INSTRUCTION MANUAL

DBa

Digital Belt Pack Transmitter

Fill in for your records:

Serial Number:

Purchase Date:

LECTROSONICS®
Rio Rancho, NM, USA
www.lectrosonics.com

This device operates on a no-protection, no-interference basis. Should the user seek to obtain protection from other radio services operating in the same TV bands, a radio licence is required. For further details, consult Innovation, Science and Economic Development Canada's document Client Procedures Circular CPC-2-1-28, Voluntary Licensing of Licence-Exempt Low-Power Radio Apparatus in the TV Bands.

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Consumer Alert for US Users - FCC Order DA 10-92

Most users do not need a license to operate this wireless microphone system. Nevertheless, operating this microphone system without a license is subject to certain restrictions: the system may not cause harmful interference; it must operate at a low power level (not in excess of 50 milliwatts); and it has no protection from interference received from any other device. Purchasers should also be aware that the FCC is currently evaluating use of wireless microphone systems, and these rules are subject to change. For more information, call the FCC at 1-888- CALL-FCC (TTY: 1-888-TELL-FCC) or visit the FCC's wireless microphone website at www.fcc.gov/cgb/wirelessmicrophones. To operate wireless microphone systems at power greater than 50mW, you must qualify as a Part 74 user and be licensed. If you qualify and wish to apply for a license go to: http://www.fcc.gov/Forms/Form601/601.html

Introduction

DSW (Digital Secure Wireless) is designed for no-compromise applications where performance and security are the highest priority.

A completely new digital architecture was developed for the DSW wireless system, which includes the DBa Transmitter. Extended operating range rivals the best analog and Digital Hybrid Wireless® systems, with remarkable audio quality and only 2.5 ms of latency. The system operates on standard UHF FCC Part 74 frequencies (TV channel band).

256-bit encryption is applied to the transmitted signal stream for security against eavesdropping. The algorithm conforms to the AES 256-CTR standard.

The DBa transmitter is a second generation design with specially developed, high efficiency digital circuitry for extended operating time on two AA batteries. The transmitter can tune in coarse or fine steps across the UHF television band from 470.100 to 691.175 MHz, with an output power of 50 mW. The pure digital architecture enables AES 256-CTR encryption for high level security applications.

Studio quality audio performance is assured by high quality components in the preamp, wide range input gain adjustment and DSP-controlled limiting. Input connections and settings are included for any lavaliere microphone, dynamic microphones and line level inputs. Input gain is adjustable over a 44 dB range in 1 dB steps to allow an exact match to the input signal level, to maximize the dynamic range and signal to noise ratio.

A separate switch is provided on the top panel that can be configured as a mute or power switch, or bypassed.

The housing is constructed of solid machined aluminum for lasting ruggedness. The exterior is finished with an ultra hard, black electroless nickel finish called ***ebENi***.

Firmware updates are made through a side panel micro USB port.

Frequency Agility

The transmitter tunes across the entire frequency range, from 470 MHz to 691 MHz.

Servo Bias Input and Wiring

The DBA input preamp is a unique design that delivers audible improvements over conventional transmitter inputs, is easier to use and much harder to overload. It is not necessary to introduce pads on some mics to prevent overload of the input stage, divide the bias voltage down for some low voltage mics, or reduce the limiter range at minimum gain settings.

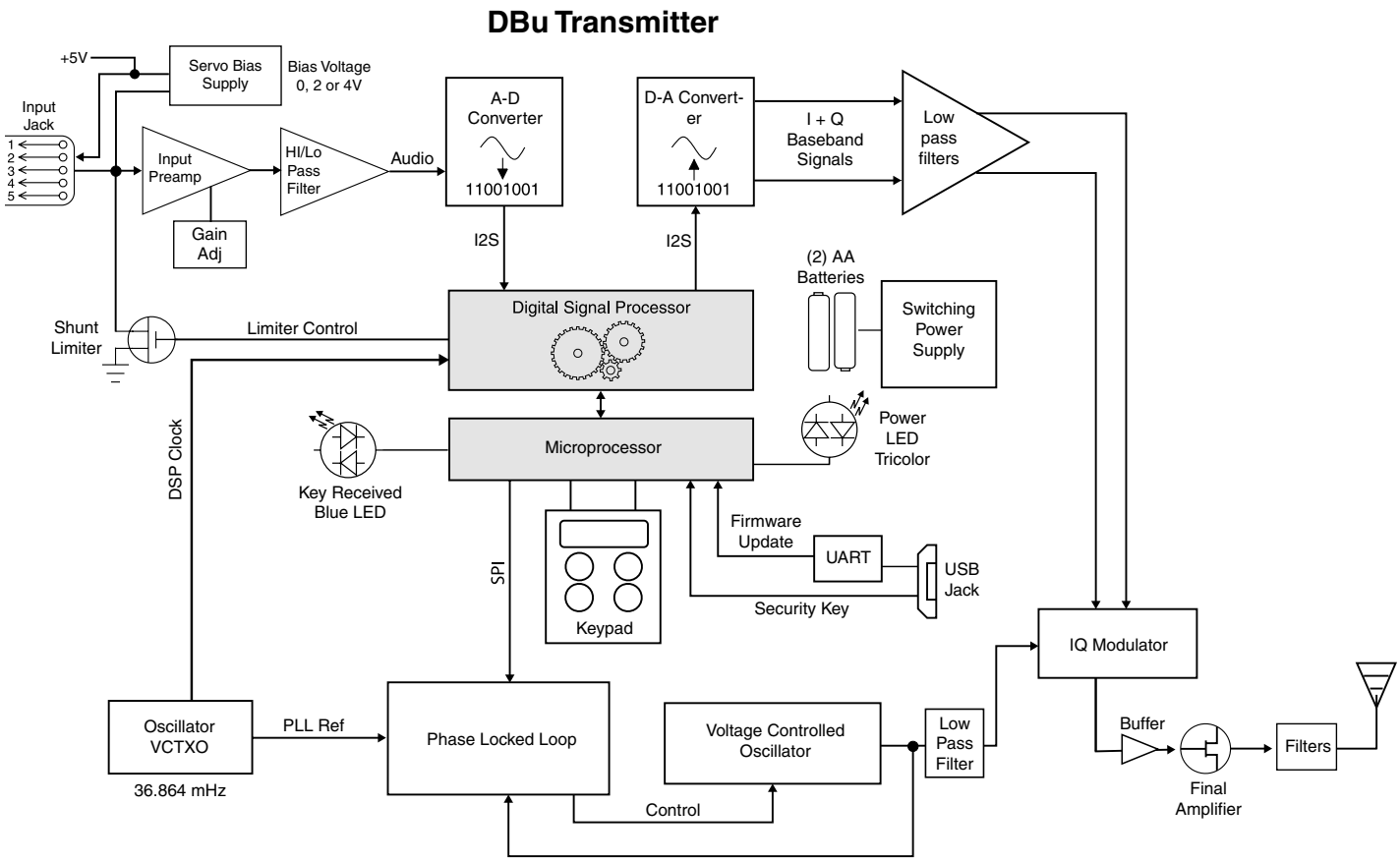
Two different microphone wiring schemes are available to simplify and standardize the configuration. Simplified 2-wire and 3-wire configurations provide several arrangements designed for use only with servo bias inputs to take full advantage of the preamp circuitry. Other wiring schemes are compatible with Servo Bias and conventional inputs.

A line level input wiring provides an extended frequency response with an LF roll-off at 35 Hz for use with instruments and line level signal sources.

DSP-controlled Input Limiter

The transmitter employs a digitally-controlled analog audio limiter prior to the analog-to-digital converter. The limiter has a range greater 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, connected as a fast attack and release limiter followed by a slow attack and release limiter. The limiter recovers quickly from brief transients, so that its action is hidden from the listener, but recovers slowly from sustained high levels to keep audio distortion low and preserve short term dynamic changes in the audio.

DBa Block Diagram



Battery Installation

The transmitter is powered by two AA batteries. We recommend using alkaline, lithium, or rechargeable batteries for longest life. Standard zinc-carbon batteries marked “heavy-duty” or “long-lasting” are not adequate.

