Redback® A 2704B Dual DAB + AM/FM Tuner with RS-232

Altronic Distributors warrants this product for one year from date of purchase from Altronics or its resellers to the consumer. If this item is part of an installation or another product, please contact the installer or supplier for your warranty.

During the warranty period, we undertake to repair or replace your product at no charge if found to be defective due to a manufacturing fault. The warranty excludes damage by misuse or incorrect installation (i.e. failure to install and operate device according to specifications in the supplied instruction manual), neglect, shipping accident, or no fault found, nor by use in a way or manner not intended by the supplier. For speakers, misuse includes burnt out voice coils.

For repair or service please contact your **PLACE OF PURCHASE.**

If this item was purchased directly from Altronics please make a warranty claim by:

1. FOR MAIL ORDER CUSTOMERS (includes school and trade orders),

a) Ringing us on 1300 797 007 and quoting your tax invoice number.
b) Upon contacting Altronics, we will issue an R.A. (Return Authorisation). As Altronics have a
 number of service agents throughout Australia, a copy of the R.A. will be emailed, faxed or mailed to you with full instructions of how and where to send the goods. The freight for shipping goods back to Altronics for all repairs is at the customer's expense.
c) A copy of the R.A. form, (or at the very minimum, the R.A. number) must accompany the goods to effect the repair.
d) Altronics will pay the return freight to the customer where the warranty claim has been accepted.
e) Please quote the R.A. number in any correspondence to us.

2. FOR OVER THE COUNTER PURCHASES; to make a warranty claim, please return the goods to us in any of our stores, with a copy of your proof of purchase (tax invoice).

a) Upon leaving the goods at one of our stores, an R.A. number will be issued to you.
b) Once repaired, you will be contacted, advising that the goods are ready to be collected from the store.
It is at Altronics discretion as to whether the goods will be repaired or replaced (whilst under warranty); and as to whether identical goods will be used to replace the item due to changes of models / products.

Note: Under no circumstances should you attempt to repair the device yourself or via a non-authorised Altronics service centre, as this will invalidate the warranty!

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 failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

A 2704B

Dual DAB + AM/FM Tuner With RS-232

Operating Instructions

• Dual outputs (one for each section) – AM/FM and DAB+/FM • Dual LCD readouts – one LCD for each tuner section • 80 station presets – Section Left (10 AM/30 FM), Section Right (20 DAB+, 20 FM)
• Antenna sockets – DAB+, FM, AM loop • PLL synthesised tuner circuit with digital processing • Rear mounted level control knobs
• Mono/stereo selector (for FM tuner only) • IR remote control
• RS-232 control • 19" rack mount ears included
• 240V a.c. operation

PACKAGE CONTENTS:
Dual Radio Tuner 1RU, Antennas - AM loop + 75Ω FM wire + DAB Telescopic, Remote control + 2 x AAA batteries, 2 x 1.5m stereo RCA to stereo RCA leads, IEC power cord, Rack mounting ears, Instruction Manual

Congratulations on your purchase of the Dual Tuner with RS232 interface and infra-red remote control. This radio tuner is a 1RU rack-mountable device with a sleek design and a symmetrical layout of buttons across the front panel. The stylish two-line LCD screens displays essential information pertaining to each section's tuner – left side AM/FM bands, right side DAB+ / FM bands. This receiver uses precision Phase Lock Loop (PLL) synthesized digital tuning technology, and is sensitive to the weakest signals when connected to appropriate antennas.

Installation

1. The unit is supplied with separate RCA line level outputs for each tuner section. Connect the stereo RCA output(s) as required to a line level amplifier input.
2. Connect a suitable FM antenna to the FM antenna terminals, and connect the AM loop antenna to the AM antenna terminals. (Included)
3. Connect the provided IEC cable to the unit, and plug it in to a 240V a.c. mains outlet. Install the batteries (supplied) in the remote control.
4. The battery compartment is located on the reverse of the remote control. Ensure the 2 x AAA batteries are inserted with the correct polarity.
5. Switch the mains outlet on.

CAUTION
• Do not use this unit where the temperatures are below 5°C or exceeds 35°C.

• Do not attempt to clean with chemical solvents as this may cause damage. Use a clean, dry cloth.

