

IFB Plus

A Highly Integrated, 2-Channel IFB System for Mobile Applications

The IFB Plus Series is designed for electronic news-gathering (ENG) trucks, satellite news-gathering (SNG) trucks, and small production vehicles. Interruptible foldback (also known as talent cueing) allows reporters and other on-air talent to receive program audio along with audio cues from production personnel, generally directors and producers. The design and implementation of a studio IFB system can be quite complex, yet normally remains the same from day to day. Talent and production personnel, along with the IFB equipment, are physically located in the same facility.

Mobile IFB applications can present increased challenges as the number and variety of program sources, interrupt sources, and configuration possibilities quickly multiply. Program audio can come from many sources, including off-air receivers, two-way radios, telephone lines, satellite receivers, and cellular telephones. Interrupt audio (talent cues) may be received with the program material connected via telephone lines or may need to come from the mobile unit itself. The ability to provide IFB audio to a number of destinations is also required. These include talent "belt pack" amplifiers, transmitters used with wireless receivers, and intercom systems.

A mobile IFB system must be easy to set up and quick to configure. It must be able to withstand the day in, day out punishment of life "on the road." Meeting these diverse requirements is made more difficult by the space restrictions imposed by mobile facilities.

Studio Technologies has addressed these requirements with the IFB Plus Series products. The IFB Plus Series consists of the Model 2 Central Controller, the Model 22 and model 24 Access Stations, the Model 32A and Model 33 Talent Amplifiers, and supporting accessories. These products combine the best features of studio IFB systems along with the special requirements of mobile applications. The end result is an IFB system that is flexible, versatile, and extremely space efficient.

The heart of the IFB Plus Series is the Model 2 Central Controller. This one rack-space unit offers a wide range of features all optimized for mobile applications. These include two independent IFB channels, an internal interrupt microphone, and four program inputs. Two telephone interfaces allow direct connection to telephone lines or standard audio signals. The telephone interfaces can be used to receive and send IFB audio.

In addition to the Model 2's internal interrupt microphone, up to four additional interrupt locations can be added using Model 22 or Model 24 Access Stations. These additional locations allow producers, directors, or other personnel to cue talent.

The Model 2 allows connection of up to four Model 32A or Model 33 Talent Amplifiers. Each is a compact, "belt pack" unit whose output is compatible with all standard ear pieces and headsets. The Model 32A is a basic unit intended for use by on-air personnel, while the Model 33 provides extra features that are useful for camera and production personnel.



Model 2 Central Controller Front Panel

Model 2 Central Controller

Two IFB Channels

The Model 2 contains two independent IFB channels. Each channel has a complete set of controls and indicators. Program source select switches allow one or more of the four program inputs, as well as incoming audio from the two telephone interfaces, to be selected as program audio. Program level controls allow adjustment of the selected program sources. Channel audio level is displayed by 5-segment LED meters. Channel interrupt activity is displayed by LED indicator lights.

Program Inputs

The Model 2 has four program inputs that can be individually assigned to the two IFB channels. Each program input has a trim pot that allows the nominal +4 dBu input level to be adjusted over a ± 8 dB range. During interrupt activity, program audio is muted. A sophisticated analog switch is used to give a noise-free mute with absolutely no clicks or pops.

IFB Outputs

Each IFB output (program and interrupt audio) is sent to four places: the talent amplifier output, a line output, telephone interface 2, and the monitor amplifier. The talent amplifier output provides IFB channel 1 and 2 audio, along with power to support any combination of up to four Model 32A or Model 33 Talent Amplifier units. The balanced line-level output can be used to drive wireless IFB transmitters, etc. Using telephone interface 2, IFB audio from channel 1 or 2 can be used to originate an IFB feed. An external speaker or headphones can be connected to the internal 4-watt amplifier, allowing monitoring of either IFB channel.

Internal Interrupt Microphone

An electret-type microphone is contained behind the Model 2's front panel. Two switches allow the internal microphone to interrupt either IFB channel with clean, clear audio.

Telephone Interfaces

The Model 2 contains two telephone interfaces. Each interface can be used to bring program or interrupt audio into the Model 2. In most applications, telco signals will be used as program audio sources. In special situations they can serve as an interrupt source in conjunction with the voice operated (VOX) interrupt function. The receive audio level of each telephone interface is adjustable using a front panel control. In addition to receiving audio, interface 2 can be used to originate an IFB feed. Using

this function, audio from IFB channel 1 or 2 can be sent to a studio, a remote vehicle, or a portable telephone.

The telephone interfaces are unique in that they allow two very different telephone "lines" to be correctly interfaced. Each interface can be set to operate with a telephone line or a standard audio signal. A telephone line would be a 2-wire DC-biased circuit provided by a local telephone company. A standard audio signal could be provided by, for example, a cellular telephone.