The battery status circuitry compensates for the difference in voltage drop between alkaline and lithium batteries across their usable life, so it’s important to select the correct battery type in the menu.

Because rechargeable batteries run down quite abruptly, using the Power LED to verify battery status will not be reliable. However, it is possible to track battery status using the battery timer function available in the receiver.

Push outward on the battery compartment door and lift it to open.

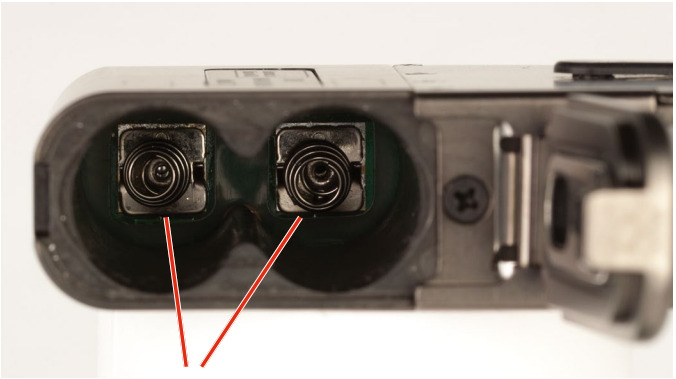
Slide door out to release catch

Lift door to open

Insert the batteries according to the markings on the back of the housing.

If the batteries are inserted incorrectly, the door will close but the unit will not operate.

The battery contacts can be cleaned with alcohol and a cotton swab, or a clean pencil eraser. Be sure not to leave any remnants of the cotton swab or eraser crumbs inside the compartment.



Contact springs

Battery Status LED Indicator

Alkaline, lithium or rechargeable batteries can be used to power the transmitter. The type of batteries in use are selectable in a menu on the LCD.

When alkaline or lithium batteries are being used, the LED labeled BATT on the keypad glows green when the batteries are good. The color changes to red when the they are nearing the end of life. When the LED begins to *blink* red, there will be only a few minutes remaining.

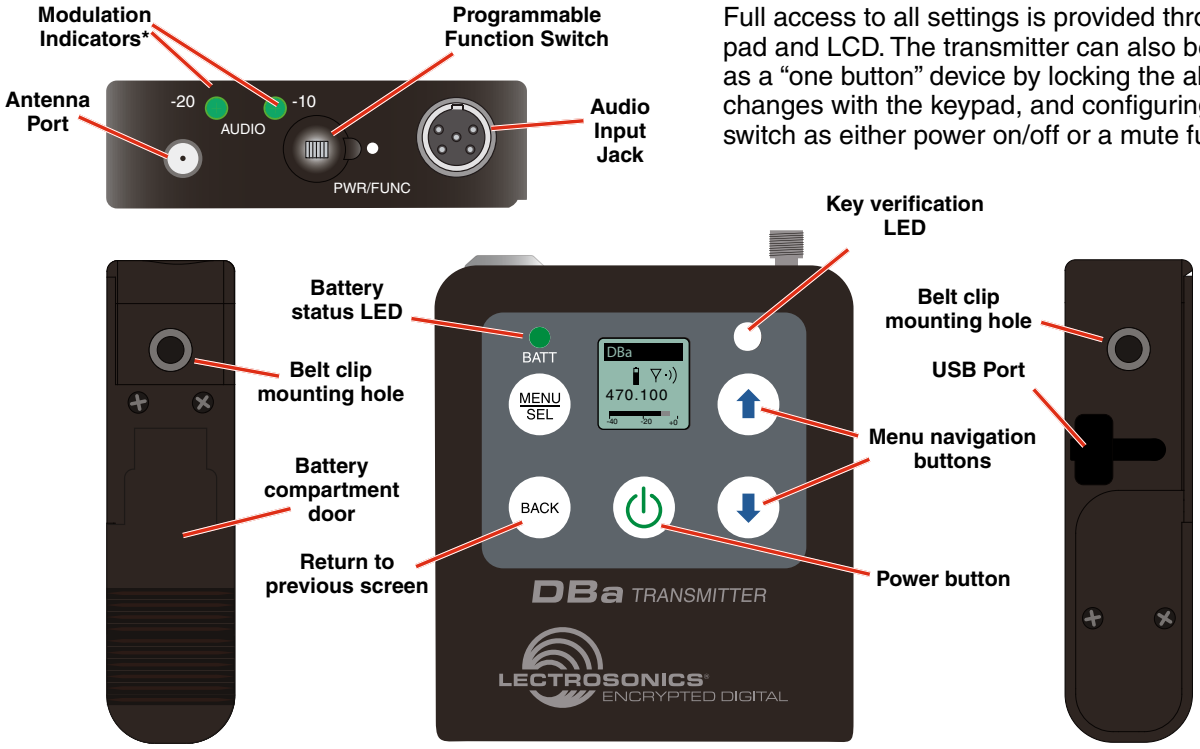
The Power/Function LED on the top panel will mirror the keypad LED unless the programmable switch is set to Mute, and the switch is turned on.

The exact point at which the LEDs turn red will vary with battery brand and condition, temperature and power consumption. The LEDs are intended to simply catch your attention, not to be an exact indicator of remaining time.

A weak battery will sometimes cause the Power LED to glow green immediately after the transmitter is turned on, but it will soon discharge to the point where it will turn red or the unit will turn off completely.

Rechargeable batteries give little or no warning when they are depleted. If you wish to use these batteries in the transmitter, the most accurate way to determine runtime status is by testing the time provided by a particular battery brand and type, then using the **BatTime** function to determine remaining runtime. Refer to the Main Menu and Setup Section for details.

Operating Instructions



Full access to all settings is provided through the keypad and LCD. The transmitter can also be configured as a "one button" device by locking the ability to make changes with the keypad, and configuring the top panel switch as either power on/off or a mute function.

*When the transmitter is set to MUTE, the -10 Modulation Indicators LED will glow solid red. Otherwise, the -10 Modulation Indicators LED will glow solid green when transmitter is on.

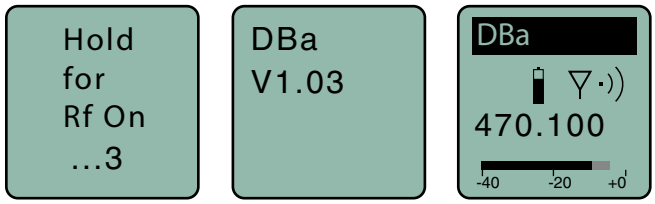
Belt Clips

The wire belt clip may be removed by pulling the ends out of the holes in the sides of the case. Use pliers to grasp the wire and avoid scratching the surface of the housing. Pliers also help when installing the clip.

An optional spring-loaded, hinged belt clip (model number BCSLEBN) is also available. This clip is attached by removing the plastic hole cap on the back of the housing and mounting the clip with the supplied screw.

Powering On in Operating Mode

Press and hold the Power Button ⏻ for several seconds until a counter on the LCD progresses from 1 through 3.



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

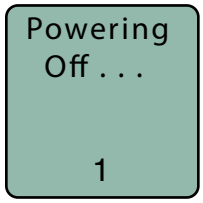
Powering On in Standby Mode

A brief press of the Power Button ⏻, releasing it before the counter has reached 3, will turn the unit on with the RF output turned off. In this Standby Mode the menus can be browsed to make settings and adjustments without the risk of interfering with other wireless systems nearby.

After settings and adjustments are made, press the power button again to turn the unit off.

NOTE: Also see the section entitled ***Power Menu*** for the AutoOn feature.

Powering Off



From any screen, power can be turned off by selecting Pwr Off in the power menu, holding the Power Button ⏻ in and waiting for the countdown, or with the programmable switch (if it is configured for this function).

If the power button is released, or the top panel switch is turned back on again 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.

NOTE: If the programmable switch is in the OFF position, power can still be turned on with the power button. If the programmable switch is then turned on, a brief message will appear on the LCD.

