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Operators handbook

8525 - B series

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## 1 INTRODUCTION

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The type 8525 B SSB transceiver offers reliable long range communication in the HF band. Designed for 12-volt DC operation in fixed or mobile installations, the transceiver features programmed control of all operating functions to a capacity of 99 channels covering the transmit frequency range 2 MHz to 24 MHz and a receiver frequency range 0.25 MHz to 30 MHz.

### Channel Programming

Transceivers are supplied programmed to the purchaser's requirements. Printed details of individual channel arrangements are supplied with each unit.

### Scanning

The transceiver incorporates a facility which enables it to scan for activity on up to fifteen selected channels.

### Antennas

The transceiver can be used with broadband antennas or tuned antenna systems incorporating manual, preset or automatic tuning.

### Control Head

Extended control of the transceiver is provided by the 8530 Control Head. Transceivers may be supplied specifically for extended control with no front panel controls, or for extended control in addition to the front panel controls.

### Mounting

A choice of mounting accessories allows for the transceiver to be mounted in a variety of different ways.

**2 INSTALLATION**

General information given in the installation handbook code 033 - Land Based HF Communications Equipment - supplied with the transceiver, and the details which follow, should be observed when installing the transceiver.

Before installation, check that the transceiver and any accessories supplied correspond with the enclosed packing list.

**Mounting Arrangements**

The transceiver must be mounted in a position which allows free flow of air through the cooling fins at the rear. Front panel control transceivers must also be sited for convenience of operation.

The Vehicle Mounting Cradle - Front Entry (Code 117) must be mounted with its rotating cam catches nearest to the front. Channel-section slides on the transceiver engage with corresponding T-section slides on each side of the cradle. The transceiver can be inserted or withdrawn when the slots in the catches are in line with the slides. On complete insertion, the transceiver must be pressed gently home to align the catches with their housings. While this alignment is made, the catches can be turned 90° (in either direction) to lock the unit in its cradle.

The Vehicle Mounting Cradle - Top or Bottom Entry (Code 118) must be mounted with its spring clips nearest to the front. When using this cradle, the cradle mounting adaptor plates must first be fitted within the transceiver side rails. The mounting plates are secured with the screws supplied with the accessory in place of the front and rear screws which secure the side rails. With the mounting plates fitted in this way their projecting studs fit the slots in the cradle. When the transceiver is fully home it can be secured by the spring clips of the cradle.

For extended control installations a cradle for mounting the 8530 control head is provided. This may be discarded if it is more convenient to install the control head without it.

**Power Connections**

Install the terminated power cable between the transceiver and the battery or power supply unit.

**NOTE:** In extended control installations, where power and control cables follow a common path they must remain separated from each other for short distances, e.g. to pass through the same hole in a bulkhead. FAILURE TO OBSERVE THIS WILL CAUSE DISTORTION OF THE TRANSMITTED AUDIO SIGNALS.

The transceiver chassis is negative to ground. Reverse polarity protection ensures that the transceiver cannot be switched on and that no damage is caused if the supply is incorrectly connected.

**Grounding**

A chassis grounding (earthing) point is provided by a size M4x8 mm screw at the rear of the transceiver chassis. This should be bonded to earth using an adequate cable (refer to the installation handbook) in fixed installations. In mobile installations the mounting hardware will generally provide sufficient bonding to the vehicle frame.

**Extended Control**

The Control Head is normally supplied with an interface cable nominally 6 metres long to connect it to the transceiver. The cable is terminated with connectors at both ends. The overall size of the cable can usually be reduced sufficiently to pass it through restricted openings by removing the shell from one connector. If the interface cable is too long the excess can be gathered neatly at one point or the cable can be cut and re-terminated at one connector. Conventional soldered joints are used.

**NOTE:** To prevent the transceiver logic locking in a non-operating condition the control head to transceiver connection must be completed before power is applied to the transceiver.

