VMA Series

VMA160
VMA1120
VMA1240
VMA260
VMA2120

Commercial Series
1 Channel & 2 Channel Mixer-Amplifier
Operation Manual

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This manual does not include all of the details of design, production, or variation of the equipment. Nor does it cover every possible situation which may arise during installation, operation or maintenance.

The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred.

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IMPORTANT SAFETY INFORMATION

WARNING: TO THE REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrow point in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

SAFETY INSTRUCTIONS

NOTICE FOR CUSTOMERS IF YOUR UNIT IS EQUIPPED WITH A POWER CORD.

WARNING: THIS APPLIANCE SHALL BE CONNECTED TO A MAINS SOCKET OUTLET WITH A PROTECTIVE EARTHING CONNECTION.

The cores in the mains lead are colored in accordance with the following code:

GREEN and YELLOW - Earth BLUE - Neutral BROWN - Live

As colors of the cores in the mains lead of this appliance may not correspond with the colored marking identifying the terminals in your plug, proceed as follows:

- The core which is colored green and yellow must be connected to the terminal in the plug marked with the letter E, or with the earth symbol, or colored green, or green and yellow.
- The core which is colored blue must be connected to the terminal marked N or colored black.
- The core which is colored brown must be connected to the terminal marked L or colored red.

This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel who should refer to the table below. The green/yellow wire shall be connected directly to the units chassis.

CONDUCTOR		WIRE COLOR	
		Normal	Alt
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN/YEL	GREEN

WARNING: If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

WARNING FOR YOUR PROTECTION READ THESE INSTRUCTIONS:

KEEP THESE INSTRUCTIONS

HEED ALL WARNINGS

FOLLOW ALL INSTRUCTIONS

THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING LIQUID AND NO OBJECT FILLED WITH LIQUID, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS

CLEAN ONLY WITH A DRY CLOTH.

DO NOT BLOCK ANY OF THE VENTILATION OPENINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

DO NOT INSTALL NEAR ANY HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTERS, STOVES, OR OTHER APPARATUS (INCLUDING AMPLIFIERS) THAT PRODUCE HEAT.

ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.

UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.

Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong are provided for your safety. If the provided plug does not fit your outlet, consult a electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

Use only with the cart stand, tripod bracket, or table specified by the manufacture, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

POWER ON/OFF SWITCH: For products provided with a power switch, the power switch DOES NOT break the connection from the mains.

MAINS DISCONNECT: The plug shall remain readily operable. For rack-mount or installation where plug is not accessible, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated into the electrical installation of the rack or building.

FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

MULTIPLE-INPUT VOLTAGE: This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. Connect this equipment only to the power source indicated on the equipment rear panel. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel or equivalent.

If connected to 240V supply, a suitable CSA/UL certified power cord shall be used for this supply.

IMPORTANT SAFETY INFORMATION

ELECTROMAGNETIC COMPATIBILITY

This device complies with part 15 of the FCC Rules and the Product specifications noted on the Declaration of Conformity. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Operation of this unit within significant electromagnetic fields should be avoided.

- Use only shielded interconnect cables when connecting to other devices.

EU - DECLARATION OF CONFORMITY

Manufacturer:
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Northridge, CA 91329 USA
Phone +1.818.893.8411

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Brand: JBL
Equipment Type: 1 Channel & 2 Channel Mixer-Amplifier
Family name: VMASeries
Model names: VMA160, VMA1120, VMA1240, VMA260, VMA2120

We, Harman International, declare under our sole responsibility that the product, to which this declaration relates, is in conformity with the relevant Union harmonizes legislation:

The following harmonized standards and technical specifications have been applied:

EMC Standards:	Descrip2on
V	Ma VSNGP b SNT b AMffIp AqaVPA VB SVV IS UdTN Pa P WVel W
V	Ma VSNGP b SNT b AMffIp AqaVPA VB SVV IS UdTN Pa P WVel W
	I P aVPAN WSPA VfhVAN W a aVR WIWSP UdTN Pa ST VbRG Pa thv ft P P dWG H
	WVXWAVRa Ba SNATAVP BA NSf TSf V MaVSP I P A MaVI M UdTN Pa fa a W V VaW bSP W H H
	A VS da VR V aS N SP Va a A SNTMVP BA AW W bSP UdTN Pa fa V IB V UdP fl H
	MaVSNGP b SNT b IMffI VaulINaWA bSPtul INaWAVSVA VN SP I dVPa NIWMSP Wp UdTN Pa P Tal
	MaVSNAGP b SNT b IMffI VaulINaWA bSPtul INaWAVSVeSMG A da db SPDWP I L VP KSf mSMG
Safety Standard:	
EN 60065:2014 8th Ed.	Audio, video and similar electronic apparatus -- Safety requirements

Copies of all technical documents can be obtained by contacting Curtis Thornburg: Curtis.Thornburg@Harman.com

