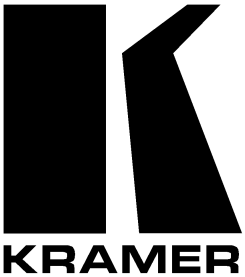
Kramer Electronics, Ltd.



USER MANUAL

Models:

TP-1xl, ***Video Line Transmitter***

TP-2xl, ***Video Line Receiver***

708, ***Video Audio Line Receiver***

711xl, ***Video-Audio Line Transmitter***

712xl, ***Video-Audio Line Receiver***

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1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer: **TP-1xl**, *Video Line Transmitter* and/or **TP-2xl**, *Video Line Receiver* and/or **708**, *Video Audio Line Receiver* and/or **711xl**, *Video-Audio Line Transmitter* and/or **712xl**, *Video-Audio Line Receiver*.

The **TP-1xl** and the **TP-2xl** are ideal for:

- Simplifications of security and CCTV installations
- Teleconferencing in offices and hospitals using existing intercom or telephone wiring
- Simple and quick studio wiring

The **708**, the **711xl** and the **712xl** are ideal for:

- Remote monitoring for CCTV, medical, school and broadcast applications
- Existing facilities with TP cable already installed
- Teleconferencing in offices and hospitals using existing intercom or telephone wiring

The package includes one or more of the following Kramer products:

- **TP-1xl**, **TP-2xl**, **708**, **711xl**, or **712xl**
- Power adapter (12V DC Input) and this user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

3 Overview

This manual describes the:

- The **TP-1xl** *Video Line Transmitter* and the **TP-2xl** *Video Line Receiver* (see section 4)
- The **708** *Video Audio Line Receiver* (see section 5)
- The **711xl** *Video-Audio Line transmitter* and the **712xl** *Video-Audio Line Receiver* (see section 6)

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise-levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your Kramer products away from moisture, excessive sunlight and dust

4 The TP-1xl and TP-2xl Video Line Transmitter and Receiver

This section:

- Overviews the **TP-1xl** and **TP-2xl** (see section 4.1)
- Defines your **TP-1xl** (see section 4.2)
- Defines your **TP-2xl** (see section 4.3)
- Describes how to connect the **TP-1xl/TP-2xl** Video Line Transmitter/Receiver (see section 4.4)

4.1 An Overview of the TP-1xl/TP-2xl

The **TP-1xl** and **TP-2xl** are a twisted pair transmitter and receiver for composite video signals. The **TP-1xl** transmitter converts a composite video signal to a twisted pair signal and the **TP-2xl** receiver converts the twisted pair signal back into a composite video signal.

The **TP-1xl/TP-2xl** also feature:

- A bandwidth of 13MHz at 300 meters (960 feet)
- Twisted pair inputs and outputs on a terminal block connector
- Level (GAIN) and equalization (HF[1]) controls
- A system range of up to 1000 meters (3200 feet)
- A LOOP terminal block on the **TP-2xl** to increase the number of outputs by connecting additional receivers

The **TP-1xl** and the **TP-2xl** are housed in a desktop-sized enclosure letting you rack-mount two units side-by-side in a 1U rack space with the optional **RK-50RN** adapter.

1 High Frequency

4.2 Your TP-1xl Video Line Transmitter

Figure 1 and Table 1 define the **TP-1xl**:

