KRAMER ELECTRONICS, Ltd.

USER MANUAL

Video/Audio Distribution Amplifiers

Models:

VM-80V
VM-10AN

<u>IMPORTANT</u>: Before proceeding, please read paragraph entitled "Unpacking and Contents"

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1. INTRODUCTION

1.1 Congratulations on your purchase of this Kramer Electronics amplifier. Since 1981 Kramer has been dedicated to the development and manufacture of high quality video/audio equipment. The Kramer line has become an integral part of many of the best production and presentation facilities around the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better. Kramer's line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to the Kramer line of high quality amplifiers, such as the one you have just purchased, Kramer also offers a full line of high quality switchers, processors, interfaces, controllers and computer-related products. This manual includes configuration, operation and option information for the VM-80V and VM-10AN distribution amplifiers.

1.2 A Word On Distribution Amplifiers

Distribution amplifiers are used to distribute one source to several acceptors for simultaneous recording or monitoring of one source, with no discernible signal degradation. They vary in the number of inputs, looping capability, programming capability, number of outputs, operating format, bandwidth and input/output coupling. A good quality distribution amplifier amplifies the incoming signal, pre-compensates the signal for potential losses (resulting from the use of long cables, noisy source, etc.) and generates several identical buffered and amplified outputs.

1.3 Factors Affecting Quality of Results

There are many factors affecting the quality of results when signals are transmitted from a source to an acceptor:
Connection cables - Low quality cables are susceptible to interference; they degrade signal quality due to poor matching and cause elevated noise levels. They should therefore be of the best quality.
Sockets and connectors of the sources and acceptors - So often ignored, they should be of highest quality, since "Zero Ohm" connection resistance is the target. Sockets and connectors also must match the required impedance (75 ohms in video). Cheap, low quality connectors tend to rust, thus causing flaws in the signal path.
Amplifying circuitry - Must have quality performance when the desired end result is high linearity, low distortion and low noise operation.
Distance between sources and acceptors - Plays a major role in the final result. For long distances (over 15 meters) between sources and acceptors, special measures should be taken in order to avoid cable losses. These include using higher quality cables or adding line amplifiers.
Interference from neighboring electrical appliances - These can have an adverse effect on signal quality. Balanced audio lines are less prone to interference, but unbalanced audio should be installed far from any mains power cables, electric motors, transmitters, etc. even when the cables are shielded.

2. SPECIFICATIONS

	VM-80V	VM-10AN
Function	1:8 Video Distribution Amplifier	1:10 AV Distribution Amplifier
Inputs Type	2 Composite/single component video 1Vpp/75ohm on BNCs with termination switches	1 video looping, 1Vpp/75ohm on a BNC with a termination switch. 1 stereo audio 1Vpp / 50 K ohm on RCAs
Outputs	2x4 Composite/single component video 1Vpp/75ohm on BNCs	10 video, 1Vpp/75ohm on BNCs 10 stereo audio 1Vpp / 100 ohm on RCAs
Input Coupling	DC or AC (internal jumper selection)	DC/AC internally selectable
S/N Ratio	74 dB	> 89dB @ 1V (audio), >74dB (video)
Audio Bandwidth	NA	20 kHz –1dB
Video Bandwidth	>330 MHz (-3dB)	>77 MHz (-3dB)
Max video Output	2 Vpp	2.5 Vpp
Differential Gain	0.12%	0.33%
Differential Phase	0.5Deg.	0.26Deg.
Audio THD+N	NA	<0.025%
K-Factor	<0.1%	<0.05%
Dimensions (W, D, H)	22 cm x 18cm x 4.5cm 8. 7" x 7" x 1.8"	24.5 cm x 16 cm x 5cm 9.6" x 6.3" x 2"
Weight	1.3 Kg (2.9lbs) Approx.	1.8 Kg (4 lbs.) Approx.
Power Source	100 - 240VAC, 50 / 60 Hz, 10VA.	230VAC, 50Hz, (115V USA), 10.5VA.

3. HOW DO I GET STARTED?

The fastest way to get started is to take your time and do everything right the first time. Taking 15 minutes to read the manual may save you a few hours later. You don't even have to read the whole manual. If the section doesn't apply to you, you don't have to spend your time reading it.

