

innkeeper PBX

Desktop Digital Hybrid



User Guide

JK Audio

Introduction

Innkeeper PBX will allow you to send and receive audio through your multi-line PBX, ISDN or analog telephone. While this may seem like a simple task that any telephone can do, the challenge is getting the best quality audio from such a limited audio path.

What is a Digital Hybrid?

The innkeeper PBX digital hybrid connects audio signals to and from the handset side of a telephone without the variations in quality found with analog hybrids. The main function of a hybrid is to bring in the caller's voice from the phone line as clear and clean as possible. In the real world, when you send your voice down the telephone line it has a tendency to bleed over into the caller's audio. The hybrid must adapt to the audio signals from the telephone in order to properly separate transmit and receive audio. We use a 16 bit DSP (Digital Signal Processor) to continuously monitor the phone line and local audio signals to deliver excellent trans-hybrid loss, also known as separation. Our dual-convergence algorithm can achieve excellent separation, typically exceeding 50 dB.

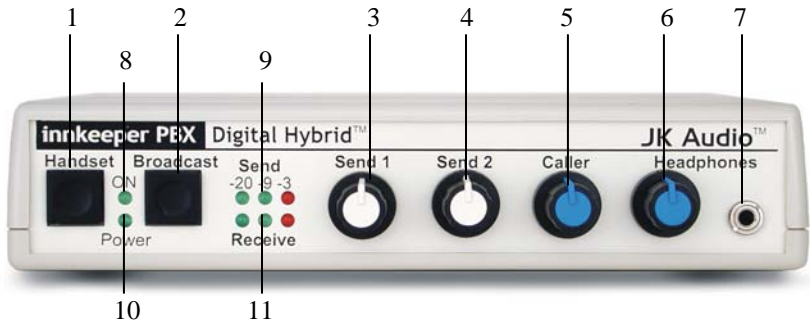
Ready to go?

The innkeeper PBX controls and connectors are clearly marked and ready for operation. The Features diagrams and Operation sections on the following pages will help you pinpoint any minor questions that you may have. 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?

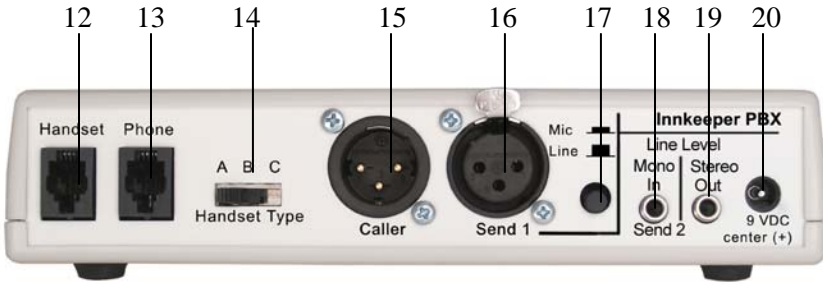
Before you pick up the phone... Please thumb through the rest of this manual. You might find those deep technical questions are covered on later pages.

Features



1. Handset Button - Press this button to use the handset as if you were on a normal telephone call.
2. Broadcast Button - Press this button to disable the handset and activate the innkeeper PBX for use as a digital hybrid.
3. Send 1 Level - Adjusts the signal level that you are sending down the telephone line, through the female XLR input.
4. Send 2 Level - Adjusts the signal level that you are sending down the telephone line, through the 3.5mm mini jack input.
5. Caller Level - Adjusts the level of the signal coming in from the telephone line, as it is going out the output jacks.
6. Headphone Level - Adjusts the signal level coming from the 3.5mm front panel headphone jack.
7. Headphones - The 3.5mm stereo headphone jack contains a mix of both the Send input audio and the Caller audio.
8. ON LED - Lit when you are on line with a call using the hybrid.
9. Send LEDs - Displays the signal level going to the phone line.
10. Power LED - Lit when unit is plugged in and receiving power.
11. Receive LEDs - Displays the signal level coming from the phone line, after the DSP. This signal level will not change when you adjust the Caller knob.