May 31, 2019
Nanshan, Shenzhen, China

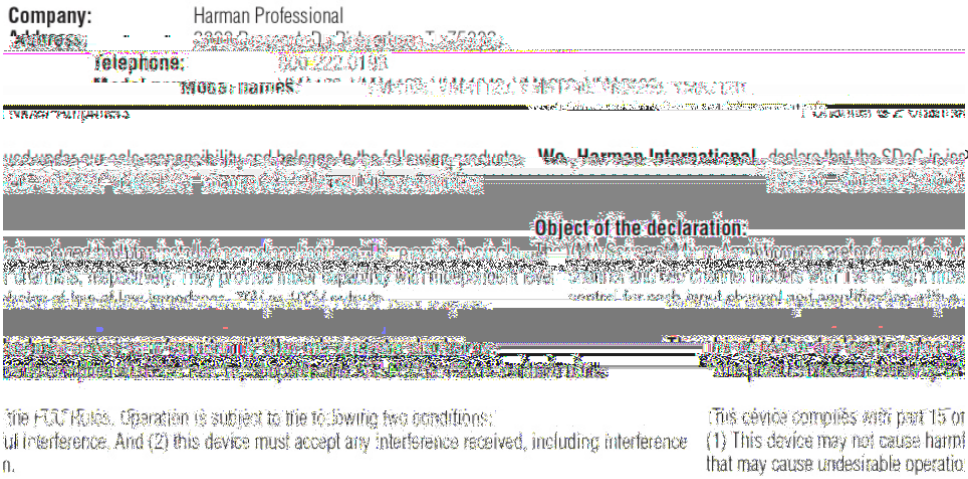
(Date and place of Issue)

Robert McKean
Director, Test & Validation,
Engineering/R&D SDC

[redacted]

(Name, Signature and function of authroirized person)

SUPPLIER DECLARATION OF CONFORMITY (SDoC)



May 31, 2019
Nanshan, Shenzhen, China

(Date and place of Issue)

Robert McKean
Director, Test & Validation,
Engineering/R&D SDC

[redacted]

(Name, Signature and function of authroirized person)

1.0 Welcome

The JBL® VMA Series of Mixer-Amplifers are professional tools designed and built for Installed sound applications. There are both single channel and two channel models with fve or eight mixer channels, respectively. They provide mixer capability with independent level control for each input channel and amplifcation with a choice of low impedance, 70V or 100V outputs.

The product includes a rack mounting kit for installations to a cabinet. The system can be easily expanded with additional JBL Commercial Series Amplifers and Commercial Series Mixers. Provisions are included for remote volume control using the JBL CSR-V control module.

1.1 Features

- 5 or 8 inputs with 1 or 2 outputs, respectively
- Ideal for commercial and industrial use
- System may be expanded by adding JBL Commercial Series Mixers or Commercial Series Amplifers.
- Euroblock, RCA and TRS type input connectors available.
- Independent Bass and Treble controls for each output channel
- VOX ducking during announcements
- Remote volume control capability using JBL CSR-V module and CAT5 cable with RJ45 connectors
- Priority muting using PTT switch closure
- Confgurable output routing
- Barrier block output connections to drive 8 Ohm, 70V or 100V speaker systems.
- 3 Year Warranty
- Media Player capable of playing MP3 fles from Bluetooth or USB drive.

*Warranty is only valid within the United States of America. For information on warranty outside of the U.S.A., please contact your local distributor.

ront Panel Controls & Indicators

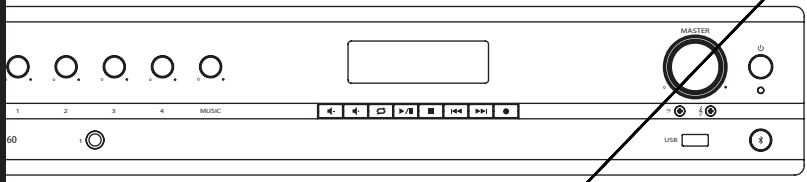
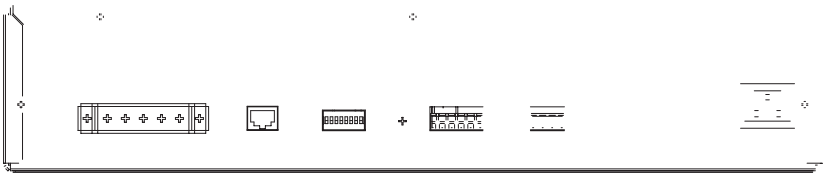


Figure 1.2.1 Front Panel, 1 Channel Model

1.3 Rear Panel Controls & Connectors (VMA160, VMA1120, VMA1240)



2.0 Setup

2.1 Unpacking Your Amplifer

Please unpack and inspect your amplifer for any damage that may have occurred during transit. If damage is found, notify the transportation company immediately. Only you can initiate a claim for shipping damage. We will be happy to help as needed. Save the shipping carton as evidence of damage for the shipper's inspection.

We also recommend that you save all packing materials so you will have them if you ever need to transport the unit. Never ship the unit without the factory pack.

WARNING: Before you start to set up your amplifer, make sure you read and observe the Important Safety Instructions found at the beginning of this manual.

