

# CRYSTAL M

## DIGITAL MEDIA RECEIVER BLUETOOTH / USB / AUX



# CR1801 User Manual

Bluetooth AM/FM TUNER MP3 WMA USB AUX INPUT 4 x 40W POWER OFF TIMER

Supplier Reference Model Number: RM1801



[crystalm.com.au](http://crystalm.com.au)

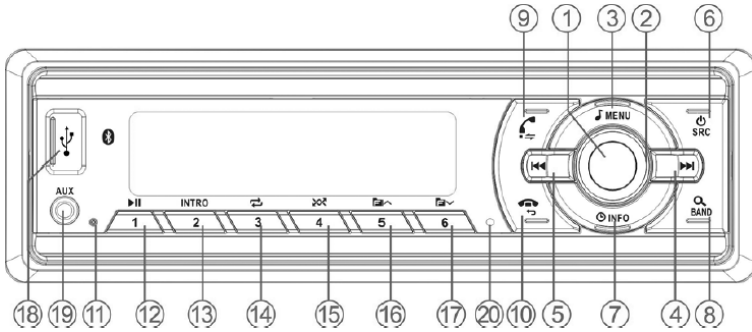
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# Front Panel Layout

# CRYSTAL M



Item	Button Name	Comments
1	<b>Mute / Select (Centre switch)</b>	
2	<b>Volume Control / Rotary browse</b>	
3	<b>Menu</b>	Audio and System Menus
4	<b>Up &gt;&gt;   Next</b>	
5	<b>Down &gt;&gt;   Previous</b>	
6	<b>Source / Power</b>	Radio / BT / USB / AUX /
7	<b>INFO (information) / Clock</b>	Select info to view or display clock
8	<b>Band / Browse</b>	FM & AM(MW/LW) band select or Browse function
9	<b>Call Pick Up</b>	Transfer or last number re-dial
10	<b>Call Hang Up</b>	Return from menu or selection
11	<b>Reset</b>	
12	<b>Preset 1 (Play / Pause)</b>	Play / Pause Media Control
13	<b>Preset 2 (Intro)</b>	
14	<b>Preset 3 (RPT - Repeat)</b>	
15	<b>Preset 4 (RDM - Random Play)</b>	
16	<b>Preset 5 (Folder - Next)</b>	
17	<b>Preset 6 (Folder - Previous)</b>	
18	<b>USB</b>	
19	<b>Aux-In</b>	3.5mm Stereo Socket
20	<b>Built-in Mic</b>	

# CRYSTAL M

## General Operation

### Buttons to navigate through Menus

In the menu system certain controls have some common functions to help you move through the menus:

- 1) Volume control centre switch = select
- 2) Volume control rotary = "choose"
- 3) Hang Up = return or move back up a menu level

### Powering On/Off

To switch the unit on press the power button. To turn the unit off, press and hold the power button for 2 seconds. In a similar manner many of the buttons on the front panel have two modes of activation: "Short press" and "Long press" to directly select different functions.

### The 'Volume' Knob

Audio volume is adjusted when the rotary knob is turned, and MUTE is toggled on/off when the knob is pressed briefly - short press. In the SYSTEM or AUDIO menus volume adjustment is temporarily disabled, and the rotation of the knob adjusts the value of the menu item. In this mode pressing the volume knob will select the item you have chosen. The menu list may also be cycled through with the >>| and |<< buttons.

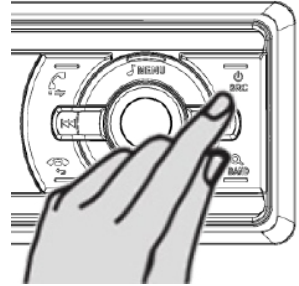
Example: short press (push and let go) the MENU button to access the AUDIO menu – EQ, loudness, bass, treble, balance, and fader.

### Radio Operating Region

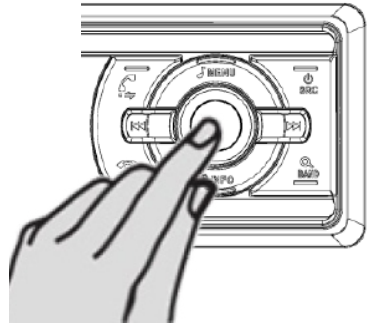
When the radio is first powered up or after a reset it will ask you to select the geographical radio operating region, use the rotary control to choose your region and press the knob to select. This can also be set using the Radio Mode menu – all menus are context sensitive i.e. Radio Only functions can only be accessed in radio mode.

