



COMM/IFB Box (CIB-02)

Communications / IFB Interface

User Manual

Version: 1.01

Product Description

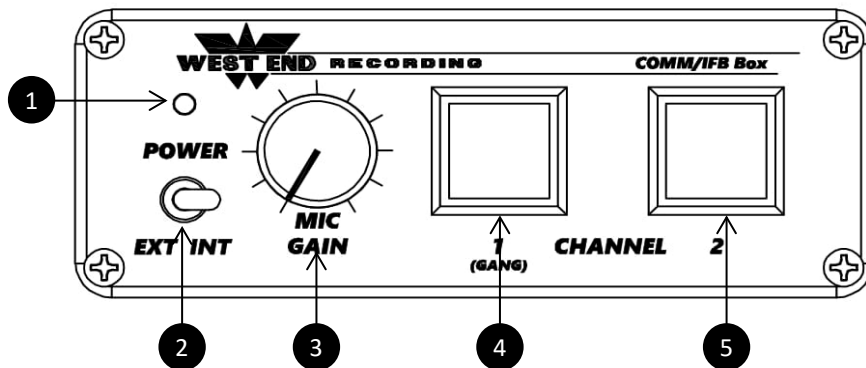
West End Recording's CIB-02 COMM/IFB Box is designed to serve as a general purpose tool to provide fundamental communications to key personnel working in a typical production environment.

The CIB-02 is comprised of a high quality microphone preamp, balanced low impedance line input, dual balanced line drivers, and a noiseless switching system which provides signal routing and operational function control.

While the CIB-02 was originally conceived for use on smaller sets where sophisticated PL and intercom systems are typically not available, it's unique and flexible design allows it to play an equally important role on sets of all sizes and scope addressing a wide variety of communication applications. It is especially useful in the ENG/EFP environment. Typically the CIB-02 would be used to facilitate communications between producers, directors, talent, camera operators and any number of other crew members, and it can be interfaced into virtually any wired or wireless environment.

Durability of the CIB-02 is assured through the use of state of the art surface mount components on the printed circuit board which is mechanically housed in an extruded aluminum case. Internal connections have been kept to an absolute minimum and all external connections and controls are of the highest quality using long life gold and silver plated contacts and connection pins wherever possible. The extruded aluminum case is black anodized providing a highly scratch resistant surface and all lettering and markings are laser etched into the anodized surface exposing the base metal thereby making them practically impossible to wear off with use.

Front Panel Controls



1 Power Indicator

Bi-color LED indicates the presence of power to the CIB-02 and the battery condition. **Green** indicates that the battery condition is optimal, **Yellow** indicates that the battery is approximately 75% depleted (depending on battery type), and **Red** indicates that the battery is close to its complete discharge state and should be changed immediately.

2 Power Switch

Selects the power source for the CIB-02. The **INT** (internal) position selects the internal battery, and the **EXT** (external) position selects one of the two external power sources. The external power source is derived from either the external DC power connector on the rear panel or phantom power which is provided by an optional phantom power supply and is delivered to the CIB-02 via the channel 2 output connector pins, (see Powering section).

3 Gain Control

Adjusts the gain of the microphone preamp continuously between 0dB and +61dB.

