



Universal Host™ VoIP/ PBX Desktop Digital Hybrid



User Guide

Welcome

Thank You

Thank you for purchasing a JK Audio Universal Host 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 **M-F: 8:30am-5:00pm (CT)**

In the US & Canada (Toll-Free)
800-552-8346

All other countries:
815-786-2929

Email us at:
support@jkaudio.com

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

Limited Warranty

The Universal Host 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.

Contents

Overview	1
Getting to know your Universal Host	2
2 Controls & Indicators	
4 Inputs & Outputs	
Getting Connected	6
Configuration	8
Operation	9
FAQs	10
Technical Information	12

Features

Features

16 bit DSP Technology	Caller XLR Line Output
16 bit USB Audio CODEC	3.5mm Stereo Line Output
Proprietary Auto Null Algorithm (50 dB null)	3.5 mm Stereo Headphone Jack
Send XLR Line Input	Send and Caller Signal Level LEDs
Mic/Line Switch	Send and Caller Volume Controls
3.5mm Mono Line Input	Handset Selector Switch (Electret, Carbon, Dynamic)

In the Box

Universal Power supply with detachable cord	RJ22 Handset Jumper Cable
---	---------------------------

Introducing the Universal Host

Universal Host will allow you to send and receive audio through your multi-line PBX, ISDN, VoIP 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.

The 16 bit USB audio CODEC allows stereo recording at up to 48 kHz sampling rate, with the talent voice on the left channel in full bandwidth, and the caller on the right. Play recordings from your computer directly into the phone system. No additional software drivers are needed for the USB audio interface.

What is a Digital Hybrid?

The Universal Host 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 phone line 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.

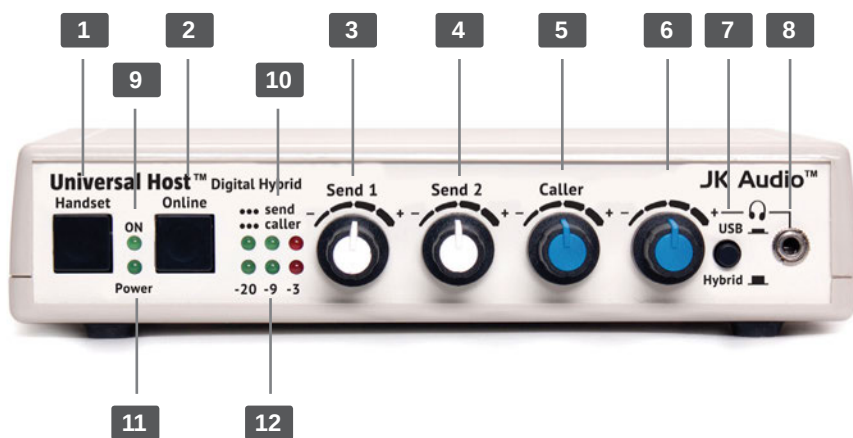
Ready to go?

The Universal Host 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.

Getting to Know Your Universal Host



Controls & Indicators

1. Handset Button

Press this button to use the handset as if you were on a normal telephone call.

2. Online Button

Press this button to disable the handset and activate the Universal Host 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 <Mono In> mini jack.

5. Caller Level

Adjusts the level of the incoming caller's audio as it's going out the output jacks.

6. Headphone Level

Adjusts the signal level coming from the 3.5mm front panel headphone jack.

7. Hybrid/USB

Selects audio heard at the headphone output.

Indicators Cont'd

8. Headphones

The 3.5mm stereo headphone jack contains either a mix of both the Send input audio and the Caller audio when the button is in the Hybrid position or stereo audio from the USB port with the button in the USB position.

9. ON LED

Lit when you are on line with a call using the hybrid.

10. Send LEDs

Displays the signal level going to the phone line. The goal is to drive the phone line audio at levels high enough 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 lower the **<Send>** volume control for the input that is causing the clipping.

