



Kramer Electronics, Ltd.

USER MANUAL

Line Amplifiers

Models: VM-9S, VM-9YC

and

Kramer Tools Models: 103YC, 104L

**IMPORTANT: Before proceeding, please read paragraph entitled
"Unpacking and Contents"**

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1 INTRODUCTION

Congratulations on your purchase of this Kramer Electronics line 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 line amplifiers, such as the one you have just purchased, Kramer also offers a full line of high quality distribution amplifiers, switchers, processors, interfaces, controllers and computer-related products. This manual includes configuration, operation and information for the following products from Kramer. Kramer line amplifiers are all are similar in operation and features.

VM-9S - Video/Audio Amplifier	103YC - YC Line Amplifier
VM-9YC - Y/C Line Amplifier	104L - Video Line Amplifier

1.1 A Word on Line Amplifiers

Line Amplifiers are usually used when video or audio units are connected via long cables. Due to imperfections and stray capacitance, video cables degrade signal quality, causing image "smear", fine detail loss and color distortion. No special care is needed for Composite video signals when using good cables, up to 10 or 15 meters. Beyond this distance, in order to avoid potential losses, a line amplifier should be used. Kramer's line amplifiers may be used up to distances of 300m when using good quality cables. If a longer distance is needed, then either another amplifier may be inserted in series, at the far end - effectively doubling the range - or a different solution is needed. Other solutions are twisted-pair cable solutions and, if longer distances are needed (5-25 km), then the optic-fiber solution is the preferred one. The line amplifiers are equipped with controls for signal level compensation (linear amplification) and for fine detail loss and distortion - cable compensation (Equalization), which null out the adverse effects of the cables. When a Y/C (s-Video) signal is involved, other problems can arise. Due to the nature of the Y/C signal, which travels on two wires: one carrying the black and white and the sync information (Luminance or "Y") and the other carrying the color information (Chrominance or "C") signal handling is more complicated. The Luminance channel may be treated as Composite video in the sense of signal loss and fine detail degradation, but the Chrominance signal, besides level deterioration, may suffer from additional problems. The Chrominance information may get phase shifted or delayed more or less than the Luminance information, resulting in an image with incorrect tint and/or a image at the end of the line with its color misprinted. As the Y/C signal is usually used for short distance operations, it uses a dual, thin, low quality cable. Therefore, a line amplifier for Y/C is necessary when distances above 5-7 meters are involved. For distances beyond 25 meters, it is highly recommended to use two discrete coax cables (RG-59 or similar) of precisely the same length.

The basic rule in effectively using a line amplifier is to install it as close as possible to the signal source and not to the acceptor side. (If the amplifier is installed close to the acceptor (the remote location) then all the noise accumulated along the cable will be amplified with the signal).

1.2 Factors Affecting Quality of Results

Many factors affect 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 objective. Sockets and connectors should also match the required impedance (75ohm 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 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-9S	VM-9YC	103YC	104L
Configuration	1:2	1:2	1:3	1:4
Input	1 video, 1Vpp/75 ohm on a BNC looping with a termination switch 1 stereo audio, 1Vpp/25kohm. on RCAs, looping	1 Y/C, 1Vpp/75 ohm. (Y) 0.3Vpp/75ohm (C) on a 4P connector looping with termination switch	1 Y/C, 1Vpp/75 ohm. (Y) 0.3Vpp/75ohm (C) on a 4P connector	1 video, 1Vpp/75 ohm on a BNC
Outputs	2 video, 1Vpp/75ohm on BNCs. 2 stereo audio 1Vpp/100ohm on RCAs	2 Y/C, 1Vpp/75ohm. (Y). 0.3Vpp/75ohm (C) 1 on a 4P connector. 1 on BNCs	3 Y/C, 1Vpp/75ohm. (Y), 0.3Vpp/75ohm (C) on 4P connectors	4 video, 1Vpp/75ohm on BNCs
Output Coupling	DC (video) AC (audio)	DC (Y), AC (C)	AC	AC
S/N Ratio	74dB	77dB	>80dB	76dB
Video Bandwidth	84MHz, -3dB	"Y": 320MHz, -3dB	("Y"): 430MHz, -3dB	420MHz, ±3dB
Audio Bandwidth	25kHz, -1dB	NA	NA	NA
Differential Gain	0.2%	0.07%	0.03%	0.16%
Differential Phase	0.5Deg.	0.05Deg.	0.03Deg	0.08Deg
K-Factor	<0.05%	<0.05%	<0.05%	<0.05%
THD (1kHz)	<0.03%	NA	NA	NA
Max. Video Output	2Vpp	2Vpp	2.5Vpp	1.9Vpp
Level Control	0 to 8dB (audio and video)	-0.6dB to 4.1dB (Y and C levels). -25 to +90Deg. (C phase)	-0.8dB to 6dB (Y), 0.9dB to 9.5dB (Y EQ. @ 5.8MHz); -0.5dB to 4.3dB (C level).	Level: -0.8 to 6dB: HF (EQ., cable compensation) 0 to 7.7dB @ 4.43MHz Chroma SC
Dimensions (W, D, H)	24.5 x 18 x 4.5 (cm) 9.6" x 7" x 1.8"	22 x 18 x 4.5 (cm) 8.7" x 7" x 1.8"	12 x 7.5 x 2.5 (cm) 4.7" x 2.9" x 0.98"	12 x 7.5 x 2.5 (cm) 4.7" x 2.9" x 0.98"
Weight	1.2kg (2.6lbs)	1.3kg (2.9lbs)	0.3kg. (0.7 lbs.) Approx.	0.3kg. (0.7lbs.) Approx.
Power Source	230 VAC, 50/60 Hz (115VAC U.S.A.) 3.5VA	230 VAC, 50/60 Hz (115VAC U.S.A.) 5.1VA	12VDC, 40mA	12VDC, 30mA



