



## **MA247 series**

### Instruction manual



## MA247 series



## Safety First !

- Caution: hot and sharp surfaces! This professional device needs to be installed by qualified personnel only.
- Please check the packing for any kind of damage upon reception of the goods. If the packing is damaged, please contact your dealer before opening it.
- !!!! Danger!!!! Exposure to high sound pressure levels may cause permanent hearing loss. Hearing loss induced by exposure to high sound pressure levels will vary from individual to individual, but nearly everyone will lose some hearing when exposed for a sufficient amount of time. Therefore it is recommended that all persons exposed to equipment capable of producing high sound pressure levels, such as this amplifier, wear sufficient ear protection while installing or operating this unit.
- Read all documentation before operating your equipment.
- Keep all documentation for future reference.
- Keep the carton and packing material, even if the equipment has arrived in good condition.
- Should you ever need to send the unit back, use only the original factory packing.
- Do not spill water or other liquids on or into the unit.
- Make sure power outlets conform to the power requirements listed on the back of the unit.
- Do not use the unit if the electrical power cord is damaged.
- Always operate the unit with the AC ground wire connected to the electrical system ground.

- Turn the level controls on the amplifiers all the way down during power-up to prevent speaker damage if there are high signal levels at the inputs.
- Do not connect the inputs / outputs of amplifiers or consoles to any other Voltage source, such as batteries, mains sources or power supplies, regardless of whether the amplifier or console is turned ON or OFF.
- Power down and disconnect units from mains Voltage before making connections.
- Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.
- Do not operate equipment on a surface or in an environment which may distort the normal flow of air around the unit. If the unit is used in an extremely dusty or smoky environment, the unit should regularly be "blown free" of dust.
- Do not remove the cover. Removing the cover will expose you to potentially dangerous Volt-ages.
- Do not drive the inputs with a signal level higher than that which is required to drive equipment to full output.
- Do not run the output of any amplifier back into another input.
- In case of malfunction, this device should be serviced by qualified service personnel only.

## Features

The MA247 sets a new standard as a professional 6 zone PA mixing amplifier/preamplifier for commercial and industrial applications, either as a standalone unit or as the central device in an expandable, simple but clever paging system. The amplifier is equipped with 4 balanced mic/line inputs, each with adjustable gain and tone controls, up to 4 line level inputs and an emergency input.

The MA247 has a six level priority system. The emergency/telephone input has the highest priority and is activated by a switch or vox circuitry. Its signal goes directly to the main amplifier, bypassing any level control accessible at the front of the unit. An attenuator next to the input sets its level. Microphone input 1 has the second priority level, followed by the mic 2, 3 and 4 and finally the line signals (music).

Zones 2 to 6 can be volume controlled individually. Please note that zones number 5 and 6 are 70 Volt outputs, these are compatible with 100 Volt speakers, but by nature, these outputs will have a slightly reduced output level, meant for the 'quiet' zones in a multizone system. For even more flexibility, zone 1 is an independent zone with a separate line level output, which turns the MA247 into a true 2 zone mixing amplifier with integrated preamplifier. During paging, the corresponding integrated volume control will be automatically bypassed. When priority has been activated in any zone, the internal 24VDC supply output (max 0.6A) can activate priority relays of loudspeaker attenuators or other devices. There is a dedicated 24V output per zone! Even an emergency 24 VDC supply input is present on the unit. The supply will automatically keep the amplifier powered when mains power is interrupted. Mic input 1 is optimized to be used with our MICPAT-6, a selective paging station 6 zone microphone. This mic is the master mic. Maximum 5 of these mics can

be switched in parallel on this single input! Mic input 2 - 4 are designed to be used with our MICPAT-2 (2 zone groups) microphone or any other microphone depending on the application. On the MA247 unit you can preset 2 paging groups to be paged with mic 2 – 4. Please note that it is not possible to connect multiple MICPAT-2 mics to the same input.

That's not all. If you are a professional installer, you will appreciate the possibility to use an external amplifier as paging amplifier. Why? Suppose zones 2 and 3 should not receive paging messages, meaning there should always be background music. Then you can use an external amplifier for all paging tasks. MA247 does all the switching and thinking for you. The internal amplifier will be used for background music. When a paging message is sent to other zones than zone 2 and 3, zone 2 and 3 will stay connected to the internal amplifier and will continue to play the music. All other zones will hear the paging message: the MA247 will disconnect these zones from the internal amplifier and will send the paging signal to the external amplifier. The external amplifier will feed the signal to the selected zones via the MA247. When paging is finished, the zones will automatically be switched back to the internal amplifier. We will show an example of such application in this manual. We will use a 2 channel PA2240BP amplifier and a MA247 in an application that would normally use at least twice as much units to do all the switching and signal routing.

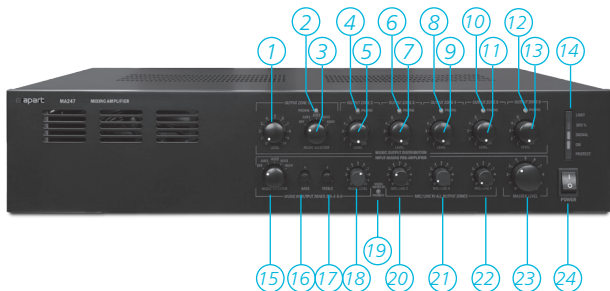
A unique new switching circuit design has been applied to ensure trouble-free switching for many years.

Removable 19" brackets are delivered as a standard accessory along with your amplifier.

The MA247 complies with the CE standards.