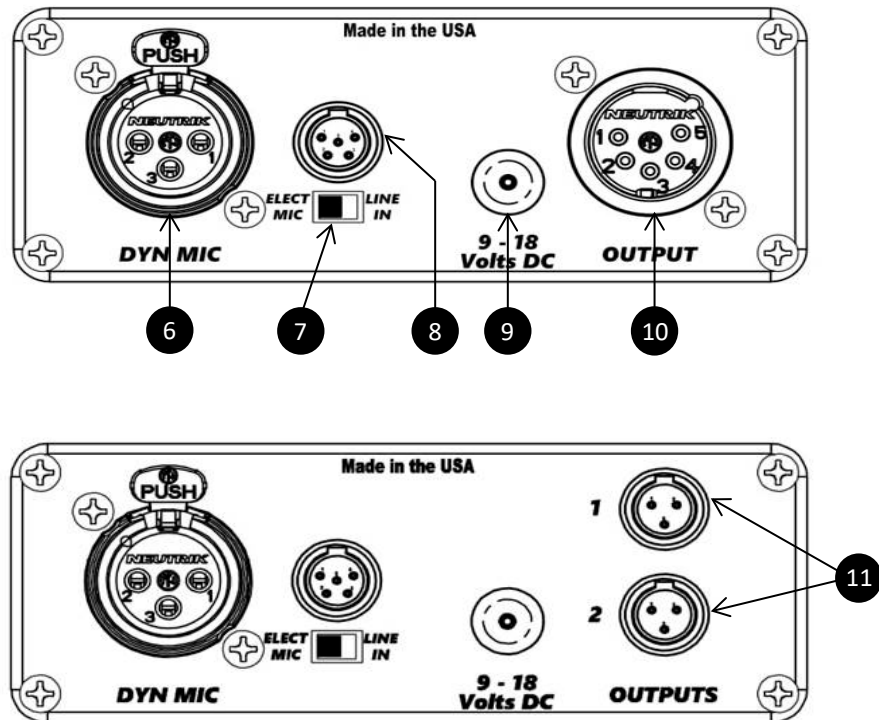
4 Channel 1 Select Pushbutton

Routes the Microphone signal to the channel 1 output. The action of the pushbutton is determined by the **Mode Switch** located on the bottom of the unit.

5 Channel 2 Select Pushbutton

Routes the Microphone signal to the channel 2 output. The action of the pushbutton is determined by the **Mode Switch** located on the bottom of the unit.

Rear Panel Controls and Connections



6 Dynamic Microphone Input

Provides an electronically balanced input via a gold plated XLR connector for mic level signals.

7 TA5 Input Mode Select Switch

Selects the operational mode of the TA5 input connector. In the **ELECT MIC** position the TA5 input connector is used to input a mic level signal from an electret type microphone (Typically a lavalier). In the **LINE IN** position the TA5 input connector is used to input a line level signal.

8 TA5 Input

Depending on the position of the TA5 Input Mode Select Switch the TA5 connector provides access to either the microphone preamp or the line amplifier. In the **ELECT MIC** mode the connector is routed to the microphone preamp as an unbalanced signal and a bias voltage is applied to power the connected microphone. In this mode of operation the connector is the equivalent of a typical Lectrosionics™ brand transmitter input. **Note:** The connected microphone must be wired as a positive bias 2 wire microphone.

In the **LINE IN** mode the connector is routed to an electronically balanced line amplifier and acts as the program input when either or both channels are operated in the IFB mode.

9 External Power Jack

Supplies the CIB-02 with power from an external DC power supply via a standard 2.1mm jack. This input is specified to be between 9 – 18 VDC.

Note: Voltages as high as 32 volts can be tolerated but may result in excessive heating and a potential for reduced power supply performance.

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Output Connector Option: A

The two electronically balanced outputs are accessed via a single gold plated 5 pin XLR connector. This connector complies with the standard stereo connector wiring scheme.

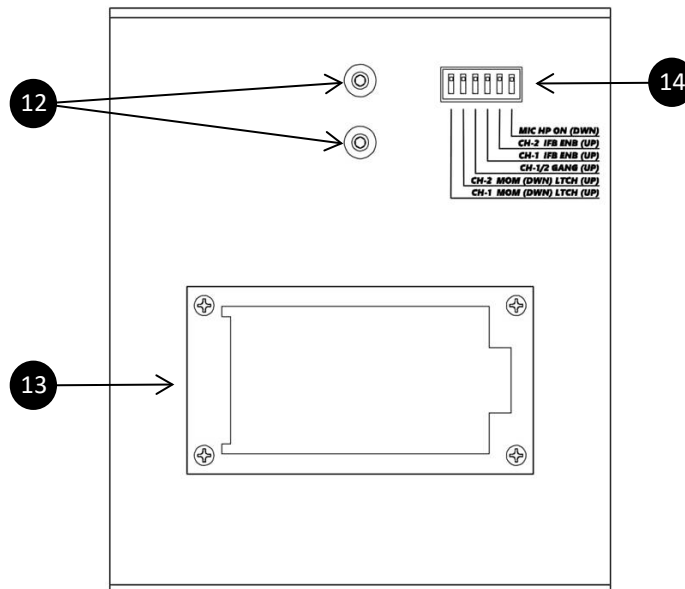
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Output Connector Option: B

The two electronically balanced outputs are accessed via two TA3 connectors.

Note: See **Specifications** for more information on connector pinouts and performance.

