LECTROSONICS DBSM-A1B1 Digital Transcorder Instruction Manual

Contents

LECTROSONICS DBSM-A1B1 Digital Transcorder

Product Information

- **Model:** DBSM/DBSMD Digital Transcorder
- **Frequency Range:** 470.100 to 607.950 MHz (DBSM/DBSMD/E01 frequency range is 470.100 to 614.375 MHz)
- **Output Power:** Selectable 10, 25, or 50 mW
- **Transmission Mode:** High-density mode at 2 mW
- **Power Source:** Two AA batteries
- **Input Jack:** Standard Lectrosonics 5-pin input jack
- **Antenna Port:** 50 ohm SMA connector

Product Usage Instructions

- **Overview**

  The DBSM/DBSMD transmitter is designed for high efficiency and extended operating time. It operates across

the UHF television band with selectable output power options.

- **Powering On**
  Insert two AA batteries into the transmitter. Make sure the batteries are properly inserted with the correct polarity. Press the power button to turn on the transmitter.
- **Frequency Tuning**
  Use the tuning controls to select the desired frequency within the supported range. Ensure that the transmitter frequency matches the receiver frequency for proper communication.
- **Input Connection**
  Connect your microphone or audio source to the standard Lectrosonics 5-pin input jack on the transmitter. Use appropriate cables and connectors for a secure connection.
- **Level Settings**
  Adjust the audio levels using the keypad LEDs for quick and accurate settings. Monitor the levels to prevent distortion or audio clipping.
- **Recording Function**
  The transmitter has a built-in recording function for standalone use or situations where RF transmission is not feasible. Remember that recording and transmitting cannot be done simultaneously.
- **Battery Replacement**
  Monitor the battery status regularly. When the batteries are low, replace them with fresh AA batteries to ensure uninterrupted operation.

Frequently Asked Questions

Q: Can I use non-Lectrosonics microphones with the transmitter?

A: Yes, you can terminate non-Lectrosonics microphones using appropriate cable terminations. Refer to the user manual for detailed instructions on wiring configurations.

Q: What is the purpose of the DSP-controlled Input Limit?

A: The DSP-controlled Input Limit helps prevent audio distortion by limiting input levels within a safe range, ensuring clear audio transmission.

Q: How do I know when to replace the batteries?

A: Keep an eye on the battery status indicator. When the indicator shows low battery levels, replace the batteries promptly to avoid interruptions in operation.

Introduction

The DBSM/DBSMD transmitter employs high-efficiency digital circuitry for extended operating time on two AA batteries. The transmitter can tune in steps across the UHF television band from 470.100 to 607.950 MHz (DBSM/DBSMD/E01 frequency range is 470.100 to 614.375 MHz), with a selectable output power of 10, 25, or 50 mW. A high-density transmission mode at 2 mW allows close carrier spacing for maximum channels within a given amount of spectrum.

The pure digital architecture enables AES 256 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.

The housing is a rugged, machined aluminum package with a standard Lectrosonics 5-pin input jack for use with electret lavaliere mics, dynamic mics, musical instrument pickups, and line-level signals. The LEDs on the keypad allow quick and accurate level settings without having to view the receiver. The unit is powered by AA batter-ies, and the antenna port uses a standard 50 ohm SMA connector.
Switching power supplies provide constant voltages to the transmitter circuits from the beginning to the end of the battery life, with output power remaining constant over the life of the battery.

Servo Bias Input and Wiring

The input preamp is a unique design that delivers audible improvements over conventional transmitter inputs. 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. A line-level input wiring provides an extended frequency response with an LF roll-off at 20 Hz for use with instruments and line-level signal sources.

DSP-controlled Input Limiter

The transmitter employs a digitally controlled analog audio limiter before 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 a 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.

Recorder function

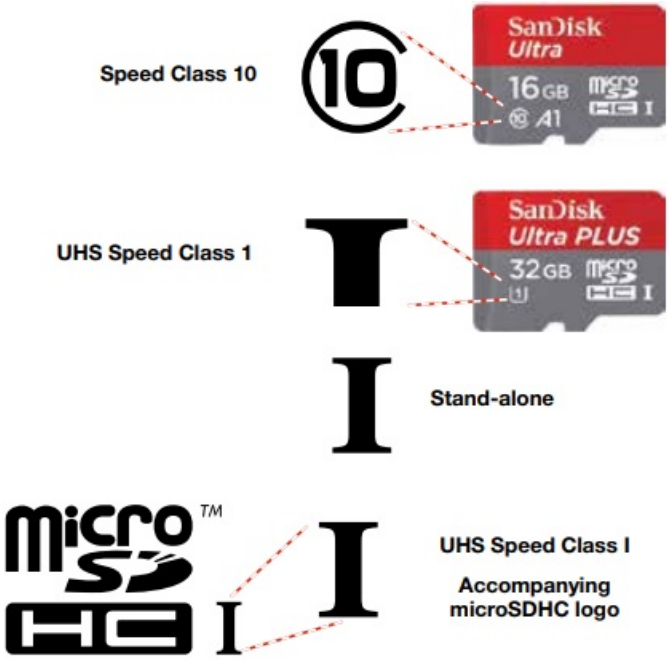
The DBSM/DBSMD has a built-in recording function for use in situations where RF may not be possible or to work as a stand-alone recorder. The record function and transmit functions are exclusive of each other – you cannot record AND transmit at the same time. When the unit is transmitting and recording is turned on, the audio in the RF transmission will stop, but the battery status will still be sent to the receiver. The recorder samples at a 48 kHz rate with a 24-bit sample depth. The micro SDHC card also offers easy firmware update capabilities without the need for a USB cable or driver issues.

Encryption

When transmitting audio, there are situations where privacy is essential, such as during professional sporting events, in courtrooms or in private meetings. For instances where your audio transmission needs to be kept secure, without sacrificing audio quality, Lectrosonics implements AES256 encryption in our digital wireless micro-phone systems. High entropy encryption keys are first created by a Lectrosonics receiver such as the DSQD Receiver. The key is then synced with the DBSM via the IR port. The transmission will be encrypted and can only be decoded if the receiver and transmitter have matching encryption keys. If you are trying to transmit an audio signal and the keys do not match, all that will be heard is silence.

