

Kramer Electronics, Ltd.



USER MANUAL

Model:

TP-50

XGA/Audio Line Receiver – DA

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups¹ that are clearly defined by function.

Thank you for purchasing the Kramer TOOLS **TP-50 XGA/Audio Line Receiver – DA**, which is ideal for:

- Presentation and multimedia applications
- Long-range graphics distribution for schools, hospitals, security, and stores

The package includes the following items:

- **TP-50**
- Power supply (12V DC)
- This user manual²

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

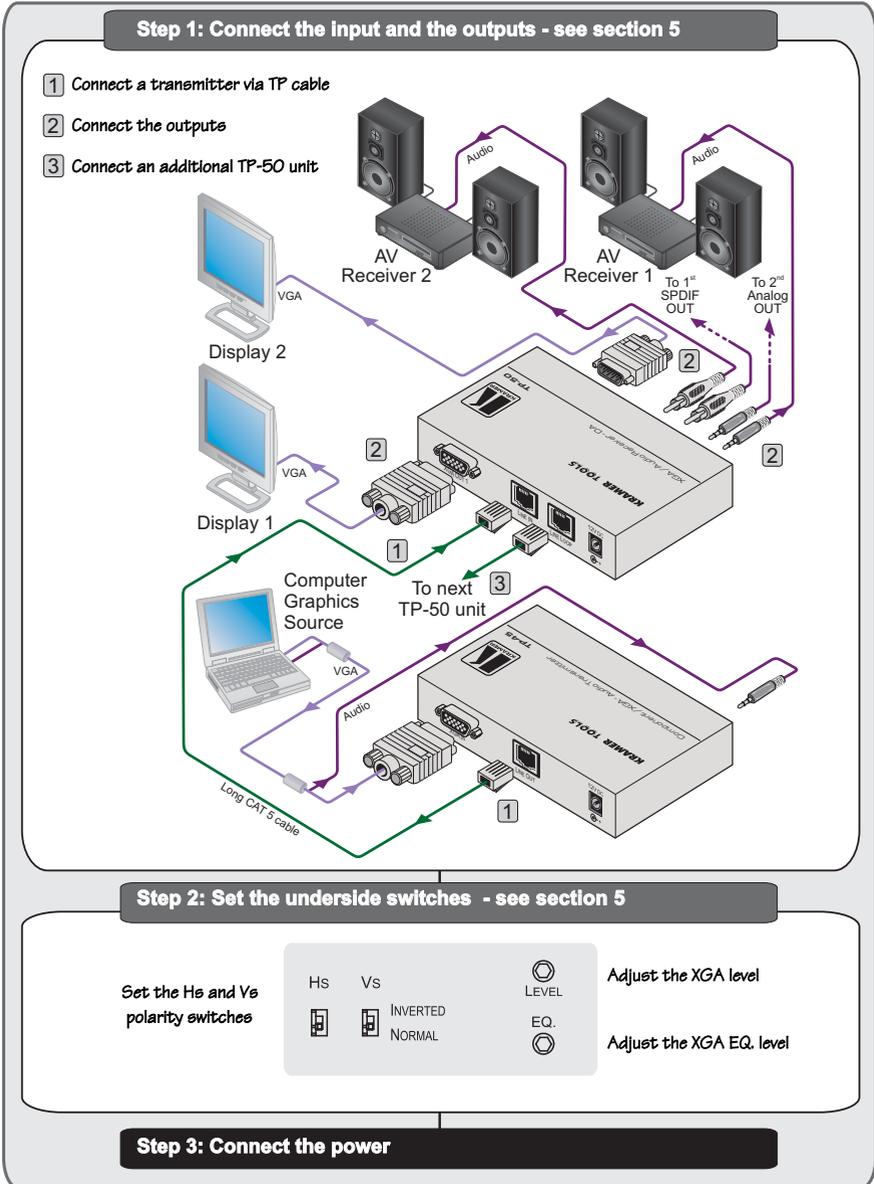
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from our Web site at <http://www.kramerelectronics.com>

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

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



3 Overview

The **TP-50** is a twisted pair receiver for computer graphics video and unbalanced stereo audio or S/PDIF audio signals. The unit converts the twisted pair signal back into two computer graphics video, stereo audio and S/PDIF audio signals simultaneously.

