

INSTRUCTION MANUAL

HH/E01 Handheld Transmitter

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Digital Hybrid Wireless® Technology

US Patent 7.225.135

CE1313 ⚠

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3 January 2012

CE - Declaration of Conformity

We, Lectrosonics Inc.
581 Laver Road NE
Rio Rancho, New Mexico 87124 USA

declare under our sole responsibility that the product:

HH/E01

to which this declaration relates is in conformity with the following standards:

EN 300 422-2 V1.2.2 (2008-03)
EN 301 489-9 V1.4.1 (2007-11)
EN 60950-1: 2001 + A11.1:2004

Test report no. R1110241-422
 Date of test report: 21 November 2011
 Test report no. R1110241-12
 Date of test report: 21 November 2011
 Test report no. R1110241-3
 Date of test report: 21 November 2011


 Robert Cummings
 V.P. Engineering
 Lectrosonics, Inc.

Option Number: R1110241



DIRECTIVE 1999/5/EC
NOTIFIED BODY STATEMENT OF OPINION
 Bay Area Compliance Laboratories Corp.

Item of Issue:	30110241		
Applicant Details:	Lectrosonics, Inc. 581 Laver Road, Rio Rancho, NM 87124, USA		
Trade Name/Model:	HH/E01		
Equipment Type:	Stereo/Mono/Mono/Mono		
Serial Number:	11, 14, 11		
Network Interface:	FM		
Frequency Range:	Block 470-475.1 MHz Block 26-487.5 MHz Block 11-88.1 MHz		
Channel Spacing:	100 kHz		
RF Output Power:	50 mW		
Modulation Type:	FM		
Antenna Type:	Integrated Dipole Antenna, 2.14 dB		
Notified Body ID:	Bay Area Compliance Laboratories Corp. 1274 Amherst Ave., Sunnyvale, CA 94086, USA. Tel: (408) 732-0462 Fax: (408) 732-0464 www.bacorp.com		

Essential Requirements	Specifications / Standards	Document Identification	Result
Radio Spectrum, Article 3(2)	EN 300 422-2 V1.2.2 (2008-03)	R1110241-422	Compliant
EMC, Article 3(1)(b)	EN 301 489-9 V1.4.1 (2007-11)	R1110241-12	Compliant
Safety, Article 3(1)(c)	EN 60950-1: 2001 + A11.1:2004	R1110241-3	Compliant

Our opinion is in accordance with Council Directive 1999/5/EC on Radio equipment and Telecommunications terminal equipment of the devices covered therein and mutual recognition of their conformity, is that the apparatus identified above complies with the requirements of that Directive stated above.

Warning: It is recommended that the notified body (NB) keep the notified body certificate on file, and also keep a copy of the technical file of the product, and a copy of the test reports and a copy of the test results of the product (EN 300 422-2 V1.2.2 (2008-03)).

Number of Annexes to this statement: 1


 John Chapp, Technical Support
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General Technical Description

Introduction

The HH/E01 handheld transmitter uses state-of-the-art Digital Hybrid Wireless® wireless technology, selectable output power and a versatile microphone capsule mounting system to meet the needs of audio professionals and vocalists.

The compandor-free Digital Hybrid audio chain preserves the quality of the selected microphone capsule and delivers it to the sound and recording system without coloration. This superb audio performance and highly reliable RF transmission makes it ideally suited for high end stage and studio production.

Digital Signal Processor

The DSP encodes the digitized audio from the A-D converter and adds an ultrasonic pilot tone to control the receiver's squelch in systems that use pilot tone. It also controls the input limiter and audio metering.

Compatibility Modes

The transmitter was designed to operate with Lectrosonics Digital Hybrid Wireless® receivers and will yield the best performance when doing so. Due to the flexibility of digital signal processing, however, the transmitter is also able to operate with Lectrosonics IFB receivers in a special compatibility mode.

Digital Hybrid Technology

All wireless links suffer from channel noise to some degree and all wireless microphone systems seek to minimize the impact of that noise on the desired signal. Conventional analog systems use compandors to increase the signal to noise ratio, at the cost of distortion artifacts. Wholly digital systems defeat the noise by sending the audio information in digital form, at the cost of some combination of power, bandwidth or channel count.

