Operating Instructions

DB477A / DB477D – 80 Channel 5 watt UHF In Car Citizen Band radio

24/5/2017

Safety information and warnings

Information on Safe Operation
Read This Information Before Using Your CRYSTAL Radio. The operation of your UHF radio in
Australia is subject to conditions in the following license:
In Australia the ACMA Radio communications (Citizen Band Radio Stations) and in New Zealand by
MED the General User Radio License for Citizen Band Radio.

Safety and general use whilst in a vehicle
Check the State and Federal laws and regulations regarding the use of two way radios in the area
where you drive, and always obey them.

For Vehicles fitted with Air Bags
Do not place your hand piece in the area over an air bag or in the air bag deployment area. Air
bags inflate with great force. If a radio is placed in the air bag deployment area and the air bag
inflates, the radio may be propelled with great force and cause serious injury to the occupants of
the vehicle.

Batteries
All batteries can cause property damage and/or bodily injury such as burns if conductive material
such as jewellery, keys, or beaded chains touches exposed terminals. The material may complete
an electrical circuit (short circuit) and become quite hot. Exercise care in handling any charged
battery, particularly when placing it inside a pocket, purse, or other container with metal objects.

Do not replace or charge batteries in a potentially explosive atmosphere. Contact sparking may
occur while installing or removing batteries and cause an explosion.

Potentially Explosive Atmospheres
Turn your radio OFF when in any area with a potentially explosive atmosphere. Sparks in such
areas could cause an explosion or fire resulting in injury or even death. **<u>NOTE:</u>** Areas with
potentially explosive atmospheres are often, but not always clearly marked. They include fueling
areas such as below deck on boats; fuel or chemical transfer or storage facilities; areas where the
air contains chemicals or particles, such as grain, dust, or metal powders; and any other area
where you would normally be advised to turn off your vehicle engine.

Blasting Caps and Areas
To avoid possible interference with blasting operations, turn your radio OFF near electrical blasting
caps or in a "blasting area" or in areas posted: "Turn off the two way radio." Obey all signs and
instructions.

Exposure to Radio Frequency Energy
Your CRYSTAL two-way radio complies with Australian Communications Authority Radio
communications (Electromagnetic Radiation-Human Exposure) Standard, 2003. To assure optimal
radio performance and make sure human exposure to radio frequency electromagnetic energy is
within the guidelines set out in the above standards always adhere to the following procedures.

Controls and connections

Front
FIG. 1 DB477A

LCD Display   Menu/Function

Volume up/down

Power on/off
Channel select
SQ Control

Microphone Connector   Scan

FIG.2 DB477D

Power on/off
SQ Control

Channel select

LCD Display

Talk Button

Menu/Function

Instant Recall

Volume up/down

Scan

Note for Factory Reset: To reset the system. Press and hold the "F" Button while turning on the unit.

Caution

When installing your radio in your vehicle, check that during installation you do not damage any wiring or vehicle components that may be hidden around the mounting position. For optimum performance your radio needs to be installed correctly. If you are unsure about how to install your radio, we suggest you have your radio professionally installed by a UHF specialist or Auto electrician. When installing the radio, avoid mounting it close to heaters or air conditioners. **Never press the PTT or CALL button before connecting the antenna to the radio.**
Screw the mounting bracket and microphone bracket to firm surfaces. To install the radio: 1. Fix the radio bracket in a suitable location.
2. Then fix the radio in the bracket using the thumb screws.

Fitting the Microphone

The microphone uses RJ type telephone plug and socket:
1. Position the microphone plug so the plastic flap faces downwards, and press the plug into the socket until it 'clicks'.

2. Gently press the rubber boot into the hole surrounding the socket so that the slot around the boot fits neatly inside the rim of the entry hole.

DC Power Connection

The **(DB477A)** Radio is designed for 12 Volt DC
The **(DB477D)** Radio is designed for 12/24 Volt DC

Antenna Information

The antenna (not supplied) is of critical importance, to maximize your output power and receiver sensitivity. A poorly installed, inferior quality antenna or one not designed for the correct frequency band will give poor performance. You should only purchase an antenna designed for the 477MHz frequency band.

