

A Loudspeaker System With Intelligence

EVOi.sys

User's Guide

Introducing The Next Generation of Installed Sound



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IMPORTANT SAFETY INFORMATION

This equipment has been tested and found to comply with the following European and international standards for Electromagnetic Compatibility and Electrical Safety:

Radiated Emmissions (EU): EN55022B (1992)
RF Immunity (EU): IEC801-3 (1994)
Electrostatic Discharge(EU): IEC801-2 (1984)
Fast Transients(EU): IEC801-4 (1988)
Electrical Safety (EU): EN60065 (1994)
Electrical Safety(USA): UL6500/ETL (1996)
Electrical Safety(CAN): CAN/CSA-E65/ETLc (1996)



Before using the apparatus read these instructions, follow all instructions, heed them and keep in a safe place.

Clean only with a damp cloth. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.

Do not defeat the safety purpose of the grounding type plug. A grounding plug has two blades and a third grounding prong. The third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched particularly at plugs, convenience recepticals and the point where they exit from the apparatus.

Only use attachments/accessories specified by the manufacturer.

Unplug this apparatus during lightning storms or when not in use for a long time.

WARNING - TO REDUCE THE RISK OF FIRE OR SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

DO NOT REMOVE COVERS, NO USER SERVICABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

THIS EQUIPMENT MUST BE GROUNDED.



**DO NOT EXPOSE
TO RAIN OR MOISTURE**



**NE PAS EXPOSER A
LA PLUIE NI L'HUMIDITE**

IT SHOULD NOT BE NECESSARY TO REMOVE ANY PROTECTIVE GROUND OR SIGNAL CABLE SHIELD CONNECTIONS TO PREVENT GROUND LOOPS. ANY SUCH DISCONNECTIONS ARE OUTSIDE THE RECOMMENDED PRACTICE OF JBL PROFESSIONAL AND WILL RENDER ANY EMC OR SAFETY CERTIFICATION VOID.

For continued compliance with international EMC legislation ensure that all input and output cables are wired with the cable screen connected to Pin 1 of the XLR connectors. The input XLR Pin 1 is connected to the chassis via a low value capacitor, providing high immunity from ground loops while ensuring good EMC performance.



WELCOME

Welcome to EVO Intelligent Sound Reinforcement Systems.

Thank you for trusting JBL with your sound. It's an honor we don't regard lightly. As a world leader in sound reinforcement, JBL sound systems are permanently installed in many famous arenas, concert halls, theaters, theme parks and clubs. In fact, JBL speakers provide the body, substance and clarity for today's hottest music acts, showcase stores and premiere restaurants you just can't make a more professional choice.

JBL Professional products are the result of over 50 years of design and manufacture of sound reinforcement solutions. From cathedrals to discos, to arenas and small boutiques, JBL has successfully provided the tools and system resources to meet and exceed every need. It's with this experience and success that JBL offers EVO, the first fully designed sound reinforcement system with built-in intelligence. Congratulations on your purchase.

USING THIS GUIDE

The majority of content in this Guide is instruction on the day to day operation of EVOi.sys. EVOi.324 and EVOi.net are both components of EVOi.sys. It is necessary to retain the Guides found in the EVOi.324 packaging. Operation of the EVOi.net is contained in the EVOi.net Users Guide.

A thorough understanding of these Guides is necessary for correct installation and set-up of EVOi.sys.

As you follow the EVOi.sys Users Guide each reference to either EVOi.324 or EVOi.net Guide is identified with the color associated with the product:

EVOi.sys - Blue
 EVOi.324 - Yellow
 EVOi.net - Green

PACKAGING CONTENTS

2 x EVOi.324 Contents:

EVOi.324 Speaker System

Accessory bag which includes:

1 AC Power Cord, 1 Eyebolt Kit, Two Small Rubber Feet, 1 Large Rubber Foot, 1 Large Washer

EVOi.324 Users Guide

Tech Note #14 Vol.1

EVOi.sys Mixer Station Contents:

EVO Mixer Station

AC Power Cord

UHF Handheld Transmitter with Dynamic Microphone Head with Clip

UHF Body Pack Transmitter with Condenser

Lavalier Microphone with Tie Clip

Six Handheld Dynamic Microphones with Clips

EVOi.sys Accessories Contents:

JBL Measurement Microphone with Clip

Four Boom Microphone Stands

Six 50 ft XLR Cables

Four 2 ft XLR Cables

Three 100 ft XLR Cables

Mixer Station Dust Cover

EVOi.sys, EVOi.net Users Guides



THANK YOU

Thank you for purchasing an EVOi.sys the first Fully Designed Sound Reinforcement System. You have just taken delivery of the World's most comprehensive designed sound reinforcement system. Everything is supplied to get a professional sound reinforcement system up and running in the shortest possible time with the minimum of stress and the most reliability. For maximum satisfaction and optimum results please read this guide thoroughly. You will be required to understand the placement of EVOi.324 loudspeakers and the operation of EVOi.net and will be directed to the relevant sections in this guide. However, through the intricate digital design and integration of sound system technology a large portion of tedious system installation and configuration has been eliminated.

DESIGN OVERVIEW

EVOi.sys has been specifically designed to provide all the elements of a sound reinforcement system in one simple to order, quick to install, easy to set-up and straight forward to operate package. The professional nature, performance and quantity of equipment supplied has been finely tailored to suit sound reinforcement applications in performing arts, worship space, educational and civic venues of up to five hundred seat capacity. For larger venues, provision has been made such that additional EVO loudspeakers can be added to the system. For complex productions additional wired and wireless microphone can be easily added.

FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Parts 74, 15, and 90 of the FCC Rules. These limits are designated to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded cables and I/O cards must be used for this equipment to comply with the relevant FCC regulations. Changes or modifications not expressly approved in writing by AKG may void the user's authority to operate this equipment.

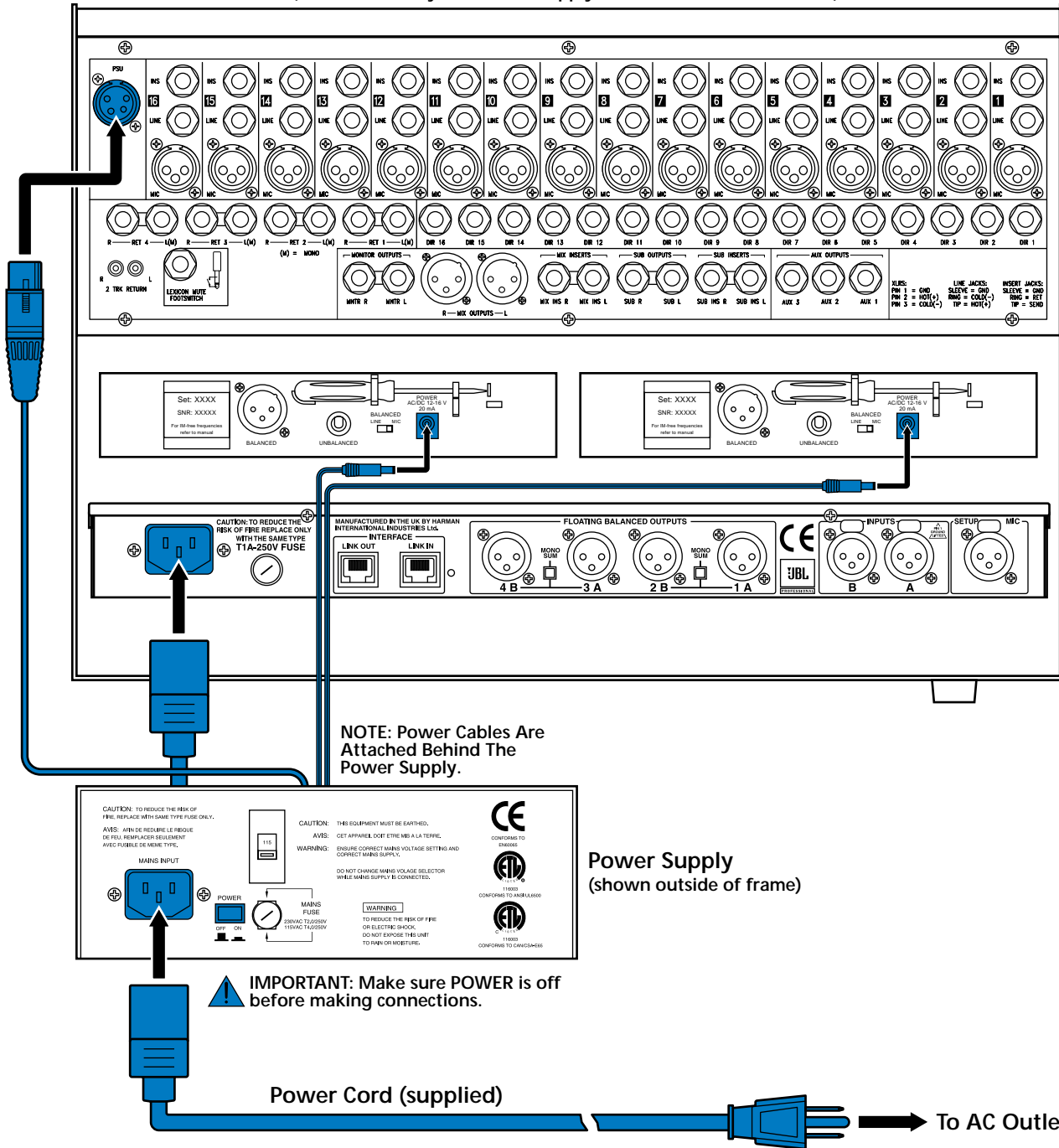
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.