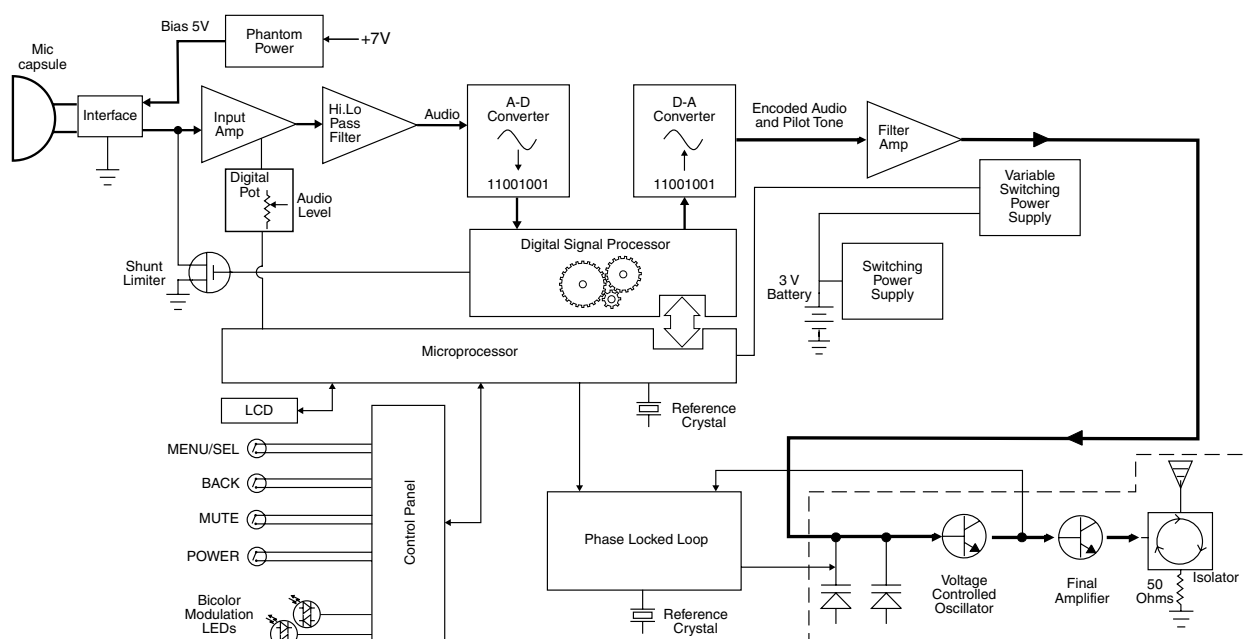
The Lectrosonics Digital Hybrid Wireless® system (also called simply Digital Hybrid) overcomes channel noise by digitally encoding the audio in the transmitter and decoding it in the receiver, yet still sending the encoded information via an analog FM wireless link.

This proprietary algorithm is not a digital implementation of an analog compandor. Instead, it is a technique that can be accomplished only in the digital domain, even though the inputs and outputs are analog signals.

Because it uses an analog FM link, the Digital Hybrid enjoys all the benefits of conventional FM wireless systems, such as excellent range, efficient use of RF spectrum, and long battery life. However, unlike conventional FM systems, the Digital Hybrid has eliminated the analog compandor and its artifacts.

No Pre-Emphasis/De-Emphasis

The Digital Hybrid design results in a signal-to-noise ratio high enough to preclude the need for conventional pre-emphasis (HF boost) in the transmitter and de-emphasis (HF roll off) in the receiver. This eliminates the potential for distortion of signals with abundant high-frequency information.



Pilot Tone Squelch

The benefit of the pilot tone squelch system is that the associated receiver will remain muted until it receives the pilot tone from the matching transmitter, even if a strong RF signal is present on the carrier frequency of the system. All Digital Hybrid transmitters use one of 256 different ultrasonic tones between 25 and 32 kHz to operate the receiver squelch. The pilot tone frequency is chosen according to which of the 256 channels has been selected by the frequency switch setting. This ensures that all transmitters on each frequency block in a multi-channel system have different pilot tone frequencies so that even spurious RF from the wrong transmitters will not open the receiver squelch.

Input Gain Range and Limiter

45 dB range of input gain adjustment allows gain settings to accurately match the user's voice level. A DSP-controlled analog audio limiter is employed before the A-D converter. The limiter has a range of more than 30 dB for excellent overload protection. A dual release envelope makes the limiter acoustically transparent while maintaining low distortion. It can be thought of as two limiters in series, a fast attack and release limiter followed by a slow attack and release limiter. The limiter recovers quickly from brief transients, with no audible side effects, and also recovers slowly from sustained high levels to keep audio distortion low while preserving short term dynamics.

Long Battery Life

Switching power supplies throughout the design extend battery life by allowing the unit to continue to operate and remain stable with full power output down to low battery voltages.

Menu-Driven Control

A high-resolution LCD and control panel with membrane switches provide access to the menu-driven setup. The backlit LCD is placed on the outer housing and the control panel is concealed by the outer housing cover. The control panel is accessed by opening the lower housing cover, which also accesses the battery compartment.

Frequency Selection

Operating frequency is normally selected using a receiver or analyzer to assess signals in the local environment to avoid interference. Once an interference-free frequency is identified, the transmitter frequency is set to match the receiver.

The LCD on the transmitter displays frequency in MHz and with a two character hex code that is used on most Lectrosonics receivers.

Membrane switches on the control panel select 256 frequencies in 100 kHz steps or 1024 frequencies in 25 kHz steps over a 25.6 MHz range.

Output Isolator

The output circuit includes a special RF device called an *isolator*. Its purpose is to block radio signals from coming back into the transmitter final amplifier through the antenna.

The isolator suppresses IM (intermodulation) that can take place between two or more transmitters that are in close proximity to one another (a few feet). This form of IM is a particular concern in productions where the transmitters must operate very close together. Isolators allow the use of higher transmitter output power without sacrificing IM rejection.

Isolators are rarely found in wireless microphone transmitters due to the high cost, but they are the best solution to address multi-channel IM between multiple transmitters.

Antenna

A newly designed integral antenna allows the transmitter to be held in any position, since the user's hands have little or no effect on the radiated power.

