

ARCAM

MZ12

MZ8

MULTI ZONE POWER AMPLIFIER

Safety Guidelines



CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

ATTENTION

RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

CAUTION: To reduce the risk of electric shock, do not remove cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel.



WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

CAUTION: In Canada and the USA, to prevent electric shock, match the wide blade of the plug to the wide slot in the socket and insert the plug fully into the socket.

Class II product



This equipment is a Class II or double insulated electrical appliance. It has been designed in such a way that it does not require a safety connection to electrical earth ('ground' in the U.S.).

MANY OF THESE ITEMS ARE COMMON SENSE PRECAUTIONS BUT, FOR YOUR OWN SAFETY AND TO ENSURE THAT YOU DO NOT DAMAGE THE UNIT, WE RECOMMEND THAT YOU READ THEM.

Important safety instructions

This product is designed and manufactured to meet strict quality and safety standards. However, you should be aware of the following installation and operation precautions.

1. Take heed of warnings and instructions

You should read all the safety and operating instructions before operating this equipment. Retain this handbook for future reference and adhere to all warnings in the handbook or on the equipment.

2. Water and moisture

The presence of electricity near water can be dangerous. Do not use the equipment near water – for example next to a bathtub, washbowl, kitchen sink, in a wet basement or near a swimming pool, etc.

3. Object or liquid entry

Take care that objects do not fall and liquids are not spilled into the enclosure through any openings. Liquid-filled objects such as vases should not be placed on the equipment.

4. Lifting and placing the equipment

This amplifier weighs up to 27.5kg, so take extreme care when lifting or moving this unit. We recommend that two people are available to lift this unit.

Only use a rack or shelf that is stable and strong enough to support the weight of this equipment.

5. Ventilation

Do not place the equipment on a bed, sofa, rug or similar soft surface, or in an enclosed bookcase or cabinet, since ventilation may be impeded. Keep a minimum of 5cm (2 inches) clear around the apparatus to allow sufficient passage of air.

6. Heat

Locate the equipment away from naked flames or heat-producing appliances such as radiators, stoves or other appliances that produce heat.

7. Climate

The equipment has been designed for use in moderate climates and in domestic situations. Unplug this equipment during lightning storms to prevent possible damage from a strike or mains surge.

8. Cleaning

Unplug the unit from the mains supply before cleaning. The case should normally only require a wipe with a soft, lint-free cloth. Do not use chemical solvents for cleaning. We do not advise the use of furniture cleaning sprays or polishes as they can cause permanent white marks.

9. Power sources

Only connect the equipment to a power supply of the type described in the operating instructions or as marked on the equipment. The primary

method of isolating the equipment from the mains supply is to remove the mains plug. The equipment must be installed in a manner that makes disconnection possible.

10. Power-cord protection

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to the point where they exit from the equipment.

11. Power lines

Locate any outdoor antenna/aerial away from power lines.

12. Speaker connections

Any speakers must be connected to the MZ8/MZ12 using class II wire (i.e. no connection to Earth should be made). Failure to observe this precaution may cause the unit to become damaged.

13. Non-use periods

If the equipment is not being used for an extended period, we recommend that you unplug the power cord of the equipment from the outlet, to save power.

14. Abnormal smell

If an abnormal smell or smoke is detected from the equipment, turn the power off immediately and unplug the equipment from the wall outlet. Contact your dealer and do not reconnect the equipment.

15. Servicing

You should not attempt to service the equipment. Contact your dealer to arrange servicing.

16. Damage requiring service

The equipment should be serviced by qualified service personnel when:

- the power-supply cord or the plug has been damaged, or
- objects have fallen, or liquid has spilled into the equipment, or
- the equipment has been exposed to rain, or
- the equipment does not appear to operate normally or exhibits a marked change in performance, or
- the equipment has been dropped or the enclosure damaged.

Safety compliance

This equipment has been designed to meet the IEC/EN60065 international electrical safety standard.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Consignes de Sécurité



ATTENTION : afin de réduire les risques de choc électrique, n'ouvrez pas le boîtier de l'appareil. Les pièces internes ne sont pas réparables par l'utilisateur. Pour tout problème matériel, contactez des techniciens qualifiés.



ATTENTION : afin de réduire les risques de choc électrique et d'incendie, veillez à ne pas exposer cet appareil à la pluie ou à l'humidité.



Le triangle dans lequel figure le symbole d'un éclair alerte l'utilisateur de la présence, dans le boîtier de l'appareil, d'une tension dangereuse, non isolée et suffisamment importante pour représenter un risque de choc électrique.

Le triangle dans lequel figure un point d'exclamation alerte l'utilisateur de la présence d'instructions de fonctionnement et de maintenance (réparation) importantes dans la documentation accompagnant le produit.

ATTENTION : au Canada et aux États-Unis, afin de prévenir tout choc électrique, aligner la plus grosse broche de la prise à la fente la plus large de la fiche et insérez entièrement la prise dans la fiche.

Class II produit



Ce produit est un appareil électrique à isolation double (appareil de classe II). Il a été conçu pour ne pas nécessiter de connexion de sécurité à la terre (ou à la masse).

BON NOMBRE DES CONSIGNES CI-DESSOUS SONT DE SIMPLS PRÉCAUTIONS DE BON SENS. NOUS VOUS RECOMMANDONS TOUTEFOIS DE LES LIRE POUR VOTRE PROPRE SÉCURITÉ ET POUR CELLE DE L'APPAREIL.

Instructions de sécurité importantes

Cet appareil a été conçu et fabriqué conformément aux normes de qualité et de sécurité les plus strictes. Vous devez cependant observer les précautions qui suivent lors de son installation et de son utilisation.

1. Avertissements et consignes

Il est impératif de lire les consignes de sécurité et d'utilisation avant de mettre cet appareil en marche. Conservez ce manuel pour vous y référer par la suite et respectez scrupuleusement les avertissements figurant dans ce manuel ou sur l'appareil lui-même.

2. Eau et humidité

L'installation d'un appareil électrique à proximité d'une source d'eau présente de sérieux risques. Il ne faut donc pas installer l'appareil près d'une baignoire, d'un lavabo, d'un évier, dans un sous-sol humide, près d'une piscine, etc.