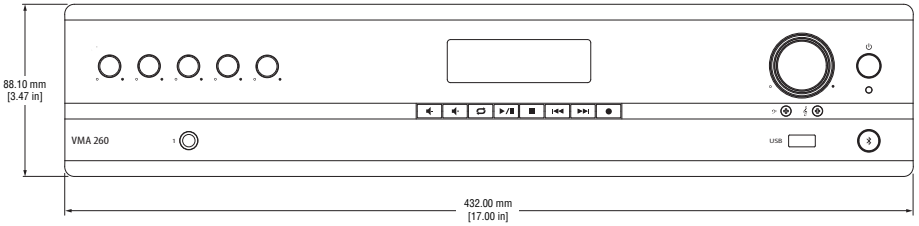
2.2 Installing Your Amplifer

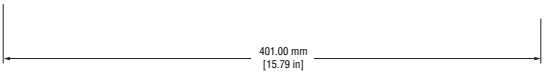
CAUTION: Before you begin, make sure your amplifer is disconnected from the power source and all level controls turned completely down (counterclockwise).

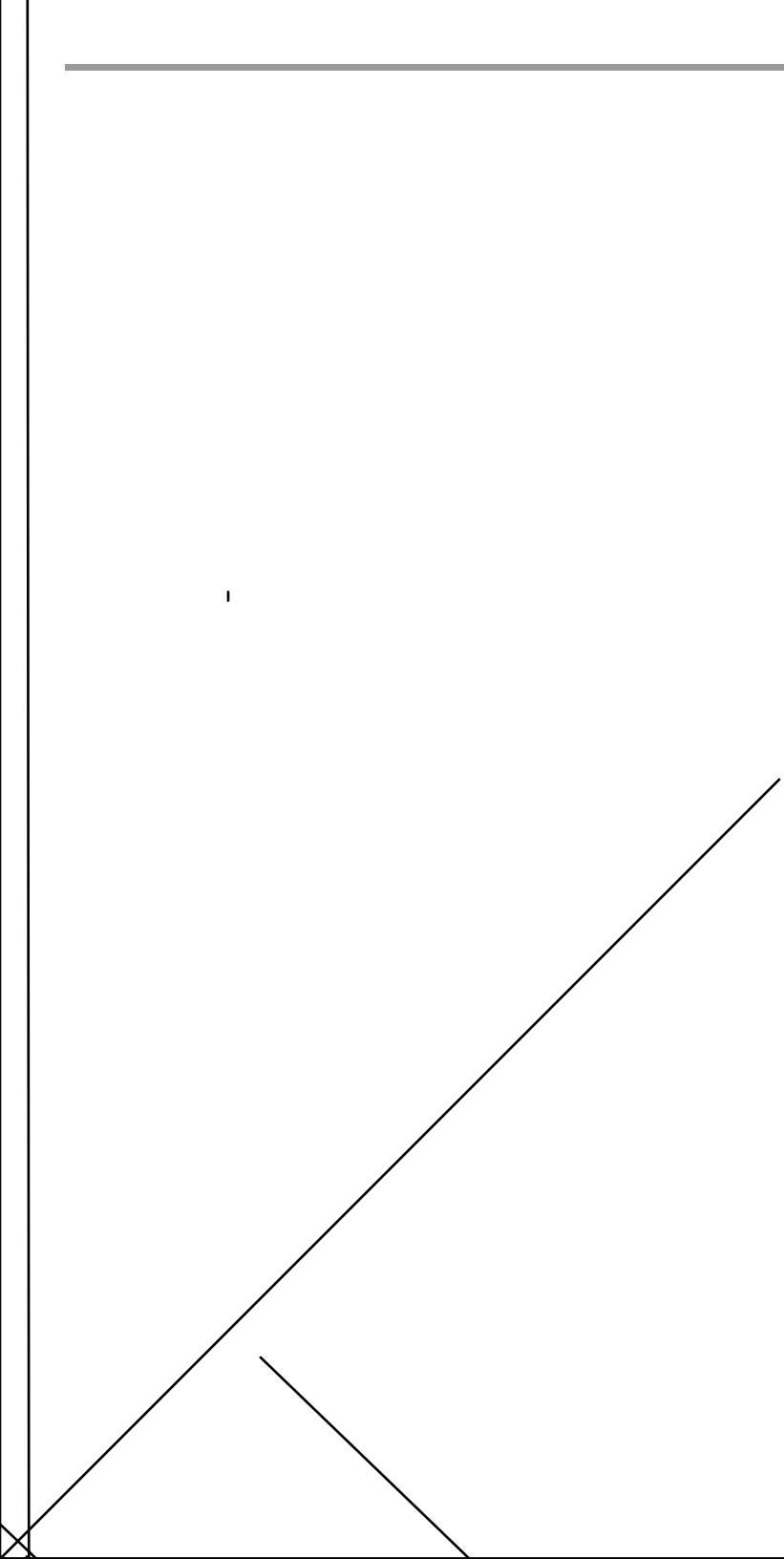
Note: We recommend that any sensitive equipment be located at least 8 inches (20 cm) away from the amplifer.