Microphone Capsules

The HH/E01 handheld transmitter is available from Lectrosonics with the HHC cardioid condenser microphone capsule. Capsules from several other manufacturers are compatible with the transmitter using an industry standard interface: 1.25" x 28 thread pitch and three contact rings. Dynamic and condenser microphone heads can be used with the HH/E01, depending on the user's preference or the application.

IR Sync

An IR Sync Port (enabled with firmware v2.10) is used for quick setup with receivers that offer this feature. Settings for frequency, step size and compatibility mode are transferred from receiver to transmitter via the IR ports.

Side Button Functions

A programmable switch on the side of the housing can be configured as a mute or cough switch, to provide a talkback, a power switch, or be disabled.

The talkback function provides a communication channel when used with a receiver equipped with this function, such as a Venue Wideband receiver with firmware Ver. 5.2 or higher. When pressed and held in, the side switch re-directs the audio output to a different audio channel on the receiver. As soon as the switch is released, audio is returned to the program channel.

The talkback function works only in the Digital Hybrid compatibility mode.

See page 11 for details.

Mechanical Design



Mic Capsules:

Lectrosonics offers two types of capsules. The HHC is the standard capsule and the HHVMC is the Variable Mic Capsule which includes adjustments for Bass, Midrange and Treble.



HHC Lectrosonics cardioid electret



HHVMC Lectrosonics cardioid electret with VariMic preamp

Along with these two models from Lectrosonics, a variety of different capsules with Shure® & EV® type threads and electrical interface will work from different manufacturers. This gives you the flexibility to choose your capsule to use with the HH wireless transmitter.

A list of compatible capsules is on the website on the HH/E01 page at:

www.lectrosonics.com/europe

Capsule Installation

Capsules are attached with a right-hand thread.

To remove the windscreen from the mic capsule, line up the blue wrench (included with the capsule head) with the flat notches on the lower threaded area of the mic capsule.

Align the flats on the wrench with the flats on the capsule. Rotate the capsule counterclockwise to remove it from the windscreen.



Do not touch the contacts between the mic capsule and transmitter body. When necessary, the contacts can be cleaned with a cotton swab and alcohol.



**All product names are trademarks of their respective owners, which are in no way affiliated with Lectrosonics.*

Mic Capsule Adjustments (EXPERT LEVEL USERS)

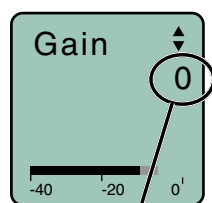
Several special adjustments can be made on the preamp circuit board under the windscreen. These adjustments significantly alter the gain and tonal quality of the microphone, and are to be used only in special circumstances.

Caution: Due to the high RF levels surrounding the transmitter, the sound of the capsules may be temporarily affected if the metal windscreen is not in place. Always make the final decision about sound quality with the windscreen in place.

Attenuator Adjustment

The HHC & HHVMC heads include an attenuator in the preamp circuitry to provide an additional 15 dB of headroom when needed for extremely loud voices.

The attenuator should **ONLY** be used when the normal gain control is already turned all the way down and the audio is still driving the preamp into significant limiting where both -20 and -10 dB LEDs stay lit all or most of the time during peaks in the audio.



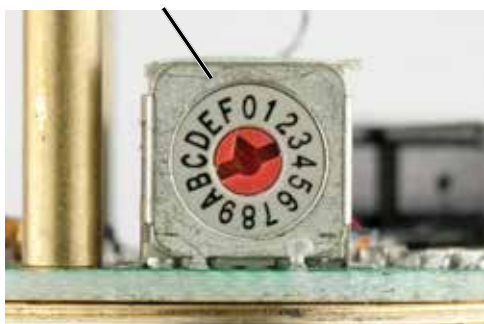
Gain set to minimum (0) on the LCD.



LEDs on control panel

The control is a 16 position switch that attenuates the audio in 1 dB steps. It is marked **0** through **F** where **F** is minimum attenuation and **0** is maximum attenuation. The switch operates much like a volume control in that rotating it clockwise increases the loudness, and counter clockwise decreases the loudness.

Attenuator switch set at F for normal operation.

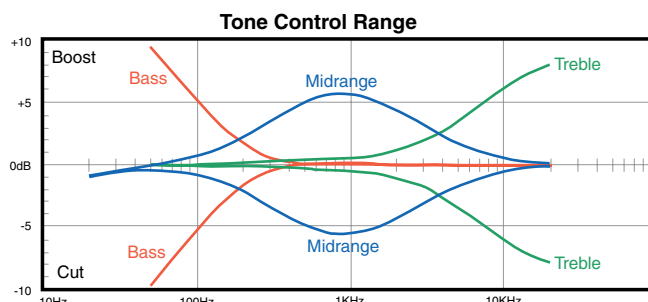


IMPORTANT: Be sure to set the attenuator control back to its original setting ("F") for normal operation.

If adjustments are made for a particular situation and the attenuator is not returned to its normal position, a subsequent user may think the unit is malfunctioning or has a poor signal to noise ratio.

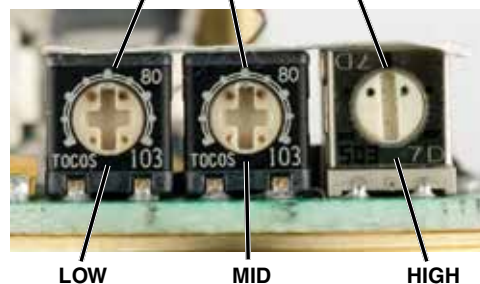
LO/MID/HI (bass/mid/treble) - HHVMC only

The HHVMC head includes VariMic™ equalization adjustments to boost or cut the frequency response in LOW, MID and HIGH ranges.