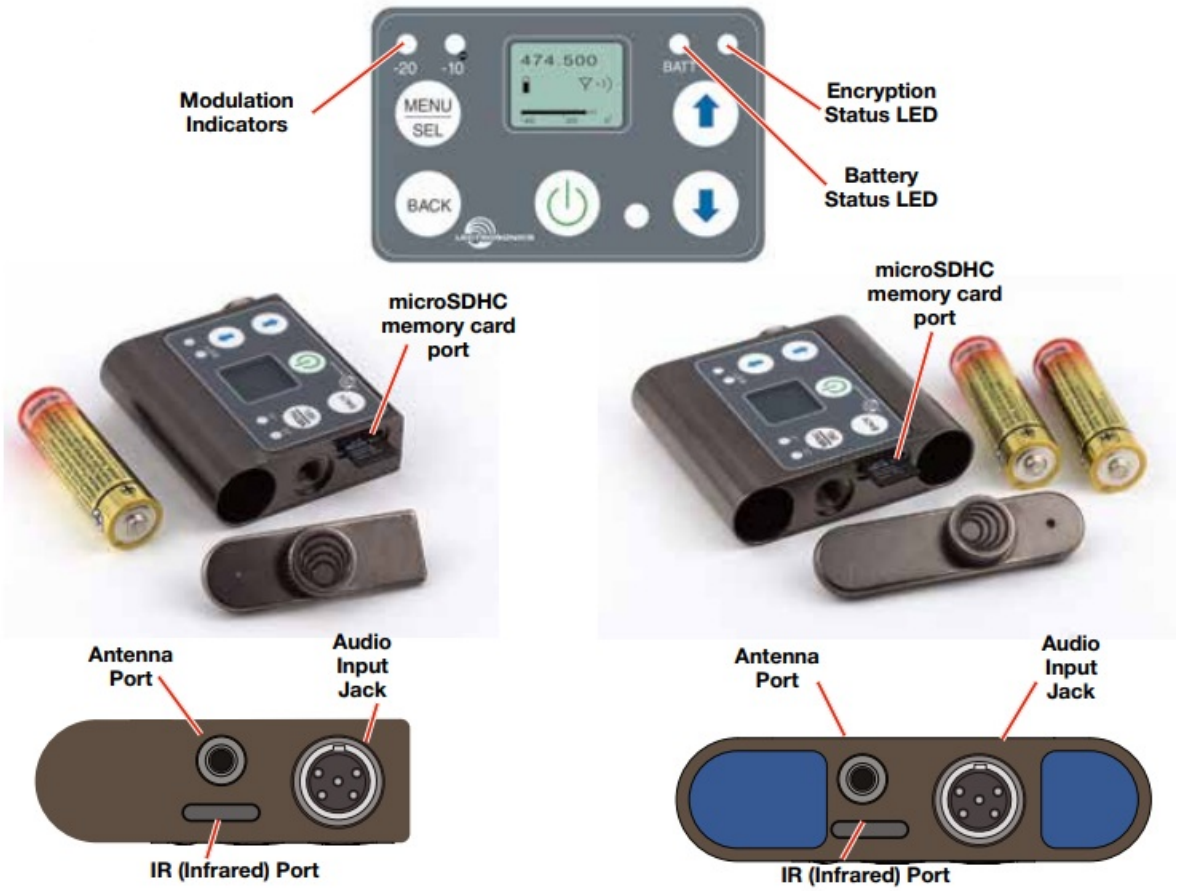
Compatibility with microSDHC memory cards

- Please note that the DBSM/DBSMD are designed for use with microSDHC memory cards. There are several types of SD card standards (as of this writing) based on capacity (storage in GB).
    - SDSC: standard capacity, up to and including 2 GB – DO NOT USE!
    - SDHC: high capacity, more than 2 GB and up to and including 32 GB – USE THIS TYPE.
    - SDXC: extended capacity, more than 32 GB and up to and including 2 TB – DO NOT USE!
    - SDUC: extended capacity, more than 2TB and up to and including 128 TB – DO NOT USE!
- The larger XC and UC cards use a different formatting method and bus structure and are NOT compatible with the recorder. These are typically used with later-generation video systems and cameras for image applications (video and high resolution, high-speed photography).
- ONLY microSDHC memory cards should be used. They are available in capacities from 4GB to 32 GB. Look for the Speed Class 10 cards (as indicated by a C wrapped around the number 10), or the UHS Speed Class I cards (as indicated by the numeral 1 inside a U symbol). Also, note the microSDHC Logo.
- If you are switching to a new brand or source of card, we always suggest testing first before using the card on a critical application.
- The following markings will appear on compatible memory cards. One or all of the markings will appear on the card housing and the packaging.

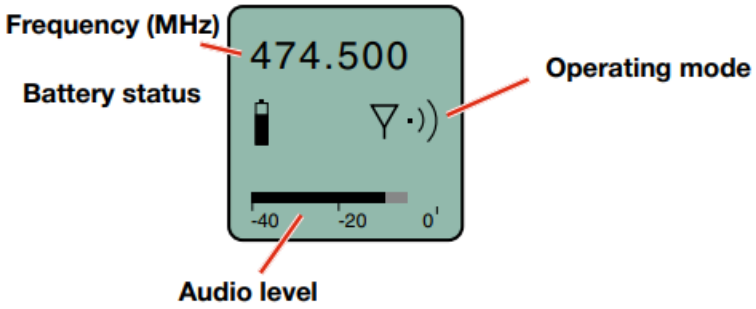


microSDHC Logo is a trademark of SD-3C, LLC

Features



Main Window Indicators
The Main Window displays RF Standby or Operating (transmitting) mode, operating frequency, audio level, and battery status.



Battery Status LED Indicator

- AA batteries can be used to power the transmitter.
- The LED labeled BATT on the keypad glows green when the batteries are good. The color changes to red when the battery voltage drops down and stays red through the remainder of the battery life. When the LED begins to blink red, there will be only a few minutes of run time remaining.
- 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 LED to glow green immediately after the transmitter is turned on, but it will soon discharge to the point where the LED will turn red or the unit will turn off completely.
- Some batteries give little or no warning when they are depleted. If you wish to use these batteries in the transmitter, you will need to manually keep track of the operating time using the receiver battery timer function

to prevent interruptions caused by dead batteries.

- Start with a fully charged battery, then measure the time it takes for the Power LED to go out completely.

NOTE:
The battery timer feature in many Lectrosonics receivers is very helpful in measuring battery runtime. Refer to the receiver instructions for details on using the timer.

Encryption Status LED Indicator Modes

- StandBy: The blue LED is OFF and the Operating Mode Indicator icon has a line through it
- Missing/Wrong Key: Blue LED is FLASHING
- Transmitting: Blue LED is steadily ON

IR (infrared) Sync
The IR port is for quick setup using a receiver with this function available. IR Sync will transfer the settings for frequency, step size, and compatibility mode from the receiver to the transmitter. This process is initiated by the receiver. When the sync function is chosen on the receiver, hold the IR port of the transmitter near the IR port of the receiver. (There is no menu item available on the transmitter to initiate the sync.)

NOTE:
If a mismatch exists between the receiver and transmitter, an error message will appear on the transmitter LCD stating what the problem is.

Battery Installation

- The transmitter is powered by AA batteries. We recom-mend using lithium for the longest life.
- Because some 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 Lectrosonics receivers.
- The battery door opens by simply unscrewing the knurled knob partway until the door will rotate. The door is also easily removed by unscrewing the knob completely, which is helpful when cleaning the battery contacts. The battery contacts can be cleaned with alcohol and a cot-ton swab, or a clean pencil eraser. Be sure not to leave any remnants of the cotton swab or eraser crumbs inside the compartment.
- A small pinpoint dab of silver conductive grease on the thumbscrew threads can improve battery performance and operation. See page 22. Do this if you experience a drop in battery life or an increase in operating tempera-ture.
- If you are unable to locate a supplier of this type of grease – a local electronics shop for example – contact your dealer or the factory for a small maintenance vial.
- Insert the batteries according to the markings on the back of the housing. If the batteries are inserted incor-rectly, the door may close but the unit will not operate.

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

Formatting SD Card

- New microSDHC memory cards come pre-formatted with a FAT32 file system which is optimized for good performance. The unit relies on this performance and will never disturb the underlying low-level formatting of the SD card.
- When the DBSM/DBSMD “formats” a card, it performs a function similar to the Windows “Quick Format” which deletes all files and prepares the card for recording. The card can be read by any standard computer but if any write, edit, or deletions are made to the card by the computer, the card must be re-formatted with the DBSM/DBSMD to prepare it again for recording. The DBSM/DBSMD never low-level formats a card and we strongly advise against doing so with the computer.
- To format the card with the DBSM/DBSMD, select Format Card in the menu and press MENU/SEL on the keypad.