### Button Functions

The function of some controls depends on context. For example, the "1" button is used to recall (short press) or store (long press) radio station preset 1. However, when playing media (USB or BT), pressing this button will toggle play / pause.



TURN for Volume adjustment / PRESS to MUTE



TURN to choose  
PRESS to select

<b>REGIONS AVAILABLE</b> EUROPE / ASIA / MID-EAST AUST / USA / LATIN (America) JAPAN / RUSSIA
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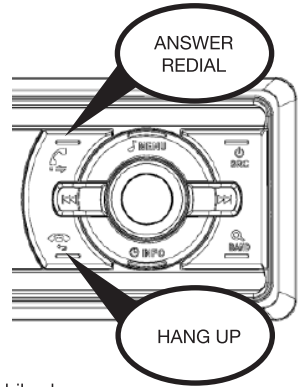


## Bluetooth Operation

### General Operation

When paired to a mobile phone Bluetooth-enabled radio models, allow the user to perform handsfree calling via the radio. The radio has “Answer” and “Hang-Up” buttons to accept or reject an incoming call.

When no call is active the “Answer” button can be used to re-dial the last number - pressing once asks if you want to re-dial, pressing again dials the number, pressing the “Hang-Up” button cancels the request.



### Bluetooth Profiles

Bluetooth enabled units can wirelessly link to Bluetooth devices such as mobile phones. The modes of Bluetooth connection are referred to as “profiles”. This radio supports the following profiles:

- 1) **A2DP:** Advanced Audio Distribution Profile – Playing (Streaming) music using Bluetooth.  
Devices that have A2DP functionality can stream music into the radio to be played through the vehicles loudspeaker system.
- 2) **AVRCP:** In addition, if supported by the device, the AVRCP profile (Remote Control Profile), allowing functions like ‘next track’ and ‘previous track’ to be controlled from the radio.
- 3) **HFP:** Handsfree Profile – Making or receiving telephone calls using Bluetooth.
- 4) **SSP:** Secure Simple Pairing - this method is based on a random number generator and the user does not need to enter a PIN number on the phone.

### Pairing

To use the Bluetooth handsfree function a mobile phone needs to be “paired” to the radio. To “pair” the mobile phone with the radio ensure that the radio is turned on. On the mobile phone search for Bluetooth devices and select the suppliers reference model number **RM1801**. Check for a successful pairing notification on the mobile phone.

Once paired it is the mobile phone that determines automatic reconnection to the radio. (e.g. on re-entry to the vehicle with the ignition on).

To disconnect a Bluetooth device temporarily use the “DISCONN” (disconnect) menu function. To permanently

## Radio FM & AM(MW/LW)

### Searching for Radio Stations

Use the >>| and |<< buttons to search for radio stations: short press to automatically seek the next available frequency (jump to the next seek stop).

### Manual Tuning

Long press either the >>| or |<< button to change to manual-seek mode. In this mode a short press of one of these seek buttons changes frequency one step at a time whereas a long press will scroll until the button is released. The radio will revert to auto-seek mode if either button is not operated for 3 seconds.

### AutoStore Radio Stations

Long press the BAND button will start an “auto store” sequence to scan the whole band and store the strongest stations found.

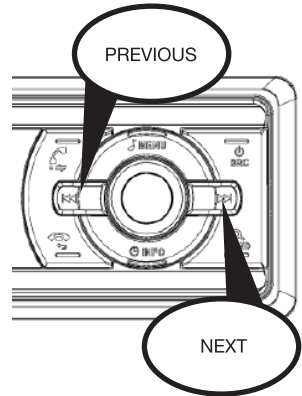
## Radio FM & AM(MW/LW) - continued

### Searching for Radio Stations

When listening to a radio station a long press on one of the radio preset buttons will store it permanently. The current station will be saved. A stored radio station can be recalled by a short press of one of these buttons. The stored radio station can be updated by tuning to a different station and performing a long press.



Long press: Store your favourite radio stations using radio station presets.  
Short press: Recall the stored station.



### FM Radio

Radio Data System (RDS) is available in many countries. If an RDS broadcast is present, RDS functions such as AF and TA can be enabled or disabled. RDS is only available in the FM bands.

### Radio RDS Notes

When RDS (Radio Data System) is operating the radio will show the station name e.g. "BBC R1" rather than the frequency. RDS is only available on the FM band. If RDS service is not available, the radio operates in conventional FM radio mode.