Antenna Installation

1. Connect the antenna to the rear antenna socket using a PL259 coaxial connector (not supplied).
2. To obtain maximum performance from the radio, select a high quality antenna and mount it in a good location. **Never press the PTT or CALL button before connecting the antenna to the radio.**

OPERATIONS

Power On/Off

Press and hold the power/Channel selector for 2 seconds. (REFER TO FIG. 1)

Volume control

To adjust volume, press the volume up/down buttons. (REFER TO FIG. 1) Volume levels 1-15.

Channel selection

(DB477A) Rotate left/right on the power/Channel selector and scroll through to desired channel.
(DB477D) Press the Channel Up and DOWN buttons to scroll through to desired channel.

For your reference a list of the available channels, corresponding frequencies and guidelines for their use and selection is printed on page 21. For Australia, channels 05 and 35 are reserved for Emergency calls.

Mute out

Capable of muting the car stereo when you receive incoming traffic on the transceiver.

Setting the squelch level

To select your desired squelch level, press on the power/Channel selector once and then rotate to 1 of 9 levels. Zero is off.

To enter the Menu features, press on the F button once. This allows you to scroll the menu and customise as per your requirements.
Some of the options available to you include:

CTC   CTC – CTCSS (Coded tone controlled squelching system)

When you have the radio set on say channel 1 there are sub channels associated with with all 80 channels, so if there are other users on that channel you can go into the CTC setting and set this feature to say 10 and you will be able to use channel 1 with sub channel 10 and not interfere or talk over other users and the other users on CH1 will not interfere with you while you have a private conversation. The only requirement is that your radio and the radio you are communicating with are on the same settings e.g... your radio is on CH1 sub CH 10 then the receiving unit must be on the same setting.

DUP Duplex

This feature will allow you to connect to any available repeater station in your are and will allow your radio to travel a much longer distance the repeater locations will be on the last page of this manual. Please note this feature is only available from CH1 through to CH8 but please note CH5 is only available for Emergency transmission and should never be used unless you are having a real emergency (penalties apply for misuse of CH5)

To use duplex simply invoke the feature of the radio that says DUP and turn the volume knob until you see r1 on the screen that mean ch1 in now in duplex mode and will automatically attach itself to a repeater if its available in you area you can turn CH2 with duplex 2 will display r2, CH3 r3 etc..
You can have all 8 channels in duplex mode and it will find any available repeaters and you travel. You will find a list of repeaters Australia wide on the internet but we will attach Victorian repeaters on the last page.

SCN SCAN

This feature will allow you to scan through all 80 channels continuously. When you enter the SCN option you will see SCN G5, that means the scan feature is disabled when its set to o5 it is set to scan mode and will scan. When in scan mode if you turn the large round knob clockwise the unit will scan from 1 to 80, If the knob is turned counter-clockwise it will it will scan from 80 to 1

BCL

BACKLITE This feature turns the back light ON or OFF user preference.

CAL

CALL RING TONE This feature allows you to change your call ring tone you can set 5 different call tones from C1 to C5 this feature only send your set tone when you press the CALL button on the hand piece. **NOTE** once you have used you call button to notify other users this feature is disabled for 60 seconds and you will need to wait the full 60 seconds to use it again.
(For DB477D your call button is the PTT & CH up or down button pressed togther to send a call tone).

RBP ROGER BEEP

This feature emits a tone when you release the Press to talk button (PTT) same as saying OVER at the end of you talk turn.

BEP Button beeps

This feature allows you to turn off the beeps when pressing buttons on the face of the radio and also disables BEEPS when scrolling through the menus

COL

Color This feature simply changes the LCD back light color

LIT

LIGHT this feature simply changes the brightness of the LCD backlight from 1to 3, 3 being brightest.

Transmit and Receive Procedure

Your two-way radio contains a transmitter and a receiver. To control your exposure and ensure compliance with the general population/uncontrolled environment exposure limits, always adhere to the following procedure: • Transmit no more than 50% of the time.
• To receive calls, release the PTT button.
• To transmit (talk), press the Push to Talk (PTT) button.
Transmitting 50% of the time, or less, is important because the radio generates measurable RF energy exposure only when transmitting (in terms of measuring standards compliance).