CONNECTING THE POWER

EVOi.sys Rear

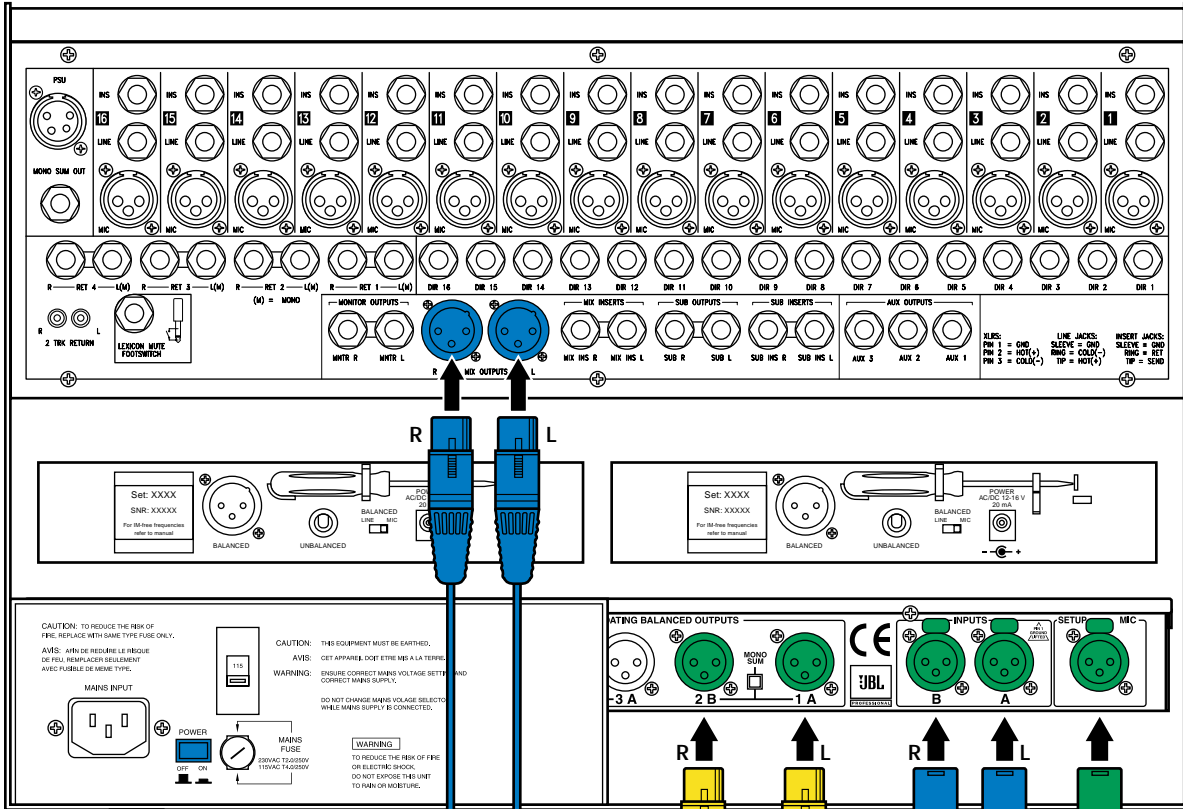
(NOTE: For clarity, the Power Supply is shown outside the frame.)



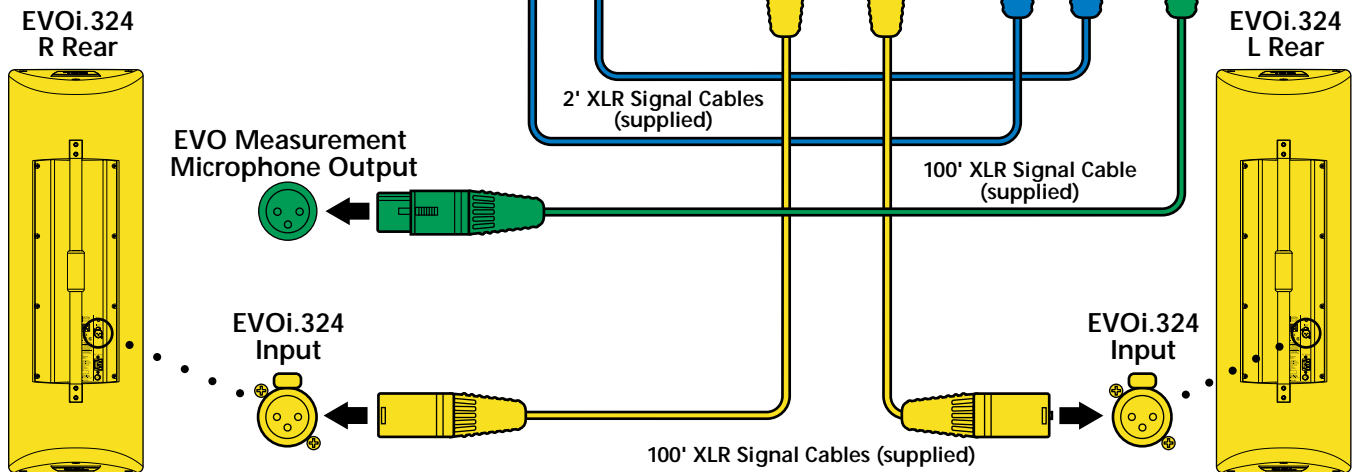
CONNECTING THE NETWORK

EVOi.sys Rear

(NOTE: For clarity, power connections are not shown – see previous page.)



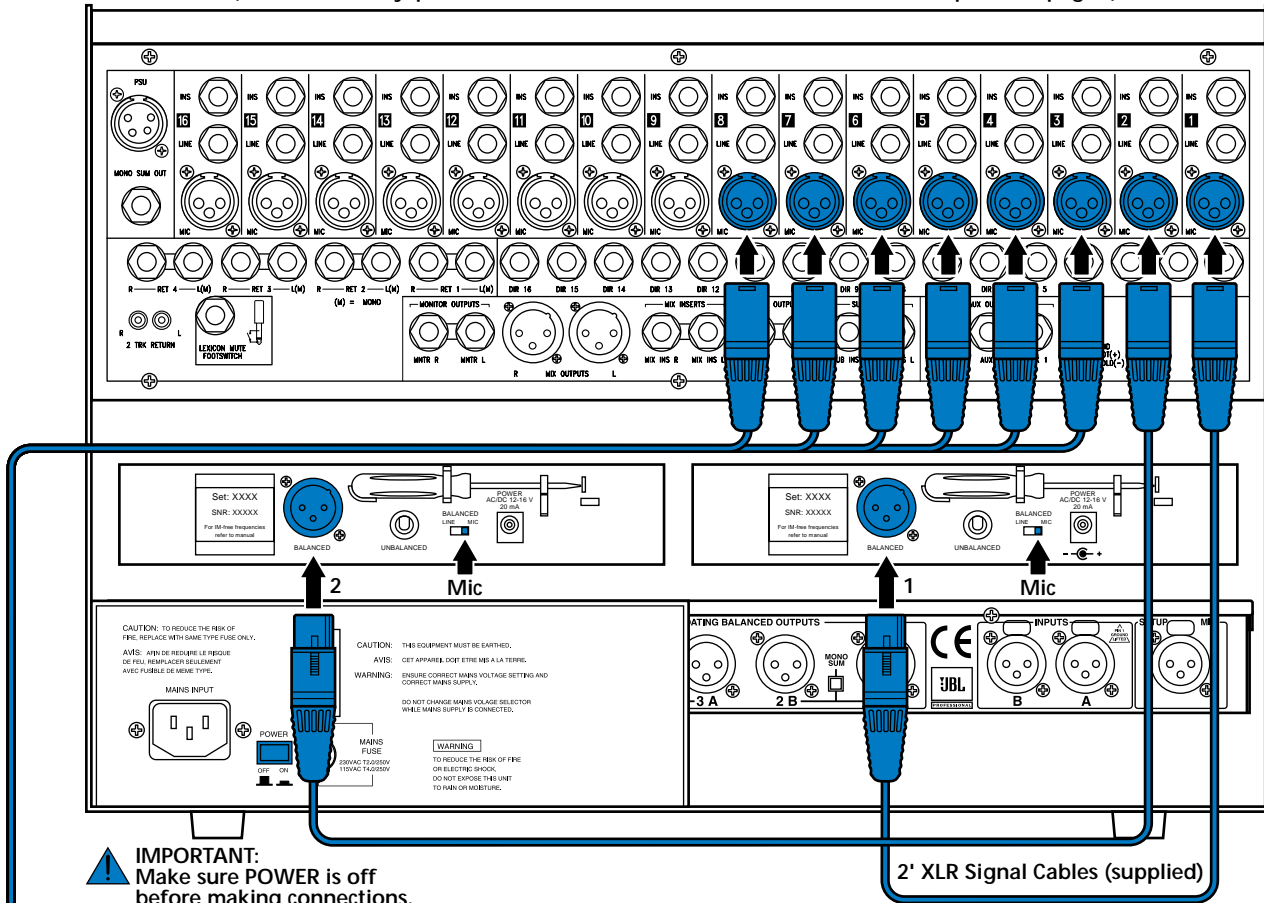
IMPORTANT: Make sure **POWER** is off before making connections.



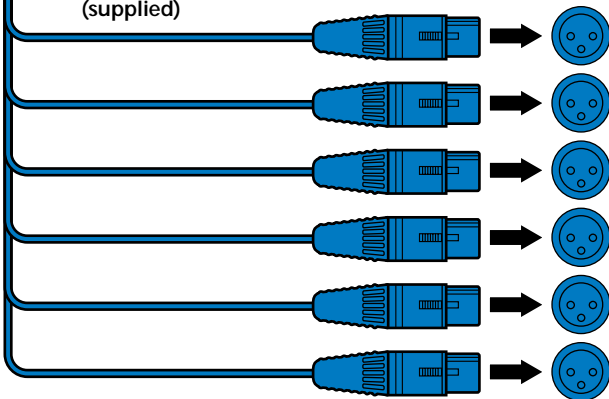
CONNECTING THE MICROPHONES

EVOi.sys Rear

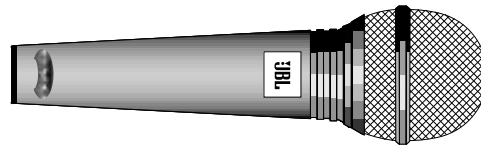
(NOTE: For clarity, power and network connections are not shown – see previous pages.)