Back Panel Controls and Description



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Belt Clip Mounting Screws

Two 6-32 button head hex screws are located in such a way as to supply a mounting location for the included belt clip.

13 Battery Compartment

Holds one 9v battery required to operate the CIB-02 from the internal power source.

14 Mode Select Switches

A six position DIP switch determines the operational mode of the CIB-02. The switches function as follows:

SW1 and **SW2** select the **Operating Function** of the **Channel 1** and **Channel 2** select pushbuttons respectively. When the switch is in the down (off) position the channel select pushbutton functions as a **momentary** pushbutton (channel is selected only when the pushbutton is pressed and held). When the switch is in the up (on) position the channel select pushbutton functions as a push on/push off, or **latching** pushbutton (channel is selected when the pushbutton is pressed and remains selected until the pushbutton is pressed again).

SW3 selects the **Gang Function**. In this mode both of the channel select pushbuttons act as one and are activated via the **Channel 1 (gang)** pushbutton and in conjunction with **SW1** and **SW2** determine how the channel select pushbuttons interact with each other. The interaction of these three switches in combination produces four operational modes.

Mode 1 (Latching)

When **SW3** is in the up (on) position and either **SW1** or **SW2** are in the up (on) position pressing the **Channel 1 (gang)** pushbutton will route both channels to their respective outputs in the **latching** mode.

Mode 2 (Momentary)

When **SW3** is in the up (on) position and either **SW1** or **SW2** are in the down (off) position pressing the **Channel 1 (gang)** pushbutton will route both channels to their respective outputs in the **momentary** mode.

Mode 3 (Alternate Latching)

With **SW3** in the down (off) position, select the latching mode on both channels by moving **SW1** and **SW2** to the up (on) position. Press either of the channel select pushbuttons, now one channel will be selected and the other will be deselected. Move switch **SW3** into the up (on) position. Pressing the **Channel 1 (gang)** pushbutton will now alternately route each channel to their respective outputs in the **latching** mode.

Mode 4 (Latching/Momentary)

When **SW3** is in the up (on) position and either **SW1** or **SW2** are in the up (on) position and the opposite switch is in the down (off) position, pressing the **Channel 1 (gang)** pushbutton will now route both channels to their respective outputs in its selected mode. (While this mode of operation is possible, its action is unusual and typically serves no practical purpose, but it is left up to the user to determine its usefulness).

SW4 and **SW5** select the **IFB mode** of channel 1 and channel 2 respectively. When the switch is in the down (off) position no program audio is available to output channels 1 and 2. When either switch is in the up (on) position program audio is available to either output channels 1 or 2 independently or both simultaneously. In the IFB mode when the channel select pushbuttons are not active the program audio connected to the **LINE IN** input is routed, at full volume, to any selected output based on the status of **SW4** or **SW5**. When any of the channel select pushbuttons are active the microphone signal is routed, at full volume, to the selected channel and the program audio for that channel is reduced by -15dB (Dim). This allows the listener to still hear the program audio in the background while communications via the microphone can be heard clearly in the foreground.

SW6 selects the **High Pass Filter**. The high pass filter will reduce any unwanted low frequency noise such as rumble, hum and handling noise. It has a gentle slope of -3dB/octave at 200Hz. When the switch is in the down (off) position the high pass filter is completely removed from the circuit. When the switch is in the up (on) position the high pass filter is inserted in the circuit between the output of the preamp and the summing amp.

Powering

The CIB-02 provides the user with a versatile powering scheme consisting of three methods of supplying power to the unit. The first is the internal battery which is convenient when the CIB-02 is used as a beltpack where external power would typically not be available. The second is the external power jack on the rear panel which can be used when the unit is powered for example from the BDS system of an audio bag or in a more permanent environment like an audio cart via the appropriate power supply. The third is via phantom power supplied by the optional PPS-01 or PPS-02. This method is particularly effective when using the CIB-02 as a beltpack where battery life is a concern, or equally, in a permanent application such as a sound cart or as a stand-alone device in an announce booth or satellite truck environment.

Internal Battery

To provide internal power to the CIB-02 a 9 volt battery must be installed into the battery compartment. This can be an alkaline or lithium type battery with the only difference being the run time of the CIB-02. With a high quality alkaline battery the run time will be approx. 3.5 hours, and with a lithium type battery it will be approx. 6.0 hours.

