

MPA-626
Installation & Operation
Manual v5.0

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MPA-626

Installation and operation manual

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1 Safety Notes

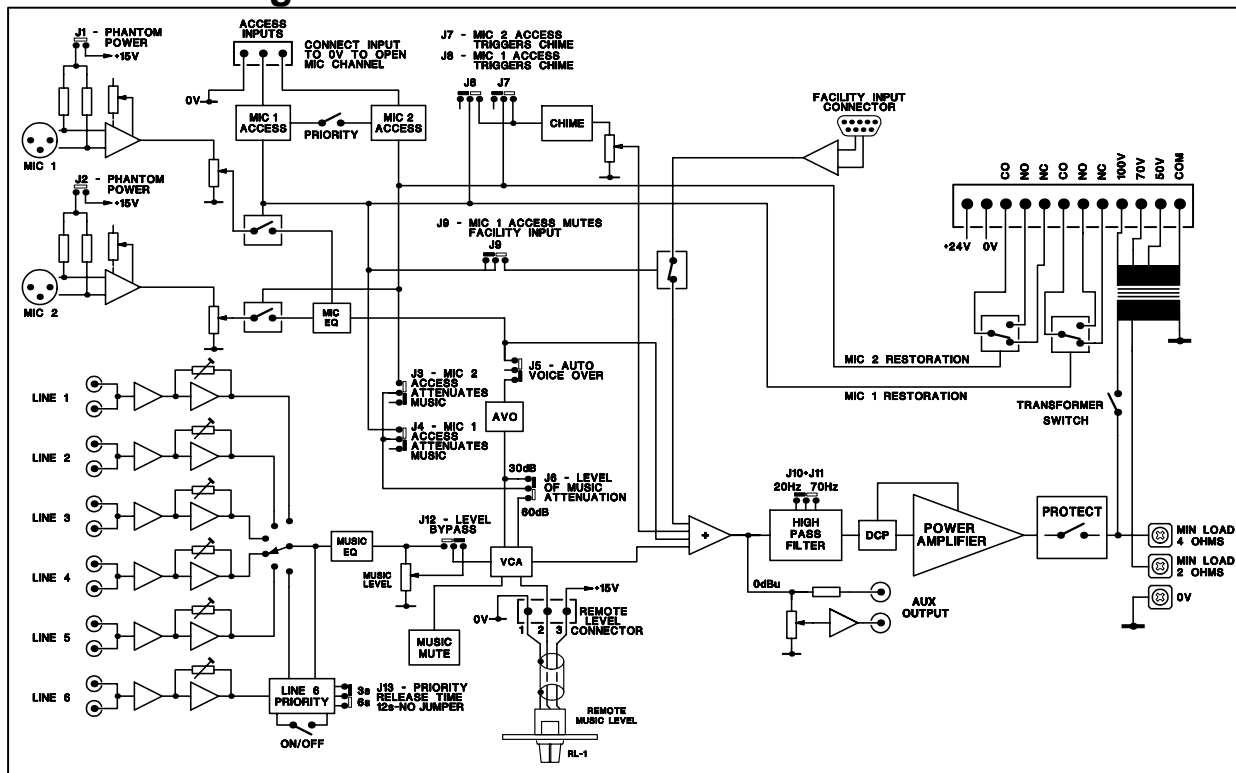
- Do not expose the unit to water or moisture.
- Do not expose the unit to naked flames.
- Do not block or restrict any air vent.
- Do not operate the unit in ambient temperatures above 35°C.
- Do not touch any part or terminal carrying the hazardous live symbol (⚡) while power is supplied to the unit.
- Do not perform any internal adjustments unless you are qualified to do so and fully understand the hazards associated with mains operated equipment.
- The unit has no user serviceable parts. Refer any servicing to qualified service personnel.
- If the moulded plug is cut off the lead for any reason, the discarded plug is a potential hazard and should be disposed of in a responsible manner.

For more detailed information refer to the rear of the manual.

2 General Description

The Cloud MPA-626 is mixer-amplifier with applications in Licensed, Retail and Leisure venues. The unit has inputs for six stereo line signals and two microphone signals. Front panel controls are provided for music source selection, music level and microphone levels. All pre-set controls are located on the rear panel with additional configuration jumpers mounted on the printed circuit board. A remote level control can be wired to the unit for applications that require remote control of the music level.

3 Schematic diagram



4 Music Inputs

The unit has six stereo line inputs that are mixed internally to mono; these inputs are suitable for most music sources such as compact disc players, tape players, satellite receivers and the like. All inputs are unbalanced and use RCA phono sockets. The input impedance is 47k Ω . The Line 6 input can be configured to have priority over any other music source, see section 6.

4.1 Sensitivity & Gain Control

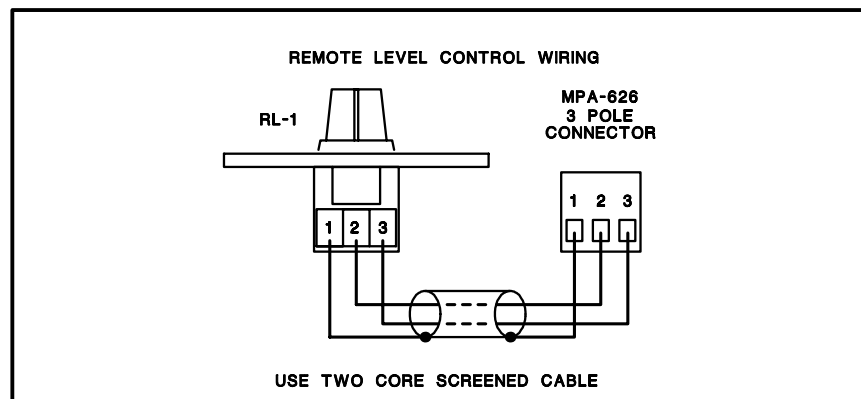
All six stereo line inputs have a pre-set gain control on the rear panel adjacent to the respective input socket. The gain control has a range of 20dB allowing the input sensitivity to be varied from -12dBu (200mV) to +8dBu (2.0V). The pre-set gain control should be set so that all the input signals are operating at the same level and that the front panel level control has an optimum range of control.

