

# USER MANUAL

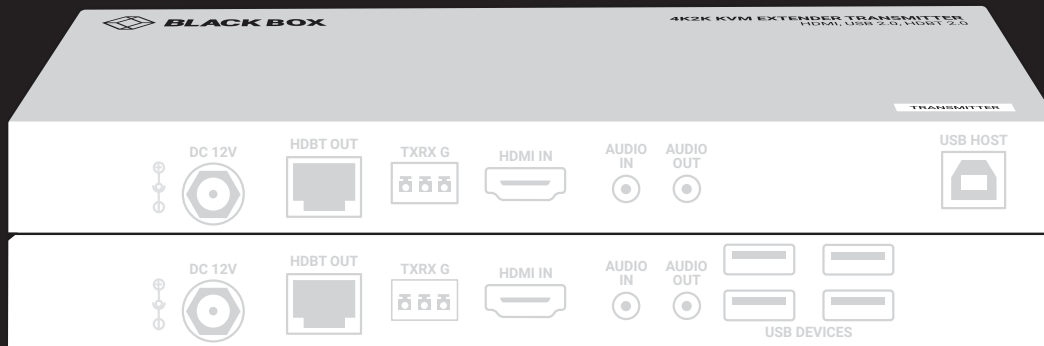
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ACU1700A

# KVM EXTENDER OVER HDBT

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24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT [BLACKBOX.COM](http://BLACKBOX.COM)



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## **SAFETY INFORMATION**

### **SAFETY PRECAUTIONS**

1. Do not expose this extender to rain, moisture, dripping or splashing and do not place any objects (such as vases) filled with liquids on the extender.
2. Do not install or place this extender in a bookcase, built-in cabinet or in another confined space. Make sure the unit is well ventilated.
3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the extender's ventilation openings with newspapers, tablecloths, curtains or similar items.
4. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
5. Do not place sources of open flames, such as lighted candles, on the unit.
6. Clean this extender only with dry cloth.
7. Unplug this extender during lightning storms or when unused for long periods of time.
8. Protect the power cord from being walked on or pinched, particularly at plugs.
9. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel.



# CHAPTER 1: SPECIFICATIONS

## 1.1 TRANSMITTER

<b>Video</b>	
Input	(1) HDMI
Input Signal Type	HDMI 1.4 with 4K
Input Resolution Support	4096 x 2160 @ 24/25/30/50/60 Hz, 3840 x 2160 @ 24/25/30/50/60 Hz, 1080P, 1080I, 720P, 576p, 576i, 480p
Input Video Level	0.5-1.0 V p-p
Input DDC Signal	5 V p-p
Maximum Pixel Clock	297 MHz
Output	(1) HDBT
Output Signal Type	HDBT 2.0
Output Resolution Support	4096 x 2160 @ 24/25/30/50/60 Hz, 3840 x 2160 @ 24/25/30/50/60 Hz, 1080P, 1080I, 720P, 576p, 576i, 480p
Video Impedance	100 ohms
Transmission Distance	Over CAT5e shielded cable: 3840 x 2160: max. 295 ft. (90 m); 1080P: max. 328 ft. (100 m); Over CAT6/6A/7 shielded cable: 3840 x 2160: max. 328 ft. (100 m); 1080P: max. 328 ft. (100 m)
<b>Audio</b>	
Audio Input	3.5-mm mini-jack, stereo
Audio Output	3.5-mm mini-jack, stereo
<b>Control</b>	
Control Method	(1) RS-232, (1) USB host



# CHAPTER 1: SPECIFICATIONS

## 1.2 RECEIVER

<b>Video</b>	
Input	(1) HDBT
Input Signal Type	HDBT 2.0
Input Resolution Support	4096 x 2160 @ 24/25/30/50/60 Hz, 3840 x 2160 @ 24/25/30/50/60 Hz, 1080P, 1080I, 720P, 576p, 576i, 480p
Input Video Level	0.5-1.0 V p-p
Input DDC Signal	5 V p-p
Maximum Pixel Clock	297 MHz
Output	(1) HDMI
Output Signal Type	HDMI 1.4 with 4K
Output Resolution Support	4096 x 2160 @ 24/25/30/50/60 Hz, 3840 x 2160 @ 24/25/30/50/60 Hz, 1080P, 1080I, 720P, 576p, 576i, 480p
Video Impedance	100 ohms
Transmission Distance	Over CAT5e cable: 3840 x 2160: max. 295 ft. (90 m); 1080P: max. 328 ft. (100 m); Over CAT6/6A/7: 3840 x 2160: max. 328 ft. (100 m); 1080P: max. 328 ft. (100 m)
<b>Audio</b>	
Audio Input	3.5-mm mini-jack, stereo
Audio Output	3.5-mm mini-jack, stereo
<b>Control</b>	
Control Method	(1) RS-232, (4) USB device