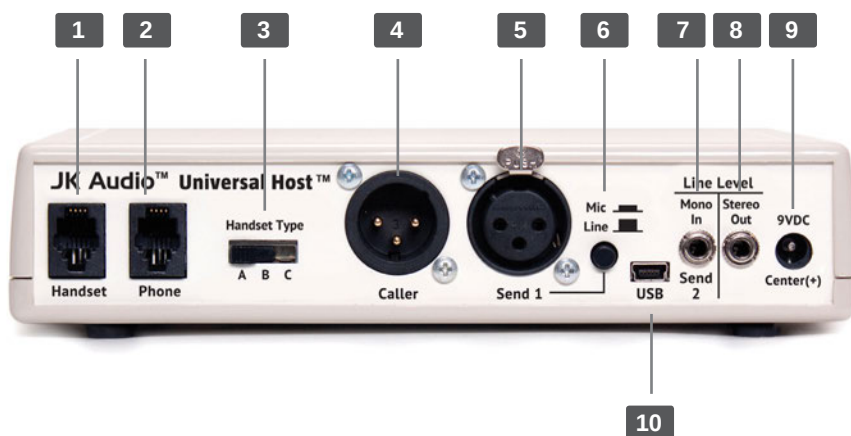
11. Power LED

Lit when unit is plugged in and receiving power.

12. Caller LEDs

Displays the signal level coming in from the phone line, after the DSP. This signal level will not change when you adjust the **<Caller>** knob. The **<Caller>** level control knob does not change what you see on these LEDs. Adjust the **<Caller>** level control to give you the best signal level at the **<Caller>** XLR output or the Caller channel of the **<Stereo Out>** mini jack.

Getting to Know Your Universal Host



Inputs & Outputs

1. Handset Jack

Connect your telephone handset to this jack.

2. Phone Jack

Connect this jack to the handset jack on your telephone using the supplied handset jumper cable.

3. 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

4. Caller Output

Male balanced XLR output contains only the caller's voice.

5. Send 1 Input

Female balanced XLR input for signals going out to the phone line. Mic or line level input.

6. 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.

Inputs & Outputs Cont'd

7. **Send 2 Mono Input**

3.5mm **<Mono In>** mini jack input for signals going into the phone line. Line level.

8. **Stereo Output**

3.5 mm **<Stereo Out>** mini jack contains both Send and Caller audio channels with levels determined by the **<Send 1>** and **<Send 2>** level controls and the **<Caller>** level control. Left channel contains your local Send audio and right channel contains the Caller's audio from the telephone line.

9. **Power Jack**

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

10. **USB Port**

For bi-directional audio connection to your computer or other equipment. Using the cable provided, you can connect this USB port to your computer or other audio device. This will enable you to send stereo audio to your computer or other recording device with your local audio on the left channel and the caller on the right. You can also use the USB port to play audio from your computer to the phone caller, but it will not be sent to the Caller XLR output jack. It will be mixed with your Send audio on the stereo mini output. You can send and receive audio at the same time through the USB port.

Getting Connected

Note: There are 2 ways to set up the audio equipment for Universal Host.

Connecting to a Multi-Line Phone

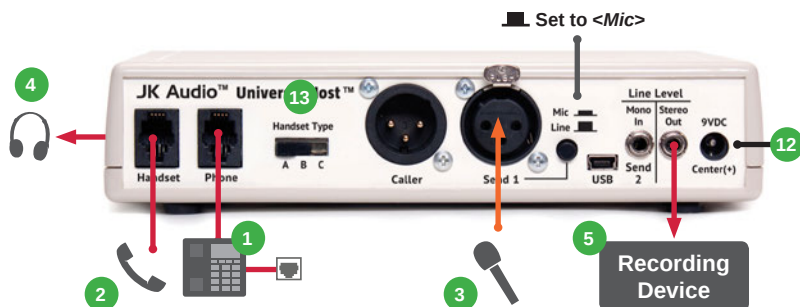
1. Connect the supplied RJ22 handset jumper cable between the jack marked **<Phone>** on the back of the Universal Host and to handset jack on the base of your telephone.
2. Connect your telephone handset to the RJ-22 jack on the back of the Universal Host marked **<Handset>**.

If you are only using **one mic**, please continue to **Step 3**.

If you are using a **mixer** with **two or more mics**, please skip to **Step 6**.

Setting up for One Mic/Headphone (No Mixer)

3. Connect a dynamic microphone cable to the **<Send 1>** jack on the hybrid. Be sure to set the Universal Host **<Mic/Line>** switch to the **<Mic>** position.
4. Connect a headphone to the front of the Universal Host.
5. Connect a stereo cable from the mini-jack **<Stereo Out>** on the Universal Host to the **<Line In>** on your computer sound card or other recording equipment that has a stereo input. Continue to **Step 12**.



Setting up for two or more Mics and 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 Universal Host will cause an echo, or feedback.

6. Connect the Universal Host **<Caller>** output to any **Line** input on the mixer.
7. Connect microphone(s) to the mic inputs on your mixer.
8. 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 1>** input on Universal Host. Set the Universal Host **<Mic/Line>** switch to the **Line** position.