The two operating modes supply distinct feature sets. When an interface is set to the telephone line mode, full monitoring and control is implemented. Each interface contains a switch that allows the telephone line to be seized (taken off hook) or hung up. When an interface is active, telephone line loop current is monitored. The interface will automatically hang up if a telephone company provided disconnect signal is received. Interface 2 also implements an auto answer function, "answering" the telephone line when ringing is detected.

When an interface is set to handle a standard audio signal, the loop-current-specific features are disabled, and the interface operates as a transformer-coupled balanced audio input. The input and output audio levels are optimized for use with telephone-type audio signals.

Voice Operated (VOX) Interrupt

For special applications, the Model 2 allows an audio signal to serve as both an interrupt audio source and a control source, eliminating the need for a push-to-talk button or contact closure. A switch is used to select the VOX audio source. The choices are: receive audio from Telephone Interface 1, receive audio from Telephone Interface 2, or audio from the VOX line-level input.

Monitor Amplifier

The Model 2 contains a 4-watt audio amplifier, allowing either IFB channel to be monitored. A click-free analog switch mutes the monitor output when the internal microphone is actively interrupting an IFB channel. In addition, Model 22 or Model 24 Access Stations can be configured to mute the monitor amplifier upon interrupt.

Audio Quality

Great care was taken to make the Model 2's audio sound clear and crisp. The unit's specifications belie its seemingly humble function as an IFB unit. This unit sounds great!



Model 2 Central Controller Back Panel

Each IFB channel includes a studio-quality compressor circuit. The compressors even out variations in interrupt audio signals, smoothly controlling peak signal levels. They make talent cues more intelligible and help reduce the risk of abnormally high signal levels from reaching the talent's ears.

Installation

For easy installation and maintenance, standard connectors are used throughout, including male and female XLR-type, ¼-inch tip and sleeve, 9-pin D-subminiature, and modular telephone jacks. Mains power is factory selected for 115 or 230 V, 50/60 Hz. The Model 2 is mounted in one space of a standard 19-inch rack.

Model 22 Access Station

While the Model 2 can be used completely “stand-alone,” the Model 22 Access Station can be used to provide additional IFB origination locations. The access stations are installed at positions convenient to producers, directors, or others who need to cue talent and related personnel. As many as four Model 22 can be used with each Model 2 Central Controller.

The Model 22 consists of a metal chassis containing two lighted pushbutton switches, microphone and line inputs, and status and control circuitry.

The mic input is configured for the connection of an electret gooseneck microphone. The line input, compatible with balanced and unbalanced signals, allows another piece of communications equipment to provide interrupt audio. This allows direct interfacing with intercom systems from companies such as Telex®/RTS® and Clear-Com®.

Several mounting options are available. One adapter allows the Model 22 to be mounted in a single rack space. A second adapter is used to install the Model 22 in a table or console opening.

Model 24 Access Station

The Model 24 Access Station allows broadcast personnel to access four IFB channels associated with two Model 2 units. The unit contains five lighted pushbutton switches, four of which are used to activate and display the status of the IFB channels and one that provides an “all call” function. The Studio Technologies Model 11A Gooseneck Microphone or a

line-level audio source can be connected. Up to four Model 24 units can be connected and supported by two Model 2 units. The Model 27A 19-Inch Rack Adapter allows a Model 24 and a Model 11A Gooseneck Microphone to be mounted in a single space of a standard rack enclosure.

Model 32A & Model 33 Talent Amplifiers

The Model 32A and Model 33 Talent Amplifiers are self-contained “belt pack” units that drive talent ear pieces or headsets. A single 3-conductor microphone-type cable links the Model 2 with the talent amplifiers. Each Model 32A and Model 33 contains both a male and female XLR-type connector, allowing simple “loop through” connection of multiple units. Up to four talent amplifiers can be connected to, and powered by, a single Model 2 Central Controller. On each talent amplifier the audio output signal is provided on a standard ¼-inch phone jack. An LED on each unit lights whenever power is present, providing setup assistance and user confidence. Identical in size, each is housed in a lightweight, yet rugged, aluminum housing that includes a belt clip. An optional mounting adapter is available, allowing a Model 32A or 33 to be installed in a permanent location.

The Model 32A is intended for use by on-air personnel, and contains a source switch, along with an output level control. Either IFB channel 1 or IFB channel 2 can be sent to the talent, along with the desired audio “volume.” For user convenience, both ¼-inch and 3.5 mm output jacks are provided.