## CHAPTER 1: SPECIFICATIONS

### 1.3 GENERAL (BOTH TRANSMITTER AND RECEIVER)

<b>Approvals</b>	
Compliance	CE, FCC
<b>Environmental</b>	
Operating Temperature	32 to 113° F (0 to 45° C)
Storage Temperature	-4 to +158° F (-20 to +70° C)
Humidity	10 to 90% noncondensing
<b>ESD Protection</b>	
Human-Body Model	±8kV(Air-gap discharge)/±4kV(Contact discharge)
<b>Surge Protection</b>	
Voltage	±1 kV (Ten times respectively for the positive and negative voltage)
<b>Electrical Fast Transient/Burst</b>	
Data communication cord	1 kV
Power cord	2 kV
<b>Power</b>	
Power Supply	12 VDC, 2 A
Power Consumption (max.)	< or = 12 W (pair)
<b>Mechanical</b>	
Dimensions	Each unit: 0.98"H x 8.27"W x 3.55"D (2.5 x 21 x 9 cm)
Weight	Each unit: 1 lb. (0.46 kg)

### 1.4 CABLE SPECIFICATIONS

Cable Type	Range	Supported Video
CAT5e	328 ft. (100 m)	Up to 1080p @ 60 Hz, 36 bit (data rates lower than 5.3 Gbps or below 225 MHz TMDS clock)
	295.2 ft. (90 m)	1080p @ 60 Hz, 48 bit
CAT6/CAT6A/CAT7	328 ft. (100 m)	1080p @ 60 Hz 3D, 4K2K/30 Hz/4:4:4 and 4K2K/60 Hz/4:2:0 video formats



## CHAPTER 2: OVERVIEW

### 2.1 INTRODUCTION

The ACU1700A is a 4K HDBaseT 2.0 Extender that distributes uncompressed 4K @ 60 Hz UHD video, analog stereo, power, RS-232 and USB 2.0 up to 328 ft. (100 m) over a single CAT6 or above cable.

The transmitter passes through USB 2.0 and connects to a USB host. The receiver connects to a USB device. The extender pair enables remote users to control PC sources with a keyboard and mouse where interactive display operation, data transmission or USB streaming device over distance is required. The extender also support audio (bi-directional 3.5-mm stereo passthrough).

With 48-V PoH integrated inside, the extender just needs one power supply connected to the transmitter to power both units. The 12-V power supply is secured with a screw-on connector to prevent the power from being accidentally disconnected. The extender has LEDs to indicate when power is on to the units and to show signal status when a connection is established to devices.

### 2.2 FEATURES

- ◆ Supports high-speed USB 2.0, up to 480 Mbps, and passthrough over HDBaseT up to 328 feet (100 m).
- ◆ Offers bi-directional Analog Stereo, and RS-232 pass-through over HDBaseT.
- ◆ Via CAT6/6A/7 cable, supports 4K x 2K @ 60 Hz or 1080p @ 60 Hz output up to 328 ft. (100 m)
- ◆ Via CAT5e cable, supports 4K x 2K @ 60 Hz or 1080p @ 60 Hz output up to 288 ft. (90 m) or 1080p @ 60 Hz output up to 328 ft. (100 m)
- ◆ Complies with HDMI 1.4 with 4K @ 60 Hz (chroma sub-sampling 4:2:0 8-bit only) and HDBT 2.0.
- ◆ Uses one way POH, TX(PSE) with PSU to power both TX and RX (PD).
- ◆ Transmitter features USB 2.0 passthrough and has a USB Host port.
- ◆ Receiver has four USB device ports