Fig 1. FRONT PANEL

1. POWER - ON/OFF master switch
2. AM/FM TUNER - LCD Tuner A
3. Power ON/OFF - Tuner A Standby
4. BAND - AM/FM selection
5. SLEEP – Return to standby after a set period.
6. DOWN - Frequency (manual steps/auto search)
7. UP - Frequency (manual steps/auto search)
8. M.DOWN – Scroll down through stored memory
9. M.UP – Scroll up through stored memory stations
10. TUNER - Power LED for remote control LHS
11. MEMORY – Store frequency in preset memory
12. Tuner A Preset selection 1 to 5, 5+
13. DAB+/FM TUNER – LCD Tuner B
14. MODE – Switch between DAB+ and FM (like BAND)
15. MENU – Choose functions for DAB+ and FM settings
16. DAB - Power LED for remote control RHS
17. INFO – Scroll through the data transmitted for each band
18. POWER ON/OFF – Tuner B Standby
19. TUNE - Jogwheel FM / DAB+ stations, navigate menus, ENTER
20. FM LIST – Displays list of stored FM station frequencies
21. ENTER – Press to select a setting or function in Menu
22. UP – Station and frequency search up (manual/auto-scan)
23. DOWN - Station and frequency search down

Fig 2. REAR PANEL

1. RS232 control port
2. DAB Ant (F-Type socket)
3. FM Ant (PAL socket)
4. AM Loop (Spring terminal)
5. DAB Out Level adjustment
6. DAB Out Stereo L/R RCA line
7. Tuner Out Level adjustment
8. Tuner Out Stereo L/R RCA line
9. 240V a.c. Mains IEC input

NOTE: On Tuner B, jogwheel performs the same functions as the front panel buttons UP / DOWN and ENTER. If the jogwheel is pressed for two seconds, it will auto scan and store stations in both DAB+ and FM modes (like ASM).

Fig 3. REMOTE CONTROL {Red alternate functions for buttons}

1. Power ON/OFF - Affects only the section whose LED is lit.

2. Numeric keypad - Memory presets 1-10+

3. Direct {SHIFT} - Tune to a specific station using the numeric keys to enter the frequency. Only affects the AM/FM tuner.

4. ASM – Auto Search Memory {INFO} - Auto Search Memory. Automatically scans the entire band (AM or FM) and stores the strongest frequencies found in memory.

5. Memory {MENU} - This button can store a station frequency into a Memory preset number. It can also activate the Menus.

6. FM List - Displays list of stored FM station frequencies

7. MUTE – Sets volume level to zero. Mute mark appears LCD.

8. RDS – Radio Data Service {AUTO SCAN}

9. BAND – Toggle between AM and FM bands (Tuner Section) and DAB+ / FM modes (DAB+ Section)

10. SLEEP [Timer] - Sets the duration for the playback timer that counts down the minutes to power standby. Max 90 min.

11. MO/ST - Mono/Stereo {ENTER} - change between mono and stereo mode for FM radio tuning. Enter is the same as pressing the jog wheel.

12. DOWN / UP – search up or down through frequencies.

13. M-Down / M-Up – scroll up or down through preset stations.

14. TUNER / DAB – Toggle between the two tuners, left (Tuner A = AM/FM) or right (Tuner B = DAB+/FM).

General Operation

NOTE: While the Remote Control (Fig 3) and the front panel of each tuner (Fig 1) share some common function controls, a few functions are ONLY available using the Remote Control, namely: DIRECT, RDS, MUTE, ASM, MO/ST, TUNER/DAB. (ASM doubles as INFO button when the DAB+/FM tuner is active.)

- MUTE button functions with whichever tuner section is active, as determined by pressing the TUNER/ DAB button. When pressed, the word MUTE will flash on the screen.

- The LCD displays of each tuner will show the current frequency or Station ID for which each receiver is tuned, for whichever band or mode has been selected.

• POWER ON / OFF: The unit has a main POWER switch on the front panel (Fig 1, button 1). When switched ON the unit will power up both tuner display screens. If a tuner – either A or B – is not required, simply press the 'POWER' button applicable to that tuner. The POWER button on the Remote (See Fig 3, button 1) is the same as the POWER buttons (Fig 1, buttons 3 & 18) on the front panel of each tuner section.

