

Kramer Electronics, Ltd.



USER MANUAL

Models:

Cobra R500A, *Video-Audio receiver*

Cobra R500-2, *Video-RS-232 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 Groups¹, which are clearly defined by function.

Congratulations on purchasing your Kramer **Cobra R500A Video-Audio receiver** and/or **Cobra R500-2 Video-RS-232 receiver**. The Kramer **Cobra Series System** extends VGA and audio signals over ordinary Category 5 cable. This manual covers the **Cobra R500A Video-Audio receiver** with audio, and the **Cobra R500-2 Video-RS-232 receiver** with RS-232 serial support. For information on the respective transmitter unit, refer to the appropriate manual included with the transmitter.

The package includes the **Cobra R500A Video-Audio receiver** or the **Cobra R500-2 Video-RS-232 receiver**, an external power supply, and this user manual².

The Kramer **Cobra** series products are not compatible with Kramer non-**Cobra** series products.

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 cables³. You may also need CAT 5 cable. We recommend that you use our Kramer Pico Skew CAT 5e cable⁴

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 Sealers; 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>

4 In addition, you may also need 1/8" (3.5mm) audio cable with RCA jacks, 1/8" (3.5mm) serial cable with DB9 connector, and Video cable with HD15 connectors

3 Overview

CAT 5/5e/6 cabling for this product must be pinned to the TIA-EIA T568B wiring specification (see appendix A). We also highly recommend that all CAT 5 cables be pre-terminated and tested. Cables terminated on-site or in an existing infrastructure should be tested before use to ensure compliance with the TIA-EIA T568B specification. Using incorrectly terminated CAT 5 cables can damage this product.

We recommend using our Kramer **Cobra** ultra low skew cable—**BC-HDTP** (solid bulk) or **BCP-HDTP** (solid plenum bulk)—available in lengths of 700' (210m) and 1300' (390m).

Our Kramer **Cobra** series products are compatible with CAT 5/5e/6 data cabling as well as skew free CAT 5/5e cabling manufactured for video applications. Note that some skew free CAT 5 is specific to a particular vendor and is not compatible with our products. Ensure any skew free CAT 5 cable is non-proprietary prior to purchase / installation. CAT6 cable, due to the manufacture method, can exhibit much greater skew than standard CAT 5/5e and may require skew compensation beyond what the standard product offers. Contact Kramer Electronics for assistance.

Achieving the best performance means:

- Connecting 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)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality and positioning your **Cobra R500A / R500-2** in a location free from moisture and away from excessive sunlight and dust



Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit¹.

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

Warning –This equipment is not intended for, nor does it support, distribution through an Ethernet network. Do not connect these devices to any sort of networking or telecommunications equipment!

¹ For example: model number AD2512C, part number 2535-000251

4 Setup and Installation

First ensure all units have been configured for correct operation and signal types. See appropriate configuration sections of this manual and the respective transmitter manual.

4.1 Making the Connections

This section contains figures showing connections with the specific **Cobra R500A / R500-2** series models. In general, however, the connection and setup procedure at both transmitter and receiver ends is as follows:

At the transmitter end (refer to the transmitter user guide):

1. Connect the source video to the **Cobra** Series transmitter video input port, which is an HD15 connector labeled SOURCE IN.
2. If desired, attach a local monitor via the local monitor port to LOCAL OUT.
3. Make your audio/serial connections via the 1/8" (3.5mm) audio connector or DB9 serial connector (transmitter model dependent).
4. Connect the CAT 5 cable to the transmitter.
5. Apply power on the transmitter. The LED should light and, if there is a local monitor attached, a video image should appear on the monitor's screen.

At the receiver end:

1. Connect the VIDEO OUT HD15 connector to the display unit and attach any audio cabling.
2. Connect a 1/8" (3.5mm) audio or serial cable to the AUDIO or SERIAL OUT connection (model dependent).
3. Connect the CAT 5 cable to the UTP INPUT connection.
4. Apply power. The LED should light and video should appear on the display(make sure display is powered ON).
5. Adjust video levels.

With regard to connecting the cables:

- We recommend mounting and connecting all cabling to the **Cobra R500A / R500-2** components before applying power.
- Be sure that the CAT 5 cable you intend to use has been tested to comply with the T568B wiring specification (see Appendix A).

4.2 Connections on the VGA/Audio Transmitter

The single-port units with audio support video and audio signals over CAT 5 cable. The audio signal is line-level audio, and powered speakers are required. Figure 1 shows the Kramer **Cobra** transmitter with Audio Transmitter connections, and Figure 2 shows the Kramer **Cobra R500A Video-Audio receiver**.