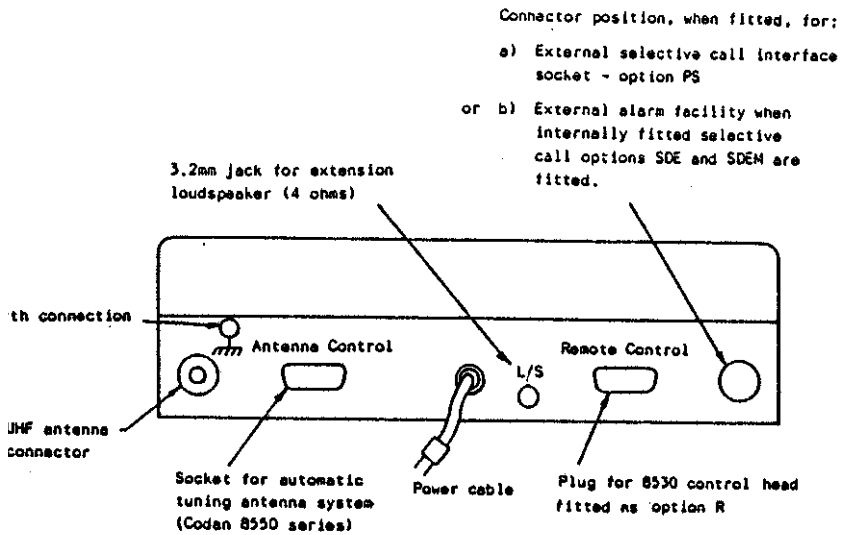


Fig. 1 Rear panel layout - Type 8525 B

### 3 OPERATING INSTRUCTIONS

#### 3.1 General

1. Switch the transceiver on by pressing the Power On/Off pad. The Audio Mute, mode (USB or LSB), and channel number display will light.

NOTE: The channel, mode, and volume settings last used will be re-selected.

2. Select the required mode by pressing the USB/LSB pad.
3. Select the required channel by pressing the Channel  $\wedge$  and  $\vee$  pads as appropriate. A single press will change to the next channel; continued pressure will cause the channels to be scrolled.
4. When using an automatic antenna tuning system, press the Tune pad once. During the tuning cycle, 'pips' will be heard at 1 second intervals. Successful tuning is indicated by two high-frequency tones. If no correct tuning point can be found, two low frequency tones will be heard and the display will alternate between the selected channel and the system error message ut (untuned).

Where a multi-frequency tapped whip is used, select the correct tap for the channel frequency in use.

5. To adjust the volume level, press the Volume  $\wedge$  and  $\vee$  pads as required. When the mute is on, pressing a volume control pad will turn the mute off for approximately 1 second.

The clarifier may be adjusted using the Clarifier  $\wedge$  and  $\vee$  pads to produce natural sounding speech.

Tones will indicate the operating limits of the Volume and Clarifier ranges.

6. The Audio Mute will remove background noise when no signals are present. However, when receiving weak signals it should be switched off (by pressing the Mute Off pad) to prevent loss of syllables.

## Operating Instructions

7. To transmit, hold the microphone side-on, close to the mouth, and speak clearly. Take care to press the microphone PTT button before speaking. Always listen before transmitting to ensure the selected channel is free of traffic.

If, when connected to an automatic antenna tuning system, on transmit, two low-frequency tones are heard and the error message 'ut' appears on the display, the antenna has not been tuned - refer to 4 above.

8. Speech transmissions will cause the Tx lamp to flicker. Tune and tone transmissions will cause the Tx lamp to light continuously.
9. Scanning: Refer to Section 4 of this manual.
10. For details of the operator system error messages indicated on the display, refer to Section 5 of this manual.

NOTE: With an automatic tuning system, any transmission with the VSMR greater than 3:1 will result in the display alternating between the selected channel number and ut for 5 seconds and will be accompanied by two low-frequency tones.

### 3.2 PTT Timer

The microphone PTT starts a timer every time the transceiver transmits. If the continuous transmit time is greater than that set, the transceiver will return to the receive mode and the error message E1 is displayed until the PTT is released. Normal operation is then resumed.

The timer is set to 10 minutes at the factory but may be changed to from 5 to 35 minutes in 5 minute steps, or disabled.

### 3.3 Emergency Working (Australian Royal Flying Doctor Service only)

1. Select a local RFDS channel which is monitored for emergency calls and tune the antenna, if required. (See 3.1 step 4.)
2. Press the Emgcy Call pad until latching is indicated by a single 'pip' (approximately 2 seconds). The 20 second transmission will be heard.

## Operating Instructions

If a single low-frequency tone is heard and 'E1' or 'E2' appears in the display, the channel selected is not an RFDS channel.

3. Wait for a reply before transmitting.
4. An unattended RFDS base station will transmit a tone within 90 seconds if the call was received.
5. To cancel a call during the 20 second transmission, press either the Tune pad or the microphone PTT button.