## Operation

### Front panel MA247



1. **Zone 1 output level:** this level control sets the output level to the zone 1 preamp output.
2. **Zone 1 paging LED:** this LED lights up when zone 1 is being paged.
3. **Zone 1 music selector:** selects the line level input for zone 1.
4. **Zone 2 paging LED:** this LED lights up when zone 2 is being paged.
5. **Zone 2 level control:** this control is used to preset the zone 2 level relative to the master level.
6. **Zone 3 paging LED:** this LED lights up when zone 3 is being paged.
7. **Zone 3 level control:** this control is used to preset the zone 3 level relative to the master level.



8. **Zone 4 paging LED:** this LED lights up when zone 4 is being paged.
9. **Zone 4 level control:** this control is used to preset the zone 4 level relative to the master level.
10. **Zone 5 paging LED:** this LED lights up when zone 5 is being paged.
11. **Zone 5 level control:** this control is used to preset the zone 5 level relative to the master level.
12. **Zone 6 paging LED:** this LED lights up when zone 6 is being paged.
13. **Zone 6 level control:** this control is used to preset the zone 6 level relative to the master level.
14. **Level indicators/clip-limit:** The protect LED lights up for a few seconds during start-up, or when an error occurs, such as overheating or overload. The lower green on LED will light up to indicate that power is present. The signal LED indicates that a strong signal is sent to the power amplifier. To work within normal conditions, the volume indicator should be kept under 0dB (100%). At -2,5dB a limiter will be activated. This red LED indicates that the "auto gain circuit" keeps the level below clipping. This is NOT a clip indicator, but an indication of the "automatic gain control". Set your max levels so that the limiter LED never lights up!
15. **Zone 2 – 6 music selector:** selects the line level input for zones 2 - 6.
16. **Music bass tone control.**
17. **Music treble tone control.**

18. **Music level control:** turn this level knob to adjust the music level relative to the microphone signals.
19. **Music muted by priority LED:** this red LED lights up when the music is muted by any priority signal or priority contact. When this LED lights up, there are 24 VDC outputs available on the rear connector. 1 output for every zone, capable of supplying 0.3A per zone with a maximum of 0.6A for all zones together.
20. **Mic/Line 2 level control:** turn this knob to adjust the mic/line 2 level relative to other signals.
21. **Mic/Line 3 level control:** turn this knob to adjust the mic/line 3 level relative to other signals.
22. **Mic/Line 4 level control:** turn this knob to adjust the mic/line 4 level relative to other signals.
23. **Master level control:** turn this knob to set the global mix level in zones 2 – 6. This control will be bypassed when the emergency input is activated.
24. **Power switch:** switch mains power on and off. This switch turns off the amplifier when connected to the mains AC supply. Please note that this switch does not switch the amplifier off when operating from a 24 VDC emergency power supply.

### Important information

- Zone 2 - 6 level controls are used to preset levels in different zones relative to the master level and to switch off certain zones temporarily. Zone 5 and 6 outputs are 70 Volt outputs, these are fully compatible with 100 Volt speakers but will produce a maximum output level about 3 dB lower than normal 100 Volt lines. Use these outputs in the most silent zones. When using an external paging amplifier, all speaker outputs from the selected zones are switched to maximum volume (100 Volt) during paging. In other words: the zone volume controls from zone 2-6 are bypassed during paging.
- A maximum of 180 Watts speaker load is allowed per zone, with a total maximum of 240 Watts for all zones when using the internal MA247 power amplifier only. Do not overload the amplifier. If the amplifier is overloaded, it will result in overheating. Check your total speaker load with an impedance or Wattmeter before operating the amplifier. Minimum total speaker impedance (all zones combined) is calculated like this  $(100\text{ V} \times 100\text{ V}) / 240\text{ W} = 41.66\text{ Ohms}$ . Please note that impedance can NOT be measured with a normal multimeter, you need a special impedance meter or 100 Volt line Wattmeter for this purpose. If you need more speakers and/or more power, then you should use an external power amplifier. The MA247 has an independent preamplifier circuit for zone 1, and a combined pre-out/amp-in connector for all other zones, allowing you to increase the total output power without the need of a supplementary preamplifier.
- Please note that in some cases the music level in non-pageable zones can slightly vary during paging. When you use an external paging amplifier, the internal power amplifier will 'see' fewer speakers at its output, because these speakers are switched to the external amplifier's output during paging. This

can result in music levels varying, depending on the speaker load variation. This is not a malfunction. This effect will increase depending on the speaker load variation. You can avoid such situations by powering the sensitive zones with an external amplifier connected to zone 1 line level output.

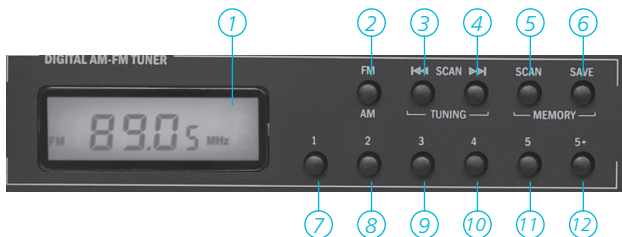
### Front & Rear panel MA247MR



- Music selector 3 and 15 have 2 aux source inputs + internal tuner and MP3 player section (MA247 has 4 aux source inputs).
- On the left side of the front panel you will find a digital tuner and the MP3 player. Operation of the tuner and MP3 player will be explained later.
- Difference in MA247MR rear panel layout:
- Aux 3 & 4 mono input (26) have been replaced by a rec out and tuner output bus.

- Antenna connector (17) for AM wire antenna and FM antenna coax connector.
- Please note that you must use a HF ground isolation transformer when connecting the FM antenna input to an active antenna or cable network!