4.2 Music Source Select

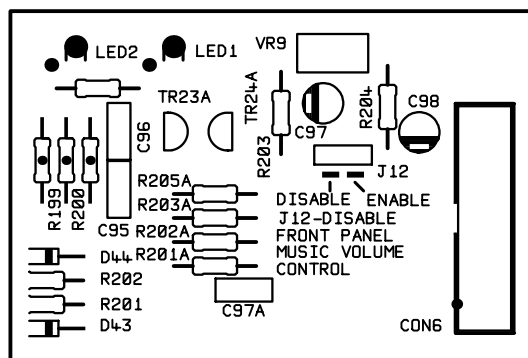
This front panel six position switch is used to select the desired music signal. Use the supplied label pack to identify the signal sources on the front panel. Line 6 input can be configured to have priority over any other selected signal, see section 6 for full details.

4.3 Music Level Control, Local or Remote

A front panel mounted music level control is provided. Remote control of the music level is possible by connecting a remote level control plate (RL-1) to the 3 pole connector on the rear panel of the MPA-626 see the diagram below.



Setting internal jumper J12 to the disable position will disable the front panel level control, see the diagram below for jumper location. A front panel LED adjacent to the level control will illuminate to indicate that the control is bypassed. Use two core screened cable to connect the remote level plate (max length 100 metres).



5 Music Equalisation

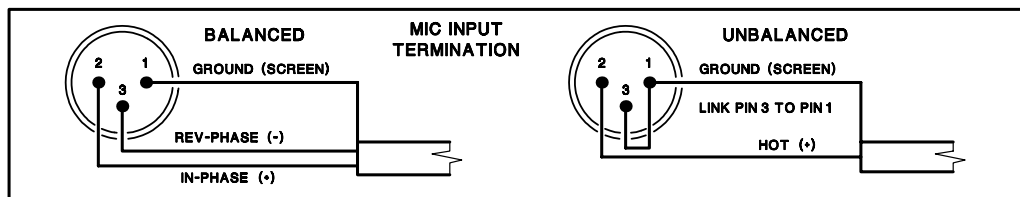
One set of independent bass and treble controls is provided for the music signals. These pre-set controls are located on the rear panel adjacent to the line input sockets. The treble control has a range of $\pm 10\text{dB}$ at 10kHz and the bass control has a range of $\pm 10\text{dB}$ at 50Hz.

6 Music Priority

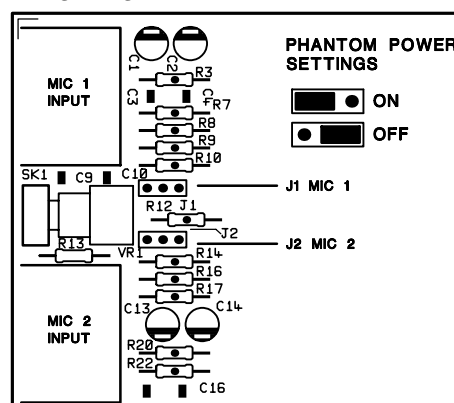
When a Juke Box or Spot Announce Player is connected to the MPA-626, fully automatic priority over any selected line input can be achieved by using the Line 6 input and setting the rear panel switch L6/PR to ON. When this mode of operation is selected, the unit will operate normally until a signal is detected on line 6, this causes the selected signal (usually background music) to mute, allowing the signal on line 6 to operate with priority. Once the signal on line 6 ceases, the selected signal will smoothly restore to its former level. The time taken for the selected signal to be restored can be set at 3, 6 or 12 seconds by repositioning jumper J13 on the upper rear printed circuit board.

7 Microphone Inputs

Two microphone inputs are provided, the microphone amplifiers are an electronically balanced, transformer-less design configured for optimum low noise performance. The input impedance is greater than $2\text{k}\Omega$ and is suitable for microphones in the 200Ω to 600Ω range. Inputs are via gold plated 3-pin XLR type latching connectors, which are positioned on the rear panel. For balanced microphones, connect the cable screen to pin 1, the in phase signal to pin 2 and the reverse phase to pin 3. To operate the channel in the unbalanced mode, connect pin 3 to pin 1 (ground) inside the XLR cable plug. Use pin 2 as hot and pin 1 as screen (ground), see diagram below: -



Phantom power facilities are provided; either of the inputs can be configured to operate with 15V phantom power by setting the relevant jumper to the ON position. Jumper details and locations are shown in the following diagram: -



Care should be taken to ensure that phantom power is activated only when the microphone connected to the input requires external phantom power

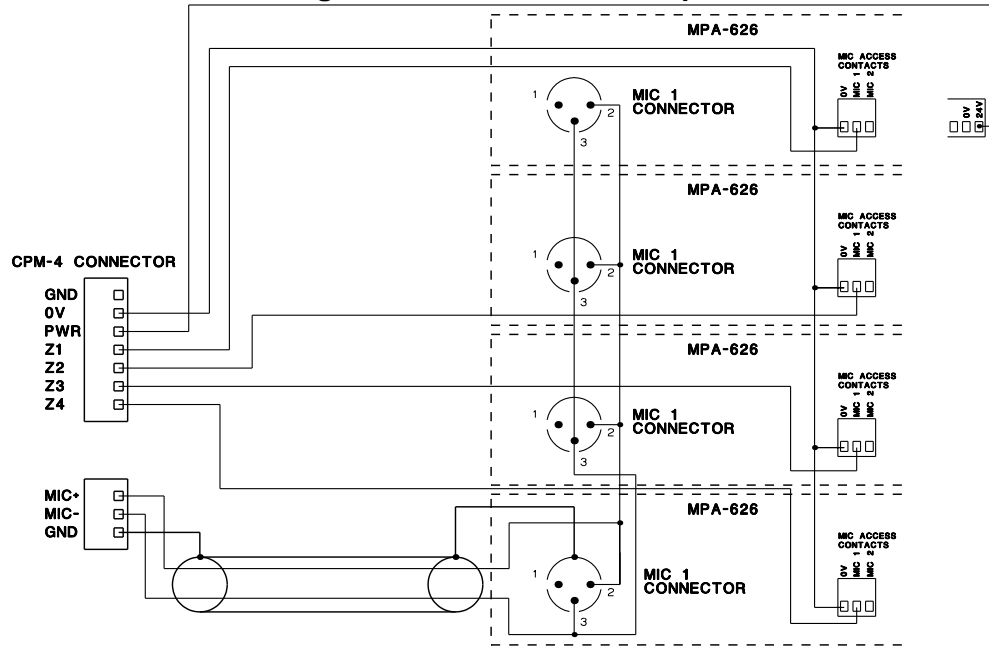
7.1 Gain Control

A pre-set gain control is provided adjacent to the XLR input connector. The gain can be adjusted from 20dB to 60dB. A high overload margin is maintained at all gain settings