The LOW and HIGH controls will boost/cut by up to 8 dB while the MID control will boost/cut up to 6 dB.

The pointer is between the black dots.



These controls operate as standard tone controls in that a counterclockwise adjustment cuts the response in that band and a clockwise adjustment boosts the response. In the photo above, all three controls are set at "zero" with no boost or cut.

NOTE: Make sure the controls are set as shown above, then complete the Gain Adjustment covered on page 10 before making changes to the tone controls.

Control Panel

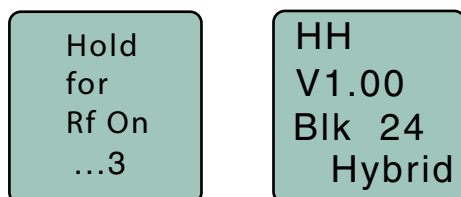
Six membrane switches on the control panel are used to set up the transmitter by navigating the menus on the LCD and selecting the desired values.

The IR SYNC (infrared sync) port is used with receivers that offer this feature. Settings stored in the receiver for frequency, step size and compatibility mode are transferred to the transmitter via the infrared ports. To use this feature, open the housing to expose the control panel and hold the transmitter near the receiver so the IR ports face each other. The transfer is triggered by a switch on the receiver, and the LCD on the transmitter will display a message confirming that the settings were successfully transferred or an error message if the transfer was not completed.

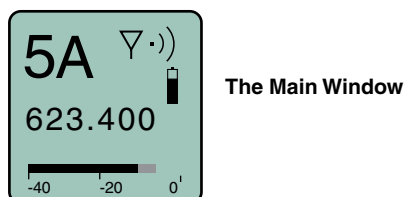


Powering On

Press and hold the *Power Button* for several seconds until a countdown on the LCD is completed. The countdown from 1 through 3 will appear on the LCD, followed by a display of the model, firmware version, frequency block and compatibility mode.



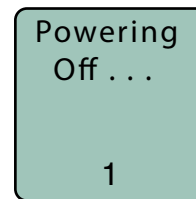
When you release the button, the unit will be operational with the RF output turned on and the *Main Window* displayed.



NOTE: If the *Power Button* is released before the countdown is completed, the unit will boot up in the “standby” mode with the RF output turned off.

Powering Off

Press and hold the *Power Button* for several seconds and observe the countdown on the LCD. The countdown on the LCD will progress from 3 to 1 and the power will then be turned off. This can be done from any menu or screen.

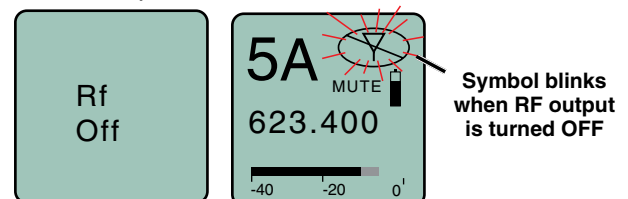


NOTE: If the *Power Button* is released before the countdown is completed, the unit will remain turned on and the LCD will return to the same screen or menu that was displayed previously.

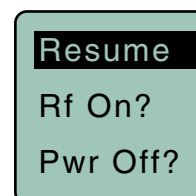
Standby Mode

A brief push of the *Power Button* turns the unit on and places it into a “standby” mode (not transmitting). This allows the transmitter to be set up without the risk of creating interference for other wireless systems that are operating in the vicinity.

A notice will appear briefly confirming that the RF output of the transmitter is turned off, followed by the *Main Window*. A symbol will blink as a reminder that the RF output is turned off.



With the unit turned on, a brief push of the *Power Button* will reveal a menu allowing you to choose between **Resume**, **Rf On?**, and **Pwr Off?**. Use the UP/DOWN buttons to select one of these menu items, then press the *MENU/SEL* button to confirm this action.

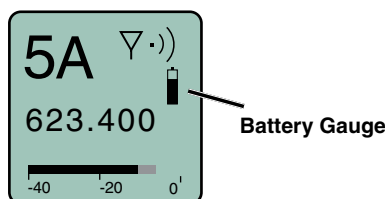


- **Resume:** Continue operating in the same condition as before.
- **Rf On?:** Begin transmitting the RF signal.
- **Pwr Off?:** Turns off the transmitter.

The unit can also be turned off from any menu or screen on the LCD by holding the power button in for the duration of the countdown.

Battery Condition

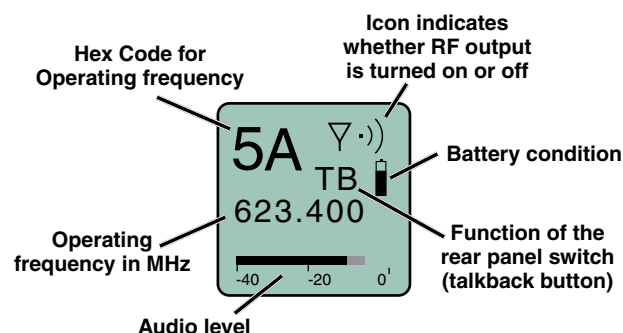
An icon on the *Main Window* indicates the remaining power of the transmitter batteries. This battery gauge is most accurate with the typical voltage drop across the life of alkaline and dry cell lithium batteries.