The Model 33 is unique in that a “mix” of IFB channels 1 and 2 can be created. Two level controls, along with a source select switch, allows camera and production personnel to hear IFB cues from either or both channels. This allows IFB signals intended for both technician and talent to be simultaneously monitored.



Model 32A Talent Amplifier (top)
Model 33 Talent Amplifier (bottom)



Model 22 Access Station (shown with optional Model 25A Rack Adapter and Model 11A Gooseneck Microphone)



Model 24 Access Station (shown with optional Model 27A Rack Adapter and Model 11A Gooseneck Microphone)

IFB Plus Specifications

Model 2 Central Controller

IFB Channels: 2

Channel Features: 6-input program select switch, program level control, 2 status LEDs, 5-segment LED level meter

General Audio Parameters:

Audio Switching and Muting: “clickless” using special “ramping” analog switches

Distortion (THD+N): 0.3%

Overall Frequency Response: 20 Hz to 20 kHz, ± 0.5 dB

S/N Ratio: 67 dB

Interrupt Audio Compressor/Limiters: one per IFB channel, studio quality, dual slope

Connectors:

Audio Inputs: 3-pin XLR-type, female

Audio Outputs: 3-pin XLR-type, male

Talent Amplifier Output: 3-pin XLR-type, male

Monitor Amplifier Output: ¼-inch, 2-conductor phone jack

Access Station: 9-pin, D-subminiature, female

Telephone Interfaces: 6-position modular (RJ11-type jack)

Mains Power: standard 3-blade IEC-type plug

Internal Interrupt Microphone: electret condenser

Program Inputs: 4

Type: electronically balanced, direct coupled

Impedance: 24 k ohms

Level: +4 dBu, nominal, trim adjustable ± 8 dB

Auxiliary Audio Input:

Type: electronically balanced, direct coupled

Impedance: 24 k ohms

Level: +4 dBu, nominal, trim adjustable ± 8 dB

Application: used with voice operated (VOX) interrupt

Talent Amplifier Output:

Application: provides power and audio signals for up to four Model 32A or Model 33 Talent Amplifiers. The output connector (3-pin XLR-type, male) has common on pin 1, +22 Vdc modulated with channel 1 audio (nominal -10 dBu) on pin 2, and channel 2 audio (nominal -10 dBu) on pin 3.

Line Outputs: 2, 1 per IFB channel

Type: electronically balanced, capacitor coupled, intended to drive 600 ohm or greater loads

Level: +4 dBu, nominal, +24 dBu maximum

Voice Operated (VOX) Interrupt Function:

Input Source: receive audio from telephone interface 1 or 2, or auxiliary audio input, selectable

Output: IFB channel 1 or 2, selectable

Detection Bandpass: 400 to 1400 Hz, nominal

Detect Time: less than 1 mSec

Telephone Interfaces 1 and 2:

Operating Modes: switch selectable for use with telephone lines or standard balanced or unbalanced audio signals

Receive Audio Level: -15 dBu, nominal, trim adjustable ± 8 dB

Telephone Line Requirements: 2-wire, loop start, 10 mA loop current minimum

Telephone Line Disconnect: manual, using front-panel switch; automatic, after detection of 250 mSec, nominal, break in loop current

Telephone Line Interface Control: switch on front panel allows manual off-hook and manual hang-up functions

Telephone Interface 2—Additional Features:

Auto Answer: when set for telephone line operation, answers on one ring

Audio Routing Control: switch on front panel allows Interface 2 to receive audio, or send IFB channel 1 or 2 audio

Send Audio Level: -6 dBu, nominal

Monitor Output:

Power: 4 W RMS into 8 ohms @ 1% THD+Noise

Application: designed to drive loads of 8 ohms or greater

Access Station Interface: allows connection of up to four Model 22 or Model 24 Access Stations

AC Mains Requirement: 115 or 230 V, $\pm 10\%$, internally configurable, 50/60 Hz, 20 watts maximum

Dimensions (Overall):

19.00 inches wide (48.3 cm)

1.72 inches high (4.4 cm)

11.4 inches deep (29.0 cm)

Mounting: one space in a standard 19-inch rack

Weight: 10.4 pounds (4.7 kg)

Model 22 Access Station

Mounting: rack mounted using Model 25A 19-inch Rack Adapter. Panel mounted using Model 28A Panel Adapter; custom mounting easily accomplished.

Interconnection: two 9-pin D-subminiature connectors (female), one intended to link Model 22 to Model 2 Central Controller, the second designed to allow “loop through” installation for connection to additional Model 22(s)

Interrupt Switches: 2

Type: back lit, momentary, EAO 99-series

Tactile Sensation: excellent!