3. Chute d'objets ou infiltration de liquides

Veillez à ne pas laisser tomber d'objets ni couler de liquides à travers les ouvertures de l'appareil et ne placez pas sur l'appareil d'objet contenant du liquide, tel qu'un vase par exemple.

4. Placement de l'équipement

Utilisez uniquement une étagère assez stable et solide pour supporter le poids de cet équipement.

5. Ventilation

Évitez de placer l'appareil sur un lit, un canapé, un tapis ou une surface similaire instable ou dans une bibliothèque ou un meuble fermé. Ceci risquerait de nuire à la ventilation du système.

6. Exposition à la chaleur

Ne placez pas l'appareil à proximité d'une flamme nue ou de tout dispositif produisant de la chaleur : radiateur, poêle ou autre.

7. Conditions climatiques

L'appareil est conçu pour fonctionner dans des climats modérés. Déconnectez cet équipement pendant un orage pour éviter tous dommages possibles d'un impacte de la foudre ou de surtension.

8. Nettoyage

Mettez l'appareil hors-tension avant de le nettoyer. Pour l'entretien du boîtier, utilisez uniquement un chiffon doux, humide et non pelucheux. N'utilisez pas de solvant chimique. L'emploi d'aérosols ou de produits de nettoyage pour meubles est déconseillé, car le passage d'un chiffon humide risquerait de laisser des traces blanches et indélébiles.

9. Alimentation secteur

Branchez l'appareil uniquement sur une alimentation secteur du type mentionné dans le manuel d'utilisation ou indiqué sur l'appareil lui-même. Le principal moyen d'isoler l'appareil du secteur est d'utiliser l'interrupteur situé à l'arrière de l'appareil. Cet appareil doit être installé

de façon à pouvoir être débranché si nécessaire.

10. Protection des câbles d'alimentation secteur

Veillez à ce que les câbles d'alimentation ne se trouvent pas dans un lieu de passage ou bloqués par d'autres objets. Cette règle s'applique plus particulièrement aux prises et câbles d'alimentation et à leurs points de sortie de l'appareil.

11. Câbles haute tension

Évitez de monter l'antenne extérieure de l'appareil à proximité de câbles haute tension.

12. Branchement des haut-parleurs

Tous les haut-parleurs doivent être connectés à la MZ8/MZ12 avec du câble de classe II (aucune mise à la terre nécessaire). Le non-respect de cette précaution est susceptible d'endommager l'appareil.

13. Périodes de non-utilisation

Si l'appareil possède une fonction de mise en veille, un courant faible continuera de circuler lorsqu'il sera réglé sur ce mode. Débrancher le cordon secteur de la prise murale si l'appareil doit rester inutilisé pendant une période prolongée.

14. Odeur suspecte

Arrêtez et débranchez immédiatement l'appareil en cas d'émission de fumée ou d'odeur anormale. Contactez immédiatement votre revendeur.

15. Service

N'essayez jamais d'effectuer d'autres opérations que celles mentionnées dans ce manuel. Toute autre intervention doit être effectuée par un personnel qualifié.

16. Entretien par des techniciens qualifiés

L'appareil doit être entretenu par du personnel qualifié lorsque :

- la prise ou le câble d'alimentation a été endommagé,
- des objets sont tombés ou du liquide a coulé dans l'appareil,
- l'appareil a été exposé à la pluie,
- l'appareil présente des dysfonctionnements,
- l'appareil est tombé ou le boîtier a été endommagé.

Respect des consignes de sécurité

Cet appareil a été conçu pour répondre à la norme internationale de sécurité électrique EN60065.

Cet appareil est conforme à la Section 15 des règles de la FCC. Son fonctionnement est soumis aux deux conditions suivantes :

- ce produit ne risque pas de causer d'interférences nuisibles et
- ce produit doit accepter toutes les interférences reçues, y compris celles qui risquent d'entraîner un fonctionnement indésirable.

Welcome

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Thank you and congratulations for purchasing your Arcam MZ Amplifier.

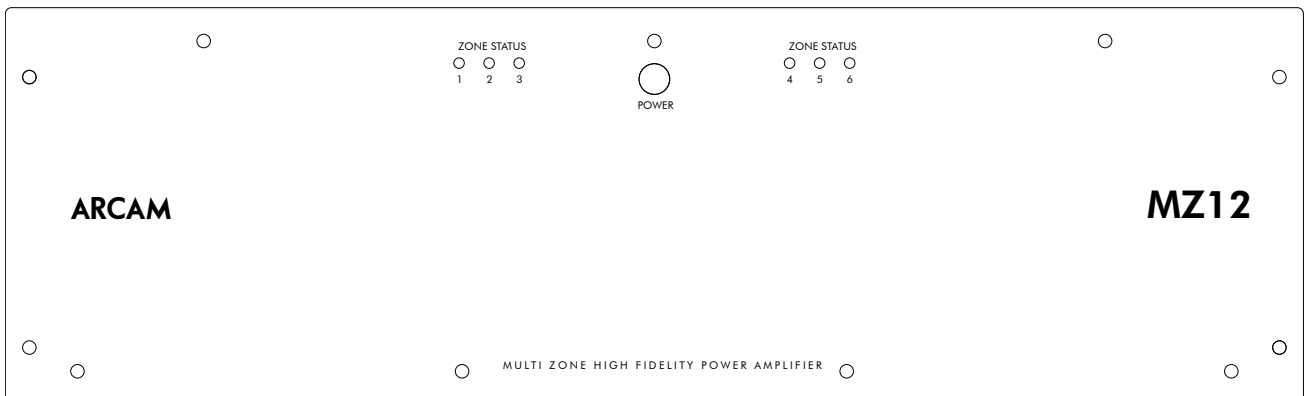
Arcam has been producing specialist audio products of remarkable quality for over three decades. The new MZ8 and MZ12 multi-zone power amplifiers draw upon all of Arcam's experience as one of the UK's most respected audio companies to bring a new level of high fidelity performance to multi-zone installations.