External Power Supply

External power is supplied to the CIB-02 via the 2.1mm jack on the rear panel. The source of external power must be capable of delivering 9 – 18 Volts DC @100mA. This would include an appropriate wall wart, sound cart power distribution system, sound bag BDS, or any other source that meets the CIB-02's power requirements.

Phantom Power

While the concept of phantom power is not unique, supplying phantom power to the CIB-02 is, due to the relatively high current consumption required. Therefore phantom power **must be supplied ONLY** by the optional PPS-01 or PPS-02 power supplies. The phantom power is delivered to the CIB-02 via the channel 2 + and - output connector pins, these are pins 4 and 5 of the 5 pin XLR connector on the "Option A" version and pins 2 and 3 of the TA3 connector on the "Option B" version of the CIB-02.

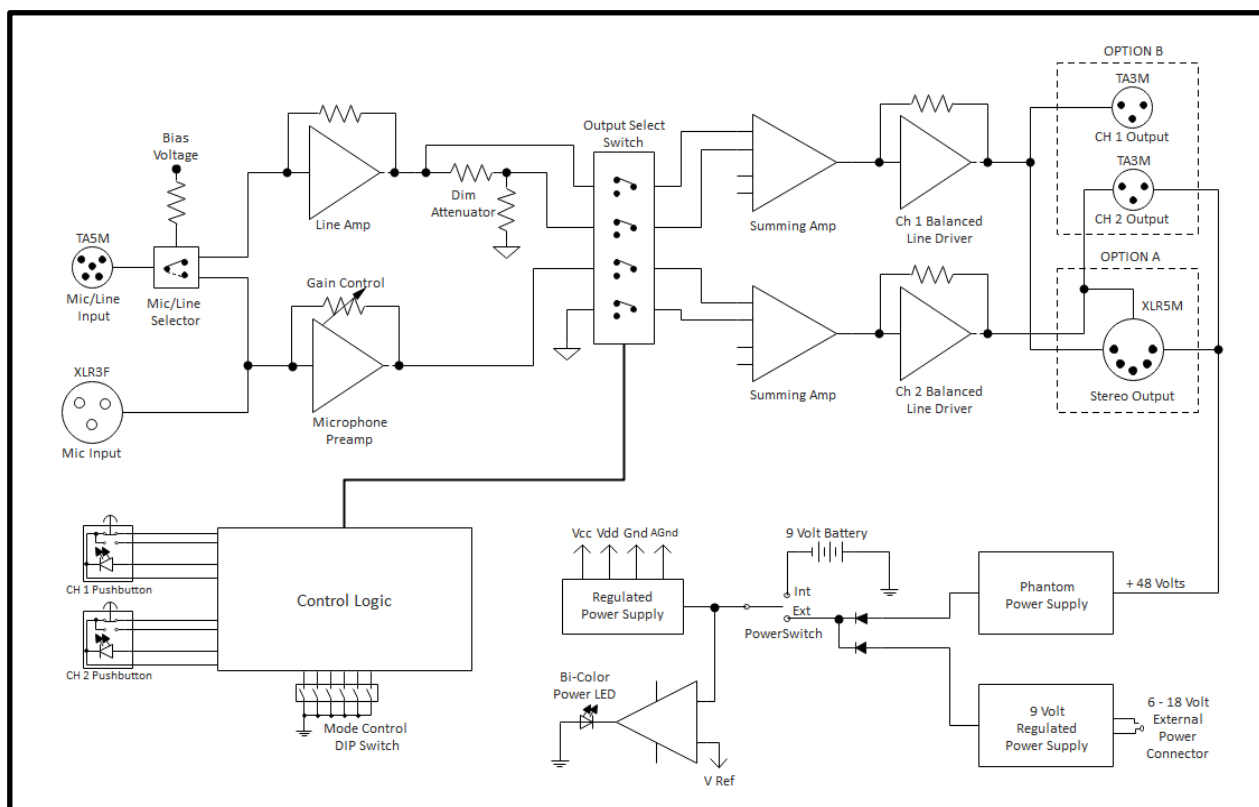
Design Philosophy / Block Diagram

The CIB -02 is designed to provide a reliable communications alternative to larger more sophisticated PL, Intercom, and IFB systems. By using advanced technologies housed in a robust enclosure we have managed to deliver a multi-functional communications tool that will hold up to the rigors of the production environment and do so for years to come.