Additional **TP-50** units can be connected via the **TP-50 LINE LOOP** twisted pair connector, to connect additional outputs as well as to extend the range of the output signals¹.

In particular, the **TP-50 XGA/Audio Line Receiver – DA** features:

- Two XGA outputs on 15-pin HD connectors
- Two digital audio outputs (S/PDIF) on RCA connectors and two stereo analog outputs on 3.5mm mini jacks
- The Power Connect feature that powers or is powered by the transmitter over the same twisted pair cable (see section [3.2](#))
- Adjustable polarity of decoding H and V Sync for video (XGA)
- EQ. and LEVEL controls for the video (XGA)
- A twisted pair output for transmitting the signal to an additional receiver
- 12V DC power

3.1 Shielded Twisted Pair (STP)/Unshielded Twisted Pair (UTP)

We recommend that you use Shielded Twisted Pair (STP) cable. There are different levels of STP cable available, and we advise you to use the best quality STP cable that you can afford. Our non-skew-free cable, Kramer **BC-STP** is intended for analog signals where skewing is not an issue. For cases where there is skewing, our UTP skew-free cable, Kramer **BC-XTP**, may be used. Bear in mind, though, that we advise using STP cables where possible, since the compliance to electromagnetic interference was tested using those cables.

Although Unshielded Twisted Pair (UTP) cable might be preferred for long range applications, the UTP cable should be installed far away from electric cables, motors and so on, which are prone to create electrical interference. However, since the use of UTP cable might cause inconformity to

¹ You can connect up to three additional TP-50 units, adding a total cable length of up to 300 meters. The video quality may be reduced if further units are connected. Adjust controls on the first unit, then on the second unit and then on the third TP-50 unit to avoid over-saturation and image loss in the chain

electromagnetic standards, Kramer does not commit to meeting the standard with UTP cable.

3.2 About the Power Connect Feature

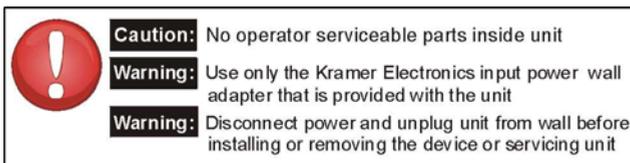
The Power Connect feature applies as long as the cable can carry power. This feature is available when using STP cable and the distance does not exceed 50m on standard CAT 5 cable. For longer distances, heavy gauge cable should be used¹. For units which are connected via RJ-45 connectors, make sure that the shield of the STP cable is connected to the metal casing of the connectors on both ends of the cable. For units which are connected via terminal block connectors, the shield of the STP cable must be connected to a ground terminal on the units at both ends (use the ground terminal of the power supply connection if necessary).

For a CAT 5 cable exceeding a distance of 50m, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

3.3 Recommendations for Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables² to avoid 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 that may adversely influence signal quality and position your Kramer **TP-50** away from moisture, excessive sunlight and dust



¹ CAT 5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

² Available from Kramer Electronics on our Web site at <http://www.kramerelectronics.com>

4 Your TP-50 XGA/Audio Line Receiver – DA

[Figure 1](#) and [Table 1](#) define the TP-50:

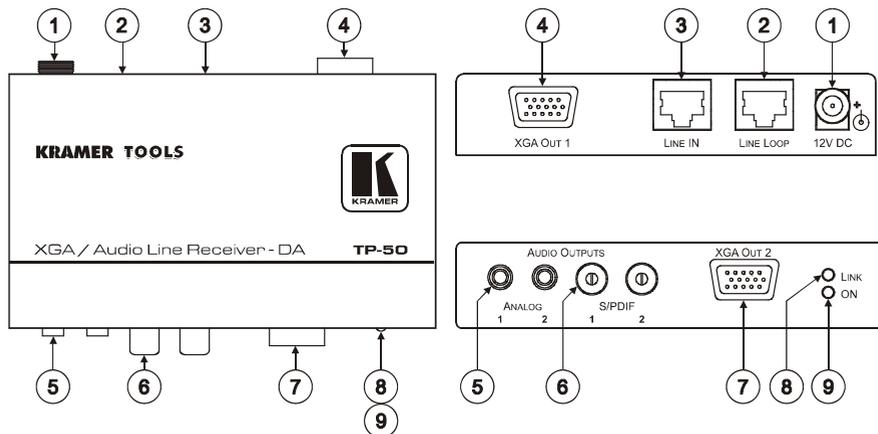


Figure 1: TP-50 XGA/Audio Line Receiver – DA

Table 1: TP-50 XGA/Audio Line Receiver – DA Features

#	Feature	Function
1	12V DC	+12V DC connector for powering the unit
2	LINE LOOP RJ-45 Connector	Connect to the LINE IN RJ-45 connector of an additional receiver to increase the number of outputs
3	LINE IN RJ-45 Connector	Connect to the LINE OUT connector of a transmitter ¹
4	XGA OUT 1 15-pin HD Connector	Connect to the video acceptor 1
5	AUDIO OUTPUTS	Connect to the stereo analog audio acceptors (1 and 2)
	ANALOG 3.5mm Mini Jacks	
6	AUDIO OUTPUTS	Connect to the digital audio acceptor (1 and 2)
	S/PDIF RCA Connectors	
7	XGA OUT 2 15-pin HD Connector	Connect to the video acceptor 2
8	LINK LED	Lights when receiving a valid input signal
9	ON LED	Lights when receiving power

¹ Using a straight pin to pin UTP or STP cable with RJ-45 connectors at both ends (the PINOUT is defined in [Table 3](#) and [Figure 4](#))

[Figure 2](#) and [Table 2](#) define the underside of the **TP-50**:

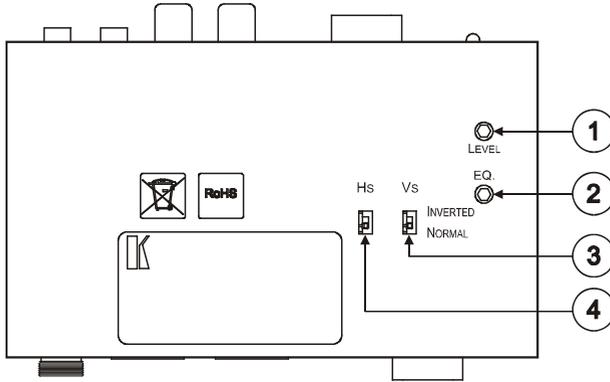


Figure 2: TP-50 XGA/Audio Line Receiver – DA Underside

Table 2: TP-50 XGA/Audio Line Receiver – DA Underside Features

#	Feature	Function
1	LEVEL Trimmer	Adjusts ¹ the output signal level for the XGA outputs
2	EQ. ² Trimmer	Adjusts ¹ the cable compensation (equalization) level for the XGA outputs
3	VS Switch ³	Slide the switch down (to NORMAL) to retain the polarity Slide the switch up (to INVERTED) to invert the VS polarity
4	HS Switch ³	Slide the switch down (to NORMAL) to retain the polarity Slide the switch up (to INVERTED) to invert the HS polarity

1 Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

2 Degradation and VGA/XGA signal loss can result from using long cables (due to the effects of stray capacitance, for example), sometimes leading to a loss of sharpness in high-resolution signals

3 By default, both switches are set to NORMAL

5 Connecting the TP-50 XGA/Audio Line Receiver – DA

You can use the **TP-50** with an XGA/audio transmitter, such as the Kramer **TP-121** or **TP-45** transmitter¹, and also connect an additional **TP-50** unit to increase the number of outputs.