This handbook is intended to give you a detailed guide to using both the MZ8 and MZ12 Multi Zone Power Amplifier systems. It starts by giving advice on installation, moves on to describe how to use the product and finishes with additional information on the more advanced features. Use the contents list shown on this page to guide you to the section of interest.

We hope that your MZ Amplifier will give you years of trouble-free operation. In the unlikely event of any fault, or if you simply require further information about Arcam products, our network of dealers will be happy to help you. Further information can also be found on the Arcam website at www.arcam.co.uk.

The MZ development team

It may be that the MZ amplifier has been installed and set up as part of your Hi-Fi or home cinema installation by a qualified Arcam dealer. In this case, you may wish to skip the sections of this handbook dealing with installation and setting up the unit. Use the Contents list to guide you to the relevant sections.



Overview

Placing the unit

Place the amplifier on a level, firm surface, avoiding direct sunlight and sources of heat or damp. Alternatively, the unit can be installed in a 19" equipment rack using the rack ears supplied. Attach the rack ears to the sides of the MZ amplifier using the supplied bolts, as shown in the diagram below.

- Do not place the MZ8/MZ12 on top of another power amplifier or other source of heat.
- Do not place the amplifier in an enclosed space such as a bookcase or rack cabinet unless there is good provision for ventilation. If installed in a rack, leave at least 2U of empty rack space above and below the unit. Use a ventilated blanking plate to cover the gap. The MZ8 and MZ12 are designed to run warm during normal operation.
- Do not place any other component or item directly on top of the amplifier as this may obstruct airflow around the heat-sink, causing the amplifier to run hot. (The unit placed on top of the amplifier would become hot, too.)
- Do not place your record deck on top of this unit. Record decks are very sensitive to the noise generated by mains power supplies which will be heard as a background 'hum' if the record deck is too close.

Power

The amplifier is supplied with a moulded mains plug already fitted to the lead. Check that the plug supplied fits your supply — should you require a new mains lead, please contact your Arcam dealer.

If your mains supply voltage or mains plug is different, please contact your Arcam dealer immediately.

Push the IEC plug end of the power cable into the socket on the back of the amplifier, making sure that it is pushed in firmly. Plug the other end of the cable into your mains socket and, if necessary, switch the socket on.

Standby power

The front panel power switch powers all circuitry down. The unit may be put into low-power standby operation using RS232 control or the trigger input. In standby, the amplifier's control power supply is kept powered on, so the amplifier can be powered up remotely. Power consumption in this mode is approximately 0.6W. If the unit is put into standby using the RS232 control or trigger input, it may be possible to hear a slight residual hum coming from the mains transformer inside the amplifier. This is perfectly normal. However, if the unit is to be left unused for an extended period, we recommend that you disconnect it from the mains supply or turn off the power using the front panel switch to save power.

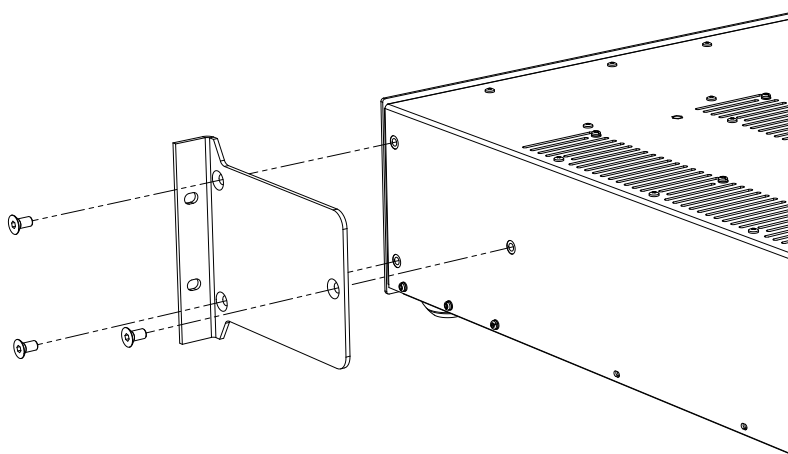
Note that when the MZ amplifier is powered on from the front panel switch or brought out of standby the amplifier modules are turned on individually to stagger the surge created when a powerful amplifier is switched on (i.e. it provides a 'soft start'). This reduces the surge current drawn from the domestic power supply.

Interconnect Cables

We recommend the use of high-quality screened cables that are designed for the particular application. Other cables will have different impedance characteristics that will degrade the performance of your system (for example, do not use cabling intended for video use to carry audio signals). All cables should be kept as short as is practically possible.

It is good practice when connecting your equipment to make sure that the mains power-supply cabling is kept as far away as possible from your audio cables. Failure to do so may result in unwanted noise in the audio signals.

If your installation requires very long cables, balanced and/or 100V lines may be necessary. Contact a specialist for advice.