9. 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.

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



Completing Setup

12. Connect the supplied DC power supply to the back of the Universal Host and then to an AC power outlet.
13. Place a test call to a quiet location. Set the <A-B-C> switch on Universal Host for best audio (**See page 8**).
14. 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.

Configuration

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**. Your Universal Host 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 Universal Host. 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.

While speaking into the microphone, you should see the **<Send>** LEDs lighting only. If the **<Caller>** LEDs also light up while you are speaking into the microphone, you may have the **<A-B-C>** switch in the wrong position. If the **<Send>** LEDs light but the person at the other end of the call hears nothing at all, or if you experience immediate feedback while levels seem to be set correctly, you also may be in the wrong position.

Although not conclusive, the following guidelines may help:

- The majority of newer telephones have electret or dynamic type microphones and will use the **<A>** or **<C>** position.
- Older telephones that have the round “screw type” handsets contain carbon microphones and use the **** position.

Optional Jumper Settings

There is a jumper located inside the Universal Host at J9 that affects handset operation. The factory default **closed** position (jumper covering both pins) disables only the handset microphone when the **<Online>** 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 **<Online>** 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 handset volume 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 Universal Host.

There are three possible settings to adjust Caller receive level:

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

Pins 2 & 3 closed: -10dB

Pins 1-3 left open: -20dB

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

Placing a Call with Universal Host

Use your telephone to place or screen a call. When you are ready to take the call on Universal Host, simply press the **<Online>** button. Universal Host will disable the microphone in the telephone handset when the **<Online>** button is pressed. 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 Universal Host. This will disable the inputs and outputs on Universal Host 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 **<Online>** button.

1. Will Universal Host work with my ____ PBX phone system?

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 wiring in each phone can change without notice. Universal Host works with virtually any PBX, ISDN, VoIP or even a plain old analog telephone as long as the telephone has a standard handset.

2. 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 Universal Host, use a dynamic mic.

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

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

4. Can Universal Host 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.

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

Check the position of the <A-B-C> switch (which will probably be set to A or C). Also, you cannot use the speakerphone function on your telephone during your recording. Universal Host accesses audio through the handset cord. With the speakerphone turned on, there is no audio going through the handset. You must use a microphone.

6. Why is there a loud hum on the output of my Universal Host, 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.

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

Many laptop computers only have a mic input, which is mono. If you want to record 2 track stereo audio, 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.

8. Why does my laptop / tablet not receive audio from the Universal Host for recording?

Many newer laptops / tablets only have a TRRS headset jack. If you want to record 2 track stereo audio, 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.

9. 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. Universal Host just allows you to access the audio from your phone line.

10. Does Universal Host come with any Talk Show software?

No, however a multi-line PBX phone system acts as a line selector switch. When the Universal Host is online, simply select which phone line you want to talk to, either dropping the last caller, or putting them back on hold.

11. Why is there a Send 2 mini-jack on the back of my Universal Host?

This is a second line level input to Universal Host. 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.

12. Can I still use my phone to take regular calls or do I have to disconnect the Universal Host when I am not using it?

You can leave the Universal Host in place and your telephone will continue to operate normally. Audio will only pass through the hybrid when you press the **<Online>** button.

