=SELFE3=FEC4=STANDBY,?=HELP

If you type '?' in response to the command prompt, your station address and other help information is displayed.

If you do not enter a response within 30 seconds, or if you type '4', the 8580 modem returns to standby.

Making an ARQ call

1. At the command prompt, type '1'.

The screen displays:

Please enter ID of station to call:

If you do not enter a response within 30 seconds, the 8580 modem returns to standby.

2. Type the address of the station you are calling and press the Return key.

The address must be four or seven letters. If you make a mistake, use the backspace key.

The transceiver starts phasing. After the link between the two stations is established, the screen displays:

Go ahead.

3. Type your message.

As each character is successfully received at the other station, it is displayed on your screen.

If no key is pressed at either station for more than 60 seconds, the link automatically closes and the command prompt is displayed.

4. To change the direction of transmission, the user at either station, whether currently transmitting or receiving, types '+?'.

5. To end the call, the user currently transmitting types '++' or Ctrl-D. The screen displays:

Transmission complete.

The command prompt is displayed.

Making a SELFEC call

1. At the command prompt, type '2'.

The screen displays:

Please enter FEC station ID to call:

If you do not enter a response within 30 seconds, the 8580 modem returns to standby.

2. Type the address of the station you are calling and press the Return key.

The address must be four or seven letters. If you make a mistake, use the backspace key.

The screen displays:

Go ahead.

3. Type your message.

If you do not press any key for more than 60 seconds, the call ends. The command prompt is displayed.

4. To end the call, type '++' or Ctrl-D.

The screen displays:

Transmission complete.

The command prompt is displayed.

Making an FEC broadcast

1. At the command prompt, type '3'.

The screen displays:

Go ahead.

2. Type your message.

If you do not press any key for more than 60 seconds, the call ends. The command prompt is displayed.

3. To end the call, type '++' or Ctrl-D. The screen displays:

Transmission complete.

The command prompt is displayed.

Making and receiving calls in 9102 mode from a dumb terminal

This section describes how to use 9102 commands to make and receive calls when you are not running Codan's 9102 Modem Controller Software.

Turning on the station

1. Turn on the terminal, the 8580 modem and the transceiver.

The screen displays:

RAM check OK.

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Calibrating....

9102 mode.

After three seconds, the 8580 modem enters standby, ready to receive calls initiated by other stations. The screen displays:

Now in standby.

Leaving standby to make a call

1. To leave standby, press the Escape key.

The 9102 mode command prompt is displayed:

>

If you do not enter a response within 30 seconds, the 8580 modem returns to standby.

Making an ARQ call

1. At the command prompt, enter:

ARQ <address of station to call> <Return key>

The station address must be four or seven letters, or four, five or nine numbers. If you make a mistake, use the backspace key.

For example, enter 'ARQ BASE' and press the Return key.

If you have used the CALL command to set the call address (see page 46), enter:

ARQ <Return key>

The transceiver starts phasing. After the link between the two stations is established, the screen displays:

Go ahead.

2. Type your message.

As each character is successfully received at the other station, it is displayed on your screen.

If no key is pressed at either station for more than 60 seconds, the link automatically closes and the command prompt is displayed.

3. To change the direction of transmission, the user at either station, whether currently transmitting or receiving, types '+?'

4. To end the call, the user currently transmitting types '++' or Ctrl-D. The screen displays:

Transmission complete.

The command prompt is displayed.

Making a SELFEC call

1. At the command prompt, enter:

SEL <station address> <Return key>

The station address must be four or seven letters, or four, five or nine numbers. If you make a mistake, use the backspace key.

For example, enter 'SEL 12345' and press the Return key.

If you have used the CALL command to set the call address (see page 46), enter:

SEL <Return key>

The screen displays:

Go ahead.

2. Type your message.

If you do not press any key for more than 60 seconds, the call ends. The command prompt is displayed.

3. To end the call, type '++' or Ctrl-D. The screen displays:

Transmission complete.

The command prompt is displayed.

Making an FEC broadcast

1. At the command prompt, enter:

FEC <Return key>

The screen displays:

Go ahead.