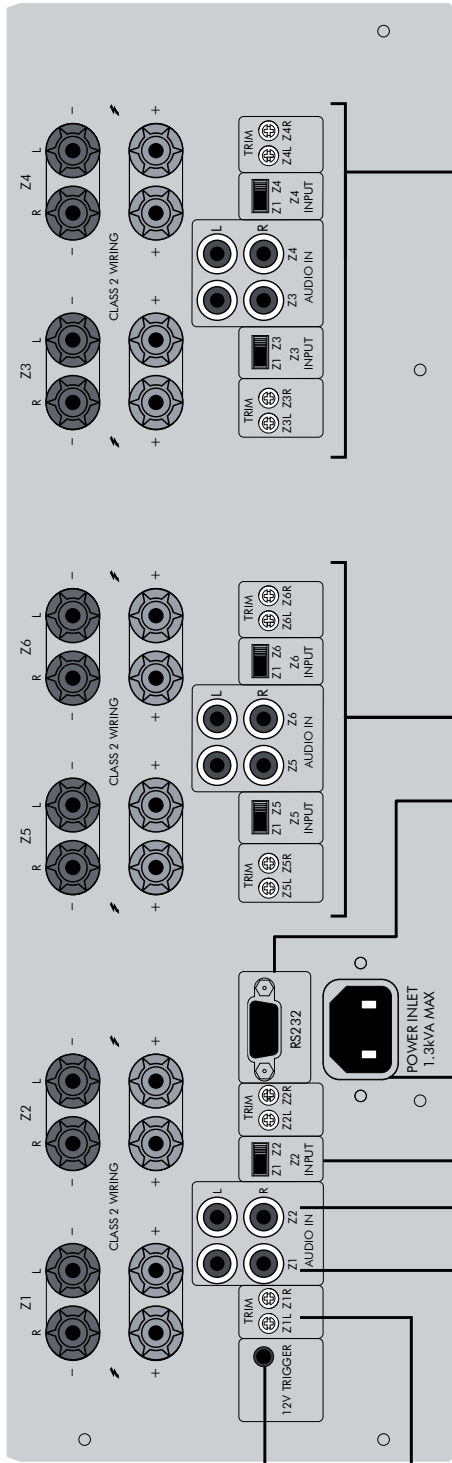


Attaching rack ears to the MZ amplifier

Connections

Speaker terminals

The MZ amplifier speaker terminals are arranged into zones, with one pair of terminals per speaker and two speakers per zone. See page 8 for information on connecting loudspeakers.



12V Trigger

Used to turn on the amplifier from a remote preamplifier. See page 11.

Zone 1 Trims

Fine adjustment for Zone 1 speakers, see page 10.

Zone 1 Input

Audio input for Zone 1. Can be connected to other zones, see page 10.

Zone 2 Input

Audio input for Zone 2. Sent to Zone 2 speakers only, see page 10.

Power Inlet

Connect the correct mains cable here

RS232 Connection

Connect an RS232 remote controller here

Zone 3 & 4 Connections and Controls

Zone 3 & 4 each have inputs, trims and input selection controls as described for Zone 2.

Zone 5 & 6 Connections and Controls

Zone 5 & 6 have identical connections and controls to Zone 3 & 4, but are present on the MZ12 model only.

Zone 2 Input Select

Select whether Zone 2 speaker outputs are connected to the Zone 2 input or the Zone 1 input. See page 10.

Speakers

Speaker Installation

The MZ12 amplifier allows the connection of up to twelve independent loudspeaker channels, arranged in six stereo zones. The MZ8 amplifier provides eight channels in four zones. Each zone is designed to provide amplification to one room of a multi-room installation; further options allow for greater flexibility when installing multiple loudspeaker pairs in a large space.

Connecting speakers

The MZ amplifiers are designed to drive full bandwidth speakers, rated between 4 and 8 ohms. The unit is fitted with speaker terminals that can accept either spade terminals or bare wires. Arcam's Muso speakers are compact mini-monitor speakers which ideally match the design values and output characteristics of the MZ amplifier series. Your dealer will be able to advise you of suitable loudspeakers for other applications, for example in-ceiling use.

Single wiring

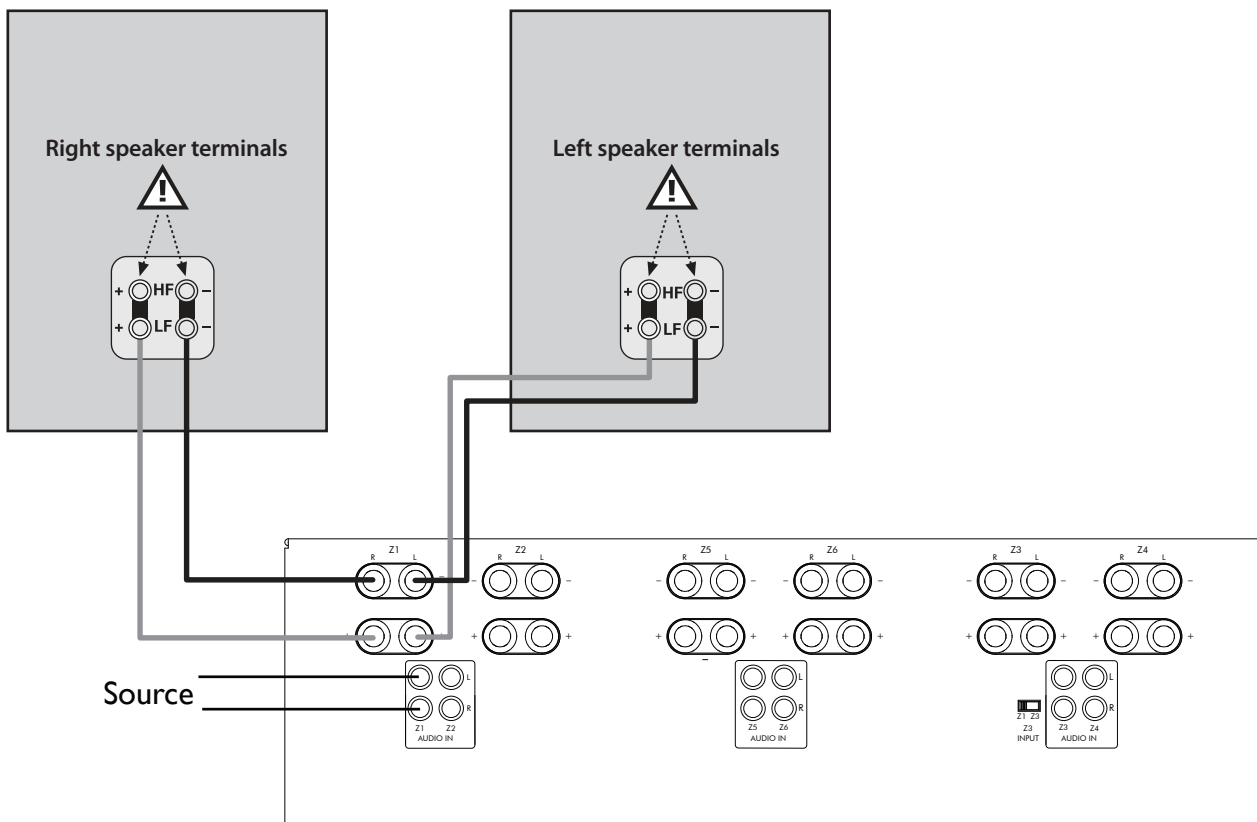
Single wiring is the conventional wiring method of running a single cable per channel between the amplifier and the speaker; this is the easiest technique.