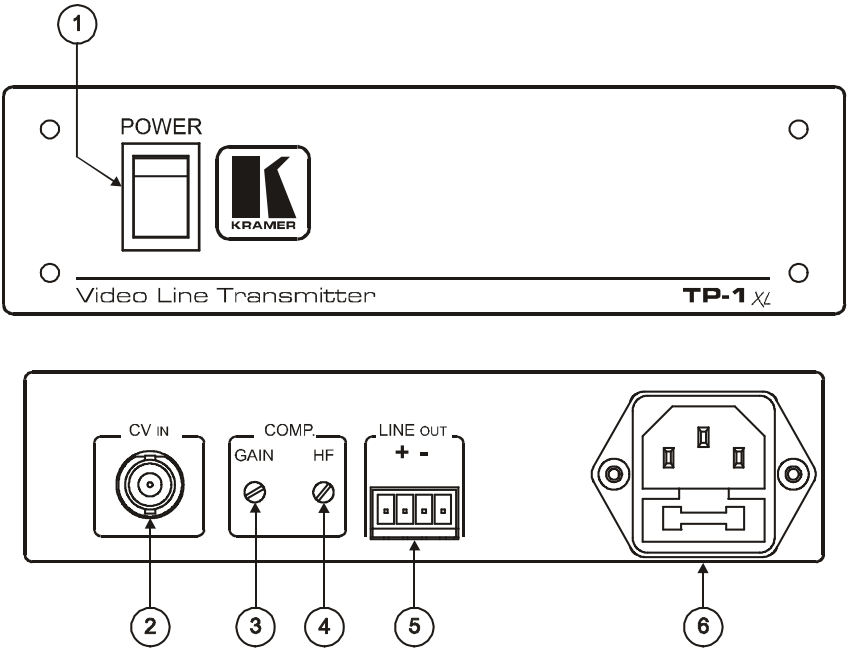

Figure 1: TP-1xl Video Line Transmitter

Table 1: TP-1xl Video Line Transmitter Features

#	Feature		Function
1	*POWER* Switch		Illuminated switch for turning the unit ON or OFF
2	*CV IN* BNC Connector		Connect to the composite video source
3	*COMP*	*GAIN* Trimmer	Turn to adjust the output signal level[1]
4		*HF* Trimmer	Turn to adjust the output signal equalization[1]
5	*LINE OUT* Terminal Block[2]		Connect to the LINE IN terminal block on the **TP-2xl**
6	Power Connector with Fuse		AC connector enabling power supply to the unit

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

2 The second and third blocks marked + and – (video + and video – respectively)

4.3 Your TP-2xl Video Line Receiver

Figure 2 and Table 2 define the **TP-2xl**:

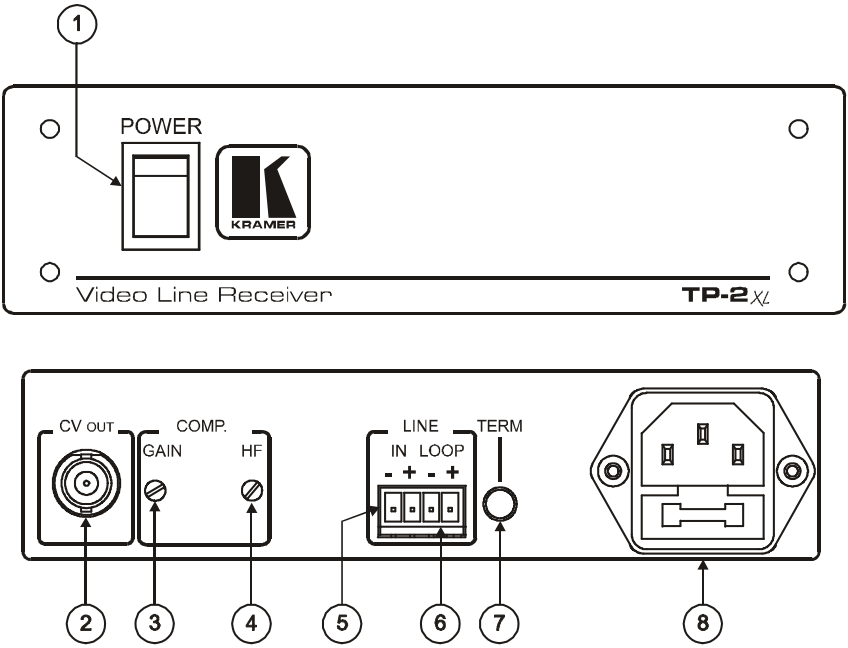

Figure 2: TP-2xl Video Line Receiver

Table 2: TP-2xl Video Line Receiver Features

#	Feature		Function
1	*POWER* Switch		Illuminated switch for turning the unit ON or OFF
2	*CV OUT* BNC Connector		Connect to the composite video acceptor
3	*COMP*	*GAIN* Trimmer	Turn to adjust the output signal level[1]
4		*HF* Trimmer	Turn to adjust the output signal equalization[1]
5	*LINE*	*IN* Terminal Block[2]	Connect to the LINE OUT terminal block on the **TP-1xl**
6		*LOOP* Terminal Block[3]	Connect to the LINE IN terminal block of an additional receiver
7	*TERM* button		When pressed, terminates the unit that is the last in the line (not looped)
8	Power Connector with Fuse		AC connector enabling power supply to the unit

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

2 The first and second blocks marked – and + (video – and video + respectively)

3 The third and fourth blocks marked – and + (video – and video + respectively)

4.4 Connecting the TP-1xl/TP-2xl Video Line Transmitter/Receiver

You can use the **TP-1xl** and **TP-2xl** to configure a Video Line Transmitter and Receiver system.