### 2.3 WHAT'S INCLUDED

Your package should contain the following items. If anything is missing or damaged, contact Black Box Technical Support at 877-877-2269 or [info@blackbox.com](mailto:info@blackbox.com)

- ◆ (1) Transmitter
- ◆ (1) Receiver
- ◆ (1) 12-VDC, 2-A power supply
- ◆ (2) 3.5-mm. 3-pin Phoenix male connectors
- ◆ (2) mounting brackets

# CHAPTER 2: OVERVIEW

## 2.4 HARDWARE DESCRIPTION

### 2.4.1 TRANSMITTER

Figures 2-1 and 2-2 show the front, top and back panels of the transmitter. Table 2-1 describes its components.

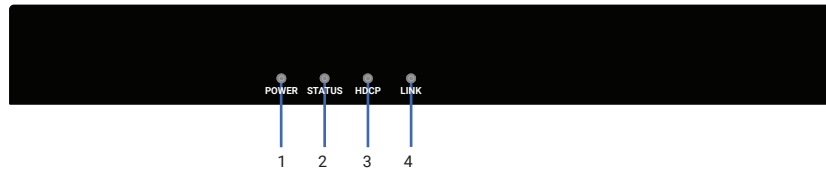


FIGURE 2-1. TRANSMITTER FRONT PANEL

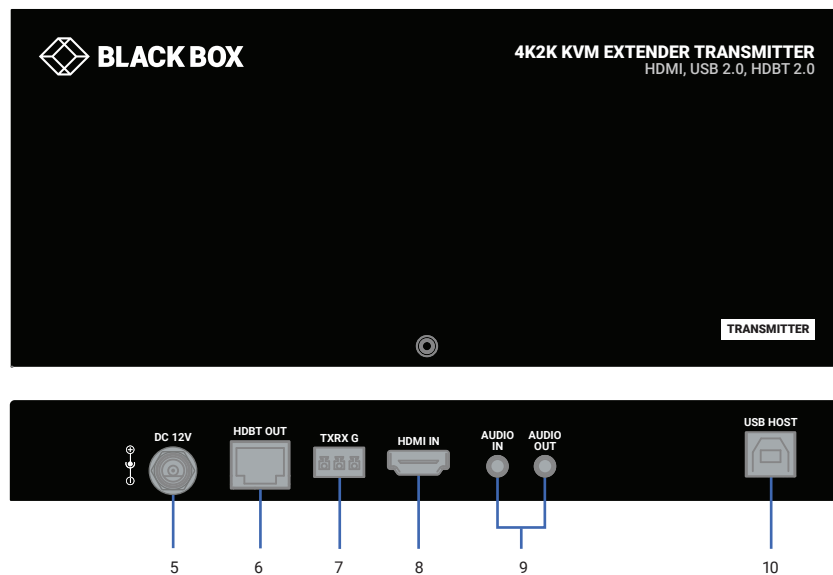


FIGURE 2-2. TRANSMITTER TOP AND BACK PANEL



**TABLE 2-1. TRANSMITTER COMPONENTS**

NUMBER IN FIGURE 2-1 OR 2-2	COMPONENT	DESCRIPTION
1	Power LED	ON: The transmitter is powered on. OFF: The transmitter is powered off.
2	Status LED	Flashing Slowly: The transmitter is working properly. OFF: The transmitter is not working properly
3	HDCP LED	Flashing Quickly: Non-HDCP video is being transmitted. OFF: No video is being transmitted
4	Link LED	ON: HDBT link is normal OFF: No HDBT Link
5	12-VDC connector	12-VDC power input, threaded port for standard or locking connection
6	HDBT OUT connector	Connects to HDBT IN port of receiver
7	RS-232 connector	RS-232 passthrough
8	HDMI IN connector	Connects to an HDMI source
9	Audio connector	Input: Connects to audio devices Output: Connects to audio devices
10	USB Host connector	Connects to a USB host device, such as a PC

# CHAPTER 2: OVERVIEW

## 2.4.2 RECEIVER

Figures 2-3 and 2-4 show the front, top and back panels of the receiver. Table 2-2 describes its components.