WARNING:
Do not perform a low-level format (com-plete format) with a computer. Doing so may render the memory card unusable with the DBSM/DBSMD recorder. With a Windows-based computer, be sure to check the quick format box before formatting the card. With a Mac, choose MS-DOS (FAT).

IMPORTANT
The formatting of the SD card sets up contiguous sectors for maximum efficiency in the recording process. The file format utilizes the BEXT (Broadcast Extension) wave format which has sufficient data space in the header for the file information and the time code imprint.

- The SD card, as formatted by the DBSM/DBSMD recorder, can be corrupted by any attempt to directly edit, change, format, or view the files on a computer.
- The simplest way to prevent data corruption is to copy the .wav files from the card to a computer or other Windows or OS-formatted media FIRST. Repeat – COPY THE FILES FIRST!
- Do not rename files directly on the SD card.
- Do not attempt to edit the files directly on the SD card.
- Do not save ANYTHING to the SD card with a computer (such as the take log, note file,s etc) – it is formatted for DBSM recorder use only.
- Do not open the files on the SD card with any third-party program such as Wave Agent or Audacity and permit a save. In Wave Agent, do not IMPORT – you can OPEN and play it but do not save or Import – Wave Agent will corrupt the file.
- In short – there should be NO manipulation of the data on the card or addition of data to the card with anything other than a DBSM/DBSMD recorder. Copy the files to a computer, thumb drive, hard drive, etc. that has been formatted as a regular OS device FIRST – then you can edit freely.

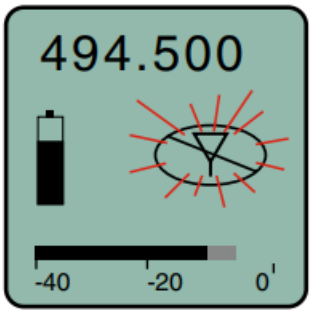
iXML HEADER SUPPORT
Recordings contain industry-standard iXML chunks in the file headers, with the most commonly used fields filled in.

Turning the Transmitter Power ON

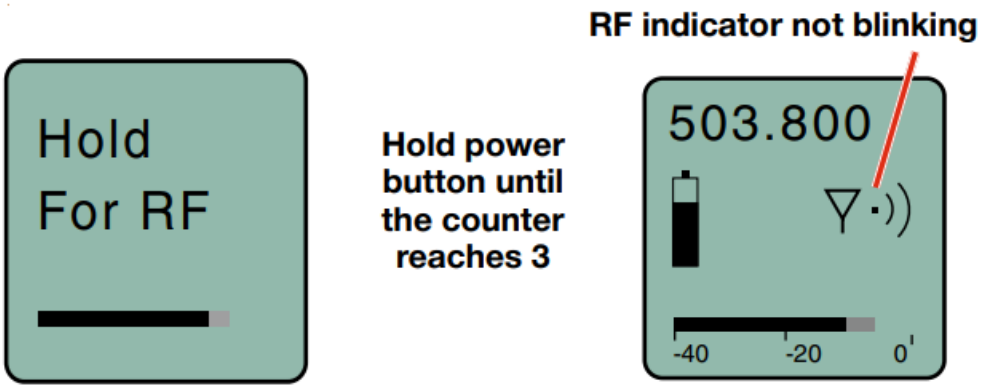
Short Button Press

When the unit is turned off, a short press of the power button will turn the unit on in the Standby Mode with the RF output turned off. This is useful for adjusting settings on the unit without transmitting.

RF indicator blinks



Long Button Press
When the unit is turned off, a long press of the power button will start a countdown to turn the unit on with the RF output turned on. Continue to hold the button until the countdown is complete.



If the button is released before the countdown is completed, the unit will power up with the RF output turned off.

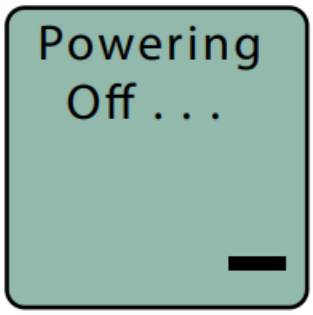
Menu Shortcuts
From the Main/Home Screen, the following shortcuts are available:

- LEDs On: Press the UP arrow
- LEDs Off: Press the DOWN arrow
- Gain Setting: Long press the MENU button and hold while adjusting gain up or down using the arrow keys
- Record: Press the BACK + UP arrow simultaneously
- Stop Recording: Press the BACK + DOWN arrow simultaneously

NOTE:
The recording shortcuts are only available from the main/home screen AND when a microSDHC memory card is installed.

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 moving progress bar, or with the programmable switch (if it is configured for this function).



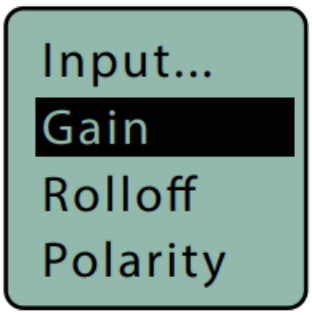
If the power button is released, or the top panel switch is turned back on again before the moving bar progresses, the unit will remain turned on and the LCD will return to the same screen or menu that was displayed previously.

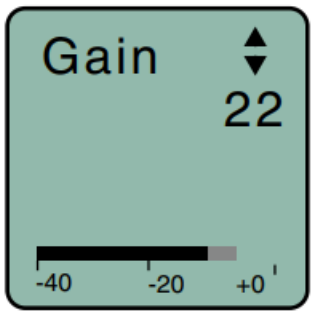
NOTE:
If the programmable switch is in the OFF position, power can still be turned on with the power button. If the programmable switch is then turned on, a brief message will appear on the LCD.

Recorder Operating Instructions

- Install battery(s)
- Insert microSDHC memory card
- Turn power on
- Format memory card
- Connect a microphone and place it in the position where it will be used.
- Have the user talk or sing at the same level that will be used in the production, and adjust the input gain so that the -20 LED blinks red on louder peaks.

Use the UP and DOWN arrow buttons to adjust the gain until the -20 LED blinks red on louder peaks