To connect the **TP-1xl** *Video Line Transmitter* with the **TP-2xl** *Video Line Receiver*, as illustrated in the example in Figure 3, do the following:

1. Connect a composite video source (for example, a composite video player) to the CV IN BNC connector of the **TP-1xl**.
2. On the **TP-2xl**, connect the CV OUT BNC connector to a composite video acceptor (for example, a display).
3. Connect the LINE OUT connector[1] of the **TP-1xl** to the LINE IN connector[2] of the **TP-2xl**, via twisted pair cabling (maximum range of up to 3200ft (1000m)).
4. If required, connect the LINE LOOP connector[3] of the **TP-2xl** to the LINE IN connector[2] of an additional **TP-2xl** (as illustrated in Figure 4).
5. Connect the power cord on the **TP-1xl** and the **TP-2xl** (not illustrated in Figure 3).
6. On the **TP-1xl** and/or the **TP-2xl**, if required, adjust the COMP GAIN and HF levels, by inserting a screwdriver into each of the small holes and carefully rotating them.

1 The second and third terminal marked + and – respectively

2 The first and second terminal marked – and + respectively

3 The third and fourth terminal marked – and + respectively

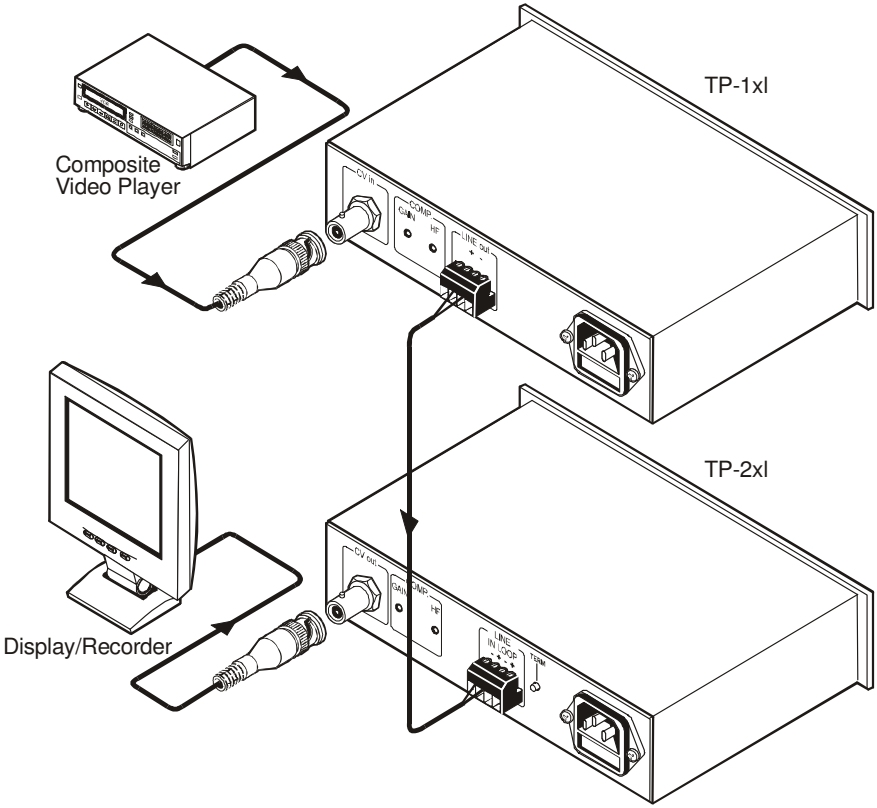

Figure 3: Connecting the TP-1xl/TP-2xl Video Line Transmitter / Receiver System

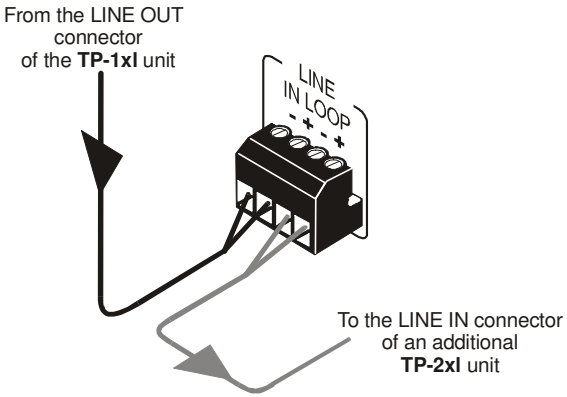

Figure 4: Connecting an Additional TP-2xl Unit

5 The 708 Video Audio Line Receiver

This section:

- Overviews the **708** (see section 5.1)
- Defines your **708** (section 5.2)
- Describes how to connect the **708** Video Audio Line Receiver (see section 5.3)

5.1 An Overview of the 708 Video Audio Line Receiver

The **708** receives video and unbalanced mono audio signals converted to a twisted pair signal and converts the signal back to composite video and twisted pair signals.

In addition, the **708** features:

- A bandwidth of 58MHz at 400 meters
- RJ-11 twisted pair connections
- Level (VIDEO GAIN) and equalization (EQ) controls
- A looping input
- A selectable input signal termination button
- A polarity inverter switch that inverts the incoming polarity

The **708** is part of the Kramer TOOLS™ family of compact high-quality and cost effective solutions, and is fed from an external 12V DC source, making it suitable for field operation.

5.2 Your 708 Video Audio Line Receiver

Figure 5 and Table 3 define the **708**:

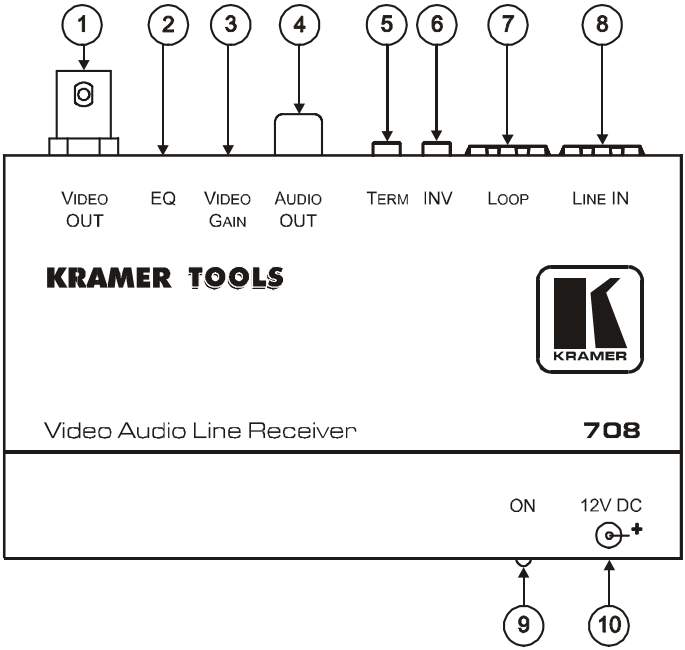

Figure 5: 708 Video Audio Line Receiver

Table 3: 708 Video Audio Line Receiver Features

#	Feature	Function
1	*VIDEO OUT* BNC Connector	Connect to the composite video acceptor
2	*EQ* Trimmer	Turn to adjust the output signal level[1]
3	*VIDEO GAIN* Trimmer	Turn to adjust the output signal equalization[1]
4	AUDIO OUT RCA Connector	Connect to the audio acceptor
5	*TERM* Push Button	When pressed, terminates the unit that is the last in the line (not looped)
6	*INV* Push Button	When pressed, Inverts the incoming video signal
7	*LOOP* RJ-11 Connector	Connect to the LINE IN terminal block of an additional receiver to increase the number of outputs
8	*LINE IN* RJ-11 Connector	Connect to the line out connector of the transmitter
9	*ON* LED	Lights when receiving power
10	*12V DC*	+12V DC connector for powering the unit

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

5.3 Connecting the 708 Video Audio Line Receiver

To connect the **708** as illustrated in the example in Figure 6, do the following:

1. Connect the VIDEO OUT BNC connector to a composite video acceptor (for example, a display).
2. Connect the AUDIO OUT RCA connector to an unbalanced mono audio acceptor (for example, an amplifier with speakers).
3. Connect a transmitter to the LINE IN RJ-11 connector.
4. If required, connect the LOOP RJ-11 connector to the LINE IN RJ-11 connector[2] of an additional **708** unit.
5. Connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity.
6. If required, adjust the EQ (equalization) and VIDEO GAIN levels, by inserting a screwdriver into each of the small holes and carefully rotating them.