13. Do I need any software drivers for the USB interface?

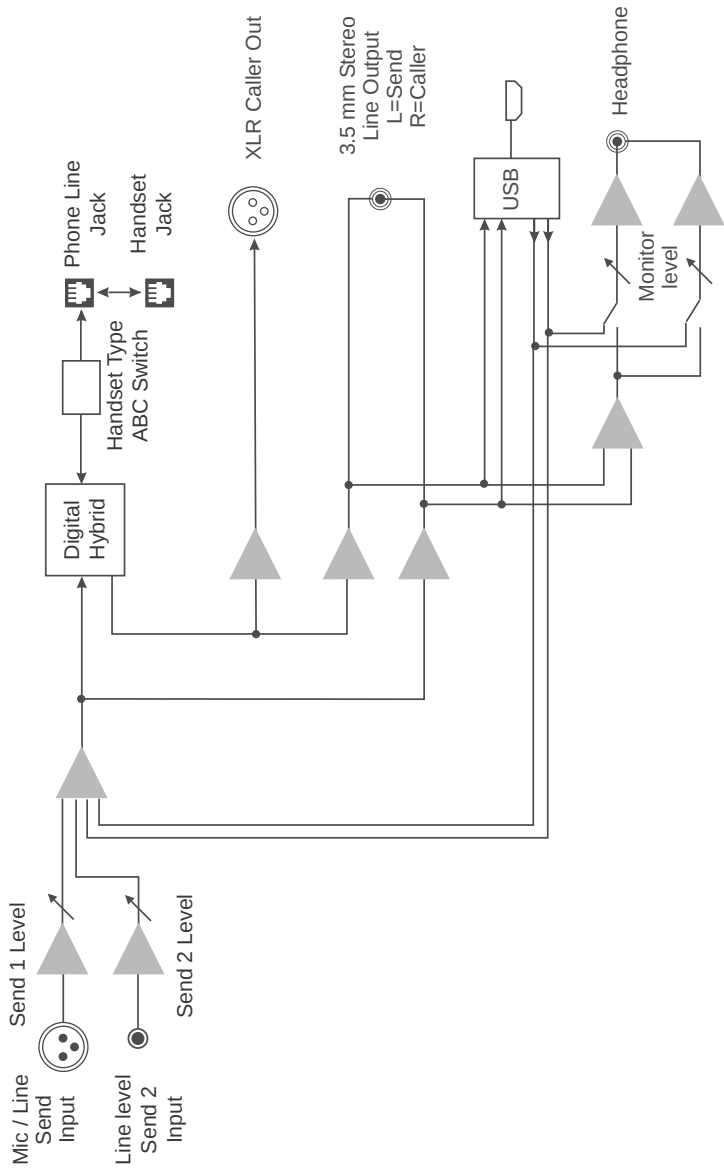
No, the USB interface is plug and play compatible.

14. I have a stereo mixer with no Aux bus and only one set of outputs. How do I create a mix-minus setup?

If your mixer does not have an **Aux Send** bus, you can use **Pan** controls with the **Left** and **Right** outputs. Pan the **Caller** to the **Right** output. Then connect only the **Left** output to the Universal Host **<Send 1>** input. Leave the microphones panned to the middle and send the **Right** channel output containing the mixed audio to your recording device.

Instead, you may also send the mix-minus signal from the L channel RCA output to the **<Send 2>** input if necessary.

Block Diagram



Specifications

Input	Impedance / Level
Balanced Female XLR:	1k ohms / 15 mV RMS; -34 dBu nom.; Mic/Line Pad Switch = +6 dBu max
1/8" (3.5mm) Mono:	20k ohms / 250 mV RMS; -10 dBu nom.
Output	
Balanced Male XLR:	200 ohms / 500 mV RMS; -4 dBu nom.; +14 dBu max; Caller Only
1/8" (3.5mm) Stereo:	50 ohms / 250 mV RMS; -10 dBu nom.; +6 dBu max Left = Send; Right = Caller
Headphone 1/4" Stereo:	8 ohms / 250 mW Mixed Send and Caller
USB	
Connector:	Mini Type B Female
Standard:	v2.0
Sampling Rate:	32 kHz, 44.1 kHz, 48 kHz
Misc	
Phone Base:	RJ22
Handset:	RJ22
Isolation:	1500 VAC
Frequency Response:	Telephone Side 200 Hz-3600 Hz
Power:	120-240 VAC Power Supply
Size:	7" x 6" x 1.6" (18 x 15 x 4.2 cm)
Weight:	2.2 lbs. (1kg)

Declaration of Conformity

Declaration of Conformity

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

Declares that the product:

Product Name: Universal Host Desktop Digital Hybrid
Model Numbers: Universal Host

Conforms to the following Product Specifications:

Safety: AS/ACIF 60950.1:2003
EN60950-1: 2006
CAN/CSA-C22.2 No. 60950-01-03
UL Standard 60950-01 1st edition

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

Emissions: EN 55022:2006
AS/NZS CISPR 22 (2006)
FCC Part 15, Subpart B
ICES-003

Telecom: AS/ACIF S002:2001
FCC CFR 47, Part 68
TIA968 A-1, A-2, A-3, A-4

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

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

The Technical File containing supporting documentation is maintained at:

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

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,

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.

Universal Host™

VoIP/PBX Desktop Digital Hybrid



User Guide Version 4/16/22

JK Audio, Inc.
1311 E 6th St.
Sandwich, IL 60548
United States
Telephone: 815.786.2929
Toll Free: 1.800.jkaudio
Fax: 815.786.8502
www.jkaudio.com

© 2022 JK Audio, Inc. All rights reserved.

JK Audio