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

- Press MENU/SEL, choose SDCard, and Record from the menu

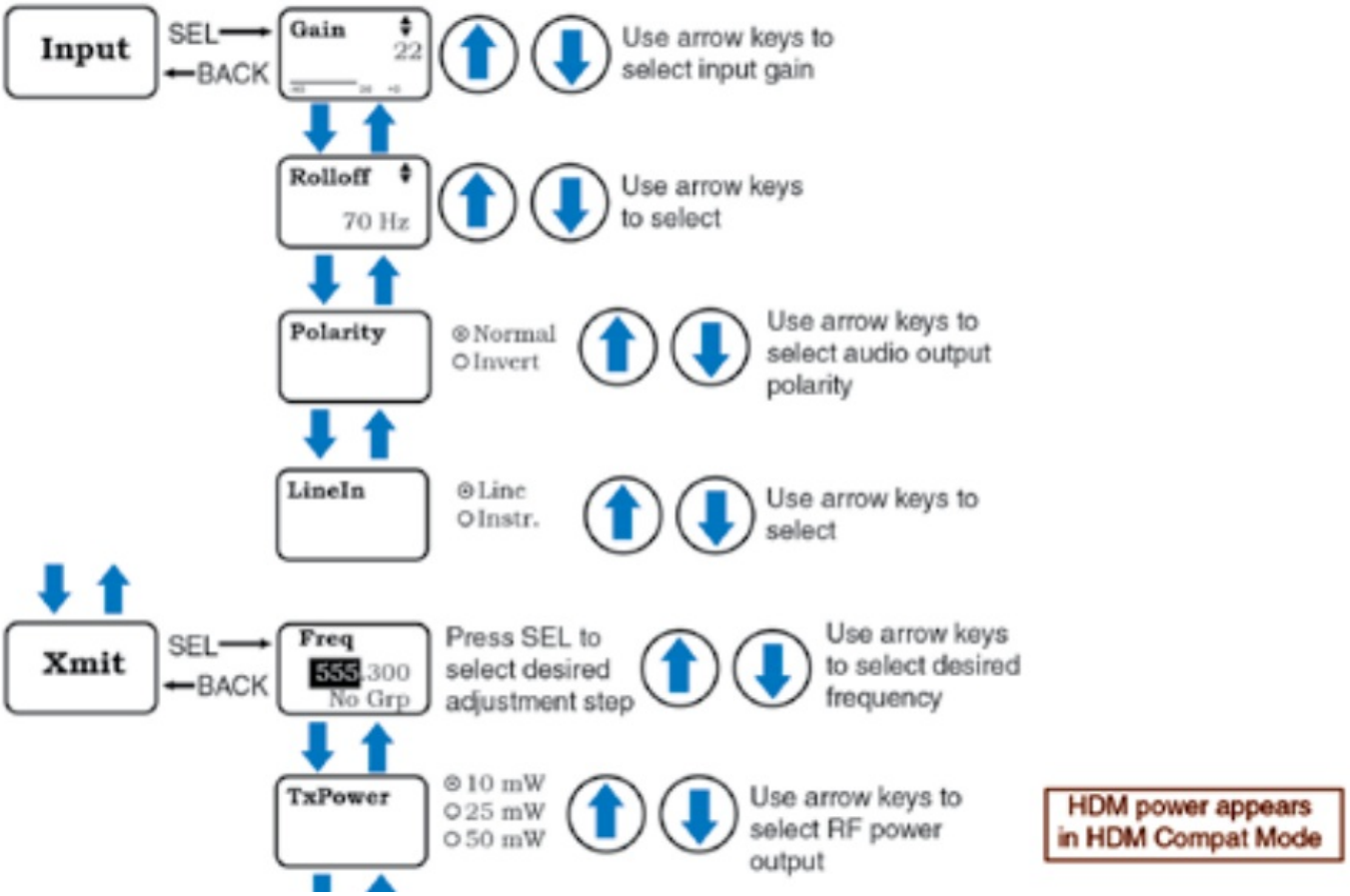
- To stop recording, press MENU/SEL, choose SDCard, and Stop; the word SAVED appears on the screen

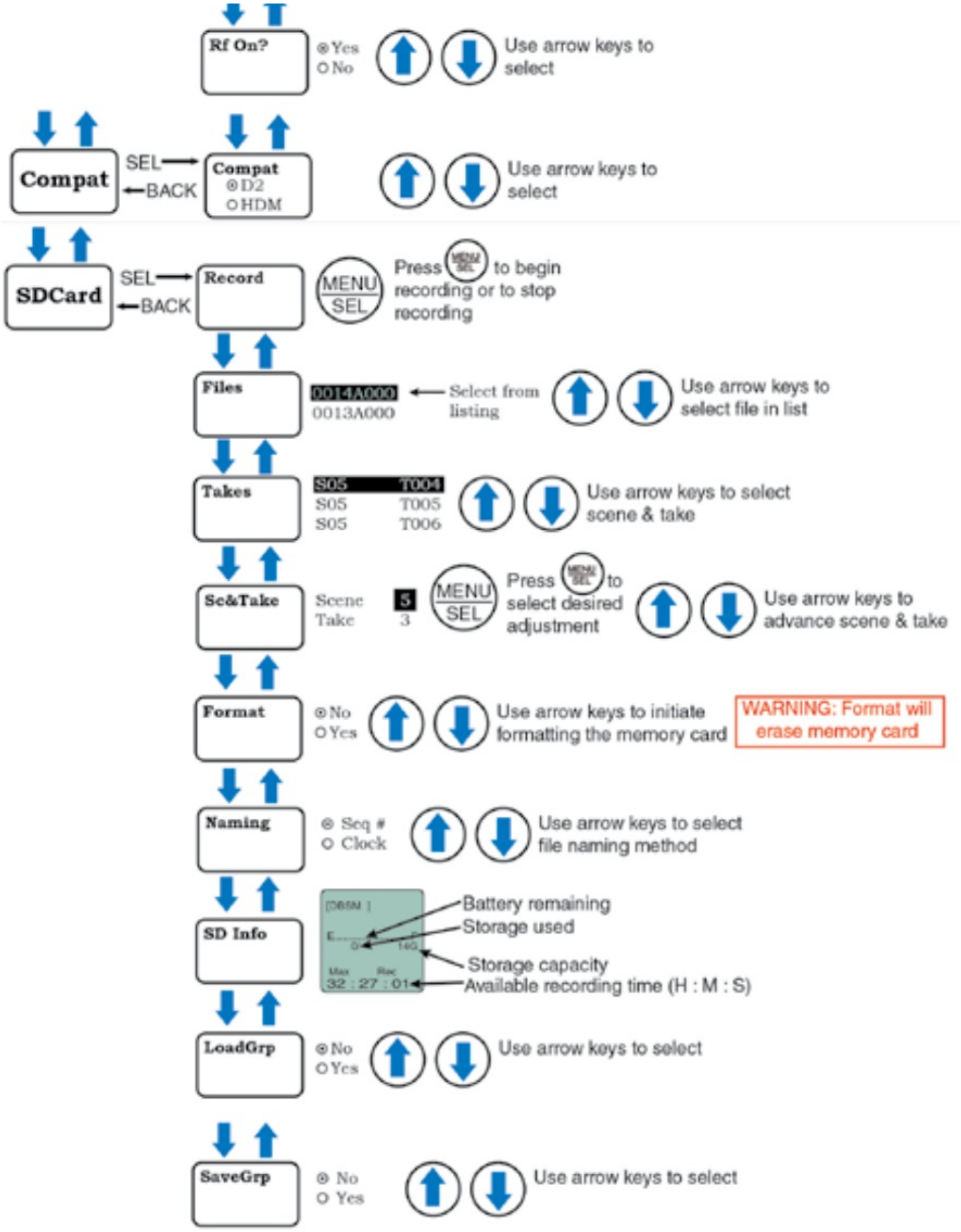
NOTE: Record and Stop Recording may also be achieved by shortcut keys from the main/home screen:

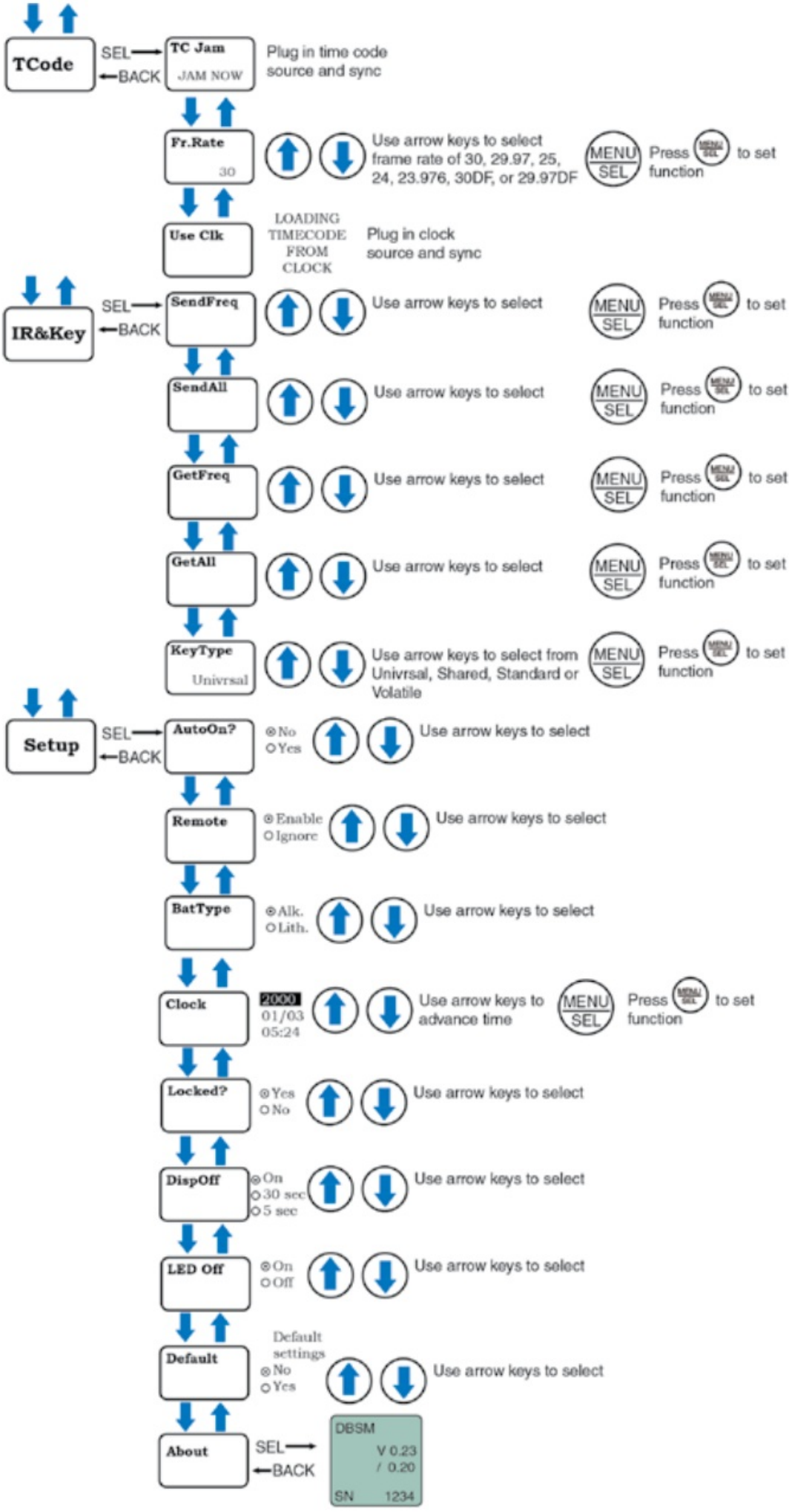
- Simultaneous press of BACK button + UP arrow button: Begin record
- Simultaneous press of BACK button + DOWN arrow button: Stop record

DBSM/DBSMD Menu Map

- From the Main Window, press MENU/SEL.
- Use the UP/DOWN arrow keys to select the item.



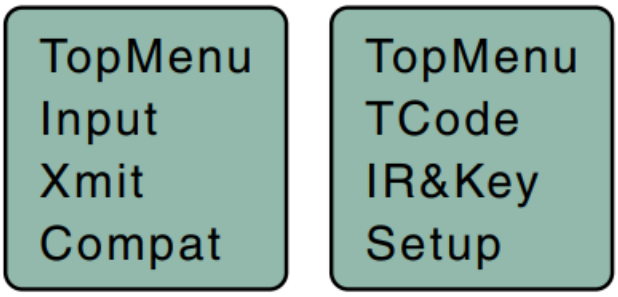

Rf On?
Yes
No
Use arrow keys to select
Compat
SEL
BACK
Compat
D2
HDM
Use arrow keys to select
SDCard
SEL
BACK
Record
MENU SEL
Press to begin recording or to stop recording
Files
0014A000
0013A000
Select from listing
Use arrow keys to select file in list
Takes
S05 T004
S05 T005
S05 T006
Use arrow keys to select scene & take
Sc&Take
Scene 5
Take 3
MENU SEL
Press to select desired adjustment
Use arrow keys to advance scene & take
Format
No
Yes
Use arrow keys to initiate formatting the memory card
WARNING: Format will erase memory card
Naming
Seq #
Clock
Use arrow keys to select file naming method
SD Info
Battery remaining
Storage used
Storage capacity
Available recording time (H : M : S)
32 : 27 : 01
LoadGrp
No
Yes
Use arrow keys to select
SaveGrp
No
Yes
Use arrow keys to select


TCode
SEL
BACK
TC Jam
JAM NOW
Plug in time code source and sync
Fr.Rate
30
Use arrow keys to select frame rate of 30, 29.97, 25, 24, 23.976, 30DF, or 29.97DF
MENU SEL
Press to set function
Use Clk
LOADING TIMECODE FROM CLOCK
Plug in clock source and sync
IR&Key
SendFreq
Use arrow keys to select
SendAll
GetFreq
GetAll
KeyType
Univrsal
Use arrow keys to select from Univrsal, Shared, Standard or Volatile
Setup
AutoOn?
No
Yes
Remote
Enable
Ignore
BatType
Alk.
Lith.
Clock
2000
01/03
05:24
Use arrow keys to advance time
Locked?
DispOff
On
30 sec
5 sec
LED Off
Default
Default settings
About
DBSM
V 0.23
/ 0.20
SN 1234

Menu Screen Details

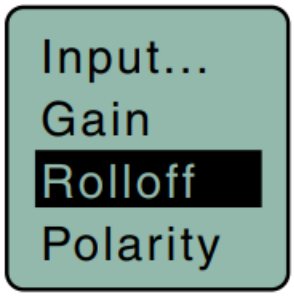
Top Menu

From the Default screen, pressing MENU/SEL will access the Top Menu. The Top Menu allows the user to access the various sub-menus to control the unit.



Input Menu

From the TopMenu, use the ⬆ and ⬇ arrow buttons to highlight INPUT and press MENU/SEL.



Adjusting the Input Gain

The two bicolor Modulation LEDs on the control panel provide a visual indication of the audio signal level enter-ing the transmitter. The LEDs will glow either red or green to indicate modulation levels as shown in the following table.

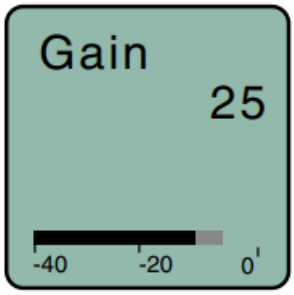
Signal Level	-20 LED	-10 LED
Less than -20 dB	● Off	● Off
-20 dB to -10 dB	● Green	● Off
-10 dB to +0 dB	● Green	● Green
+0 dB to +10 dB	● Red	● Green
Greater than +10 dB	● Red	● Red

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 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 Turning Power ON and OFF).