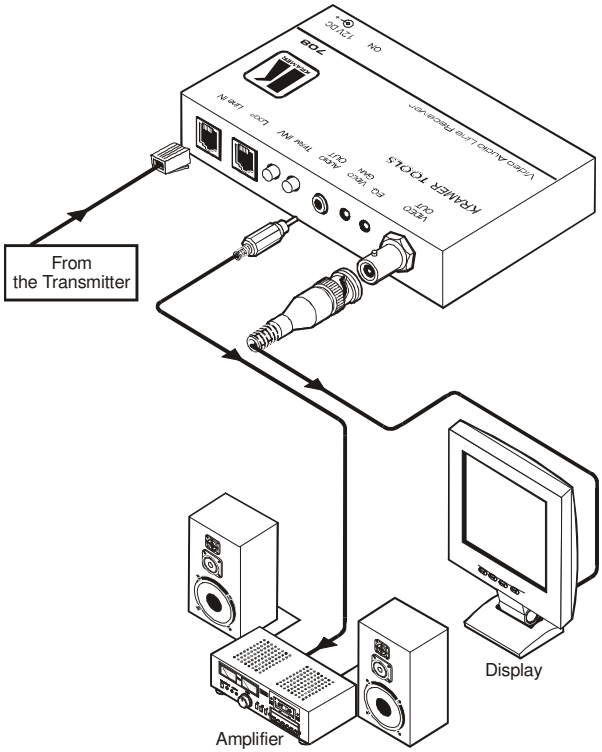

Figure 6: Connecting the 708 Video Audio Line Receiver

6 The 711xl and 712xl Video-Audio Line Transmitter and Receiver

This section:

- Overviews the **711xl** and **712xl** (see section 6.1)
- Defines your **711xl** (see section 6.2)
- Defines your **712xl** (see section 6.3)
- Defines the 6-pole detachable terminal block connector pinout (see section 6.4)
- Describes how to connect the **711xl/712xl** Video-Audio Line Transmitter/Receiver (see section 6.5)

6.1 An Overview of the 711xl / 712xl

The **711xl** and **712xl** are a twisted pair transmitter and receiver for composite video and unbalanced stereo audio signals. The **711xl** transmitter converts composite video and stereo audio to a twisted pair signal and the **712xl** receiver converts the twisted pair signal back into composite video and stereo audio signals.

The **711xl/712xl** feature:

- A bandwidth of 45MHz
- Twisted pair inputs and outputs on terminal block connectors
- A system range of up to 300 meters (1000 feet)
- Level (GAIN) and equalization (EQ) controls (for the **712xl**)

In addition, the **712xl** LINE IN can be looped to add additional outputs and includes a selectable input signal termination push button.

The **711xl/712xl** are part of the Kramer TOOLS™ family of compact high-quality and cost effective solutions, and are fed from an external 12V DC source, making them suitable for field operation.

6.2 Your 711xl Video-Audio Line Transmitter

Figure 7 and Table 4 define the **711xl**:

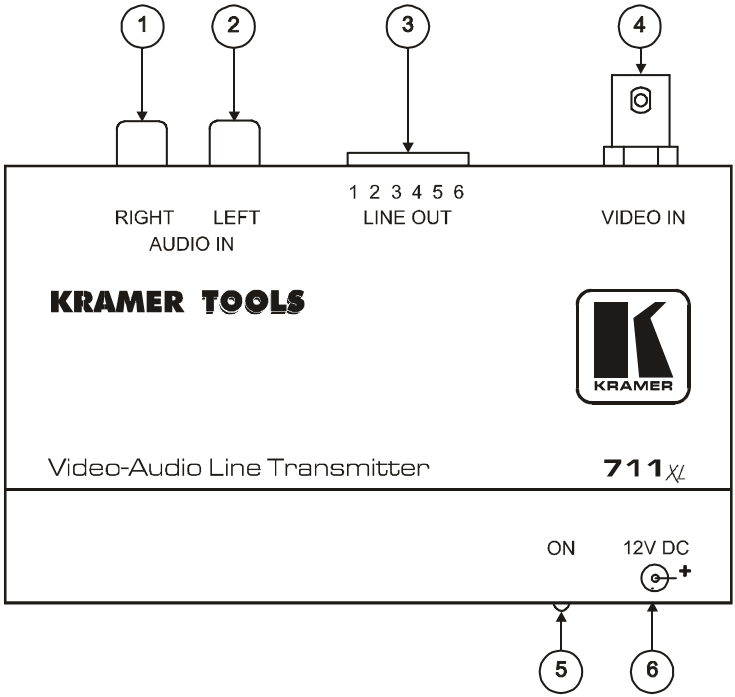

Figure 7: 711xl Video-Audio Line Transmitter

Table 4: 711xl Video-Audio Line Transmitter Features

#	Feature		Function
1	*AUDIO IN*	*RIGHT* RCA Connector	Connect to the right unbalanced stereo audio source
2		*LEFT* RCA Connector	Connect to the left unbalanced stereo audio source
3	*LINE OUT* 6-pole Detachable Terminal Block Connector		Connect to the LINE IN 6-pole detachable block connector of the **712xl** (see section 6.4 for pinout)
4	*VIDEO IN* BNC Connector		Connect to composite video source
5	*ON* LED		Lights when receiving power
6	*12V DC*		+12V DC connector for powering the unit

6.3 Your 712xl Video-Audio Line Receiver

Figure 8 and Table 5 define the **712xl**:

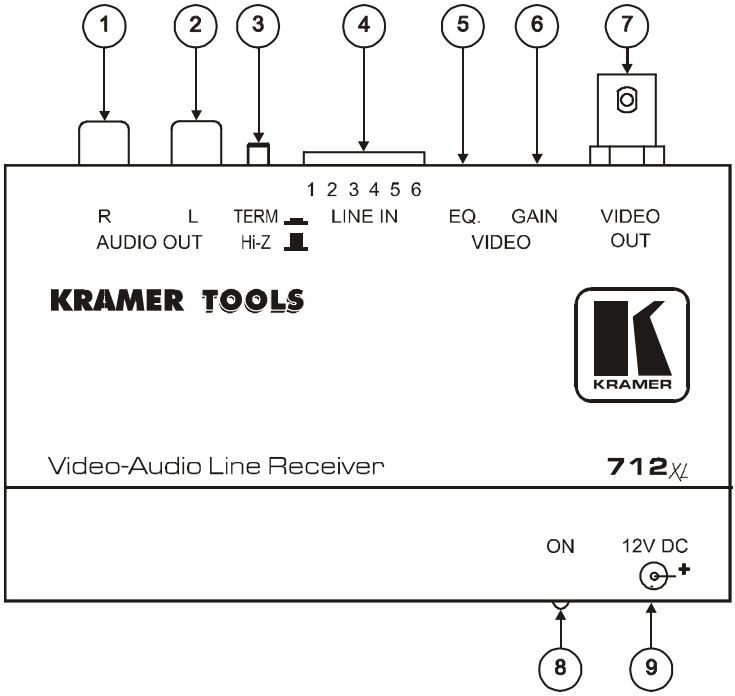

Figure 8: 712xl Video-Audio Line Receiver

Table 5: 712xl Video-Audio Line Receiver Features

#	Feature		Function
1	*AUDIO OUT*	*R* RCA Connector	Connect to the right unbalanced stereo audio acceptor
2		*L* RCA Connector	Connect to the left unbalanced stereo audio acceptor
3	*TERM* Push Button		When pressed, terminates the unit that is the last in the line (not looped)
4	*LINE IN* 6-pole Detachable Terminal Block Connector		Connect to the LINE OUT 6-pole detachable block connector of the **711xl** (see section 6.4 for pin-out)
5	*VIDEO*	*EQ.* Trimmer	Turn to adjust the output signal equalization[1]
6		*GAIN* Trimmer	Turn to adjust the output signal level[1]
7	*VIDEO OUT* BNC Connector		Connect to the composite video acceptor
8	*ON* LED		Lights when receiving power
9	*12V DC*		+12V DC connector for powering the unit

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

6.4 The 6-pole Detachable Terminal Block Connector Pinout

Table 6 defines the LINE IN and LINE OUT connector pinout:

Table 6: 711xl/712xl LINE IN and LINE OUT Connector Pinout

PIN	Function
1	Audio R+
2	Audio R-
3	Audio L+
4	Audio L-
5	Video +
6	Video -

6.5 Connecting the 711xl and the 712xl

You can use the **711xl** and **712xl** to configure a *Video-Audio* Transmitter and Receiver system.