### 3.4 Manual Antenna Tuner 8560

1. Connect the 8560 tuner to the transceiver, earth and antenna as detailed in the transceiver installation instructions.

NOTE: The input circuits of Antenna 1 and Antenna 2 terminals are identical. It is usual to use Antenna 1 for the connection of a single antenna or for the lower frequency antenna of a dual antenna installation.

2. With the transceiver channel selected, set Load to 6, the Antenna control to C, and select Antenna 1 or 2 as appropriate to the channel frequency and antenna system installed.
3. Press and hold down the Tune pad on the transceiver and adjust the Tune control on the tuner for peak level indication of the meter reading. If a peak cannot be found, repeat using different positions of the Antenna control.
4. When the peak level is found, adjust the Load control to find the position giving the highest meter reading - retrim Tune.
5. Record the control settings used on the logging scale for future use.

- NOTE:
1. A peak may be found on several Load and Antenna settings. Use the highest peak.
  2. In general, the lower the frequency the lower the setting of the Antenna switch.

### Operating Instructions

3. The meter must always be adjusted for a maximum reading but the magnitude of this reading may vary from channel to channel. This indicates changes in antenna impedance - it does not mean that power output is different.
4. Any change in antenna, earth or nearby metallic objects will necessitate rechecking the full procedure above and possibly changing the logging scale figures.

## 4 SCANNING FACILITIES

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Up to fifteen channels can be programmed to be scanned. When the scan mode is selected, all fifteen can be scanned for audio signals. If a selective calling option is fitted, the first eight can be scanned for selective calling codes.

The scanning facilities can be used only with a suitable antenna system: for base transceivers a broadband antenna, and for mobile installations a Codan type 8550 series Automatic Tuning Antenna System with the scan option fitted.

### 4.1 Scan Channel Programming

1. With the transceiver switched on, press Mute off - Audio mute - Scan pads in that sequence within one second. The Scan lamp and digital display will flash on and off.

This operation erases any previous entries held in the scan program.

If the program has been locked as in para. 5, note (e), E3 will be displayed if program entry is attempted.

2. Select the required channel and mode (USB/LSB) for entry into the program. It is important to note that any channels required to operate in the selective call mode must be programmed within the first eight entries.
3. Press the Scan pad to enter channel and mode selections into the program. The decimal point on the digital display will light to confirm entry.
4. Repeat 2 and 3 as required to a maximum of 15 entries. Any channel may be programmed more than once in the 15 entries. A channel may be programmed in consecutive entries to extend the listening time, or spaced over intervals between other channels.

## Scanning Facilities

5. When all entries have been made, press Mute Off - Audio Mute - Scan pads in that sequence within one second (as for 1 above). This switches the transceiver out of the programming mode.

- NOTE:
- (a) If a programming error is made during operations 2 to 4 above, the programming mode must be switched out (step 5), then the whole procedure from 1 onwards must be repeated.
  - (b) If an attempt is made to program more than 15 entries, a single low-frequency tone will be heard, and the digital display will show the error message code E3 alternating with the channel number.
  - (c) Whilst in the scan programming mode, the channel entries made into the program can be reviewed by normal operation of the Channel  $\wedge$  and  $\vee$  pads; channels in the scan program will be highlighted with the decimal point appearing in the digital display.
  - (d) If no channels have been programmed when scan is selected, the Scan indicator will flash, one low-frequency 'beep' will be heard and the display will alternate between E3 and the channel number current when scan was selected.
  - (e) After setting up the required channels for scanning, the program can, if necessary, be locked by linking P2 pins 1 and 2 on the Microprocessor Interface PCB (08-03230). This inhibits entry into the scan programming mode so that the program can no longer be changed by the front panel controls.

### 4.2 Audio Scan Operation

The audio scan mode is initiated by pressing the Scan pad. Selection is confirmed by the Scan indicator lighting and the display showing the sequence of channels programmed as in 4.1

Transmission is inhibited when the transceiver is in the scan mode. Scan must be deselected by re-operation of the Scan pad. Any attempt to transmit in the scan mode will cause the error message E1 to be displayed accompanied by a low-frequency tone.

## Scanning Facilities

Within the scan facility there are three modes of scanning for audio signals:

- (a) Pause Scanning - scanning pauses for 5 seconds when an audio signal is detected.
- (b) Hold Scanning - scanning stops when an audio signal is detected and continues only when the audio signal ceases.
- (c) Continuous Scanning - each channel is monitored for 1 second and scanning continues irrespective of any audio signals being detected.