### Tuner operation

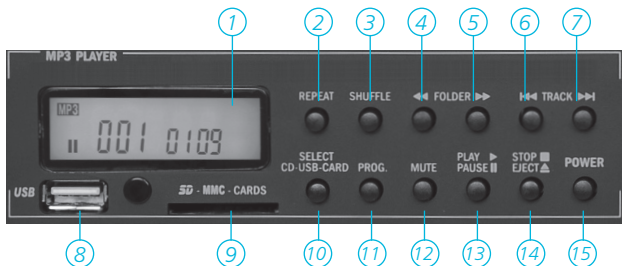


1. **Display section:** shows various tuner parameters such as frequency band (FM or AM), selected frequency and preset number. The tuner has 10 AM and 10 FM preset memory locations.
2. **FM/AM selector:** press to switch between FM or AM band.
3. **Scan down:** press shortly to scroll one step down in the frequency band (9 kHz AM, 50 or 100 kHz FM). Press for about a second to search for the next radio station down the frequency band.
4. **Scan up:** press shortly to scroll one step up in the frequency band (9 kHz AM, 50 or 100 kHz FM). Press for about a second to search for the next radio station up the frequency band.

5. **Scan button:** press to scan all memory locations: the tuner automatically selects the next memory location every 3 seconds. After a full scan, the tuner resumes to normal operation. You can interrupt the scan cycle by pressing the scan button during the memory scan.
6. **Save button:** press this button, followed by a numeric button (1 to 5, 5+) to store a preset in the internal memory. E.g., you want to store the currently selected station in memory location number 1: press the save button, followed by the numeric 1 button. If you want to save in locations 6 to 10: press the save button first, then the +5 button followed by a numeric button 1 to 5 -> preset 6 = button +5 followed by button 1...
7. **Numeric button 1:** press to select or save preset 1
8. **Numeric button 2:** press to select or save preset 2
9. **Numeric button 3:** press to select or save preset 3
10. **Numeric button 4:** press to select or save preset 4
11. **Numeric button 5:** press to select or save preset 5
12. **Numeric button +5:** press this button first to select or save preset stations 6 to 10, followed by a numeric button 1 to 5. Alternatively, during manual frequency scan, you can press this button to select a half frequency step, e.g. FM steps are 100 kHz by default, press the +5 button to step up 50 kHz in the FM band.

**Note:** after powering on the MA247/MA247MR main unit, the tuner is automatically powered on. The tuner cannot be powered off separately.

### MP3 operation



1. **Display section:** shows various parameters such as track number, folder number (if present), elapsed track time, MP3 mode...
2. **Repeat:** press this button to alternate between repeat 1 (repeat one track), repeat folder or repeat all. Repeat mode is shown in the display.
3. **Shuffle:** press once to activate the shuffle function. The unit will play a randomly selected track. To exit shuffle mode, press the button once again. Shuffle mode is shown in the display.
4. **Folder <<:** press this button to select the previous folder. This button has no function when no folders are present on the media (USB stick or SD/MMC CARD slot).
5. **Folder >>:** press this button to select the next folder. This button has no function when no folders are present on the media (USB stick or SD/MMC CARD slot).

6. **Track <<:** press once (shortly) to select the previous track, keep pushing to search backward in the track currently playing.
7. **Track >>:** press once (shortly) to select the next track, keep pushing to search forward in the track currently playing.
8. **USB slot:** insert your USB memory stick here. Please note that an external USB hard disk will most likely not work on this slot. File system recognized is FAT32, maximum memory size is up to 32 gigabytes. Some USB sticks don't allow direct memory access. These will not work on the MA247MR.
9. **MMC /SD card slot:** push in the card gently, metal contacts first, pointing down. Push the card in until you hear a click. Push the card again to eject. File system recognized is FAT32, maximum memory size is up to 32 gigabytes.
10. **Select USB-CARD:** press this button to select USB or memory card operation.
11. **Prog button:** press this button to enter program mode. Press a second time to quit program mode, or press STOP to clear all program steps. Programs are not memorized after powering on and off. If you enter program mode, PROGRAM is displayed in the display, the numeric characters show folder number, track number and program step number. Enter program mode, select a folder and track and press shuffle to enter the selected folder/track. The last characters show the program step. Select another folder/track and press shuffle to confirm the program step. When you press shuffle twice, the selected track will be played twice... After programming all steps, press play to start playing the program. In order to clear the program, press program or stop to clear the program steps. Programs cannot be stored or recalled after cycling the power.



12. **Mute button:** press once to mute the MP3 player, press again to unmute.
13. **Play /pause:** press to start playback, press again to pause playback.
14. **Stop:** press to stop playback.
15. **Power button:** press to power on or off the MP3 player.

### [Notes about media compatibility](#)

The USB and CARD reader will only read MP3 files. ID3 tag and folder names are not displayed.

For maximum compatibility, avoid media containing other than the supported file types.

When a medium is inserted while another medium is playing, playback will be interrupted.

Not all media are compatible with the media player. Media must be formatted in FAT32 file system only.

All memory locations on the media must be accessible. Hidden files and folders, autorun executables or other types of software necessary for accessing the memory will cause malfunction of the media player, causing dropouts during playback, unexpected skipping of files or no functionality at all. In such cases, remove the media and try media from other manufacturers. Files present on the media with file extensions other than MP3 may cause erratic behavior of the media player and should always be avoided.

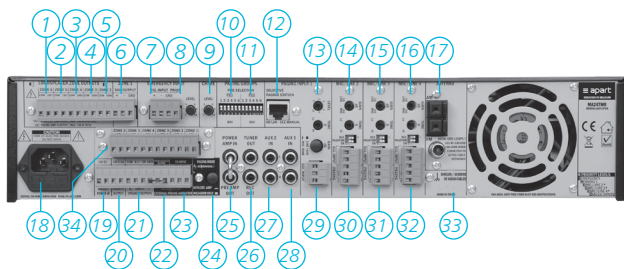
USB hard disks will most likely not work on the media player's USB

port for many reasons: the file system is not FAT32, the memory size exceeds the maximum specifications and the USB port's supply current is insufficient to power the hard drive.