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 a 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 Line Amplifier package are listed below. Please save the original box and packaging materials for possible future transportation and shipment.

- Line Amplifier
- AC power cable (where applicable) or 12VDC power supply
- User Manual
- Kramer concise product catalog
- 2 mounting brackets (Kramer Tools only)
- 4 rubber feet

4.1 Optional Accessories

The following Kramer accessories can enhance implementation of your amplifier. For additional information regarding optional cables and additional accessories, contact your Kramer dealer.

- **Rack Adapter** - Used to install smaller size machines in a standard 1U rack. One or more machines may be installed on each adapter.
- **BNC "Y" Connector** - Used for looping purposes and splits the incoming signal to enable connection of an additional machine.
- **Termination Plug** - Used to terminate the line to 75ohm for proper matching.
- **VS-5x4** - (5x4 Video/ Stereo Audio Matrix Switcher) can be serially connected between sources and VM amplifiers for video and audio input switching. The VS-5x4 may also be used as one 1:4 or two 2:2 Y/C-video/audio DAs or any other combination as well. The VS-5x4 switches during the Vertical Interval for smooth transitions between genlocked sources. The machine is microprocessor and RS-232 controlled (software included), and is operated by touching a keypad on the front panel. Front switches control the audio level of each output. Large illuminated seven segment LED displays show the connection status of the machine at any given moment.
- **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 LINE AMPLIFIERS

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

5.1 Getting to Know Your VM-9S Amplifier

The KRAMER VM-9S Video/Audio Line Amplifier is a high quality 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. The line amplifier may also be used as a 1:2 video/stereo audio (compensated) distributor. Front/rear panel features of the VM-9S are described in Figure 1 and Table 1.

NOTE

For operation instructions refer to section 9.