Audio Input: electret microphone or line level, switch selectable

Microphone Input:

Compatibility: designed for use with Studio Technologies' Model 11A Gooseneck Microphone

Connector: three terminals on a screw terminal strip

Line Input:

Type: electronically balanced, capacitor coupled, compatible with balanced or unbalanced audio signals

Input Impedance: 24 k ohms

Input Level: -15 to +10 dBu, adjustable via trim potentiometer

Connector: two terminals on a screw terminal strip

Monitor Muting: switch selectable, allows Model 22 interrupt activity to mute monitor amplifier on Model 2 Central Controller

Power Requirements: +18 Vdc filtered and regulated, 25 mA maximum, provided by Model 2 Central Controller

Dimensions (Overall):

6.4 inches wide (16.3 cm)

21.6 inches high (4.1 cm)

5.2 inches deep (13.2 cm)

Weight: 0.8 pounds (0.35 kg)

Model 22 Access Station

Mounting: rack mounted using Model 27A 19-inch Rack Adapter (purchased separately); can also be flush mounted in custom-fabricated rectangular opening in enclosure or work surface

Interconnections: two 9-pin D-subminiature connectors (female), each linking the Model 24 with a Model 2 Central Controller

Interrupt Switches: 5

Functions: IFB 1-4, All Call

Type: momentary pushbutton, EAO 99-series, all backlit, tally indication for IFB 1-4 functions

Microphone Input:

Compatibility: 2-wire electret, designed for use with Studio Technologies' Model 11A gooseneck microphone (purchased separately)

Connector: three terminals on a screw terminal strip

Line Input:

Type: transformer coupled, compatible with balanced or unbalanced audio signals

Input Impedance: 40 k ohms, nominal

Input Level: -15 to +10 dBu, adjustable using trim potentiometer

Connector: two terminals on a screw terminal strip

Monitor Muting: switch selectable, allows Model 24 interrupt activity to mute monitor amplifier outputs on Model 2 Central Controllers

Power Requirements: +18 volts DC, 50 milliamperes, nominal, provided by connected Model 2 Central Controllers

Dimensions (Overall):

6.40 inches wide (16.3 cm)

21.60 inches high (4.1 cm)

5.20 inches deep (13.2 cm)

Weight: 0.8 pounds (0.35 kg)

Model 32A Talent Amplifier

Application: intended for portable applications. Contains integral belt clip. Optional adapter available to allow permanent mounting.

Indicator Light: 1, indicates presence of operating power

Input Connector: 3-pin XLR-type, female

Loop Through Connector:

Type: 3-pin XLR-type, male. Connected in parallel with input connector. Intended to be used to connect multiple talent amplifiers in a "loop through" arrangement.

Audio Source: IFB channel 1 or channel 2, switch selectable by user

Audio Output:

Connectors: ¼-inch and 3.5 mm, 2-conductor (monaural) phone jacks

Load: intended for connection to headphones or earpieces with impedance of 8 ohms or greater

Output Level: user adjustable via potentiometer

Maximum Output Power: 170 mW into 8 ohms at 1% THD+Noise, 400 Hz

Distortion: <0.15%, THD+Noise, measured at 400 Hz with 100 mW output power into 8 ohms

Frequency Response: optimized for voice response (100 Hz to 20 kHz, ±0.5 dB)

Dimensions (Overall):

3.25 inches wide (8.3 cm)

1.80 inches high (4.6 cm)

3.95 inches deep (10.0 cm)

Weight: 0.6 pounds (0.3 kg)

Model 33 Talent Amplifier

Application: intended for portable applications. Contains integral belt clip. Optional adapter available to allow permanent mounting.

Indicator Light: 1, indicates presence of operating power

Input Connector: 3-pin XLR-type, female

Loop Through Connector:

Type: 3-pin XLR-type, male. Connected in parallel with input connector. Intended to be used to connect multiple talent amplifiers in a "loop through" arrangement.

Audio Source: IFB channel 1 and/or channel 2, switch selectable by user

Audio Output:

Connector: ¼-inch, 2-conductor (monaural) phone jack

Load: intended for connection to headphones or ear pieces with impedance of 150 ohms or greater

Output Level: user adjustable via potentiometer

Maximum Output Power: 35 mW into 150 ohms @ 1% THD+Noise, 400 Hz

Distortion: <0.15%, THD+Noise, measured at 400 Hz with 32 mW output power into 150 ohms

Frequency Response: optimized for voice response (100 Hz to 20 kHz, ±0.5 dB)

Dimensions (Overall):

3.25 inches wide (8.3 cm)

3.95 inches high (10.0 cm)

1.8 inches deep (4.6 cm)

Weight: 0.6 pounds (0.3 kg)

Features and specifications subject to change without notice.

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