• SWITCHING BETWEEN THE DUAL TUNERS: On the Remote Control, press the TUNER/DAB button to toggle between which section (Left or Right) that the remote will control. A blue light on the front panel will be lit to indicate which tuner is under the remote's control. The Power / Standby button will work with whichever section is under the control of the remote handset. The same is true for the MUTE, SLEEP, BAND buttons. Furthermore, all the red labels on remote control buttons will work when pressed during DAB section operation.

• TUNING A RADIO STATION: A station frequency can be located by pressing either the 'UP' or 'DOWN' buttons (Refer Fig 1 – Buttons 6 or 7 [Tuner AM/FM] and Buttons 22 or 23 [DAB]+ / FM). Holding the

buttons down for a couple of seconds will start the AUTO SEARCH function, which will stop on the next strong frequency that the tuner can lock on to.

Press and hold the 'UP / DOWN' buttons again to recommence AUTO SCAN either up or down the dial. In manual tuning, the frequency will move up or down in fixed steps for each button press, according to frequency step applicable to the band in which the tuning is taking place.

AM/FM Tuner Operation

• SWITCH BETWEEN BANDS: On either the Remote Control or the front panel, pressing the 'BAND' button will switch the tuner section between AM and FM frequencies, and allow tuning to proceed. "AM" or "FM" markers will appear on the screen to indicate the Band in use.

• MONO/STEREO SELECTION: On the Remote Control only (Fig 3), press the 'MO/ST' button to switch between FM mono and FM stereo reception for the Tuner A side. A marker will show on the screen to indicate Mono or Stereo mode, unless the station is broadcasting in FM mono only, as some low-power stations between 87.6 MHz and 88.0 MHz sometimes do, in which case there will be no marker and the MO/ST button will do nothing.

NOTE: This button only works with the AM/FM section tuner. It has no impact on the FM tuner integrated with the DAB+ section. However, there is a setting within the MENU functions on the DAB side (Tuner B) which controls the FM Stereo and Mono audio for that FM receiver only.

• AUTO SCAN MEMORY (ASM):
1. Press TUNER/DAB to switch to the AM/FM tuner.
2. On the Remote Control, press and hold the 'ASM'
button. The tuner will SCAN the frequencies in that band (AM or FM), and store in memory automatically any station signals that are strong enough to lock onto. This is an easy way to store preset stations for Tuner A across each band.
3. To replace a presentation frequency with another frequency, simply follow the PROGRAM A STATION PRESET procedure below, and manually select the preset memory number you wish to replace with a new frequency, and it will be stored in that preset.

• DIRECTLY ENTERING A FREQUENCY: This is only possible using the 'DIRECT' button on the Remote Control, and it only works with the AM/FM tuner section.
1. Use TUNER/DAB toggle button to select the AM/FM tuner. Press 'DIRECT' (see Fig 3).
SCAN MEMORY (ASM):
2. The display on the front panel (Fig 1) will delete the current frequency and leave spaces for numbers referring to the frequency to which you wish to tune.
3. Use the keypad on the Remote to enter the station frequency and press 'DIRECT' again to confirm.
4. The tuner will jump to that frequency. If the input frequency is beyond the tuning range, the tuner will display ERR.

• TO PROGRAM A STATION PRESET MANUALLY:
1. Use the 'UP/DOWN' tuning keys to find a desired station frequency that you wish to program as a preset.
2. Press the 'Memory' key to enter the memory mode for that tuner (either A or B). The memory mode is set, when the 'MEMORY' key was pressed. The "MEMO" mark appears on the display.
3. The memory mode is released automatically after five seconds if there is no further input in this mode.
4. Select a memory number, either by accepting the number displayed on screen, or by pressing another preset button number, either using the panel buttons or from the remote control.
5. Press the 'Memory' button again and the frequency will be stored to that preset number.