Due to FAT32 file system limitations, maximum file size is limited to 4 Gb.

Depending on the reading speed of the media, excessive file fragmentation may cause erratic behavior of the media player. Usually, reformatting the media and rewriting the files will solve this problem.

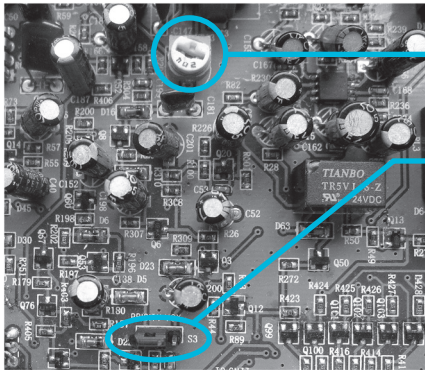
### Rear panel



1. **Loudspeaker output connector zone 6:** zone 6 is a 70 Volt speaker line output compatible with 100 Volt speaker lines. Com = speaker ground, 70 V = speaker plus connection. If this zone is selected for paging, it will become a normal 100 Volt line. Use this output for your 'silent' zones.
2. **Loudspeaker output connector zone 5:** zone 5 is a 70 Volt speaker line output compatible with 100 Volt speaker lines. Com = speaker ground, 70 V = speaker plus connection. If this zone is selected for paging, it will become a normal 100 Volt

line. Use this output for your 'silent' zones.

3. **Loudspeaker output connector zone 4:** zone 4 is a 100 Volt speaker line output compatible with 100 Volt speaker lines. Com = speaker ground, 100 V = speaker plus connection.
4. **Loudspeaker output connector zone 3:** zone 3 is a 100 Volt speaker line output compatible with 100 Volt speaker lines. Com = speaker ground, 100 V = speaker plus connection.
5. **Loudspeaker output connector zone 2:** zone 2 is a 100 Volt speaker line output compatible with 100 Volt speaker lines. Com = speaker ground, 100 V = speaker plus connection.
6. **Zone 1 balanced line level output:** this is the line level output for zone 1. Connect your external amplifier here.
7. **Emergency input with priority contact:** the emergency input has highest priority. The emergency level can be set with knob '8' only and bypasses ALL other level controls. The emergency signal is also present on the preamp out connectors. You can activate the emergency input by closing a contact between the GND and prior connections, or alternatively, activate the input by setting the automatic vox circuitry. Set the internal jumper marked 'S3' to the vox position and set the threshold level with VR13. The jumper and level adjustment are located inside the unit on the rear PCB. In order to reach them you will need to open the unit. For authorized persons only.



LEVEL  
ADJUSTMENT

PRIORITY  
SWITCH / VOX  
SELECTION  
JUMPER

8. **Emergency input level:** this is the only level control on the emergency input. The emergency signal bypasses all possible level controls in the MA247 unit.
9. **Chime level:** turn this knob to set the level of the two tone chime. The chime is activated by the priority switches from mic line 1 – 4. Please note that the emergency input switch or vox circuitry does not activate the chime.
10. **Paging group 1 dipswitches:** click the dipswitches to the ON position for zone 1 to 6 to enable zone 1 to 6 zone group paging with mic 2-4. Connect the GND and PG1 (paging group) connector on mic 2, 3 or 4 to the microphone paging switch. This will enable zone group 1 paging (e.g.using our MICPAT-2 unit). The dipswitch settings are valid for mic 2 – 4 inputs only. Mic 1 is a higher priority mic and overrides these settings.
11. **Paging group 2 dipswitches:** click the dipswitches to the ON position for zone 1 to 6 to enable zone 1 to 6 zone group paging with mic 2-4. Connect the GND and PG2 (paging group)

connector on mic 2, 3 or 4 to the microphone paging switch. This will enable zone group 2 paging (e.g. using our MICPAT-2 unit). The dipswitch settings are valid for mic 2 – 4 inputs only. Mic 1 is a higher priority mic and overrides these settings.

12. **Selective paging connector on RJ45:** connect the MICPAT-6 RJ45 connector to this connector for selective zone paging. This is not a LAN or computer network connector, so NEVER connect this to any other network. Connection details:

Orange white cable: zone 1 – pin 1

Orange cable: zone 2 – pin 2

Green white cable: zone 3 – pin 3

Blue cable: zone 4 – pin 4

Blue white cable: zone 5 – pin 5

Green cable: zone 6 – pin 6

Brown white cable: GND – pin 7

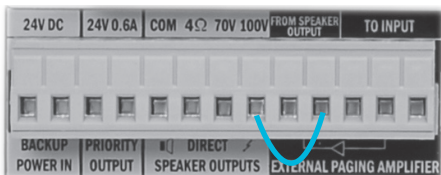
Brown cable: +24V – pin 8

13. **Mic 1 level, tone adjustment:** adjust the mic 1 level and tone here. For use with MICPAT-6, set the mic/line pushbutton to the line position.
14. **Mic/line 2:** this mic has lower priority than mic 1; see below for details.
15. **Mic/line 3:** this mic has lower priority than mic 2; see below for

details.