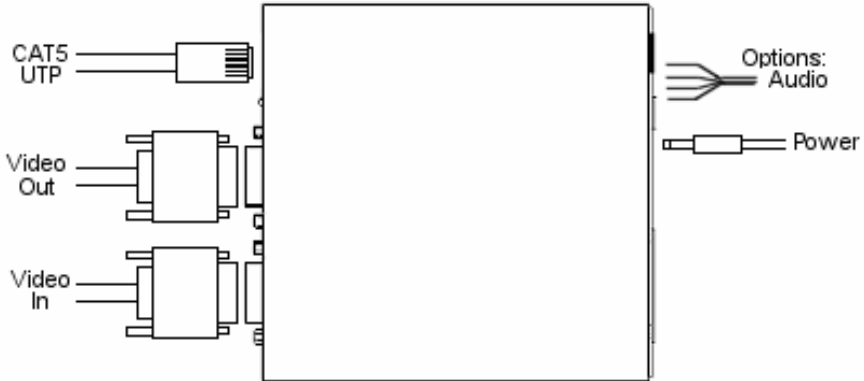


Figure 1: Transmitter Connections

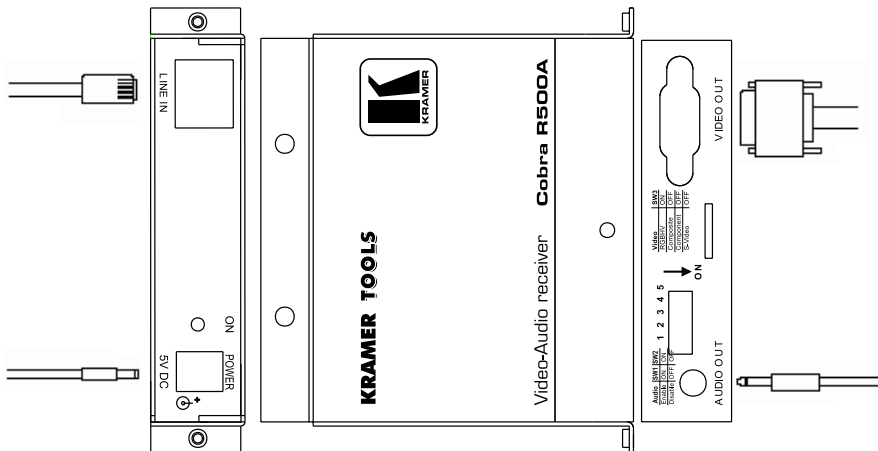


Figure 2: Cobra R500A Video-Audio receiver Connections

4.3 Connections on the Video/Serial Transmitter

The single-port units with audio support video and serial signals over CAT 5 cable. The serial signal is 3 wire TX, RX, GND serial. Figure 3 shows the Kramer **Cobra** transmitter with serial Transmitter connections, and Figure 4 shows the **Cobra R500-2 Video-RS-232 receiver**. See Appendix A for cable pinouts of the **Cobra R500-2**.

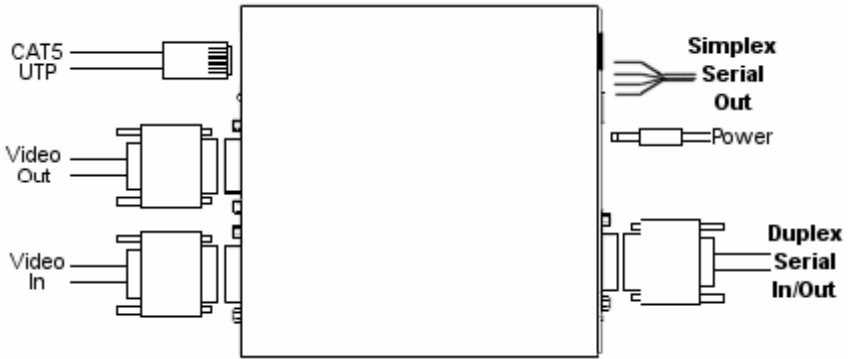


Figure 3: Transmitter Connections

(Note: Both serial connection types are shown, but only one is used depending on the model and settings).