2. Navigate to the Gain setup screen.

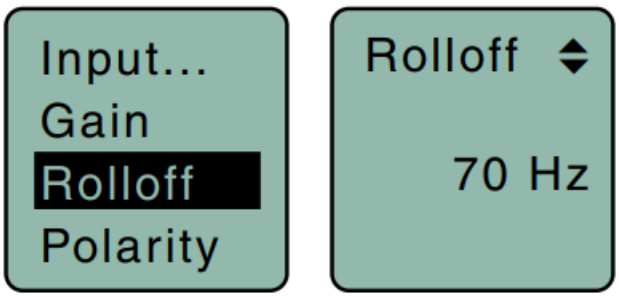


3. Prepare the signal source. Position a microphone the way it will be used in actual operation and have the user speak or sing at the loudest level that will occur during use, or set the output level of the in-strument or audio device to the maximum level that will be used.
4. Use the and arrow buttons 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 instruc-tions, and do not change it to adjust the audio output level of the receiver.

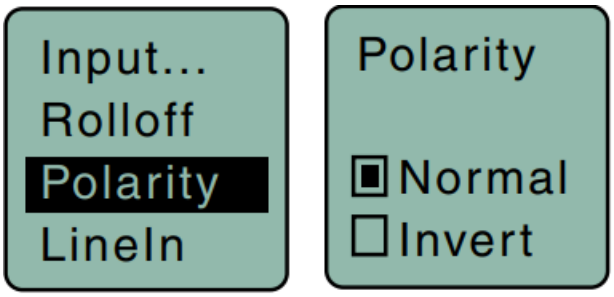
Selecting the Low Frequency Roll-off
It is possible that the low-frequency roll-off point could affect the gain setting, so it's generally good practice to make this adjustment before adjusting the input gain. The point at which the roll-off takes place can be set to:

- LF 20 20 Hz
- LF 35 35 Hz
- LF 50 50 Hz
- LF 70 70 Hz
- LF 100 100 Hz
- LF 120 120 Hz
- LF 150 150 Hz

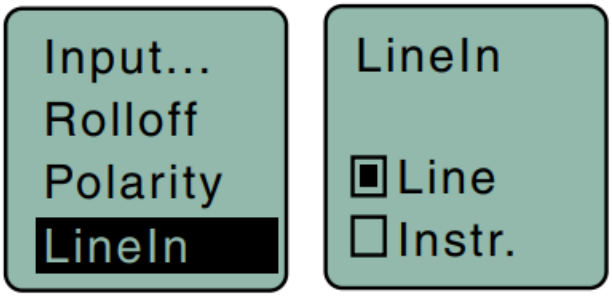
The roll-off is often adjusted by ear while monitoring the audio.



Selecting Audio Polarity
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.

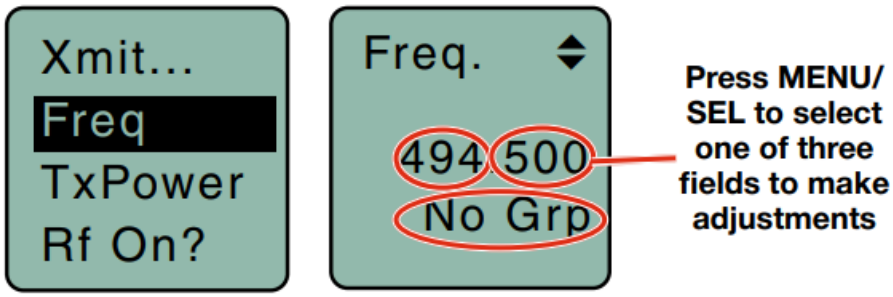


Selecting LineIn/Instrument
Audio input can be selected as either LineIn or Instrument Level.



Xmit Menu
Use the and arrow buttons to select the Transmit Menu from the top menu.

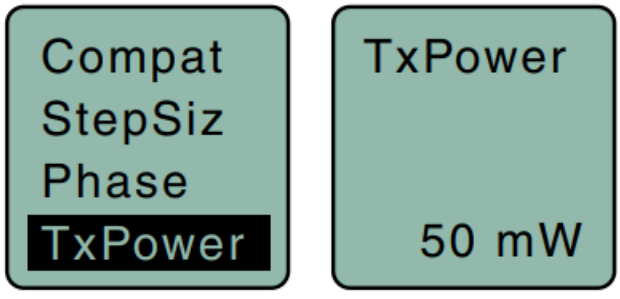
Selecting Frequency
The setup screen for frequency selection offers several ways to browse the available frequencies.



Pressing MENU/SEL will change frequency fields. The MHz frequency will change in 1 MHz steps, the KHz frequency will change in 25 KHz steps.

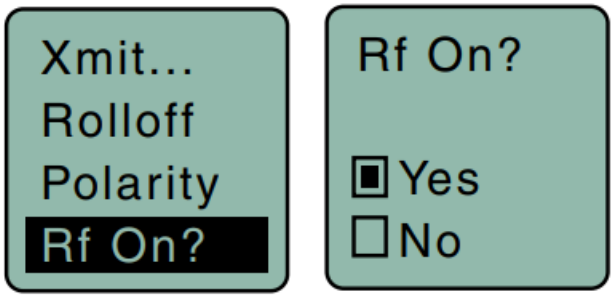
Setting Transmitter Output Power
The output power can be set to:

- 10, 25 or 50 mW, or HDM (High Density Mode)



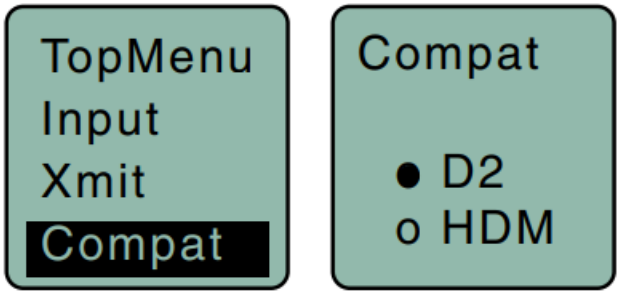
RF On?

RF transmission can be turned on or off using the and arrow buttons.



Compact Menu

Selecting the Compatibility Mode



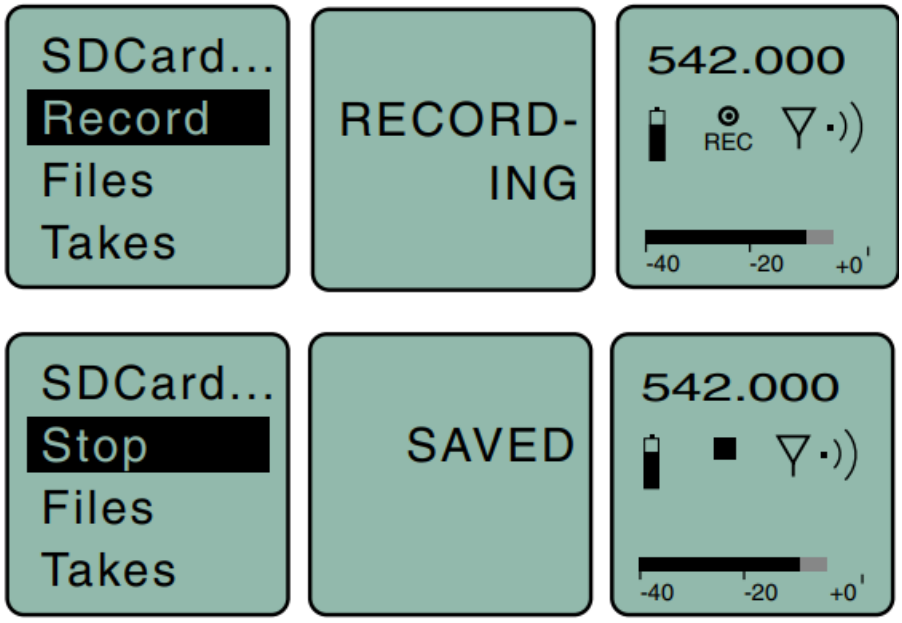
- Use the and arrow buttons to select the desired mode, then press the BACK button twice to return to the Main Window.
- Compatibility modes are as follows:

  DBSM/DBSMD:
  - Standard Mono Digital D2
  - High-Density Mode HDM

HDM Mode (High Density Transmission)
This special transmitting mode and associated low RF power of 2mW allows the user to “stack” many units into a very small area of the spectrum. Standard, ETSI-compliant RF carriers take up about 200 kHz of occupied bandwidth, while HDM takes up about half of that, or 100 kHz, and allows for much tighter channel spacing.