Features (continued)



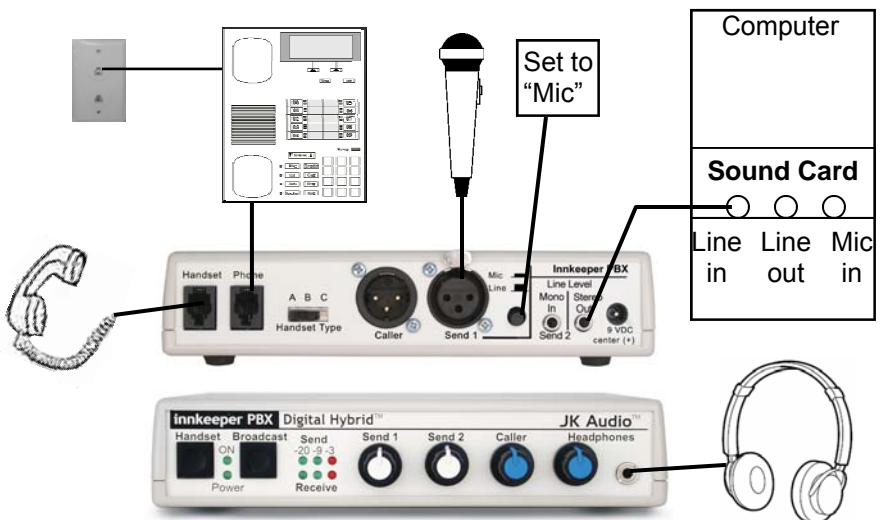
12. Handset Jack - Connect your telephone handset to this jack.
13. Phone Jack - Connect this jack to the handset jack on your telephone using the supplied handset jumper cable.
14. Handset Type Selector Switch - Use this switch to select the correct type of handset microphone that your telephone uses. A=Electret, B=Carbon, C=Dynamic
15. Caller Output - Male balanced XLR output contains only the caller's voice.
16. Send 1 Input - Female balanced XLR input for audio going into the phone line. Mic or line level input.
17. Mic / Line switch - Sets the front end sensitivity of the Send 1 XLR jack. Set to *Mic* if you intend to connect a dynamic microphone directly to the Send 1 jack. Set to *Line* if you are connecting to the output of a mic mixer.
18. Send 2 Mono Input - 3.5mm mono mini jack input for signals going into the phone line. Line level.
19. Stereo Output - 3.5 mm stereo mini jack output contains Send and Caller audio determined by the Send 1 and Send 2 levels and the Caller level controls. Left channel contains your local Send audio and right channel contains the Caller's audio from the telephone line.
20. Power Jack - For connection only to the supplied 9VDC regulated power supply only.

Connection

Although each application may require a slightly different setup, there are two primary configurations.