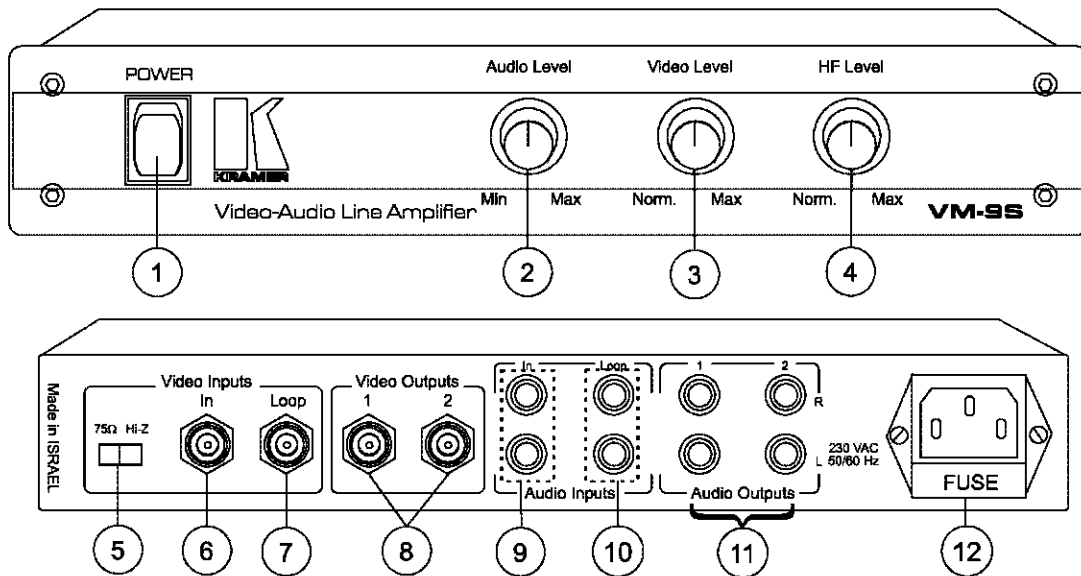


Figure 1: VM-9S Front/Rear Panel Features

Table 1: VM-9S Front/Rear Panel Features

No.	Feature	Function
1.	Illuminated POWER Switch	Supplies power to the unit.
2.	Audio Level knob	Controls audio level of the outputs.
3.	Video Level knob	Controls video level of the outputs.
4.	HF Level knob	Controls cable equalization of the video outputs.
5.	75 ohm/Hi-Z switch	Selects "75ohm" or "Hi-Z" impedance (for looping select Hi-Z).
6.	In BNC connector	Video input.
7.	Loop BNC connector	Provides video looping capability.
8.	Video Outputs 1-2 BNC connectors	2 amplified and buffered video outputs.
9.	In RCA connectors (R, L)	Audio input.
10.	Loop RCA connectors (R, L)	Provides audio looping capability.
11.	Audio Outputs 1-2 RCA connectors (R, L)	2 amplified and buffered audio outputs.
12.	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-9YC Amplifier

The KRAMER **VM-9YC** Y/C Line amplifier is a high quality amplifier which compensates for Y (Luma) and C (Chroma) signal losses when long cables are used. In any video setup requiring considerable distances between video source and acceptors, signal loss and thus depreciation in the quality of picture-becomes a real problem. The **VM-9YC** allows the user to compensate for cable losses by changing the level of the Y signal and its frequency response, as well as and the level of the C signal and its phase. The machine has a looping input with termination switch and two outputs, thus serving as a cascable 1:2 distribution amplifier. Signal bandwidth of well over 320MHz makes the **VM-9YC** suitable for the most demanding applications. It is housed in a half 19" enclosure, so two machines of that size may be installed together side by side occupying only 1U in a 19" rack. Front/Rear panel features of the **VM-9YC** are described in Figure 2 and Table 2.

NOTE

For operation instructions refer to section 9.

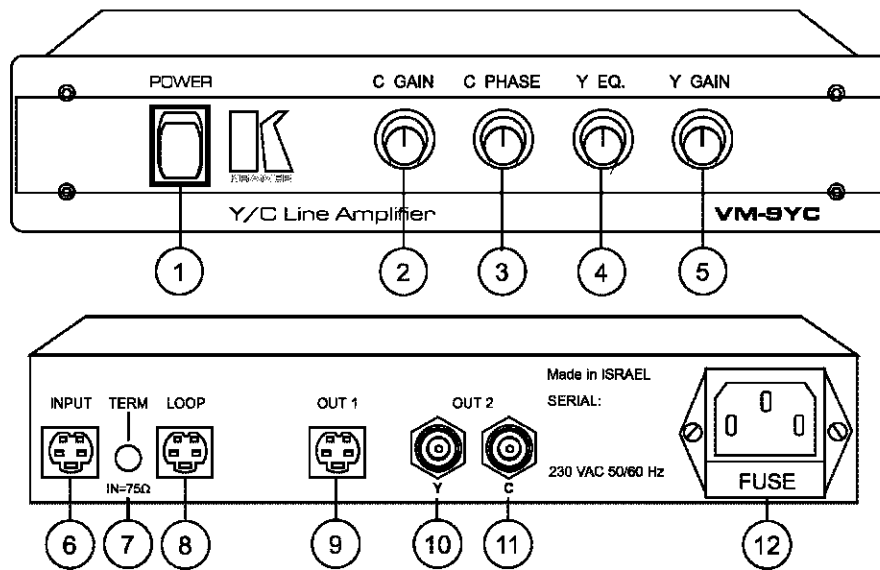


Figure 2: VM-9YC Front/Rear Panel Features

Table 2: VM-9YC Front/Rear Panel Features

No.	Feature	Function
1.	Illuminated POWER Switch	Supplies power to the unit.
2.	C GAIN knob	Controls C (Chroma) level of the outputs.
3.	C PHASE knob	Controls the phase of the C (Chroma) output signal.
4.	Y EQ. knob	Controls cable equalization of the "Y" outputs.
5.	Y GAIN knob	Controls (Luma) level of the "Y" output.
6.	INPUT 4P connector	s-Video input (YC)
7.	TERM pushbutton	Selects "75ohm" or "Hi-Z" impedance (for looping select Hi-Z).
8.	LOOP 4P connector	Provides video looping capability to increase number of outputs.
9.	OUT 1 4P connector	Y/C amplified and buffered video output.
10.	OUT 2 Y BNC connector	Amplified and buffered Y video output.
11.	OUT 2 C BNC connector	Amplified and buffered C video output.
12.	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.