Radio Operation and EME Exposure

Unauthorised antennas, modifications, or attachments could damage the radio and violate compliance. Do NOT hold the antenna when the radio is "IN USE." Holding the antenna reduces the effective range. Do not use the radio if the antenna is damaged. If a damaged antenna makes contact with your skin, a minor burn can result.

Electromagnetic Interference/Compatibility

Nearly every electronic device is susceptible to electromagnetic interference (EMI). To avoid the possibility of electromagnetic interference and/or compatibility conflicts, turn off your radio in any location where posted notices instruct you to do so such as health care facilities.

Aircraft

When instructed to do so, turn off your radio when onboard an aircraft. Any use of a radio must be in accordance with applicable regulations per airline crew instructions.

Medical Devices – Pacemakers

The Advanced Medical Technology Association recommends that a minimum separation of 6 inches (15cm) be maintained between a radio and a pacemaker. These recommendations are consistent with the independent research by and recommendations of the U.S. Food and Drug Administration.
People with pacemakers should:
• ALWAYS keep the radio more than 15cm from their pacemaker when the radio is turned ON.
• Not carry the radio in the breast pocket (Handheld Radio).
• Use the ear opposite the pacemaker to minimise the potential for interference.

• Turn the radio OFF immediately if there is any reason to suspect that interference is taking place.

Medical Devices - Hearing Aids
Some radios may interfere with some hearing aids. In the event of such interference, you may want to consult your hearing aid manufacturer to discuss alternatives.

Other Medical Devices
If you use any other personal medical device, consult the manufacturer of your device to determine if it is adequately shielded from RF energy. Your physician may be able to assist you in obtaining this information.
General warnings
Keep the radio out of reach of babies and young children.
Transmitting Range
The talk range will depend on your surroundings and environment it will be affected by obstructions such as hills or buildings.

Don't try to use two radio units which are less than 1.5m (5 feet) apart. Otherwise, you may experience interference. Talk range depends on the terrain. It will be affected by concrete structures, heavy foliage and by operating radios indoors or in vehicles.

Your **DB477** is simplex "one way at a time". While you are speaking, you can not receive a transmission.
Your **DB477** is an open-license band. Always identify yourself when transmitting on the same channel.

IMPORTANT: Before transmitting on a UHF channel listen to ensure it is not already in use.

Transmitting (sending speech)
The unit is continuously in the Receive mode when the unit is turned ON and not transmitting. When a signal is received on the current channel, "RX" icon will be displayed on the LCD screen. a. Press and hold the PTT (Push to Talk) button to transmit your voice. The transmit signal icon "TX" will display on the LCD screen. b. Hold the unit in a vertical position with the Mic (Microphone) 5 cm away from the mouth. While holding the PTT button, speak into the microphone in a normal tone of voice. c. Release the PTT button when you have finished transmitting.

For others to receive your transmission, they must be on the same channel as you.

Call-Ring tone
You can use the CALL button to send a tone to other users on the same channel. To activate this feature; a. With the unit in normal mode, press and release the CALL button. The unit will transmit a 2-second page tone to the other unit/s set with the same channel within transmitting range.
NOTE: This function is only possible every 60 seconds.

Roger Beep
This is a tone which is automatically transmitted whenever the PTT button is released. This alerts the receiving party that you have ended the transmission, and you are now in receive mode.

Duplex operation via repeaters

This feature allows to use local repeater stations that are designed to automatically re-transmit your broadcast over a large area thus giving you increased range.

Repeaters stations are privately operated radio systems installed throughout Australia.

For example, if you wish to access a repeater station in your area which operates on channel 2 you only need to set the Duplex access on this Channel.

So, if you are in the range of a local repeater which transmits on channel 2, after setting your radio to allow access of the repeater on that channel, you will select channel 2 as normal, but during transmit operation your radio will automatically transmit to the repeater on channel 32.

Receive Channel	1	2	3	4	5*	6	7	8
Transmit channel	31	32	33	34	35*	36	37	38

Receive Channel	41	42	43	44	45	46	47	48
Transmit channel	71	72	73	74	75	76	77	78

* Channel 5 is emergency channel only

Channel 5 and 35 (paired for Duplex repeaters) are reserved as emergency channels and should be used only in an emergency. CTCSS and DCS will not operate on channels 5 and 35.

