



## innkeeper LTD™ Digital Hybrid



### User Guide

# Welcome

## Thank You

Thank you for purchasing a JK Audio innkeeper LTD Digital Hybrid. Please read this guide for instructions on setting up and using your new product.

## Getting Assistance

If you have technical or application questions:

**Call us at:**

**815-786-2929**

**Email us at:**

**[support@jkaudio.com](mailto:support@jkaudio.com)**

Or check out our **FAQ** section for answers to common questions.

## Warnings & Safety Precautions

- Read and keep these instructions.
- Follow all instructions.
- Clean only with a soft dry cloth.
- Refer all servicing to qualified service personnel.
- Heed all warnings.



**Warning:** Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



**Warning:** Do not defeat the safety purpose of the three-prong grounding type plug. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.



**Warning:** Do not use this unit if the electrical power cord is frayed or broken. The power cord should be routed so that it is not likely to be walked on or pinched by items placed upon or against it.



**To reduce the risk of fire:** Use only No. 26 AWG or larger telecommunication line cord.



**To reduce the risk of fire or electric shock:** Do not expose this apparatus to rain or moisture.

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## Limited Warranty

The innkeeper LTD is covered by a 1 year warranty to be free from defective workmanship and materials. To obtain service, contact JK Audio by phone or email for return authorization. Once authorized, you will carefully pack and ship the faulty product and all accessories to us. You will pay for shipping to us and we will pay for return back to you.

This warranty does not cover damages due to accident, weather, fire, flood, earthquake, misuse, unauthorized repairs or modifications, or damages occurred in shipping, only defective workmanship or materials.

**There are no expressed or implied warranties which extend beyond the warranty here made.**

# Features

## Features

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16 bit DSP Technology

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Auto-Answer (Switchable On/Off)

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Proprietary Auto Null Algorithm  
(50 dB null)

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Send XLR Line Input

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Caller XLR Line Output

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Front Panel Off-Hook LED

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Guest Module 1 Remote Control Jack

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Send and Caller Signal Level LEDs

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Send and Caller Volume Controls

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Rack Mountable

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## What's in the Box?

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Universal Power Supply  
with Detachable Cord

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RJ11 Phone Cord

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### **Introducing the innkeeper LTD™**

Innkeeper LTD allows you to send line level signals into the phone line while maintaining excellent separation between your voice and the caller. The balanced XLR output jack contains only the caller's voice, making this the perfect companion to mixers, consoles, and PA systems that demand talk show quality audio from a phone line.

The digital hybrid connects audio signals to a standard analog phone line without the transmit/receive crosstalk common to analog hybrids. Its Digital Signal Processor (DSP) continuously monitors both the phone line and audio signals to deliver excellent separation. This proprietary, dual-convergence echo canceller algorithm can achieve separation typically exceeding 50 dB without any setup and without sending a noise burst down the line. While this may sound complicated, it's all done automatically during every call.

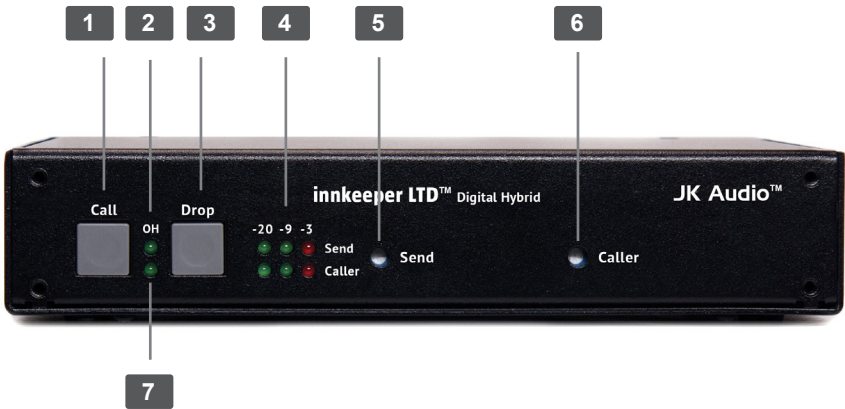
### **Ready to go?**

The innkeeper LTD controls and connectors are clearly marked and ready for operation. If this is your first exposure to a hybrid, we suggest that you read the entire manual to allow you to take advantage of all these features.