- AF** Alternative Frequencies. When this feature is enabled, the radio can stay tuned to BBC R1 by automatically retuning the reception frequency when the first signal becomes weak such as when the vehicle has moved out of range, providing that a stronger signal on the alternative frequency is available. Channel switching to the same radio station is performed automatically. In fringe reception areas the user may switch off AF if silent frequency seek is experienced frequently. Choose the AF menu item and select OFF.
- TA** Traffic Announcement. When switched on, if a traffic announcement is available the radio will automatically switch to the station broadcasting the announcement until it is complete. The TA menu item toggles between TA ON and TA OFF.
- TP** Traffic Program – An indicator is displayed if the currently tuned station is a traffic announcement capable station.
- PTY** Program type. RDS broadcasting services categorizes the type of programs for the listener. Examples are NEWS, AFFAIRS, INFO, SPORT, EDUCATION, DRAMA, CULTURE, SCIENCE, POP M, ROCK.

### Radio Preset Notes

FM has 3 bands, FM1, FM2 and FM3 bands each band has 6 radio presets. In total there are 18 FM radio presets for the user to store pre-tuned radio stations.

MW has one band with 6 radio presets, as does LW. There are 12 AM (MW & LW) radio pre-sets.

In total there are  $5 \times 6 = 30$  radio presets. The radio stores these permanently on an EEPROM memory device, that does not require external power to retain the radio station preset memory.

## Media USB

One single media device can easily fit thousands of songs (audio tracks). These tracks are often referred to as MP3 and WMA. Without any specific metadata, the radio uses the track filename as the title. Tracks can be put into folders and sub-folders.

For media carriers such as USB sticks, the unit can play files inside sub-folders.

Avoid having too many levels of depth in the sub-folders.

Do not carry too many audio files on a media to avoid difficulty in finding the desired song / track.

Media software and hardware are updated at a fast pace, so although the radio is shipped with the latest media compatibility; newer USB sticks and/or new file formats may not be compatible.

Listed below are the alternative functions of various keys on the front panel for media play-back.

- >>| Next track (short press), Fast forward (press and hold down)
- |<< Previous Track (short press), rewind (press and hold down)
- > || Play and Pause playback.

Repeat play mode. RPT TRK repeats the current track when it has reached the end. RPT FLD repeats playing of all the tracks in the current folder. RPT ALL repeats all the tracks in the entire media library.

**INTRO** Intro-play INT indicator will be shown on the LCD display. When in this mode the radio will play the first 10 seconds of each track (intro) then skip to the next track. When at the desired track, press the INTRO button again to cancel intro-play and listen to the whole track.

**RDM** Random-play, RDM ALL randomly plays from all tracks, RDM FLD plays tracks randomly from the current folder. RDM OFF plays tracks in the order they appear in the folder.

**FLV / FL** Previous folder and next folder.

There is a BROWSE feature that allows the user to cycle through the available media by folders and files to select a track. Press the BAND button to select this mode. Rotate the volume knob to scroll through the folder / filename / track list. Press the volume knob to select.



## Reset - Software / Hardware

**Soft Reset – MENU – RESET:** If the user is not sure if settings on the radio have been altered inadvertently, restoring the factory default settings may help. On a reset factory settings will be reloaded, overwriting the current data selections with their default values. This includes such items as BT pairing, station presets, tone settings, etc.

**Hard Reset -** A hardware reset button is located on the front panel (see “Front Panel Layout”) and can be activated by a paper clip or pen. This is only necessary if the radio refuses to react to any button input.

## Power Off Timer

This radio has a power-off-timer enhancement feature. The setting for this is accessed by a long press on the MENU button (system menu), in any mode, and using the >>| or |<< buttons to select the timer menu. Settings are OFF, AUTO, 30 min, 60 min and 90 min. OFF is the factory default value where the radio powers off immediately when the ignition key is switched off. This is the same as conventional radios.

AUTO mode will switch off the radio with the ignition, but you can turn the radio back on (or off) for a 30-minute period.

30, 60 or 90 minutes will keep the radio playing for this time after the ignition is switched off. Turning the radio off manually will cancel the timer and the radio will not switch on until the ignition is also turned on. This countdown timer is shown on the display using the small secondary line of characters. In the last 5 minutes of the countdown time the main display will warn the user that the radio is about to shut down.

This feature extends listening time and allows the ignition key to be removed for safety reasons. It also prevents the battery from being drained if the radio is left turned on for an extended period. Exact availability of this feature depends on the type of the vehicle since both a switched ignition "ACC" wire and a permanent battery "B+" wire are used to control this function and must be connected to the radio.