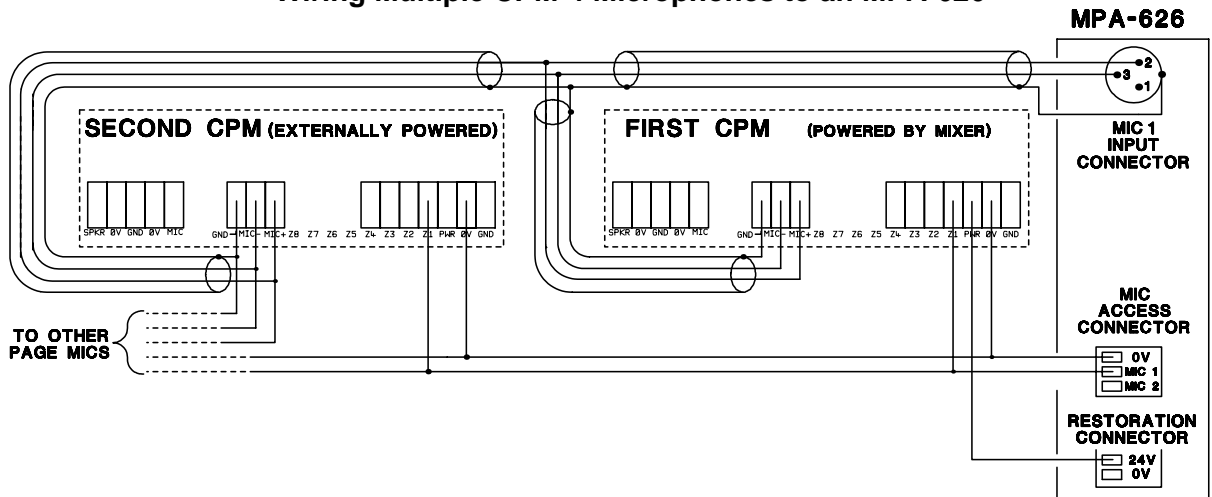
7.2 Microphone Access Inputs

The microphone access inputs are primarily intended to provide compatibility with paging microphones and their associated switching arrangements. When these inputs are left open circuit the microphone inputs are muted. When either terminal 1 or 2 is connected to the 0v terminal the respective microphone channel will become open for use.

Wiring a CPM-4 to MPA-626 Amplifiers



Wiring Multiple CPM-4 Microphones to an MPA-626



The access inputs can also trigger the following functions:

1. Chime

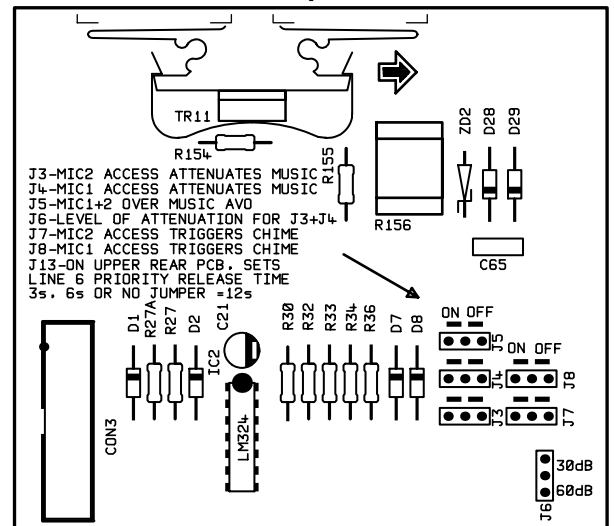
Optional depending upon the setting of jumpers J8 and J7 for Mic 1 and 2 respectively

2. Muting of music signals

Optional depending upon the setting of jumpers J4 and J3 for Mic 1 and 2 respectively. Repositioning Jumper J6 sets the amount of attenuation for Mic 1&2. The 30dB setting is intended to provide a 'voice over' function. The 60dB setting has two intended uses:

- (i) To provide a more dramatic 'voice over' during announcements.
- (ii) When restoration relays are used they could increase the volume of the music signal, the 60dB attenuation will prevent this from happening.

Location of Jumpers J3,4,5,6,7&8



3. Restoration Relays

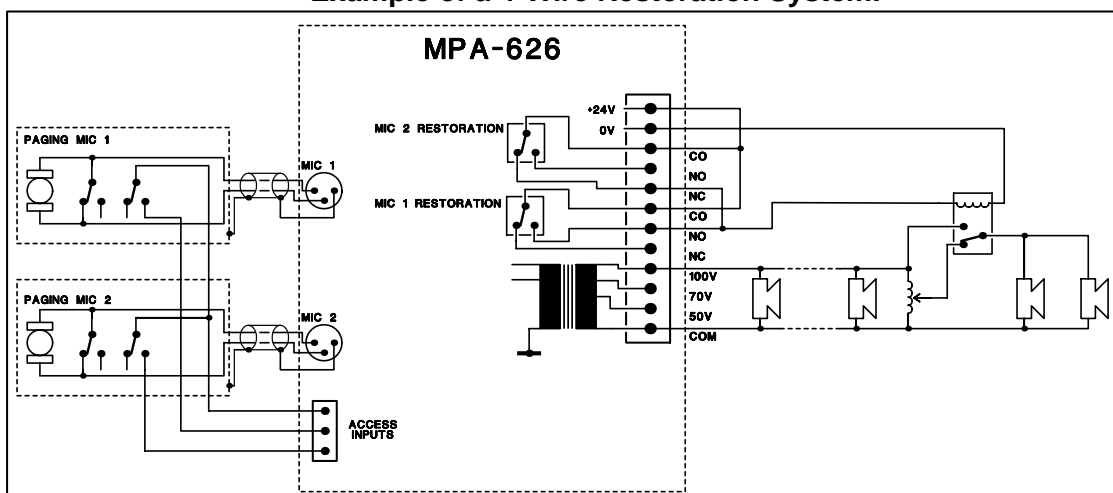
The MPA-626 has two restoration relays one activated by Mic 1 access, the other by Mic 2 access. See section 7.3

When the microphone input(s) are to be used without the access feature the microphone access connector must be fitted with two shorting links, one from 0V to 1 and another from 0V to 2. The rear panel priority switch must also be in the 'out' position. These settings will ensure that both microphone channels are open at all times.