2. Type your message.

If you do not press any key for more than 60 seconds, the call ends. The command prompt is displayed.

3. To end the call, type '++' or Ctrl-D. The screen displays:

Transmission complete.

The command prompt is displayed.

This chapter describes the two ways in which you set and change modem settings.

You can:

- set DIP switches 1-8
- use setup mode to store settings in 8580 modem memory.

When DIP switch 7 is off, the 8580 modem uses the current DIP switch settings to control modem operation.

When DIP switch 7 is on, the 8580 modem uses the current memory settings to control modem operation.

DIP switch settings

The eight DIP switches set the mode and control communication with the terminal or computer.

Except for switches 4 and 6, the factory settings for the DIP switches are off. Factory settings are marked '*' in the table below.

<i>Function</i>		<i>Switches</i>
Baud rate	2400	1 off 2 off *
	1200	1 on 2 off
	300	1 off 2 on
	50	1 on 2 on
Parity	none	3 off *
	even	3 on
Number of stop bits	1.5	4 off
	1	4 on *
Number of data bits	8	5 off *
	5	5 on
Mode	User	6 off 8 off
	9102	6 on 8 off *
	Setup	8 on
Modem settings	use switches	7 off *
	use memory	7 on

Setup mode settings

You use setup mode to set and change memory settings.

Settings for call information include:

- station address
- answerback message
- character assignment.

Settings that control communication with the terminal include:

- baud rate
- parity
- number of stop bits
- number of data bits
- handshaking protocol
- character translation
- carriage return/line feed (CR/LF) handling
- word wrap.

Settings that control signal transmission include:

- PTT delay
- tone frequencies
- scan check.

You can also change some of these modem settings in 9102 mode. See the list of 9102 mode commands in Chapter 5, '9102 mode commands' on page 45.

Setup mode commands are displayed as menu options. To select an option, type the number of the option and press the Return key. To abort an option and return to the menu without making any change, press the Escape key.

Main menu options

The Main menu is displayed when you enter setup mode and when you return from the Setup menu or Terminal menu.

1> Setup menu

This option displays the Setup menu.

2> Terminal menu

This option displays the Terminal menu.

3> Test menu

This option is only used by the Codan agent.

4> List current settings

This option displays all current modem settings stored in 8580 modem memory.

5> Save settings

This option saves all current modem settings in memory.

If you do **not** use this option before turning off the 8580 modem, all changes made since turning on the 8580 modem are lost.

6> Restore factory settings

This option restores settings to factory preset values as follows:

<i>Item</i>	<i>Factory Setting</i>
Station address	STATION
Answerback message	TEST ANSWERBACK MESSAGE
PTT delay	25 ms
Number of errors allowed	10
Letter/figure shift character	!
Answerback character	\$
International characters	%, @ and #
Tone frequencies	1615 and 1785 Hz
Scan check	Off
Baud rate	2400
Parity	None
Number of stop bits	1
Number of data bits	8
Handshaking protocol	Xon/Xoff
Character translation	ASCII
Word wrap	Off

Setup menu options

These options set call information and control transceiver operation.

1> Set station address

This option sets the short four letter or long seven letter station address.

Other stations use this name to call you up in ARQ or SELFEC.

2> Set PTT delay

This option sets the PTT (Press To Transmit) delay in milliseconds.

In an ARQ call, this is the time allowed for the transceiver to switch from receive to transmit.

Specify a value in the range 1-99 ms. If you are not using a Codan transceiver, see 'Determining the optimal PTT delay' on page 56 for details.

3> Edit internal answerback

This option sets up an answerback message.

During an ARQ call, the other station can obtain your answerback message by typing the answerback request character (\$ unless changed). The answerback message is the same as the WRU (Who aRe yoU) code.

Enter a message of 30 characters or less.

4> Set character assignment

This option sets the keys that are used for the following five characters (factory settings shown in parentheses):

- the letter/figure shift character (!)
- the answerback request character (\$)
- the first international character (%)
- the second international character (@)
- the third international character (#).

5> Set tone frequencies

This option is only for the Codan agent.

6> Set number of errors allowed

This option sets the number of transmission errors allowed.