SD Card Menu
The SD Card Menu can be accessed from the TopMenu. It contains various recording functions, file management, and naming.

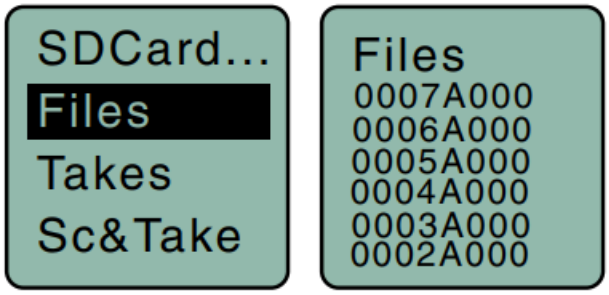
Record
Selecting this will start the unit recording. To stop recording, press MENU/SEL, choose SDCard, and Stop; the word SAVED appears on the screen.



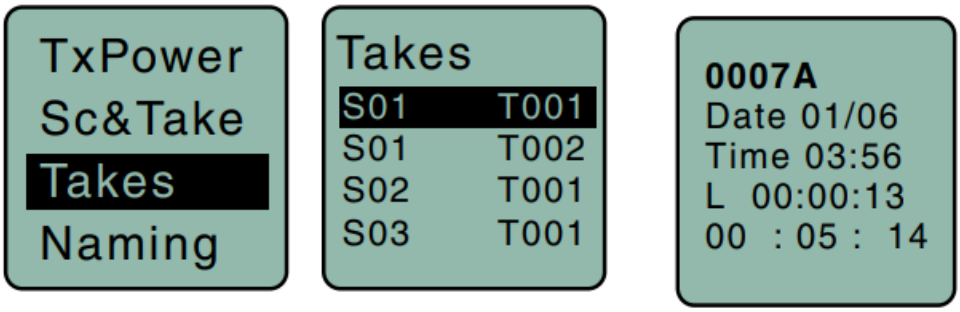
NOTE:
Record and Stop Recording may also be achieved by shortcut keys from the main/home screen:

- Simultaneous press of BACK button + UP arrow button: Begin record
- Simultaneous press of BACK button + DOWN arrow button: Stop record

Files
This screen shows the existing files on the SD card. Selecting a file will display details about the file.



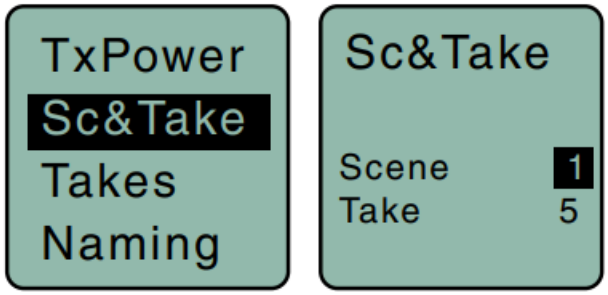
Viewing Takes
Use the UP and DOWN arrows to toggle and MENU/SEL to view takes.



To play back the recordings, remove the memory card and copy the files onto a computer with video or audio editing software installed.

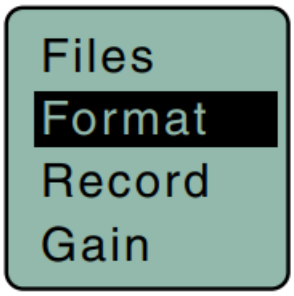
Setting Scene and Take Number
Use the UP and DOWN arrows to advance Scene and Take and MENU/SEL to toggle. Press the BACK button to

return to the menu.

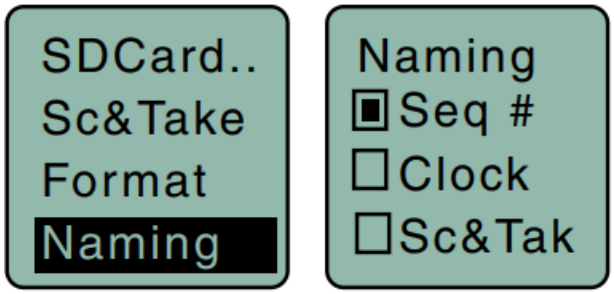


Format
Formats the microSDHC memory card.

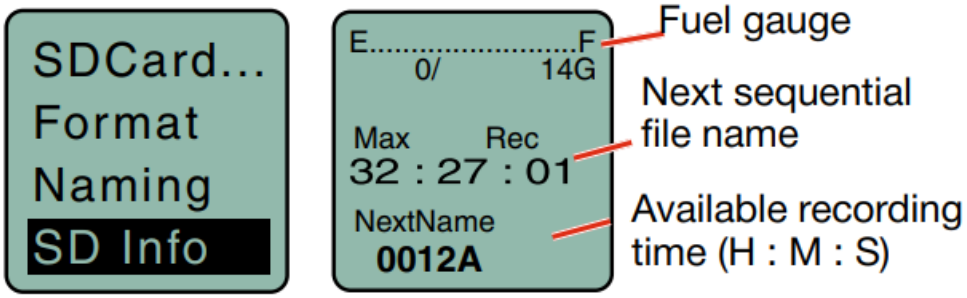
WARNING:
This function erases any content on the microSDHC memory card.



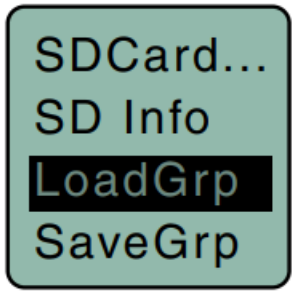
Recorded File Naming
Choose to name the recorded files by the sequence number, clock time, or scene and take.



SD Info
Information regarding the microSDHC memory card including space remaining on the card.



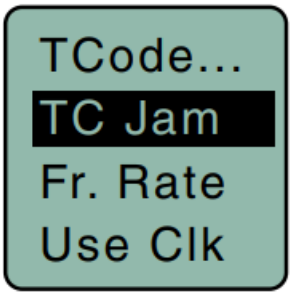
Load Group
Choose the name of the frequency group on the SD card to load.

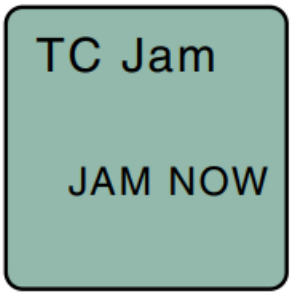


Save Group
Choose the name of the frequency group to save onto the SD card.

TCode Menu

TC Jam (jam timecode)

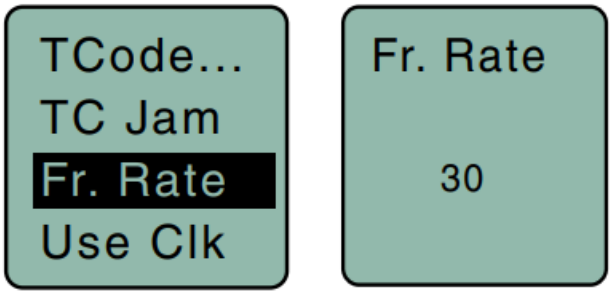




- When TC Jam is selected, JAM NOW will blink on the LCD and the unit is ready to be synced with the timecode source. Connect the timecode source and the sync will take place automatically. When the sync is successful, a message will be displayed to confirm the operation.
- The timecode defaults to 00:00:00 at power-up if no time-code source is used to jam the unit. A timing reference is logged into the BWF metadata.

