RM-SERIES

Rackmount 100V mixer-amplifiers with Bluetooth™

Item ref: 953.113UK, 953.114UK, 953.115UK

User Manual

⚠	Caution: Please read this manual carefully before operating Damage caused by misuse is not covered by the warranty

Introduction

Thank you for choosing the Adastra RM-series rackmount 100V amplifier as part of your public address system. This amplifier is designed to offer high quality, dependable service for mobile and installed systems. Please read this manual fully and follow the instructions to achieve the best results with your new purchase and to avoid damage through misuse.

SAFETY SYMBOL AND MESSAGE CONVENTIONS

CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	AVIS RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

SAFETY NOTICE

1. Prior to use, read through this manual
2. Keep the manual in good condition
3. Pay attention to safety warnings
4. Observe all operating requirements
5. Do not use the device near water or wet areas
6. For cleaning, only use a lint-free, dry cloth
7. Install according to the specifications
8. Place away from heat sources or heating appliances
9. Use mains lead provided and avoid damage to cable or connectors
10. Unplug power from mains during stormy weather or if unused for long periods
11. In case of malfunction, water ingress or other damage, consult qualified service personnel
12. Do not place in damp areas or near liquids or moisture. Do not spill liquids on the housing
13. Please pay attention to warning symbols during transit and placement
14. Terminals marked with the ϟ symbol are HAZARDOUS LIVE and should only be connected by qualified personnel
15. Ensure that the apparatus is connected to a mains socket with a protective EARTH connection
16. Ensure correct operation of the mains switch

Warning

To prevent the risk of fire or electric shock, do not expose any components to rain or moisture.
If liquids are spilled on the casing, stop using immediately, allow unit to dry out and have checked by qualified personnel before further use. Avoid impact, extreme pressure or heavy vibration to the case
No user serviceable parts inside – Do not open the case – refer all servicing to qualified service personnel.

Safety

- Check for correct mains voltage and condition of IEC lead before connecting to power outlet
- Use double insulated speaker wire with adequate current rating for 100V speaker connections
- Only use one type of output – i.e. 8Ω or 100V – do not mix or combine these outputs on a single zone or output
- Do not connect 8Ω speakers to the 100V terminal or 100V speakers to the 8Ω terminal
- Do not allow any foreign objects to enter the case or through the ventilation grilles

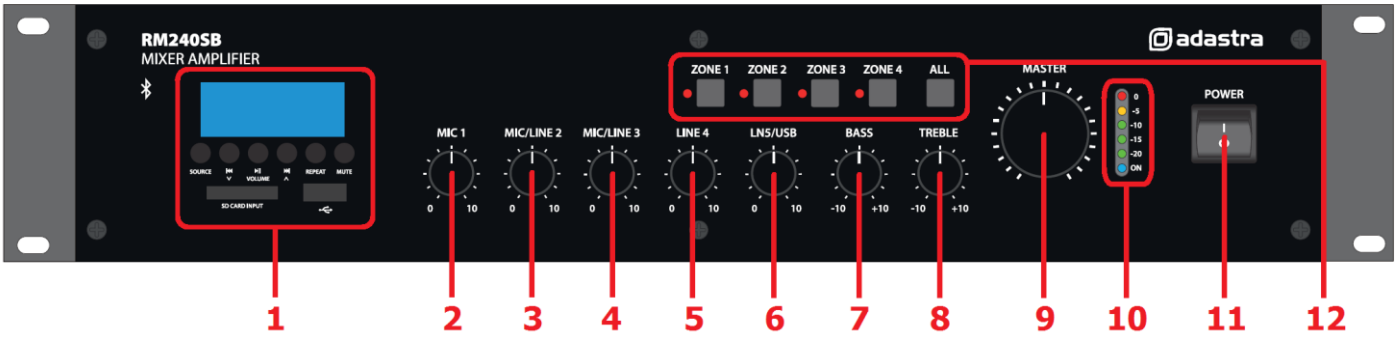
Placement

- Keep out of direct sunlight and away from heat sources
- Keep away from damp or dusty environments
- For rack-mounting, use the rack ears provided and ensure adequate support for the weight of the amplifier
- Ensure adequate air-flow and do not cover cooling vents at the front and rear of the amplifier
- Ensure adequate access to controls and connections