The operations to select individual modes of audio scanning are as follows:

- (a) Pause and Hold scanning are selected by alternate operations of the Audio Mute pad. Entry to Pause is confirmed by a single 'pip' - entry to Hold is confirmed by a double 'pip'. In both modes the Audio Mute indicator is lit.
- (b) Continuous scanning is selected by pressing the Mute Off pad which overrides any selection made by the Audio Mute pad. Selection is confirmed by the Audio Mute indicator being extinguished.
- (c) Re-entry to the Pause and Hold modes is made by a further operation of the Audio Mute pad.



## Scanning Facilities

### 4.3 Selective Call Scan Operation

For networks using selective call scanning it is important for the calling station to transmit a long preamble. (Refer to Fig 2.)

For selective call scanning, the scan mode is initiated by pressing the Scan pad. Selection is confirmed by the Scan indicator lighting and the display showing the sequence of channels programmed as in 4.1. The detection of the call codes may be carried out in one of two ways depending upon the options fitted to the transceiver.

(a) Internally fitted selective call option:

(i) Selective Call scanning is initiated by pressing the S'Call Mute pad. This overrides any audio scanning mode selected. Selection is confirmed by the S'call Mute indicator lighting.

(ii) Selective Call scanning is deselected by operation of the Audio Mute pad.

(b) External selective call unit connected via option PS:

Selection of Mute at the external unit has the same effect as operation of S'call Mute with the internally fitted selective calling option.

On detection of a call by either method, scanning is stopped until the call is decoded. If the call is found to be addressed to the transceiver, the decimal point on the channel display is lit and the Called indicator(s) on the external equipment and/or the type 8525 B transceiver are/is lit. Scanning is held for 2½ minutes with the display showing the number of the channel on which the call was received and single 'pips' being heard at 4 second intervals. When scanning is resumed, the Called indicator remains lit, the 4 second 'pips' continue and the decimal point is lit whenever the number of the calling channel is displayed.

## 5 ERROR MESSAGES

The transceiver can detect certain operator and system errors that may occur when the equipment is being used. An audio visual alarm is given when:

- (a) a facility selected is not available (operator error), or
- (b) certain malfunctions occur within either the transceiver or a connected antenna (system error).

The nature of the error is indicated by a letter and/or number code appearing on the digital display which will be seen alternating with the selected channel number. The key to the message code, with a description of the error, is given below.

### 5.1 Operator Errors

All operator induced errors are accompanied by a single short, low-frequency tone.

Code E1 - A transmission is not allowed, e.g. an attempt has been made to transmit on a receive only channel, or whilst the transceiver is in the Scan mode.

Code E2 - Calling in inhibited, e.g. an Emergency call, option TE call, or a Selective call has been attempted on a channel where the function is not allowed.

Code E3 - All errors related to the Scan facility.

For example, if the error message occurs whilst operating in the scan program mode (refer to para 4.2) it may be indicating that an attempt has been made to program more than 15 entries. If the error message is accompanied by the Scan lamp flashing, it is indicating that the channel has not been programmed with a frequency.

## Error Messages

### 5.2 System Errors

Code ut - Untuned automatic antenna system.

Error caused by tuning failure or VSWR greater than 3:1 on transmit, and is only activated by automatic antennas similar to the Codan 8550 and 4203 series automatic tuning antenna system.

The displayed error code is accompanied by two short, low-frequency tones.

Code UL - Internal synthesizer unlocked.

All transmissions are inhibited and the receiver is muted. If the problem persists, the transceiver should be returned to Codan Pty Ltd or your dealer.

The displayed error code is accompanied by three short, low-frequency tones.

Code UP - Channel frequencies have not been programmed into the transceiver.

The transceiver should be returned to Codan Pty Ltd or your dealer to program the channel frequencies, as required.

The displayed error is not accompanied by tones.

### 3 Displayed Messages at Power Off

With the transceiver on, push and hold the Power On-Off pad. The display will change to Segment Test Mode for 3 seconds and then show the EPROM issue number.

## 6 SELECTIVE CALLING OPTION

The selective call system is microprocessor based having a 10,000 address capacity, operating by the transmission and reception of coded digital signals. These signals contain the identification number of the station being called - 'called address' - and the 'self identification' number of the calling, or local, station. The identification numbers are represented by 4-digit codes which can be programmed into the transceiver with either internal or front panel mounted switches.