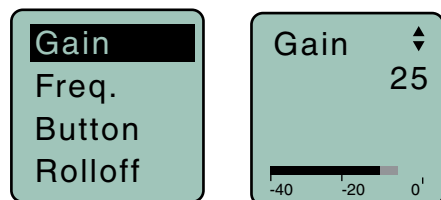
Rechargeable batteries give little or no warning when nearing depletion. If you use rechargeable batteries in the HH/E01, we recommend trying fully charged batteries first, noting the length of time that the batteries will run the unit, and in the future using somewhat less than that time to determine when the battery needs to be replaced. The Venue and other receivers from Lectrosonics offer a timer function to assist in this process.

Navigating Menus and Screens

The *Main Window* displays the following information:



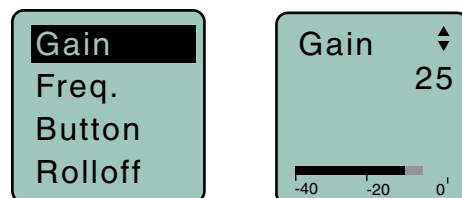
- 1) Press the *MENU/SEL* button to enter the setup menu. Use the UP/DOWN buttons to highlight the menu item.
- 2) Press the *MENU/SEL* button to enter the setup screen for that item. Use the UP/DOWN buttons to select the desired value or mode.



- 3) Press the *MENU/SEL* button to save this setting and return to the previous screen.
- 4) Press the *BACK* button to return to the *Main Window*.

Gain

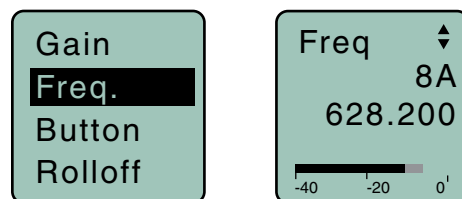
This setting is very important since it will determine the audio signal to noise ratio and dynamic range that the wireless system will deliver. Gain must be set according to the individual voice, the mic capsule in use and the handling technique of the user. LEDs in the control panel facilitate accurate gain adjustment.



IMPORTANT: See the section *Input Gain Adjustment* on page 10 for details.

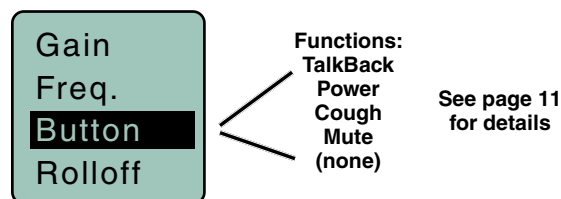
Freq.

The operating frequency is normally determined using the scanning function in the receiver or with coordination software. The frequency is shown on the transmitter LCD display in MHz and with a hexadecimal code that is used on most Lectrosonics receivers.



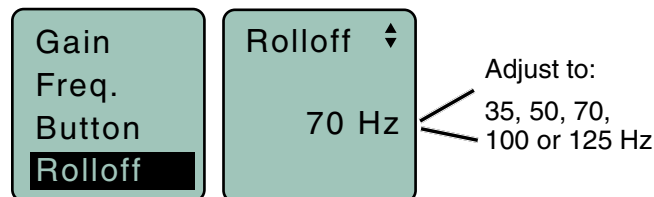
Button

The *Side Button* on the housing can be set to provide several functions, or it can be bypassed.



Rolloff

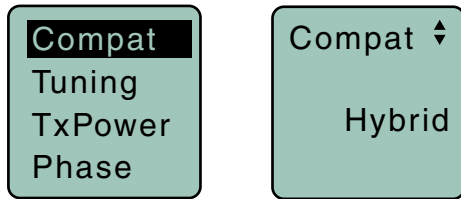
A low frequency rolloff filter can be set for a -3dB point at 35, 50, 70, 100 or 125 Hz. Rolloff slopes are 12.2 dB/octave at 35 and 50 Hz and 10.1 dB/octave at 70 Hz through 125 Hz.



The rolloff frequency is normally adjusted while listening to suit personal preferences.

Compat

The HH/E01 can be used with Lectrosonics Euro version IFB systems by selecting the correct *Compatibility Mode*. Navigate to the **Compat** setup screen and use the UP/DOWN buttons to make the selection.

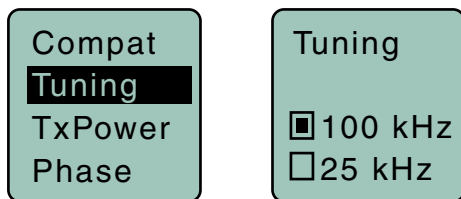


The available modes are as follows:

- **Hybrid** Digital Hybrid receivers
- **IFB Mode** Lectrosonics Euro IFB receivers

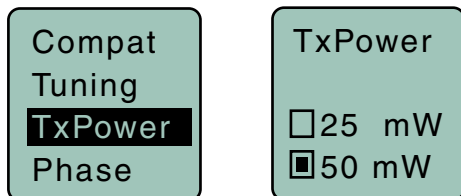
Tuning

The frequency can be adjusted in 100 kHz or 25 kHz steps to match the receiver. 100 kHz is the standard increment for Lectrosonics wireless systems, but 25 kHz increments may be needed when frequency coordination requires it.