4. UNPACKING AND CONTENTS

The items contained in your Kramer VM amplifier package are listed below. Please save the original box and packaging materials for possible future shipment of the amplifier.

- The amplifier
- AC power cable (where applicable)
- User Manual
- Rubber feet

For additional information regarding optional cables and additional accessories, contact your Kramer dealer.

4.1 Optional Accessories

The following Kramer accessories can enhance implementation of your amplifier.

- **Rack Adapter -** Used to install small machines in a standard 1U rack. One or more machines may be installed in each adapter.
- **BNC "Y" Connector -** Splits the incoming signal for looping purposes to enable connection of an additional machine.
- **SP-40** - (video/audio Processor) Serially connected between the video/audio source and the VM amplifier for video and audio processing. The machine is a high quality processor used for video control and correction in duplication and production studios, camera control, luminance and white balance correction. The SP-40 is capable of Composite to Y/C conversion and bi-directional Transcoding. The machine allows video gain control down to full fade, definition control, contrast control, color saturation control, black level control, audio mix control for mixing between the selected source and an audio AUX source, and a screen splitter control for "before-after" comparison. The unique limiter switch in the SP-40 allows true signal limiting and special effects.
- **SP-11** - (video/audio Processor) can be serially connected between the video/audio source and the VM amplifier for video and audio control/correction. The machine provides camera control and luminance/white balance correction. The SP-11 is also capable of performing composite to Y/C conversion and bi-directional transcoding. The machine allows full control over the video signal: video gain down to full fade, log or linear definition control, log or linear contrast control, color saturation control, black level control, red, green and blue controls and a screen splitter control for "before-after" comparison. The Input switch control is "audio-follow-video".
- **104L** - (video Line Amplifier) Serially connected between the video source and the VM amplifier, the machine is used for video line amplification and cable compensation, video field work and SDI signal distribution. Signal loss and the resulting depreciation in picture quality is a real problem in any video setup requiring considerable distance between video source and acceptors. The KRAMER 104L video Line Amplifier, one of the KRAMER TOOLS, is a high quality amplifier, which prevents video signal losses over long cables. For best results the 104L amplifier is installed adjacent to the video source. The 104L is housed in the compact KRAMER TOOLS enclosure and is fed by a 12VDC source. High bandwidth and front accessible controls make it suitable for the most demanding analog and SDI studio applications.
- **VM-9YC** - (video/audio Line Amplifier) Serially connected between the video/audio source and the VM amplifier, the machine is a high quality video/stereo amplifier which compensates for video and audio signal losses when long cables are used. In any video/audio setup requiring considerable distances between video/audio source and acceptors, signal loss and thus depreciation in the quality of both picture and sound is a real problem. To prevent this phenomenon, a VM-9S amplifier is installed adjacent to the video/audio source.