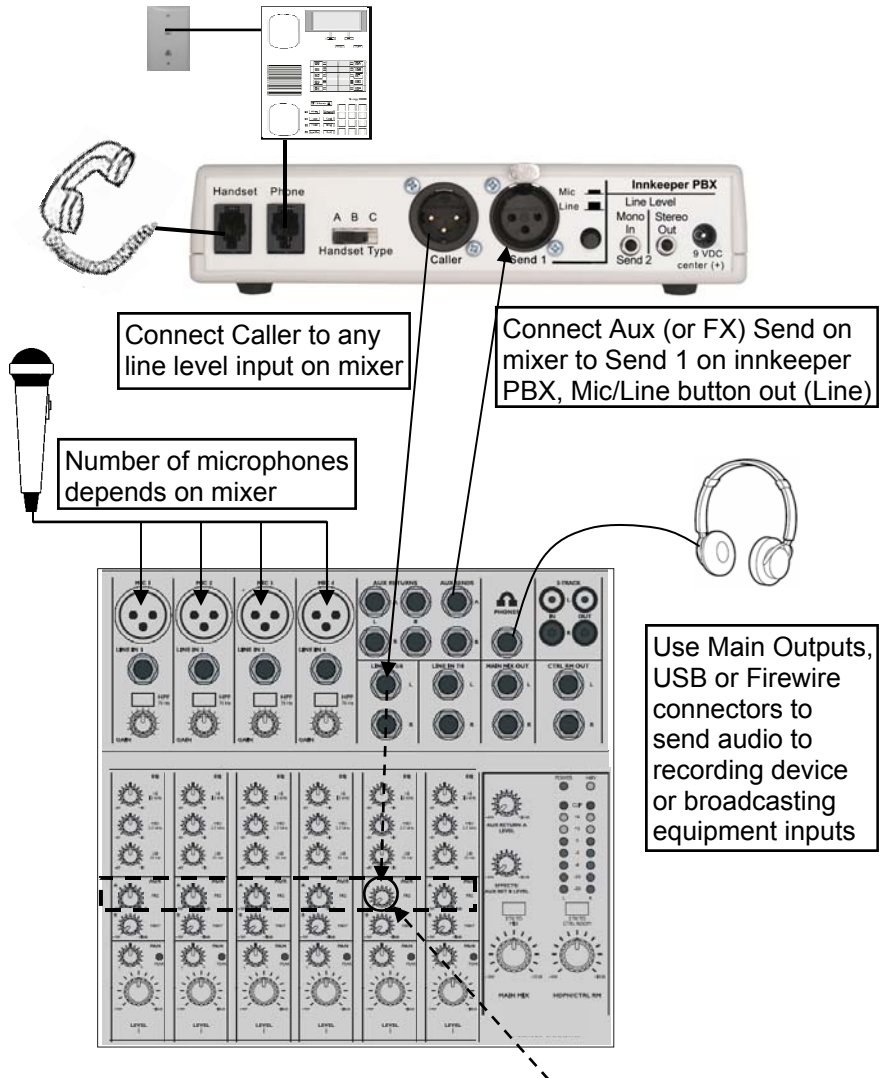
For a direct connection to innkeeper PBX:

- Handset cable - Connect the supplied RJ-22 handset cable between the jack marked "Phone" on the back of innkeeper PBX and to the handset jack on the base of your telephone.
- Handset - Connect your telephone handset to the RJ-22 jack on the back of the innkeeper PBX marked "Handset".
- Send Audio - Connect a dynamic microphone cable to the Send 1 jack on the innkeeper PBX. Be sure to set the Mic/Line switch to the "Mic" position.
- Output - Connect a *stereo* cable from the mini jack "Stereo Out" on the innkeeper PBX to the "Line Input" on your computer sound card, mini disk recorder or other equipment.
- Power - Connect the supplied DC power supply to the back of the innkeeper PBX and then to an AC power outlet.
- Place a test call to a quiet location. Set the "A-B-C" switch on innkeeper PBX for best audio.
- Set the "Send" level control so that while you are speaking into the microphone, the Send LEDs on the hybrid light the -20 dB green LED consistently and flash the -9 dB green LED. If you flash the -3 dB red LED, lower the level. Set the "Caller" control for good recording level of the caller audio at the output jack.



Connection (continued)

To connect innkeeper PBX through a mixer—Mix Minus Setup



For whichever input channel you have the Caller connected to, turn the corresponding Aux control to minimum (usually hard left). All other Aux controls should be set for what you want to send 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. This Aux Send bus should be pre-fader, so you can use the fader controls to set the levels of each channel to the main output.

Operation

- Using balanced XLR cables (not included) with 1/4" TRS adapters if necessary for your mixer, make all connections as shown.
- On your mixer and on innkeeper PBX, set all controls to nominal levels, usually 12:00.
- On your mixer, set local microphone channel input gain for good microphone level.
- On your mixer, set all output faders and the main mix control for good recording level of the local audio.
- On your mixer, set the headphone level for comfortable listening.
- On your mixer, set the Caller channel input gain to line level, if there is a selector switch. If there is no line level input and you must connect the Caller to a Mic in, turn the input gain way down.
- On your mixer, set the Aux control for Caller channel only to minimum (zero or ∞). Aux controls for all other channels should initially be set at 12:00. Set Aux Send Master for good overall level.
- Place a test call to a quiet location. Set the A-B-C switch on the innkeeper PBX for best audio.
- On your mixer, set the Aux Send control so that while you are speaking into the microphone the Send LEDs on the hybrid light the -20 dB green LED consistently and flash the -9 dB green LED. If you flash the -3 dB red LED, lower the level.
- On your mixer, set the Caller channel output level for good recording level of the caller audio. If you need more control of this level, on the mixer first adjust the caller channel input gain (if applicable), then adjust the Caller control on the innkeeper PBX.