To install the amplifer, you can use one of the following approaches:

- Rack mount the amplifer with the rack mounting kit, see Figure 2.2.2.
- Place a single amplifer on a surface with 12 inches of air space around the unit for convection cooling. Rubber feet are included and can be attached onto the underside of the chassis. For amplifer dimensions, see Figure 2.2.1.


88.10 mm
[3.47 in]
VMA 260
USB
432.00 mm
[17.00 in]


401.00 mm
[15.79 in]



13 Figure

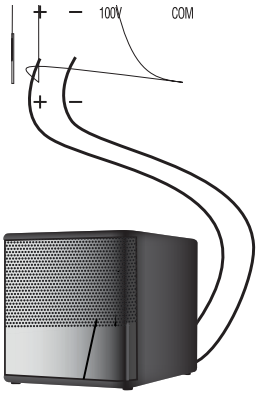
2.5 Output Wiring & Connectors

To drive distributed speaker systems designed to operate at 70V or 100V, connect to the corresponding output terminals.

JBL recommends using pre-built or professionally wired, high-quality, two-conductor, heavy gauge speaker wire. Speaker wires should be twisted cable, if possible. To prevent the possibility of short-circuits, the wires should be stripped back no greater than 6 mm (1/4 inch), see Figure 2.5.1.

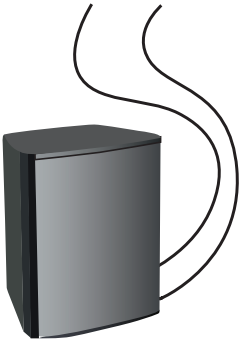
Suggested below are guidelines to select the appropriate size of wire based on the distance from amplifer to speaker. Check with local code as this may vary.

Distance	**Wire Size**
Up to 25 ft. (7.6m)	16AWG
26-40 ft. (7.9-12.2m)	14AWG



8 Ohm Speaker

70V Speaker System



100V Speaker System

2.7 Connecting to AC Mains

Connect your amplifer to the AC mains power source (power outlet) with the supplied AC power cord. First, connect the IEC end of the cord set to the IEC connector on the amplifer; then, plug the other end of the cord set to the AC mains. When properly connected to a live power source, the power LED should illuminate blue.

WARNING: *The third prong of this connector (ground) is an important safety feature. Do not attempt to disable this ground connection by using an adapter or other methods.*

Amplifers don't create energy. The AC mains voltage and current must be suffcient to deliver the power you expect. You must operate your amplifer from an AC mains power source with not more than a 10% variation above or below the specifed line voltage and within the specifed frequency range indicated on the back panel of the amplifer. If you are unsure of the output voltage of your AC mains, please consult your electrician.

2.8 Protecting Your Speakers

It's wise to avoid clipping the amplifer signal. Not only does clipping sound bad, but it can damage high-frequency drivers. The built-in clip limiter prevents clipping.

Also, avoid sending strong subsonic signals to the amplifer. High-level, low-frequency signals from breath pops or dropped microphones can blow out drivers. You can switch to the HI-Z mode which, in addition to switching in the output transformers for 70V and 100V speakers, activates the high-pass flter. The flter prevents potentially damaging subsonic signals from going to the amplifer by eliminating signals below 70Hz.

2.9 Startup Procedure

Use the following procedure when frst turning on your amplifer:

1. Turn down the level of your audio source.
2. Turn down the level controls of the amplifer.
3. Power up the amplifer. The blue Power LED should be ON.
4. Turn up the level of your audio source to an optimum level.
5. Turn up the Level controls on the amplifer until the desired loudness or power level is achieved.

If you ever need to make any wiring or installation changes, don't forget to disconnect the power cord.

3.0 Operation

3.1 Precautions

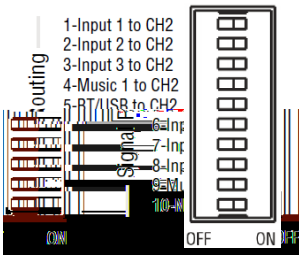
Your amplifer is protected from internal and external faults, but you should still take the following precautions for optimum performance and safety:

1. Before use, your amplifer frst must be confgured for proper operation, including input and output wiring hookup. Improper wiring can result in serious operating diffculties.

   For information on wiring and confguration, please consult the Setup section of this manual.
2. Use care when making connections, selecting signal sources and controlling the output level.
3. Always be sure to have all levels at minimum when connecting or disconnecting audio sources from the inputs, especially when MIC is selected from the MIC/LINE switch. Failure to do so may cause the amplifer or speaker to go into a protection mode or even cause damage.
4. **WARNING:** Never connect the output to a power supply, battery or power main. Electrical shock may result.
5. Tampering with the circuitry, or making unauthorized circuit changes may be hazardous and invalidates all agency listings.
6. Do not operate the amplifer with the red Clip LEDs constantly fashing.
7. Do not overdrive the mixer, which will cause clipped signal to be sent to the amplifer. Such signals will be reproduced with extreme accuracy, and loudspeaker damage may result.
8. Do not operate the amplifer with less than the rated load impedance. Due to the amplifer's output protection, such a confguration may result in premature clipping and speaker damage.
9. Use the amplifer in a well-ventilated environment and do not use it in ambient temperature conditions in excess of 40°C. Failure to do so will result in the automatic disconnection from the power supply as the overheat auto protection function will be activated and there will not be any audio signal coming out of the amplifer. In this case, turn down the volume to the minimum, and the amplifer will soon resume working. When the amplifer returns to normal temperature you may turn the volume up to a safe level.
10. If the line voltage to the amplifer is too low, the low voltage protection function will be activated.