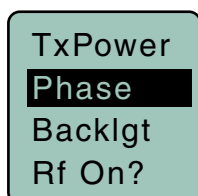
TxPower

Output power can be set to 50 mW to extend operating range (which can also suppress noise and dropouts to some extent) or set to 25 mW to extend the operating life of the batteries.



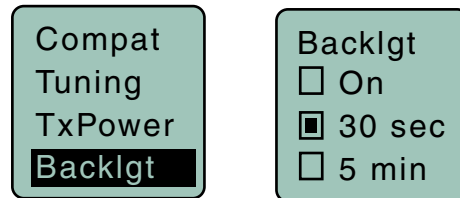
Phase

The phase (polarity) of the audio can be inverted to match other microphone capsules as needed.



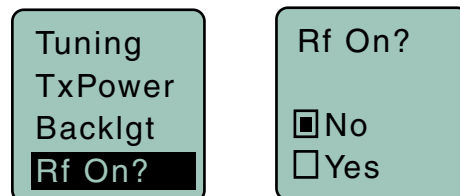
Backlgt

The LCD includes a backlight that illuminates the display for easier viewing in dim lighting conditions. It is set to come on when any button on the control panel is pressed, then stay on for either 30 seconds or 5 minutes, or to stay on all the time.



Rf On?

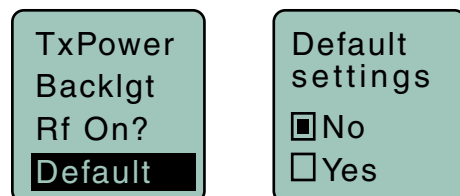
The transmitter output can be switched on or off with this menu item. This is useful, for example, when the transmitter is in the “standby” mode during setup, allowing it to be turned on for normal operation without having to cycle the power.



This menu item can also be used to change the transmitter to the “standby” mode with the RF output turned off for additional setup.

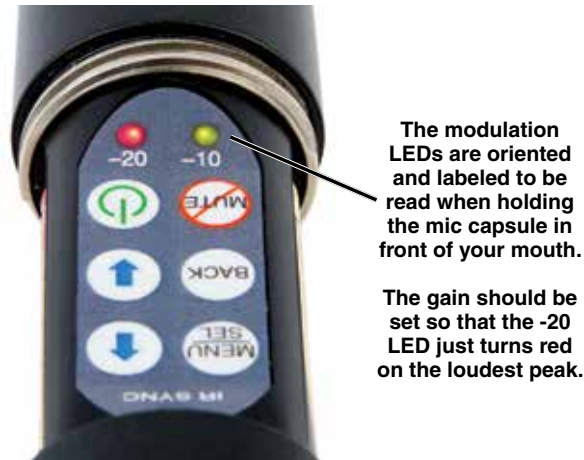
Default

The default setting simple returns the transmitter back to the factory settings and any of the menu items can be readjusted from that default point.



Input Gain Adjustment

The two bicolor Modulation LEDs (located at the bottom of the control panel) provide a visual indication of the audio signal level entering the transmitter.



The LEDs will glow either red or green to indicate modulation levels as shown in the following table.

Signal Level	-20 LED	-10 LED
Less than -20 dB	● Off	● Off
-20 dB to -10 dB	● Green	● Off
-10 dB to +0 dB	● Green	● Green
+0 dB to +10 dB	● Red	● Green
Greater than +10 dB	● Red	● Red

It is best to go through the following procedure with the transmitter in the “standby” mode so that no audio will enter the sound system, which could cause feedback.

- 1) With fresh batteries in the transmitter, power the unit on into “standby” (no transmission) mode.
- 2) Press the *MENU/SEL* button once to enter the setup menu. Use the UP/DOWN buttons to select *Gain*. Press the *MENU/SEL* button again to enter the setup screen.
- 3) Hold the microphone the way it will be used in actual operation.
- 4) Speak or sing at the same voice level that will actually be used during the program, while observing the modulation LEDs. Use the UP/DOWN buttons to adjust the gain until the **-20 dB** LED starts to flicker red and the **-10 dB** glows green.
- 5) Once the audio gain has been set, the signal can be sent through the sound system for overall level adjustments, monitor settings, etc. To do this, the unit must be set to transmit (see **Powering On and Off**, and the **Standby Mode** on page 7).

NOTE: Full modulation is achieved when the -20 LED first turns red. 30 dB of clean limiting is available above this point.

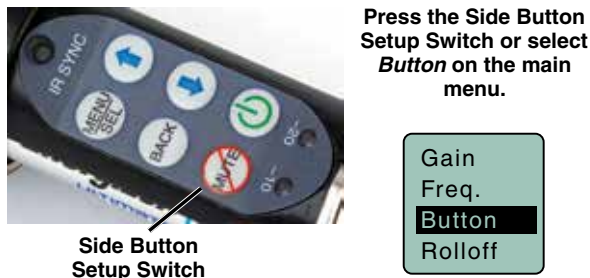
Side Button Functions

NOTE: The Power and Cough functions were added starting with serial number 501.