The selective call option transmit facility will operate only on channels which have been programmed for this. Channels that have been programmed are identified on the frequency label/chart supplied with the transceiver with the letter 'S' in the 'options enabled' column.

The following applies to those transceivers fitted with the selective calling option SE2, SDE or SDEM. The option code fitted is written on the frequency label/chart.

### 6.1 Definitions

To assist the user to understand the terms used in this section the following brief explanations are given:

**Called address** - the 4-digit identification number of the station being called.

**Self identification** - the 4-digit identification number of the calling, or local, station.

**Program** - setting the identification number(s) into the transceiver using internal or front panel mounted switches.

**Encode** - translation of the identification number and instructions into a coded message that is transmitted.

**Decoding station** - a station able to receive and process the encoded message.

## Selective Calling Option

**Group call** - a coded message that is transmitted to all stations in a selected group. For example, a call with an identification number 0200 (group call) will at once be received by all decoding stations whose identification number falls within the range 0201 to 0299.

**Revertive signal** - a message signal automatically transmitted by a station after receiving and decoding a call thus indicating to the calling station that the call was successfully received.

### 2 Layout

Figure 2 shows the locations, viewed from the front of the transceiver, of the switches and links used in setting up the selective calling functions.

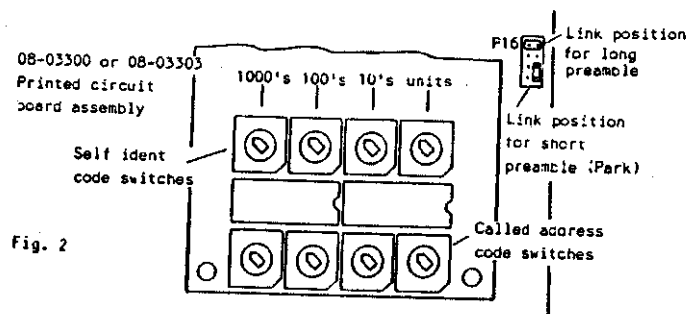


Figure 2 Selective calling switches and links

Both sets of switches are used for option SE2 and SDE. Both sets are fitted for option SDEM and the self ident switches operate in the same way. However, option SDEM duplicates, on the front panel, from two (10's and units) to all four of the called address switches. Any of the preset switches duplicated in this way are inoperative.

## Selective Calling Option

### 6.3 Setting-up Procedures

One of three selective calling options may be fitted:

- (a) SE2 - This provides encode only facilities enabling the local station to call one station whose identity has been set on the internal switches. It does not allow the local station to decode selective calls.
- (b) SDE - This provides encode and decode facilities which enable the local station to call one station whose identity has been set on internal switches. It also allows the local station to decode selective calls addressed to the local station.
- (c) SDEM - This provides encode and decode facilities enabling the local station to call any other station whose identity code is set up on the front panel mounted digiswitches (in some versions of the option the more significant digits of the called address are preset and only the less significant digits can be set on the front panel switches). The option also allows the local station to decode selective calls addressed to the local station.

#### 6.3.1 Access

Irrespective of the option fitted, access to the selective call settings is gained by releasing the two screws (one of each side) retaining the transceiver bottom cover, and removing the cover.

#### 6.3.2 Switch Settings

A small screwdriver should be used to set the self ident and called address switches (refer to Fig 2) to the appropriate numbers.

If option SDEM is fitted, the self ident switches must be set in the same way, but only those called address switches not duplicated on the front panel need be set. Settings of the duplicated called address switches are immaterial.

**NOTE:** Codes ending in '00' should not be set as they are used for the group facility.

On completion, record the switch settings on the frequency label/chart.

## Selective Calling Option

### 6.3.3 Link Setting

Set the link on P16 on the Motherboard (refer to Fig 2) for long preamble if selective calling is to be used to call a station in the scan mode.

### 6.3.4 Completion

On completion, re-install the bottom cover by first placing it on the transceiver so that its front edge rests on the two spring clips. Press firmly on the front edge of the cover and slide it forward under the panel surround until the screw holes are aligned. Resecure with the fixing screws.

## 6.4 Operation

1. With the transceiver switched on, the required channel selected, Mute off (see 3, below) and the antenna tuned as for normal operation described in section 3, check that the channel is free of traffic before transmitting.

**NOTE:** For transceivers fitted with option SDEM, ensure that the correct 'called address' identity code has been set with the front panel mounted digiswitches.

2. Calling - to call the decoding station press the Call pad once. The selective call will be automatically transmitted accompanied by a 'warbling' sound heard on the loudspeaker. The transmission time lasts approximately 9 seconds.