## Menu Reference

SYSTEM MENU	
<b>DIS-CON</b>	Disconnect current BT device
<b>UNPAIR</b>	Forget current BT device
<b>CLK (SET)</b>	Set - Hours (down) Minutes (up)
<b>CLK (12/24H)</b>	Select 12/24 hour display
<b>BEEP</b>	Audible feedback (on/off)
<b>RESET</b>	Reset radio to default settings
<b>MANUAL</b>	Auto-play USB media on/off
<b>TIMER</b>	Off timer setting (off / AUTO / 30/60/90min)

AUDIO MENU	
<b>EQ</b>	Equalisation presets
<b>LOUD</b>	Equal loudness contour on/off
<b>BASS</b>	Bass tone control
<b>TREBLE</b>	Treble tone control
<b>BALANCE</b>	Left/Right balance
<b>FADER</b>	Front/Rear fader

### Menu Reference - Context Sensitive

RADIO (context case sensitive items)	
<b>LOC</b>	Local or DX seek setting
<b>AREA</b>	Operating region
<b>RDS</b>	Radio Data System
<b>PTY</b>	Select and choose available
<b>AF</b>	Alternative Frequencies
<b>TA</b>	Traffic Announcement
<b>CT</b>	Clock, Time & Date
<b>SOFT</b>	Soft mute on/off (*)

(\*) Soft mute is a noise reduction technique used in FM receivers to lower the volume when the signal to noise ratio decreases. If you are in a weak signal area we recommend that you keep this function OFF to get the maximum received signal even if more background noise or "hiss" is heard.



## Wiring Notes

Connections to be made at the rear of the unit during installation.

### Connector A Pins:

#### A4 B+ or BATT +12V

When the radio is turned on electrical power is supplied to the internal electronics of the unit through this pin. Main consuming blocks such as audio power amplifier and backlights draw power from this pin. Ensure the connecting wire has minimum AWG14 wire gauge to carry the current.

#### A5 AUTO ANTENNA OUTPUT +12V

The voltage state on this output pin is a direct indicator of whether this unit is powered on or off. It can be used to control ancillary equipment such as an automatic electric antenna or an audio power amplifier. When connected properly such ancillary equipment will power on and off automatically in sync with the radio.

#### A7 ACCESSORY (ACC) or IGNITION +12V (key position)

Normally connects to the ignition or accessory circuit. By sensing the voltage on this pin, the unit is able to automatically power on and off when the ignition key switch is turned on or off.

#### A8 CHASSIS GROUND (EARTH)

All electrical current from this pin is combined to complete the power supply circuit. Ensure the connecting wire has minimum AWG14 wire gauge to carry the current. The metal enclosure of this unit is grounded to this pin. The unit is only suitable for "negative earth" vehicles.

**PINS A4 and A7 B+ (BATT) and ACC (IGNITION) CAN BE SWAPPED BY CHANGING THE POSITION OF THE FUSE - (SEE DIAGRAM BELOW)**

### Connector B pins (loudspeakers pins):

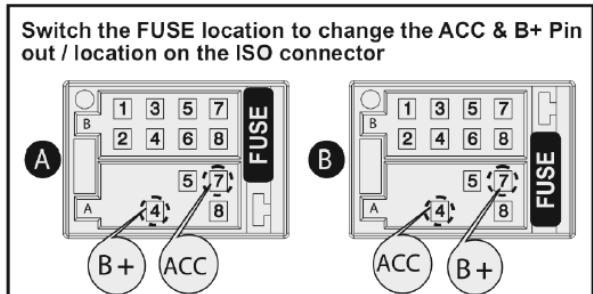
- B1.** REAR RIGHT (+)
- B2.** REAR RIGHT (-)
- B3.** FRONT RIGHT (+)
- B4.** FRONT RIGHT (-)
- B5.** FRONT LEFT (+)
- B6.** FRONT LEFT (-)
- B7.** REAR LEFT (+)
- B8.** REAR LEFT (-)

### IMPORTANT NOTE:

Always replace the fuse with the same type and rating. A blown fuse usually indicates a problem in the circuit.

Do not rely completely on replacing the fuse to fix a problem. An over-rated fuse will compromise protection against over-current.

Under-rated fuses can blow even if a fault condition does not exist.



## Mounting Notes

### ***Fitting the Radio***

Fit the mounting cage (sleeve) into the vehicles' ISO / DIN slot and bend the fixing tangs to lock it in place.

Connect the wiring to the rear of the radio.

Slide the radio into the cage until it "clicks" into place on the locking clips.

Fit the bezel (trim ring) on the front of the radio.

Check correct operation of the radio.