50' XLR Signal Cables (supplied)

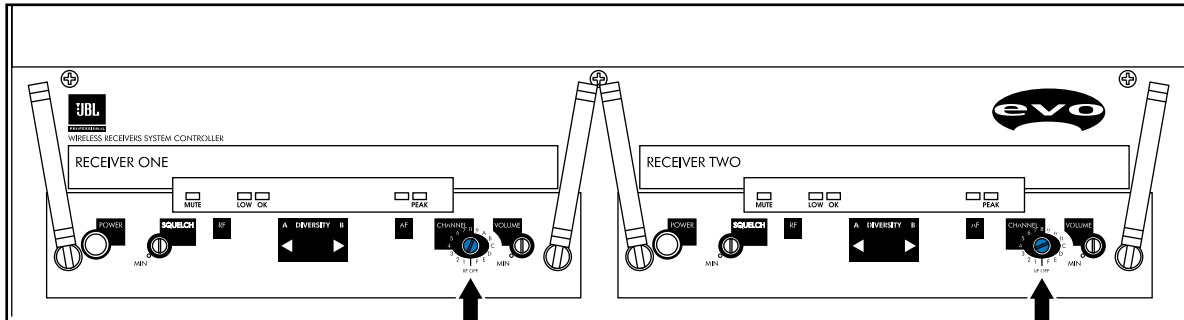


EVO Dynamic Microphones (supplied)



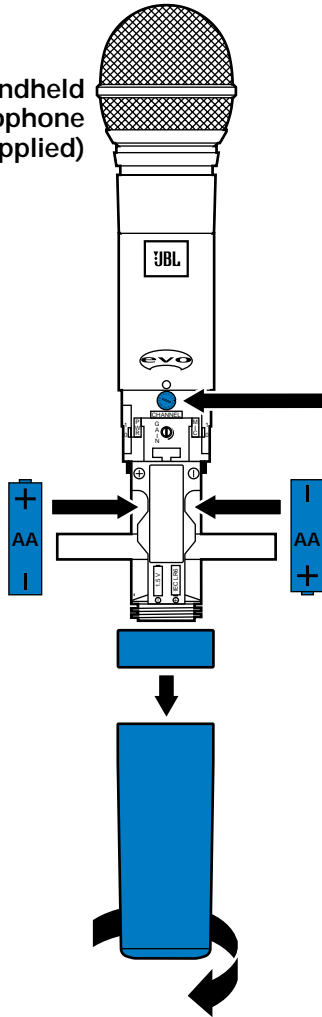
SETTING UP THE WIRELESS MICROPHONES

EVOi.sys Partial Front



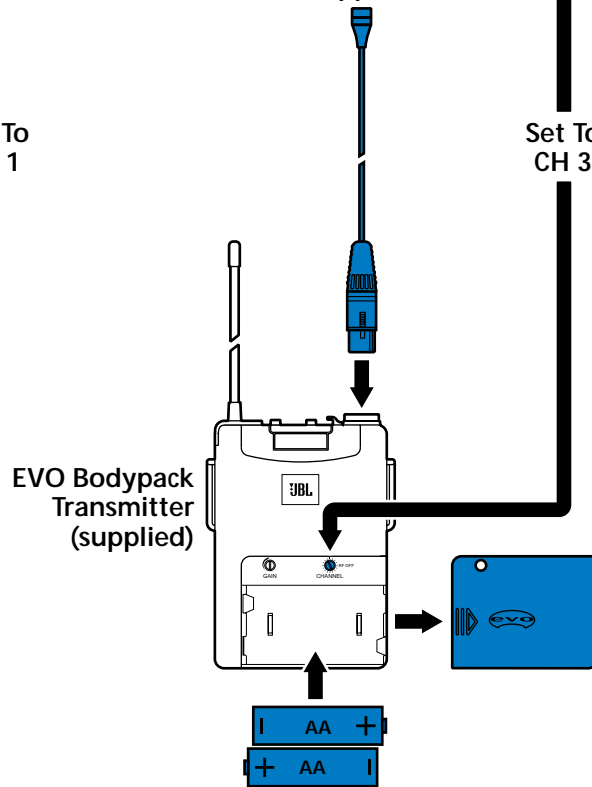
IMPORTANT: Make sure POWER (on the Power Supply rear) is off before setting up microphones.

EVO Handheld Microphone (supplied)



Set To CH 1

EVO Lavalier Microphone (supplied)



Set To CH 3



SETTING UP THE SYSTEM

Initial Settings

Before powering on the system, set the following controls to their initial settings:

- On the EVOi.sys Power Supply:
POWER = OFF
- On the EVOi.sys Mixer:
All Faders = ∞ “all the way down”
All Pan, Send, and Return controls = 0
All MUTE buttons = On
All microphone SENS controls = - 30
MIC 48V (POWER) = OFF
- On the EVOi.sys Receivers, One and Two:
POWER = Off

Power On

1. Verify that the voltage setting and fuse value on the EVOi.sys (rear) is set for your ac power service (e.g., 115 V).
2. Connect AC MAINS on all EVOi.324s (see page 6 EVOi.sys Users Guide) to active ac outlets. Each power indicator will turn on.
3. On the EVOi.sys (rear), press POWER to the ON position. The POWER indicator (on the EVOi.net) will turn on.

Testing The System

Perform the instructions listed in the EVOi.net section, *Installation/Setup – Starting Up* starting on page 7 EVOi.net Users Guide.

Setting Up The Initial Mix

1. Connect other sources (e.g. phantom-powered microphone, keyboard, etc.) to available inputs and release the MUTE switches on all channels being used. If required, press MIC 48V to On to supply phantom power. The POWER LED will turn on.

2. Set the L MIX R and L SUB R faders to 0. On all input channels with signal, press MIX to route the signal to the mix buss.
3. On the Master section, select MIX as the monitor source and select PFL as the listening mode.
4. Press SOLO on Channel 1 while a performer provides a typical performance-level signal. Observe the level on the bargraph meters and adjust SENS until the meter display is in the amber section, with occasional peaks to the first red LED for a typical maximum source level. This setting will allow sufficient headroom to accommodate peaks and establishes the maximum level for normal operation.

NOTE: The SENS setting is only the starting point for your mix. Remember that many factors affect the sound during a live performance, including EQ settings or even audience size.
5. Release SOLO on Channel 1. Repeat steps 4 and 5 for all other channels as required.

You are now ready to start building the mix and this should be done progressively, listening carefully for each component in the mix and watching the meters for any hint of overload. If this occurs, back off the appropriate Channel fader slightly until the level being monitored is out of the red segments, or adjust the faders. This procedure will ensure that the mixer is set up correctly, with adequate headroom.

Operating The Equipment

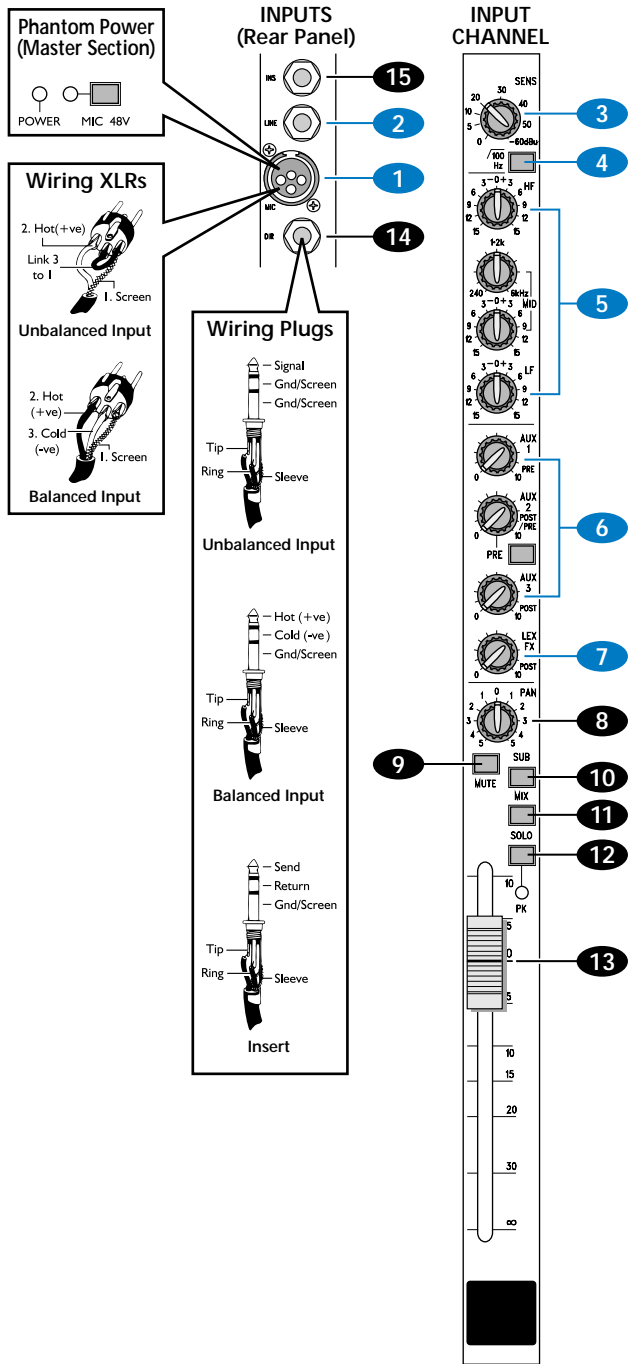
To learn more about EVOi.sys, we encourage you to study the remaining pages in this section to learn how to operate the controls on the mixer and microphone equipment. If you encounter any problems, please refer to *Troubleshooting* at the end of this manual.

Power Off

Important

Before turning off, make sure L Mix R faders are set to ∞ “all the way down”.





INPUT CHANNEL

1 MIC Input

The MIC input accepts a male XLR connector and is designed to suit a wide range of balanced or unbalanced signals. Use professional dynamic, condenser, or ribbon microphones, because their low impedance helps to reduce background noise compared to low-cost high-impedance microphones. If you press down the MIC 48 V switch (see master section detail) the XLR receptacle provides a suitable power voltage for professional condenser microphones (a.k.a., *Phantom Power*). When using a MIC input, unplug any signal from the LINE input and adjust the input level using the SENS control.



IMPORTANT: To prevent damage to the mixer or external devices, only connect condenser microphones when MIC 48 V is off (i.e., switch up), and only turn it off or on with all output faders down. When using unbalanced microphones, make sure MIC 48 V is off, since phantom power supplied on pins 2 and 3 of the XLR connector may damage the equipment.

2 LINE Input

Each LINE input accepts a 3-pole A-gauge (TRS) plug. Use this high impedance input for sources other than microphones, such as keyboards, drum machines, synthesizers, tape machines, or guitars. The LINE input is balanced for low noise and top-quality signal transfer from professional equipment. To use unbalanced sources, wire the plugs as shown and keep cable lengths as short as possible. When using a LINE input, unplug any microphone from the MIC input and adjust the input level using the SENS control.

3 SENS (Sensitivity)

This control sets how much of the source signal is sent to the rest of the mixer. Too high, and the signal will distort as it overloads the channel. Too low, and the level of any background hiss will be more noticeable, and you may not be able to get enough signal level to the output of the mixer.

Setting the **SENS** control to 10 gives approximate unity gain for the **LINE** input. Some sound equipment, including home consumer products, may operate at a lower level (i.e., -10 dBv) than professional equipment and, therefore, will require setting **SENS** to a higher gain to reach the same output level.

See *Setting Up the System on page 9* to learn how to set **SENS** correctly.

4 100 Hz Hi-Pass Filter

Pressing this switch activates a steep 18 dB per octave filter which reduces the level of bass frequencies only. Use this filter in live PA (public address) situations to clean up the mix, reducing stage rumble or “popping” from microphones.

5 Equalizer (EQ)

The 3-band swept equalizer (EQ) allows fine manipulation of the frequency bands, and is particularly useful for improving the sound in live PA applications where the original signal is often far from ideal and where slight boosting or cutting of particular voice frequencies can dramatically improve clarity.