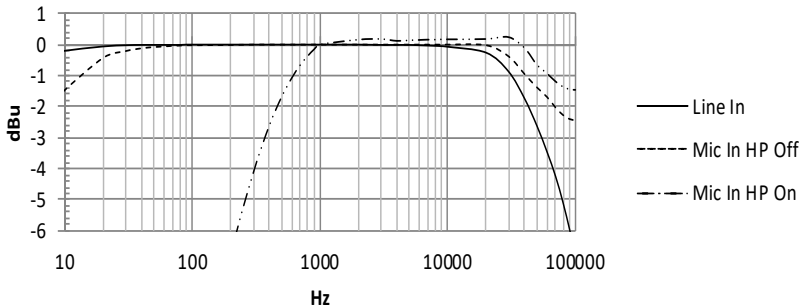
While the design is fairly straight forward it is a very versatile and feature rich communications tool in a convenient package. Essentially there are two inputs that are routed thru a comprehensive switching matrix to two outputs. The first input is a high quality electronically balanced microphone preamplifier that can be used with any low impedance dynamic microphone, or via a switch selection, reconfigured to provide the necessary bias voltage for the use of an electret type microphone. The second input is an electronically balanced line amplifier which allows a line level signal to be introduced into signal path that can be selectively attenuated thereby creating a true IFB function.

All of the routing of the audio signal is accomplished by noiseless switches which ensure a pristine audio signal path. These switches are controlled by digital control logic that monitors the status of the **Mode Select** switches and the two **Channel Select** pushbuttons located on the front panel. The audio signal is then summed and sent to the two low impedance line drivers.

Finally power can be supplied by a total of 3 sources, an internal battery, an external power supply, and an optional phantom power supply. The power condition is monitored via a bi-color LED indicating remaining battery life when internally powered and the presence of power while externally powered. Both external power sources can be applied simultaneously and will automatically switch from one to the other if one of the sources should fail. This creates a virtual **Uninterruptable Power Supply** for mission critical applications.