The number of errors allowed controls the response of the receiving modem when transmission errors occur during a SELFEC call or FEC broadcast.

The factory setting is 10.

7> Scan check on/off

This option turns scan checking on or off.

While on standby, the transceiver may be set to scan for incoming calls over several channels instead of being tuned to just one channel.

Any attempt to make a call while the transceiver is scanning fails because the 8580 modem does not

know which channel to transmit on. Scan check is an option that warns you of this condition.

If you try and make a call while the transceiver is scanning and scan check is on, the screen displays:

Error, transceiver in scan.

If scan check is off, no reason is given for the call failure.

You can normally set scan check on when you are using a Codan transceiver because Codan transceivers inform the 8580 modem when they are scanning.

Scan check does not work for makes of transceiver that do not inform the 8580 modem when they are scanning.

Scan check does not work with the Codan 8525 or 8528 transceiver if internal selective calling is fitted.

8> Main menu

This option returns you to the Main menu.

Terminal menu options

Terminal menu options change the memory settings that control communication between the 8580 modem and the terminal or computer. These memory settings are active when DIP switch 7 is on.

To change memory settings and run the 8580 modem using the new settings:

1. Turn on the 8580 modem in setup mode.

The Main menu is displayed.

2. Select the '2> Terminal menu' option.

The Terminal menu is displayed.

3. Select the various Terminal menu options to change the characteristics of the 8580 modem.

The Terminal menu is displayed after each change.

4. Select the '9> Main menu' option.

The Main menu is displayed.

5. Select the '5> Save settings' option to save the changes.

The Main menu is displayed.

6. Turn off the 8580 modem.

7. Make sure DIP switch 7 is on.

This ensures that the 8580 modem uses memory settings instead of DIP switch settings when it is next turned on.

8. Change the characteristics of the terminal or computer to match the new 8580 modem settings.

9. Turn on the 8580 modem in User or 9102 mode.

1> Baud rate

This option sets the baud rate.

The baud rate is the speed of character transmission between the 8580 modem and terminal or computer. There are 10 baud rate settings in the range 50–38,400.

2> Parity

This option sets the method for controlling the parity bit of each character.

Parity can be even, odd or none.

3> Data bits

This option sets 5, 6, 7 or 8-bit character representation.

4> Stop bits

This option sets the number of stop bits.

Stop bits follow the data bits of each character. Set the number of stop bits as 0.5, 1.0, 1.5 or 2.0.

5> Handshaking

This option sets one of six handshaking protocols:

- no handshaking
- Xon/Xoff
- hardware handshaking (CTS/RTS)
- Both Xon/Xoff and CTS/RTS
- CTS only (TTY control)
- CTS only, RTS used as terminal detection.

Handshaking controls the speed of data flow from the terminal or computer to the 8580 modem.

6> Character translation

This option sets one of two types of character translation:

- ASCII
- 5-bit TTY.

Only set 5-bit TTY if your terminal is a teletype machine.

7> CR/LF handling

This option ensures that each line after the Return key is displayed on a new line of the terminal screen.

CR/LF handling detects whether the Return key of your terminal generates a carriage return or a carriage return and line feed. If the Return key only generates a carriage return, the 8580 modem automatically adds a line feed every time you press the Return key.

Use this option if lines overwrite or double space when you press the Return key.

8> Auto word wrap

This option controls word wrapping on the screen.

When auto word wrap is on, typing automatically continues on the next screen line as soon as you type a space after column position 60.

9> Main menu

This option returns you to the Main menu.

This chapter lists the commands available in 9102 mode.

You can use 9102 commands to make calls and change some modem settings.

You only need type the first three letters of a 9102 command. If you type the wrong letter, use the backspace key. To abort a command without making any changes, press the Escape key.

ANSWERBACK

This command sets up an answerback message.

Enter:

ANS <space> <message> <Return key>

Enter a message of 30 characters or less.

During an ARQ call, the other station can obtain your answerback message by typing the answerback request character (\$) unless changed). The answerback message is the same as the WRU (Who aRe yoU) code.

ARQ

This command starts an ARQ call.