A special button (the **Side Button**) on the outside of the housing can be configured to provide a several different functions, or to be inoperative.



The **Side Button Setup Switch** on the control panel opens a setup screen to set the **Side Button** function. Enter this setup screen and then use the UP/DOWN arrows to select the desired function, then press the **MENU/SEL** button to return to the **Main Window**.



The button menu provides a scrollable list of the available functions. Use the UP/DOWN arrows to highlight the desired function and press **BACK** or **MENU/SEL** to select it and return to the main menu.

Button ▼

TalkBk

Talkback is a “push to talk” function that is active only while the button is pressed. The talk-back function provides a communication channel when used with a receiver equipped with this function, such as a Venue Wideband receiver with firmware Ver. 5.2 or higher. When pressed and held in, the side button re-directs the audio output to a different audio channel on the receiver. As soon as the switch is released, audio is returned to the program channel.

NOTE: The Talkback function is only available in the Digital Hybrid compatibility mode. An error message will appear if Talkback is selected while in another mode.

Button ▼

Power

Power turns the power on and off in the same manner as the control panel switch

Button ▼

Cough

Cough is a momentary mute switch. Audio is muted while the button is held in.

Button ▲

Mute

Mute is a “push on/push” off function that toggles on and off each time the **Side Button** is pressed. The mute function defeats the audio in the transmitter, so it works in all compatibility modes and with all receivers.

Button ▲

(none)

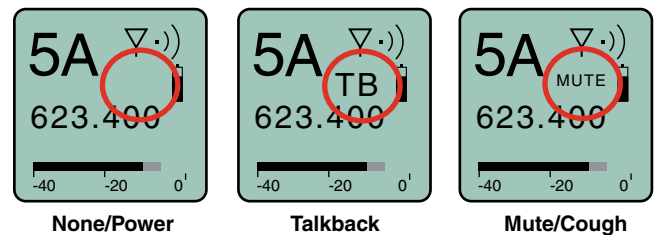
(none) disables the switch.

For detailed information on setting up the **Talkback** function and the Venue receiver, refer to the Installation Guide for the Venue Wideband Receiver:

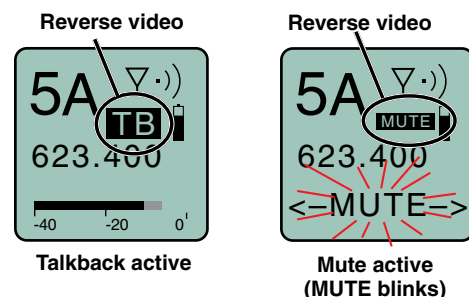
http://www.lectrosonics.com/images/Manuals/vr_wideband_installguide.pdf

Main Window Displays for Mute and Talkback Functions

The function of the **Side Button** is displayed in the LCD **Main Window**.



When the **Side Button** is pressed, the function will be active and the LCD will display an indication.



Parts and Accessories

#55008 - Blue Battery Caddy



#CCHH - Zippered Pouch

Padded zipper pouch for handheld transmitter



#26872 Mic Capsule Wrench

Custom wrench for removing windscreen and Ambient HHA adapter from mic capsule



#13585 Mic Clip

Screw on mic clip for standard mic stands with 5/8"-27 thread



#32443 Foam Windscreen

Foam windscreen for handheld transmitter



HHXTND

Extender to for use with microphone flags commonly used in ENG for network or station ID to keep the flag from covering the side switch and LCD



HHA Adapter by Ambient Recording

Adapts Neumann KK104 and KK105 capsules with Shure style threads to the HH transmitter.