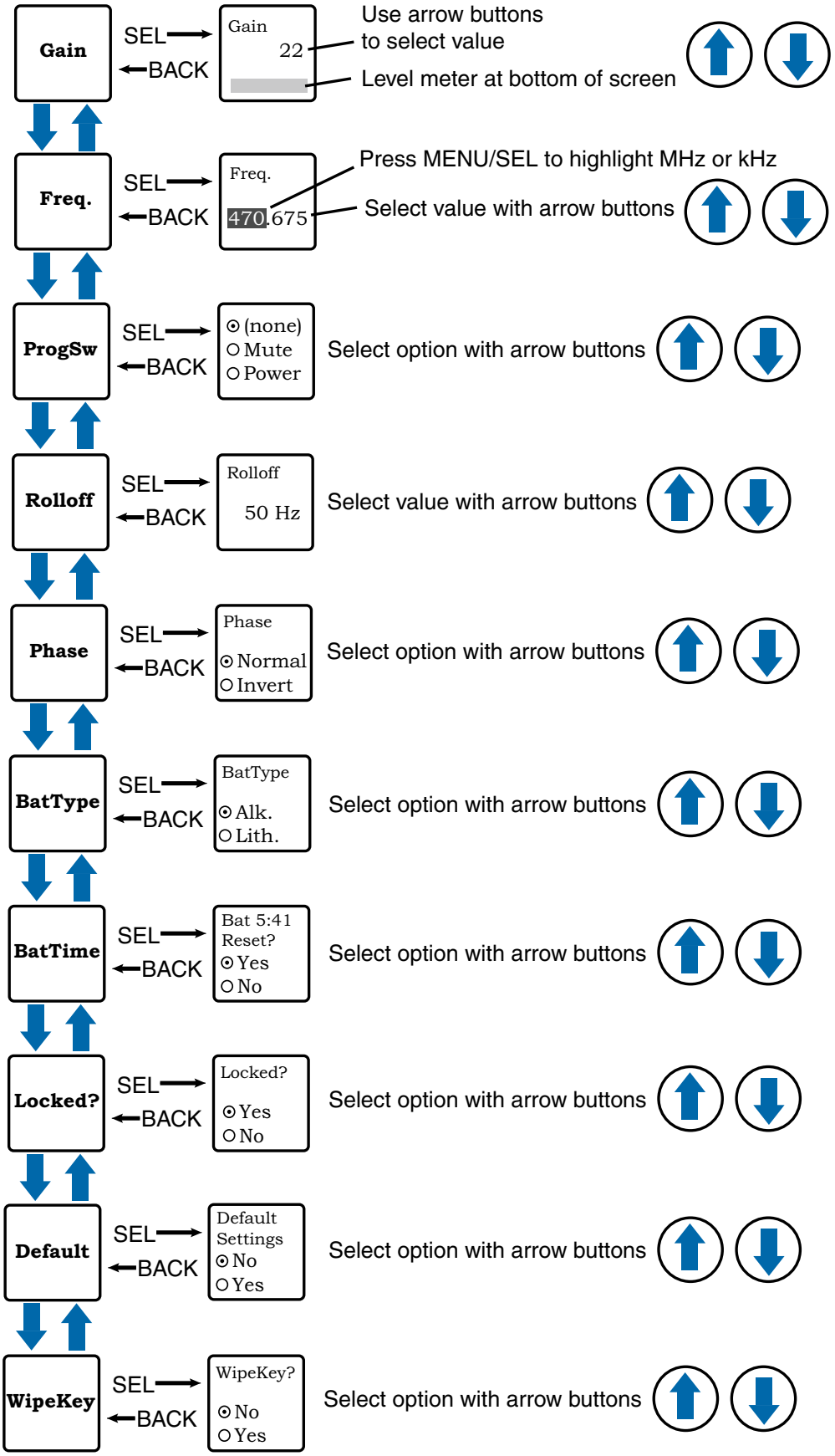
Power Menu Options

Entering the Power Menu

Press the power button ⏻ once briefly from any menu or screen and a menu will appear with several options. Use the ⬆ and ⬇ arrow buttons to highlight menu items. Then press MENU/SEL to execute the item or enter a setup screen. The following options are available:

- **Resume** - returns to the previous mode and screen
- **Pwr Off** - turns the unit off irrevocably
- **Rf On?** - enters a screen to enable the operating or standby modes
- **AutoOn?** - allows the unit to automatically turn back on after a power failure or when fresh batteries are installed (works in the operating mode only)
- **Backlit** - adjusts the duration of the LCD back light to 30 seconds or 5 minutes, or to remain on
- **About** - displays model number and firmware version

LCD Menu Map

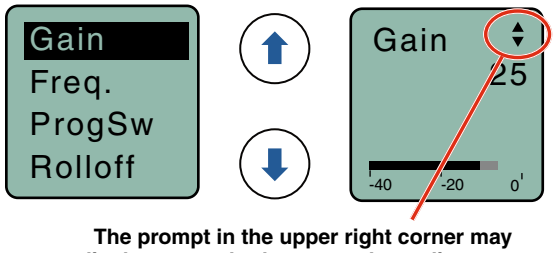


NOTE: The settings will be stored when the BACK button is pressed.

Main Menu and Setup Screen Details

Entering the Main Menu

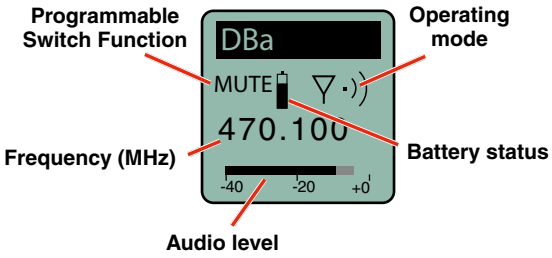
The LCD and keypad interface makes it easy to browse the menus and make the selections for the setup you need. When the unit is powered up in either the operating or the standby mode, press MENU/SEL on the keypad to enter a menu structure on the LCD. Use the ⇧ and ⇩ arrow buttons to select the menu item. Then press the MENU/SEL button to enter the setup screen.



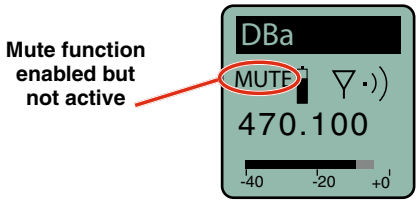
The prompt in the upper right corner may display one or both arrows, depending upon what adjustment can be made. If the changes are locked, a small padlock symbol will appear.

Main Window Indicators

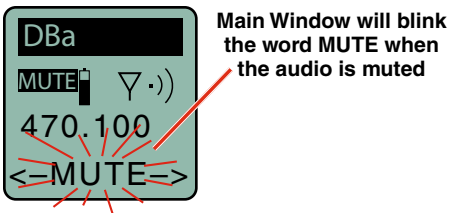
The Main Window displays programmable switch function, Standby or Operating mode, operating frequency, audio level and battery status.



If the programmable switch function is set for Mute, the Main Window will indicate that the function is enabled.



When the switch is turned on, the mute icon appearance will change and the word MUTE will blink at the bottom of the display. The -10 LED on the top panel will also glow solid red.



Connecting the Signal Source

Microphones, line level audio sources and instruments can be used with the transmitter. Refer to the section entitled ***Wiring Hookups for Different Sources*** for details on the correct wiring for line level sources and microphones to take full advantage of the Servo Bias circuitry.

Adjusting the Input Gain

The two bicolor Modulation LEDs on the top 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.

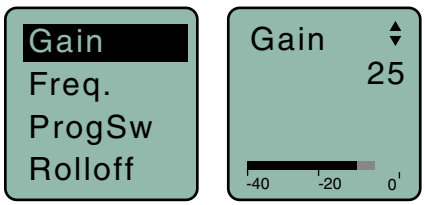
Signal Level	-20 LED	-10 LED
Less than -20 dB	Off	Off
-20 dB to -10 dB	Green	Off
-10 dB to +0 dB	Green	Green
+0 dB to +10 dB	Red	Green
Greater than +10 dB	Red	Red

NOTE: Full modulation is achieved at 0 dB, when the "-20" LED first turns red. The limiter can cleanly handle peaks up to 30 dB above this point.

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 or recorder during adjustment.

1) With fresh batteries in the transmitter, power the unit on in the standby mode (see previous section ***Powering On in Standby Mode***).

2) Navigate to the Gain setup screen.