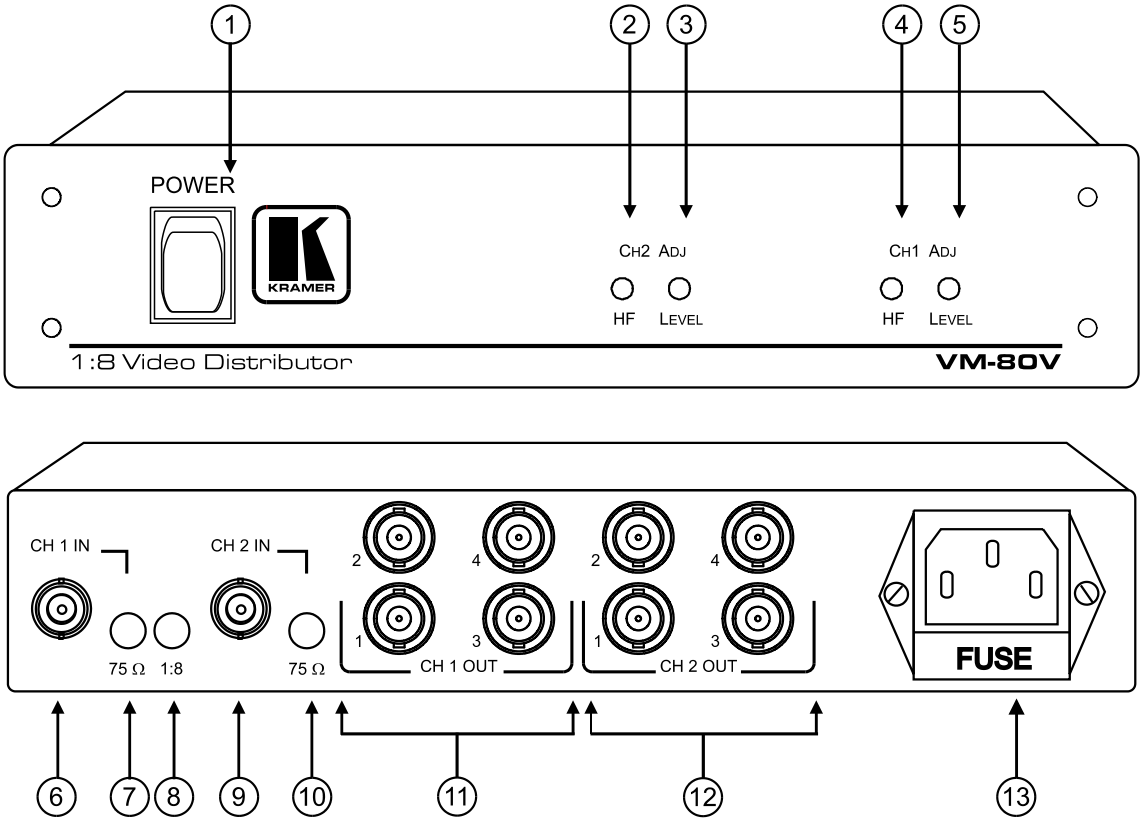
- **VS-4E** - (A precision mechanical 4x4 video/audio switcher) Several video/audio sources may be connected to its inputs for switching. The machine may be used in every application where easy and fast video and audio source selection is needed and for high isolation between inputs. All unselected inputs are internally terminated with 75-Ohm resistors. The VS-4E switches video, SDI and any other high frequency signals. The VS-4E is housed in a small enclosure, occupying very little desk space.
- **VS-81AV** - (A precision mechanical 8x1 video/stereo audio switcher) Several video/audio sources may be connected to its inputs for switching. The machine offers fast and easy video/audio source and acceptor selection. The VS-81AV provides high isolation between inputs and outputs and all unselected video inputs are internally terminated with 75-Ohm resistors. The VS-81AV is housed in a professional 19" rack mountable enclosure.
- **VS-801xl**- (8:1 Composite or Single Component video & unbalanced audio switcher) Several video/audio sources may be connected to its inputs for switching. The machine provides truly effortless switching between eight video and unbalanced audio inputs and one output. Switching is done during vertical interval, either of source #1 or of the video available on the external sync socket. The switcher may be controlled by touch buttons or by contact closure via a remote socket on the back of the machine. Video signal bandwidth is 225 MHz (typical), allowing the machine to be used in the most demanding applications.
- **TP-1** (video Line Transmitter) If a DA output is sent over a distance of 100 meters or more, it is necessary to convert the signal to twisted pair type. The TP-1 sends a color video signal over long distances using telephone wire or any other twisted pair wire thus extending the range of operation of a DA. The TP-1 maintains the bandwidth of an industrial color video signal up to several hundred meters and of broadcast quality (up to 12 MHz) signals up to 100 meters. At shorter distances, as in a studio, bandwidth