**Available from Ambient
Recording dealers**

Visit: www.ambient.de

Troubleshooting

SYMPTOM

HH/E01 WILL NOT POWER ON

HH/E01 MODULATION LEDs OFF

HH/E01 MODULATION LEDs GOOD BUT NO SOUND

RECEIVER RF INDICATOR OFF

NO SOUND BUT RECEIVER AUDIO LEVEL METER INDICATES SOUND

DISTORTED SOUND

HISS AND NOISE -- AUDIBLE DROPOUTS

EXCESSIVE FEEDBACK

POSSIBLE CAUSE

- 1) Batteries are inserted backwards.
- 2) Batteries are dead, or too low to be used.
- 1) Audio Gain set too low.
- 2) Battery is inserted backwards. Check LCD for power indication.
- 3) Mic capsule is damaged or malfunctioning. Contact the factory for repair.
- 1) Talkback function is engaged (release multi-function button). See p. 10
- 2) Receiver on wrong frequency or wrong block.
- 3) Receiver connected incorrectly to sound system.
- 1) HH/E01 not turned on.
- 2) HH/E01 is in "standby" (non-transmitting) mode. Check the LCD for the antenna/transmission icon status.
- 3) Batteries are dead or installed backwards.
- 4) Receiver antenna missing, defective or improperly positioned.
- 5) HH/E01 and receiver not on same frequency block. Check labels on HH/E01 and receiver to be sure they are operating on the same frequency block.
- 6) Make sure the transmitter and receiver associated frequency settings are in agreement.
- 7) Operating range is too great.
- 1) Receiver audio is muted. (Unmute receiver.)
- 2) Receiver audio output levels set too low.
- 3) Receiver audio output is disconnected or cable defective or miswired.
- 4) Sound system or recorder input level is turned down.
- 1) HH/E01 Audio Gain set too high. Speak or sing into the HH/E01 and check the Audio Level LEDs, Audio Level bar graph in the HH/E01 LCD and corresponding indicators on the receiver.
- 2) Receiver output level may be too high for the sound system or recorder input.
- 3) Excessive wind noise or breath "pops." Microphone may require an additional wind screen.
- 4) HH/E01 Frequency setting is not correct.
- 5) Compatibility Mode mismatch between transmitter and receiver.
- 1) HH/E01 Audio Gain set too low. See page 10 for proper audio gain setting.
- 2) Receiver antenna missing, defective or obstructed.
- 3) Operating range too great.
- 4) HH/E01 transmitting frequency set incorrectly.
- 5) Interference may be present. Turn transmitter off and observe the RF level indicator on the receiver. Change frequency if necessary.
- 1) HH/E01 Audio Gain set too high. Check level adjustment, reduce receiver output level, or both.
- 2) Microphone too close to speaker system.
- 3) Move microphone closer to the user's mouth and lower the sound system volume.

Specifications

Operating frequencies:

Block 470	470.100 - 495.600
Block 19	486.400 - 511.900
Block 20	512.000 - 537.500
Block 21	537.600 - 563.100
Block 22	563.200 - 588.700
Block 23	588.800 - 614.300
Block 24	614.400 - 639.900
Block 25	640.000 - 665.500
Block 26	665.600 - 691.100
Block 606	606.000 - 631.500

Frequency selection:

(Normal Tuning mode);	256 frequencies in 100 kHz steps
(Fine Tuning mode)	1024 frequencies in 25 kHz steps (except block 23 - contact Lectrosonics for details)

Channel Step Size:

Normal Tuning mode:	100 kHz in Normal Tuning mode
Fine Tuning mode:	25 kHz in Fine Tuning mode

RF Power output:

Selectable at 25 or 50 mW

Pilot tone:

25 to 32 kHz frequency - 3 kHz deviation

Frequency stability:

± 0.002%

Deviation:

± 50 kHz max. (in Digital Hybrid mode)

Spurious radiation:

90 dB below carrier

Operating temperature range:

-30° C to +60° C

Input compressor:

Dual envelope compressor, >30 dB range

Gain control range:

45 dB; menu-driven control

Modulation indicators:

Dual bicolor LEDs indicate modulation of -20, -10, 0 and +10 dB referenced to full modulation, LCD bar-graph indicator

Frequency response

40 Hz to 20 kHz (+/- 1dB)

Low frequency roll-off:

-3 dB selectable @35, 50, 70, 100, 125 Hz, 36 dB/octave (varies slightly w/ selection)

Antenna:

Integral

Controls:

External:	Programmable mute/talkback button
Internal control panel:	Power, Side Button Setup, MENU/SEL, BACK and UP/DOWN arrow buttons for menu item selection and settings.

Battery:

(2) AA with polarity protection and battery ejection lever

Battery Life at 50 mW output:

6 hours (alkaline); 8-10 hours (lithium)

Battery Status Indication:

Transmitted to Lectrosonics Digital Hybrid receivers

Capsule Interface:

1.25 inch x 28 thread pitch
Phantom power available: 5V, 25 mA max
Input impedance: 1000 Ohms

Weight:

11.4 oz. with lithium batteries and HHC capsule

Dimensions:

241 mm (9.5") long x 50 mm (1.97") diameter at largest point with HHC capsule attached

Emission Designator:

180KF3E

Specifications subject to change without notice.

Service and Repair

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check the interconnecting cables and then go through the **Troubleshooting** section in this manual.

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment. **There are no adjustments inside that will make a malfunctioning unit start working.**

LECTROSONICS' Service Department is equipped and staffed to quickly repair your equipment. In-warranty repairs are made at no charge in accordance with the terms of the warranty. Out-of-warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out-of-warranty repairs.

Returning Units for Repair

For timely service, please follow the steps below:

- A.** DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 A.M. to 4 P.M. (U.S. Mountain Standard Time).
- B.** After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the **outside** of the shipping container.
- C.** Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.
- D.** We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Factory Service Center

Mailing address:

Lectrosonics, Inc.
PO Box 15900
Rio Rancho, NM 87174
USA

Shipping address:

Lectrosonics, Inc.
581 Laser Rd.
Rio Rancho, NM 87124
USA

Telephone:

(505) 892-4501
(800) 821-1121 Toll-free
(505) 892-6243 Fax

Web:

www.lectrosonics.com

E-mail:

sales@lectrosonics.com

Canada Service Center:

Mailing address:

Lectrosonics Canada
720 Spadina Ave., Suite 600
Toronto, Ontario M5S 2T9
Canada

Telephone:

(Toll Free in Canada)
877) 753-2876
Direct: (416) 596-2202
Fax: (416) 596-6648

European Service Centers:

United Kingdom

Raycom Ltd

Langton House
19 Village St
Harvington, WR11 8NQ
United Kingdom
Main Tel: +44 (0) 1789 777 040
email: sales@raycom.co.uk

Germany

Ambient Recording GmbH

Schleissheimerstr. 181c
Service department
80797 Munich
Germany
email: info@ambient.de

LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.



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