### **Any Questions?**

Before you pick up the phone... Please thumb through the rest of this manual. You might find those deep technical questions are covered on later pages.

# Getting to Know Your innkeeper LTD



## Controls & Indicators

- 1. Call Button**

Takes the line off-hook; press this button to answer a call or you can direct a call from your aux phone through the hybrid.
- 2. OH LED**

Lit when you are on line with a call (off-hook).
- 3. Drop Button**

Press this button to drop (hang up) a call.
- 4. Signal LEDs**

Send LEDs represent the signal level going out to the telephone line. Caller LEDs represent the signal level coming from the phone line, after the DSP.
- 5. Send Level**

Adjusts the signal that you are sending down the telephone line.
- 6. Caller Level**

Adjusts the level of the incoming caller's audio as it is going out the output jacks.
- 7. Power LED**

Lit when unit is plugged in and receiving power.

# Getting to Know Your innkeeper LTD



## Inputs & Outputs

### 1. Phone Line

Connect to a standard, single line, analog telephone line.

### 2. Aux Phone

Connect a single line analog telephone for call setup / dialing, or producer call screening.

### 3. Auto Answer

When enabled, innkeeper LTD automatically answers an incoming call and then disconnects after the caller hangs up. Auto answer will occur on the first ring.

### 4. Caller Output

Male balanced XLR output contains only the callers voice.

### 5. Send Input

Female balanced XLR input for signals going into the phone line.

### 6. Remote Control Jack

8-pin modular RJ-45 jack for connection to the optional JK Audio Guest Module 1 Remote Keypad or your broadcast console switch contacts (see [page 7](#)). Do not connect this jack to your computer network port.

### 7. Power Jack

For connection only to the supplied 9VDC regulated power supply.

# Getting Connected

## Connecting to a Single Line Phone

1. Connect the supplied RJ-11 phone line cable between the jack marked **<Line>** and your wall jack. Be sure this jack supports standard single line analog telephone operation.
2. You may want to connect an auxiliary telephone to the innkeeper LTD **<Phone>** jack so you can dial out and set up calls, or use the **<Auto-Answer>** feature to answer incoming calls.

## Connecting to a Mixer (Mix Minus Caller)

**Note:** A mix-minus signal is an audio signal that contains a mix of your local microphones plus any other audio, minus the Caller's own voice. Sending the Caller's audio back to the innkeeper LTD will cause an echo, or feedback.

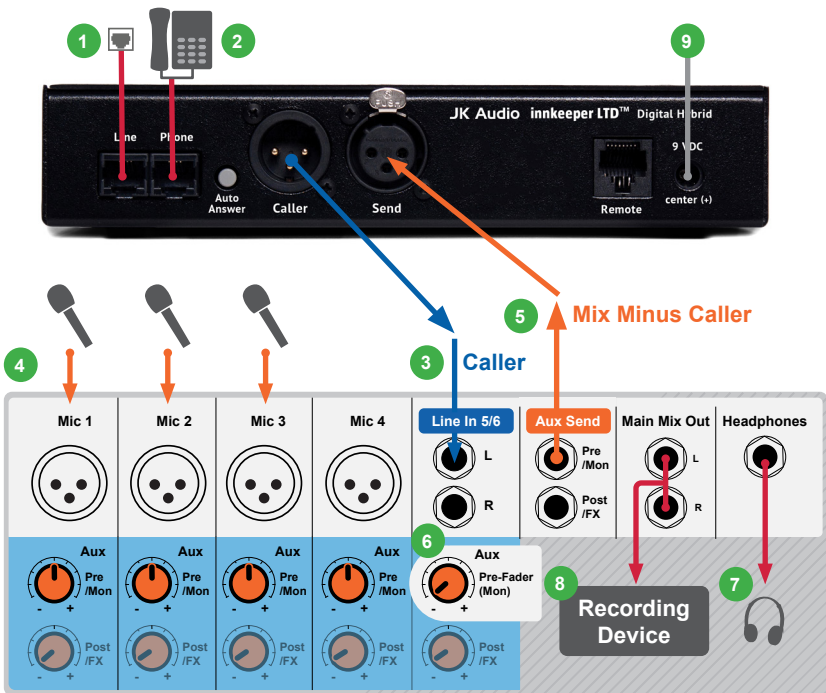
3. Connect the innkeeper LTD **<Caller>** output to any **Line** input on the mixer.
4. Connect your microphone(s) to the mic inputs on your mixer.
5. Connect the mixer's Mix-Minus bus or **Aux Send** output (this may be labeled **FX** or **Mon** but any Aux bus will work) to the **<Send>** input on innkeeper 1rx. Set the innkeeper 1rx **<Mic/Line>** switch to the **Line** position.
6. **If your mixer doesn't have a mix-minus bus:** Whichever input channel you have the **<Caller>** connected to, turn the corresponding **Aux** control to minimum. All **Aux** controls for other channels should be set for audio sent to the phone line. Each **Aux Send** bus is completely separate from all other outputs, so these Aux controls will not affect what is heard on the Main outputs or on any other Aux buses.