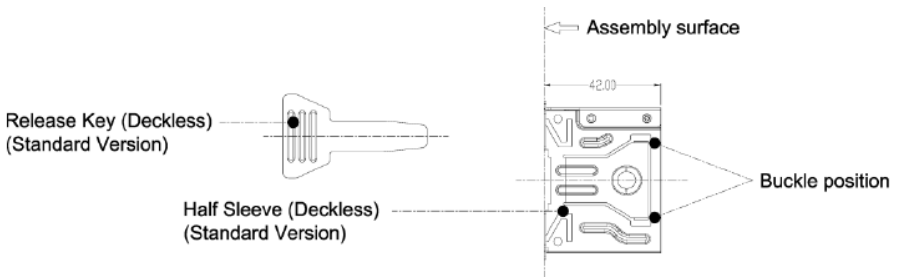
### ***Removing the Radio***

Slide the Release Keys centrally along the two sides of the radio to release the locking clips.

Slide the radio out, keeping the Release Keys in place.

Once the radio is out disconnect all the wiring and remove the radio completely.

If necessary bend the fixing tangs inward to remove the mounting cage as well.



# Technical Information

## TUNER (FM)

Frequency range See World Bands below  
 Channel step See World Bands below  
 Sensitivity <= 10 dBμV  
 Stereo separation >= 30 dB  
 SNR >= 50 dB  
 Auto Stop Sens. LOC on 38 dBμV +/- 6dB (LO)  
 Auto Stop Sens. LOC off 18 dBμV +/- 6dB (DX)

## MEDIA (USB)

Stereo separation <= 50dB  
 SNR <= 65dB  
 Media Codecs WAV, FLAC, MP3, WMA

## TUNER (FM)

Frequency range See World Bands below  
 Channel step See World Bands below  
 Sensitivity <= 40 dBμV  
 SNR >= 40 dB  
 Auto Stop Sens. LOC on 55 dBμV +/- 6dB (LO) Auto  
 Stop Sens. LOC off 33 dBμV +/- 6dB (DX)

## AUDIO

Audio Power 40W max / Chancel  
 4 Ohms @ 10% THD  
 Speaker Impedance 4 to 8 Ohm  
 Line Output Level 1.7V nominal  
 Line Output SNR >=70dB

## GENERAL

Power Supply 12V DC (9 to 18V)  
 Fuse Rating 15A  
 Permanent Memory EEPROM  
 Mounting DIN / ISO Cage

World Bands	FM Frequency (MHz)			AM MW Frequency (kHz)			AM LW Frequency (kHz)		
	Start	End	Step (kHz)	Start	End	Step (kHz)	Start	End	Step (kHz)
EUROPE	87.5	108.0	50	522	1620	9	144	288	1
USA	87.5	107.9	200	530	1710	10	--	--	--
LATIN	87.5	108.0	100	530	1710	10	--	--	--
M-EAST	87.5	108.0	100	522	1620	9	144	288	1
AUSTRALIA	87.5	108.0	100	522	1710	9	144	288	1
ASIA	87.5	108.0	100	522	1620	9	144	288	1
JAPAN	76.0	90.00	100	522	1629	9	--	--	--
RUSSIA	87.5	108.0	50	522	1620	9	144	288	1

## FCC Statement

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - This device may not cause harmful interference, and
  - This device must accept any interference received, including interference that may cause undesired operation.

2. Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Industry Canada (IC) Warning

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

- This device may not cause interference, and
- This device must accept any interference, including interference that may cause undesired operation of the device.

## FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body

## Bluetooth Models

Bluetooth Frequency : 2.402 - 2.480 GHz  
 Output Power : +4dBm (max.), 0dBm (Ave.), Power Class2



Instructions on Disposal and Environmental Protection  
 Do not dispose of this product in the usual household garbage at the end of its lifecycle; hand it over at a collection point for the recycling of electrical and electronic appliances. The symbol on the product, the instructions for use or the packing will inform about the methods for disposal. The materials are recyclable as mentioned in this marking. By recycling, material recycling or other forms of reutilization of old appliances, you are making an important contribution to protecting our environment.  
 Please inquire at the community administration for the authorized disposal location.

# Technical Assistance

## ***For Australasian support***

If you need assistance setting up or using your CrystalM product now or in the future, call CrystalM Support. Australia

TEL: 03 – 8587 8898  
FAX: 03 – 8587 8866  
Mon-Fri 9am – 5pm AEST

If you would like to download a digital copy of this manual, or other CrystalM manual/software, please visit the <http://crystalm.com.au> website and search for the product model number for more information and products.

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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Please retain this user guide for future reference.



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