Enter:

ARQ <station address> <Return key>

The station address must be four or seven letters, or four, five or nine numbers.

If you have used the CALL command to set the call address, enter:

ARQ <Return key>

CALL

This command sets the station address be called if you omit the address in the ARQ or SELFEC command.

This feature saves you having to enter a commonly used address each time you make a call.

Enter:

CAL <station address> <Return key>

DELAY

This command sets the PTT (Press To Transmit) delay in milliseconds.

In an ARQ call, this is the time allowed for the transceiver to switch from receive to transmit.

Enter:

DEL <ms delay time> <Return key>

Specify a value in the range 1–99 ms. If you are not using a Codan transceiver, see 'Determining the optimal PTT delay' on page 56 for details.

DISPLAY

This command displays current modem settings.

Enter:

DIS <Return key>

FEC

This command starts an FEC broadcast.

Enter:

FEC <Return key>

IDENT

This command sets your station address.

Other stations use this name to call you up in ARQ or SELFEC.

Enter:

IDE <station address name> <Return key>

The station address must be four or seven letters, or four, five or nine numbers.

NEWLINE

This option controls word wrapping on the screen.

When word wrapping is on, typing automatically continues on the next screen line as soon as you type a space after column position 60.

To turn word wrapping on, enter:

NEW 1 <Return key>

To turn word wrapping off, enter:

NEW 0 <Return key>

RESET

This command resets all current settings to their memory values. It cancels all changes made since turning on the 8580 modem or using the SAVE command.

Enter:

RES <Return key>

To return modem settings to their factory preset values, use the setup mode option 'Restore factory settings' on page 37.

SAVE

This command saves all current modem settings in memory.

Enter:

SAV <Return key>

If you do not use this option before turning off the 8580 modem, all changes made since turning on the 8580 modem are lost.

SELFEC

This command starts a SELFEC call.

Enter:

SEL <station address> <Return key>

The station address must be a four or seven letters, or four, five or nine numbers.

If you have used the CALL command to set the call address, enter:

SEL <Return key>

STANDBY

This command puts the 8580 modem on standby, ready to receive calls initiated by other stations.

Enter:

STA <Return key>

XFLOW

This command controls the Xon/Xoff handshaking protocol.

To disable Xon/Xoff handshaking, enter:

XFL 0 <Return key>

To enable Xon/Xoff handshaking, enter:

XFL 1 <Return key>

Xon/Xoff is usually enabled.

6

Trouble-shooting

This chapter explains what to do if you have problems using the 8580 modem.

<i>Problem</i>	<i>Cause</i>	<i>Action</i>
Cannot establish link in ARQ call.	PTT delay too short or too long.	Determine optimal PTT delay and change corresponding modem setting. See 'Determining the optimal PTT delay' on page 56 in the Appendix).
Cannot contact other station.	The HF path may not currently support any communication.	Check if reasonable voice contact can be established. If not, try later or try different channel.
Letters are displayed as numbers or vice versa.	Letter or figure shift character was lost due to transmission errors.	While still receiving characters, type '!'. While still transmitting characters, type '!'.
Call to a station with a long address fails after the receiving station attempts to connect.	When the station you are calling has a long address, your station must have a long address.	Change to a long address for your station or call using a short address.

<i>Problem</i>	<i>Cause</i>	<i>Action</i>
Terminal or computer does not communicate with the 8580 modem.	Characteristics of the 8580 modem do not match those of the terminal or computer.	Turn off the 8580 modem. Set all DIP switches off. (Leave switch 6 on if using 9102 Modem Controller Software.) Set the terminal or computer to 2400 baud, no parity and 8 data bits.
The transceiver makes a 'plop' sound every few seconds.	The cable connecting the 8580 modem to the transceiver is loose.	Tighten both locking rings of the cable.

Appendix

The appendix:

- describes how to determine the optimal PTT delay
- lists the 8580 modem character set
- lists the 8580 modem technical specifications
- lists the accessories available for the 8580 modem.

Determining the optimal PTT delay

The factory setting for the 8580 modem PTT delay suits all Codan transceivers working up to a range of 11,000 kilometres.