5.3 Getting to Know Your 103YC line Amplifier

The Kramer 103YC is a high performance line amplifier which combines the functions of a distribution amplifier and line driver. It accepts a single S-video (Y/C) input and provides three identical buffered outputs that are affected by gain and equalization controls located on the top panel. The gain and equalization controls are designed to compensate for signal loss inherent in long cable runs. Separate overall gain controls for Y (Luma) and C (Chroma) are provided, and the EQ. control boosts the upper frequencies of the Y component most susceptible to loss. Bandwidth exceeding 430MHz ensures that the 103YC remains transparent even in the most critical applications. A 12VDC-power supply is provided for typical operation, but the optional 50P can power up to six Kramer devices requiring 12VDC. The 103YC is part of the Kramer Tools family of compact, high quality, and cost effective solutions for a variety of applications. Front panel features of the 103YC are described in Figure 3 and Table 3.

NOTE

For operation instructions refer to section 9.

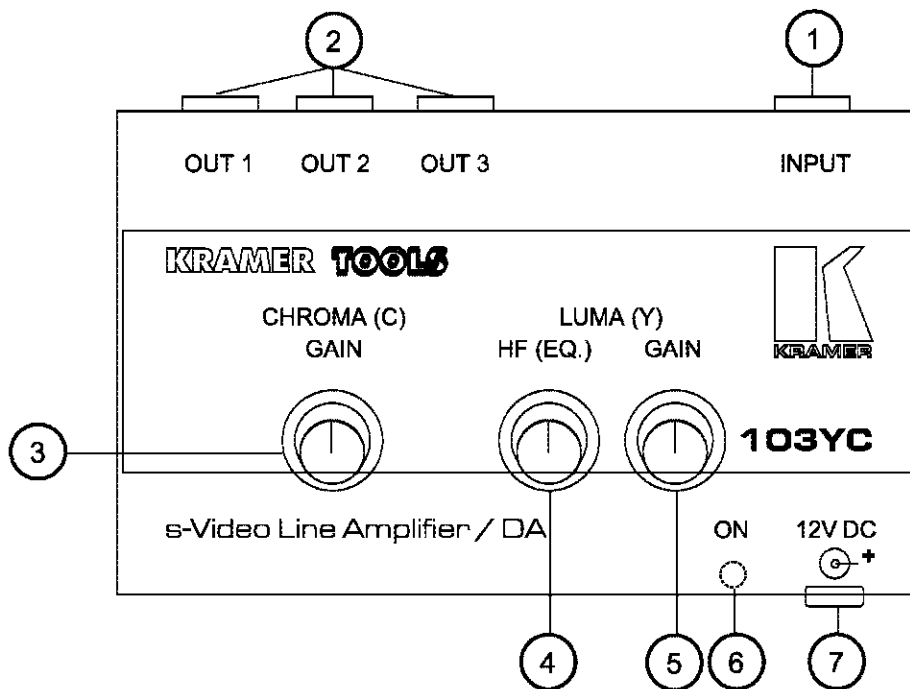


Figure 3: 103YC Front Panel Features

Table 3: 103YC Front Panel Features

No.	Feature	Function
1.	INPUT 4P connector	s-Video input (YC)
2.	OUT 1-OUT 3 4P connectors	Y/C amplified and buffered video outputs.
3.	CHROMA (C) GAIN knob	Controls C (Chroma) Level of the outputs.
4.	LUMA (Y) HF (EQ.) knob	Controls cable equalization of the video outputs.
5.	LUMA (Y) GAIN knob	Controls (Luma) Level of the "Y" output.
6.	ON Led	Indicates that the machine is powered when turns on.
7.	12V DC connector	A DC connector that allows power to be supplied to the unit.