CAUTION: JBL is not liable for damage that results from overdriving other system components.

3.2 Input Routing



The two-channel models, VMA260 and VMA2120, include a default routing of Input channels 1-3, Music 1 and the Bluetooth/USB source to amplifer 1. Input channels 4-6 and Music 2 are routed to amplifer 2. The user may take any input and have it routed to both outputs by selecting the appropriate switch. For example, if you set switch 1 to ON, Input 1 will be routed to both AMP1 and AMP2.

3.3 Confguration Settings

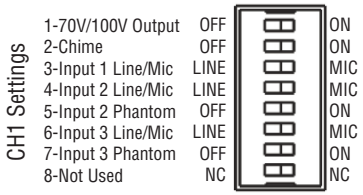
A DIP switch is available for each output channel to confgure the unit to your specifc system.

3.3.1 70V/100V Output Selection

When this switch is in the “OFF” position, the amplifer is confgured to drive low impedance speakers, (4 Ohms ,minimum) The 70V/100V switch will activate the built-in output transformer allowing the unit to directly drive 70V or 100V speaker systems when connected to the appropriate output terminals. As an added feature when driving the high impedance speakers, the system automatically apply a 70Hz high pass flter.

3.3.2 Chime Function

Turning chime ON will enable a chime sound at the onset of an announcement when priority muting is invoked. (See section 3.5, Priority Muting, on the following page.)



3.3.3 Line/Mic Gain Switch

Additional gain is available for use with sources, in particular microphones, that have low output levels. Switching to MIC position activates 48dB additional gain. Use only when necessary as the added gain may cause higher noise levels.

3.3.4 Phantom Power

Phantom power (27V) can be applied to specifc mic inputs by turning on the appropriate Phantom Power switch.

3.4 VOX Function

Voice activated ducking is available on input channel 2 of the VMA160, VMA1120 and VMA1240. The feature is available for both input channels 2 and 5 of the VMA260, and VMA2120. The audio input level required to activate ducking is set using the trim pot on the rear panel. Adjusting in the counterclockwise direction will reduce that level while the full clockwise setting will disable the VOX function.

3.5 Priority Muting

VMA160, VMA1120 and VMA1240 may use Input channel 2 as a priority channel, muting all other channels when pins 4 and 5 are shorted using a switch closure.

The VMA260, and VMA2120 lets Input2 operate with priority over all inputs into output amplifer CH1. Similarly, Input5 can exercise priority over all inputs into output amplifer CH2. Input2 will have priority over both amplifers CH1 and CH2 if the routing DIP switch #2 is set to ON.

3.6 Remote Volume Control

Remote volume control can be implemented using a CSR-V controller connected via a CAT5 cable to the RJ45 connector on the back panel. For the VMA260 and VMA2120, there are two connectors, one for each amplifer output.

3.7 Media Player

3.7.1 Bluetooth Operation

To activate Bluetooth, perform the following:

1. Press the Bluetooth Key until the Bluetooth Indicator begins to flash.
2. Enable Bluetooth of your source media player and search for “JBL COMMERCIAL (XX)”. Establish a connection. (Note that the “XX” represents the last two digits of the MAC address which allows the user to have multiple systems in close proximity.)
3. Once connected, the Bluetooth Indicator will stop flashing and remain illuminated.
4. Press the VOLUME UP/VOLUME DOWN keys to increase or decrease the volume.
5. Press the NEXT key to jump to the beginning of the next track.
6. Press the PREVIOUS key once to jump to the beginning of the current track or twice to the previous track.
7. Press the STOP key to stop playing. (**Note:** *This may not work for some Bluetooth devices*.)
8. Press the PLAY/PAUSE key to pause or resume playing.
9. To disconnect, either press the Bluetooth Key or disable Bluetooth at the media player source device. (**Note:** *Play will resume automatically upon reconnect if disconnected by pressing the Bluetooth Key*.)
10. Press the REC key to start recording. (**Note:** *Media player signals are not recorded*.)

Note: *Bluetooth signal is muted when broadcasting the chime tone.*

3.7.2 USB Operation

1. Insert a USB Drive to the USB Audio Input and the number of folders and files on the USB Drive will be displayed.
2. Press PREVIOUS or NEXT Key to scroll the playable media.
3. Press the VOLUME UP/VOLUME DOWN keys to increase or decrease the volume.
4. Press the REPEAT Key to enter different repeat modes:
    - REPEAT CURRENT – Repeat the current track.
    - REPEAT ALL – Repeat all tracks.
    - REPEAT ALL 30Min Message – Play the track with the predefined name, “MESSAGE_1.mp3” every 30 minutes while repeating all other tracks.