To determine the optimal PTT delay:

1. Set up a dummy load for the transceiver.
2. Connect an oscilloscope across the dummy load with the external trigger connected to the PTT line from the 8580 modem (pin 2 of the 'TCVR' connector on the smaller printed circuit board).

The RF output is shown on the oscilloscope.

3. Set the oscilloscope timebase to 10 ms per division. Trigger on the negative edge of the PTT signal.
4. Set the PTT delay to 1 ms.

See 'Set PTT delay' on page 38 for details on changing the delay.

5. Make an ARQ call.
6. Note the time for the RF output to build up after triggering.
7. Set the PTT delay to this time.

The character set

The 8580 modem handles the standard telex character set of CCIR Recommendation 476-4 and 625. This character set is listed below.

The 8580 modem uses the Frequency Shift Keying (FSK) method to send characters. Each character is transmitted as a signal consisting of a total of seven high and low frequency pulses.

In the table below, B represents a high frequency pulse and Y a low frequency pulse. The high and low frequencies are usually centred around 1700 Hz.

Although the sequence of high and low frequency pulses is different for each character, each character has a total of four high and three low pulses. The receiving station is able to check for transmission errors by checking that the 4:3 ratio is true for each character.

While efficient, this method is not perfect. If a sequence is wrong but the 4:3 ratio is maintained by chance, no error is detected.

<i>Code No.</i>	<i>Letter Case</i>	<i>Figure Case</i>	<i>7-Unit Signal</i>
1	A	—	BBBYYB
2	B	?	YBYBBB
3	C	:	BYBBYY
4	D	\$ (Note 1)	BBYBYB
5	E	3	YBBYBY
6	F	% (Note 2)	BBYBBYY
7	G	@ (Note 2)	BYBYBBY
8	H	# (Note 2)	BYBYBB
9	I	8	BYBBYYB
10	J	<Bell>	BBBYBY
11	K	(YBBBBYY
12	L)	BYBYBB
13	M	.	BYBBBBY
14	N	,	BYBBYB
15	O	9	BYYBBB
16	P	0	BYBBYBY
17	Q	1	YBBYBY
18	R	4	BYBYBYB
19	S	'	BBYBYB
20	T	5	YYBYBBB
21	U	7	YBBYYB
22	V	=	YYBBBBY
23	W	2	BBBYBY
24	X	/	YBYBBY
25	Y	6	BBYBYBY
26	Z	+	BBYYBB
27	<CR>	<CR>	YYBBBB
28	<LF>	<LF>	YYBBYBB
29	<Let shift>	<Let shift>	YBYBBYB
30	<Fig shift>	<Fig shift>	YBBYBBY
31	<Space>	<Space>	YYBBBBYB
32	<Null>	<Null>	YBYBYBB

Note 1

This is the answerback or WRU (Who aRe yoU) request character. To change this character, see '4> Set character assignment' on page 39.

Note 2

These are the three international characters. To change these characters, see '4> Set character assignment' on page 39.

Specifications

<i>Item</i>	<i>Specification</i>
Protocol	CCIR recommendation 476-4. CCIR recommendation 625. ARQ, SELFEC and FEC transmission.
Modulation	Phase continuous FSK, 100 Baud.
Primary voltage	12 volt DC nominal, negative ground. Normally supplied from transceiver.
Primary power	160 mA nominal.
Audio input	350 mV rms (33 k_ nominal impedance).
Audio output	350 mV rms (22 k_ nominal impedance).
Input band width	300 Hz adaptive 8-pole filter with automatic calibration.
Tone frequencies	1615 and 1785 Hz.
Terminal interface	RS-232C, 300-9600 Baud.
Dimensions	250 mm (W) x 215 mm (D) x 78 mm (H).
Weight	1.5 Kg.

Accessories

<i>Codan Accessory Code</i>	<i>Accessory</i>
121	2-module clamp for locking 8580 modem with one similar sized unit.
122	3-module clamp for locking 8580 modem with two similar sized units.
123	4-module clamp for locking 8580 modem with three similar sized units.
164	Rack mounting frame for 8580 modem (483 mm, iridescent grey).