3) Prepare the signal source. Position a microphone the way it will be used in actual operation and have the user speak or sing at the loudest level that occur during use, or set the output level of the instrument or audio device to the maximum level that will be used.

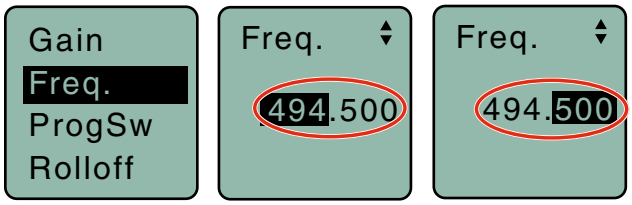
4) Use the ⇧ and ⇩ arrow buttons to adjust the gain until the **–10 dB** glows green and the **–20 dB** LED starts to flicker red during the loudest peaks in the audio.

5) Once the audio gain has been set, the signal can be sent through the sound system for overall level adjustments, monitor settings, etc.

6) If the audio output level of the receiver is too high or low, use only the controls on the receiver to make adjustments. Always leave the transmitter gain adjustment set according to these instructions, and do not change it to adjust the audio output level of the receiver.

Selecting Frequency

The setup screen for frequency selection offers two ways to browse the available frequencies.

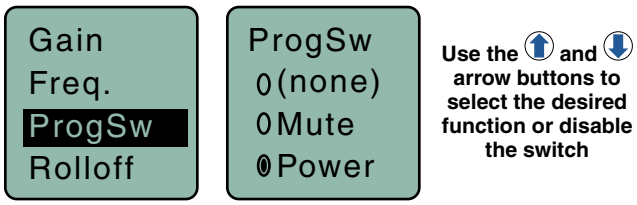


Press the MENU/SEL button to select each field. Use the ⇧ and ⇩ arrow buttons to adjust the frequency. Each field will step through the available frequencies in a different increment.

Selecting Programmable Switch Functions

The programmable switch on the top panel can be configured using the menu to provide several functions:

- **(none) -** disables the switch
- **Mute** - mutes the audio when switched on; LCD will blink a message and -10 LED will glow solid red.
- **Power** - turns the power on and off



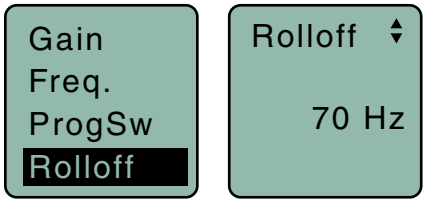
Use the ⇧ and ⇩ arrow buttons to select the desired function or disable the switch

NOTE: The programmable switch will continue to operate whether or not keypad changes are locked.

Selecting the Low Frequency Roll-off

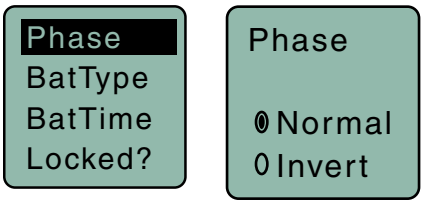
The low frequency audio roll-off is adjustable to optimize performance for ambient noise conditions or personal preference.

Low frequency audio content may be desirable or distracting, so the point at which the roll-off takes place can be set to 35, 50, 70, 100, 120 and 150 Hz.



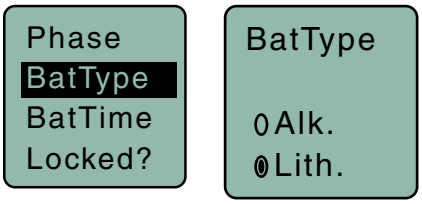
Selecting Audio Polarity (Phase)

Audio polarity can be inverted at the transmitter so the audio can be mixed with other microphones without comb filtering. The polarity can also be inverted at the receiver outputs.



Selecting Battery Type

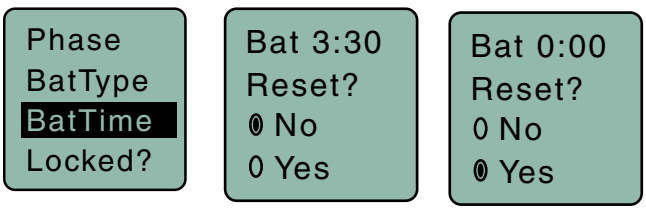
The voltage drop over the life of different batteries varies by type and brand. Be sure to set the correct battery type for accurate indications and warnings. The menu offers alkaline or lithium types.



If you are using rechargeable batteries, it is better to use the timer function on the receiver to monitor the battery life rather than the indicators on the transmitter. Rechargeable batteries maintain a fairly constant voltage across the operating time on each charge and stop working abruptly, so you will have little or no warning as they reach the end of operation.

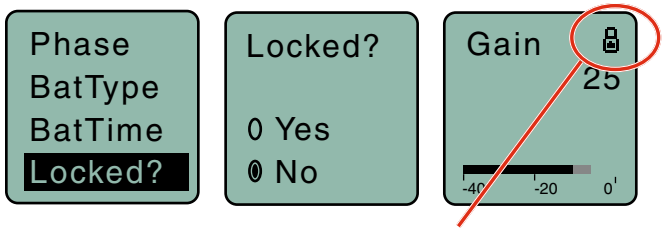
BatTime

A built-in timer can be used with any battery type, but it is especially valuable with rechargeable batteries such as NiMH types. The voltage remains fairly constant across the discharge time of a rechargeable battery, then drops quickly near the end of the operating time. The most accurate way to determine runtime status is by testing the time provided by a particular battery brand and type, then using the timer to determine remaining runtime. Rechargeable batteries lose capacity over their life, so it is good to run the battery down and note the runtime on older or unfamiliar batteries.



Locking/Unlocking Changes to Settings

Changes to the settings can be locked to prevent inadvertent changes being made.



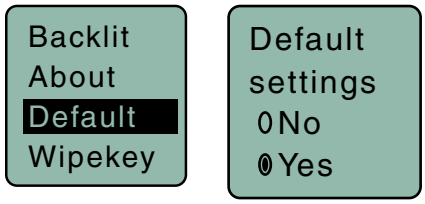
A small padlock symbol will appear on adjustment screens when changes have been locked.

When changes are locked, several controls and actions can still be used:

- Settings can still be unlocked
- Menus can still be browsed
- Programmable switch still works (Mute, On/Off)
- Power can still be turned off by using the power menu or removing the batteries.

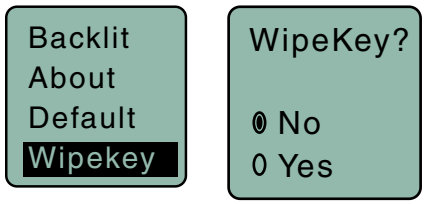
Restoring Default Settings

This is used to restore the factory settings.



Wipekey

The encryption key can be erased with this setup screen.



Whip Antennas

Because the transmitter tunes across such a broad frequency range, it is best to use the appropriate antenna for maximum operation. Three antennas are included with the transmitter, and are shipped from the factory pre-cut and fully assembled. Each antenna covers three blocks. Use the chart below to determine which antenna best fits your needs.

Block	Frequency Range MHz	Cap Color	Antenna
470	470.100 - 495.600	Black	AMM19
19	486.400 - 511.900	Black	AMM19
20	512.000 - 537.500	Black	AMM19
21	537.600 - 563.100	Red	AMM22
22	563.200 - 588.700	Red	AMM22
23	588.800 - 614.300	Red	AMM22
24	614.400 - 639.900	Green	AMM25
25	640.000 - 665.500	Green	AMM25
26	665.600 - 691.100	Green	AMM25

Encryption Key and Settings Transfer

A cable between the receiver and the micro USB port on the side of the transmitter is used to transfer the encryption key from the receiver to the transmitter. This connection can also be used to send the transmitter settings stored in the receiver to the transmitter.

The interface cable, P/N DRKEYCABLE, is used to make this connection.

NOTE: Reference the DSW System Instruction Manual for instructions on Encryption Key settings and software.