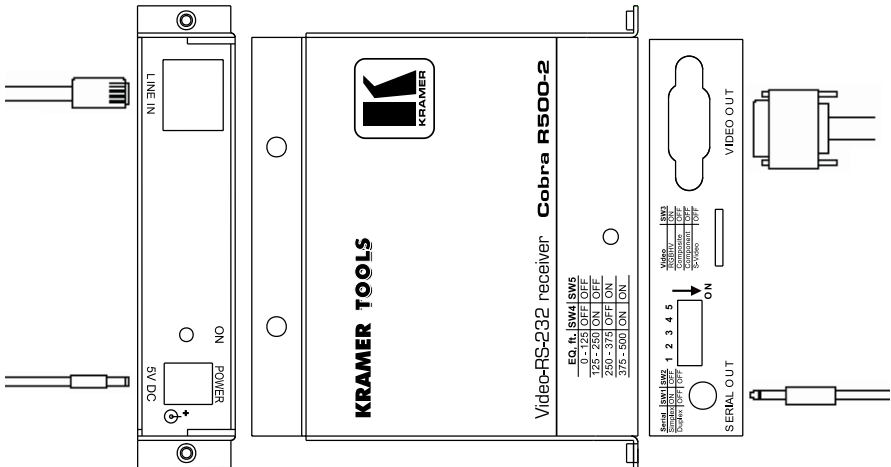


Figure 4: Cobra R500-2 Video-RS-232 receiver Connections

4.4 Configuration Settings

The **Cobra R500A** and the **Cobra R500-2** are configurable for various video, audio and serial modes. Note that a compatible transmitter unit must be used at the source end. Reference the appropriate transmitter user guide or call for technical assistance. It is not possible to change an audio unit to a serial unit and vice versa. A dipswitch on the receiver unit is used to set the video, audio, serial configuration mode. Table 3-1 below shows the configuration settings (ON = down, OFF = up):

NOTE: There are no user serviceable parts inside the Cobra R500A / Cobra R500-2. All adjustments are performed externally.

Table 1: Cobra R500A / Cobra R500-2 Configuration Settings

SW Configuration Settings				
	SW position	1	2	3
Signal	Setting			
L/R Audio R500A models	On (100 Ω term.)	ON	ON	
	On (no term.)	OFF	ON	
	Off	OFF	OFF	
Serial R500-2 models	Duplex	OFF	OFF	
	Simplex	ON	OFF	
Video All Models	RGBHV			ON
	Composite			OFF
	S-Video			OFF
	Component			OFF

4.5 Video Adjustment

The only adjustments required on the **Cobra R500A** and **Cobra R500-2** are the SW positions 4 and 5 which must be set to compensate for cable length. Using the table below as a guide, turn SW positions ON or OFF for best picture clarity (ON = down, OFF = up):

Table 2: Cable Length EQ Settings

Cable distance EQ settings		
Cable Length	4	5
(0-125 Ft)	OFF	OFF
(125-250 Ft)	ON	OFF
(250-375 Ft)	OFF	ON
(375-500 Ft)	ON	ON

5 Solutions to Common Problems

In most cases, nearly every issue with the **Cobra** series can be resolved by checking the CAT 5 termination and making sure that it's pinned to the TIA/EIA 568B wiring specification. However, there may be other problems that cause the system to not perform as it is designed. Below are solutions to the most common installation errors.

Problem:	No video signal at the transmitter local port or at the receiver.
Solution:	Check that both units are powered. Ensure EQ adjustment switches are set correctly Make sure the CAT 5 cable is terminated correctly per the TIA/EIA 568B wiring specification. Is the display device powered on and functioning? Check to ensure display settings (resolution, refresh rate, and so on) are compatible with input signal.
Problem:	Poor video quality.
Solution:	Have all receiver adjustments been finished? Ensure EQ adjustment switches are set correctly Check all cable connections The video signal's refresh rate may be set too high. Reset to a lower refresh rate in your monitor-configuration menu
Problem:	Poor audio quality. (Cobra R500A only)
Solution:	Powered speakers are required. Make sure speaker power is ON Check input source levels from the source device. Make sure the audio source is not overdriven or underdriven. Audio is summed left and right for "A" versions. If using a single channel, both audio inputs must be connected at the transmitter end for full audio gain. Audio is line level Low Level Audio may require the 100 Ω termination disabled. Turn SW1 off to disable termination
Problem:	Serial communication doesn't work correctly. (Cobra R500-2 only)
Solution:	Are the serial devices connected properly? Are the serial parameters correct for source/destination devices? Are the serial cables terminated correctly? If a null-modem cable is used, it must be placed at the receiver end. When using RS-232 transmitters or receivers in daisy chains, CAT 5 switches, or CAT 5 distribution amps, the serial signal is a unidirectionally broadcast mode only. In this mode, all other Cobra CAT5 Video System devices must be the simplex serial type. Cobra R500-2 use 3 wire (TX,RX,GND) signals only via the 1/8" connector (see Appendix A for pinout)
Problem:	"Green shift" or "green washout" on multimedia signals
Solution:	The standard video model is designed to function with DC coupled signals in which the black level is referenced to 0 volts. For five-component (RGB/H&V) AC coupled video, the Cobra transmitter has been designed with full DC restoration capability. Refer to the transmitter user manual.