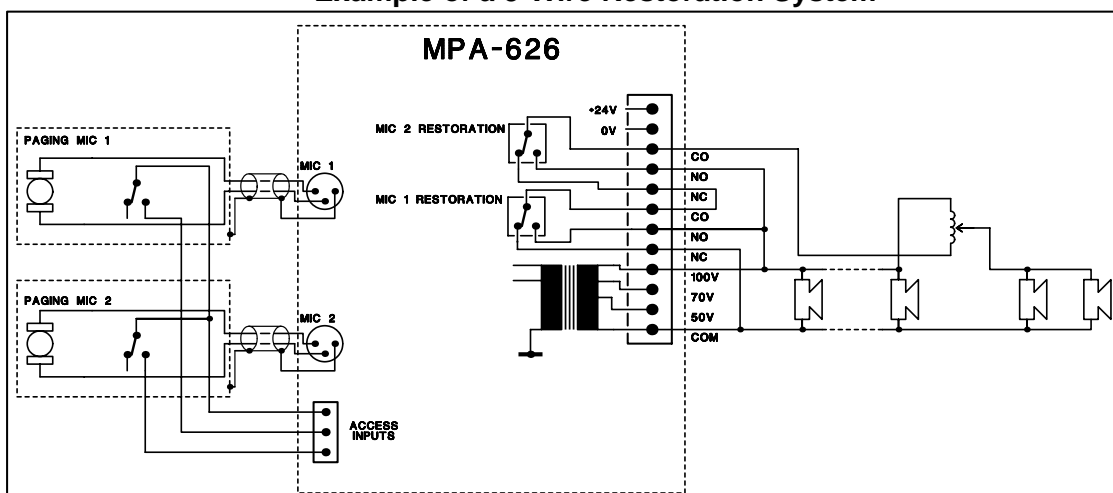
7.3 Restoration Relays

There are two restoration relays; one activated by mic 1 access the other by mic 2 access. Whilst the relay contacts are intended for use in restoration in line speaker systems, the contact ratings are adequate to enable them to switch the low impedance outputs. All of the relay contacts have been made available on the rear panel connector, enabling the MPA-626 to work with either 3 wire or 4 wire restoration systems. A 24V d.c supply is provided for 4 wire systems. The 24V supply is protected by means of a 0.4A PTC type thermal fuse, which can be reset by switching off the unit for 15 seconds. In the diagram below the paging microphones are shown with a shorting switch across the microphone, this is a common feature in such microphones but is not a requirement with the MPA-626 as the unit contains circuitry that mutes the microphone inputs when they are not accessed.

Example of a 4-Wire Restoration System.

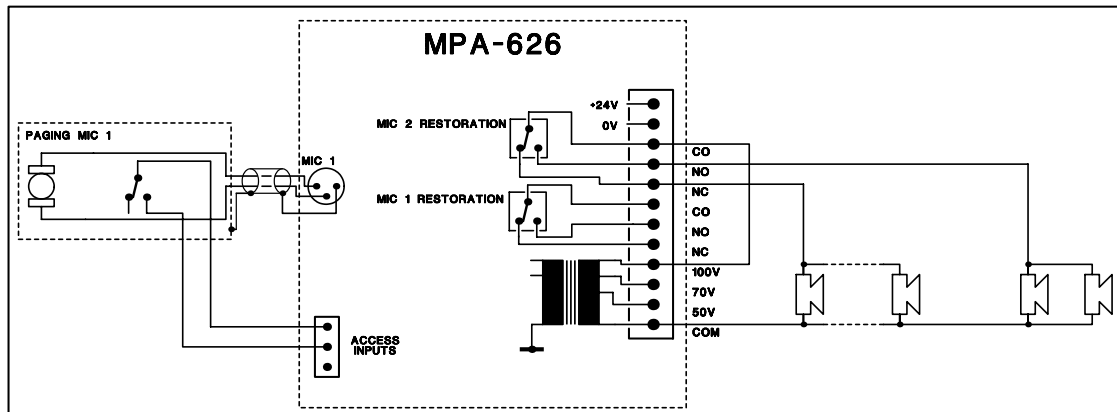


Example of a 3-Wire Restoration System



The restoration relays may also be used to route the output to specific zones for paging purposes as shown below.

Using a Restoration Relay to Route the Output



8 Front Panel Level Controls

A separate microphone level control is provided for each microphone input and these provide the user with a convenient means to operate the microphones at a suitable level. The microphone signals are routed directly to the aux output and power amplifier and are unaffected by the operation of the music level control. The gain controls on the rear panel should be set at a level where it is not possible to have excessive gain even when the front panel level controls are fully clockwise. Self-adhesive labels are provided to customise the controls.

9 Microphone Equalisation

The microphone channel has both a fixed high pass filter and independent pre-set equalisation controls positioned on the rear panel. The filter attenuates the signal below 100Hz and the tone controls provide $\pm 10\text{dB}$ at 100Hz and 5kHz.

10 Microphone Priority

The MPA-626 provides three separate microphone priority functions. Two of these enable the microphones to have priority over music the other allows Mic 1 to have priority over Mic 2.

10.1 Microphone over music priority

Fully automatic, voice operated priority is provided for the microphone signals. This function can be selected by means of jumper J5. With this priority function on, when a microphone signal is detected, the music signal is attenuated, allowing the message to be clearly heard; normal music operation is restored smoothly after the announcement has been made.

In circumstances where a microphone is switched on by means of the access input the access input can also be used to trigger a reduction in music level. For Mic 1 this function selected by J4, for Mic 2 use J3. The amount of attenuation can be set to 30dB or 60dB by means of J6. For installations using restoration relays it is recommended that this access input priority is used, with the attenuation set to 60dB. This will prevent any music signals going up and down in areas where the volume controls have been set low.