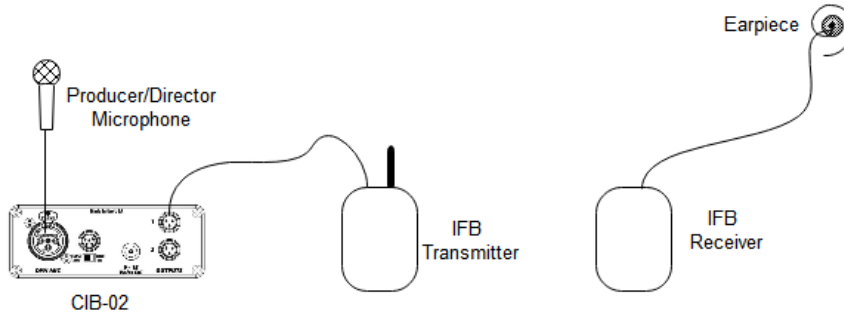
Specifications

Gain Microphone Input:	0dB - 61dB Input to Output
Line Input:	6dB Input to Output
Frequency Response:	<p>Mic: -.40 to +.02 dB 20 - 20 kHz, -1.25 dB @50kHz (@48dB Gain, 150 ohm source referenced to 1kHz)</p> <p>Line: - 0 to -.25 dB 20 - 20 kHz, -2.5 dB @50kHz (@0dBu Input, 150 ohm source referenced to 1kHz)</p>  <p>The graph plots frequency response in dBu against frequency in Hz on a logarithmic scale from 10 to 100,000 Hz. Three curves are shown: a solid line for 'Line In', a dashed line for 'Mic In HP Off', and a dash-dot line for 'Mic In HP On'. The 'Line In' curve is flat at 0 dBu until about 10 kHz, then drops to -6 dBu at 100 kHz. The 'Mic In HP Off' curve starts at -1 dBu at 10 Hz, rises to 0 dBu by 100 Hz, and follows the 'Line In' curve. The 'Mic In HP On' curve starts at -6 dBu at 10 Hz, rises to 0 dBu by 100 Hz, and follows the 'Line In' curve.</p>
High Pass Filter:	200 Hz 3dB / octave
THD + Noise:	.06% max.@ +4dBu output level 20 - 20kHz
Dynamic Range:	97.5dB
Input Level Mic:	Max. +5 dBu
Line:	Nom. -10 - +4dBu, Max. +10dBu
Input Impedance Mic:	2K Ohms (Electronically Balanced)
Line:	10K Ohms (Electronically Balanced)
Output Level:	Max. +13dBu (600 Ohms)
Output Impedance:	50 ohms
Phase:	Input to Output 180 Degrees
Mic Mute:	-70dB (de-selected channel to output)
Channel Attenuation (Dim):	-15dB (line input to output)
Connector Wiring Convention:	<p>XLR Pin 1 Ground, Pin 2 Hot, Pin 3 Cold</p> <p>5 Pin XLR Pin 1 Ground, Pin 2 Chan. 1 Hot, Pin 3 Chan. 1 Cold, Pin 4 Chan. 2 Hot, Pin 5 Chan. 2 Cold</p> <p>TA5 (Line Mode) Pin 1 Ground, Pin 2 Hot, Pin 3 Cold</p> <p>TA5 (Electret Mic Mode) Pin 1 Ground, Pin 2 Ground, Pin 3 Hot (+5 volts @ 5mA Applied)</p> <p>TA3 Pin 1 Ground, Pin 2 Hot, Pin 3 Cold</p>
Power Voltage:	<p>Internal: 1.9 Volt Battery (Alkaline or Lithium)</p> <p>External: 9 -18 VDC via 2.1mm non-locking jack (Pin Positive, Sleeve Negative)</p> <p>Phantom: 48 VDC via Chan. 2 hot and cold signal connections</p>
Current:	72mA @ 9 VDC (Both channels selected with signal present at mic and line inputs)
Dimensions:	<p>1.56" x 4.25" x 5.62" (h x w x d)</p> <p>(40mm x 108mm x 143mm)</p>
Weight:	12.95 oz., (.37kg)

Applications

Talent IFB

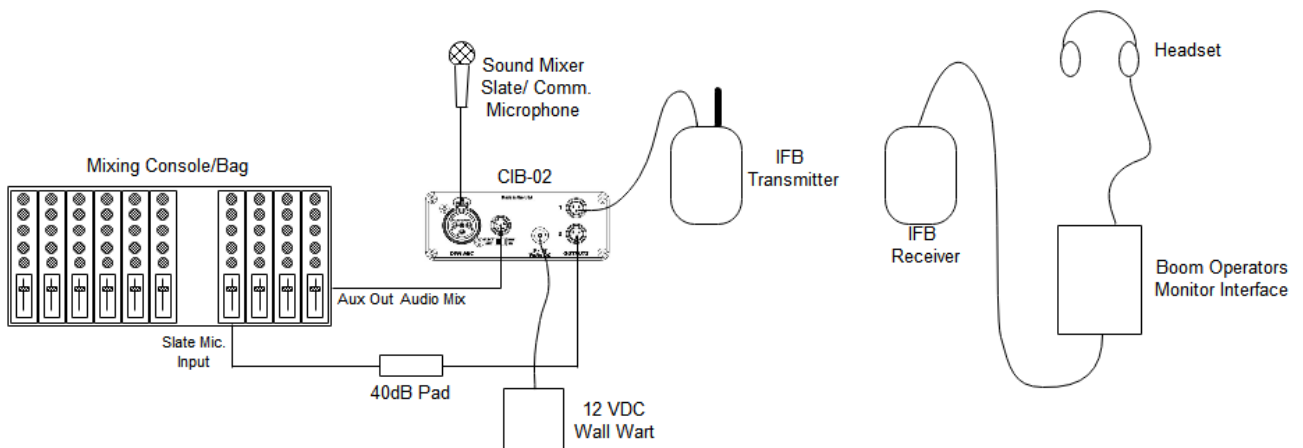
This is a simple example of a Talent IFB. A dynamic microphone is connected to the CIB-02 and output 1 of the CIB-02 is connected to the input of an IFB transmitter. On the listening side an earpiece is connected to an IFB receiver. Now when the **Channel 1** pushbutton is pressed the Producer/Director can speak to the talent.



Sound Mixer Boom Operator Comms.

In this application the CIB-02 provides communications between the sound mixer and boom operator and a slate microphone function. The mixers headset microphone is connected to the CIB-02, output 1 is connected to the boom operators PL transmitter, and output 2 is connected to the mixing console's slate microphone via a -40dB pad. Also the aux output of the mixing console is connected to the line input of the CIB-02 and a wall wart external power supply is used to provide a constant source of power.

