



# Model 42 *Interface*

## Introduction

The Model 42 is designed to create broadcast-standard IFB circuits from line-level audio sources. The unit's primary application is to interface analog outputs associated with digital matrix intercom systems with broadcast IFB user devices. The Model 42 provides four independent IFB circuits. Each IFB circuit provides DC power and two analog audio signals to support the connected IFB user devices. The Model 42's audio quality is excellent; little hiss, hum, or other artifacts are present. Installation is very simple. Audio input connections are made using a 25-pin D-subminiature connector. The IFB output circuits interface using standard 3-pin XLR-type connectors. The compact, one-rack-space package is constructed using heavy-gauge steel components. The unit's mains power input can range from 100 to 230 volts, 50/60 hertz. This "universal input" ensures correct operation virtually anywhere in the world.

There may be persons not familiar with the term IFB. That's not unreasonable as it's a somewhat obscure acronym for interruptible foldback. On its own, the term foldback is an alternate way of describing a cue or monitor function. Adding "interruptible" 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, both in 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 +4dBu 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 -10dBu. Wet IFB circuits are the type implemented by the Model 42. As such, in this user guide the term IFB will always represent this type of circuit.

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 100 or 1000 feet apart, reliable operation can be provided.

In many cases, the Model 42 Interface will be used in on-air television applications. Whether installed in a fixed location or as part of a remote facility, excellent performance can be obtained. In addition, the Model 42 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. As the Model 42's audio inputs are compatible with standard line-level audio signals virtually any analog source can be connected.

## Model 42 Front Panel



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|-------------------|-----------------------------------|----------------------------------|
| <b>Highlights</b> | • Transformer-coupled inputs      | • Four independent IFB circuits  |
|                   | • Excellent audio quality         | • Single rack-space mounting     |
|                   | • Superior power-feed performance | • Universal mains input powering |
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## Four Independent IFB Circuits

The Model 42 supplies four independent IFB circuits. Each circuit consists of two audio inputs and a “wet” IFB output circuit. The audio inputs are transformer coupled, have a nominal level of +4dBu, 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. 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 42’s audio inputs can be connected to a 2-channel or 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 42 design goal—the hiss, hum, and noise associated with typical IFB circuits was simply not acceptable. The Model 42 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.

The Model 42’s IFB circuits provide 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 42 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; longer cable runs, more user devices, excellent performance.

## Compatibility

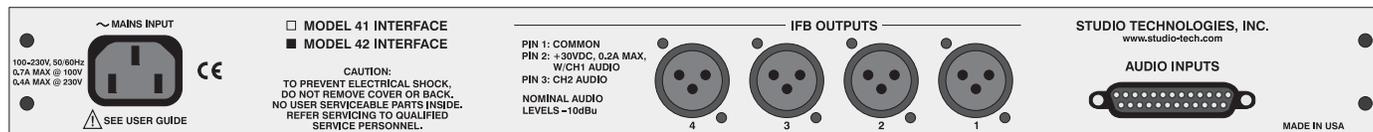
The Model 42 is compatible with virtually every digital matrix intercom systems, including those from Clear-Com®, Drake, RTS™, and Riedel Communications. Interfacing requires only the connection of analog output ports from the intercom system to the Model 42’s audio inputs. With the Model 42’s excellent audio and power delivery performance it’s an ideal alternative to the interface devices offered by the intercom system vendors. Using the Model 42 the intercom system’s audio quality can be maintained all the way to the IFB users.

The Model 42’s IFB circuits allow virtually every 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 200-series 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 intercom applications, the Model 42 can be used to create high-performance stereo headphone cue systems. Stereo line-level signals coming from audio consoles, routing switchers, or off-air receivers can be connected to the Model 42’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. Each of the four Model 42 IFB circuits will support up to six Model 35 Talent Amplifiers.

## Model 42 Back Panel





# Model 42

## Interface

### Specifications

#### General Audio:

##### **Frequency Response:**

Pin 2 Outputs (DC with Channel 1 Audio): 20Hz-20kHz  $\pm 2.5$ dB (80Hz-20kHz  $\pm 0.25$ dB)

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

**Distortion (THD+N):** pin 2 outputs (DC with channel 1 audio) 0.01%, ref +4dBu in, measured at 1kHz

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

**Crosstalk:** 81dB, typical, ref +4dBu in, 20Hz-20kHz

**Audio Inputs:** 8, organized as four 2-channel inputs

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

**Impedance:** 10k ohms, nominal

**Nominal Level:** +4dBu

#### IFB Circuits: 4

**Type:** "wet" (DC power with two channels of unbalanced audio)

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

#### **Maximum Level:**

Pin 2 Outputs (DC with Channel 1 Audio): +9dBu (+23dBu on audio input)

Pin 3 Outputs (Channel 2 Audio): +14dBu (+28dBu on audio input)

#### Connectors:

**Audio Inputs:** 1, 25-pin, female, D-subminiature, 4-40 threads

**IFB Outputs:** 4, 3-pin, male, XLR-type

**AC Mains:** 3-blade, IEC 320 C14-type (mates with C13-type socket)

#### AC Mains Requirement:

100-230V, 50/60Hz, 0.7A maximum @ 100V, 0.4A maximum @ 230V

#### Dimensions (Overall):

19.00 inches wide (48.3cm)

1.72 inches high (4.4cm)

9.58 inches deep (24.3cm)

**Mounting:** one space in a standard 19-inch rack

**Weight:** 6.4 pounds (2.9kg)

Specifications subject to change without notice.

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