

Model 43

Interface

Introduction

The Model 43 is designed to create a broadcast-standard IFB circuit from two line-level audio sources. The unit will find use in on-air and production broadcast applications, as well as specialized applications such as post-production, recording studio, and equipment test and maintenance. The Model 43 is a unique and versatile product, providing the resources to easily create a high-performance “wet” IFB circuit in a compact, easy-to-use package.

The Model 43’s audio inputs are compatible with standard line-level audio sources, including analog outputs associated with digital matrix intercom systems. The unit’s IFB circuit provides DC power and two analog audio signals to support a range of IFB user devices. The audio quality is excellent—little hiss, hum, or other artifacts are present. The Model 43 is housed in a rugged aluminum enclosure, making it suitable for permanent or temporary applications. All inputs and outputs interface using industry-standard 3-pin male and female XLR-type connectors. The connectors are manufactured by Neutrik® and feature gold-plated contacts and metal housings. A source of 24 volts DC is required for operation. Included with each unit is an external wall-mount 24 volt DC power source.

There may be persons not familiar with the term IFB. That’s not unreasonable as it’s a somewhat obscure acronym for interrupted foldback. (It can also be known as interruptible foldback.) On its own, the term “foldback” is an alternate way of describing a cue or monitor function. Adding “interrupted” before it means that the cue source can be temporarily replaced with an audio signal originating from a producer, director, or other production personnel. IFB circuits are often used in the broadcast industry for talent cueing applications, in both studio and field settings. Both “dry” and “wet” IFB circuits can be deployed and their characteristics are worth reviewing. The term “dry” IFB typically refers to a transformer-balanced line-level audio circuit with a +4 dBu nominal level. This is essentially a standard audio circuit that is commonly used to interconnect audio equipment. The term “wet” IFB refers to a circuit that combines DC power and one or two channels of analog audio. The audio is unbalanced with a typical nominal level of –10 dBu. A wet IFB circuit is the type implemented by the Model 43. As such, in this user guide the term IFB will always indicate a wet circuit.



View showing 24 volt DC input and IFB circuit connections



View showing left and right audio inputs

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| Highlights | • Transformer-coupled inputs | • Broadcast-standard IFB circuit |
| | • Excellent audio quality | • Compact, lightweight package |
| | • Superior power-feed performance | • Fixed or remote applications |
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IFB circuits provide an effective means of delivering power and two channels of audio to user devices by means of standard audio cables. These cables, ubiquitous to the audio industry, interface using 3-pin male and female XLR-type connectors. With IFB circuits and standard audio cables it's a simple matter to support user devices such as listen-only belt packs and announcer's consoles with no external power source required. Whether the distance from the source to the user device is 100 or 1000 feet, reliable operation can be provided.

In many cases, the Model 43 Interface will be used in on-air television applications. No matter if a unit is installed in a fixed location or as part of a remote facility, excellent performance can be obtained. In addition, the Model 43 is applicable for non-broadcast applications. For example, audio recording and post-production facilities can also effectively use the unit. Combined with stereo or mono listen-only belt packs, also available from Studio Technologies, a variety of headphone cue systems can easily be deployed. Maintenance facilities and test benches will appreciate having a Model 43 available to provide assistance during the testing and repair of IFB user devices. As the unit's audio inputs are compatible with standard line-level audio signals virtually any analog source can be connected.

IFB Circuit

The Model 43 supplies one circuit that incorporates two audio inputs and a "wet" IFB output. The audio inputs are transformer coupled, have a nominal level of +4 dBu, and are compatible with balanced or unbalanced sources. In on-air television broadcast applications the audio sources will often be analog outputs from matrix intercom systems. If this is the case, two sources are typically designated to feed user cue signals to stereo or monaural headsets or headphones. Generally one source is configured in the matrix intercom system as "interrupt" while the other is configured as "program." An alternate term often used for the "interrupt" channel is "program-with-interrupt." This may be more descriptive as the function is actually a program source that gets interrupted with talkback audio. The "program" channel is typically a continuous source of program audio. An alternate term is "program-only." For other applications the Model 43's audio inputs can be connected to one or two monaural sources, or alternately, to a stereo audio source. This configuration may prove useful in radio broadcasting, audio-with-picture, or recording studio applications.