of 30MHz is easily achieved. By using the KRAMER TP-1 together with the TP-2 (video Line Receiver) coax wiring (in a studio, for example) can be completely eliminated. The TP-1 can also be used for simplification of security and CCTV installations, and for teleconferencing in offices and hospitals using existing unused intercom or telephone wiring.
- **VA-11 -** (video/audio Combiner) Used to distribute video/audio signals. The machine can be inserted in front of a DA, allowing the DA to distribute a video signal and two audio signals simultaneously. It sends a color video signal and a stereo audio signal in real time using only one standard coax cable. The machine maintains the bandwidth of an industrial color video signal and the output signal may be viewed and recorded as a normal video signal. By using the VA-11 together with the VA-12 (video/audio Separator) the audio stereo signal may be recovered so audio signals may be sent in a hidden mode, to be recovered only by the VA-12. The VA-11 can be used for simplification of security and CCTV installations, using existing video coax wiring for video and audio transmissions.
- **611T/611R -** (611T Fiber Optic Transmitter and 611R Fiber Optic Receiver) Part of the KRAMER TOOLS series, and designed for studio and other demanding applications, these machines, in combination, may be used to send one of the distributed channels to distances of 5-25Km. The full bandwidth 611T and matching 611R use state-of-the-art fiber optic circuitry and allow the user (via rear panel trimmers) to adjust input and output video levels and high frequency peaking to achieve best performance.
- **VIDEO TESTER** - A new, unique, patented, indispensable tool for the video professional, the Video Tester is used to test a video path leading to/from an amplifier. By pressing only one touch switch it can trace missing signals, distinguish between good and jittery (VCR sourced) signals, and identify the presence of good signals. Whenever a video signal is missing, because of bad connections, cable breaks or faulty sources, the Video Tester is all you need.