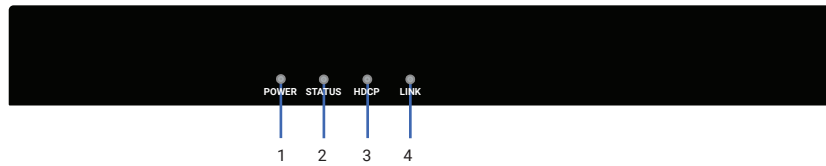


FIGURE 2-3. RECEIVER FRONT PANEL

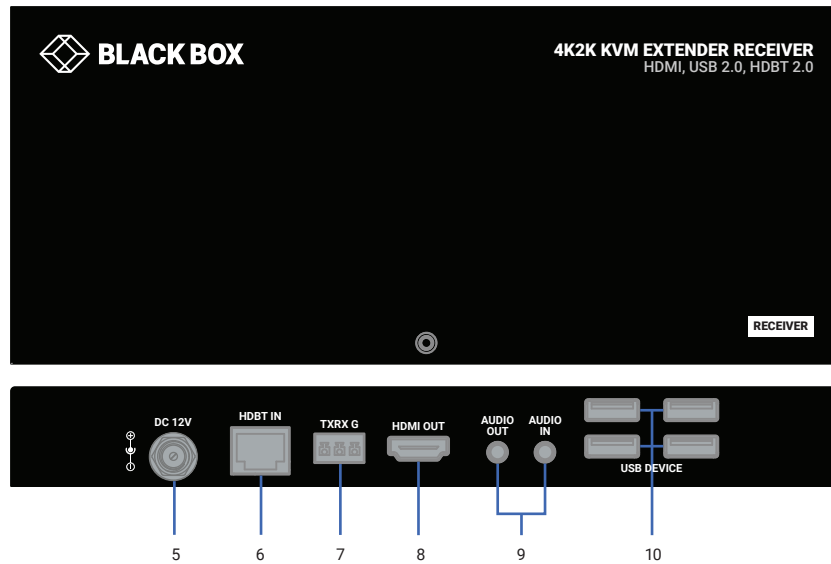


FIGURE 2-4. RECEIVER TOP AND BACK PANEL

**TABLE 2-2. RECEIVER COMPONENTS**

NUMBER IN FIGURE 2-3 OR 2-4	COMPONENT	DESCRIPTION
1	Power LED	ON: The transmitter is powered on. OFF: The transmitter is powered off.
2	Status LED	Flashing Slowly: The transmitter is working properly. OFF: The transmitter is not working properly
3	HDCP LED	Flashing Quickly: Non-HDCP video is being transmitted. OFF: No video is being transmitted
4	Link LED	ON: HDBT link is normal OFF: No HDBT Link
5	12-VDC connector	12-VDC power input, threaded port for standard or locking connection
6	HDBT IN connector	Connects to HDBT OUT port of transmitter
7	RS-232 connector	RS-232 passthrough
8	HDMI OUT connector	Connects to an HDMI monitor
9	Audio connector	Input: Connects to audio devices Output: Connects to audio devices
10	USB Host connector	Connects to a USB host device, such as a PC

## CHAPTER 3: INITIAL INSTALLATION

1. Using quality HDMI cables, connect an HDMI source (such as Blu-ray, games console, satellite/cable TV, media server, etc.) to the HDMI IN connector of the Transmitter.
2. Connect a good-quality, well-terminated CAT5e or better cable between the HDBT OUT connector of the Transmitter to the HDBT IN Input port of the Receiver.
3. Using quality HDMI cables, connect the HDMI display device (LED/LCD display or projector) to the HDMI OUT port of the Receiver.
4. Connect the included 12-V power supply to the Transmitter. The PoH function carries power along the length of the cable one way to power the Receiver. No additional power supply is required for the receiver.
5. Power on all devices. Check the status of indicators on the front panel. The Power and Link LEDs will light ON solid while the Status LED should be blinking.
6. Most USB devices are supported, however some are not. Gaming controllers and keyboards are not compatible with this extender.