Cleaning

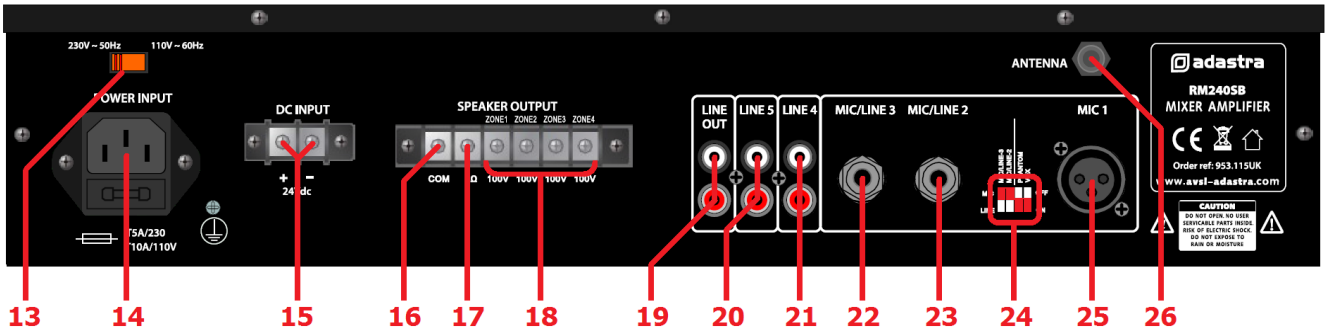
- Use a soft cloth with a neutral detergent to clean the casing as required
- Use a vacuum cleaner to clear ventilation grilles of any dust or debris build-ups
- Do not use strong solvents for cleaning the unit

Front panel



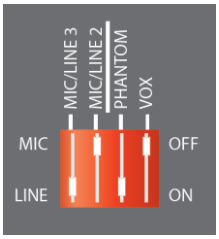
1. USB/SD/FM/BT media player
2. MIC 1 volume control
3. MIC/LINE 2 volume control
4. MIC/LINE 3 volume control
5. LINE 4 volume control
6. LN5/USB volume control
7. BASS EQ control
8. TREBLE EQ control
9. MASTER volume control
10. VU level meter
11. POWER on/off switch
12. Speaker zone selector buttons (RM240SB only)

Rear panel



13. Mains voltage switch
14. IEC mains inlet & fuse holder
15. DC power terminals
16. COM speaker terminal
17. 8Ω speaker terminal
18. 100V speaker terminal (4 zones for RM240SB)
19. LINE OUT connectors (RCA)
20. LINE 5 input (RCA)
21. LINE 4 input (RCA)
22. MIC/LINE 3 input (6.3mm jack)
23. MIC/LINE 2 input (6.3mm jack)
24. DIP switches (see DIP switches section below)
25. MIC 1 input (balanced XLR)
26. Antenna connection for FM tuner

DIP switches



MIC 1 channel has an option for +20V phantom power for condenser microphones and paging microphones with chimes.

MIC 1 also has the option of VOX control, which attenuates the line input channels 4 and 5 by -40dB when MIC 1 signal is detected and returns them to normal when MIC 1 signal is silent.

MIC/LINE 2 (23) and MIC/LINE 3 (22) inputs can be set to MIC (up position) or LINE (down position) sensitivity to suit the type of input being used. Be sure to make these DIP switch settings when the amplifier is switched off. Making any changes when the amplifier is powered up may cause loud transient noises which can damage the speakers.

Connection and setup

Connect the rear IEC inlet (14) to the mains using the supplied mains lead (or an equivalent approved type). Ensure that the voltage is correct as indicated on the voltage selector (13) and that the mains outlet is switched on.

Alternatively, the amplifier can be powered by a 24V battery, such as a lorry or boat battery, by connecting the "+" and "-" of the battery to the 24Vdc INPUT (15) on the rear panel. Ensure that DC cables are capable of handling the current (10A min. recommended)

The RM series amplifiers have a total of 5 input channels. MIC 1 input (25) is fed to a dedicated microphone channel. Connect the main announcement microphone to this channel using a balanced XLR lead.

Connect microphones or mono line inputs to MIC/LINE 2 and MIC/LINE 3 inputs using good quality 6.3mm jack leads. Make sure the correct sensitivity is selected for the type of input source.