5.4 Getting to Know Your 104L line Amplifier

The **104L** is a high performance line amplifier, which combines the functions of a distribution amplifier and line driver. It accepts a single composite video input and provides four identical buffered outputs, which are affected by gain and equalization controls located on the top panel. The gain and equalization controls are designed to compensate for signal loss inherent in long cable runs. The gain control adjusts the overall signal level, and the EQ. control boosts the upper frequencies most susceptible to loss. Bandwidth of 430MHz ensures that the **104L** remains transparent even in the most critical applications. A 12V power supply is provided for typical operation, but the optional 50P can power up to six Kramer devices requiring 12VDC. The **104L** is part of the **Kramer Tools** family of compact, high quality, and cost effective solutions for a variety of applications. Front panel features of the **104L** are described in Figure 4 and Table 4.

NOTE

For operation instructions refer to section 9.

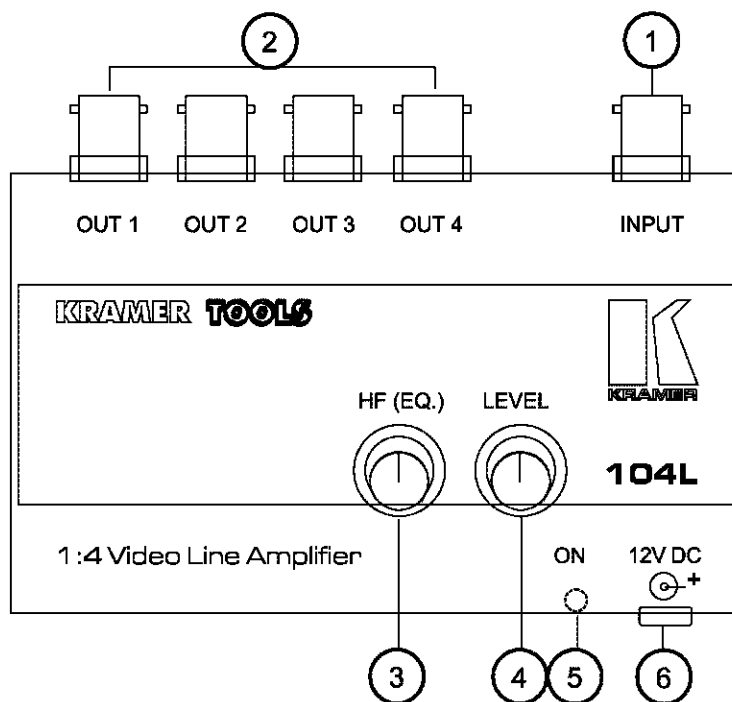


Figure 4: 104L Front Panel Features

Table 4: 104L Front Panel Features

No.	Feature	Function
1.	INPUT BNC connector	Video input.
2.	OUT 1-OUT 4 BNC connectors	Amplified and buffered video outputs.
3.	HF (EQ.) knob	Controls cable equalization of the video outputs.
4.	LEVEL knob	Controls video Level of the outputs.
5.	ON Led	Indicates that the machine is powered when turns on.
6.	12V DC connector	A DC connector that allows power to be supplied to the unit.



6 INSTALLATION

6.1 Rack/Table Mounting

The VM-9S and the VM-9YC amplifiers may be rack mounted in a standard 19" (1U) EIA rack assembly using special adapters (see section 4.1 "mechanical adapters"). These adapters allow 1 or 2 machines to be installed on each adapter, depending on the model. The 103YC and the 104L can be table mounted using the two brackets enclosed in the box or installed in rack adapters that can accommodate 3 or 8 machines. To mount any of the amplifiers into the rack, follow the instructions in the installation guide enclosed with the adapter. These devices do not require any specific spacing above or below the unit for ventilation.

7 CONNECTING TO VIDEO DEVICES

Video sources and output devices (such as monitors, projectors or recorders) may be connected to the amplifiers using the BNC or 4P type connectors located on the back of the units. Unused inputs are terminated to 75ohm, and active inputs should be terminated by the connecting source. All signal connections that use more than one cable interconnecting between devices should be of equal length.

8 CONNECTING TO AUDIO DEVICES (VM-9S only)

Audio sources and output devices (such as amplifiers or recorders) may be connected to the line amplifier using the RCA type connectors located at the back of the machine.

9 USING LINE AMPLIFIERS

As a basic rule, line amplifiers should be installed as close as possible to the source to achieve the best results. If the amplifier is located close to the acceptor, then it also amplifies all the noise accumulated along the way degrading the signal quality.

9.1 Powering on the Amplifier

NOTES

1. *The Line amplifier should only be powered on after all connections are completed and all source devices have been powered on. Do not attempt to connect or disconnect any video, audio or control signals to the amplifier while it is powered on!*
2. *The socket-outlet should be near the equipment and should be easily accessible. To fully disconnect equipment, remove the power cord from its socket.*

➤ For the VM-9S/VM-9YC only:

- 1) Press the toggle switch on the far-left of the front panel to the up position. In the up position, the toggle switch illuminates.
- 2) Operate the acceptors.