To configure a **TP-45/TP-50** XGA/Audio Line Receiver – DA system² as illustrated in the example in [Figure 3](#), do the following:

1. On the **TP-45**:
 - Connect an XGA source to the XGA IN 15-pin HD connector
 - Connect an analog audio source to the ANALOG AUDIO 3.5mm mini jack³
 - If necessary, set the HS and VS switches on the **TP-45** underside
 - Press the video SELECT button to choose XGA
 - Release the audio SELECT button to choose ANALOG AUDIO⁴
2. On the **TP-50**, connect the following:
 - The XGA OUT 1 15-pin HD connector to an XGA acceptor (for example, display 1) and the ANALOG 1 AUDIO OUTPUT 3.5mm mini jack⁵ to an analog audio acceptor (for example, AV receiver 1)
 - The XGA OUT 2 15-pin HD connector to an XGA acceptor (for example, display 2) and the S/PDIF 2 AUDIO OUTPUT RCA connector to an S/PDIF acceptor (for example, AV receiver 2)
3. Connect the LINE OUTPUT RJ-45 connector on the **TP-45** to the LINE IN RJ-45 connector on the **TP-50**, via twisted pair cabling, see section [3.1](#).
4. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity on both⁶ the **TP-45** and the **TP-50** (not shown in [Figure 3](#)).

The signal from the XGA source is transmitted via twisted pair cable, decoded and converted at the XGA OUT 15-pin HD connector to the XGA acceptor.

1 See the separate user manuals for these machines that can be downloaded from the Internet at:

<http://www.kramerelectronics.com>

2 Using up to 300ft (100m) of UTP cabling

3 Or you can connect a digital audio source to the S/PDIF RCA connector

4 If the digital audio input is connected, press the button to select S/PDIF

5 Alternatively, you can connect a digital audio acceptor to the S/PDIF RCA connector, or you can connect both

6 You can connect the power to the TP-50 to power both the TP-45 and TP-50

5. If required, connect the LINE LOOP RJ-45 connector on the **TP-50** to an additional **TP-50** unit¹.
6. On the **TP-50** underside:
 - Adjust² the video output signal level and/or cable compensation equalization level, if required
 - If necessary, set the HS and VS switches³, on the underside