Maintaining excellent audio performance was a major Model 43 design goal—the hiss, hum, and noise associated with typical IFB circuits was simply not acceptable. The Model 43 meets those requirements with audio that is "on-air" quality: low distortion, high signal-to-noise ratio, and ample headroom. On-air talent and guests, production personnel, and technicians will all appreciate the clean, quiet cue signal.

As previously covered briefly, the Model 43's IFB circuit provides DC power and two channels of unbalanced audio over a single 3-conductor output. The DC output is nominally 30 volts with a maximum rated current of 200 milliamperes. A major strength of the Model 43 is the IFB circuit's ability to effectively deliver DC power over a variety of conditions. Unlike other interface devices that use a common but less-than-ideal circuit topology, a unique IFB circuit was developed by Studio Technologies to achieve the desired performance goals. The result is a major improvement in effectively supporting IFB user devices over a wide range of conditions. Connected devices can draw up to the full rated 200 milliamperes of current with little drop in DC voltage. This output voltage stability is the key—whether drawing 50, 100, or 200 milliamperes, the output will remain close to 30 volts. In practical terms this means that reliable IFB-based cue systems can now be deployed in more stadiums, concert halls, or motor racing facilities than was previously possible.

Compatibility

The Model 43's audio inputs are compatible with virtually every digital matrix intercom system, including those from Clear-Com®, Drake, RTS™, and Riedel Communications. Interfacing requires only the connection of analog output ports from the intercom system to the Model 43's audio inputs. The Model 43's IFB circuit allows virtually any IFB user device to be supported. These include the Model 30-series listen-only belt packs and Model 200-series announcer console products from Studio Technologies. The announcer console units combine a variety of microphone control, headphone monitoring, IFB and intercom system interfacing, and related functions into compact desktop units. Industry-standard listen-only belt packs from RTS, including the 4020 and 4030, can also be directly supported.

Alternate Applications

In addition to broadcast IFB applications, the Model 43 can be used to create a high-performance stereo headphone cue system. Line-level signals coming from audio consoles, routing switchers, or off-air receivers can be connected to the Model 43's audio inputs. The IFB circuits can be connected to listen-only belt packs, several models of which are available from Studio Technologies. For example, the Model 35 Talent Amplifier will allow one or two pairs of stereo headphones to be supported. The Model 43's IFB circuit will support up to six Model 35 Talent Amplifiers.

Specifications

General Audio:

Frequency Response:

Pin 2 Output (DC with Channel 1 Audio): 20 Hz-20 kHz \pm 3 dB
(80 Hz-20 kHz \pm 0.25 dB)

Pin 3 Output (Channel 2 Audio): 20 Hz-20 kHz \pm 0.25 dB

Distortion (THD+N): 0.02%, measured at 1 kHz, +4 dBu, pin 2 output (DC with channel 1 audio)

S/N Ratio: 80 dB, ref +4 dBu out, 20 Hz-20 kHz, pin 2 output (DC with channel 1 audio)

Crosstalk: 75 dB, typical, ref +4 dBu in, 20 Hz-20 kHz

Audio Inputs: 2

Type: transformer balanced, capacitor coupled, compatible with balanced or unbalanced sources

Impedance: 10 k ohms, nominal

Nominal Level: +4 dBu

IFB Output Circuit:

Type: DC power with two channels of unbalanced audio

Connections: common on pin 1, DC (+30 V nominal) modulated with channel 1 audio (-10 dBu nominal) on pin 2, and channel 2 audio (-10 dBu nominal) on pin 3

Maximum Audio Output Level:

Pin 2: +9 dBu with +23 dBu on audio input

Pin 3: +14 dBu with +28 dBu on audio input

DC Current Output: 200 mA maximum

Connectors:

Audio Inputs: 2, 3-pin XLR-type female

IFB Circuit: 3-pin XLR-type male

24 Vdc: 2.1 x 5.0 mm locking coaxial power jack (compatible with Switchcraft S760K plug)

Power Requirement:

20 to 32 Vdc, 0.4 A at 24 Vdc, 0.45 A @ 20 Vdc

Dimensions (Overall):

4.2 inches wide (10.7 cm)

2.0 inches high (5.1 cm)

4.7 inches deep (11.9 cm)

Weight: 0.8 pounds (0.35 kg)

Specifications subject to change without notice.
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