NOTE: The FM band has 30 channels for memory storage while the AM band has 10 channels for

the Tuner section. Use the 'BAND' button to select FM or AM frequencies. The FM and AM antenna connections for each tuner are on the rear of the unit, along with the RCA outputs and level controls. (refer Fig 2)

• SELECTING A PRESET STATION:
1. Use the 'M-UP' or 'M-DOWN' buttons, on either the
front panel (Fig 1) or the Remote Control (Fig 3), to scroll up or down through the preset station frequencies that have been programmed using the 'MEMORY' function.
2. The other method to get to a preset station is to use the station preset buttons directly on the front panel (1 to 5 for AM/FM Tuner A) OR by typing the station preset number on the Remote Control (1 to 10).
3. You can also move through the stored present stations using the jogwheel. Press to enter / select the station.
4. Furthermore, pressing the '+5' button TWICE on the tuner panel (Fig 1) OR the '+10' button ONCE on the Remote Control (Fig 3) will jump up the preset list by that number to another frequency programmed into the memory.
5. Meanwhile, by hitting the +5 key first, and then another number on the front panel or on the remote handset keypad, the tuner will jump to the preset position equal to the sum of numbers on those keys.

Examples: On remote control press the number '9' and then '+10', and that tuner will jump to station preset 19. On the front panel, press '+5', then another preset button number 3, and that tuner will jump to station preset 8. Press '+5' twice, and the 6 on the remote and the preset will jump up to number 16.

NOTE: AM station memories on Tuner A number from 1 to 10 only. FM stations memories on Tuner A number 1 to 30 only.

• SLEEP FUNCTION: When 'SLEEP' key is pressed on either the AM/FM tuner front panel or the remote control, the SLEEP function is set and the timer starting duration is displayed for 2 seconds. The sleep time is changed as shown below:
1. Every press of the 'SLEEP' key while the sleep time is displayed on the screen will decrease the sleep time as follows (in minutes): 90 80 70 60 50 40 30 20 10 OFF
2. The "SLEEP" mark appears on the display when the sleep function is set and operating.
3. Pressing the 'SLEEP' button while the sleep timer is active will cancel the sleep function.
4. The power for that tuner switches off automatically once the sleep timer reaches zero.

DAB/FM Tuner Operation
• SWITCH BETWEEN MODES: On the front panel, when the DAB+ tuner section is active, press the MODE button to toggle between DAB+ and FM radio modes. On the remote handset, the BAND button functions the same as the MODE button on the DAB+ tuner section's front panel.

• SETTING THE CLOCK TIME: From the MENU, choose the Main Menu option and press 'ENTER' (remote or on panel). Then use the Up or Down button to select the Time Setup function and press enter. Follow the prompts to set the time. Remember that the DAB+ transmissions already contain the time codes in the signal data, and the DAB+ tuner decodes these and sets the time automatically, which is the default setting for the receiver.

• FM LIST: Press this button to display the FM frequencies stored on Tuner B. Scroll through the list using Up / Down buttons or the TUNE jogwheel. To organise and retune the FM List, when in FM Mode, press FM List and then press the Jogwheel knob for two seconds until it starts FM auto scanning. Any FM station frequencies strong enough to be locked on will be stored – up to 20 memories on Tuner B side. This function is similar to ASM, which only activates on the left side AM/FM tuner.

SLEEP function on the DAB+ Tuner side: This can be activated two ways.

1. From the MENU functions, for both FM and DAB+ modes. Press MENU and then use the jogwheel to select "MAIN MENU". Within Main Menu you will find the SLEEP function - Off, 15, 30, 45, 60, 90 min.
2. SLEEP menu can also be activated by pressing the SLEEP button on the remote, but only when the DAB side is actively under the remote's control.

Menu Functions

Menu Options – DAB Mode [Use Up / Down or Knob + Enter]

Press Menu Command	1st Level Functions	2nd Level Functions	3rd Level Operation
Sation Scan	Full	<Auto Scans>	N/A
	Manual	<Search>	N/A
Main Menu	Time Setup	Set Clock	<Time>
		Set Date	<Date>
		Auto Update	<Radio>
		Set 12Hr/24Hr	<Choose>
	Sleep	Off, 15, 30, 45. 60, 90min	<Choose>
	Tune Stations	<Automatic>	N/A
	Station Order	Multiplex	N/A
		Alphanumeric	N/A
		Active	N/A
	Factory Reset	N/A	N/A
	SW Version	N/A	N/A

Menu Options – FM Mode [Use Up / Down or Knob + Enter]

Press Menu Command	1st Level Functions	2nd Level Functions	3rd Level Operation
Audio Settings	Stereo or Mono	<Choose>	N/A
	Mono Only	<Choose>	N/A
Main Menu	Time Setup	Set Clock	<Time>
		Set Date	<Date>
		Auto Update	<Radio>
		Set 12Hr/24Hr	<Choose>
	Sleep	Off, 15, 30, 45. 60, 90min	<Choose>
	Factory Reset	N/A	N/A
	SW Version	N/A	N/A

~ Press and hold MENU to display the device's SW version.