5. VM SERIES AMPLIFIERS

This section describes all the controls and connections of your amplifier. Understanding the controls and connections helps you realize its full power.

5.1 Getting To Know Your VM-80V

The Kramer **VM-80V** is a broadcast quality distribution amplifier designed primarily for composite video signals on BNC connectors. Using a simple rear panel switch, it can be configured either as a single 1:8 DA, or as two separate 1:4s. In either mode its purpose is to provide identical outputs to drive multiple monitors, projectors or other receiving devices. Bandwidth exceeding 330MHz ensures transparent performance, even with high-resolution analog and SDI (serial digital) video signals. The inputs can be un-terminated to provide looping capability, making it easy to create larger systems. The **VM-80A** is the companion unit for distributing balanced audio signals. Two sets of recessed front panel controls are provided for fine-tuning of gain and high frequency EQ. The **VM-80V** is housed in a rugged, professional half-rack enclosure with an internal power supply connected by a standard, detachable AC power cord. Two "**80**" series products can be mounted in one vertical rack space using the **RK-80** kit. Front/Rear panel features of the **VM-80V** are described in Figure 1 and Table 1.



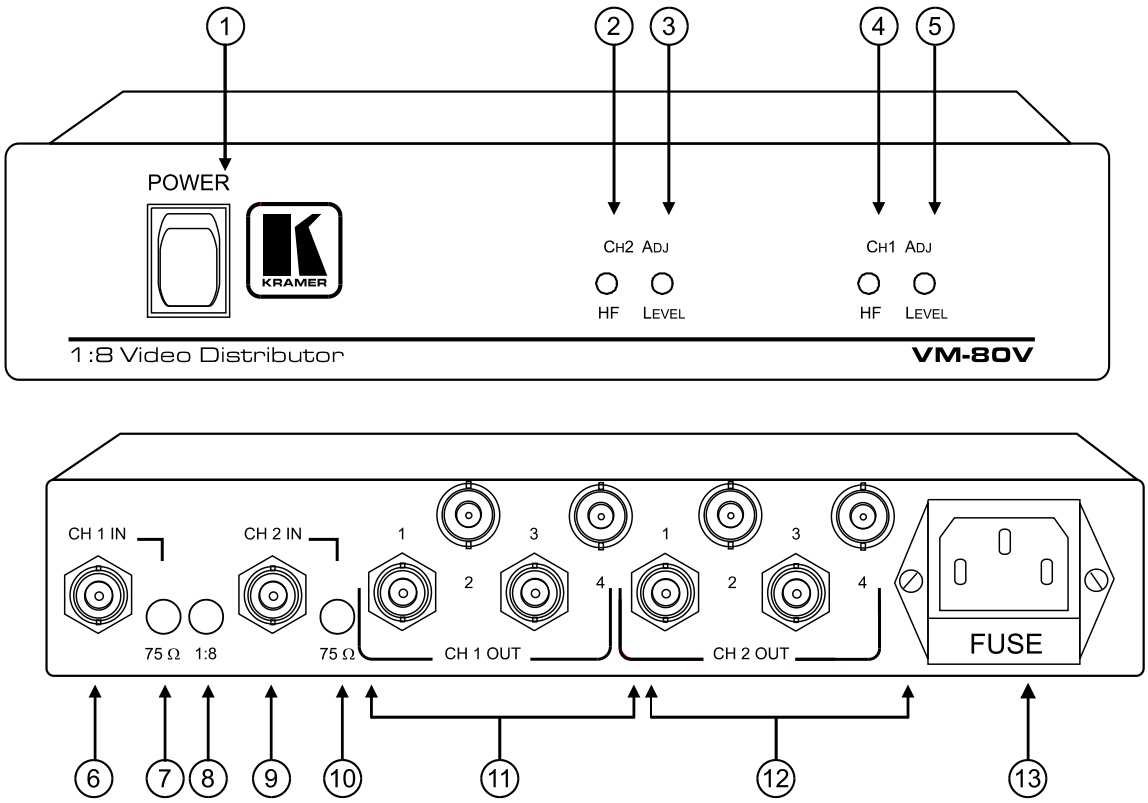


Figure 1: VM-80V Front/Rear Panel Features

Table 1: VM-80V Front/Rear Panel Features

No.	Feature	Function
1.	**POWER** - Illuminated power switch (on front panel)	Supplies power to the unit.
2.	**HF (CHANNEL 2)**	Cable compensation adjustment for output set 2.
3.	**LEVEL (CHANNEL 2)**	Video level control for output set 2.
4.	**HF (CHANNEL 1)**	Cable compensation adjustment for output set 1.
5.	**LEVEL (CHANNEL 1)**	Video level control for output set 1.
6.	**Channel 1 INPUT**	Video input BNC for channel 1
7.	**75 Ω**	Termination switch for channel 1 (pressed = 75 ohm)
8.	**1:8 Selector Switch**	Mode selector switch (pressed = 1:8 operation)
9.	**Channel 2 INPUT**	Video input BNC for channel 2
10.	**75 Ω**	Termination switch for channel 2 (pressed = 75 ohm)
11.	**Channel 1 OUT**	4 buffered and amplified outputs on BNCs.
12.	**Channel 2 OUT**	4 buffered and amplified outputs on BNCs.
13.	**Power connector**	A 3-prong AC connector allows power to be supplied to the unit. Directly underneath this connector, a fuse holder houses the appropriate fuse.

5.2 Getting To Know Your VM-10AN Amplifier

The Kramer **VM-10AN** is a compact, high quality 1:10 distribution amplifier using BNC connectors for composite video, and RCA connectors for stereo audio signals. It accepts one set of inputs, provides correct buffering and isolation, and distributes it to up to ten identical outputs designed to drive monitors, projectors, and other receiving devices. Bandwidth exceeding 70MHz ensures transparent performance with typical video and audio sources. Looping inputs make it easy to expand to larger distribution systems.
The **VM-10AN** can also be mounted in a standard 19" rack using the **RK-10** kit, which holds one unit in two vertical spaces. Front/Rear panel features of the **VM-10AN** are described in Figure 2 and Table 2.