Mix-Minus Setup

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 PBX through Send 1 will cause an echo, or feedback.

If your mixer does not have an Aux Send bus, you can achieve the same results using Pan controls with the Left and Right outputs. Simply pan all the microphones, etc. to the Left output and pan the Caller to the Right output. Then connect only the Left output to the innkeeper PBX Send 1. Or, you may use an external Mix-Minus box that will create this signal for you.

Operation (continued)

Telephone Handset

Innkeeper PBX will disable the microphone in the telephone handset when you press the Broadcast button. Use your telephone to place or screen a call. When you are ready to take the call on innkeeper PBX, simply press the Broadcast button. Innkeeper PBX will automatically release the Hold (if Hold is used). **Make sure you do not put the telephone handset back in its cradle while you are on a call.** This will still drop the call. **Do not disconnect or remove the handset during your call** as this will change the input impedance from the phone line and change the audio level.

If you need to take the call back on your telephone, press the Handset button on innkeeper PBX. This will disable the inputs and outputs on innkeeper PBX and connect your handset back to the telephone. Your telephone will operate as a normal telephone anytime you are in Handset mode. Leaving the hybrid connected to the handset jack on your telephone will not affect normal use of your telephone. Audio will only pass through the hybrid when you press the Broadcast button.

Optional Jumper Settings

There is a jumper located inside the innkeeper PBX at **J9** that affects handset operation. The factory default closed position (jumper covering both pins) disables only the handset microphone when the Broadcast button is pressed. Changing the jumper to the open position (either remove the jumper or cover just one pin) allows you to completely disable both the handset microphone and speaker when the Broadcast button is pressed.

If the incoming audio level from your telephone is too high and you are consistently lighting the red -3dB Receive LED, first try decreasing the volume using the controls on the base of your telephone. If you still cannot drop the incoming audio level enough, and your unit was purchased after February 2007, you may need to change jumper **J10** inside innkeeper PBX. There are three possible settings to adjust Caller receive level:

Pins 1 & 2 closed = 0dB (factory default)

Pins 2 & 3 closed = -6dB

Pins 1-3 left open = -12dB

To change the jumper settings, first disconnect power from the innkeeper PBX, then remove the cover and locate the appropriate jumpers on the printed circuit board.

Operation (continued)

Send Signal Level

The Send LEDs display the signal level as it goes out to the phone line. The goal is to drive the phone line at high enough levels to avoid phone line noise, but not so loud as to cause excessive clipping. Adjust the Send level control so that you rarely see flashes of the red -3dB 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. In this case you should decrease the Send volume control for the input that is causing the clipping.

Caller Signal Level

The Receive LEDs only display the strength of the signal coming in from the phone line just after the DSP. The Caller level control does not change what you see on these LEDs. Adjust the Caller level for the best signal at the output jacks of innkeeper PBX.

A-B-C Selector Switch

Use this switch to select the correct type of handset microphone your telephone uses. A=Electret, B=Carbon, C=Dynamic. Trial and error seems to work best in determining which handset type to use. Your innkeeper PBX will only function correctly if the handset type selector switch is in the correct position. This switch changes signal level, impedance, and wiring to accommodate the differences in handset microphone types. To determine the correct position, you should place a call to another telephone line, then try to send audio to the phone line through the input jack of the innkeeper PBX. While doing this, switch between the three different handset type positions. Choose the position that works best by monitoring the audio quality and Send LEDs.

Although not conclusive, the following guidelines may help:

The majority of newer telephones have electret type microphones and will use the "A" position.

Older telephones that have the round "screw type" handsets contain carbon microphones and use the "B" position.

Many Radio Shack[®], Panasonic[®], and Nortel[®] telephones have dynamic microphone types and use the "C" position.

FAQs

? Will innkeeper PBX work with my ___ PBX phone system?

! Probably yes. We have to say probably because the handset interface is proprietary and therefore can change from model to model. We have no way of predicting how a phone manufacturer will use the handset wires in the future. The three handset microphone types that we support, electret, dynamic and carbon, cover every handset microphone type that we have seen in use, but the wire diagrams can change without notice.