A successfully received and decoded call will be acknowledged within 5 seconds by the decoding station transmitting a revertive signal heard as a series of short tones on the loudspeaker. No revertive is transmitted in response to a Group Call.

Normal transceiver operation can commence once voice communication has been established.

**NOTE:** If when attempting a call, the error message codes E1 or E2 appear on the digital display, selective calling is not permissible on the selected channel.

## Selective Calling Option

3. Receiving - the following applies only to transceivers fitted with options SDE or SDEM; option SE2 does not allow for the local station to be selectively called.

When the local station is called by another station the Called lamp will light and a 'tone' will be heard on the loudspeaker. The tone heard depends on the type of call received:

- (a) Selective calls produce a series of three, double telephone-like rings.
- (b) Group calls produce a series of 16 short 'beeps'.

To silence the tones and turn off the Called lamp, press the microphone PTT button once then commence normal transceiver operation with the calling station.

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

- (a) the Called lamp will remain on to indicate that a call was received,
- (b) 'pips' will be heard at 4 second intervals, and
- (c) the external alarm relay contacts will close for a period of 2 minutes.

**NOTE:** Operation of the S'call Mute pad will cause the lamp to light and the transceiver to remain muted until a selective call is received. With the mute on, voice transmissions will not be heard - calling stations without the selective call facility in operation will not be received.

When an external selective call controller is operating with the transceiver, the S'call Mute will be switched on and off by the controller's Mute button.

## Selective Calling Option

### 6.5 External Alarm Facility

With the selective calling options SDE and SDEM fitted, an external alarm facility is made available through a connector mounted on the rear panel of the transceiver (refer Fig. 1). This provides a contact closure for 2 minutes after the receipt of a call. The relay contact closure completes the circuit for an external supply source to operate an alarm bell or buzzer.

The contacts are rated at 50 Vdc, 1 A.

Connection to the plug is made to pins 2 and 3.

### 6.6 Call Back

The facility allows an operator at the called station to return calls in the selective call mode without setting the identity numbers of the stations lodging the calls.

The facility is optional and is selected by a moveable link. When setting the links on P16 (paragraph 6.3.3) link 2 should be set as follows:

- (a) To select the facility, connect the link between pins 3 and 4, i.e. the two pins next to the long preamble pair.
- (b) To deselect the facility, place the link in a parking position.

When a selective call is received, the Called indicator light comes on and the audio alarm sounds as in the normal selective call operation. In addition, the decimal point on the channel number display flashes regularly to indicate that the caller's identification number has been stored and a callback can be made. To return the call, the operator has only to press the call button and a selective call will be transmitted to the station whose identity number was stored.

The callback facility - which can also be used in the scan mode - will store one address per channel. A new call will replace the old one on a channel already recording a call. Channels on which calls are recorded are indicated by the decimal point of their channel number flashing when displayed. When calling back to calls recorded in the scan mode, the operator must first ensure that the antenna is tuned to the channel frequency.

## Selective Calling Option

Should a callback by operation of the Call button be unsuccessful, the call remains recorded. A stored call is cleared by operation of the microphone PTT switch with the relevant channel selected. The Called Indicator remains lit while a call remains recorded on any channel.

**NOTE:** Operation of the Call button on any channel on which the decimal point is flashing will cause the transmission of the stored identity code, i.e. any setting of the code switches will be over-ridden. It is therefore necessary to clear a call recorded on a channel before it can be used for selective calls to manually selected stations.

### 6.7 Call Review

The facility allows the transceiver to display the identity number of the station calling.

Channels on which a selective call has been received are indicated by a steadily lit decimal point, or if in the callback mode, a flashing decimal point. In either case the identification code of the station lodging the call can be found by operation of the Mute Off pad. While the pad is held down the left digit of the channel display cycles through the four digits of the identification code, each digit being displayed for approximately 1 second. While each digit is displayed, its significance in the code is indicated by the right hand digit. From one to four of the lower four segments of the digit are lit; one segment for the thousands digits, progressing up to four segments for the units. For instance, 3572 would be indicated by:

3 5 7 2  
1 2 3 4

In the non-callback mode, a single operation of the PTT switch clears records of calls from all channels. It is therefore advisable, when the transceiver has been in the scan mode, to observe all channels for indications of a call. If calls are recorded on more than one channel, it is necessary to return to the non-scan mode and note the identifications of all the callers before answering any of them. With the callback mode, selected callers' identities may be noted in the same way but can be cleared individually by PTT.