A list of currently authorised channels can be obtained from the ACMA website in Australia and the MED website in New Zealand. Channel 11 is a calling channel generally used to call others and channel 40 is the customary road vehicle channel.

Once contact is established on the calling channel, both stations should move to another unused "SIMPLEX" channel to allow others to use the calling channel.

Channels 22 and 23 are for Telemetry and Telecommand use, voice communications are not allowed on these channels by law. Channel 9 and above are the best choices for general use in Simplex mode.

Radiocommunications (Citizen Band Radio Stations)
Class Licence 2002
No licence is required to own or operate this radio in Australia and New Zealand. The Radiocommunications (Citizen Band Radio Stations) Class Licence 2002 contains the technical parameters, operating requirements, conditions of licence and relevant standards for Citizen Band (CB) radios. CB radios must comply with the class licence for their use to be authorised under the class licence.

UHF channels and frequencies
IMPORTANT NOTE: The operation of your UHF radio in Australia and New Zealand is subject to conditions in the following licenses: In Australia the ACMA Radio communications (Citizen Band Radio Stations) and in New Zealand by MED the General User Radio License for Citizen Band Radio.

Channel:	Frequency:	Use:	Channel Spacing:
Channel 1	476.4250	Duplex - Repeater Output	12.5 KHz
Channel 2	476.4500	Duplex - Repeater Output	12.5 KHz
Channel 3	476.4750	Duplex - Repeater Output	12.5 KHz
Channel 4	476.5000	Duplex - Repeater Output	12.5 KHz
Channel 5	476.5250	Duplex - Repeater Output (Emergency use only)	12.5 KHz
Channel 6	476.5500	Duplex - Repeater Output	12.5 KHz
Channel 7	476.5750	Duplex - Repeater Output	12.5 KHz
Channel 8	476.6000	Duplex - Repeater Output	12.5 KHz
Channel 9	476.6250	Simplex	12.5 KHz
Channel 10	476.6500	Simplex 4WD Drivers - Convoy, Clubs & National Parks	12.5 KHz
Channel 11	476.6750	Simplex Call Channel	12.5 KHz
Channel 12	476.7000	Simplex	12.5 KHz
Channel 13	476.7250	Simplex	12.5 KHz
Channel 14	476.7500	Simplex	12.5 KHz
Channel 15	476.7750	Simplex	12.5 KHz
Channel 16	476.8000	Simplex	12.5 KHz
Channel 17	476.8250	Simplex	12.5 KHz
Channel 18	476.8500	Simplex Caravan & Campers Convoy Channel	12.5 KHz
Channel 19	476.8750	Simplex	12.5 KHz
Channel 20	476.9000	Simplex	12.5 KHz
Channel 21	476.9250	Simplex	12.5 KHz
Channel 22	476.9500	Data Only (No Voice - No Packet)	25 KHz
Channel 23	476.9750	Data Only (No Voice - No Packet)	25 KHz