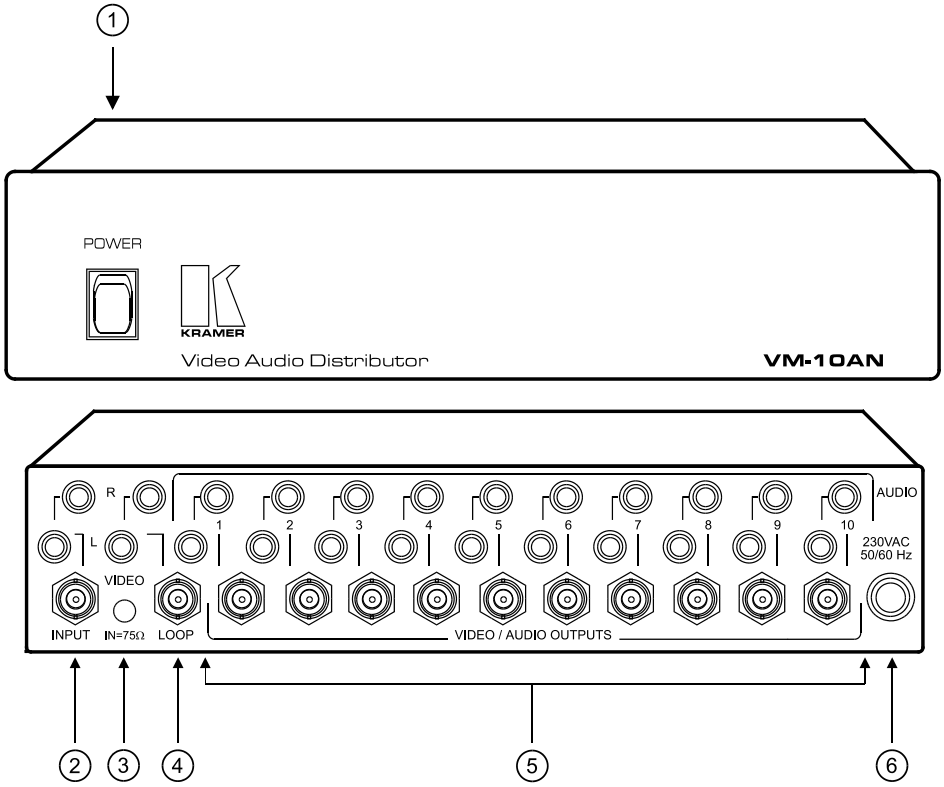


Figure 2: VM-10AN Front/Rear Panel Features

Table 2: VM-10AN Front/Rear Panel Features

No.	Feature	Function
1.	**POWER** - Illuminated power switch (on front panel)	Supplies power to the unit.
2.	**INPUT**	Video and audio inputs
3.	**TERMINATION** pushbutton	Selects **"75ohm"** or **"HI-z"** impedance (pressed=75ohm**).** For looping select **"Hi-z"**.
4.	**LOOP**	Video and audio loop connectors.
5.	**VIDEO AUDIO OUTPUTS**	10 amplified and buffered video and audio stereo outputs.
6.	Power connector	A 3-prong power cord allows power to be supplied to the unit.

6. INSTALLATION

The amplifier is provided with four rubber feet packed in a separate bag. Fit the feet to the unit, place it on the table remote from heat generating sources and make the required connections. Use a rack adapter in case a rack installation is required (see section 4.1 "Rack Adapters"), in which case do not attach the feet.

7. CONNECTING TO VIDEO DEVICES

Video sources and output devices (such as amplifiers or recorders) may be connected to the amplifier through the BNC connectors located at the back of the machine. Please keep in mind that the output signal format must match that of the input signal format.

8. CONNECTING TO AUDIO DEVICES

Audio sources and output devices (such as amplifiers or recorders) may be connected to the amplifier through the RCA type connectors (VM-10AN) located at the back of the machines.

9. USING THE VM VIDEO/AUDIO AMPLIFIERS

9.1 Turning On The Amplifier

NOTES

1. Amplifier should only be turned on after all connections are completed and all source devices have been turned on. Do not attempt to connect or disconnect any video, audio or control signals to the amplifier while it is turned on!

2. The socket-outlet should be near the equipment and should be easily accessible. To fully disconnect equipment, remove power cord from its socket.

1) Press the toggle switch on the far-left front panel to the up position. In the up position, the toggle switch glows, and the active input button illuminates as well.
2) Operate the sources and acceptors.

9.2 Looping

The looping function enables the operator to extend the number of outputs per input. The following example describes looping performed by using 3 amplifiers with one input and 5 outputs each: A video signal reaches input of amplifier No. 1. From looping connector of amplifier No. 1 a cable is connected to input socket of amplifier No. 2. The loop output of amplifier No. 2 is connected to the input socket of amplifier No. 3. In this way the input signal is divided into 15 separate output signals. The operator must always switch the termination switch of all the amplifiers but the last to "**Hi-z**". The **last** amplifier's termination switch should always be at "**75ohm**" to maintain well-matched video line (of 75ohm impedance) from first to last amplifier. Note that if looping function is not used, the termination switch should be set to "**75 ohm**".