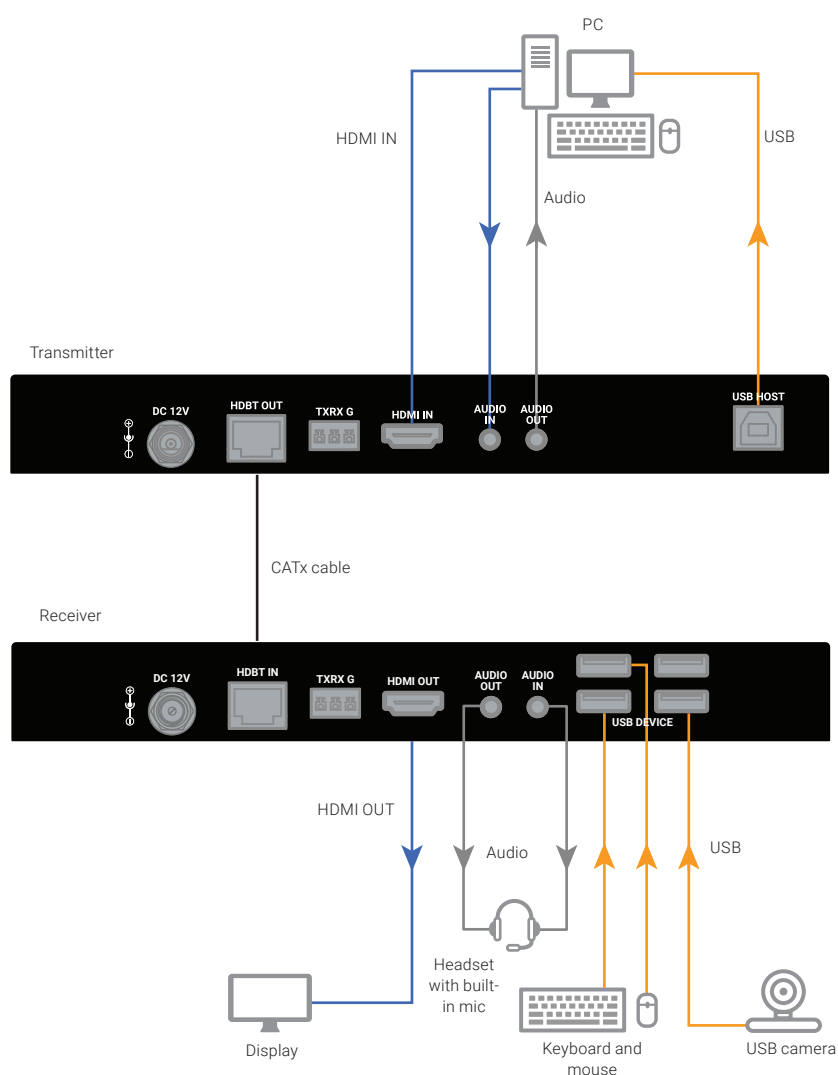


FIGURE 3-1. TYPICAL INSTALLATION

## CHAPTER 4: TECHNICAL SUPPORT

### 4.1 CONTACTING BLACK BOX

If you determine that your extender is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 877-877-2269 or [info@blackbox.com](mailto:info@blackbox.com).

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- ♦ the nature and duration of the problem.
- ♦ when the problem occurs.
- ♦ the components involved in the problem.
- ♦ any particular application that, when used, appears to create the problem or make it worse.

### 4.2 SHIPPING AND PACKAGING

If you need to transport or ship your extender:

- ♦ Package it carefully. We recommend that you use the original container.
- ♦ If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

## APPENDIX A: REGULATORY INFORMATION

### A.1 FCC STATEMENT

This equipment has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Shielded cables must be used with this equipment to maintain compliance with radio frequency energy emission regulations and ensure a suitably high level of immunity to electromagnetic disturbances.

All power supplies are certified to the relevant major international safety standards.



## APPENDIX A: REGULATORY INFORMATION

### A.2 NOM STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
  - A: El cable de poder o el contacto ha sido dañado; u
  - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
  - C: El aparato ha sido expuesto a la lluvia; o
  - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
  - E: El aparato ha sido tirado o su cubierta ha sido dañada.

## APPENDIX B: DISCLAIMER/TRADEMARKS

### B.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

### B.2 TRADEMARKS USED IN THIS MANUAL

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**NEED HELP?  
LEAVE THE TECH TO US**

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**LIVE 24/7  
TECHNICAL  
SUPPORT**

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**1.877.877.2269**