HF EQ

Turn **HF** to the right to boost high (treble) frequencies (at 12 kHz and above) up to 15 dB, adding crispness to cymbals, vocals, and electronic instruments. Turn **HF** to the left to cut the same frequencies up to 15 dB, reducing hiss or excessive sibilance which can occur with certain types of microphone. When **HF** is not being used, set it to the center-detent position.

MID EQ

This pair of controls work together to form a mid-frequency EQ section. The (lower) **MID** gain control provides 15 dB of boost or cut, just like the **HF** control, but the frequency at which this occurs can be set by the (upper) **MID** frequency control over a range of 240 Hz to 6 kHz. This allows some truly creative improvement of the signal in live situations, because the mid band covers the range of most vocals. Listen carefully as you use these controls together to find how particular characteristics of a signal (i.e., vocal) can be enhanced or reduced. When **MID EQ** is not being used, set the (lower) **MID** gain control to its center-detent position.

NOTE: The Q is fixed at 1.5.

LF EQ

Turn **LF** clockwise to boost low (bass) frequencies (at 60 Hz and below) by up to 15 dB, adding warmth to vocals or extra punch to synthesizers, guitars, and drums. Turn **LF** anticlockwise to cut low frequencies by up to 15 dB to reduce hum, stage rumble, or to improve a mushy sound. When **LF** is not being used, set it to the center-detent position.

6 AUX Sends

Use these controls to set up separate mixes for foldback, effects, or recording. The combination of each **AUX** Send is mixed to the respective **AUX** Output at the rear of the mixer.

For effects work, the signal should be *post-fade*, so it will fade up and down with the fader. However, for foldback or monitor feeds, the signal should be *pre-fade*, so it is independent of the fader. **AUX 1** is always *pre-fade, post-EQ*, and would typically be used as a foldback or monitor feed. **AUX 2** and **AUX 3** are normally *post-fade, post-EQ* for use as effects sends or additional submixes, but for flexibility **AUX 2** may be switched to *pre-fade, post-EQ* by pressing the associated **PRE** switch.

All **AUX** Sends are muted, along with the other channel outputs, when the **MUTE** switch is pressed.

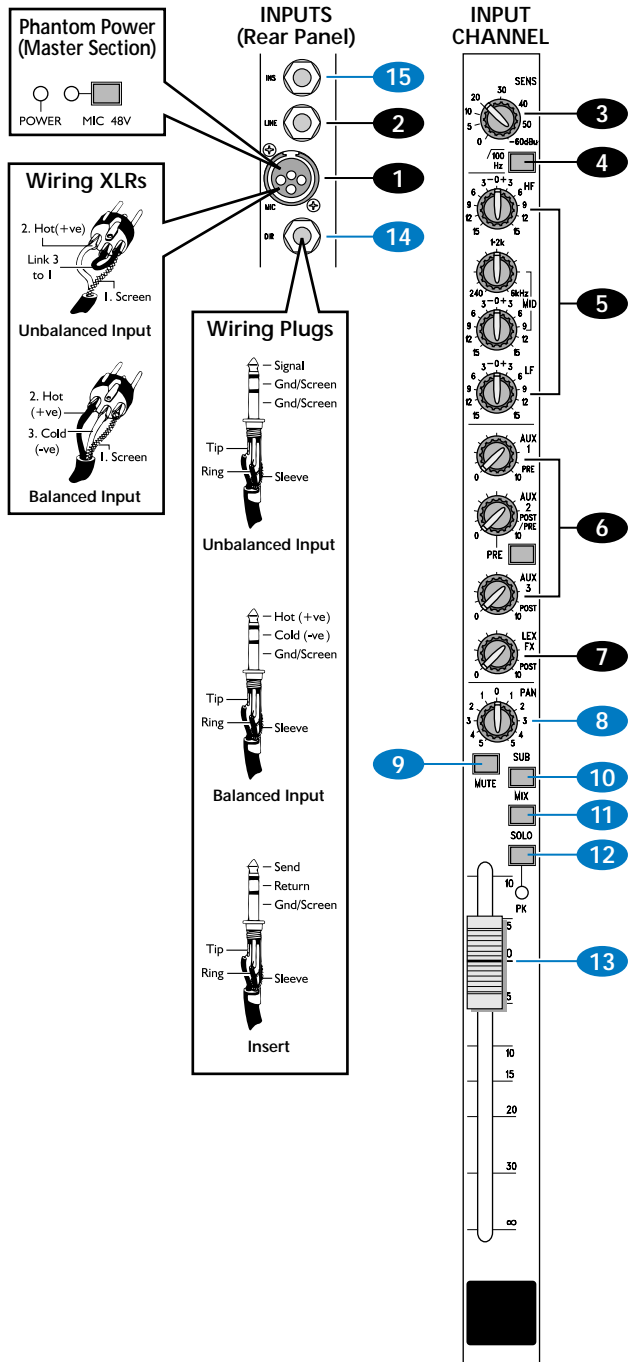
7 LEX FX

The **LEX FX** control is identical to the post-fade **AUX 3**, but the signal is sent to the internal bus which feeds the input of the built-in Lexicon Digital Effects Processor. The output of the Lexicon processor may be added to the mix or **AUX 1** or **AUX 2**. The more you increase **LEX FX**, the more channel signal you send to the Lexicon effects unit.

continued on next page...



MIXER OPERATION



INPUT CHANNEL (continued)

8 PAN

The **PAN** control sets the amount of the channel signal feeding the Mix L and R or Sub L and R busses (see **SUB** and **MIX** on the next page), allowing you to move the source smoothly across the stereo image. When the control is turned fully right or left you are able to route the signal at unity gain to either left or right outputs individually. A mono sum of the post-fader channel signal is also fed to the Mono output, unaffected by the position of the **PAN** control.

9 MUTE

All outputs from the channel except inserts and pre-fade direct outputs are active when the **MUTE** switch is released and muted when the switch is down, allowing levels to be pre-set before the signal is required.

10 SUB

Pressing **SUB** routes the channel signal to Sub L and R busses. The channel signal will be fed proportionately to left or right depending on the position of the **PAN** control.

11 MIX

Pressing **MIX** routes the channel signal to Mix L and R busses. The channel signal will be fed proportionately to left or right depending on the position of the **PAN** control.

12 SOLO/PK

Pressing **SOLO** routes the pre-fade, post-EQ signal to the headphones, control room output, and meters, where it replaces the selected monitor source. The adjacent **PK LED** illuminates to identify the selected channel is in solo mode. This Pre Fader Listen (PFL) feature is a useful way of listening to any required input signal, without interrupting the main mix, for making adjustments or tracing problems.

When **SOLO** is released, the **PK LED** serves as a peak indicator of the pre-fade, post-EQ signal and illuminates approximately 4 dB before clipping to give warning of a possible overload. The signal is sampled both pre-insert and after the HF EQ.

NOTE: It is normal for the PK LED to turn off slowly when SOLO is released.

13 Fader

The 100 mm fader allows precise balancing of the various source signals being mixed to the selected outputs. You get the most control when the input sensitivity is set up correctly, giving full travel on the fader. See *Setting Up the System* on page 9 for help in setting a suitable signal level.

14 DIR (Direct Output)

Each channel has a dedicated direct output, labeled as **DIR**, which allows direct connection to external devices; for example, to feed a tape machine or effects unit.

The pre-fade direct output level may be monitored by pressing **SOLO** on the appropriate channel to feed the pre-fade signal to the monitors and the bargraph meters.

15 INS (Insert Point)

The unbalanced, pre-EQ insert point is a break in the channel signal path, allowing a limiter, compressor, special EQ, or other signal processing unit to be added in the signal path. The insert point is a 3-pole 'A' gauge jack which is normally bypassed. When a plug is inserted, the signal path is broken, just before the EQ section. The send may be tapped off as an alternative pre-fade, pre-EQ direct output if required, using a plug with tip and ring shorted together so that the signal path is not interrupted.

Inserts can also be used to send and return from a multitrack tape machine.



MASTER SECTION

1 AUX OUTPUT MASTERS

Each of the three auxiliary outputs (AUX1 ~ AUX3) has a master level control which sets the output level of the combined auxiliary signals from the channels, and an associated AFL (After Fader Listen) switch. Just as a channel's SOLO switch allows pre-fade listening, you can monitor each auxiliary output after the level control by pressing the AFL switch to determine what level is leaving the output connector. This routes the auxiliary output signal to the MONITOR or PHONES circuits, replacing any existing signal which is selected. The console METERS will also switch from the selected source to display the PFL/AFL signal and the PFL/AFL LED lights to warn that a PFL or AFL switch is pressed. When you release the switch the MONITOR returns back to the previous source.

2 LEX FX MASTER

The LEX FX master control sets the overall level of the effects sends from the channels before the input of the Lexicon Digital Effects Processor. An associated AFL switch allows the signal to be monitored in the same way as the auxiliary masters (see above callout).

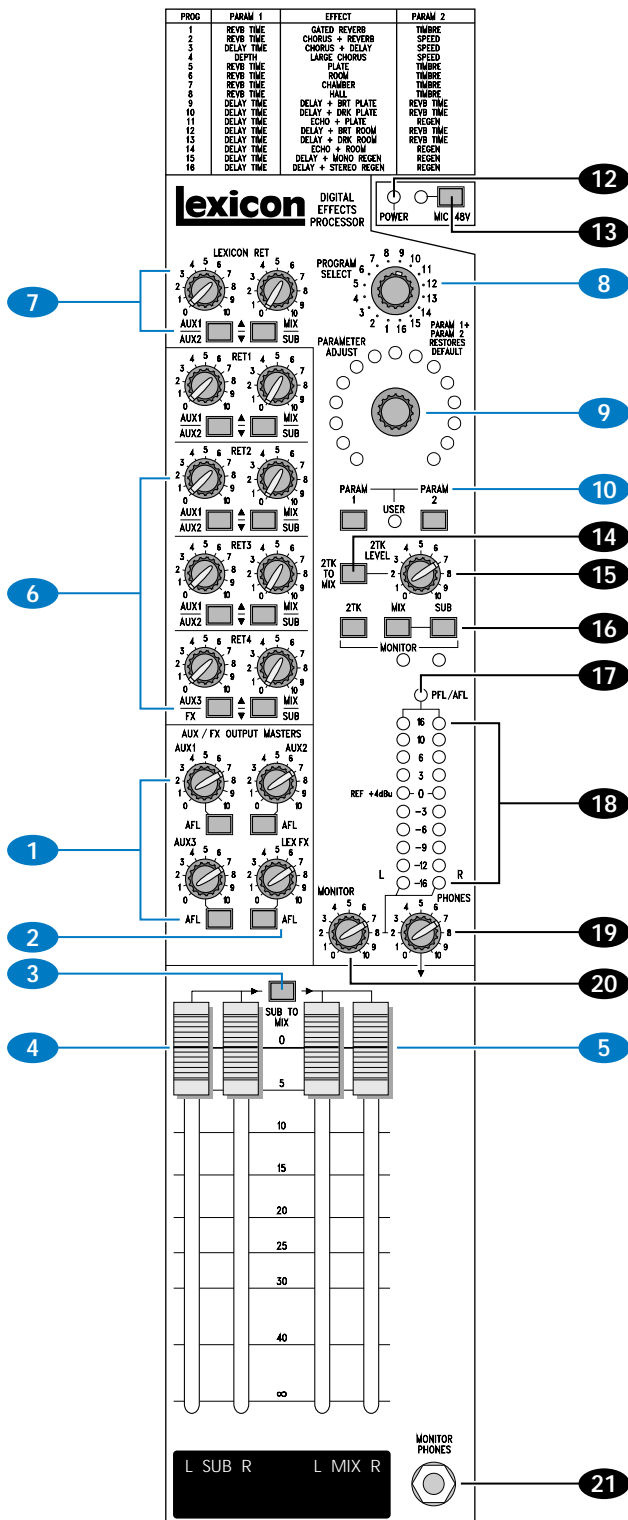
NOTE: When the LEX FX AFL switch is pressed, the meters become the Lexicon Input level indicators.