9.3 Coupling

The coupling function enables the operator to determine whether the incoming video signal is DC or AC coupled. When DC coupling is selected and proper standard video signal is applied to the amplifier's input, the output signal is equal to the input signal. When AC coupling is selected, DC components of the incoming signal are removed. DC coupling is in general preferable, at it allows full signal transparency. AC coupling in some occasions might cause some linearity distortions in low and high frequencies (due to undesirable behavior of capacitors). However, a problem may arise when the incoming signal is riding on a large DC offset level, especially when the acceptors are highly effected by deviation of DC offsets (A to D converters, LCD monitors etc.), which in turn results in a distorted picture. For these cases AC coupling should be selected.

9.4 Coupling Selection

The **VM-80V** and the **VM-10AN** come from the factory with DC coupling. Selecting AC Coupling is performed by removing the internal jumper. To remove jumper, perform the following steps:

1) Disconnect the machine from the mains supply by removing the power cord from the wall outlet.
2) Using a Philips screwdriver, remove the screws from the cover and remove the cover.
3) Locate the internal jumper on the internal printed board near the input sockets and remove it.
4) Reinstall the cover.

9.5 Operating the VM-80V

- Connect a cable from the video sources to the input sockets of the **VM-80V**.
- If a 1:8 operation is needed, press the rear button marked 1:8.
- If looping is needed, release the rear termination switch. If looping is not needed, press the switch in to the 75-Ohm position. If 1:8 operation is selected, one of the termination switches should always be in "Hi-Z" state (released) and the other according to looping requirements.
- Connect up to 8 acceptors to the OUTPUT sockets.
- Adjust, if necessary, the trimmers on the front panel of the machine to achieve best results.
- Connect a mains power source to the socket on the rear panel of the **VM-80V**.
- Operate source, acceptors and the **VM-80V** machine.

9.6 Operating the VM-10AN

- Connect a video cable from the video source to the video input socket of the VM-10AN and an audio-stereo cable from the source to the Right and Left Audio inputs sockets.
- If looping is needed, release the rear termination switch. If looping is not needed, press the switch in to the 75-Ohm position.
- Connect up to 10 Video / Audio stereo acceptors to the OUTPUT sockets.
- Connect the machine to a mains power source with its power cord.
- Operate source, acceptors and the **VM-10AN** machine.

10. TAKING CARE OF YOUR AMPLIFIER

Do not locate your amplifier in an environment where it is susceptible to dust or moisture. These may damage the electronics, and cause erratic operation or failure. Do not locate your amplifier where temperature and humidity may be excessive. Do not clean your amplifier with abrasives or strong cleaners. Doing so may remove or damage the finish, or may allow moisture to build up. Take care not to allow dust or particles to build up inside unused or open connectors.

11. TROUBLESHOOTING

NOTES

1. Please note that if the output signal is disturbed or interrupted by very strong external electromagnetic interference, it should return and stabilize when such interference ends. If not, turn the power switch off and on again to reset the machine.

2. If the following recommended actions still do not result in satisfactory operation, please consult your KRAMER Dealer.

11.1 Power And Indicators

Problem	Remedy
No Power	1. Confirm that the rocker switch is in the "ON" position, and that the light is illuminated. 2. Confirm that power connections are secured at the amplifier and at the receptacle. Make sure the receptacle is active, outputting the proper mains voltage. ➢ **For model VM-80V perform the following:** Remove power cord from AC outlet and the machine and then using a flat head screwdriver, remove fuse holder located directly below the power connector on your amplifier. Confirm that the fuse is good by looking for the wire connected between the ends of the fuse. If the wire is broken, replace the fuse with another, with the same rating. ➢ **For model VM-10AN perform the following:** Remove the power cord from the AC outlet and then using a philips screwdriver, carefully remove the cover of the machine. Locate the fuse near the power socket on the printed circuit board. Confirm that the fuse is good by looking for the wire connected between the ends of the fuse. If the wire is broken, replace the fuse with another, with the same rating. Reinstall the cover of the machine.