**Tip:** Using an Aux Send bus that is **Pre-Fader** allows you to control the levels of each channel to the main output without affecting what is sent to the phone line.

7. Connect your headphones to the mixer.
8. Use Main Outputs to send audio to recording device or broadcasting equipment inputs.



## Getting Connected



### Completing Setup

9. Connect the supplied DC power supply to the back of the innkeeper 1rx and then to an AC power outlet.



This device should be connected to an adequate surge protective device at all times both for the power connector and for the telephone line to avoid damage from lightning or electrical surges.

10. Adjust the **<Send>** level controls so that you consistently light the green -20 dB and -9 dB and rarely light the red -3 dB peak Send LED. These flashes should occur only during loud speech bursts. If the red LED stays lit for extended periods you can assume that much of your speech is being clipped or distorted. Set the **<Caller>** control for good recording level of the caller audio at the output jack.

# Operation

## Auxiliary Telephone

An auxiliary telephone provides you with an easy way to dial out or set up your calls. innkeeper LTD will disconnect the auxiliary telephone when you press the **<Call>** button. If you need to take the call back on the aux telephone, simply pick up the telephone handset before the innkeeper LTD's **<Drop>** button is pressed.

To use an auxiliary phone equipped with a "Hold" feature to place or screen a call, first set up the call and place the call on hold. When you are ready to take the call on Innkeeper LTD, press the **<Call>** button on the innkeeper LTD and your telephone will automatically release the hold.

Your phone will operate as a normal telephone anytime you are in Drop mode. Leaving the hybrid connected between the wall jack and your telephone will not affect normal use of your phone. Audio will only pass through the hybrid when you press the **<Call>** button.

## Optional Jumper Settings

If the incoming Caller level is too high and peaking the red -3 dB LED, you may need to change the setting of an internal jumper. Disconnect power from the hybrid and remove the cover of the innkeeper LTD to locate Jumper 1. The default position for this jumper is **closed** (covering both pins). Changing the jumper to the **open** position (either remove the jumper or cover just one pin) will provide 6 dB attenuation of the incoming audio signal.

## Auto-Answer

The **<Auto-Answer>** feature will answer on the first ring. When **<Auto-Answer>** is enabled, you can still make calls manually using the **<Call>** button.

When finished, you can either drop the call manually or allow the call to Auto-Disconnect. innkeeper LTD will look for a CPC disconnect signal from the phone company to determine when a call has disconnected. This can take up to a minute.

## Remote Control Jack

The RJ-45 jack on the back of the innkeeper LTD provides connection to an optional JK Audio Guest Module 1 remote control, or it can be wired to the switch contacts on your broadcast console. Do not connect this jack to the network port on your computer.

### RJ-45 Pinout:

- 1: Ground
- 2: Call / Drop Control (main control pin)
- 3: Ring / OH LED
- 4: DTMF Input
- 5: +4.3 VDC
- 6: Reserved
- 7: Reserved
- 8: Reserved

**To take innkeeper LTD off-hook**, momentarily connect pin 2 to pin 5 (power) through a 100 ohm ¼ watt resistor.

**To release (Drop) the phone line**, momentarily connect pin 2 to pin 1 (ground) through a 100 ohm 1/4 watt resistor.

Pin 3 contains a 4.3 VDC, 40 mA current limited output to drive a signal LED. We suggest adding a 200 ohm ¼ watt resistor in series with an LED connected to ground.