16. **Mic/line 4:** this mic has lower priority than mic 3; see below for details.
17. **Antenna inputs, MA247/MR only:** connect an AM wire frame antenna on the push spring connectors and/or a suitable FM antenna on the coaxial connector. ALWAYS use a HF ground isolator transformer when connected to a cable network or active FM antenna!
18. **Mains socket:** connect the included mains power cord here. The mains fuse is also located inside the socket. Replace it if necessary with an identical fuse only.
19. **Backup power input:** connect the 24 VDC backup power here. In case the mains Voltage is interrupted, the backup power will automatically keep the unit operational. Please note that maximum output power of the internal power amplifier is limited when operating on the emergency supply. 24V supply current is 20A max.
20. **Priority output:** 24 VDC is present on this connector when priority is activated. You can use the 24 VDC to switch local volume controllers relays. Warning, maximum 0.6 A!!! Do not exceed maximum output current, do not short-circuit this output and do not apply any foreign Voltage to this output! This is the general 24V output, active when priority is activated in any zone. There are dedicated priority outputs per zone available on connector '34'.
21. **Direct speaker outputs:** This is the direct amplifier output, available in 100V, 70V and low impedance. For normal operation, leave the 100V wire bridge between '21' and '22' in place. The wire bridge connects the internal amplifier's

output to the integrated volume control and speaker switching circuitry. When a separate paging amplifier is in use, this wire bridge MUST be removed. Never use the 4 Ohm output together with any 50V, 70V, 100V or zone output.



Wire bridge in case of standalone use. Remove when using an external paging amplifier.

22. **External paging amp in:** connect the 100V output from an external 500 Watt max paging amplifier here. This is useful in situations where you want to separate certain zones from each other, e.g. some zones will need music only, and other zones will need paging and music. The external amplifier will take care of the power amplification of the paging messages. The MA247 takes care of all switching and signal processing.

#### EXPERT TIP:

You may wonder why the external amplifier can be more than 240 Watts. Suppose you have a lot of speakers connected to zone 5 and 6, these are the 70 Volts zones by default. When powered by the internal MA247 amp, the load on the internal amplifier is only half of the power compared to the power in 100 Volt. When you switch these zones to the external paging amplifier, these silent zones will become 100 Volt zones, meaning that the external amplifier will see double the power compared to the internal amplifier.

23. **External paging amp pre out:** the line level signal for the external paging amp is present on this balanced euroblock.
24. **Paging mode switch:** When pushed in, you can use an external paging amplifier. The external amplifier takes care of the paging messages. When not pushed in, all signals are amplified by the MA247 internal amplifier only. As a consequence, in standalone use (switch not pushed in), music will be muted whenever a paging message is sent. Please note that the wire bridge **MUST** be present in standalone applications in order to hear paging messages.
25. **Power amp in – pre out:** here you can connect an external signal processor, e.g. an equalizer. In all other cases, leave the signal bridge in place or there will be no output from the power amplifier. You can use a Y connector here to feed the line signal to an external device.
26. **Aux 3 – aux 4 inputs:** mono inputs aux 3 and aux 4: MA247 only. Tuner out – rec out connector: MA247MR only.
27. **Aux 2:** aux 2 stereo input, stereo signals are internally mixed to mono. Monosignals can be applied to the left and/or right input connector.
28. **Aux 1:** aux 1 stereo input, stereo signals are internally mixed to mono. Monosignals can be applied to the left and/or right input connector.
29. **Paging mic 1:** input for mic 1 on balanced euroblock. Both mic and line levels are supported. For operation with Micpat-6, switch to line level operation with the mic/line selector switch, located above the euroblock. This mic has priority level 2.
30. **mic/line 2 input,** this mic has priority level 3, for details about



the mic channel strip, see below.

31. **mic/line 3 input**, this mic has priority level 4, for details about the mic channel strip, see below.
32. **mic/line 4 input**, this mic has priority level 5, for details about the mic channel strip, see below.
33. **GND screw**.
34. **Zone 1 – 6 priority outputs**: these are the individual zone priority outputs: 24 VDC is present on these connectors when priority is activated in zone 1 – 6. You can use the 24 VDC to switch local volume controllers relays. Warning, maximum current per zone is 0.3 A, maximum total current for all zones is 0.6A!!! Do not exceed maximum output current, do not short-circuit this output and do not apply any foreign Voltage to this output!  
Use the 24VDC supply for priority purposes only. A general priority output is available on connector (20).
35. **Fan section**: the internal cooling fan operates when the amplifier's temperature rises above 55°C. Keep this area clear of any cables and foreign objects and clean the interior of the amplifier once per year to avoid overheating due to excessive dust.

**Note:** the fan is a mechanical device and the area around it needs to be kept clean at all times. If the unit is used in a dusty environment, regularly clean the entire amplifier with clean and dry compressed air. Dust may collect inside the unit and prevent proper cooling, causing overheating, eventually causing malfunction. Replace the fan if necessary. Failures caused by improper maintenance are not covered by warranty.

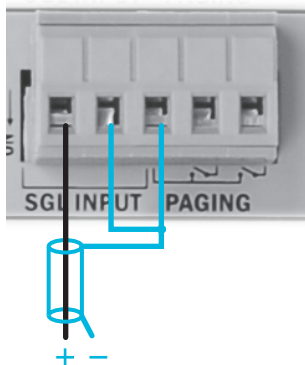
### Microphone connections



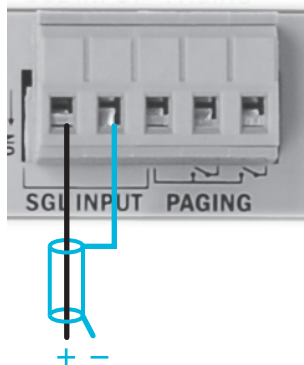
- Status dipswitches: set to \* when using a microphone with a push button(s) connected to the paging contact(s). Set to mix when you want the speech to be mixed with the music: this is useful for mics without pushbuttons or switches.
- Phantom power: set to on if your microphone needs phantom power (such as condenser mics). Voltage supplied is 18 VDC.
- Signal input: balanced input on euroblock.