Station ID data displayed on LCD

• RDS – RADIO DATA SERVICE: This feature only operates for the FM receiver on Tuner A. RDS is a series of data bits encoded within the FM Audio signal, which enable text to be transmitted and displayed on

the screen of an RDS enabled tuner. If the FM station is transmitting any RDS, the information will scroll across the bottom line of the LCD. Otherwise, the LCD will display "NONE" for the following codes: PS – Program Callsign, PTY – Program Type, RT – Radio Text, CT – Clock Time & Date, Signal Strength Bar (FM Receiver Tuner B INFO only)
**Press RDS on remote when in DAB+ mode to start auto scan.

• INFO – RDS for DAB+ stations: This button feature operates for the FM and DAB+ receiver on Tuner B. Press the INFO button in FM mode and the FM RDS will display on the right LCD if it is being transmitted by that station. (See RDS above). Press the INFO button in the DAB+ mode and the data that is encoded in the DAB+ signal will display on screen. The DAB+ INFO data codes are as follows: Scroll Text, Program Type, Multiplex Name, Clock Time & Date, Bit Error Rate (BER), Channel, Quality, Signal Strength Bar.

Specifications

FM Input:	75Ω unbalanced antenna wire
Tuning Frequency Range:	87.5-108MHz in 0.5MHz steps
FM Frequency Step:	50KHz
Usable Sensitivity:	6µV emf
Signal to Noise Ratio:	50dB
Total Harmonic Distortion:	0.1%
Stereo Separation:	40dB (1KHz)
IF Rejection Ratio:	45dB
AM Input:	AM loop antenna terminals
Tuning Frequency Range:	522-1710KHz in 9KHz steps
Usable Sensitivity:	50µV emf
Signal to Noise Ratio:	50dB
Total Harmonic Distortion:	1%
Frequency Response:	30Hz -8KHz (±3dB)
Selectivity:	25dB
RS232 Baud rate:	9600 bps
Data Bit:	8 bits
STOP Bit:	1 bit
Parity:	None
Flow Control:	Non
Power:	230VAC 50-60Hz 50VA
Output Connection:	RCA
Dimensions:	44H x 482W x 250D
Weight:	3.45kg

RS-232 Control Information

Command	String Hexadecimal
1	45 43 41 0D 0A
2	45 43 42 0D 0A
3	45 43 43 0D 0A
4	45 43 44 0D 0A
5	45 43 45 0D 0A
6	45 43 46 0D 0A
7	45 43 47 0D 0A
8	45 43 48 0D 0A
9	45 43 49 0D 0A
10/10	45 43 4A 0D 0A
+10	45 43 4B 0D 0A
DIRECT	45 43 4C 0D 0A
DOWN	45 43 4D 0D 0A
UP	45 43 4E 0D 0A
POWER ON	45 43 4F 0D 0A
POWER OFF	45 43 50 0D 0A
TUNER 1	45 43 51 0D 0A
TUNER 2	45 43 52 0D 0A
ME-UP	45 43 30 0D 0A
ME-DOWN	45 43 31 0D 0A
MEMORY	45 43 32 0D 0A
ASM	45 43 32 0D 0A
MO/ST	45 43 34 0D 0A
SLEEP	45 43 35 0D 0A
BAND	45 43 36 0D 0A
Auto search DOWN	45 43 37 0D 0A
Auto search UP	45 43 38 0D 0A
Answer from device if all ok	2B 4F 4B 0D 0A
Answer from device if not all ok	2B 45 52 OD 0A

**The RS-232 communication is 2-way. Therefore any commands entered via the remote control are outputted as an RS-232 command.