- REPEAT ALL 60Min Message – Play the track with the predefned name, “MESSAGE_1.mp3” every 60 minutes while repeating all other tracks.
- REPEAT OFF – No repeat.

5. Press the PLAY/PAUSE key to pause or resume playing.
6. Press the STOP key to stop playing.
7. Press the PREVIOUS Key once to jump to the beginning of the current track or twice to the previous track.
8. Hold down the PREVIOUS Key to rewind.
9. Press the NEXT Key to jump to the beginning of the next track.
10. Hold down the NEXT Key to fast forward.
11. Press the REC key to start recording. (**Note:** *Media player signals are not recorded*.)

3.7.3 Additional Media Player Information

Bluetooth playback will always have priority over USB.

The default media player volume is maximum.

USB and Bluetooth signals cannot be recorded.

While playing from the USB or Bluetooth source, the signal being played is interrupted momentarily when a chime tone is sounding in another channel.

Hidden functions are available by pressing and holding a media player key for more than 1 second then pressing and holding the Bluetooth key along with it.

- RECORD (>1s) + BT — Displays the BT MAC address
- STOP (>1s) + BT — Displays the frmware version
- PLAY (>1s) + BT — Illuminates all dots in the display
- REPEAT (>1s) + BT — Factory Reset

3.7.4 Firmware Upgrade Procedure

1. Place the frmware fle “*.mcs” onto a blank USB Drive.
2. Insert the USB Drive.
3. Display will show “USB UPGRADE”.
4. Wait until display shows “USB SUCCESS” and the display turns off.
5. Power off the unit.
6. Remove the USB Drive.
7. Power on the unit, the upgrade procedure is fnished.

4.0 Troubleshooting

CONDITION: No power to the mixer-amplifer so that the power LED is not illuminated.

POSSIBLE REASON: The mixer-amplifer is not plugged into the power outlet.

CONDITION: No sound or low sound.

POSSIBLE REASON: The input signal is not present or at a very low level.

POSSIBLE REASON: The Master Volume control is turned down.

POSSIBLE REASON: A CSR-V is connected and turned down.

POSSIBLE REASON: Mixer channel inputs are turned down.

POSSIBLE REASON: A Priority switch is closed, muting all except the priority input.

POSSIBLE REASON: The 70V/100V switch is OFF while using the 70V or 100V outputs.

CONDITION: Distorted sound.

POSSIBLE REASON: Input signal level is too high. Please turn down the input level controls. Note that the mixer-amplifer should not be operated at a level that allows the clip indicator (red ring around the Master Volume) to be constantly ON.

POSSIBLE REASON: Master Volume is too high.

POSSIBLE REASON: MIC/LINE switch is in MIC position when using a line level source.

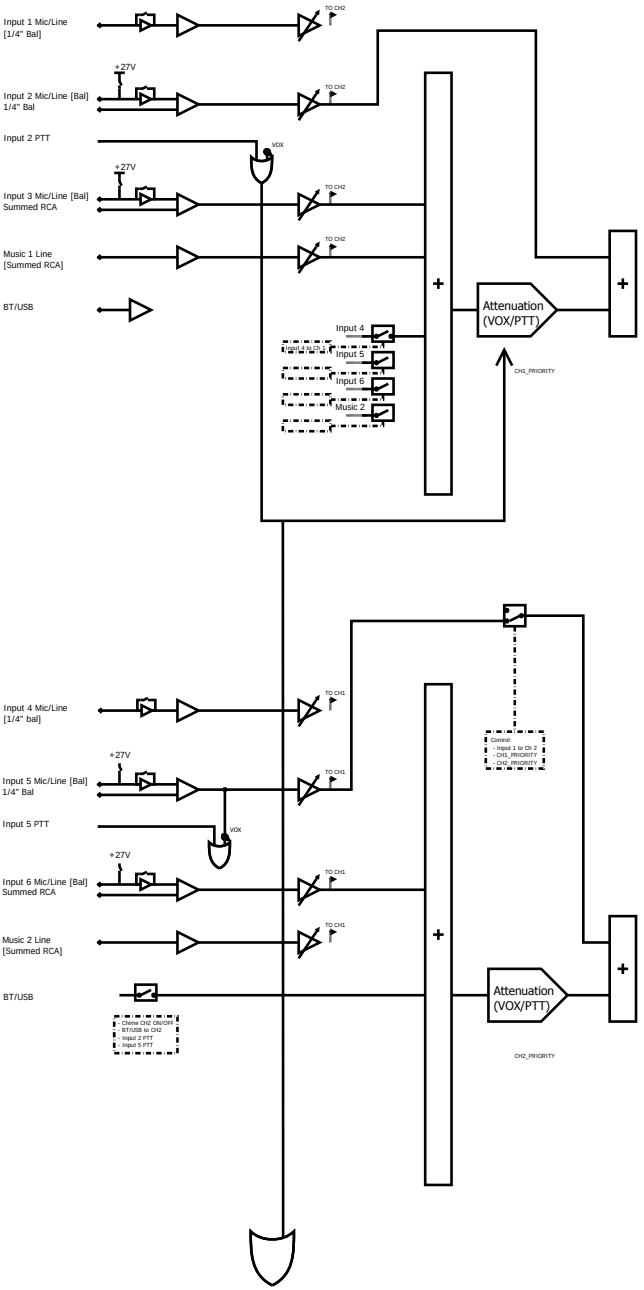
Appendix A: Preliminary Performance Specifications