Unbalanced mic/line signal connection

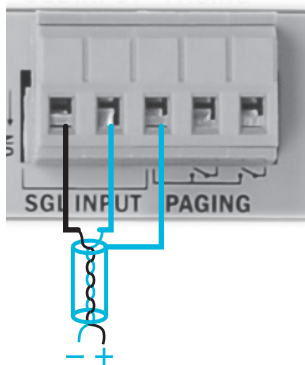
1)



2)

Unbalanced mic/line signal connection

3)



- 1) This connector accepts balanced and unbalanced mic/line signals. For use with unbalanced mics or line level signals, connect the source GND to both GND and -, connect the unbalanced hot wire to +. This can be useful when connecting the receiver output from a wireless microphone.
- 2) Alternatively, you can connect the unbalanced signal ground to the - connector and the 'hot' wire to the + connector. By not connecting the ground connection, you can avoid a lot of ground loop problems (such as hum, excessive noise...)
- 3) Standard connection method for balanced mic/line signals.

- Paging switch connector: for selecting paging group 1 or paging group 2. MIC1 will always override the paging group preselection.
  - Paging group 1: connect GND to PG1 using a switch. Do not apply external Voltages to these contacts.
  - Paging group 2: connect GND to PG2 using a switch. Do not apply external Voltages to these contacts.
  - Note: MICPAT-2 is equipped with 2 switches for paging 2 zone groups and can be connected to the euroblock connector.
- 
- The mic /line inputs all have different priority levels according to the table below:

6 PRIORITY LEVELS	
1	EMERGENCY
2	PAGING 1
3	MIC / LINE 2
4	MIC / LINE 3
5	MIC / LINE 4
6	MUSIC INPUTS

### MICPAT-6 Connection



- MICPAT-6 must be connected to the PAGING INPUT 1: connect the RJ45 plug to the selective paging station RJ45 connector. The second wire, the one with the blank leads must be connected to the SGL input euroblock: screen (black) to GND, white to -, red to +. The MIC1 level can be set using the controls on the rear only. You can connect up to 5 pieces MICPAT-6 units to this input. Use one or more RJ45 split units to connect the RJ45 connectors from the mics to the RJ45 connector. The SGL input of all MICPAT-6's must be connected in parallel on the SGL input euroblock.

### MICPAT-2 Connection



- MICPAT-2 (or other paging mic) can be connected to MIC/LINE 2 -4, depending on the priority level required (see priority level table). Connect red wire to +, white wire to -, shield + yellow wire to GND, black wire to PG1, blue wire to PG2. You can preset the paging groups 1 and 2 using the dipswitches at the rear of the MA247. The paging group settings are equal for mic 2 to 4.

### Speaker zone connections

- Zone 1 amplifier connection (e.g. 480 Watts in zone 1):

Connect the signal output zone 1 (balanced, on euroblock) to the external amplifier's signal input, e.g. our PA2240BP in bridge mode, providing 480 Watts into 100 Volt. Zone 1 has independent line source selection and volume control.

- The benefit of the 70 Volt and 100 Volt output zones:

The 70 Volt outputs from zone 5 and 6 are fully compatible with 100 Volt speakers. In silent zones, such as toilets or showroom areas, the 100 Volt speakers usually play at very low levels, even far below

70 Volt. However, when paging is needed in these zones, full power at 100 Volt might be required.

Zone outputs 5-6 are specially designed for any application where a clear (louder) speech paging is required above the normal background music level. Zones 2-3-4 outputs are standard 100 Volt for both speech and background music. Of course, the level of BGM in each zone can be adjusted or even switched off (paging only) by the zone level controls on the front panel.

- Using an external paging and/or zone 1 amplifier:

The external paging amplifier must have at least the same power as the internal MA247 amplifier. By connecting an external paging amplifier, you have the possibility to create independent zones with different sound levels with a very simple setup. You can use our PA240P for this purpose, or even the PA2240P-2 channel amp. The second PA2240P channel

can be used as zone 1 amplifier, e.g. to power the speakers in a warehouse or production facility, where music source and level requirements are different from the other zones, such as office areas, boardrooms, showrooms... Another possibility is to use the PA240P as paging amplifier, and use the PA2240P in bridge mode in zone 1, this offers you 480 Watts in zone 1. The benefits are clear: less wiring, easy installation, flexible routing, possibility to have zones with extremely high power demands controlled by one central unit, the MA247.

- Zone connection examples:

Zone 1 = production facility and parking area: independent source selection, 480 Watts from

PA2240BP in bridge mode, non-pageable.

Zone 2-4: office area, showroom and boardroom: from internal amplifier, pageable.

Zone 5-6 (70 Volt outs): toilets, hallways: the most silent zones in this case powered by the internal amplifier, non-pageable.

The external paging amp (e.g. PA240P or PA2240BP) takes over the pageable zones, zone 2-4 in this case, while the other zones continue to hear the music without interruption from the paging messages.



- Notes:

What about external volume controls? If you use additional external volume controls, such as our E-VOL series, be sure to connect the 24 Volt priority output from the MA247 to the volume control's 24 V priority input. This will bypass the external volume controls, allowing paging messages to be heard at full power. There is a general 24VDC output and also an individual (per zone) 24VDC output available. Max current supplied is 0.6A in total, with a limit of 0.3A for the individual zone outputs.

As a general rule, a normal external volume control such as our E-VOL series volume controllers consume about 50 mA when priority is active. As a result, the MA247 can "feed" a maximum of 12 external volume controllers ( $12 \times 50\text{mA} = 0.6\text{A}$ ), with a limit of 6 controllers per zone ( $6 \times 50\text{mA} = 0.3\text{A}$ ).