Channel 24	477.0000	Simplex	12.5 KHz
Channel 25	477.0250	Simplex	12.5 KHz
Channel 26	477.0500	Simplex	12.5 KHz
Channel 27	477.0750	Simplex	12.5 KHz
Channel 28	477.1000	Simplex	12.5 KHz
Channel 29	477.1250	Simplex Pacific Hwy (NSW) & Bruce Hwy (Qld) Road Channel	12.5 KHz
Channel 30	477.1500	Simplex UHF CB Broadcasts	12.5 KHz
Channel 31	477.1750	Repeater Input	12.5 KHz
Channel 32	477.2000	Repeater Input	12.5 KHz
Channel 33	477.2250	Repeater Input	12.5 KHz
Channel 34	477.2500	Repeater Input	12.5 KHz
Channel 35	477.2750	Repeater Input (Emergency Use Only)	12.5 KHz
Channel 36	477.3000	Repeater Input	12.5 KHz
Channel 37	477.3250	Repeater Input	12.5 KHz
Channel 38	477.3500	Repeater Input	12.5 KHz
Channel 39	477.3750	Simplex	12.5 KHz
Channel 40	477.4000	Simplex Highway Channel	12.5 KHz
Channel 41	476.4375	Duplex - Repeater Output	12.5 KHz
Channel 42	476.4625	Duplex - Repeater Output	12.5 KHz
Channel 43	476.4875	Duplex - Repeater Output	12.5 KHz
Channel 44	476.5125	Duplex - Repeater Output	12.5 KHz
Channel 45	476.5375	Duplex - Repeater Output	12.5 KHz
Channel 46	476.5625	Duplex - Repeater Output	12.5 KHz
Channel 47	476.5875	Duplex - Repeater Output	12.5 KHz
Channel 48	476.6125	Duplex - Repeater Output	12.5 KHz
Channel 49	476.6375	Simplex	12.5 KHz
Channel 50	476.6625	Simplex	12.5 KHz
Channel 51	476.6875	Simplex	12.5 KHz
Channel 52	476.7125	Simplex	12.5 KHz
Channel 53	476.7375	Simplex	12.5 KHz
Channel 54	476.7625	Simplex	12.5 KHz
Channel 55	476.7875	Simplex	12.5 KHz
Channel 56	476.8125	Simplex	12.5 KHz
Channel 57	476.8375	Simplex	12.5 KHz
Channel 58	476.8625	Simplex	12.5 KHz
Channel 59	476.8875	Simplex	12.5 KHz
Channel 60	476.9125	Simplex	12.5 KHz
Channel 61		Reserved for Future Expansion	

Channel 62		Reserved for Future Expansion	
Channel 63		Reserved for Future Expansion	
Channel 64	477.0125	Simplex	12.5 KHz
Channel 65	477.0375	Simplex	12.5 KHz
Channel 66	477.0625	Simplex	12.5 KHz
Channel 67	477.0875	Simplex	12.5 KHz
Channel 68	477.1125	Simplex	12.5 KHz
Channel 69	477.1375	Simplex	12.5 KHz
Channel 70	477.1625	Simplex	12.5 KHz
Channel 71	477.1875	Repeater Input	12.5 KHz
Channel 72	477.2125	Repeater Input	12.5 KHz
Channel 73	477.2375	Repeater Input	12.5 KHz
Channel 74	477.2625	Repeater Input	12.5 KHz
Channel 75	477.2875	Repeater Input	12.5 KHz
Channel 76	477.3125	Repeater Input	12.5 KHz
Channel 77	477.3375	Repeater Input	12.5 KHz
Channel 78	477.3625	Repeater Input	12.5 KHz
Channel 79	477.3875	Simplex	12.5 KHz
Channel 80	477.4125	Simplex	12.5 KHz

Licenses for Repeater Channels 44 & 45 will not be licensed for an additional 6 to 12 months to allow extra time for owners of Channel 5 Emergency repeaters to upgrade equipment to meet the new standards

Channels 1 to 8 and 41 to 48 - Repeater Channels Press the DUPLEX button on your radio to used any available repeaters

Channel 5 & 35 - Emergency use only - Monitored by Volunteers, No general conversations are to take place on this channel

Channels 22 & 23 - Data transmissions only (Excluding Packet)

Channels 31 to 38 and 71 to 78 - Repeater inputs - Do not use these channels for simplex transmissions as you will interfere with conversations on channels 1 to 8 and 41 to 48

The Australian Government has legislated that channels 5 & 35 on the UHF CB Band are reserved for emergency use only

As at January 2007 the maximum penalties for the misuse of the legally allocated CB emergency channels are:

For general misuse - if an individual 2 years imprisonment, otherwise

$165,000 (a $220 on-the-spot fine can be issued in minor cases); or

For interference to an Emergency call - if an individual 5 years imprisonment, otherwise $550,000

If you do find you are interfering with another persons conversation, just select another channel.

Technical assistance

If you need assistance setting up or using your CRYSTAL product now or in the future, call CRYSTAL Support.
Australia
TEL: 03 – 8587 8898
FAX: 03 – 8587 8866

Mon-Fri 9am – 5pm AEST

Please retain this user guide for future reference.