Accessories

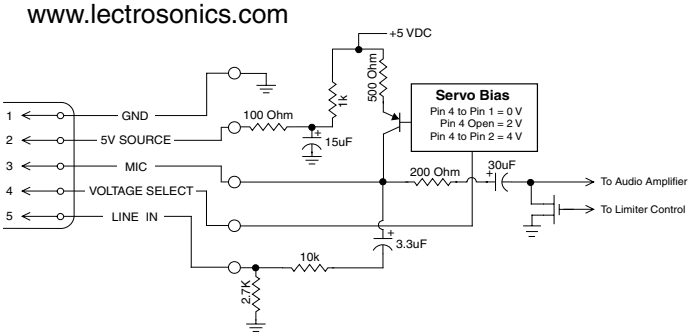
P/N 26895	Wire belt clip
BCSLEBN	Spring-loaded belt clip
DRKEYCABLE	Encryption key and settings transfer cable; micro USB to male 3.5 mm TRS; 42 in. length
M152/5P 700	Lavaliere microphone; omnidirectional
MI33PRA	Instrument cable; passive type for use with very high output pickups; right angle 1/4” plug
MI33PST	Instrument cable; passive type for use with very high output pickups; straight 1/4” plug
MC35	Line level adapter cable; XLR-F to TA5F; 37” length
MC41	Dynamic mic level adapter cable; XLR-F to TA5F; 37” length

5-Pin Input Jack Wiring

The wiring diagrams included in this section represent the basic wiring necessary for the most common types of microphones and other audio inputs. Some microphones may require extra jumpers or a slight variation on the diagrams shown.

It is virtually impossible to keep completely up to date on changes that other manufacturers make to their products, thus you may encounter a microphone that differs from these instructions. If this occurs please call our toll-free number listed under Service and Repair in this manual or visit our web site at:

www.lectrosonics.com



Audio input jack wiring:

PIN 1
Shield (ground) for positive biased electret lavaliere microphones. Shield (ground) for dynamic microphones and line level inputs.

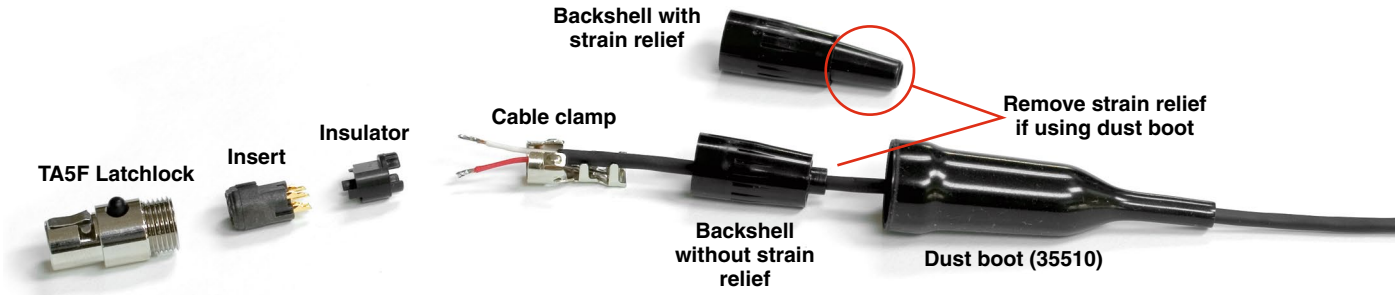
PIN 2
Bias voltage source for positive biased electret lavaliere microphones that are not using servo bias circuitry and voltage source for 4 volt servo bias wiring.

PIN 3
Microphone level input and bias supply.

PIN 4
Bias voltage selector for Pin 3.
Pin 3 voltage depends on Pin 4 connection.

Pin 4 tied to Pin 1: 0 V
Pin 4 Open: 2 V
Pin 4 to Pin 2: 4 V

PIN 5
Line level input for tape decks, mixer outputs, musical instruments, etc.



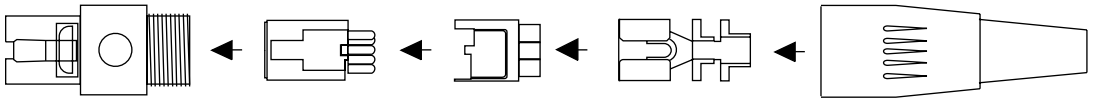
Note: If you use the dust boot, remove the rubber strain relief that is attached to the TA5F cap, or the boot will not fit over the assembly.

Installing the Connector:

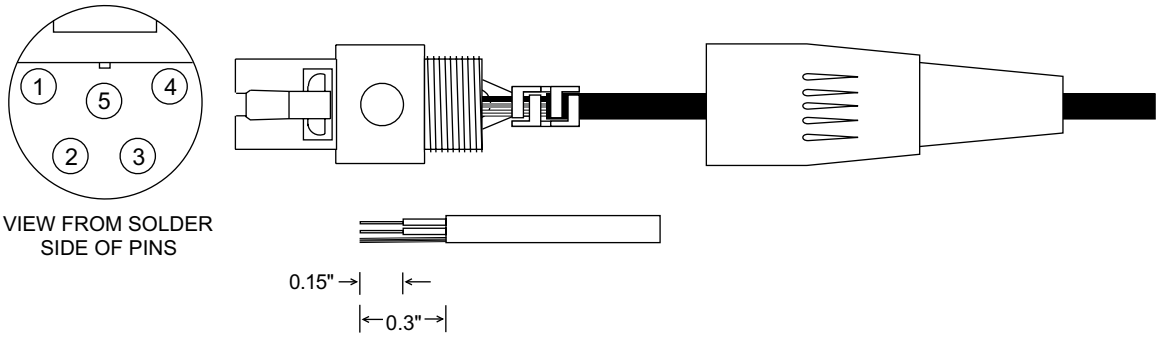
1) If necessary, remove the old connector from the microphone cable.
2) Slide the dust boot onto microphone cable with the large end facing the connector.
3) If necessary, slide the 1/8-inch black shrink tubing onto the microphone cable. This tubing is needed for some smaller diameter cables to ensure there is a snug fit in the dust boot.
4) Slide the backshell over the cable as shown above. Slide the insulator over the cable before soldering the wires to the pins on the insert.
5) Solder the wires and resistors to the pins on the insert according to the diagrams shown in ***Wiring Hookups for Different Sources.*** A length of .065 OD clear tubing is included if you need to insulate the resistor leads or shield wire.
6) If necessary, remove the rubber strain relief from the TA5F backshell by simply pulling it out.
7) Seat the insulator on the insert. Slide the cable clamp over the and of the insulator and crimp as shown on the next page.
8) Insert the assembled insert/insulator/clamp into the latchlock. Make sure the tab and slot align to allow the insert to fully seat in the latchlock. Thread the backshell onto the latchlock.

Microphone Cable Termination for Non-Lectrosonics Microphones

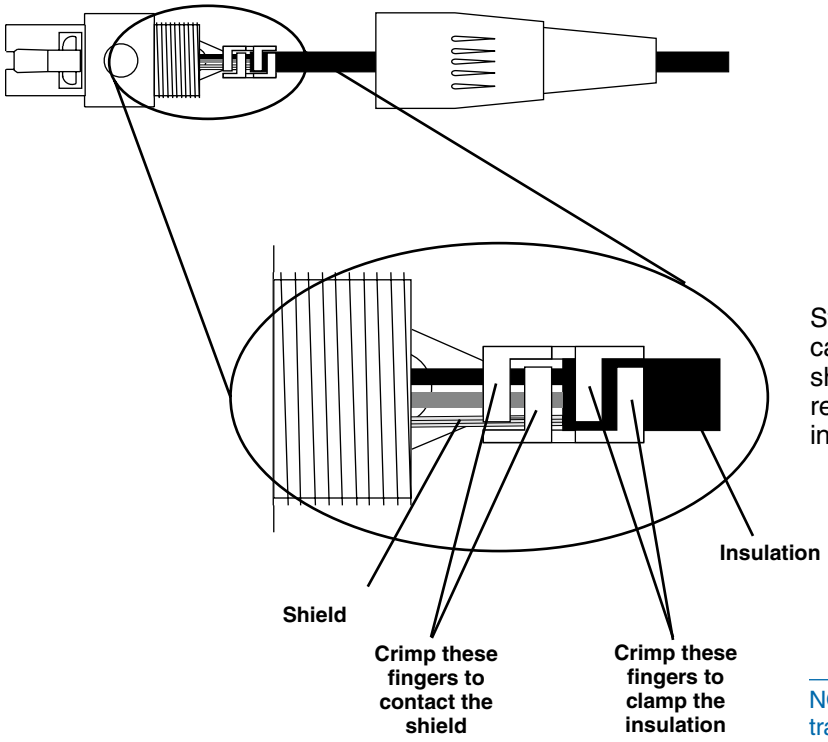
TA5F Connector Assembly



Mic Cord Stripping Instructions



Crimping to Shield and Insulation



Strip and position the cable so that the clamp can be crimped to contact both the mic cable shield and the insulation. The shield contact reduces noise with some microphones and the insulation clamp increases ruggedness.