Appendix A Cabling Pinouts

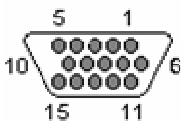


Table 3: HD15 Video Connector PINOUT

Pin	RGBHV (VGA)	RGBS	RGsB	Composite	SVHS (Y/C)	YUV
1	Red +	Red +	Red +		C+	V+
2	Green+	Green+	Green+	C+	Y+	Y+
3	Blue+	Blue+	Blue+			U+
4	—	—	—			
5	Gnd	Gnd	Gnd			
6	Red-	Red-	Red-		C-	V-
7	Green-	Green-	Green-	C-	Y-	Y-
8	Blue-	Blue-	Blue-			U-
9	—	—	—			
10	Gnd	Gnd	—			
11	Gnd	Gnd	—			
12	—	—	—			
13	H Sync	C Sync	—			
14	V Sync	—	—			
15	Gnd	Gnd	—			

Table 4: T568B CAT 5 PINOUT

T568B CAT5 Specification

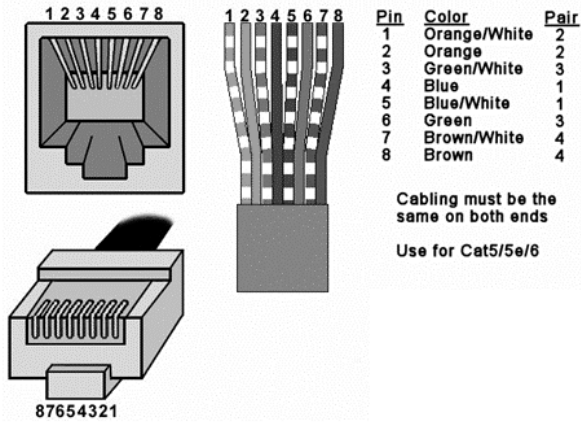


Table 5: 1/8" (3.5 mm) Audio/Serial Connection (model dependent)

Pin	Signal	
Tip	Serial Tx (DB9 pin3)	Left Audio+
Ring	Serial Rx (DB9 pin2)	Right Audio+
Sleeve	Serial GND (DB9 pin5)	GND

Note: The stereo audio input at the transmitter is summed and output as mono audio on both channels at the receiver.

6 Technical Specifications

Table 6: Technical Specifications¹ of the Cobra R500A, Cobra R500-2

CABLE REQUIRED:	Category 5, 5e, 6 shielded or unshielded twisted pair
COMPLIANCE:	CE; FCC Class A, IC Class/class A
VIDEO SUPPORT:	To UXGA (1600x1200 @ 60Hz), RGBHV, RGB, Composite, s-Video, Component Video modes
MAXIMUM RESOLUTION AND REFRESH RATE:	At 500 ft. (152 m) or less, 1600 x 1200 at 70Hz
REQUIRED SOURCE IMPEDANCE:	Video OUT: 75 ohms; Audio OUT (if any): 600 ohms maximum
REQUIRED DESTINATION IMPEDANCE:	Video IN: 75 ohms; Audio IN (if any): 600 ohms minimum
AUDIO CHARACTERISTICS:	Channels: Right/Left summed; Line Level 600 Ohm Unbalanced
SERIAL CHARACTERISTICS:	Protocol: Asynchronous; transparent to data format; transparent to data rates up to 19.2 kbps duplex; data rates to 115 kbps simplex 3 wire Tx, Rx, Gnd
CONNECTORS:	(1) 3.5-mm, (1) RJ-45, (1) HD15 F
TEMPERATURE TOLERANCE:	Operating: 32 to 104 °F (0 to 40 °C); Storage: -4 to +140 °F (-20 to +60 °C).
HUMIDITY TOLERANCE:	Up to 80% noncondensing
ENCLOSURE:	Steel
POWER:	+5 VDC @ 260 mA max Consumption: 1.3 watts maximum
SIZE:	0.88" H x 3.12" W x 3.75" D (2.2 x 7.9 x 9.5 cm)
WEIGHT:	0.56 lb. (0.26 kg)

¹ Specifications are subject to change without notice

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 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:
 - 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.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.



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P/N: 2900-650005 REV 3

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