10.2 Mic 1 over Mic 2 priority

In situations where the access inputs are used to open both mic 1 and mic 2 the descending priority feature can be used to give mic 1 priority over mic 2. This is selected by means of a rear panel switch. When switched on this feature prevents any signal from Mic 2 being broadcast when Mic 1 is 'accessed'. It should be noted that this feature will allow the user of Mic 1 to cut off announcements being made using Mic 2.

11 Chime

The MPA-626 has an internal pre-announcement chime generator. The chime can be triggered by either (or both) Mic access input; this is selected by means of jumper J8 for Mic 1 and J7 for Mic 2. A rear panel rotary control is provided to set the chime volume. The chime signal is present on the AUX outputs, low impedance and line outputs.

12 Power amplifier and line outputs

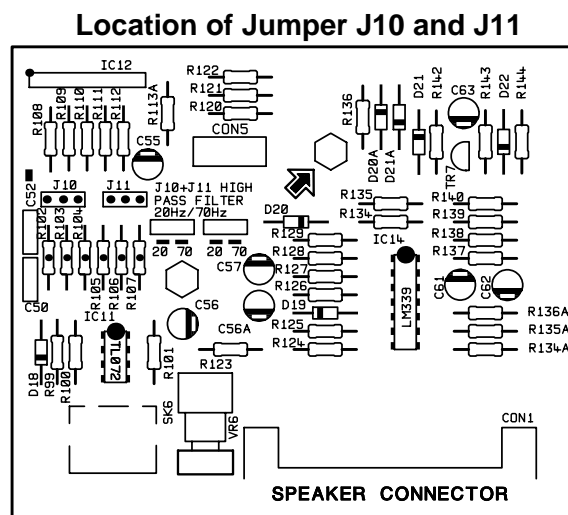
12.1 Power amplifier and protection circuits

The MPA-626 has a 150W output (at the minimum load of 4Ω) power amplifier with a low impedance output. In order to provide more flexibility the MPA-626 also has an output transformer that can be switched on via a rear panel switch. When this transformer is switched on it is strongly recommended that the MPA-626's internal high pass filter be set to 70Hz (see section 12.2). The transformer provides one additional low impedance output, with a minimum load of 2Ω. This additional low impedance output is produced using an 'auto transformer' style primary and is therefore not isolated from the rest of the mixer-amplifier circuitry. The transformer secondary has 3 line outputs 100V, 70V and 50V, whilst these have a common 0v connection, they are fully floating i.e. they are isolated from the rest of the amplifier. When the transformer is in use the maximum total combined load on all outputs should not exceed 120W. Should the installation require a 25V line the 4Ω low impedance output should be used (150W into a 4Ω load is approximately 25V rms.)

The MPA-626 power amplifier section contains several protection circuits to protect it from abuse. A VI limiter is used to protect the amplifier from short circuits and load impedances below the rated minimum. The Dynamic clip protection reduces the signal level when the amplifier is driven into clipping, thus limiting any clipping distortion to a set level. An output relay is used to provide a switch on delay, eliminating switch on 'pops'. This relay is also used to disconnect the output should the amplifier overheat or if the amplifier develops a fault that gives rise to a D.C. output. If the amplifier cuts out because of overheating it will reset automatically after cooling down.

12.2 High pass filter

A high pass filter is provided to protect speakers, transformers etc. from low frequency signals. This filter has two settings, determined by the position of jumpers J10 and J11 (see diagram below). The 70Hz setting offers the most protection and ideally it should be used whenever the output transformer is switched on. The 20Hz setting offers less protection and should be used, when only the 4Ω output is used i.e. when the output transformer is switched off.

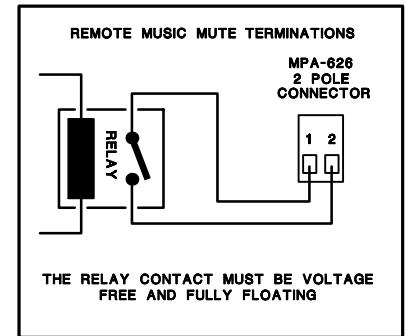


12.3 Aux Outputs

Two unbalanced Auxiliary outputs are provided on phono connectors situated on the rear panel. One of the Aux outputs is at a fixed level, nominally 0dBu (775mV). The level on the other can be varied from no signal to 0dBu by means of an adjacent rotary control. The nominal output level is 0dBu (775mV) but the MPA-626 can operate with a wide range of signal levels up to a maximum output of +20dBu (7.75V). The music level control affects the auxiliary outputs.

13 Music Mute (Fire Alarm Interface)

In certain installations, such as licensed premises or retail outlets within a shopping mall, there may be a local authority or fire service requirement to mute the music signals via a fire alarm control panel in an alarm condition. The MPA-626 provides a facility to mute the music signals only, by using a fully isolated pair of contacts. This is usually a relay mounted close to the MPA-626, which is powered by the fire alarm control panel. The relay should close during an alarm condition (the installation of this relay is normally undertaken by the fire alarm installation company). See right hand diagram.

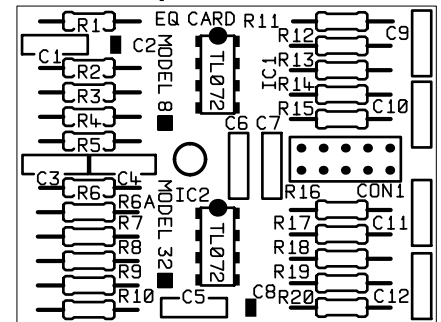


14 Bose® Equalisation Module

The single channel Bose® equalisation module is compatible with the MPA-626; it is available in two different models:

- Model 8 card for use with Bose® model 8 speakers.
- Model 32 card for use with Bose® model 25, 32 and 102 speakers.

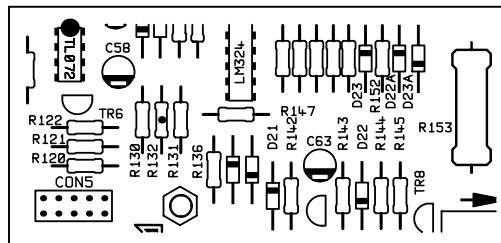
Bose® Equalisation Module



14.1 Installation Information

The connector for the Bose® equalisation module is approximately 50mm from the rear of the variable line out control. The connector is marked CON5 (see diagram below).