NOTE: This termination is intended for UHF transmitters only. VHF transmitters with 5-pin jacks require a different termination. Lectrosonics lavaliere microphones are terminated for compatibility with VHF and UHF transmitters, which is different from what is shown here.

Input Jack Wiring for Different Sources

In addition to the microphone and line level wiring hook-ups illustrated below, Lectrosonics makes a number of cables and adapters for other situations such as connecting musical instruments (guitars, bass guitars, etc.) to the transmitter. Visit **www.lectrosonics.com** and click on Accessories, or download the master catalog.

A lot of information regarding microphone wiring is also available in the FAQ section of the web site at:

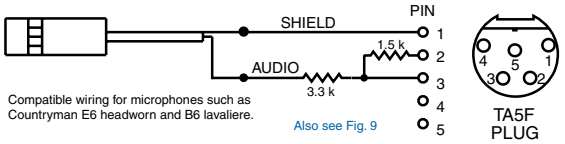
http://www.lectrosonics.com/faqdb

Follow the instructions to search by model number or other search options.

Compatible Wiring for Both Servo Bias Inputs and Earlier Transmitters:

Fig. 1

2 VOLT POSITIVE BIAS 2-WIRE ELECTRET

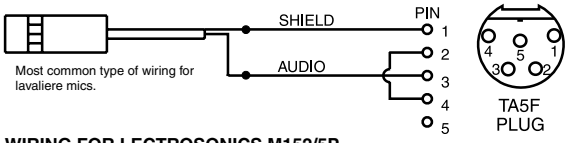


Compatible wiring for microphones such as Countryman E6 headworn and B6 lavaliere.

Also see Fig. 9

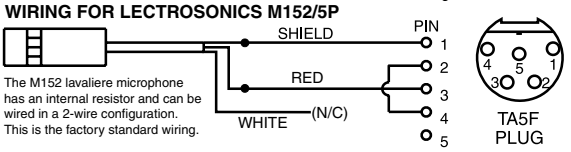
Fig. 2

4 VOLT POSITIVE BIAS 2-WIRE ELECTRET



Most common type of wiring for lavaliere mics.

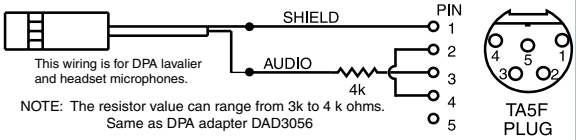
WIRING FOR LECTROSONICS M152/5P



The M152 lavaliere microphone has an internal resistor and can be wired in a 2-wire configuration. This is the factory standard wiring.

Fig. 3 - DPA Microphones

DANISH PRO AUDIO MINIATURE MODELS

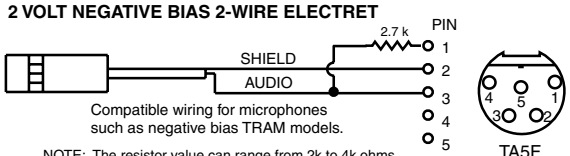


This wiring is for DPA lavalier and headset microphones.

NOTE: The resistor value can range from 3k to 4 k ohms. Same as DPA adapter DAD3056

Fig. 4

2 VOLT NEGATIVE BIAS 2-WIRE ELECTRET

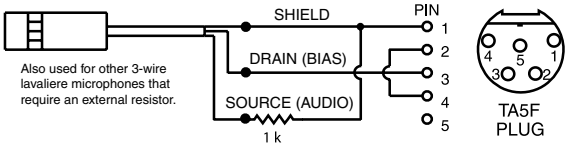


Compatible wiring for microphones such as negative bias TRAM models.

NOTE: The resistor value can range from 2k to 4k ohms.

Fig. 5 - Sanken COS-11 and others

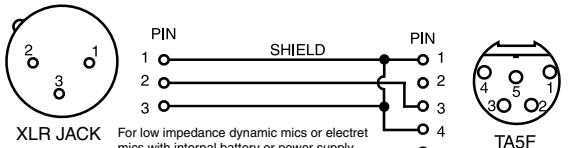
4 VOLT POSITIVE BIAS 3-WIRE ELECTRET WITH EXTERNAL RESISTOR



Also used for other 3-wire lavaliere microphones that require an external resistor.

Fig. 6

LO-Z MICROPHONE LEVEL SIGNALS

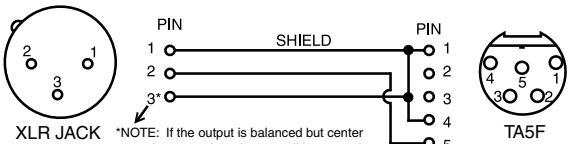


For low impedance dynamic mics or electret mics with internal battery or power supply.

Insert 1k resistor in series with pin 3 if attenuation is needed

Fig. 7

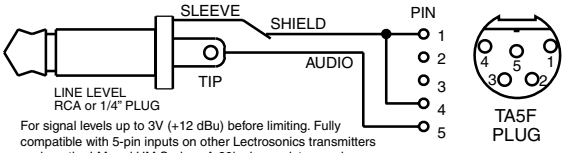
BALANCED AND FLOATING LINE LEVEL SIGNALS



*NOTE: If the output is balanced but center tapped to ground, such as on all Lectrosonics receivers, do not connect Pin 3 of the XLR jack to Pin 4 of the TA5F connector.

Fig. 8

UNBALANCED LINE LEVEL SIGNALS



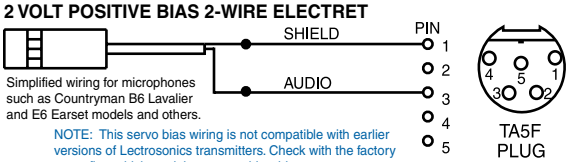
For signal levels up to 3V (+12 dBu) before limiting. Fully compatible with 5-pin inputs on other Lectrosonics transmitters such as the LM and UM Series. A 20k ohm resistor can be inserted in series with Pin 5 for an additional 20 dB of attenuation to handle up to 30V (+32 dBu).

Simple Wiring - Can ONLY be used with Servo Bias Inputs:

Servo Bias was introduced in 2005 and all transmitters with 5-pin inputs have been built with this feature since 2007.

Fig. 9

2 VOLT POSITIVE BIAS 2-WIRE ELECTRET

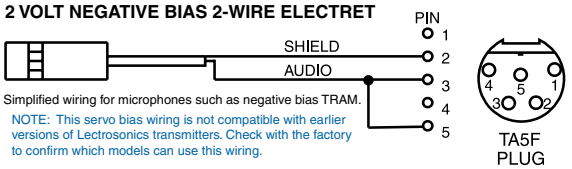


Simplified wiring for microphones such as Countryman B6 Lavalier and E6 Earset models and others.

NOTE: This servo bias wiring is not compatible with earlier versions of Lectrosonics transmitters. Check with the factory to confirm which models can use this wiring.

Fig. 10

2 VOLT NEGATIVE BIAS 2-WIRE ELECTRET

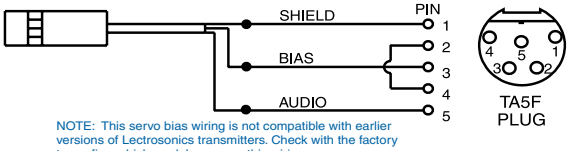


Simplified wiring for microphones such as negative bias TRAM.