? Will your digital hybrid provide phantom power for a condenser mic?

! No, this device will not provide phantom power. If you are connecting your microphone directly to the innkeeper PBX, use a dynamic mic.

? Why can't I dial out on my phone and I hear a lot of noise on the call?

! The innkeeper PBX will not work with any telephone that has a keypad in the handset. You need to use a telephone with a standard handset.

? Can innkeeper PBX auto-answer or auto-disconnect?

! No, the handset cord on your phone is only active if the handset is off-hook. This must be done manually. So there is no way to auto-disconnect. You must return the handset to the cradle.

? I have everything connected correctly. Why can't the caller hear me?

! There are two things you should check: First, the position of the A-B-C switch which will probably use either setting A or C. Next, you cannot use the speakerphone function on your telephone during your recording. Innkeeper PBX accesses audio through the handset cord. With the speakerphone turned on, there is no audio going through the handset. You must use a microphone.

? Why is there a loud hum on the output of my innkeeper PBX, even when nothing else is connected?

! Make certain you are using the regulated power supply that was shipped with this unit. Power supplies are not all the same.

? Why does my laptop only record half of the conversation? I am using the Stereo output on the innkeeper PBX and I have a stereo cable.

! Most laptop computers only have a mic input, which is mono. You will need to either get a sound card with a stereo line level input for your laptop or use a USB or FireWire interface product.

? How do I record onto my computer and edit the files?

! You will need to purchase or download any audio editing software of your choice. You may also need to edit the audio configuration files on your computer or in your software to allow recording in stereo. Innkeeper PBX just allows you to access the audio from your phone line.

? Does innkeeper PBX come with any Talk Show software?

! No, our description "Turn your PBX into a low cost talk show system" pertains to using a multi-line PBX phone system as a line selector switch. When the innkeeper PBX is on line, simply select which phone line you want to talk to, either dropping the last caller, or putting them back on hold.

? Why is there a Send 2 mini-jack on the back of my innkeeper PBX?

! This is a second line level input to innkeeper PBX. Here you can connect another device, such as a CD player, the *Line Out* from your computer or even the output of your personal audio player, to add audio to the conversation. This enables you to play background music or other sound bites during your discussion. Do not connect a microphone to this jack. This is a mono input. If you connect a stereo output here such as a computer Line Out, you will receive only Left channel audio on this jack.

? Can I still use my phone to take regular calls or do I have to disconnect the innkeeper PBX when I am not using it?

! You can leave the innkeeper PBX in place and your telephone will continue to operate normally. Audio will only pass through the hybrid when you press the "Broadcast" button.

Specifications

Inputs:

- Send 1: Balanced Female XLR, 1k ohm,
-10 mV RMS (-35 dBv nom)
Mic/Line pad switch = +4 dBv max
- Send 2: 3.5mm mono, 20k ohm, 250 mV RMS
(-10 dBv nom)

Outputs:

- Balanced: Male XLR, 200 ohm, 500 mV RMS
(+4 dBv max)
- Unbalanced: 3.5mm stereo, 50 ohm,
250 mV RMS (0 dBv max)
Left = Send, Right = Caller
- Headphone: 3.5mm stereo, 8 ohms, 250 mW
mixed send and receive

Phone Line:

- Aux Phone: RJ11C
- Phone Line: RJ11C
- Isolation: 1500 VAC
- Ringer: 0.5B REN
- Frequency Response: Telephone side 200 Hz - 3600 Hz

- Power: 120-240 VAC power supply (included)
- Size: 7" x 6" x 1.6" (18 x 15 x 4.2 cm)
- Weight: 2.2 pounds (1 kg)

FCC Part 15 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 own expense.

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

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

FCC Registration (continued)

- 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.

Warranty

Innkeeper PBX is covered by a 2-year warranty to be free from defective workmanship and materials. In the event that the innkeeper PBX needs repair, you must call us to get an authorization, and then carefully pack and ship it to us. You will pay for shipping to us and we will pay for return back to you, UPS ground. No free repairs will be made if the defect was caused by misuse, weather conditions, or other cause, except for defective workmanship or materials. THERE ARE NO EXPRESSED OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE WARRANTY HERE MADE.

03/07