Performance	VMA160	VMA1120	VMA1240	VMA260	VMA2120
Max Output Power per Channel into 4 Ω or 8 Ω; 1kHz, ≤ 0.5% THD	60W	120W	240W	60W	120W
Insertion Loss (70V & 100V outputs)	1 dB maximum				
Number of Input Channels	5	5	5	8	8
Number of Output Channels	1	1	1	2	2
Tone Controls (Bass and Treble non-detented potentiometers on each channel)	Bass +/-14dB @ 50Hz Treble +/-14dB @ 10kHz				
Input Sensitivity (to obtain full rated power into 8 Ω load)	Mic Input: 5.5mV$_{RMS}$ Line Input: 1.3V$_{RMS}$ RCA Input (stereo in): 130mV$_{RMS}$				
Frequency Response (measured at 2.83V$_{RMS}$ into rated load impedance at any output)	4/8 Ω Output: 20Hz - 20kHz, +/-2dB 70V/100V Outputs: 80Hz - 15kHz +/-3dB				
Total Harmonic Distortion (THD) (measured at 2.83V$_{RMS}$ into rated load impedance at any output)	Power Amp Output: <0.5%, 20Hz - 20kHz				
Signal-to-Noise Ratio (Ref. Rated Power, mixer levels @ min., master volume @ max. A-weighted)	>76dB				
Input Impedance (nominal)	Mic: 400 Ω Line: 20 kΩ (balanced) RCA: 50 kΩ				
Phantom Power	27VDC				
Crosstalk (reference rated power, volume at mid position, 1kHz)	-70 dB				
Nominal AC Line Voltages	100V, 120V, 220V, 220-240V, 50/60 Hz				
Minimum Load Impedance Low Impedance Output 70V Output 100V Output	 4 Ω 80 Ω 160 Ω	 4 Ω 40 Ω 80 Ω	 4 Ω 20 Ω 40 Ω	 4 Ω 80 Ω 160 Ω	 4 Ω 40 Ω 80 Ω
Operating Temperature/ Humidity	0°C to 35°C @ 95% R.H. (non-condensing)				
Storage Temperature	-20°C to 85°C				
Dimensions & Weight					
Net Weight	19.4 lb (8.8 kg)	20.2 lb (9.2 kg)	25.5 lb (11.6 kg)	25.5 lb (11.6 kg)	29.3 lb (13.3 kg)
Dimensions	Width: 17.0 in. (432 mm) Depth: 16.3 in. (415 mm) Height: 3.5 in. (88 mm)				
Shipping Weight	24.6 lb (11.2 kg)	25.5 lb (11.6 kg)	30.8 lb (14 kg)	30.8 lb (14 kg)	34.5 lb (15.7 kg)

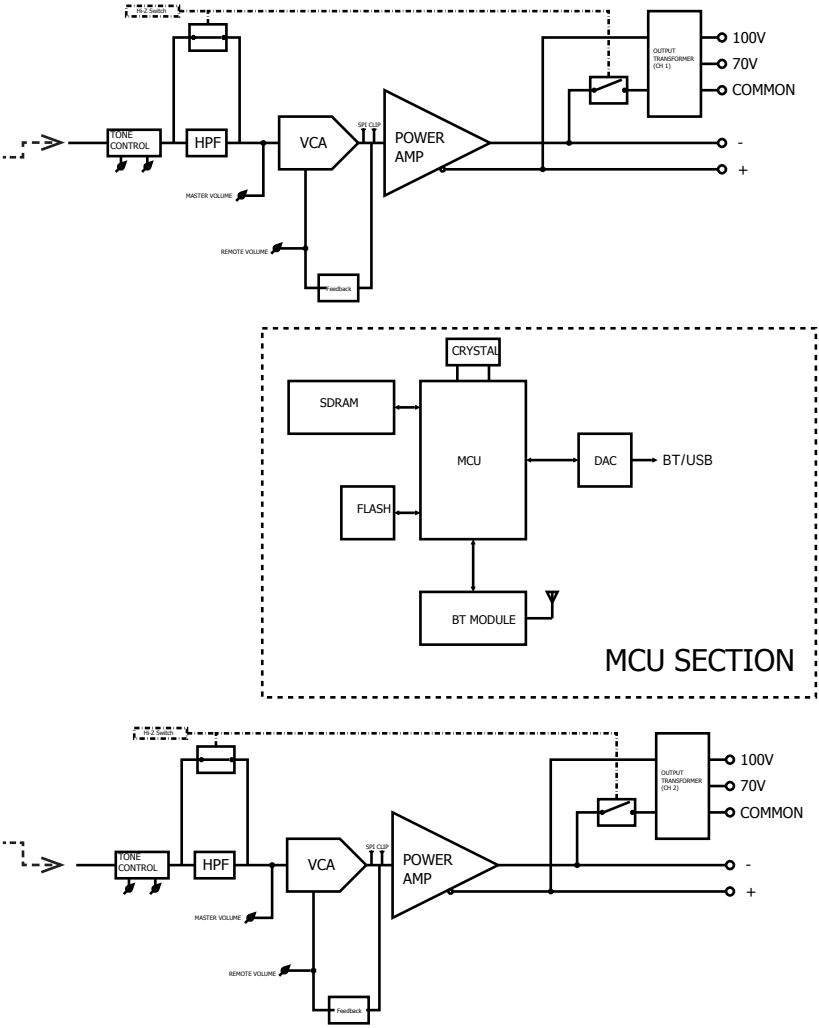
Note: *For AC power draw and thermal dissipation information, please visit our website.* www.jblcommercialproducts.com