Connect any other line level audio inputs to the LINE 4 (21) and LINE 5 (20) connectors on the rear panel using good quality RCA leads. Since RM series amplifiers have a mono output, stereo signals will be summed together.

Further mixer-amplifiers or slave amplifiers can be connected from the rear LINE OUT sockets, again using a good quality RCA lead. This output carries the full mix of all channels 1 – 5 as produced through the speakers.

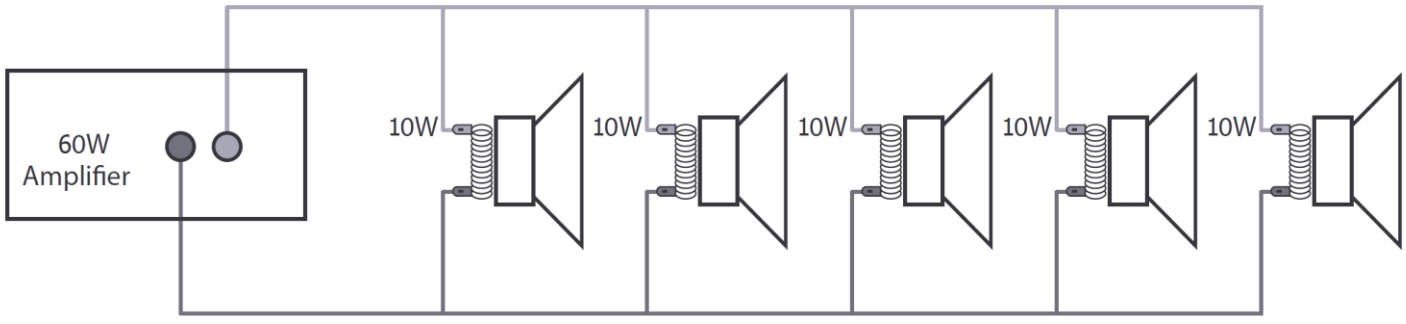
Speaker outputs

The RM series amplifiers can be used either as 100V line amplifiers or standard low impedance power amplifiers. These 2 configurations cannot be used together, so it is important to decide which method will be used at the start.

100V line systems

For 100V line systems, connect the amplifier to the first speaker in the system using double-insulated speaker wire which has adequate current rating to handle the total output of the amplifier.

Connect the "100V" (18) output terminal to the positive (+) connection of the speaker and "COM" output (16) to the negative (-) connection of the speaker. Connect further speakers in parallel to the first speaker with all positive terminals and connected together and all negative terminals connected together as shown below.



A 100V line speaker system can comprise of many speakers connected together. The determining factor for how many speakers can be used on a single amplifier is the power rating. For most purposes, it is advised to connect as many speakers as needed with a combined wattage of no more than 90% of the amplifier's output power rating.

The terminals of a 100V speaker are connected to a transformer and in some cases, this transformer may be "tapped" for different power ratings. These tappings can be used to adjust the wattage (and output volume) of each speaker in the system to help achieve the ideal total power of the system for the amplifier.

Speaker switching zones (RM240SB only)

The RM240SB has 4 separate terminals for 100V speakers. Any 100V speakers connected to the terminals labelled ZONE 1/ ZONE 2 / ZONE 3 / ZONE 4 (+) and COM (-) will be governed by 4 front panel speaker switches (e.g. a speaker connected to ZONE 1 and COM will only work if Zone 1 is selected on the front panel)

There is also a switch labelled "ALL" on the front panel which enables zones 1 to 4 all at once.

Low impedance systems

Alternatively, the RM series amplifiers can provide an output for a single 8Ω speaker by connecting the "8Ω" terminal (16) to the positive (+) speaker connection and "COM" terminal (15) to the negative (-) speaker connection.

It is important to ensure that the speaker load is no less than 8Ω and that the power handling of the speaker is equal to or greater than the output power of the amplifier. Do not use 8Ω and 100V at the same time.

Operation

When all connections to the amplifier are made, turn all rotary controls down and switch on the power (11) and a power "ON" LED will illuminate.

Turn BASS and TREBLE controls to the 12 o'clock position (pointing straight up) and turn the MASTER rotary control (9) up part way for testing.