3 SUB TO MIX

The submaster mix may be used to provide alternative outputs from the mixer or, by pressing SUB TO MIX, the SUB L and R master faders may be used as audio subgroups. When SUB TO MIX is selected, the combined level of input channels are added to the main mix under the control of a pair of faders.

4 L SUB R (Master) Faders

The L SUB R (master) faders set the final level of the submaster L and R outputs. Assuming input SENS settings have been correctly set, the L SUB R (master) faders should be set close to the '0' mark to provide maximum travel on the faders for smoothest control.



5 L MIX R (Master) Faders

The L MIX R (master) faders set the final level of the mix L and R outputs. Assuming input SENS settings have been correctly set, the L MIX R (master) faders should be set close to the '0' mark to provide maximum travel on the faders for smoothest control.

6 RET1-RET4 (Stereo Returns)

Four balanced stereo returns, RET1 through RET4, are available for use as outputs of effects units or other stereo sources and are mixed directly to the AUX or MIX/SUB busses at a level set by the respective controls. The left-hand control sets the return level to a choice of AUX1 or AUX2 (AUX3 or Lexicon FX in the case of RET4), depending on the position of the adjacent switch. The right-hand control sends the return level to MIX or SUB, depending on the position of the adjacent switch (i.e., it is effectively a rotary fader).

If a mono source is used, plugging it into the left jack only will automatically feed the signal to both left and right busses.

Lexicon DIGITAL EFFECTS PROCESSOR

The built-in Lexicon Digital Effects Processor provides a wide range of echo, reverb, and acoustic treatments to add fullness to sound, complement room acoustics, or for specific effects.

7 LEXICON RET (Return)

LEXICON RET is similar in operation to the stereo returns, RET1 through RET4, but instead of taking an external source, this section is fed from the output of the internal Lexicon Digital Effects Processor. The left-hand control sets the return level to a choice of AUX1 or AUX2, depending on the position of the adjacent switch. The right-hand control sends the return level to MIX or SUB, depending on the position of the adjacent switch (i.e., it is effectively a rotary fader).

8 PROGRAM SELECT

PROGRAM SELECT is a rotary switch that provides selection of any one of 16 factory-programmed effect combinations, as listed on the panel legend below the controls. These factory presets have been carefully implemented for this mixer and should be suitable for most applications.

9 PARAMETER ADJUST

10 PARAM1/PARAM2

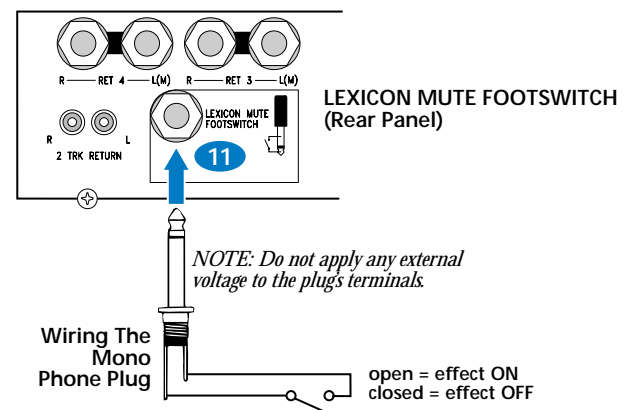
Two pre-programmed effects may be adjusted and saved in on-board RAM (random access memory) using the PROGRAM ADJUST encoder knob and PARAM1/PARAM2 storage switches. The best settings for a particular application are found by experimentation and through careful listening to the final sound.

Adjustments are made by turning PROGRAM ADJUST, while pressing down on PARAM1 or PARAM2, and listening to the result. As soon as you release PARAM1 or PARAM2, the setting will be held in internal RAM. Any alterations to the pre-programmed settings are retained, even if the mixer is turned off, and will be recalled the next time the particular program is selected. If a setting differs from the original default values, the USER LED will illuminate.

NOTE: To restore a parameter to its factory setting, press down on both PARAM1 and PARAM2 until the USER LED goes out.

11 LEXICON MUTE FOOTSWITCH

Lexicon effects may be remotely turned ON or OFF through the LEXICON MUTE FOOTSWITCH jack (on the rear panel). Use a standard latching (or non-latching) guitar footswitch, or similar unit that provides an isolated switch closure, and connect it as shown below. The effect will be muted when the switch is closed.



continued on next page...

MASTER SECTION (continued)

12 POWER Indicator

The POWER LED illuminates to show that power is being supplied to the console.

13 MIC 48V (Phantom Power)

Many professional condenser microphones need an external powering voltage, normally 48 volts dc, also known as *Phantom Power*. This method sends a powering voltage down the same wires as the microphone signal. When needed, press the MIC 48V switch to supply the 48-volt dc power to all of the microphone inputs. The adjacent LED illuminates when power is active.

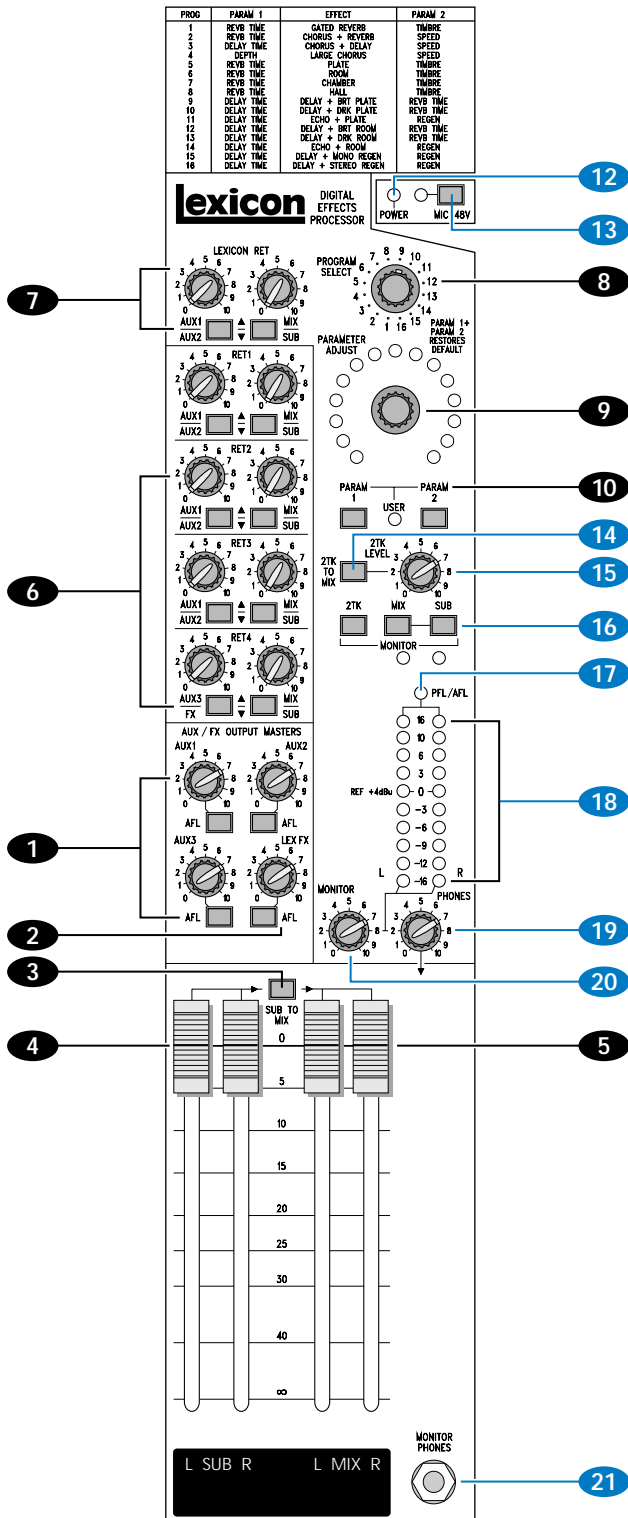


IMPORTANT: Do not use unbalanced microphones with MIC 48V switched on as they may be damaged by the phantom power voltage. Balanced dynamic microphones and cables can normally be used with MIC 48V switched on. Contact your microphone manufacturer for guidance.

To avoid damaging external equipment, always set all output faders set to minimum and then plug in all the balanced microphones before pressing MIC 48V.

14 2TK TO MIX

Press 2TK TO MIX to route the stereo signal connected to 2T RETURN directly into MIX outputs. This is an ideal way of feeding pre-show music to the main outputs in live applications without using up valuable input channels.



15 2TK LEVEL

The **2TK LEVEL** control sets the level of the 2-Track Tape input, which is routed to the headphones, monitor outputs, meters, or mix when **2TK TO MIX** is active (see next callout). Connect the unbalanced RCA L/R inputs, **2T RETURN**, to the tape machine's unbalanced RCA outputs.

16 MONITOR Source Select

These switches allow a choice source for the phones, monitor outputs, and meters. Normally the monitor source is either **MIX** or **SUB** (or both, depending on which of the two right-hand switches is selected), but pressing the **2TK** switch swaps the monitoring to the 2-track output. When the switch is released, the normal **MIX** or **SUB** selection is restored.

17 PFL/AFL LED

The **PFL/AFL LED** illuminates to show that a **PFL** or **AFL** is active and is the source for the monitors and meters. The LED will normally be off.