NOTE: This servo bias wiring is not compatible with earlier versions of Lectrosonics transmitters. Check with the factory to confirm which models can use this wiring.

Fig. 11

4 VOLT POSITIVE BIAS 3-WIRE ELECTRET



NOTE: This servo bias wiring is not compatible with earlier versions of Lectrosonics transmitters. Check with the factory to confirm which models can use this wiring.

Microphone RF Bypassing

When used on a wireless transmitter, the microphone element is in the proximity of the RF coming from the transmitter. The nature of electret microphones makes them sensitive to RF, which can cause problems with microphone/transmitter compatibility. If the electret microphone is not designed properly for use with wireless transmitters, it may be necessary to install a chip capacitor in the mic capsule or connector to block the RF from entering the electret capsule.

Some mics require RF protection to keep the radio signal from affecting the capsule, even though the transmitter input circuitry is already RF bypassed.

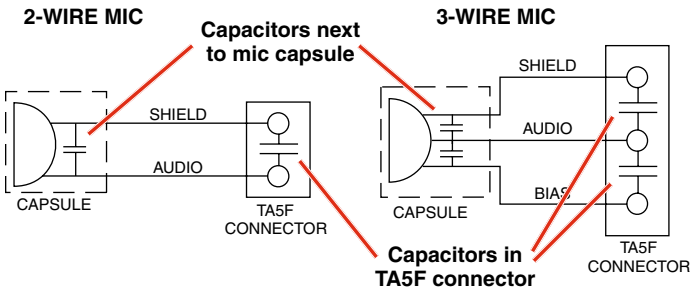
If the mic is wired as directed, and you are having difficulty with squealing, high noise, or poor frequency response, RF is likely to be the cause.

The best RF protection is accomplished by installing RF bypass capacitors at the mic capsule. If this is not possible, or if you are still having problems, capacitors can be installed on the mic pins inside the TA5F connector housing. Refer to the diagram below for the correct locations of capacitors.

Use 330 pF capacitors. Capacitors are available from Lectrosonics. Please specify the part number for the desired lead style.

Leaded capacitors: P/N 15117
Leadless capacitors: P/N SCC330P

All Lectrosonics lavaliere mics are already bypassed and do not need any additional capacitors installed for proper operation.



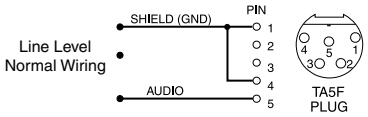
Line Level Signals

The wiring for line level and instrument signals is:

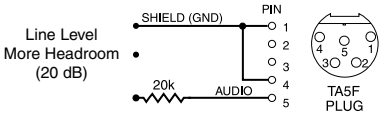
- Signal Hot to pin 5
- Signal Gnd to pin 1
- Pin 4 jumped to pin 1

This allows signal levels up to 3V RMS to be applied without limiting.

NOTE for line level inputs only (not instrument): If more headroom is needed, insert a 20 k resistor in series with pin 5. Put this resistor inside the TA5F connector to minimize noise pickup. The resistor will have little or no effect on the signal if the input is set for instrument.



See Fig. 8 on previous page



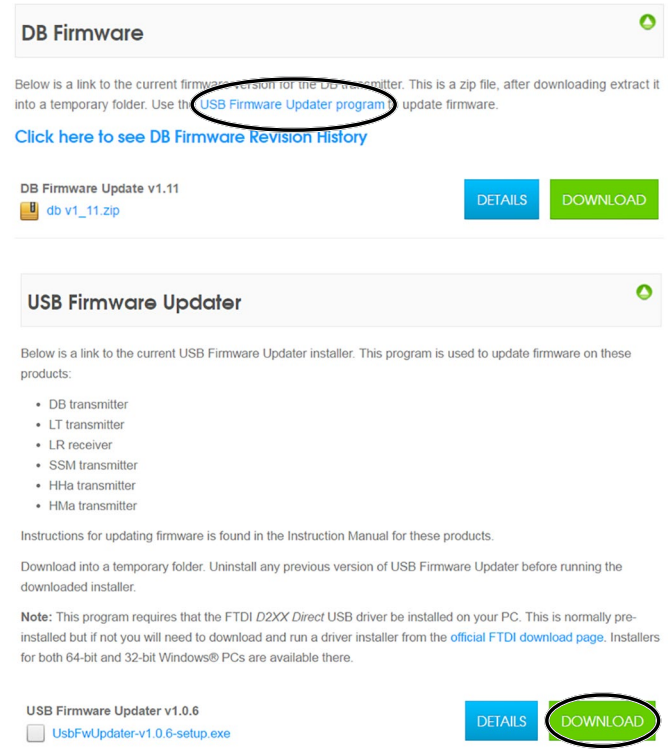
Firmware Update

Updating the firmware is a simple matter of downloading a utility program and file from the website and running the program on a **Windows operating system** with the transmitter connected to a computer via the USB port.

Go to www.lectrosonics.com/US. In the top menu, hover the mouse over Support, and click on Wireless Support. On the right-hand-side Wireless Support Menu, choose Wireless Downloads. Choose your product (DSW Series,) then choose DB Firmware.

Step 1:

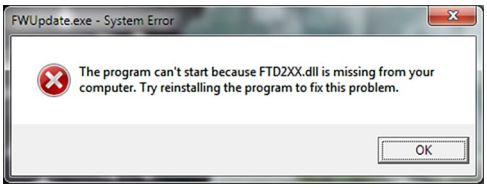
Begin by downloading the USB Firmware Updater Program.



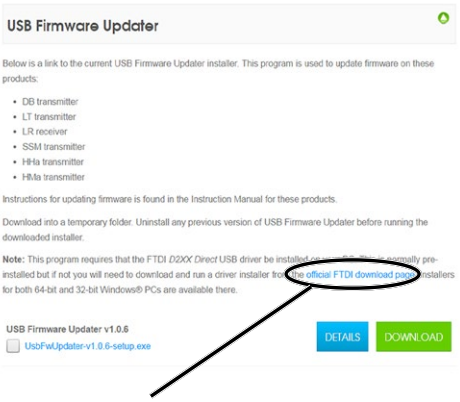
Step 2:

Next, test the Updater by opening the icon: If the driver opens automatically, proceed to Step 3.

WARNING: If you receive the following error, the FTDI USB Device Driver is not installed on your system. Follow the TROUBLESHOOTING steps to fix the error.



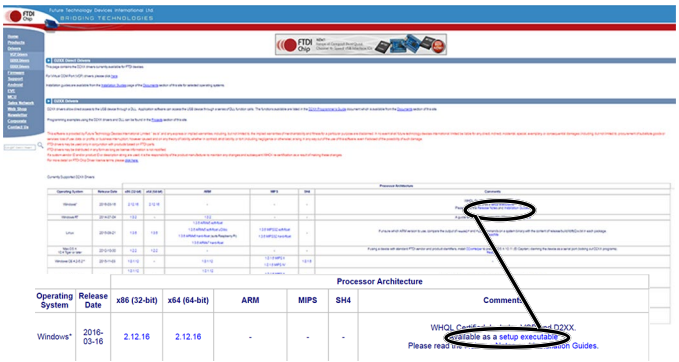
TROUBLESHOOTING:



If you receive the FTDI D2XX error shown above, download and install the driver by clicking on this link.

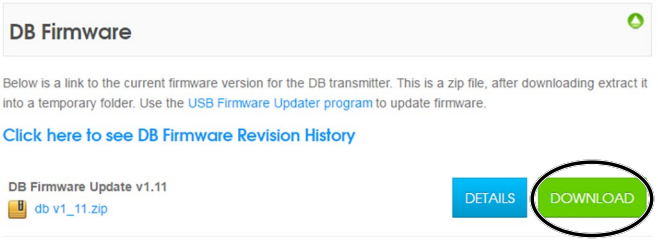
Then click here to download.

NOTE: This website, http://www.ftdichip.com/Drivers/D2XX.htm, is not associated with Lectrosonics.com. It is a third party site used only for D2XX drivers currently available for Lectrosonics' devices' upgrades.