If each speaker has more than one pair of connecting terminals, use the terminals labelled LF or 'Low Frequency' for each speaker.

Connect the positive terminal of the right speaker connection on the amplifier (coloured red and labelled +R) to the positive terminal of your right speaker.

Similarly, connect the negative terminal of the amplifier (coloured black and labelled with R-) to the negative terminal of your speaker. Repeat the process for the left speaker, using the amplifier terminals labelled +L and L-.

If your speakers support bi-wiring, then there is a strip of conductive metal on the speakers connecting the low-frequency terminals to those for the higher-frequencies; this **MUST NOT BE REMOVED** in a single-wired system.



Zone 1 of an MZ12 amplifier connected to speakers using single wiring

Bi-amping

Bi-amping is the separation of the amplification of low- and high-frequency signals over two amplifiers. You will need to connect to loudspeakers that provide separate terminals for the two cables. Each speaker must have two pairs of terminals; one pair labelled HF For 'High Frequency', the other pair labelled LF or 'Low Frequency'.



If your speakers support bi-amping, then there will be a strip of conductive metal or a wire on the speakers connecting the low-frequency terminals to those for the higher-frequencies. This connection **MUST BE REMOVED** in a bi-wired system. Failure to remove this connection is likely to cause damage to the amplifier when used in bi-amping configuration. This damage is not covered by warranty.

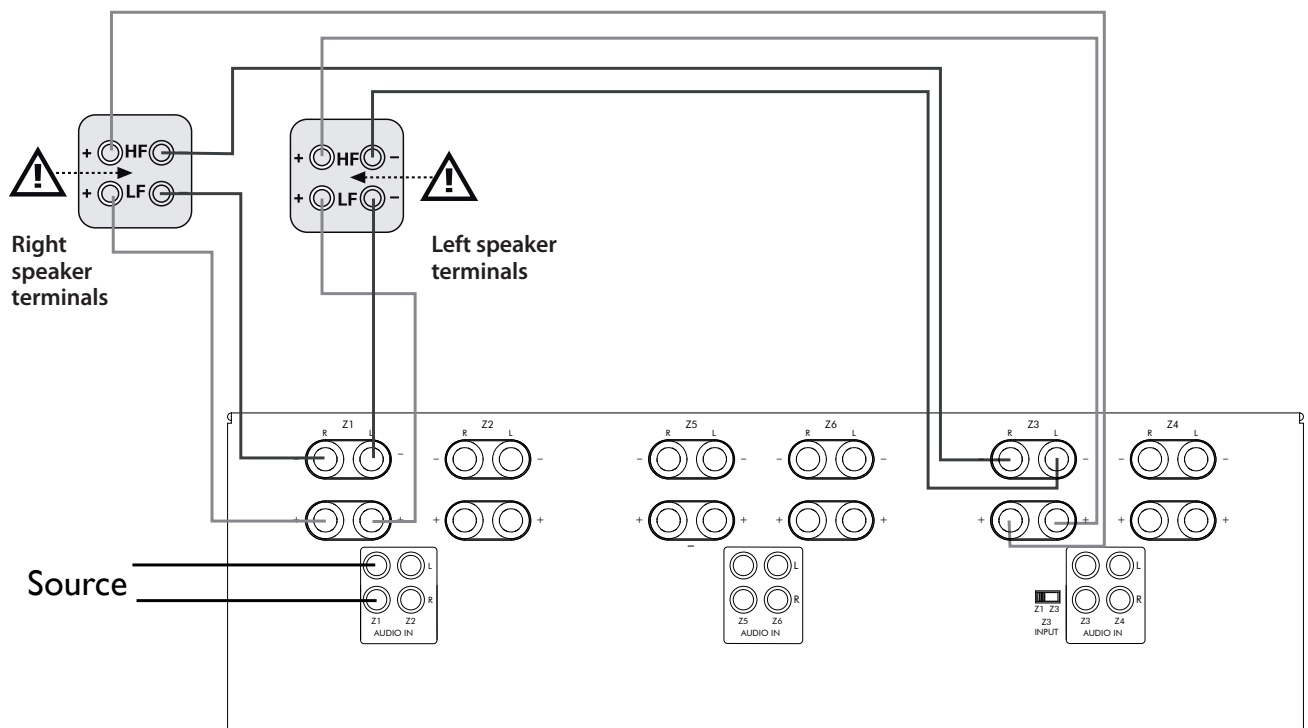
Bi-amping requires the use of two zones for every pair of speakers. Zone 1 of the amplifier can easily be bi-amplified. Connect the Zone 1 speaker terminals to the low-frequency loudspeaker terminals. Connect a second zone to the high-frequency speaker terminals and set the input switch for this zone to the Z1 position. For best performance, use Zone 3. Zone 1 and Zone 3 have completely independent power supplies, including transformers, making this arrangement equivalent to using two separate amplifier components.

Further zones can be bi-amplified by using splitter cables to feed two zone inputs from one source. Contact your dealer for further information.

Notes on making speaker connections

- DO NOT MAKE ANY CONNECTIONS TO ANY AMPLIFIER WHILE IT IS SWITCHED ON. We recommend that your amplifier is completely disconnected from the mains supply before starting.
- Before switching your amplifier(s) on for the first time after connecting to speakers, please check all connections thoroughly. Ensure that bare wires or cables are not touching each other or the amplifier's chassis (which could cause short circuits), and that you have connected positive (+) to positive and negative (-) to negative. Be sure to check the wiring for both the amplifier and the speaker.
- After making connections: switch the amplifier(s) on, select a source signal, then gradually increase the volume to the required listening level.

If you are unsure as to how your system should be connected, or need advice on bi-wiring or bi-amping, please contact your Arcam dealer who will be happy to help you.