Pin 5 supply output is current limited to 100 mA with a resettable fuse for use with the Guest Module and pin 2 connections. Do not attempt to power additional circuitry from this pin.

## Guest Module 1 (Sold Separately)

This convenient device gives you remote access to the on-hook/offhook and dial features of the innkeeper LTD. The <Call> button will flicker when a call comes in and will stay lit while a call is present. When you dial out using the Guest Module 1 keypad, the tones are sent directly down the phone line, and do not come back blasting in your ear. **Product sold separately.**

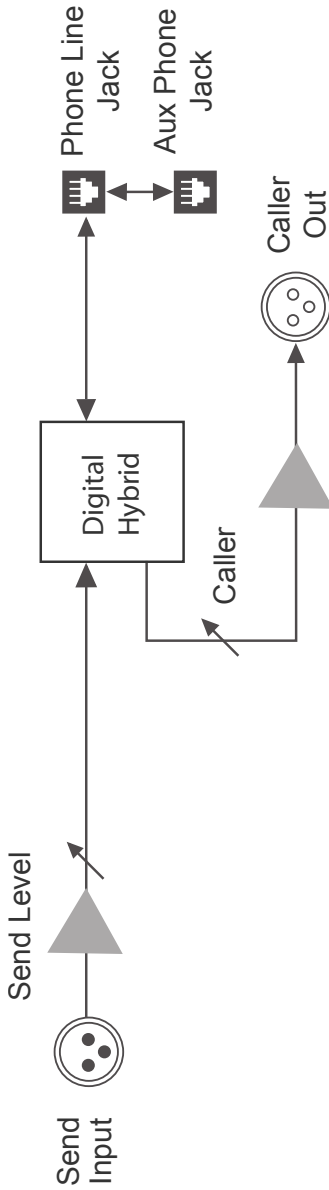
### Guest Module 1 Features:

- Ring and Call LED
- Call and Drop Buttons
- DTMF Keypad
- Keypad Disable Switch
- Remote Powered



# Technical Information

## Block Diagram



## Specifications

<b>Input</b>	<b>Impedance / Level</b>
Balanced Female XLR:	20k ohms / 50 mV RMS; -4 dBu nom.;

<b>Output</b>	
Balanced Male XLR:	200 ohms / 500 mV RMS; -4 dBu nom.; +14 dBu max; Caller Only

<b>Misc</b>	
Phone Line:	RJ11C
Remote Jack:	RJ45
Ringer:	0.8B REN
Isolation:	1500 VAC
Frequency Response:	Telephone Side 200 Hz-3.6 kHz
Power:	120-240 VAC Power Supply
Size:	7.6" x 5.3" x 1.5" (20 x 14 x 4 cm)
Weight:	2.7 lbs (1.2 kg)

## FAQs

### **1. Does the innkeeper LTD send a burst or beep down the phone line at the beginning of each call like our current hybrid?**

No. Innkeeper LTD uses the actual transmit signal to evaluate the phone line and tune its algorithm. As you begin to speak, innkeeper LTD is hard at work canceling your voice from the Caller Output jack. Within milliseconds your voice is reduced into the noise floor.

### **2. Can I use the innkeeper LTD on a VoIP line?**

Many VoIP lines have an analog telephone adapter you can connect your telephone to. If you can use any standard analog telephone, then innkeeper LTD should work great. If you have to use a specific telephone, you should consider our AutoHybrid IP2 VoIP hybrid or Innkeeper PBX digital hybrid instead.

### **3. The caller's audio is too high and is always distorted even though I have the Caller level control turned down low. What else can I do?**

The Receive LED meter will indicate the level of audio coming in from the telephone line, just after it passes through the DSP. The Caller level control will only set how much of that audio will be sent to the output jack, and will have no effect on the LED meter. If your incoming audio level is unusually hot and already peaking the  $-3$  dB LED, there is a jumper on the circuit board you can change to attenuate the incoming audio. Please see page 6 for more information.