Appendix B: Block Diagrams

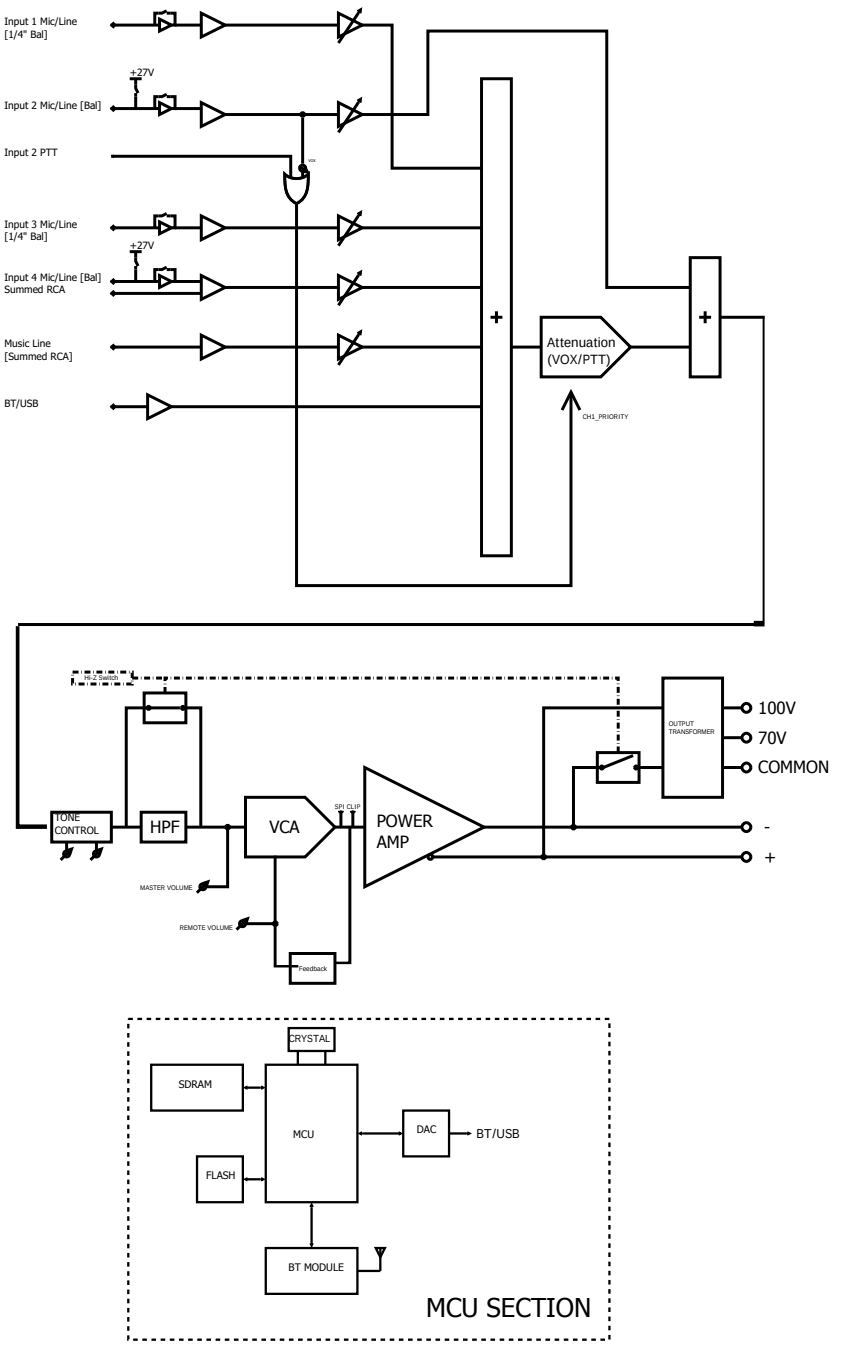
VMA260 & VMA2120



VMA260 & VMA2120 Continued



VMA160, VMA1120 & VMA1240



Appendix C: Contact Information

For additional information, please consult JBL Professional Customer Service, your system installer or retailer.