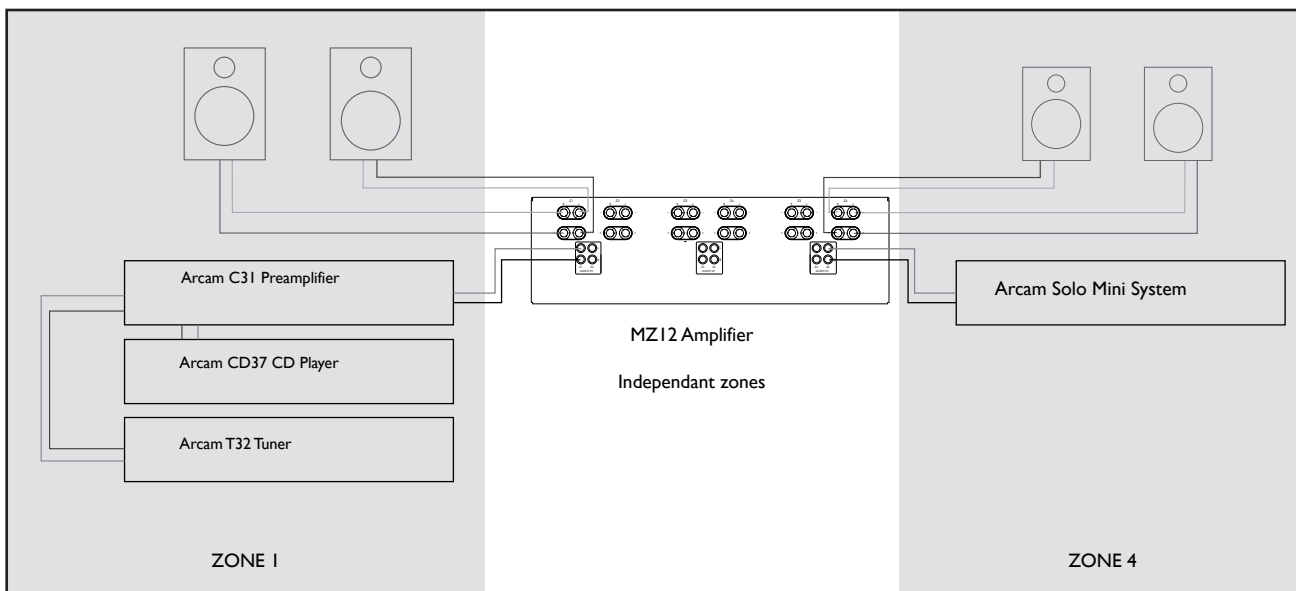
Zone 1 of an MZ12 amplifier connected to speakers using bi-amping, by means of Zone 3

Operation

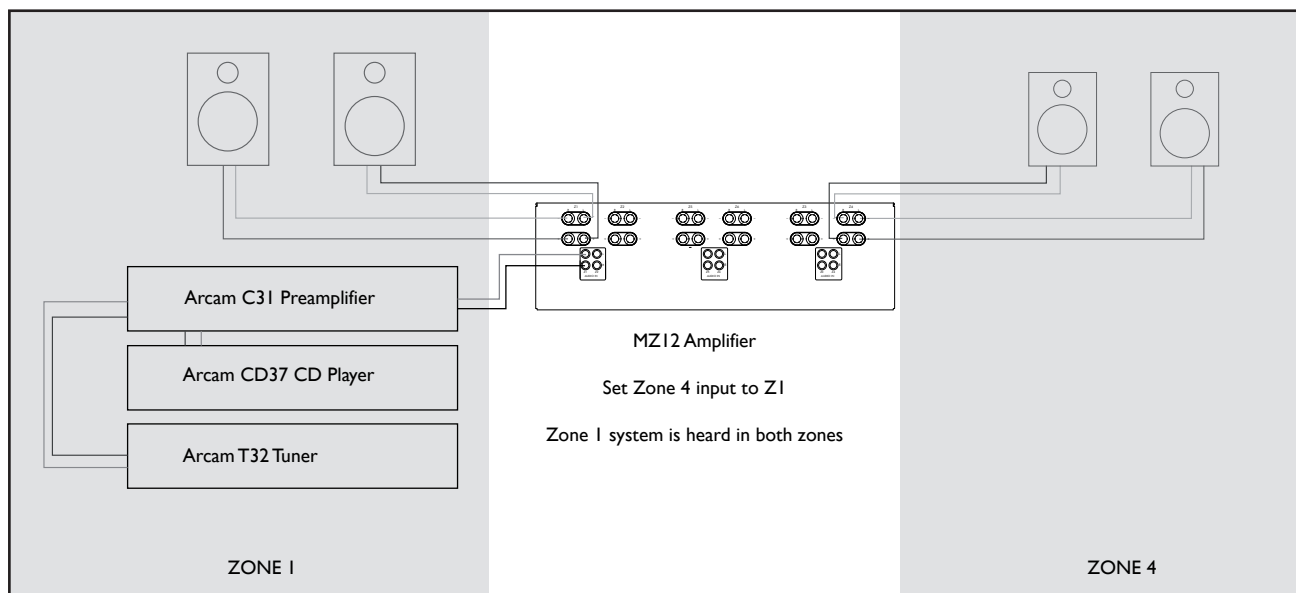
Zone operation

Each zone (except Zone 1) has an input switch. This switch allows the input for the zone to be taken from either the corresponding zone input or the zone 1 input. This allows for the input to zone 1 to be sent to multiple loudspeaker pairs. Switch all input switches to Zone 1 if you require the same stereo source to be reproduced in all zones. Note that if the input switch is set to the other position, then the zone will require its own stereo source (preamplifier or stereo music system). Examples of different setups are shown below:

Each channel of each zone has a trim control. This recessed control allows each speaker's volume to be adjusted using a small flat blade or cross-head screwdriver and is ideal for compensating for differences in sensitivity between different speaker types. For everyday volume adjustment, it is recommended to connect source equipment with an adjustable output such as the Arcam C31 preamplifier or Solo Music system.