Ensure a signal is being fed to one of the line inputs 2, 3, 4 or 5 and gradually increase the volume control for that channel until the output is heard through the speakers.

Turn up the MASTER to the maximum required volume level and reduce the channel volume control if necessary.

Repeat this process for any other line inputs connected to channels 2, 3, 4 or 5.

Note: If a line input is not connected to an RM series mixer-amplifier, the initial test can be made using the built-in media player. See the "Media player" section for instructions.

Both the media player output and LINE 5 input are governed by the LN5/USB volume control.

The output of the amplifier is represented on the VU meter LEDs (10) and care should be taken that the Red "0" LED is only lit momentarily during use. Anything longer than a short flash of this LED may be indicating distortion or clipping of the output signal and the MASTER volume control or channel volume control should be turned down.

If a microphone is connected to MIC 1 input, make sure it is switched on and if it requires phantom power, make sure this feature is enabled on the DIP switch. Gradually increase the MIC 1 control (2) whilst speaking into the microphone until the required volume level is reached. The microphone should not be able to "hear" the speakers, which can cause feedback (squealing or howling noise).

Repeat this process for microphones or line inputs connected via the MIC/LINE 2 and MIC/LINE 3 inputs.

If the VOX feature is enabled, audio playback through channels 4 and 5 will be reduced in volume automatically when speaking into MIC 1.

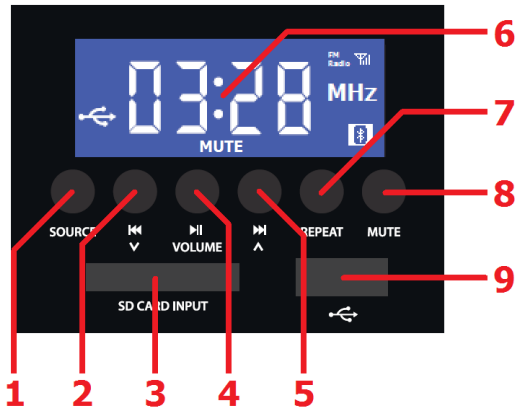
In addition to channel and MASTER volume controls, there are BASS and TREBLE EQ controls to adjust the tone of the overall output. At the 12 o'clock position, these controls are applying no effect to the signal (no boost or cut).

Moving the BASS control clockwise boosts the low frequencies in the audio, whilst moving it anticlockwise will cut these low frequencies.

Likewise, moving the TREBLE control clockwise boosts the high frequencies in the audio, whilst moving it anticlockwise will cut these high frequencies.

Adjust these EQ controls to suit the type of audio signal or compensate for the room acoustics.

Media player



1. SOURCE select button
2. Previous / volume down button
3. SD card slot
4. Play / pause button
5. Next / volume up button
6. Media player display
7. REPEAT mode button
8. MUTE button
9. USB input

RM60B, RM120B and RM240SB mixer-amplifiers are fitted with a built-in media player. This section comprises a Bluetooth receiver, USB/SD audio player and FM tuner. Pressing the SOURCE select button (1) will step through "bt" (Bluetooth), USB, SD card and FM tuner modes.

Bluetooth

The Bluetooth function allows connection of a smart phone or tablet to the media player section for playback of stored files or streamed digital audio. In order to enable this function, it will be necessary to pair the sending device to the receiver as follows.

1. Open the Bluetooth settings menu on the smart phone or tablet (or other sending device)
2. Scan for Bluetooth devices and look for "adastra" in the list of available devices (ensure that the RM amp is powered on and within reception range)
3. Select "adastra" and the sending device should confirm that it is connected as an audio device
4. Play audio from the sending device, ensuring that volume controls are not turned down/muted
5. Turn up the USB/LN5 volume control on the amplifier to the required level

The Previous, Next and Play/pause buttons will operate in Bluetooth as remote playback controls. Holding the Previous track or Next track buttons (2, 5) will adjust the output volume of the player.

FM Tuner

The FM tuner function operates in the same way as a standard FM radio and benefits from the connection of an FM antenna to the rear panel 'F' type connector. If no channels are tuned in, press the Play/Pause button (4) to begin auto tuning, which scans available stations and stores them as channels within the FM tuner. Pressing Play/Pause again will abort the auto-tuning.
To step through pre-set stations, press the Previous or Next buttons.
Holding the Previous track or Next track buttons will adjust the output volume of the player.