5.8 Memory Retention

The contents of the call memory are retained during lowering of the supply voltage, e.g. engine starting and other forms of power glitches. However, switching off the transceiver at the Power On/Off pad resets the memory, deleting all the stored identifications.

5.9 Scanning

Reception of a selective call in all scanning modes will cause scanning to stop and the normal sequence on receipt of a selective call to occur.

NOTE: The selective call scanning mode is recommended for more reliable operation of selective calling. When more than eight channels are scanned, the interval between the times when a specific channel is monitored may allow a selective call to be missed.

5.10 Beacon Mode

When the Beacon Mode is programmed, a beacon signal consisting of four long tones is transmitted on the receipt of a selective call to an address ending in 99, with the thousands and hundreds digits the same as the receiving station's self ident (eg 3599). This is used to check signal conditions on various frequencies. No alarm or call is recorded at the receiving station and if in scan mode, the scan sequence recommences immediately; therefore the next channel may be tried for signal strength without waiting.

Normal selective call operation is not affected.

It is recommended that only the base station operate as a beacon, but if mobiles are also enabled, the thousands or hundreds digits of each mobile's self ident should be set to different addresses so that they do not all transmit a beacon response together. Self idents ending in 99 should also be avoided as this will cause confusion.

6.11 Test Mode

This is a special test mode and is not required for normal operation.

In this mode, the transceiver will decode ALL selective call signals to the Codan standard and display the address to which it was sent and the self ident of the calling station.

No called alarms or revertives are generated.

To enter this mode, the self ident switches on the Option SDE PCB must be set to 0000.

When a call is received, the Called indicator will light and then using the Call Review Facility (9.7), the calling station is shown first and then the called station.

## 7 TONE ENCODE (TE) AND TONE DECODE (TD) OPTIONS

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The operation of option TE is limited to selected channels (as programmed) and provides stations within a network with the facility to either call (encode - option TE), or be called by (decode - option TD) other stations by the transmission of a calling tone.

Channels that have been programmed will be identified on the frequency label/chart supplied with the transceiver. The tone frequency will be given against the TD heading or the TE tone identity T1, T2 etc (if more than one tone frequency is used), with the appropriate identification appearing adjacent to the channel frequency in the 'options enable' column.

### 7.1 Operation

1. With transceiver switched on, the required channel selected, audio Mute off and the antenna tuned as for normal operation described in section 3, check that the channel is free of traffic before transmitting.
2. Calling - press and hold down the call pad for 10 seconds. The calling tone will be transmitted during the period the Call pad is pressed causing the Tx lamp to light continuously. Normal transceiver operation can commence once voice communication has been established.

**NOTE:** Any attempted transmission initiated by pressing the Call pad, on a channel which has not been programmed for the option, will cause the error message code E2 to be displayed accompanied by a single short, low frequency tone. The call will not be transmitted.

3. Receiving - with option TD fitted, on receiving a call the Call lamp will light and an alarm consisting of two sets of three short tones - 'pips' - will be heard from the loudspeaker. After this 'pips' will be heard at 4 second intervals and the Call lamp will remain lit (the 'pips' can be cancelled by pressing the PTT button). The audio level will not be affected by the volume control setting.

## 8 TELETYPE FACILITIES - ARQ

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Provision is made for the transceiver, fitted with option PS, to operate a teletype terminal system operating in the automatic repeat request (ARQ) mode. For further details refer to the appropriate Technical Service Manual.

9.1 Mute Settings

The power-on state of the Audio Mute or S'call Mute may be set at any time as follows:

1. Start with the transceiver off. Press and hold the Audio Mute pad and then switch the transceiver on (do not hold the Power On/Off pad down). The display will show "-2".

Now select either-

Audio Mute  
Mute Off  
or S'call Mute (if option is fitted).

Then switch the transceiver off.

2. From now on, the transceiver will power on with the mute setting selected. The setting can be changed at any time as in step 1.

9.2 S'call Mute Disable

The S'call mute may be disabled from the front panel as follows:

1. Start with the transceiver off. Press and hold the S'call Mute pad and then switch the transceiver on (do not hold the Power On/Off pad down). The display will show: "-1". Now push the S'call Mute pad to select either:

S'call Mute enable - light on  
S'call Mute disable - light off

Then switch the transceiver off.