Location of CON5



Important note: Refer to Section 16 before installing the Bose® Equalisation module.

14.2 Installation Instructions

1. Switch off power and remove the mains lead.
2. Switch the output transformer on.
3. Remove the top panel from the unit.
4. Remove the jumper from the main PCB connector 'CON5'.
5. Next to 'CON5' there is an M3 screw through the PCB with a white arrow pointing to it, locate this screw, remove it, retain it and replace it with the 12mm metal hex spacer.
6. Push the Bose® equalisation module onto the PCB connector; take care to position the module correctly always using the mounting post to verify correct position of the module.
7. Fit the M3 screw (removed earlier) through the mounting hole into the hex spacer.
8. Replace the top panel.

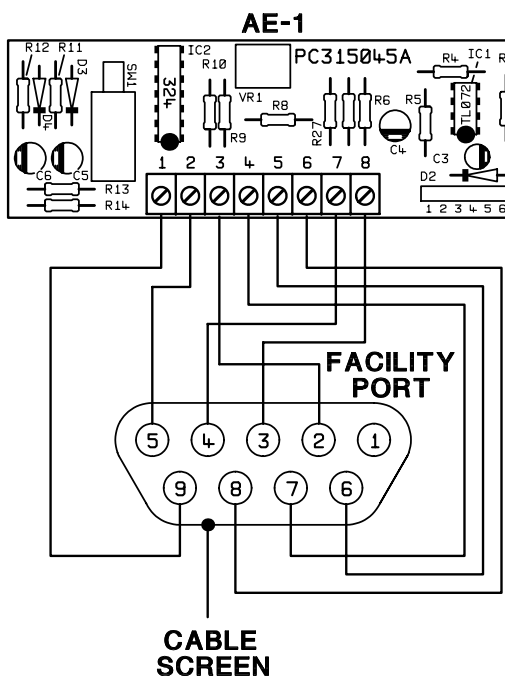
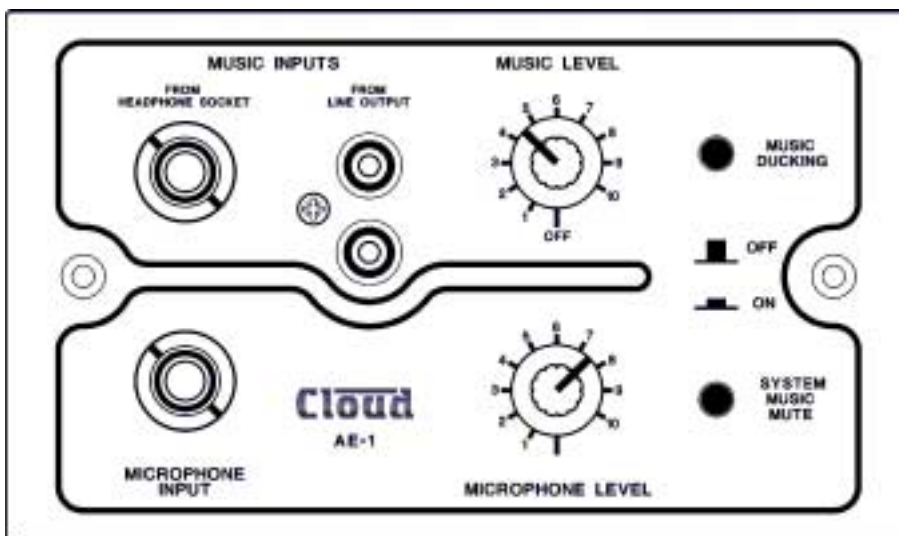
15 Facility Input

Each zone has a 9-Pin Sub D-Type connector called 'Facility Input' this input allows the connection of a variety of remote local input modules as detailed in the following sections; 15.1, 15.2 and 15.3.

15.1 AE-1 Aerobics Module

The Cloud AE-1 is a remotely located active module with facilities for line level music and an unbalanced microphone. The AE-1 can be used for any application where there is a need for a local music and/or an unbalanced microphone source to be connected to the house system. The prime application is the fitness suite, where the aerobic instructors are required to connect their music source and radio microphone directly into the house system. Use 8 core screened cable to link the AE-1 to the facility input.

Important note: Refer to Section 16 before installing the AE-1.



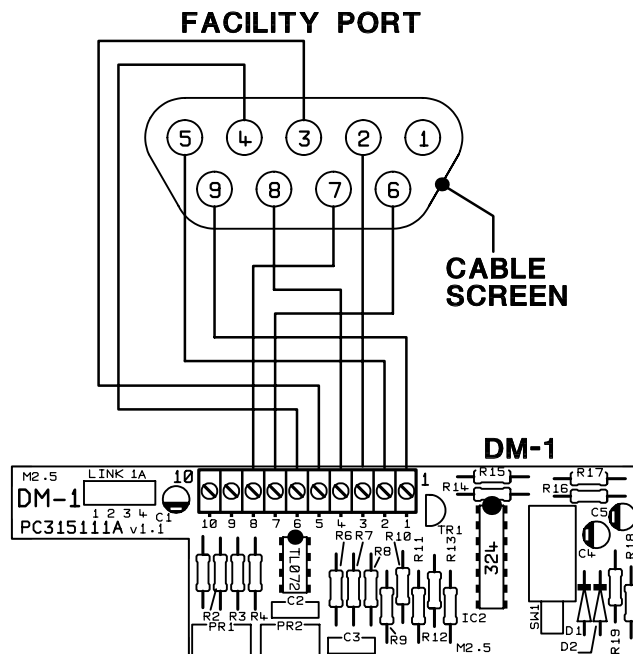
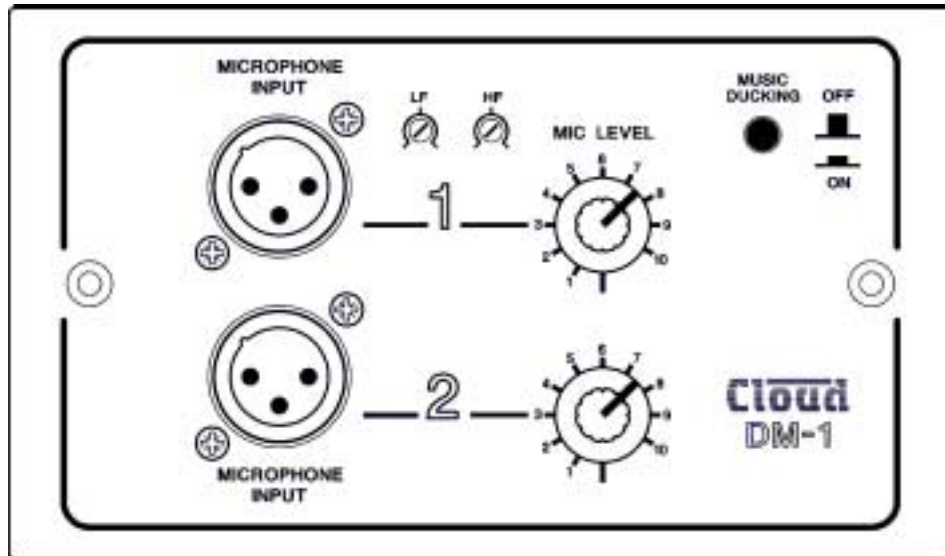
AE-1 CONNECTION TABLE