### **4. I have my new innkeeper LTD connected to the phone jack in my office. Why does it keep dropping the calls as soon as I try to connect it?**

The telephone jack in your office is very likely for a multi-line phone system. The jack may look like a standard phone jack, but it is wired differently and may carry voltage on different pins which could cause serious damage to your hybrid. Innkeeper LTD should only be connected to a single, analog phone line. Check with the telephone specialist in your building for the possibility of getting an analog line for your innkeeper LTD.

### **5. I have my new innkeeper LTD connected to an analog extension in my office. It will auto answer just fine but does not auto disconnect after the call has ended. How can I make it auto disconnect properly?**

A PBX phone system can be programmed to provide an analog line. Check with the telephone specialist in your building for the possibility of resetting the characteristics of your analog line to provide an appropriate CPC disconnect signal.

## Declaration of Conformity

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Manufacturer's Name: JK Audio, Inc.  
Manufacturer's Address: 1311 E 6<sup>th</sup> Street  
Address: Sandwich, Illinois 60548 USA

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Declares that the product:

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Product Name: innkeeper LTD Digital Hybrid  
Model Numbers: innkeeper LTD

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Conforms to the following Product Specifications:

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Safety: AS/NZS 60950.1:2003  
CAN/CSA-C22.2 No. 60950-01-03  
UL Standard 60950-01 1<sup>st</sup> edition

ESD: EN 55024:1998; EN 61000-3-2; EN 61000-3-3

Emissions: EN 55022:1998  
AS/NZS CISPR 22 (2002)  
FCC Part 15, Subpart B  
ICES-003

Telecom: AS/ACIF S002:2005  
FCC CFR 47, Part 68  
TIA968 A-1, A-2, A-4

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The product herewith complies with the requirements of the following Directives and carries the CE marking accordingly:

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LVD 2006/95/EC (Safety)  
R&TTE 1999/5/EC (Telecom)  
EMC 89/336/EEC (EMC)  
RoHS Directive 2015/863

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The Technical File containing supporting documentation is maintained at:

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JK Audio, Inc (Corporate Headquarters)  
Compliance Manager  
1311 E 6th Street  
Sandwich, Illinois 60548 USA  
815-786-2929 phone  
815-786-8502 fax

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# FCC Registration

## FCC Registration

Your new JK Audio product has been registered with the Federal Communications Commission (FCC). This product complies with the standards in Part 68 of the FCC rules.

### 1. Connection and use with the nationwide telephone network

The FCC requires that you connect this telephone equipment to the national telephone network through a USOC RJ-11C modular telephone jack. This equipment may not be used with Party Line Service or Coin Telephone Lines. This equipment is hearing aid compatible.

### 2. Information for the telephone company

Upon request from your local telephone company, you are required to provide the following information:

- A. The "line" to which you will connect the telephone equipment (that is, your telephone number), and
- B. The telephone equipment's FCC registration number. This can be found on the bottom of your telephone equipment, and,
- C. The ringer equivalence number (REN) for this equipment. The REN is used to determine the quantity of devices which will be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed 5.0. To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the local telephone company.

### 3. Repair Instructions

If it is determined that your telephone equipment is malfunctioning, the FCC requires that it not be used and that it be unplugged from the modular outlet until the problem has been corrected. Repairs to this telephone equipment can only be made by the manufacturer or its authorized agents or by others who may be authorized by the FCC. For repair procedures, follow the instructions outlined under the warranty section of the manual.

### 4. Rights of the telephone company

If telephone equipment is causing harm to the network, the telephone company may temporarily discontinue your telephone service. If possible, they'll notify you before they interrupt service. If advanced notice isn't practical, you'll be notified as soon as possible. You'll be given the opportunity to correct the problem, and you'll be informed of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your JK Audio product. If such changes are planned, you'll be notified by your telephone company.



### **FCC Part 15 Subpart A Compliance**

This equipment has been tested and 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/her own expense.

Changes or modifications not expressly approved by JK Audio can void the user's authority to operate the equipment.





**innkeeper LTD™**  
Digital Hybrid



**User Guide Version 7/17/23**

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