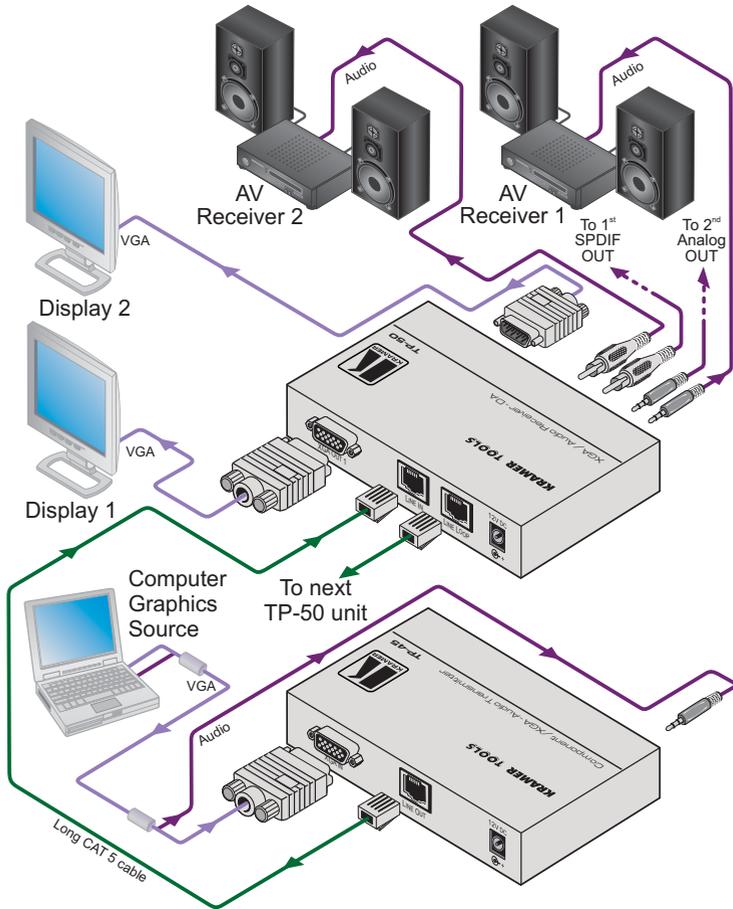


Figure 3: Component/XGA – Audio Distribution System, XGA Mode

1 Alternatively, you can connect it to an additional TP-46 unit

2 Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

3 By default, both switches are set down (for normal V SYNC and H SYNC polarity)

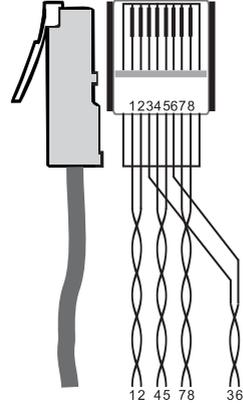
5.1 Wiring the CAT 5 LINE IN/LINE OUT RJ-45 Connectors

[Table 3](#) and [Figure 4](#) define the UTP CAT 5 PINOUT, using a straight pin to pin cable with RJ-45 connectors:

Table 3: CAT 5 PINOUT

EIA /TIA 568A		EIA /TIA 568B	
PIN	Wire Color	PIN	Wire Color
1	Green/White	1	Orange/White
2	Green	2	Orange
3	Orange/White	3	Green/White
4	Blue	4	Blue
5	Blue/White	5	Blue/White
6	Orange	6	Green
7	Brown/White	7	Brown/White
8	Brown	8	Brown
Pair 1		Pair 1	
Pair 1	4 and 5	Pair 1	4 and 5
Pair 2		Pair 2	
Pair 2	3 and 6	Pair 2	1 and 2
Pair 3		Pair 3	
Pair 3	1 and 2	Pair 3	3 and 6
Pair 4		Pair 4	
Pair 4	7 and 8	Pair 4	7 and 8

Figure 4: CAT 5 PINOUT



6 Technical Specifications

[Table 4](#) defines the technical specifications:

Table 4: Technical Specifications¹ of the TP-50

INPUTS:	1 twisted pair on an RJ-45 connector, for differential XGA and S/PDIF audio (line input)	
OUTPUTS:	2 XGA outputs on 15-pin HD connectors 1 LINE LOOP on an RJ-45 connector 2 stereo unbalanced audio outputs on 3.5mm phone jacks 2 S/PDIF outputs on RCA connectors	
MAX. OUTPUT LEVEL:	Video: 2Vpp @max gain	Audio: 4.6Vpp (analog)
VIDEO RESOLUTION:	Up to WUXGA	
AUDIO BANDWIDTH:	22kHz	
DIFF. GAIN:	4.7%	
DIFF. PHASE:	0.3Deg.	
K-FACTOR:	<0.05%	
S/N RATIO:	Video: 62.5dB	Audio: 69.2dB
CONTROLS:	Video level: -9.5dB to +2.2dB; video EQ: 0 to +26.3dB @50MHz	
COUPLING:	Video: DC	Audio: Input: AC Output: Analog: DC; S/PDIF: AC
AUDIO THD + NOISE:	0.035% @1kHz	
AUDIO 2nd HARMONIC:	0.003% @1kHz	
POWER SOURCE:	12V DC, 800mA	
DIMENSIONS:	12.1cm x 7.18cm x 2.42cm (4.76" x 2.83" x 0.95") W, D, H	
WEIGHT:	0.3kg (0.67lbs.) approx.	
ACCESSORIES:	Power supply	
OPTIONS:	RK-3T 19" rack adapter	

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 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, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
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 your 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.

* FCC and CE approved using STP cable (for twisted pair products)



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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