Connector	Pin Numbers									
9 PIN SUB D	1	2	3	4	5	6	7	8	9	SHELL
AE-1	N/C	3	8	7	2	5	4	6	1	3

15.2 DM-1 Dual Microphone Input Module

The Cloud DM-1 is an active remote module with facilities for two balanced microphones. The DM-1 can be used in any application where local connection and control of two microphones is required. The prime application is venues that may require the connection of extra microphones to the house system at any time for speeches, announcements and conferencing etc. In addition to the separate level controls for each microphone signal, the installer can adjust the tamperproof EQ that is common to both microphone inputs and select music ducking to attenuate the level of the house system background music. The DM1 should be wired to the facility connector with an 8-core cable that has an overall screen.

Important note: Refer to Section 16 before installing the DM-1

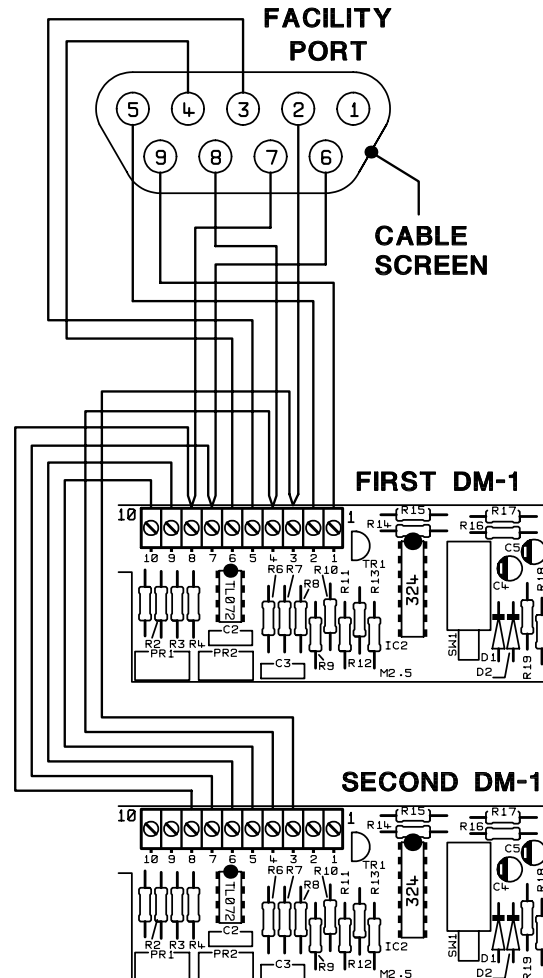


DM-1 CONNECTION TABLE

Connector	Pin Number									
Sub D-Type	1	2	3	4	5	6	7	8	9	SHELL
DM-1	N/C	3	5	6	2	7	8	4	1	3

15.3 Connecting Multiple DM-1 modules to the facility input.

It is possible to connect up to 3 DM-1 modules to the facility input using a 'daisy chain'. When two or more panels are connected together in the following 'daisy-chain' format the EQ on the DM-1 'closest' to the host mixer should be used as the master EQ, while all others should be left neutral. The following diagrams show how two units can be 'daisy chained' for connection to the single facility input.



Note: If you require further information on an active module it can be found in its manual, available from us upon request.

16 Power Supply Capacity

The existing MPA-626 can supply a total load of 54mA to external active devices and internal modules. Care should be taken when using external active devices and internal modules with the MPA-626 amplifier since exceeding the external load capacity risks the power supply cutting out. The table below lists the current consumption of each compatible MPA-626 external active device and internal module. Use this table to verify that the external load of your proposed system falls within the specified limits.

External Active Device / Internal Module	Current Consumption
AE-1	9mA @ ±15V
DM-1	18mA @ ±15V
Bose® Equalisation Module	7mA

If the 54mA load limit is exceeded the risk of temporary host unit failure will arise. If a failure occurs switch off the amplifier and disconnect the remote modules, the amplifier should be left off for approximately 30 seconds to allow it to reset. Check the wiring and total current consumption of the external active devices before reconnecting the power and if the problem persists contact our technical department.

17 General Notes

17.1 Multi-zone Applications

Where the sound system specification calls for separate control in several zones, the MPA-626 can be used in multiples. Signal sources can be connected to several inputs as required, but care must be taken to ensure the output stage of the signal source is capable of driving the lower impedance load. Line input impedance is $47k\Omega$ and it is reasonable to assume that most op-amp based signal sources should drive a $10k\Omega$ load, thus allowing up to five parallel circuits. The input impedance of the microphone amplifier is $2.4k\Omega$ making it suitable for a microphone with a maximum impedance of 600Ω . A single 200Ω microphone could therefore be connected to three balanced inputs. To avoid any problems associated with differences in mains supply earthing, we recommend that all MPA-626's used in a multi-zone application should be located close together and connected to a common mains supply. Note that when using MPA-626 in multiples in a 19" rack, ventilation provisions must be made to ensure that the hot air rising from the ventilation slots of one MPA-626 does not rise up into the unit above it.