If you would like to download a digital copy of this manual, or other Crystal M manuals/software, please visit the crystalm.com.au website. This manual is considered correct at time of printing but is subject to change. For latest manuals and updates refer to the website.

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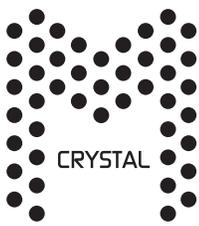
CRYSTAL MOBILE WARRANTY AGAINST DEFECTS

This warranty against manufacturing defects is given by TDJ Australia Pty Ltd ACN 006 385 191). Our contact details are set out in clause 2.7.

1. Consumer guarantee

1.1 Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major *(description according to Australian Consumer Laws)* failure and compensation for any other reasonably foreseeable *(description according to Australian Consumer Laws)* loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to meet manufacturers specifications and the failure does not amount to a major failure.

1.2 To the extent we are able, we exclude all other conditions, warranties and obligations which would otherwise be implied.

2. Warranty against defects

2.1 This Warranty is in addition to and does not limit, exclude or restrict your rights under the Competition and Consumer Act 2010 (Australia) or any other mandatory protection laws that may apply. Consumer guarantees are a set of rules that apply to goods and services purchased by consumers under the Australian Consumer Law (ACL).

These rules set out the circumstances under which a business is required to provide a consumer with a remedy.

The consumer guarantees automatically apply regardless of any voluntary or extended warranty given by a seller or manufacturer of goods and services, or if such a warranty has expired.

2.2 We warrant our goods to be free from defects in materials and workmanship for the warranty period from the date of original sale (or another period we agree to in writing). Subject to our obligations under clause 1.2, we will at our option, either repair or replace goods which we are satisfied do not meet manufacturers specifications. We warrant any replacement parts for the remainder of the period of warranty for the goods into which they are incorporated.

2.3 To the extent permitted by law, our sole liability for breach of a condition, warranty or other obligation implied by law is limited   (a) in the case of goods we supply, to any one of the following as we decide -   (i) the replacement of the goods or the supply of equivalent goods;   (ii) the repair of the goods;   (iii) the cost of repairing the goods or of acquiring equivalent goods;   (b) in the case of services we supply, to any one of the following as we decide –   (i) the supplying of the services again;   (ii) the cost of having the services supplied again.

2.4 For repairs outside the warranty period, we warrant our repairs to be free from defects in materials and workmanship for three months from the date of the original repair. We agree to re-

repair or replace (at our option) any materials or workmanship which we are satisfied do not meet manufacturers specifications.

2.5 We warrant that we will perform services with reasonable care and skill and agree to investigate any complaint regarding our services made in good faith. If we are satisfied that the complaint is justified, and as our sole liability to you under this warranty (to the extent permitted at law), we agree to supply those services again at no extra charge to you.

2.6 To make a warranty claim you must before the end of the applicable warranty period, at your own cost, return the goods you allege do not meet manufacturers specifications, provide written details of the alleged defect, and give us an original or copy of the purchase receipt, sales invoice or some other evidence showing details of the transaction.

2.7 Send your claim to: TDJ Australia PTY LTD. 78 Mills Road, Braeside Melbourne
Victoria 3195, Australia,
TEL: 03 8587 8898 FAX: 03 8587 8866
Email: tdj-service-team@tdj.com.au

2.8 If we determine that your goods do not meet manufacturers specifications, we will pay for the cost of returning the repaired or replaced goods to you. If we find your goods meet manufacturers specifications and no major defect is found, we will contact you to arrange the return of the goods at your expense.

3. What this warranty does not cover

3.1 This warranty will not apply in relation to: (a) goods modified or altered in any way;   (b) defects and damage caused by use with non Standard Communications products;   (c) repairs performed other than by our authorized *service team*;   (d) defects or damage resulting from misuse, accident, impact or neglect;   (e) goods improperly installed or used in a manner contrary to the relevant instruction manual; or   (f) goods where the serial number has been removed or made illegal.

4. Warranty period

4.1 We provide the following warranty on Crystal Mobile products. No repair or replacement during the warranty period will renew or extend the warranty period past the period from original date of purchase.

This products warranty period is 3 years from date of purchase