MZ amplifier with two independent zones



MZ amplifier with one source feeding two zones

Front panel indicators

The front panel Zone Status LEDs indicate the status of each of the amplifier zones:

- Red - standby
- Amber - zone muted
- Green - zone on
- Flashing Red - over temperature

RS232 remote control

The Arcam MZ amplifiers may be remote controlled using an RS232 data connection. The communication protocol is described from page 13 onwards. The following functions are available:

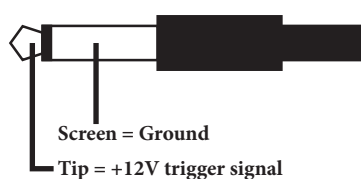
- Zone mute on/off
- Power/Standby
- Query zone status (mute, temperature)

12V Trigger Input

If a 12V trigger output is provided by any of the pre-amps connected to the MZ amplifier, it can be connected to the 12V trigger in socket using a 3.5mm jack (shown below).

This enables the MZ amplifier to be powered on or off remotely from a pre-amp.

Note that the main power switch on the front panel must be depressed to allow the MZ amplifier to be switched in and out of standby using this method.



3.5mm jack - trigger connections

Troubleshooting

If you are having trouble with your amplifier, check the following items:

No sound

Check the following:

- Both the source component (pre-amp) and MZ amplifier are switched on, indicated by the front panel LED being lit green on the MZ amplifier.
- The MZ amplifier is not in standby, indicated by the front panel LED being lit red.
- The source component (pre-amp) is not muted.
- The MZ amplifier is not muted, indicated by the front panel LED being lit amber.

Sound cuts-out unexpectedly or suddenly becomes poor or distorted:

If the temperature of the internal heatsink rises above a safe level, then a thermal cut-out inside the amplifier will operate. During this time the front panel LED will flash red and the amplifier protection system temporarily removes the power to the speakers. The system will reset itself as the heatsink cools down.

- With low-impedance speakers connected (6Ω or less), overloads are more likely.
- Overloading the amplifier may cause it to shut down because of overheating.

Specifications

Continual improvement policy

Arcam has a policy of continual improvement for its products. This means that designs and specifications are subject to change without notice.

Continuous power output (1kHz at 0.1% THD)

Single zone, both channels, 8Ω	80W RMS
Single channel, 4Ω	116W RMS
Harmonic distortion, 80% power, 8Ω at 1kHz	0.01%
Power output, all zones all channels driven, 8Ω at 1kHz, 0.1% THD+N	65W RMS per channel

Inputs

Nominal sensitivity	0.9V—1.5V
Input impedance	11kΩ
Signal/noise ratio (CCIR, 45W)	101dB

General

Mains voltage	110—120V or 220—240V
Power consumption (maximum)	600W
Heat dissipation (maximum)	1,715 BTU/h
Power consumption, idle	MZ12: 110W; MZ8: 73W
Heat dissipation, idle	MZ12: 375BTU/h; MZ8: 256 BTU/h
Power consumption, standby	0.6W
Heat dissipation in standby	2 BTU/h
Dimensions W x D x H (including feet, excluding rack ears and connectors)	432mm x 436.5mm x 144.5mm (19" rackmount x 3U)
Weight (net)	MZ12: 24.7 Kg; MZ8 19.3 Kg.
Weight (packed)	MZ12: 27.3 Kg; MZ8 21.9 Kg.
Supplied accessories	mains lead

E&OE

NOTE: All specification values are typical unless otherwise stated.

Product Guarantee

Worldwide Guarantee

This entitles you to have the unit repaired free of charge, during the first two years after purchase, at any authorised Arcam distributor provided that it was originally purchased from an authorised Arcam dealer or distributor. The manufacturer can take no responsibility for defects arising from accident, misuse, abuse, wear and tear, neglect or through unauthorized adjustment and/or repair, neither can they accept responsibility for damage or loss occurring during transit to or from the person claiming under the guarantee.

The warranty covers:

Parts and labour costs for two years from the purchase date. After two years you must pay for both parts and labour costs. **The warranty does not cover transportation costs at any time.**

On-line registration

You can register your product on-line at www.arcam.co.uk.

Claims under guarantee

This equipment should be packed in the original packing and returned to the dealer from whom it was purchased, or failing this, directly to the Arcam distributor in the country of residence.

It should be sent carriage prepaid by a reputable carrier – **not** by post. No responsibility can be accepted for the unit whilst in transit to the dealer or distributor and customers are therefore advised to insure the unit against loss or damage whilst in transit.

For further details contact Arcam at:

Arcam Customer Support Department,
Pembroke Avenue,
Waterbeach,
CAMBRIDGE,
CB25 9QR,
England

or via www.arcam.co.uk.

Problems?

If your Arcam dealer is unable to answer any query regarding this or any other Arcam product please contact Arcam Customer Support at the above address and we will do our best to help you.

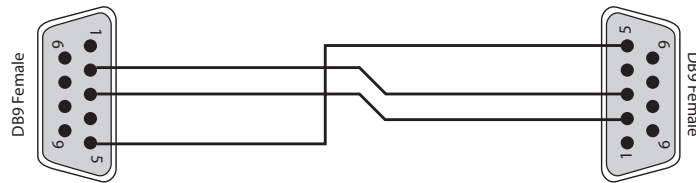
RS232 Control

Introduction

This document describes the remote control protocol for controlling the MZ8/12 via the RS232 interface.

The document relates to MZ RS232 control protocol version 1.0. Any updates to this protocol will be posted on the Arcam Extranet website at <http://www.arcam.co.uk/extranet>.

Serial Cable Specification



The cable is wired as a null modem:

Connector 1 pin	Connector 2 pin	Function
2	3	Rx ← Tx
3	2	Tx → Rx
5	5	RS232 Ground

Data transfer format

- Transfer rate: 38,400bps.
- 1 start bit, 8 data bits, 1 stop bit, no parity, no flow control.

Conventions

All hexadecimal numbers begin 0x.

Any character in single quotes gives the ASCII equivalent of a hex value.

<n> represents an unknown or variable number.

Command and response formats

Communication between the remote controller (RC) and the MZ8/MZ12 takes the form of sequences of bytes, with all commands and responses having the same basic format. The MZ8/MZ12 shall always respond to a received command, but may also send messages at other times.