17.2 EMC Considerations

The MPA-626 fully conforms to the relevant electromagnetic compatibility (EMC) standards and is technically well behaved. You should experience no problems interfacing the unit to other items of equipment and under normal circumstances, no special precautions need to be taken. If the unit is to be used within close proximity to potential sources of HF disturbance such as high power communication transmitters, radar stations and the like, it is suggested that the cable screen be connected to the shell of the XLR type connector and the line input signal leads be kept as short as possible. Always use balanced interconnections wherever possible. If the MPA-626 is mounted in a 19" rack, do not locate the unit in close proximity to a powerful amplifier, which may radiate a strong magnetic field from the power transformer.

17.3 Earthing

The 0V rail of the MPA-626 is coupled to the chassis ground by a parallel resistor/capacitor network and no interconnection problems should be encountered. When several mains powered units are connected together via their signal cables, there is a risk of one or more earth loops which may cause an audible hum on the system even with the gain controls set to minimum. The 'hum' can be remedied in several ways; the preferred method is to operate interconnects in the balanced mode wherever possible, with the cable screen only connected at the receiving end (amplifier input). The signal source units should be located as close as possible to the MPA-626 and the metal housing of the various units should not be electrically connected together through the equipment rack. If this is a problem, rack isolating kits are available from specialist hardware suppliers. If the problem persists, try to connect all interconnected units, including power amplifiers to a common power source to ensure a common ground is provided.

17.4 Ventilation

The MPA-626 is convection cooled and requires adequate space to allow a free flow of air through the unit. In 19" rack applications we recommend leaving 1U of rack space above and below. In free standing applications we recommend fitting the feet supplied and placing the unit on a flat surface and leaving the ventilation slots on top of the unit free from any obstructions.

18 Technical Specifications

Line inputs

Frequency Response	-3dB 20Hz/70Hz selectable -20kHz ± 0.5 dB
Distortion	<0.02% 1kHz
Sensitivity	195mV (-12dBu) to 2.0V (+8dBu)
Input Gain Control	20dB range
Input Impedance	$47k\Omega$
Headroom	>20dB
Noise	-89dB 22Hz -22KHz, at speaker output relative to 150W into 4Ω
Equalisation	HF: ± 10 dB/10kHz LF: ± 10 dB/50Hz

Microphone Inputs

Frequency Response	100Hz / -3dB(filter) 20kHz \pm 0.5dB
Distortion	<0.03% 1kHz
Gain Range	40dB
Input Impedance	>2k Ω (balanced)
Common mode rejection	>70dB 1kHz
Headroom	>20dB
Noise	-127dB EIN 22Hz-22kHz (150 Ω)
Equalisation	HF: \pm 10dB/5kHz LF: \pm 10dB/100Hz

Outputs

Auxiliary Outputs	775mV (0dBu) unbalanced (RCA phono sockets), 1 output fixed level, one variable
Speaker Outputs	150 watts rms/4 Ω 105watts rms/8 Ω via screw terminals 120 watts rms/2 Ω via screw terminals
100V line output	100 volts balanced – 83 Ω min load (120W)
70V line output	70 volts balanced – 40 Ω min load (120W)
50V line output	50 volts balanced – 21 Ω min load (120W)
Protection	VI Limiting, DC Offset, Thermal & switch-on delay
Cooling	Convection

19 General Specifications

Power input	230V \pm 5% (115V \pm 5% available) 40 to 60 Hz
Typical power consumption	160VA
Fuse rating	T3.15A for 230V supply T6.3A for 115V supply
Fuse type	20mm x 5mm class 3T 250V
Dimensions (cm)	48.26 x 8.80(2U) x 30.00 deep (+ connectors)
Weight (kg)	8.70kg net

20 Factory Default Jumper Settings

JUMPER	FUNCTION	DEFAULT SETTING
J1	Mic 1 phantom power	OFF
J2	Mic 2 phantom power	OFF
J3	Mic 2 access attenuates music	OFF
J4	Mic 1 access attenuates music	OFF
J5	Mic 1+2 auto voice over	ON
J6	Mic 1+2 level off access attenuation see J3+J4	30dB
J7	Mic 2 access triggers chime	OFF
J8	Mic 1 access triggers chime	OFF
J9	Mic 1 access mutes facility input	OFF
J10+J11	High pass filter frequency 20 or 70 Hz	20 Hz
J12	Disable/enable front panel volume control	ENABLE
J13	L6 priority release time 3s, 6s, 12s	6s

This product conforms to the following European EMC Standards:

BS EN 55103-1:1997

BS EN 55103-2:1997

This product has been tested for use in commercial and light industrial environments. If the equipment is used in controlled EMC environments, the urban outdoors, heavy industrial environments or close to railways, transmitters, overhead power lines etc. the performance of the unit may be degraded.

The product conforms to the following European electrical safety standard.

BS EN 60065:1998



Safety Considerations and Information

The unit must be earthed. Ensure that the mains power supply provides an effective earth connection using a three-wire termination.

When the mains switch is in the off 'O' position the live and neutral conductors of the mains transformer are disconnected.

CAUTION – Installation

Do not expose the unit to water or moisture.

Do not expose the unit to naked flames.

Do not block or restrict any air vent.

Do not operate the unit in ambient temperatures above 35°C.

CAUTION – Hazardous Live

Do not touch any part or terminal carrying the hazardous live symbol () while power is supplied to the unit.

Terminals to which the hazardous live symbol refers require installation by a qualified person.

CAUTION - Mains Fuse

Replace the mains fuse only with the same type and rating as marked on the rear panel. The fuse body size is 20mm x 5mm.

CAUTION – Servicing

The unit contains no user serviceable parts. Refer servicing to qualified service personnel. Do not perform servicing unless you are qualified to do so.

Disconnect the power cable from the unit before removing the top panel and do not make any internal adjustments with the unit switched on.

Only reassemble the unit using bolts/screws identical to the original parts.

Bose® is a registered trademark of The Bose Corporation.

In the interest of continuing improvements Cloud Electronics Limited reserves the right to alter specifications without prior notice.

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