➤ For the 103YC/104L only:

- 1) Connect the DC socket to the DC source. Observe proper polarity!
- 2) Observe that the Led on the front panel is illuminated.
- 3) Operate the acceptors.

9.2 Looping (VM-9S, VM-9YC only)

The looping function enables the operator to connect several machines to a video/YC source. The operator must always switch the termination switch of the **first** and **middle** machines to "**Hi-z**". The **last** amplifier's termination switch should always be at "**75ohm**" to maintain well-matched lines (of 75ohm impedance) from the first to the last amplifier. Note that if the looping function is not used, the termination switch should be set to "**75 ohm**".



9.3 C Phase Control (VM-9YC only)

When long cables are used in any video setup, phase shift occurs due to stray capacitance and inductance as well as for other cable related reasons, resulting in signal distortion and thus depreciation in the quality of picture. The colors may be wrong and the color information may be delayed more than the black and white information, causing a "misprinted" image. The inputs and the outputs of the machine in use should match perfectly to the cables used in order to avoid all sorts of unwanted phenomena, which deteriorate the final image. The cables leading to and from the amplifier should be of the best quality and have the same length to avoid cross delay problems. It is possible to compensate for the phase (delay) problem by using the C Phase Control function of the VM-9YC. To correct the incoming video signal, adjust the **C Phase** knob until a satisfactory and true color picture is achieved.

9.4 C Gain Control (VM-9YC, 103YC only)

C Gain Control function enables the operator to control the C signal level to compensate for color loss resulting from the use of long cables. Using a non-standard or an uncalibrated video source also affects the incoming signal. To correct the incoming video signal, the **C Gain** knob is adjusted to a satisfactory level until a proper saturated picture is achieved.

9.5 HF (EQUALIZATION) Control

The HF Control function compensates for degradation of the video signal in high frequencies due to long or non-standard cables. Popular cables such as the RG-59, RG-11 or the RG-179 signal cause degradation/attenuation as shown in the following Table 5:

Table 5: Cable Degradation/Attenuation List

CABLE TYPE	LENGTH	FREQUENCY	ATTENUATION
RG-59	100 meter	10MHz	3.6dB
	100 meter	100MHz	11dB
RG-11	100 meter	10MHz	2.2dB
	100 meter	100MHz	7.5dB
RG-179	100 meter	10MHz	8dB
	100 meter	100MHz	30dB

Degradation and loss of video signal are mainly a result of stray capacitance and inductance, which occur in long cables. The longer the cables or higher the frequencies used, the worse the problem becomes, resulting in fine detail loss as well as color degradation. When RGB signals are involved (200-300MHz), degradation is even greater, leading to a total loss of sharpness at high resolution. It is possible to compensate for the problem by using the amplifier's EQ. Control. HF (EQ.) control is performed as follows: A Color Bar Generator is connected to the amplifier's input and a Waveform Monitor (or an Oscilloscope with 75ohm termination) is connected to the long cable output. A known color bar signal is applied to the amplifier's input and compared to the signal monitored at the far side. The operator adjusts the **HF** trimmer/knob until the measured output Multiburst signal matches that of the input signal.

9.6 Y GAIN Control (VM-9YC, 103YC only)

Y GAIN Control function enables the operator to control the Y signal level or compensate for losses and signal attenuations such as those caused by long cables. Using a non-standard, or an uncalibrated video source also affects the incoming signal. To correct the incoming video signal the **Y GAIN** knob is adjusted to a satisfactory level until a properly illuminated picture is achieved. It is best done using an oscilloscope or a waveform monitor (see section 9).

9.7 Audio Level Control (VM-9S only)

To adjust audio level, simply adjust the **Audio Level** knob located on the front panel, until the required audio level is achieved.

9.8 Video Level/Gain Control (VM-9S, 104L only)

The Level Control function enables the operator to control the whole composite video signal level to compensate for losses such as those caused by long cables, non-standard or uncalibrated video sources. Picture darkness is usually caused by a low video signal and at the other extreme, an excessive video level "burns" the picture. The sync signal (should be around 0.3V) may be used to check conformity of the whole video signal: If sync level is too low or too high, the incoming video signal is not within the standard level. To correct the incoming video signal, an oscilloscope should be connected to amplifier's output and the Gain/Level trimmer/knob adjusted until a satisfactory sync level and hence proper picture are achieved.