USB/SD player

When a USB memory stick is inserted into the USB port (9) or SD card into the SD slot (3), the USB or SD symbol will show in the display and any compressed audio files will start to play automatically. The last connected media will take priority. If playback does not start automatically, press the SOURCE select button (1) and Play/Pause button (4) to check if the player is set to the correct mode. Try Previous track and Next track buttons (2, 5) if the selected track is unable to play. Otherwise, check that the audio files are standard compressed type.

Turn up the USB/LN5 volume control gradually to hear the output from the speakers and increase to the required level.

Normal playback will read through all tracks on the storage device. Pressing the REPEAT button (7) will step through the repeat modes – ONE (repeat current track), rAND (random), ALL (repeat all)

Pressing the Previous track button (2) briefly steps backwards through tracks on the memory device. Press and hold this button to decrease the playback volume.

Pressing the Next track button (5) briefly steps forwards through tracks on the memory device. Press and hold this button to increase the playback volume.

To pause the current track, press the Play/Pause button (4) and press it again to resume playback. The display shows the track number when a track is selected and then elapsed time during playback

To avoid loud pops through the speakers, turn down the MASTER control before powering down.

Specifications

	RM60B	RM120B	RM240SB
Power supply	110/230Vac, 50/60Hz (IEC) or 24Vdc option (screw terminals)		
Output power: RMS	60Wrms	120Wrms	240Wrms
Outputs : Speaker	100V / 8Ω / COM	100V / 8Ω / COM	4 x 100V / 8Ω / COM
Output: Line	RCA signal output		
Inputs	Mic XLR, 2 x mic/line jack, 2 x RCA line		
Volume controls	Mic1, mic/line2+3, line4+5 (USB), master		
Equalizer : Bass / Treble	100Hz ±10dB / 10kHz ±10dB		
Bluetooth version	2.0		
Phantom power	+20V (MIC 1 input)		
THD	<1.0%		
Dimensions	433 x 320 x 89mm		
Weight	5.98kg	8.36kg	9.62kg

Troubleshooting

No power LED on control panel	Ensure IEC lead is in good condition and connected properly
	Ensure POWER switch is on and check mains inlet fuse
Power LED is on but no other LEDs and no output	Check input signals and condition of input connection leads
	Check MASTER, MIC, LINE or USB/SD volume controls are turned up
Power light and output LEDs lighting but no output	Check speaker output terminals are connected correctly
	Check speakers are working (test on another amp if available)
	Check memory device is connected properly (remove and re-insert)
	Check file types – standard compressed digital audio files required
	Check memory device works on a PC or Mac for standard playback
Bluetooth cannot connect	Ensure that Bluetooth is enabled on sending device
	Ensure that the sending device is within Bluetooth range (5-10m)
	Check that "adastra" is the connected device
	If there are more than one "adastra" devices, check each in turn
	If one of many "adastra" devices, rename it on the sending device
No audio from Bluetooth device	Ensure that volume controls are not turned down on sending device
	Check volume and Play/Pause buttons in case Bluetooth is muted
Output too loud or distorted	Reduce MIC, LINE IN, USB/SD and/or MASTER level
	Ensure Hi-Z line level input(s) not connected via MIC input
Output too quiet or inaudible	Increase MIC, LINE IN, USB/SD and/or MASTER level
	Check for quiet recording of media files on USB
	Check VOX override is not unintentionally suppressing audio playback
No microphone output	Check phantom power is enabled if using a condenser microphone
Feedback from microphone	Face microphone away from speakers and monitors and reduce level
Amplifier overheating	Ensure cooling vents are clear from debris and dust
	Check that 8Ω speakers are not connected to 100V terminals
	Ensure total 100V speaker wattage is lower than amplifier rating
	Ensure that 100V and 8Ω speakers are not both connected
	Ensure that total load connected to 8Ω output is not less than 8Ω

Disposal: The "Crossed Wheelie Bin" symbol on the product means that the product is classed as Electrical or Electronic equipment and should not be disposed with other household or commercial waste at the end of its useful life. The goods must be disposed of according to your local council guidelines.

Errors and omissions excepted.