Each transmission by the RC is the following format:

<St> <Zn> <Cc> <DI> <Data> <Et>

St (Start transmission): 0x21 '!'

Zn (Zone number): see below.

Cc (Command code): the code for the command

DI (Data length): the number of data items following this item, excluding the ETR

Data: the parameters for the command

Et (End transmission): 0x0D

Each response by the MZ8/MZ12 is the following format:

<St> <Zn> <Cc> <Ac> <DI> <Data> <Et>

St (Start transmission): 0x21 '!'

Zn (Zone number): see below.

Cc (Command code): the code for the command

Ac (Answer code): see below.

DI (Data Length): the number of data items following this item, excluding the ETR

Data: the parameters for the response of length n. n is limited to 255.

Et (End transmission): 0x0D

The MZ8/MZ12 responds to each command from the RC within three seconds. The RC may send further commands before a previous command response has been received.

Zone numbers

The following zone numbers are defined:

- 0x01 - Zone number 1. (Zone 1 is the master zone. Commands that are global are addressed to Zone 1)
- 0x02 - Zone number 2.
- 0x03 - Zone number 3.
- 0x04 - Zone number 4.
- 0x05 - Zone number 5.
- 0x06 - Zone number 6.

Answer codes

The following answer codes are defined:

- 0x00 - Status update.
- 0x82 - Zone Invalid.
- 0x83 - Command not recognised.
- 0x84 - Parameter not recognised.
- 0x85 - Command invalid at this time.
- 0x86 - Invalid data length.

Example command and response sequence

As an example, the command 0x00, change power state – enter standby:

STR	ZONE	CC	DL	Data 1	Data 2	ETR
0x21	0x01	0x08	0x02	0x10	0x10	0x0D

Assuming that the command was accepted by the amplifier and is being processed, the MZ8/MZ12 responds to this command with the following sequence:

STR	ZONE	CC	AC	DL	Data 1	Data 2	ETR
0x21	0x01	0x08	0x00	0x02	0x10	0x10	0x0D

AMX Duet™ Support

The MZ8 & MZ12 shall be fully compatible with AMX Duet™ Dynamic Device Discovery Protocol (DDDP) The following description of Dynamic Device Discovery comes from the AMX website (www.amx.com). Dynamic Device Discovery is part of AMX's Duet™ platform, which combines the proven reliability and power of NetLinx with the extensive capabilities of the Java 2 Micro Edition (J2ME) platform. When integrating a serial or IP device from a manufacturer embedding the Dynamic Device Discovery Protocol (DDDP), Duet recognizes the device and loads the appropriate Duet module, which automatically installs the new device. AMX's NetLinx Master can then find and install the Duet device module either from a library on the master, from AMX's Web site, or from the manufacturer's Web site. Duet also allows for device swapping so that programming changes are not required when devices with DDDP are removed or replaced – a huge benefit for end users. The Duet platform is an extension AMX's InConcert® manufacturer partner program, which was developed to ensure seamless communication between partners' devices and the AMX control system.

Data is specified in the ASCII format. All ASCII characters between the quotes "" should be recognised/transmitted. "\r" is a carriage return (0x0D)

Command: "AMX\r"

Response: "AMXB<Device-SDKClass=Amplifier><Device-Make=ARCAM><Device-Model=MZ><Device-Revision=x.y>\r"

Where x.y = RS232 protocol version number.

System Command Specifications

Software version (0x04)

Request the version number of the main software or the control protocol of the MZ8/MZ12.

Example

Command/response sequence to request the RS232 protocol version (1.4):

Command: 0x21 0x01 0x04 0x01 0xF0 0x0D
 Response: 0x21 0x01 0x04 0x00 0x03 0xF0 0x01 0x04 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x04
Dl	0x01
Data	0xF0 – Request version RS232 protocol 0xF1 - Request version main software
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x04
Ac	Answer code
Dl	0x03
Data1	Echo data from command
Data2	Major version number
Data3	Minor version number
Et	0x0D

Power (0x00)

Request or change the standby state.

Example

Command/response sequence to request the power state where the power is on:

Command: 0x21 0x01 0x00 0x01 0xF0 0x0D
 Response: 0x21 0x01 0x00 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01 (command affects all zones)
Cc	0x00
Dl	0x01
Data	0x00 – Enter standby state 0x01 – Power-on 0x02 – Toggle power state 0xF0 – Request power state
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x00
Ac	Answer code
Dl	0x01
Data	0x00 – System is in standby 0x01 – System is powered on
Et	0x0D

Request Mute status (0x0E)

Request the mute status of the audio in a zone.

Example

Command/response sequence to request the mute status of zone 1 where zone 1 is muted:

Command: 0x21 0x01 0x0E 0x01 0xF0 0x0D
 Response: 0x21 0x01 0x0E 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0E
Dl	0x01
Data	0xF0 – Request mute status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0E
Ac	Answer code
Dl	0x01
Data	0x00 – Zone is muted 0x01 – Zone is not muted
Et	0x0D

Activate/deactivate the mute lines (0x1F)

Activate/deactivate the mute lines on the designated zone.

Example

Command/response sequence to activate the mute relays:

Command: 0x21 0x01 0x1F 0x01 0x0D

Response: 0x21 0x01 0x1F 0x00 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1F
Data1	0x00 – Deactivate mute line 0x01 – Activate mute line
Dl	0x01
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1F
Ac	Answer code
Dl	Data length <n>
Data1	Relay state
Et	0x0D

Report Amplifier temperature status (0x27)

Report the temperature status of the various zones amplifiers.

Example

Command/response sequence to request the temperature of zone 1 where temperature is too high:

Command: 0x21 0x01 0x27 0x01 0xF0 0x0D

Response: 0x21 0x01 0x27 0x00 0x01 0x01 0x0D

Note: As each amplifier powers a pair of zones (1&2, 3&4, 5&6) the temperature status of zones 1 and 2 is the same value.

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x27
Dl	0x01
Data	0xF0 – Request temperature status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x27
Ac	Answer code
Dl	0x01
P2	0x00 – Temperature OK 0x01 – Over temperature
Et	0x0D

ARCAM

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