18 Bargraph Meters

Three-color peak-reading bargraph meters are provided to monitor **2TK**, **MIX**, or **SUB** signals, giving you a constant warning of excessive peaks in the signal which might cause overloading. Aim to keep the signal within the amber segments at peak levels for best performance.

Similarly, if the output level is too low and hardly registering on meters, the level of background noise may become significant. Take care to set up the input levels for best performance.

When any **SOLO** or **AFL** switch is pressed, the L and R meters automatically switch to show the selected **PFL** or **AFL** signal on both meters, in mono.

19 PHONES

This control sets the level of the monitor signal being sent to the **MONITOR PHONES** output.

20 MONITOR

This control sets the output level being sent to the **MONITOR OUTPUTS L** and **R** (on the rear panel) without affecting the level to the meters.

21 MONITOR PHONES

The **MONITOR PHONES** output appears on a 3-pole 1/4" phone jack for use with stereo headphones having an impedance of 200 ohms or higher.

EVO HANDHELD DYNAMIC MICROPHONE

Features

- Frequency response tailored to vocalist use.
- Built-in windscreen/pop filter for effective suppression of pop and breath noise.
- High feedback resistance due to frequency-independent supercardioid polar response.

Description

The EVO Handheld Dynamic Microphone has a supercardioid polar response and is designed primarily as a vocalist microphone for rough stage use. Due to its wide frequency response, which slightly favors the midfrequency and treble regions, this microphone ensures good intelligibility of speech. The term *supercardioid polar response* means that the EVO Handheld Dynamic Microphone is most sensitive to sound arriving in the front, less sensitive to sound arriving in the sides, and even less sensitive to sound arriving in the rear. This directional characteristic is virtually the same for all frequencies and is, therefore, *frequency independent*.

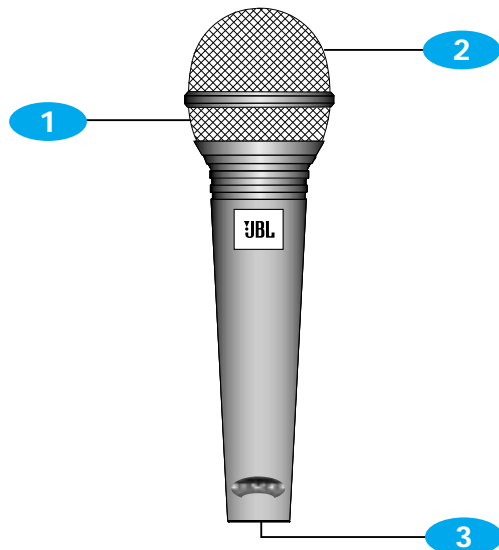


Figure 1. The EVO Handheld Dynamic Microphone.

1 Shock-Absorbing Inner Grille

The EVO Handheld Dynamic Microphone is fitted with a shock-absorbing inner grille for transducer protection against damage. The strong die cast housing and the wire-mesh outer grille provide additional protection for the transducer system.

2 Effective Windscreen

A very effective windscreen against pop and breath noise and sibilance is formed by the outer steel wire mesh grille and a layer of a special textile material.

3 Gold-plated XLR Connector

The EVO Handheld Dynamic Microphone also has a standard 3-pin male, gold-plated, XLR-type connector for wired use. This connector type is internationally standardized so that you can connect the microphone to the rest of your equipment by using any commercially-available microphone cable fitted with a female 3-pin XLR-type connector.

Wiring

The EVO Handheld Dynamic Microphone is a low-impedance microphone with an electrical impedance rated at 200 ohms and has a balanced output (see Figure 2).

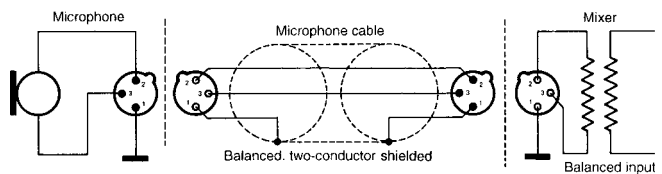


Figure 2. Balanced wiring diagram for EVO Handheld Microphone.

In order to prevent interference from stray magnetic fields, use the supplied two-conductor shielded cable to connect the microphone to a MIC input on EVOi.sys.

NOTE: Do not use an unbalanced cable, since it may act as an antenna and pick up stray magnetic fields.

Using The Microphone On Vocals

The human voice is the most expressive musical instrument that exists. The EVO Handheld Dynamic Microphone helps bring out all the nuances of the human voice, even when acoustic conditions are less than ideal. Singing with a microphone, however, requires a certain discipline and practice. Study the following hints so you can make full use of your microphone's sound potential.

Proximity Effect

This phenomenon is common to all dynamic unidirectional microphones and occurs when the microphone is used close to the sound source. It boosts the low frequencies and may, if uncontrolled and at great loudness, render the words of a song unintelligible. Yet, you may also want to utilize the proximity effect to give more body and an intimate sound to your voice. Basically, the closer your lips are to the microphone, the bigger and mellower your voice will sound, while a longer working distance will produce a colder, harder, more distant sound. Use this effect to make your voice sound aggressive, neutral, insinuating, etc., just as the music requires, simply by changing the working distance.

Proper Placement

Don't sing directly into any microphone! If you do, it will not only pick up excessive breath noise but also cause sibilance. Try singing to one side of the microphone or over the microphone head. The result will be a well-balanced, natural sound.



Figure 3. Singing over the top of the microphone.

Controlling Feedback

A sound reinforcement system that spontaneously starts to howl and scream is dreaded by musicians and audiences alike. This phenomenon, known as feedback, occurs when part of the sound radiated by a loudspeaker is picked up by a microphone, amplified, and fed back into the loudspeaker. Above a certain volume setting (i.e., feedback threshold), it seems the signal runs in circles as the system starts to howl and can only be brought under control again by turning down the volume.

Even though EVOi.sys has its own suppression capabilities to counteract the onset of feedback, the EVO Handheld Dynamic Microphone has a super cardioid polar response to help suppress feedback as well. This means that it is most sensitive to sound (e. g., the voice) arriving from the front and is less sensitive to sound coming from the sides and the rear (e. g., monitor speakers), as shown in Figure 4.

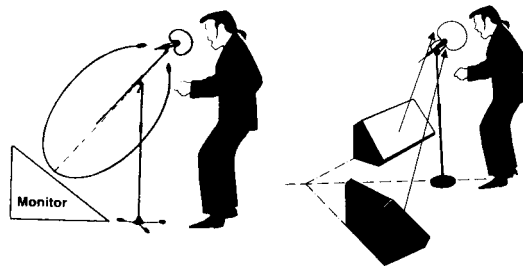


Figure 4. The EVO Handheld Dynamic Microphone helps to suppress sound arriving from the rear and sides.

The greatest feedback suppression is achieved by placing the main speakers in front of the microphones (i.e., at the front edge and to the sides of the stage). When singing behind these speakers, you will inevitably hear your voice softer than it is actually being reproduced. This is why many singers end up "devouring" their microphones. Using monitor speakers solves this problem, but at the expense of an increased risk of feedback. Therefore, you should never point your microphones directly toward the monitor speakers.

continued on next page...

EVO HANDHELD DYNAMIC MICROPHONE

Using The Microphone On Vocals Controlling Feedback (continued)

Feedback may also be triggered by room resonances (determined by the acoustics of the room you're in), particularly in the low-frequency region (i.e., indirectly by the proximity effect). In this case, you can easily stop the howling just by moving a bit away from the microphone.

Background Vocals

Never let more than two people sing into one microphone. With more singers, sound arrives at an angle greater than 35° off-axis and is picked up in the region where the microphone starts to become less sensitive. To attain the same loudness as a solo voice, mixer gain would have to be boosted and feedback risk would therefore increase.

Microphone Care

The EVO Handheld Dynamic Microphone has a matte nickel-plated housing that is easily cleaned with a soft cloth, slightly dampened in water. After extended use, a windscreen will become soiled by dust and saliva and start to alter the sound and feedback performance of any microphone. We therefore recommend washing the foam windscreen with water or a very mild detergent solution and letting it dry overnight.



EVO WIRELESS HANDHELD DYNAMIC MICROPHONE

The EVO Wireless Handheld Dynamic Microphone provides the same acoustic performance as the equivalent hardwire microphone versions. The transmitter uses a dipole antenna integrated in the body and operates in a subband up to 4 MHz wide within the 710 to 861 MHz UHF range. The EVO Wireless Handheld Dynamic Microphone can be switched to a maximum of 15 different carrier frequencies, depending on local frequency allocations.



1 POWER

Slide the switch to turn transmitter power on (I) or off (O).

2 CHANNEL

Use the rotary CHANNEL switch to select a desired carrier frequency for transmission.



IMPORTANT: *Be sure to switch POWER to off before selecting a CHANNEL.*

3 Status LED

Indicates battery status and audio input overload. If the LED glows, the batteries are OK. If the LED is constantly lit, the batteries will be dead in about 90 minutes. If the LED flashes, the audio input is being overloaded.

4 GAIN

Use the rotary GAIN control to match the microphone's level to the transmitter's audio section.

5 MIC

Slide the switch to 0 to mute the audio signal while power and carrier frequency remain on. Thus, no noise will become audible if you mute the microphone, even if the SQUELCH control on the EVO wireless receiver is set to minimum.

6 Battery Compartment

The battery compartment is inside the lower portion of the microphone body. See *Setting Up* on page 8

7 Carrier Frequency Table

A label of available Carrier Frequencies is affixed inside the battery compartment.

8 Frequency Set Designation

The same label (in the battery compartment) also lists the Frequency Set designated for this microphone.



EVO LAVALIERE MICROPHONE/ BODYPACK TRANSMITTER

The EVO Lavalier Microphone is a professional, omnidirectional, miniature-condenser, clip-on microphone. With its wide frequency range (20~20,000 Hz), low distortion at high sound pressure levels, and small size, it is an ideal choice for speech use in situations calling for an inconspicuous microphone and mobility for the speaker.