9.9 Typical Line Amplifier Setup

Figure 4 illustrates a typical setup of the line amplifiers described in this manual. Perform the following steps:

- 1) Connect the output of the video source to the inputs of a line amplifier (VM-9S in the example). Always locate the line amplifier as close as possible to the video source.
- 2) Connect the output of the line amplifier via the long cable to the input of the DA.
- 3) Use the looping option if needed (see section 9.2 for more details).
- 4) Use the controls of the line amplifier to restore proper image.

NOTE

Several line amplifiers may be cascaded to extend the range, although some picture degradation may occur, due to some noise and distortion added by the line.

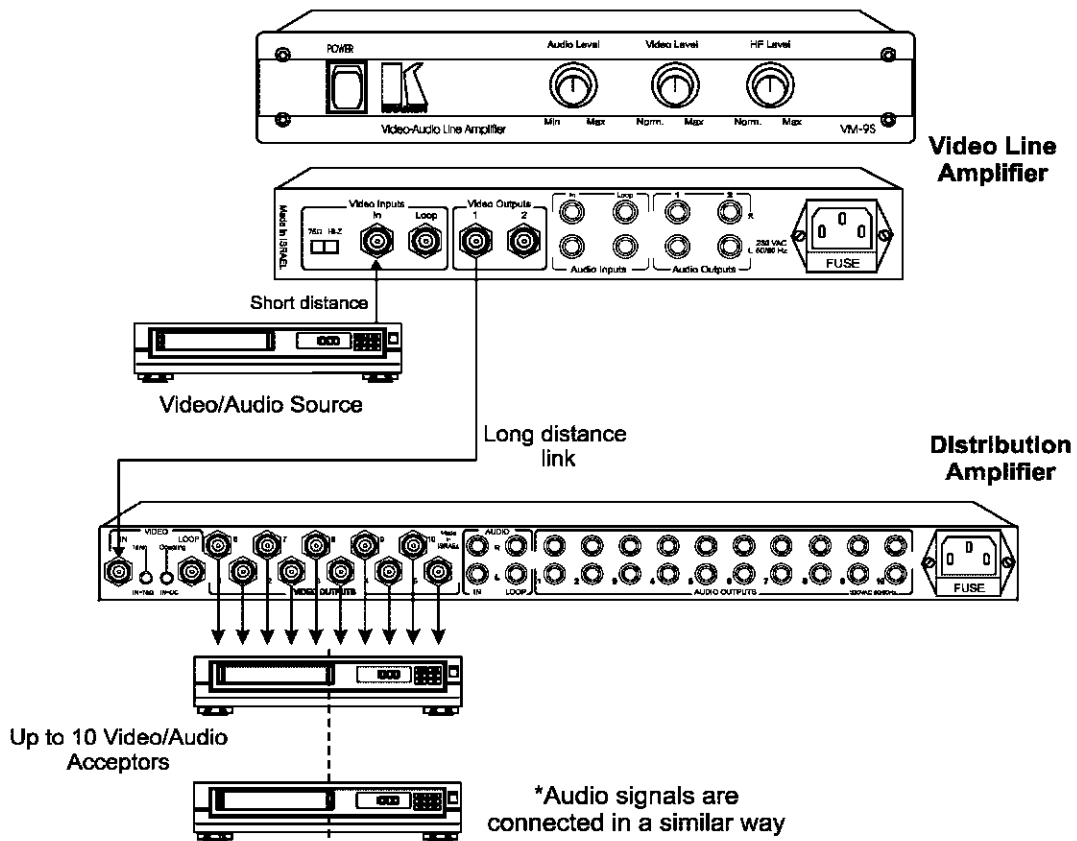


Figure 5: Typical Line Amplifier Setup

10 TAKING CARE OF YOUR LINE AMPLIFIER

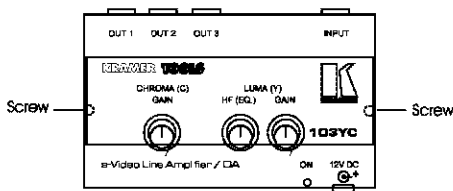
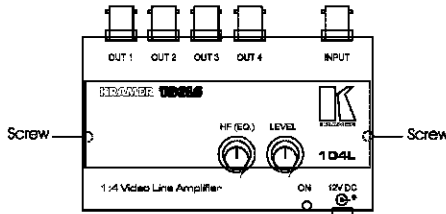
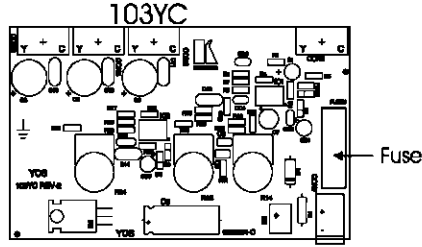
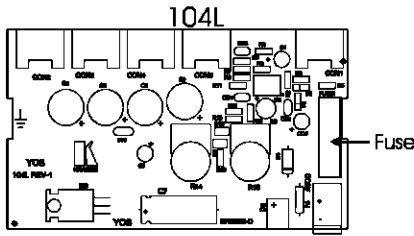
Do not locate your line amplifier in an environment where it is susceptible to dust or moisture. These may damage the electronics, and cause erratic operation or failure. Do not locate your line amplifier where temperature and humidity may be excessive. Do not clean your line amplifier with abrasives 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	<p>➤ For models VM-9S, VM-9YC, perform the following:</p> <ol style="list-style-type: none"> 1. Confirm that the rocker switch is in the "ON" position, and that the indicator lamp 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 voltage. 3. If there is still no power, check the fuse. Remove the power cord from the AC outlet and from the machine and then, using a flat head screwdriver, remove the fuse holder located directly below the power connector. Confirm that the fuse is good by looking at the wire connected to the ends of the fuse. If the wire is broken, replace the fuse with another, with the same value. <p>➤ For models 103YC, 104L, perform the following:</p> <ol style="list-style-type: none"> 1. Confirm that power connections are secured at the amplifier and at the receptacle. Make sure the receptacle is active, outputting the proper voltage. 2. If there is still no power, use a Philips screwdriver, to remove screws on both sides of the machine and release the panel. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <ol style="list-style-type: none"> 3. Locate the fuse holder inside your machine. Confirm that the fuse is good by looking at the wire connected between the ends of the fuse. If this wire is broken, replace the fuse with another, with the same rating. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <ol style="list-style-type: none"> 4. Install the front panel by replacing the screws on each side of the machine.



11.2 Video Signal

Problem	Remedy