11.2 Audio Signal

(VM-10AN Only)

Problem	Remedy
No audio at the output device, Regardless of Input Selected	1. Confirm that your sources and output device are turned on and connected properly. Audio signals connected to the input of your amplifier should be properly wired to the output of your source. Audio signals connected to the output of your amplifier should be properly wired to the input of your amplifier or recorder. 2. Confirm that any other amplifiers in the signal path have the proper input and/or output selected. Pay special attention to input amplifiers that may be built into your amplifier or recording device.
Audio level is too low	1. Confirm that the connecting cables are of high quality and properly built. Take special care in noting the wiring configuration of balanced to unbalanced cables. 2. Check level controls located on your source input device or output device.

11.3 Video Signal

(VM-80V, VM-10AN)

Problem	Remedy
No video at the output device, regardless of input selected	1. Confirm that your sources and output device are turned on and connected properly. Video signals connected to the input of your amplifier should be of an identical signal format at the output of your source. Video signals at the output of your amplifier should be of an identical signal format as at the input of your display or recorder. 2. Confirm that any other amplifiers in the signal path have the proper input and/or output selected. 3. Use the Video Tester to test the video path leading to/from your amplifier (see section 4.1 " Video Tester")
Video level is too high or too low	1. The amplifiers in this manual have termination switches on each input. Verify that the video line is well interfaced through 75ohm impedance; otherwise it results in a video level that is too high or too low. Check if looping is used and if termination switch is in the proper position for this state. 2. Confirm that the connecting cables are of high quality, properly built and terminated with 75ohm BNC connectors. Check level controls located on your source input device or output device. 3. Adjust (**VM-80V**), *only if necessary*, video output levels using the front panel trimmers. Bear in mind that the machine was fine-tuned at the factory for transparent operation, and unnecessarily adjusting the trimmers will upset this transparency.
Noise bars "roll" up or down in the output image or: Low frequency hum in the output signal	Hum bars (ground loop) are caused by a difference in the ground potential of any two or more devices connected to your signal path. Passing that voltage difference through any available interconnection, including your video cables, compensates this difference. **WARNING**! ***Do not disconnect the ground from any piece of video equipment in your signal path!*** Check the following to remove hum bars: 1. Confirm that all interconnected equipment is connected to the same phase of power. 2. Remove equipment connected to this phase that may be introducing noise, such as motors, generators, etc. 3. Disconnect all cables and reconnect them one at a time until ground loop reappears. Disconnect the affected cable and replace, or insert an isolation device (opto isolator or transformer) in the signal path.

LIMITED WARRANTY

Kramer Electronics (hereafter Kramer) warrants this product to be free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three year from the date of the first customer purchase.

WHO IS PROTECTED

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1) Any product which is not distributed by Kramer or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site **www.kramerelectronics.com**.
2) Any product, on which the serial number has been defaced, modified or removed.
3) Damage, deterioration or malfunction resulting from:
    a) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature, unauthorized
    b) product modification, or failure to follow instructions supplied with the product.
    c) Repair or attempted repair by anyone not authorized by Kramer.
    d) Any shipment of the product (claims must be presented to the carrier).
    e) Removal or installation of the product.
    f) Any other cause, which does not relate to a product defect.
    g) Cartons, equipment enclosures, cables or accessories used in conjunction with the product.

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1) Removal or installations charges.
2) Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3) Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1) To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2) Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3) For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

Kramer's liability for any defective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1) Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or
2) Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

NOTICE

This equipment has been tested to determine compliance with the requirements of:

EN-50081: "Electromagnetic compatibility (EMC);
generic emission standard.
Part 1: Residential, commercial and light industry"

EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".

CFR-47 FCC Rules and Regulations:
Part 15- "Radio frequency devices:
Subpart B- Unintentional radiators

CAUTION

- Servicing of the above mentioned machines is only allowed to a Kramer authorized technician or Engineer. Any user who makes changes or modifications to the unit without the express approval of the manufacturer will void user authority to operate the equipment.
- Use the DC power supply (provided) to supply power to the machine and controllers.
- Please use recommended interconnect cables to connect the machine to controllers and other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found. We welcome your questions, comments and feedback.

Caution

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

P/N: 2900-001007 Rev: 4

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-001007 REV 4