When third party external volume controllers are in use, please check the supply current and polarity of the priority inputs!

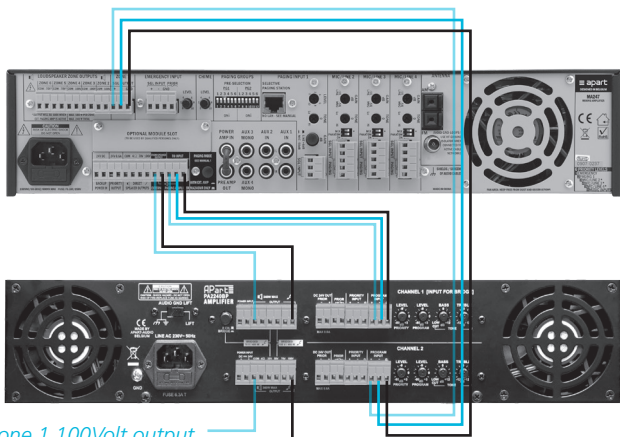
<b>SETUP</b>	5 zone individual volume control with priority bypass	6 zone operation with independent zone 1 source selection
<b>MA247(MR) only</b>	<b>YES</b> Paging mode switch not pressed in, wire bridge in place (see picture)	<b>NO</b> Paging mode switch not pressed in, wire bridge in place (see picture).
<b>MA247(MR) + paging amp</b>	<b>YES</b> Paging mode switch pressed in, wire bridge removed.	<b>NO</b> Paging mode switch pressed in, wire bridge removed.
<b>MA247(MR) + zone 1 amp</b>	<b>YES</b> Paging mode switch not pressed in, wire bridge in place (see picture).	<b>YES</b> Paging mode switch not pressed in, wire bridge in place (see picture).
<b>MA247(MR) + paging amp + zone 1 amp</b>	<b>YES</b> Paging mode switch pressed in, wire bridge removed.	<b>YES</b> Paging mode switch pressed in, wire bridge removed.

<p>selective paging MICPAT-6: per zone selectable. MICPAT-2: preset paging groups using dipswitches for PG1 and/or PG2.</p>	<p>selective paging without background music interruption MICPAT-6: per zone selectable. MICPAT-2: preset paging groups using dipswitches for PG1 and/or PG2.</p>
<p><b>YES*</b> BGM will be interrupted in non-paged zones. Paging mode switch not pressed in, wire bridge in place (see picture).</p>	<p><b>NO</b> BGM will be interrupted in non-paged zones. Paging mode switch not pressed in, wire bridge in place (see picture).</p>
<p><b>YES</b> BGM will NOT be interrupted in non-paged zones. Paging mode switch pressed in, wire bridge removed.</p>	<p><b>YES</b> BGM will NOT be interrupted in non-paged zones. Paging mode switch pressed in, wire bridge removed.</p>
<p><b>YES*</b> BGM will be interrupted in non-paged zones. Paging mode switch not pressed in, wire bridge in place (see picture).</p>	<p><b>NO</b> BGM will be interrupted in non-paged zones. Paging mode switch not pressed in, wire bridge in place (see picture).</p>
<p><b>YES</b> BGM will NOT be interrupted in non-paged zones. Paging mode switch pressed in, wire bridge removed.</p>	<p><b>YES</b> BGM will NOT be interrupted in non-paged zones. Paging mode switch pressed in, wire bridge removed.</p>

\*Selective paging without an external paging amplifier will cause interruption of the BGM in the non-paged zones. In case a zone is being paged, the MA247(MR) will bypass the internal zone level control, causing the paging message to be heard at full level in the selected zone(s). When external volume controllers are in use, connect the 24V priority input of the controller to the dedicated 24V zone output of the MA247(MR).

If you want BGM and selective paging without music interruption in the non-paged zones, please use an external paging amplifier (PA240P, PA2240P, ...)

- Practical wiring example when using the PA2240BP as dedicated zone 2-6 paging amplifier and as ZONE1/240Watts power amplifier: In this configuration, zone 1 selected sources will always be amplified by the PA2240BP channel 2 amplifier. Zone 2-6 selected music sources will be amplified by the MA247 internal power amplifier. During paging, the zones that must hear the paging messages are automatically disconnected from the MA247 internal amplifier and will be switched to the PA2240BP channel 1 amplifier. The internal MA247 power amplifier will continue to play the music in the non-paged zones.



*Zone 1 100V output  
240 Watts maximum*

## Technical Specifications

General specifications	
Output power rating RMS	240 Watt
Frequency response 100 Volt out	40 - 25 kHz +1/-3dB
Total harmonic distortion	<0,3% @ -6dB, 1kHz
Frequency response line output zone 1	20 - 30 kHz +1/-3dB
Bass tone control zone 2-6	+8/- 8dB @ 100Hz
Treble tone control zone 2-6	+8/-8dB @ 10kHz
Tone control mic/line 1-4	from 100Hz/+3dB, 10kHz/-6dB to 100Hz/-9dB, 10kHz/+4dB
S/N ratio (20Hz-20kHz)	amplifier in: >95dB line in: >80dB mic in: >65dB
Indicator LEDs	zone paging : 6 x yellow LED muted by priority : 1 x red LED Limiter activity : 1 x red LED Signal 100% : 1 x yellow LED Signal -25dB : 1 x green LED Power on : 1 x green LED Protection active : 1 x red (also lights up during power on)
Zone controls	Individual volume and source selection for zone 1 line output 5 x 100 Volt volume controls for zone 2-6