No video at the output device	<ol style="list-style-type: none">1. Confirm that your source and output devices are powered on and connected properly. The input of your amplifier should be of an identical signal format at the output of your source. Signals at the output of your amplifier should be of an identical signal format as at the input of your display.2. Confirm that any other device in the signal path has 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 dim.	<ol style="list-style-type: none">1. Verify that the lines are well matched through 75ohm impedances; otherwise it results in a video level that is too high or too dim.2. Confirm that the connecting cables are of high quality and properly inserted.3. Check level controls located on your source input device or output display.
Noise bars "roll" up or down in the output image or: Low frequency hum in the output signal	<p>Hum bars (ground loop) are caused by a difference in the ground potential of any two or more devices connected to your signal path. This difference is compensated by passing that voltage difference through any available interconnection, including your cables.</p> <p style="text-align: center;">WARNING! <i>Do not disconnect the ground from any piece of equipment in your signal path!</i></p> <p>Check the following to remove hum bars:</p> <ol style="list-style-type: none">1. Confirm that all interconnected equipment is connected to the same phase of power, if possible.2. Remove equipment connected to that phase that may introduce noise, such as motors, generators, etc.3. Disconnect all interconnecting cables and reconnect them one at a time until the ground loop reappears. Disconnect the affected cable and replace, or insert an isolation transformer in the signal path.

11.3 Audio Signal (VM-9S only)

Problem	Remedy
No audio at the output device, regardless of input selected	<ol style="list-style-type: none">1. Confirm that your sources and output device are powered on and connected properly. Audio signals connected to the input of your switcher should be properly wired to the output of your source. Audio signals connected to the output of your switcher should be properly wired to the input of your line 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 acceptor.
Audio level is too low	<ol style="list-style-type: none">1. Confirm that the connecting cables are of high quality and properly built.2. Check level controls located on your source input device or output display or recorder.



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 years 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.
 - b) Unauthorized 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.

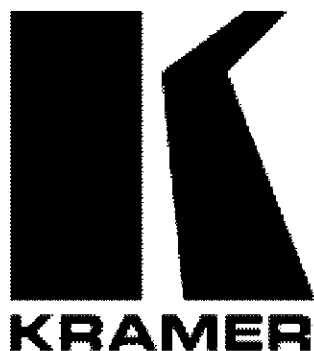
NOTICE

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 the machines can only be done by an authorized Kramer technician. 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 supplied AC power cord (when applicable) to supply power to the machine and controllers.
- Please use recommended interconnect cables to connect the machine to controllers and other components.



The list of Kramer distributors appears on our web site:

www.kramerelectronics.com

From the web site it is also possible to e-mail factory headquarters.

We welcome your questions, comments and feedback.

Kramer Electronics Ltd.

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