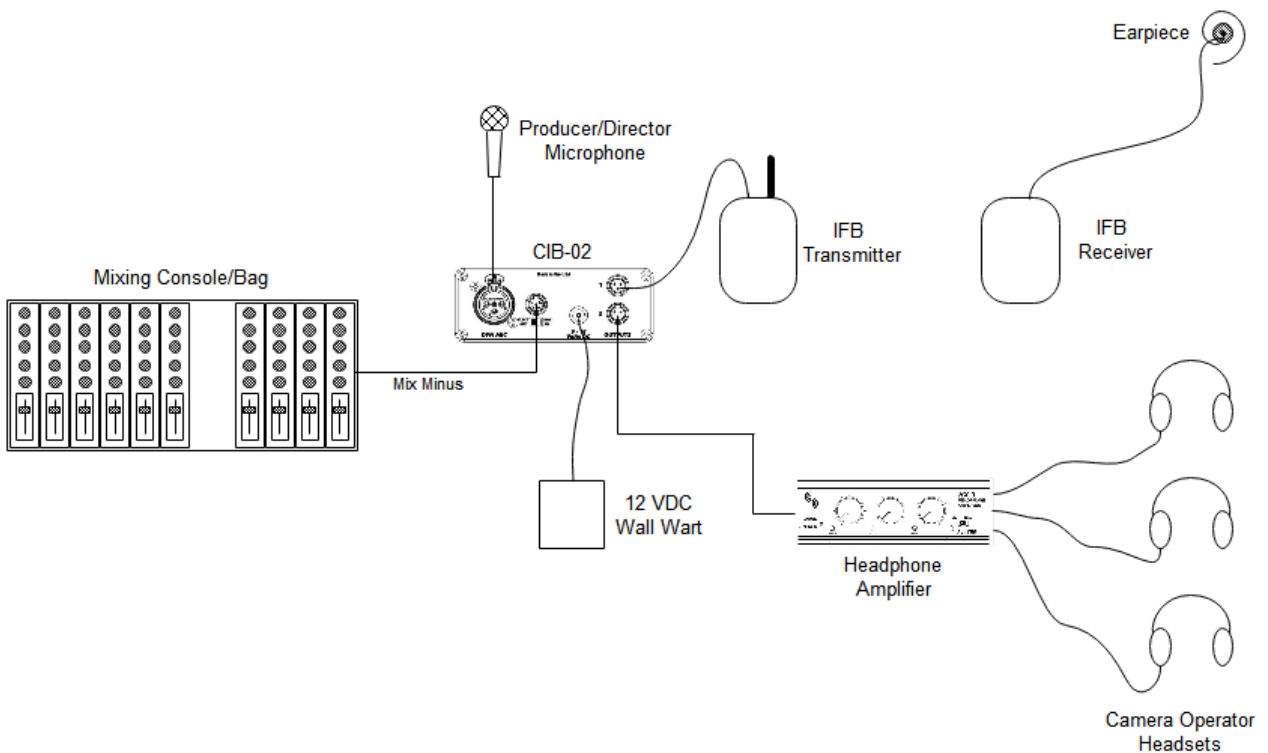
When the **Channel 1** pushbutton is pressed the sound mixer can talk to the boom operator, when the **Channel 2** pushbutton is pressed the mixer can slate through the existing slate system of the mixing console. **Note:** The Channel 2 pushbutton can be locked in the on position allowing the sound mixer to use the existing slate mic enable on the mixing console if desired. Also a mix can be sent to the boom operator via the IFB function of the CIB-02 allowing them to hear the boom in context of the entire mix.



Multi-Camera Production with Host

In this scenario a PL or intercom system would typically be employed. But if one is not available simply by just adding a multiple output headphone amplifier to the Talent IFB system application described on the previous page, basic communications to the camera operators can be achieved. The headphone amplifier is connected to output 2 of the CIB-02 to affect this configuration.

When the **Channel 1** pushbutton is pressed the producer/director can talk to the talent, and when the **Channel 2** pushbutton is pressed the producer/director can talk to the camera operators. Additionally a mix minus feed is sent to the talent and optionally to the camera operators via the IFB function of the CIB-02. This allows them to hear program content that is being produced remotely.



Note: All of the application examples use the “B” version of the CIB-02 for clarity, but any application can be achieved with either the “A” or “B” versions. Which to use is purely a function of personal choice and ease of integration into an existing workflow.

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