Source controls	Music selector zone 2-6 Music selector zone 1 music level control zone 2-6 mic/line 2-4 volume control all zones Master level control zone 2-6 Master level control zone 1 Chime level control (back panel) Emergency level control (back panel) Emergency vox on/off/level control: setting inside the unit
Power supply	230VAC/50-60Hz MAX 800 VA
Mains fuse rating	T6,3AL250V (inside mains connector on back panel)
24VDC Emergency supply fuse	T20AL250V (inside the unit)
Priority output fuse	0,6A resettable autofuse
Weight net MA247 - MA247MR	13,6 kg - 13,7 kg - 14,2 kg
Shipping weight MA247 - MA247MR	15,5 kg - 15,6 kg - 16,1 kg
Dimensions	430(w) x 88 (h) x 360 (d) - 2 HE, 19" brackets included
Shipping dimensions	500 (w) x 175 (h) x 480 (d)
Operating temperature and humidity	-10 to +45°C/up to 90% RH non-condensing

Outputs	
Zone 1	Line level output, balanced 0 dB on euroblock connector
Zone 2-6	100V outputs, zone 5 and 6 are limited to 70V compatible with 100V speakers. MAX 240 Watt total power in 100V (180 Watt max in 1 zone). Preselectable output levels: 5 steps + off + automatic bypass (priority). Minimum load impedance all zones summed: 41,66 Ohms. Zone 2-6 outputs on euroblock connector, amplifier power can be supplied by internal or external amplifier (selectable with paging mode switch at the back panel)
Separate speaker out	50V/70V/100V and low impedance on euroblock.
Rec out	1V
Tuner out (MA247MR only)	300 mV
Pre amp out zone 2-6	1 V
Phantom power	18 VDC
Pre amp out zone 1	1 V balanced on euroblock/100 Ohm output impedance
Paging amp out	2 V balanced on euroblock/100 Ohm output impedance
Priority out	24VDC, max 0,6A
Chime	2 tone chime activated by contact closure



Inputs	
MIC/LINE 1	balanced input on euroblock
Sensitivity mic/line	variable 3mV to 2V
Impedance	600Ω
S/N mic/line	>65dB/>80dB
Phantom power	NA
Frequency response	80Hz - 15kHz (+1/-3dB) speech eq
Muting activated by contact	mutes inputs with lower priority by more than 40dB
Mic/line 2-4	balanced inputs on euroblock
Sensitivity mic/line	variable 1,5mV to 200mV
Impedance	600Ω
S/N mic/line	>65dB/>80dB
Phantom power	18 VDC
Frequency response	80Hz - 15kHz (+1/-3dB) speech eq
Muting activated by contact	> 40dB
Emergency input	transformer coupled balanced input on euroblock
Sensitivity	1V
Impedance	600Ω
S/N	>80dB
Frequency response	100Hz - 20 kHz (+1/-3dB)

Muting	Activated by contact or vox (selectable inside the unit). Emergency has highest priority and mutes all other inputs by more than 40 dB. The signal is also present on the preamp out.
Aux 1 - 2	unbalanced stereo input on RCA
Sensitivity	500mV
Impedance	22K $\Omega$
S/N	>80dB
Frequency response	40 - 25 kHz +1/-3dB
	Signal is internally mixed to mono
Aux 3 - 4	unbalanced mono input on RCA
Sensitivity	500mV
Impedance	22K $\Omega$
S/N	>80dB
Frequency response	40 - 25 kHz +1/-3dB
Tuner (MA247MR only)	
Tuning range FM band	87,5 - 108 MHz (100 kHz/50 kHz tuning step)
Tuning range AM band	531 - 1602 kHz (9 kHz tuning step)
Aerial terminal AM	AM antenna spring lock terminal
Aerial terminal FM	75 $\Omega$ coax connector
Sensitivity FM	1 $\mu$ V/75 $\Omega$ at 26 dB S/N
S/N FM band	> 74 dB at 40 kHz deviation

Sensitivity AM	40 $\mu$ V (26 dB S/N)
Harmonic distortion FM band	< 0,1% at preamp and tuner output
Frequency response FM band	30 Hz - 15 kHz (+1/-3 dB) at preamp and tuner output
Number of presets	10 FM, 10 AM
MP3 (MA247MR only)	
Frequency response	20 Hz - 20 kHz (+0/-1 dB) at preamp output
Harmonic distortion	< 0,01% at preamp output
Supported file types	USB/SD(HC)/MMC-CARD MP3 32 - 320 kbps, variable bit rate
File system/capacity	USB/SD(HC)/MMC-CARD FAT32 up to 32 gigabyte

### [Apart-Audio general warranty conditions](#)

Apart-Audio warrants this product to be free of defects in material and workmanship for a period of one\* year for parts and for a period of one\* year for labor from the date of original end-user purchase. This warranty is valid only for the original end-user and cannot be transferred.

During the warranty period Apart-Audio or one of its authorized service partners shall either repair or replace any product, free of charge, that proves to be defective on inspection by Apart-Audio or its authorized service representative.

All warranty claims must be accompanied by a detailed description of the problem. All returns must be sent to Apart-Audio or an authorized Apart-Audio repair centre, postage prepaid, insured and properly packaged. Proof of purchase must be presented in the form of a valid invoice or some other positive proof that the product is within the warranty period.

This warranty does not cover any defects caused by faulty installation, damage due to abuse, neglect, alteration or attempted repair by unauthorized personnel, system mismatch, insufficient maintenance or any damage caused by excessive mechanical stress and is strictly limited to failures arising during normal use that are due to defects in material or workmanship in the product.

Under no circumstance, Apart-Audio or one of its service centres can be held responsible for the loss of data caused by a repair or exchange operation.

Apart-Audio reserves the right to change or improve the design and/or specification of the product at any time without prior notice.

\*warranty period may be different for your country. Please consult your local dealer.







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**by**  
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Apart-Audio specifications are subject to change without notice.