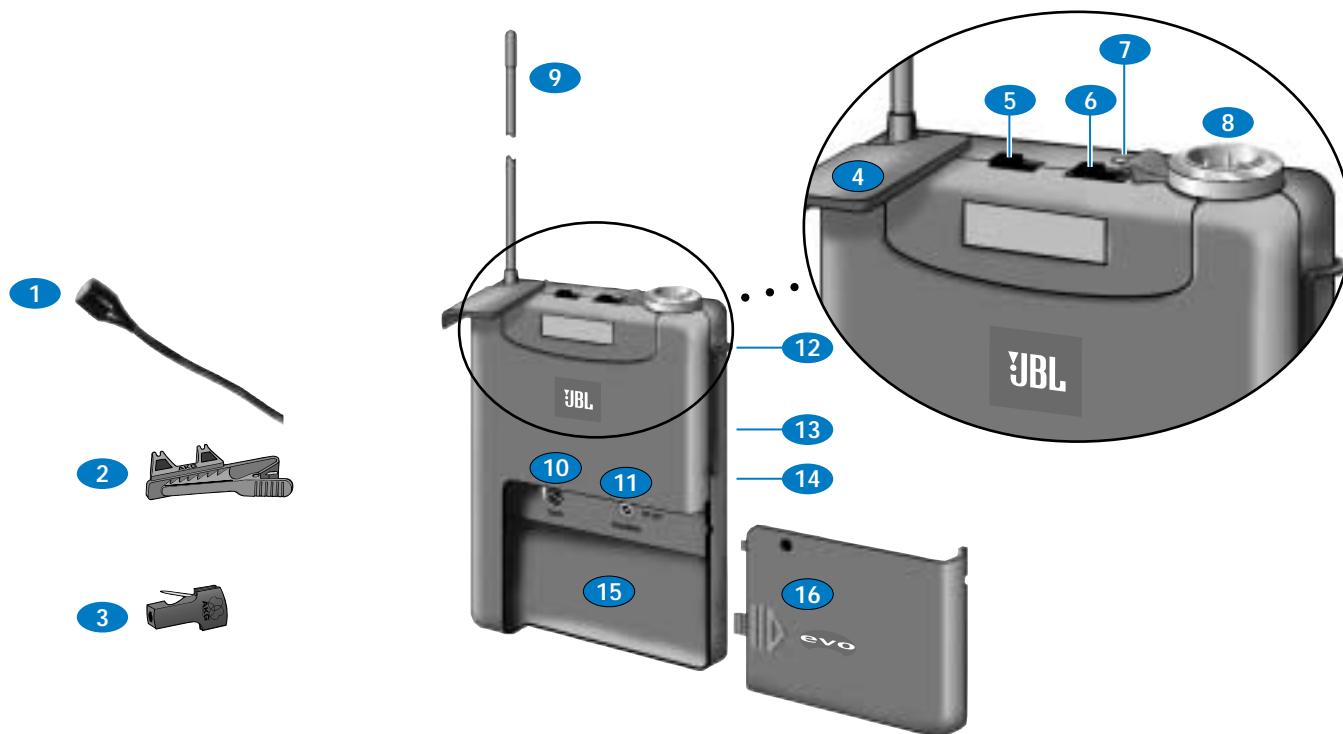
The EVO Bodypack Transmitter is internally powered by two (2) AA batteries and is designed for use with the supplied lavalier condenser microphone. It operates in a subband up to 4 MHz wide of the 710 to 861 MHz UHF range. The EVO Bodypack Transmitter can be switched to a maximum of 15 different carrier frequencies, depending on local frequency allocations.

Lavalier Microphone

1 Lavalier Microphone
EVO Lavalier Microphone with attached 3-pin female mini-XLR connector.

2 Clip
Use this accessory to attach the EVO Lavalier Microphone to clothing (e.g., a lapel). Insert the cable about 1/2" away from the microphone case.

3 Tie Pin
Use this accessory to attach the EVO Lavalier Microphone to a tie. Insert the cable about 1/2" away from the microphone case.



Bodypack Transmitter

4 Security Cover

Protects the POWER and MIC switches from being actuated unintentionally.

5 MIC

Slide the switch to 0 to mute the audio signal while power and carrier frequency remain on. Thus, no noise will become audible if you mute the microphone, even if the SQUELCH control on the EVO wireless receiver is set to minimum.

6 POWER

Slide the switch to turn the transmitter power on (I) or off (O).

7 Status LED

Indicates battery status and audio input overload. If the LED is constantly lit, the batteries will be dead in about 90 minutes. If the LED flashes, the audio input is being overloaded.

8 Audio Input

3-pin male mini-XLR connector for connection to the EVO Lavalier Microphone.

9 Antenna

Permanently connected, flexible antenna.

10 GAIN

Use the rotary GAIN control to match the microphone's level to the transmitter's audio section. It is also accessible when the battery door is on.

11 CHANNEL

Use the rotary CHANNEL switch to select a desired carrier frequency for transmission.



IMPORTANT: Be sure to switch POWER to off before selecting a CHANNEL.

12 Belt Clip

Use the Belt Clip to attach the transmitter to your belt in one of four ways, as shown in Figure 5 (on the right).

13 Carrier Frequency Table

A label lists available frequencies and is affixed to the rear panel of the bodypack transmitter.

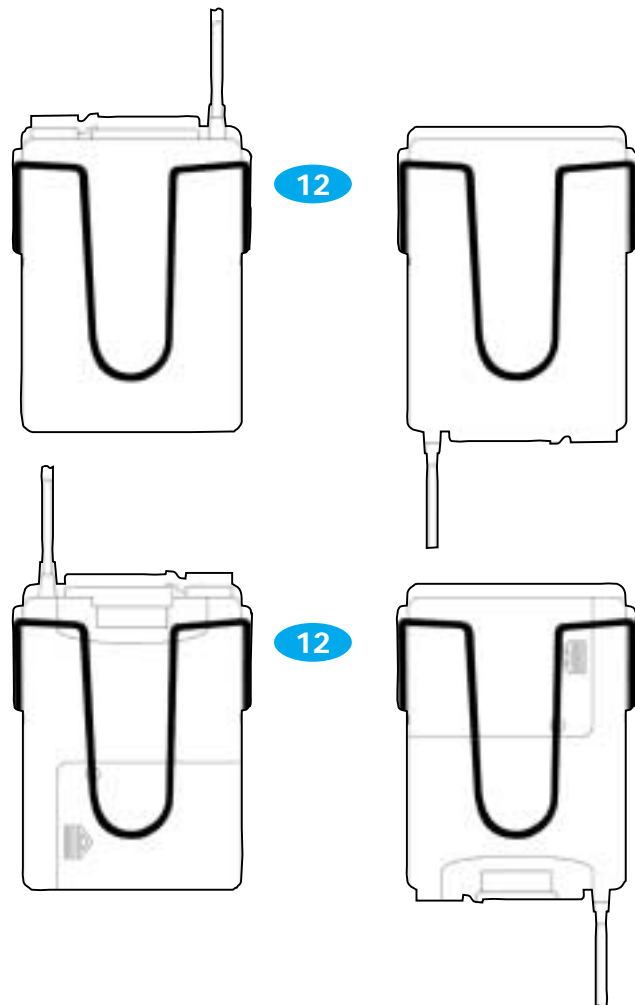


Figure 5 The Belt Clip can be positioned on the EVO Bodypack Transmitter in four ways.

14 Frequency Set Designation

The same label (on the rear panel) also indicates the designation of the Frequency Set.

15 Battery Compartment

See *Setting Up* on page 8

16 Battery Door

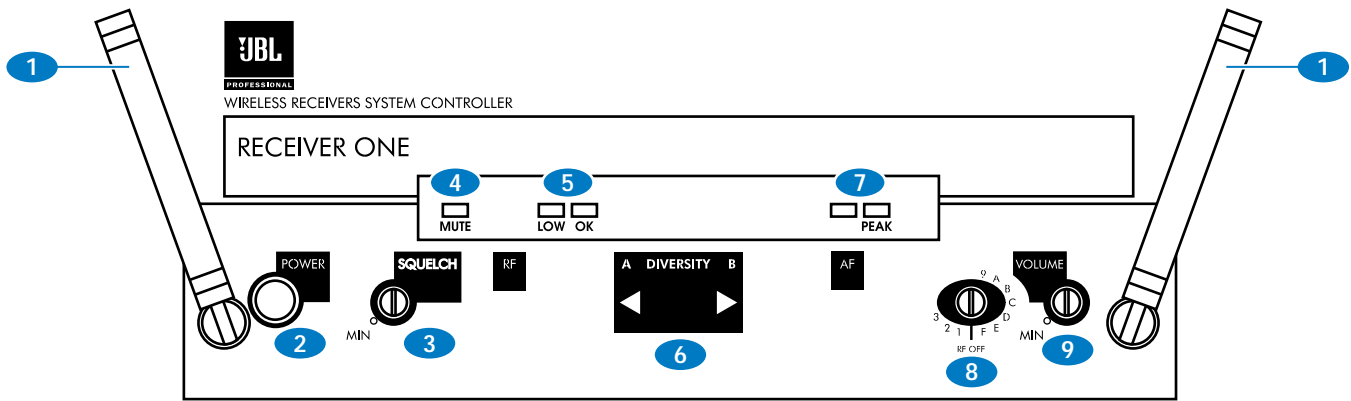
See *Setting Up* on page 8



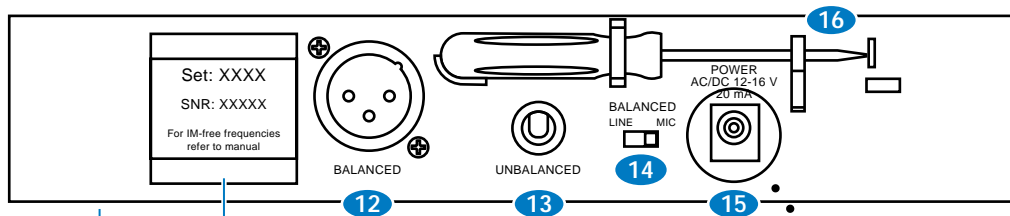
EVO WIRELESS RECEIVER SYSTEM CONTROLLER

The EVO Wireless Receiver System Controller consists of a pair of stationary true-microcontrolled diversity receivers for

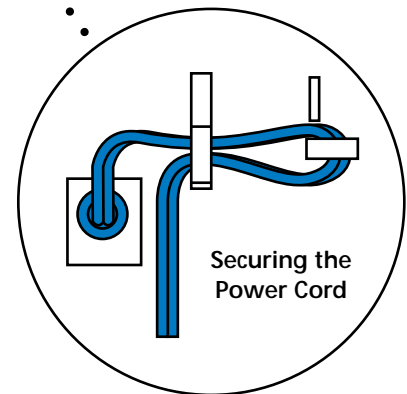
use with EVO microphone transmitters. Each EVO Wireless Receiver operates in a subband of up to 4 MHz wide across the 710 MHz to 861 MHz UHF range. Each unit can be switched to a maximum of 15 different carrier frequencies, depending on local frequency allocations.



Front Panel



Rear Panel



Front Panel

1 Antennas

Each EVO Wireless Receiver uses two antennas for diversity in order to receive the transmitter signal at two different spots. The diversity electronics will automatically activate the antenna that delivers the better signal.

2 POWER

Press this switch to turn the controller's power on or off.

3 SQUELCH

The squelch circuit switches the receiver off if the received signal is too weak, in order to suppress related or residual noise while the transmitter is off. Set the **SQUELCH** control to minimum before first switching the receiver on.