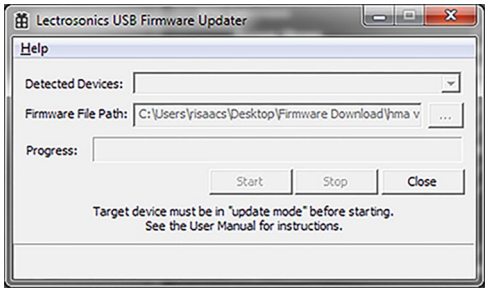
Step 3:

Refer to Step 1 to return to Firmware web page. Download Firmware Update and save to a local file on your PC for easy locating when updating.



Step 4:

Open Lectrosonics USB Firmware Updater.



Step 5:

Put the transmitter in UPDATE mode by simultaneously holding down the ***UP*** and ***DOWN*** arrow buttons on the transmitter control panel while powering it up.

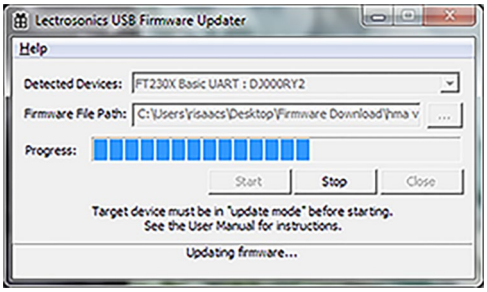
Step 6:

Using a microUSB cable, connect the transmitter to your PC.

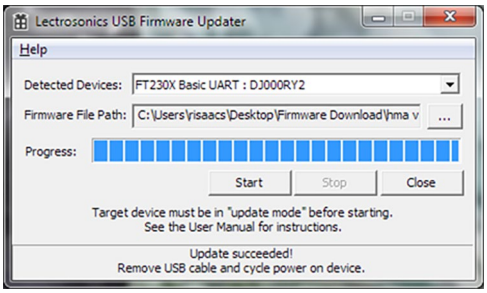
Step 7:

In Lectrosonics USB Firmware Updater, choose the detected device, browse to local Firmware File and click Start.

NOTE: It may take up to a minute or so for the Updater to recognize the transmitter.



WARNING: Do not disrupt the microUSB cable during updating.



The Updater alerts with progress and completion.

Step 8:

Once the Updater has completed, turn off the transmitter, then turn it back on to verify that the firmware version on the transmitter LCD matches the firmware version shown on the web site. The firmware is the second LCD display during boot up sequence.

Step 9:

Close Updater and disconnect microUSB cable.

Troubleshooting

It is important that you follow these steps in the sequence listed.

Symptom:	Possible Cause:
Transmitter Battery LED off when Power Switch "ON"	1. Batteries are inserted incorrectly. 2. Batteries are low or dead.
No Transmitter Modulation LEDs when Signal Should be Present	1. Gain control turned all the way down. 2. Batteries are inserted incorrectly. Check power LED. 3. Mic capsule is damaged or malfunctioning. 4. Mic cable damaged or miswired. 5. Instrument Cable damaged or not plugged in. 6. Musical instrument output level set too low.
Receiver Indicates RF But No Audio	1. Audio source or cable connected to transmitter is defective. Try using an alternate source or cable. 2. Make sure the compatibility mode is the same on transmitter and receiver. 3. Ensure musical instrument volume control is not set to minimum. 4. Check for correct pilot tone indication on the receiver. See item on page 11 entitled ***About Overlapping Frequency Bands.***
Receiver RF Indicator Off	1. Ensure that the transmitter and receiver are set to the same frequency, and that the hex code matches. 2. Transmitter not turned on, or battery is dead. 3. Receiver antenna missing or improperly positioned. 4. Operating distance is too great. 5. Transmitter may be set to the Standby Mode. See page 8.
No Sound (Or Low Sound Level), Receiver Indicates Proper Audio Modulation	1. Receiver output level set too low. 2. Receiver output is disconnected; cable is defective or miswired. 3. Sound system or recorder input is turned down.
Distorted Sound	1. Transmitter gain (audio level) is too high. Check Modulation LEDs on transmitter and receiver while distortion is being heard. 2. Receiver output level may be mismatched with the sound system or recorder input. Adjust output level on receiver to the correct level for the recorder, mixer or sound system. 3. Transmitter and receiver may not be set to the same compatibility mode. Some mis-matched combinations will pass audio. 4. RF interference. Reset both transmitter and receiver to a clear channel. Use scanning function on receiver if available.
Wind Noise or Breath "Pops'"	1. Reposition microphone, or use a larger windscreen, or both. 2. Omni-directional mics produce less wind noise and breath pops than directional types.
Hiss and Noise -- Audible Dropouts	1. Transmitter gain (audio level) far too low. 2. Receiver antenna missing or obstructed. 3. Operating distance too great. 4. RF interference. Reset both transmitter and receiver to a clear channel. Use scanning function on receiver if available. 5. Musical instrument output set too low. 6. Microphone capsule picking up RF noise. See item on page 15 entitled ***Microphone RF Bypassing***.
Excessive Feedback (With Microphone)	1. Transmitter gain (audio level) too high. Check gain adjustment and/or reduce receiver output level. 2. Microphone too close to speaker system. 3. Microphone is too far from user's mouth.

Specifications and Features

Operating Frequencies: 470.000 - 691.175

Frequency Selection Steps:	25 kHz
RF Power Output:	50 mW
Frequency Stability:	± 0.002%
Digital Modulation:	8 PSK
Spurious Radiation:	>90 dB below carrier
Equivalent Input Noise:	–128 dBV
Input Level:	Nominal 2 mV to 300 mV, before limiting Greater than 1V maximum, with limiting.
Input Impedance:	• Mic: 300 Ohm • Line: 2k Ohm
Input Limiter:	Dual envelope type; 30 dB range
Gain Control Range:	44 dB in 1 dB steps; digital control
Modulation Indicators:	• Dual bicolor LEDs indicate modulation of -20, -10, 0 and +10 dB referenced to full modulation • LCD bar graph
Controls:	• Top panel toggle switch; programmable as ***power***, ***mute*** or ***none*** (off) function • Side panel membrane switches with LCD interface for power on/off and all setup and configuration controls
Audio Input Jack:	Switchcraft 5-pin locking (TA5F)
Antenna:	Galvanized steel, flexible wire
Battery:	Two AA Duracell Quantum recommended
Battery Life:	5 hours; Duracell Quantum alkaline
Weight:	6.24 ounces (177 grams), including two AA batteries and wire belt clip
Dimensions:	3.2 x 2.5 x .74 in. (86 x 62 x 19 mm)
Emission Designator:	200KG1E

Audio Performance (Digital Hybrid mode)

Frequency Response:

Mic input:	35 Hz to 20 kHz (+/-1dB); low frequency roll-off is selectable at 35, 50, 70, 100, 120, 180 Hz
Line/Instrument:	35 Hz to 20 kHz (+/-1dB)
THD:	0.2% (typical)

SNR at receiver output:

SmartNR	No Limiting	w/Limiting
OFF	103.5	108.0
NORMAL	107.0	111.5
FULL	108.5	113.0

Note: The dual envelope "soft" limiter provides exceptionally good handling of transients using variable attack and release time constants. Once activated, the limiter compresses 30+ dB of transmitter input range into 4.5 dB of receiver output range, thus reducing the measured figure for *SNR without limiting* by 4.5 dB

Specifications subject to change without notice.

For body worn operation, this transmitter model has been tested and meets the FCC RF exposure guidelines when used with the Lectrosonics accessories supplied or designated for this product. Use of other accessories may not ensure compliance with FCC RF exposure guidelines. Contact Lectrosonics if you have any questions or need more information about RF exposure using this product..

This device complies with FCC radiation exposure limits as set forth for an uncontrolled environment. This device should be installed and operated so that its antenna(s) are not co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Industry Canada radiation exposure limits as set forth for a controlled "professional" use only.

Cet appareil est conforme avec les normes d'Industrie Canada concernant les limites d'exposition aux radiations pour un usage professionnel contrôlé seulement.

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 email 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.

Lectrosonics USA:

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

Shipping address:
Lectrosonics, Inc.
561 Laser Rd. NE, Suite 102
Rio Rancho, NM 87124
USA

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

Web:
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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 liablility 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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