To connect the **711xl** *Video-Audio Line Transmitter* with the **712xl** *Video-Audio Line Receiver*, as illustrated in the example in Figure 9, do the following:

1. Connect a composite video source (for example, a composite video player) to the VIDEO IN BNC connector on the **711xl**.
2. Connect an unbalanced stereo source to the AUDIO IN RIGHT and LEFT RCA connectors (for example, a composite video player).
3. On the **712xl**, connect the VIDEO OUT BNC connector to a composite video acceptor (for example, a display).
4. Connect an unbalanced stereo acceptor to the AUDIO OUT R and L RCA connectors (for example, speakers).
5. Connect the LINE OUT 6-pole detachable terminal block connector[1] of the **711xl** to the LINE IN 6-pole detachable terminal connector [1] of the **712xl**, via twisted pair cabling (maximum range of up to 1000ft (300m))[2].
6. On each **711xl / 712xl** unit, connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity.
7. On the **712xl**, if required, adjust the VIDEO GAIN and EQ. levels, by inserting a screwdriver into each of the small holes and carefully rotating them.

1 See Table 6 for pinout. If you want to add an additional 712xl unit, connect the LINE IN 6-pole detachable terminal block connector to the LINE IN connector of that additional 712xl by attaching another set of wires

2 A straight connection should be made between the units (PIN 1 to PIN 1, PIN 2 to PIN 2, and so on)

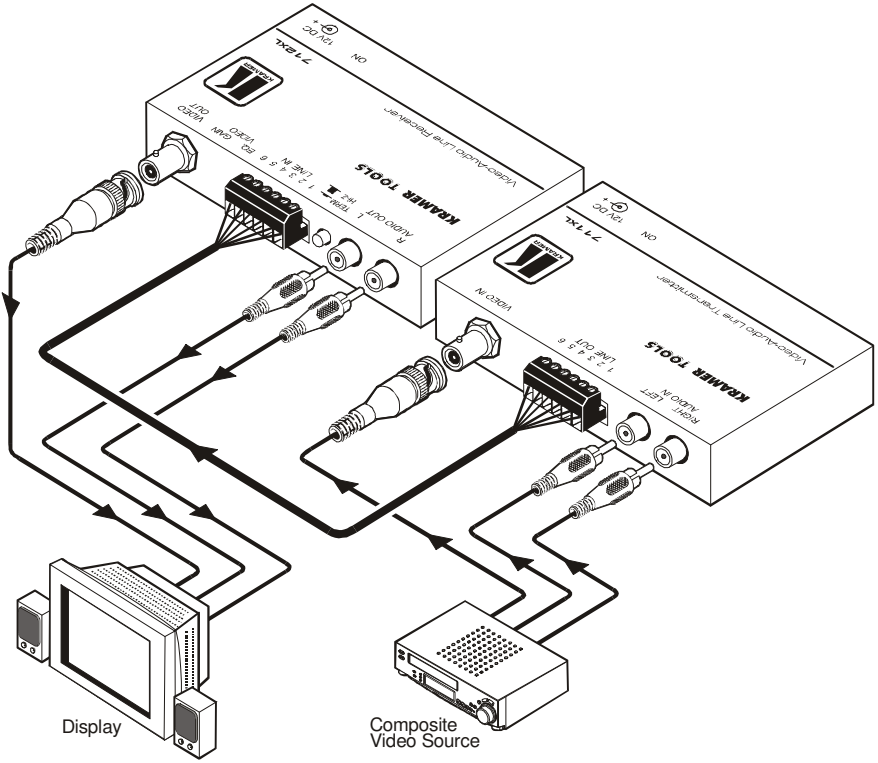

Figure 9: Connecting the Video-Audio Line Transmitter / Receiver System

7 Technical Specifications[1]

Table 7 includes the technical specifications of the **TP-1xl** and the **TP-2xl**, Table 8 includes the technical specifications of the **708**, and Table 9 includes the technical specifications of the **711xl**, and the **712xl**:

Table 7: Technical Specifications of the TP-1xl and the TP-2xl

	TP-1xl	**TP-2xl**
INPUT:	1 composite video, 1Vpp/75Ω on a BNC type connector	4-pin detachable terminal block
OUTPUT:	4-pin detachable terminal block	1 composite video, 1Vpp/75Ω on a BNC type connector
VIDEO BANDWIDTH (-3dB):	13MHz at 300 meters	
DIFF. GAIN:	2% (@ 20 meters)	
CONTROL:	0.9Deg (@ 20 meters)	
VIDEO S/N RATIO:	73dB (@ 20 meters)	
SYSTEM DELAY:	<1 microsecond TYP. at 100 meters	
CONTROLS:	Gain: -3dB to +4.4dB; EQ.: -16dB to +9.9dB @ 4.4MHz	
POWER SOURCE:	230 VAC, 50/60Hz, (115VAC, U.S.A.) 4VA each	
DIMENSIONS:	16.5cm x 12cm x 4.5cm (6.5” x 4.7” x 1.8”, W, D, H.)	
WEIGHT:	0.7kg. (1.6lbs.) approx. (each)	
ACCESSORIES:	Power cord (each)	
OPTIONS:	RK-50RN, 19” rack adapter holds two units in one vertical rack space	

Table 8: Technical Specifications of the 708

INPUTS:	Looping balanced 150Ω on a 6/4 standard telephone socket, with termination switch and polarity inversion switch
OUTPUTS:	1 composite video, 1Vpp/75Ω composite video, 1Vpp/75Ω unbalanced on a BNC connector 1 audio - line level, up to 4.6Vpp/100Ω on an RCA connector
BANDWIDTH:	Video: 58MHz; audio: 30kHz (at 30 meters without lightening arrestors)
NON-LINEARITY:	<0.2% at short distances
DIFF. GAIN:	0.41%
DIFF. PHASE:	0.3 Deg.
K-FACTOR:	0.1% (@ 20m)
S/N RATIO:	72dB
CONTROLS:	Video gain: -1.8dB to +2.3dB, EQ above 2.5 MHz: 0dB to 16dB, audio: 0dB to 52dB; loop termination, signal invert
POWER SOURCE:	12 VDC 40mA
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7” x 2.95” x 0.98”, W, D, H.)
WEIGHT:	0.28kg. (0.62lbs.) Approx.
ACCESSORIES:	Power supply, mounting bracket
OPTIONS:	Model VA-50P power supply with six 12VDC outlets; RK-T1, RK-T3, 19” rack adapters

1 Specifications are subject to change without notice

Table 9: Technical Specifications of the 711xl and the 712xl

	711xl	**712xl**
INPUT:	Video, 1Vpp/75Ω on a BNC connector; audio 1Vpp / 33kΩ on RCA connectors	6-pole detachable terminal block connector
OUTPUT:	6-pole detachable terminal block connector	Video, 1Vpp/75Ω on a BNC connector; audio 1Vpp / 150Ω on RCA connectors
MAX. SIGNAL LEVEL:	2.1Vpp (video), 4.2Vpp (audio)	
VIDEO BANDWIDTH (-3dB):	45MHz	
AUDIO BANDWIDTH (-3dB):	100kHz	
DIFF. GAIN:	1.4%	
DIFF. PHASE:	0.6 Deg.	
VIDEO S/N RATIO:	76dB	
AUDIO S/N RATIO:	77dB unweighted	
AUDIO THD + NOISE:	0.033%, 1kHz	
AUDIO 2nd HARMONIC:	0.002%	
MAX. SIGNAL LEVEL:	1.7Vpp (video), 4.2Vpp (audio)	
POWER SOURCE:	12 VDC 80mA	
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7” x 2.95” x 0.98”, W, D, H.)	
WEIGHT:	0.28kg. (0.62lbs.) approx. (each)	
ACCESSORIES:	Power supply, mounting bracket (each)	
OPTIONS:	RK-T1, RK-T3, 19 inch rack adapters	

LIMITED WARRANTY

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

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven 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:
   - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   - ii) Product modification, or failure to follow instructions supplied with the product
   - iii) Repair or attempted repair by anyone not authorized by Kramer
   - iv) Any shipment of the product (claims must be presented to the carrier)
   - v) Removal or installation of the product
   - vi) Any other cause, which does not relate to a product defect
   - vii) 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

The liability of Kramer for any effective 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.
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 expressed approval of the manufacturer will void user authority to operate the equipment.
- ⌦ Use the supplied DC power supply to feed power to the machine.
- ⌦ Please use recommended interconnection cables to connect the machine to 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.

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

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000164 REV 1