4 MUTE LED

The **MUTE LED** turns on red if the squelch is active. In this case, the audio output will be muted.

NOTE: The MUTE LED does not indicate the position of the MUTE switch on a microphone transmitter.

5 RF LOW/OK LEDs

Indicate the received field strength of the transmitter signal.

6 DIVERSITY A/B LEDs

Indicate which of the two receiving antennas is active.

7 AF/PEAK LEDs

Indicate the received audio level. Optimum modulation occurs when the green LED is on and the red LED flashes occasionally. If the LEDs do not light, the sensitivity setting on the transmitter is too low. If the red LED is constantly on, overmodulation is occurring.

8 CHANNEL

Use the **CHANNEL** rotary switch to select the desired carrier frequency or alternative frequencies.

9 VOLUME

Use the **VOLUME** control to match an EVO Wireless Receiver's output level to an input channel's sensitivity on the EVO mixer.

Rear Panel

10 Carrier Frequency Table

A label (on the bottom) lists available Carrier Frequencies.

11 Frequency Set Designation

The label (on the rear panel) lists the Frequency Set for this receiver.

12 AUDIO OUT (Balanced)

Balanced 3-pin male XLR audio output for connection to a balanced audio input (e.g., a MIC input on the EVO mixer).

13 AUDIO OUT (Unbalanced)

Unbalanced audio output on a 1/4" mono jack for connection to an unbalanced audio input (e.g., a guitar amplifier).

14 BALANCED LINE/MIC

Use the **BALANCED LINE/MIC** switch to set **AUDIO OUT (Balanced)** to line or microphone level.

15 POWER

Input connector for the supplied ac adapter.

16 Screwdriver

If desired, use the **Screwdriver** to adjust **CHANNEL** and **GAIN** controls on microphone transmitters.



TROUBLE SHOOTING

This Troubleshooting section specifically concerns the operation of the EVO Mixer and EVO Microphones.

For problems associated specifically with EVOi.324 Loudspeakers and the integrated EVOi.net please refer to the Troubleshoot Sections in each User's Guide respectively.

The EVO Mixer Station Doesn't Power Up:

Check that the AC mains supply is present. Check that the mains voltage selection is correct for your country.

Check that the AC mains power cord is firmly connected.

Check the AC mains fuse.

If none of the above provide a solution then contact your Dealer.

My condenser microphone is not working:

Check that the 48V phantom power is on.

Make sure the mic is plugged into the Mic input.

Make sure that the mic cable is a balanced 3-wire type.

The Meters don't show any signal:

Check that the input gain has been set correctly.

Make sure that the source is connected to the appropriate input socket for the level of signal.

Do you have something connected on the Inserts, and is that external device switched on?

Are the Master faders set at max., are input faders set high enough and is the channel routed to the output being monitored?

Check that the Mute switch is not engaged on the relevant channel.

Is the appropriate monitor select switch pressed?

Is there a SOLO or AFL pressed on another channel?

There is no Mix output:

Check that the Mix Master fader is up.

Do you have something connected on the Mix Inserts, and is that external device switched on?

There is no Monitor output:

Is the monitor control set high enough?

Is the appropriate monitor select switch pressed?

My headphones are distorting:

Check that the Phones level is not set too high.

Are the headphones less than 200 ohm impedance?

How do I prevent my wireless microphones from cutting out, clicking, and generally being noisy:

Try to keep a minimum transmitter to receiver distance of 16ft (5m).

Make sure the transmitter is never more than 164ft (50m) from the receiver.

Keep the two transmitters at least 40" (1m) apart, and check before the performance what frequency to set each to for best operation.

Make sure that the Bodypack transmitter antenna hangs freely, and doesn't make contact with the user's skin. The human body attenuates RF signals.

Always use fresh batteries before a performance!

The Reception on the selected carrier frequency is disrupted:

Change the carrier frequencies. Make sure these are at least one step up or down from each other. This is necessary to provide the minimum frequency spacing required for intermodulation-free operation.

IMPORTANT: Make sure the Transmitter and the Receiver are both switched OFF when changing the carrier frequency. The new, selected carrier frequency is activated when the Transmitter is switched back ON.

EVOi.sys Specifications

Noise

Measured RMS	20 Hz to 20 kHz Bandwidth
Mic. E.I.N. @ max gain 150W source impedance	-129 dBu
Aux, Mix & Masters @ max., 16 inputs routed with faders, pots down	< -80 dBu

Crosstalk (@1 kHz, typical) Channel Mute	< 96 dB
Fader cut-off (rel. 0 mark)	< 90 dB
Routing Isolation	< 90 dB
Aux Send pots offness	< 84 dB

Frequency Response

Mic/Line Input to any output	20 Hz - 30 kHz < .05 dB
------------------------------	-------------------------

THD + N

Mic sens. -30 dBu, + 14 dBu at all outputs @ 1 kHz	< 0.009%
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Input & Output Impedance

Mic Input	1.8 kW
Line Input	10 kW
Stereo Return Input (Balanced jack)	10 kW
2TK Return (Unbalanced RCA Phono)	12 kW
Mix, Aux, Direct Outputs, and Insert Sends	75 W

Input and Output Levels

Mic Input max. level	+22 dBu
Line Input max. level	< +30 dBu
Stereo Return Input max. level	< +30 dBu
Headphones (@ 200 Ohms)	150 mW



EVO Microphones-Wireless

UHF Transmitters

	HANDHELD	BODYPACK	RECEIVER
Carrier Frequency	710 to 860 MHz	710 to 860 MHz	710 to 860 MHz
Modulation FM	FM	FM	FM
Audio Bandwidth	50-20.000 Hz	50-20.000 Hz	50-20.000 Hz
Frequency Stability (-10 degrees C to +45 C degrees ETS +30 degrees C to +60 degrees C FCC)	+/- 10 ppm	+/- 10 ppm	
Rated deviation	30kHz	30kHz	
T.H.D. at 1 kHz	< 0.5%	< 0.5%	< 0.4%
Compander Characteristics	Yes	Yes	Yes
S/N Ratio	typ 50 dB(A)	typ 50 dB(A)	>100 dB(A)
Limiter		Yes	Yes
RF-Output	10mW	10mW	
Current Consumption	typ 130 mA	typ 130 mA	typ 145 mA
Power Requirement	2 x AA	2 x AA	
Battery Life	>10h	>8h	
Input Sensitivity			typ. -95 dBm
Audio Input-related Deviation	350mV/ 1 kHz	350mV/ 1 kHz	
Input Impedance	220v.Ohm	220v.Ohm	
Phantom Power		Pin 3-6V/6k8	
Squelch Threshold			-95 to -80 dBm
Audio Output			Balanced XLR: MIC/Line level switchable; typ. 30 dB Unbalanced 1/4" Jack: 0 dBm XLR; 6 dBm
Size (W x D x H)	240 x 36 mm (9.45 x 14.17 in.)	92 x 65 x 20 mm (3.62 x 2.56 x 0.79 in.)	210 x 170 x 42 mm (8.27 x 6.70 x 1.65 in.)
Net Weight g (oz)	245 g (9.8 oz.)	76 g (3.04 oz.)	470 g (18.8 oz.)

Dynamic Pressure Gradient Microphone

Polar pattern:	Supercardioid
Frequency range:	60 to 20,000 Hz; at 1 cm: 20 to 20,000 Hz
Sensitivity at 1000 Hz:	2.5 mV/Pa (-52 dBV) re 1 V/Pa
Impedance at 1000 Hz:	<600 ohms
Recommended load impedance:	>2000 ohms
Max. SPL for 1 % (3 %) THD:	147 dB SPL (156 dB SPL)
Equivalent noise level:	22 dB(A) (DIN 45412)
Environment:	Temperature: -10° C to +60° C
Rel. humidity at +20° C:	95 %
Connector:	3-pin XLR
Connector pinout:	Pin 1 ground Pin 2 hot Pin 3 return
Case material:	Die-cast zinc alloy



WARRANTY

JBL Limited Warranty

The JBL Limited Warranty on professional loudspeaker products (except for enclosures) remains in effect for five years from the date of the first consumer purchase. JBL amplifiers are warranted for three years from the date of original purchase.

Enclosures and all other JBL products are warranted for two years from the date of original purchase.

Who Is Protected by This Warranty?

Your JBL Warranty protects the original owner and all subsequent owners so long as: A.) Your JBL product has been purchased in the Continental United States, Hawaii or Alaska. (This Warranty does not apply to JBL products purchased elsewhere except for purchases by military outlets. Other purchasers should contact the local JBL distributor for warranty information.); and B.) The original dated bill of sale is presented whenever warranty service is required.

What is Covered by the JBL Warranty?

Except as specified below, your JBL Warranty covers all defects in material and workmanship. The following are not covered: Damage caused by accident, misuse, abuse, product modification or neglect; damage occurring during shipment; damage resulting from failure to follow instructions contained in your Instruction Manual; damage resulting from the performance of repairs by someone not authorized by JBL; claims based upon any misrepresentations by the seller; any JBL product on which the serial number has been defaced, modified or removed.

Who Pays for What?

JBL will pay all labor and material expenses for all repairs covered by this warranty. Please be sure to save the original shipping cartons because a charge will be made if replacement cartons are requested. Payment of shipping charges is discussed in the next section of this warranty.

How to Obtain Warranty Performance

If your JBL product ever needs service, write or telephone us at JBL Incorporated (Attn: Customer Service Department), 8500 Balboa Boulevard, PO. Box 2200, Northridge, California 91329 (818/893-8411). We may direct you to an authorized JBL Service Agency or ask you to send your unit to the factory

for repair. Either way, you'll need to present the original bill of sale to establish the date of purchase. Please do not ship your JBL product to the factory without prior authorization.

If transportation of your JBL product presents any unusual difficulties, please advise us and we may make special arrangements with you. Otherwise, you are responsible for transporting your product for repair or arranging for its transportation and for payment of any initial shipping charges. However, we will pay the return shipping charges if repairs are covered by the warranty.

Limitation of Implied Warranties

ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE LENGTH OF THIS WARRANTY.

EXCLUSION OF CERTAIN DAMAGES

JBL'S LIABILITY IS LIMITED TO THE REPAIR OR REPLACEMENT, AT OUR OPTION, OF ANY DEFECTIVE PRODUCT AND SHALL NOT INCLUDE INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS AND/OR DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

JBL Professional Contact Information

Mailing Address

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8500 Balboa Blvd.

Northridge California 91329

Customer Service

Monday through Friday 8:00am - 5:00pm Pacific Coast Time

In the U.S.A. (800) 8JBLPRO (800.852.5776)

On the World Wide Web: <http://www.jblpro.com>



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