2. The setting can be changed at any time as in step 1.

9.3 Beep Volume

1. Start with the transceiver off. Press and hold either Volume pad and then switch the transceiver on (do not hold the Power On/Off pad down). The display will show: Hi or Lo. Press either volume pad to select Hi or Lo and then switch the transceiver off.
2. The setting can be changed at any time as in step 1.



Frequency Range:	Transmit; 2 MHz to 24 MHz Receive; 0.25 MHz to 30 MHz
Channel Capacity:	99. Any combination of single or dual-frequency simplex.
Frequency Generation:	Frequency Synthesizer with 10 Hz resolution. Controlled by plug-in EPROM
Operating Mode:	Single Side Band: Upper Side Band (USB-J3E). (LSB-J3E optional).
Sensitivity:	0.25 MHz to 0.5 MHz Not specified 0.5 MHz to 2 MHz 8 $\mu$ V 2 MHz to 28 MHz 0.25 $\mu$ V 28 MHz to 30 MHz 0.5 $\mu$ V
Transmitted Power Output:	100 W (PEP). May be internally set to any output between 25 and 125 W PEP.
Frequency Stability:	USB: $\pm 2$ ppm LSB: $\pm 2$ ppm $\pm 20$ Hz } -30°C to +60°C  Long term ageing : 1 ppm per year Oven warm-up time : 1 minute
Controls:	Membrane switches
Display Indication:	Channel number.
Supply Voltage:	12 Vdc nominal, negative ground. Reverse polarity and over-voltage protection.
Supply Current	Receive (no signal): 0.5 A Transmit J3E average: 3 A Transmit J3E two-tone: 9-12 A

## Specifications

Transmit-receive Switching Time:	20 ms via Option PS. Transmit-receive frequencies may be separated by up to 1 MHz.
Size and Weight:	8525 B transceiver: width, 250 mm; depth, 320 mm; height, 78 mm; weight, 3.3 kg. (excluding connectors).  8530 Control head: width 190 mm; depth 70 mm; height 78 mm; weight 1 kg. (includes mounting bracket).
Colours:	Case: Textured silver grey. Panel surround and heatsink: Matt black. Panel overlay: Lexan matt black. Painted surfaces are scratch resistant textured polyester powdercoat.

L	Fit for LSB only operation on selected channels (option LU must be fitted.)
LU	Fit for LSB operation in addition to, or in lieu of, USB (specify requirements).
*M	Fit CW facility.
*PH	Fit headphone output.
PS	Fit selective call interface
*R	Fit extended/remote control interface.
SE2	Fit programmable 4-digit (internally preset) selective call encoder.
SDE	Fit programmable 4-digit (internally preset) selective call encoder/decoder.
SDEM	Fit externally programmable 4-digit (mesh) selective call encoder with (internally preset) decoder.
TD	Fit tone operated decoder.
TE	Tone encode (programmable option).
SM	Fit control head 8530 for SDEM externally programmable 4-digit (mesh) selective call.

\* Available for front control transceivers only.

## Accessories

112	Vehicle installation hardware kit.
117	Vehicle mounting cradle - front entry.
118	Vehicle mounting cradle - top or bottom entry.
602	Headphone complete with cable and connector.
640	Telephone handset complete with cable and connector.
641	Desk microphone complete with cable and connector.
649	Extension loudspeaker.
650	Extension loudspeaker with in-built amplifier (12 Vdc operation)
651PC	Program package - 8525 B/8528 series. For use with IBM compatible PC (Dealer item only).
652	Morse key complete with base, cable and connector.
704	Vehicle interference suppression kit.
722	Extended control to front control transceiver conversion kit. Includes hand PTT microphone.
723	Extended control to front control transceiver conversion kit - fitted with 4 digiswitches for SDEM selective call operation. Includes hand PTT microphone.
724	Front control to extended control transceiver conversion kit - includes option R retrofit kit. Excludes the type 8530 control head.
726	Channel Decoder.
2036	Service manual for type 8525 B series.
Type 8530	Control head complete with 6 metres of interface cable fitted with connectors and hand PTT microphone.

*tions and Accessories*

**Power Supplies**

**508** Voltage Regulator (24 to 12 V operation).

**Type** AC power supply, 13 Vdc regulated, with no-break  
**7113-B** facility. Includes interface cable and handbook.

**Type** AC power supply, 13.8 Vdc regulated. Includes  
**8540** interface cable.

**Service**

Should any part of this equipment required service, the local Codan service agent should be consulted.