NOTE:
The timecode input for the DBSM is in the 5-pin mic input. In order to use the timecode, remove the mic connector and replace it with a timecode sync adapter cable. We recommend MCTCTA5BNC or MCTCA5LEMO5 (see Optional Accessories). Wiring is addressed on page 16.

Setting Frame Rate

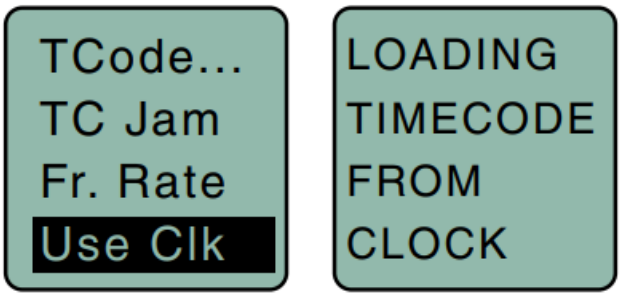


The frame rate affects the embedding of the timing reference in the. BWF file metadata and display of timecode. The following options are available:

- 30
- 23.976l
- 24
- 29.97
- 30DF
- 25
- 29.97DF

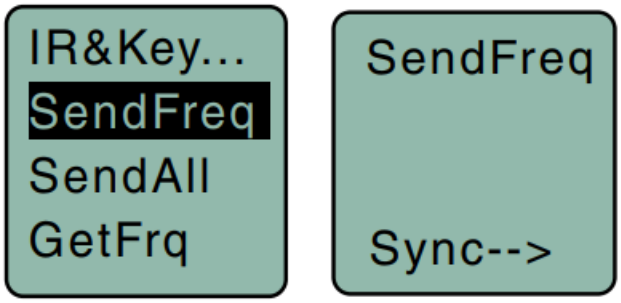
NOTE:
While it is possible to change the frame rate, the most common use will be to check the frame rate that was received during the most recent timecode jam. In rare situations, it might be useful to alter the frame rate here, but be aware that audio tracks may not line up correctly with mismatched frame rates.

Use Clock
The DBSM time clock and calendar (RTCC) cannot be relied on as an accurate time code source. Use Clock should only be used when there is no need for the time to agree with an external timecode source.



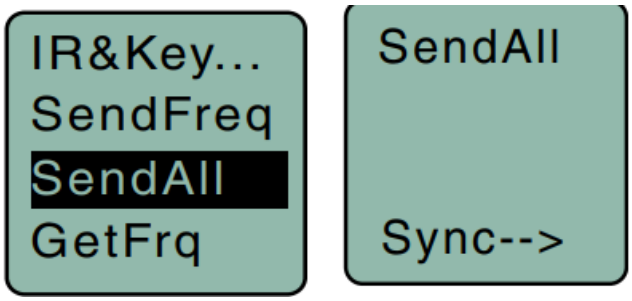
IR&Key Menu

SendFreq
Press MENU/SEL to sync the Frequency to another transmitter or receiver via the IR port.



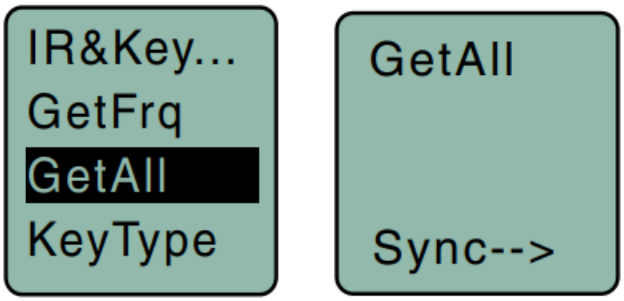
SendAll
Press MENU/SEL to sync: Frequency, Transmitter Name, Talkback Enabled, and Compatibility Mode to another transmitter or receiver via the IR port.

NOTE:
SendAll does not send an Encryption Key. This must be done separately.



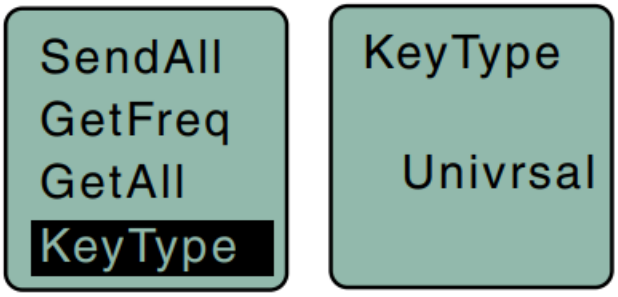
GetFreq
Press MENU/SEL to sync Frequency to another transmitter or receiver via the IR port.

GetAll
Press MENU/SEL to sync: Frequency, Transmitter Name, Talkback Enabled, and Compatibility Mode from another transmitter or receiver via the IR port.



KeyType
The DBSM/DBSMD receives an encryption key via the IR port from a key-generating receiver. Begin by selecting a key type in the receiver and generating a new key (the key type is labeled KEY POLICY in the DSQD receiver).

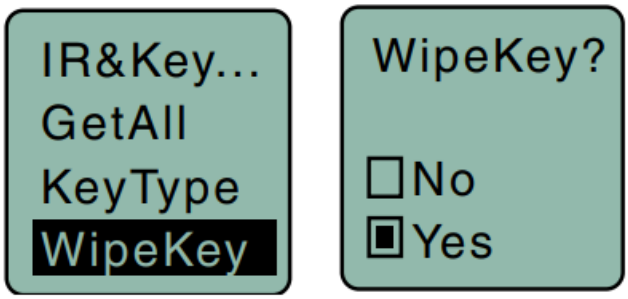
Set the matching KEY TYPE in the DBSM/DBSMD and transfer the key from the receiver (SYNC KEY) to the DBSM/DBSMD via the IR ports. A confirmation message will display on the receiver display if the transfer is successful. The transmitted audio will then be encrypted and can only be listened to if the receiver has the matching encryption key.



The encryption system in Lectrosonics Digital modes D2, DCHX, and HDM may be configured in four different ways, determined by a parameter known as the Key Type. The four key types range from least secure but most convenient, to most secure but least convenient. Below are descriptions of the four Key Types and how they work.

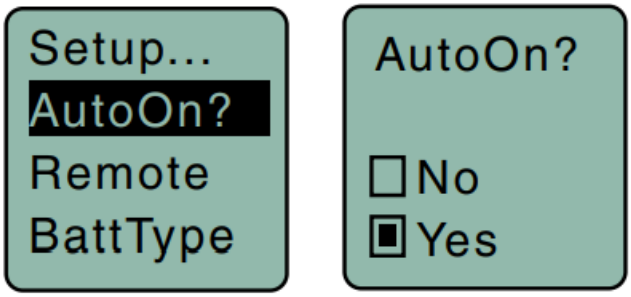
- Universal: This is the default key type, the simplest to use, and the least secure. While encryption is technically being performed and a scanner or simple demodulator would not reveal the signal content, communications are not truly secure. This is because all Lectrosonics products employing the Universal key type use this same “universal” encryption key. With this key type selected, keys do not need to be created or exchanged, and wireless devices can be used without attention to the encryption feature.
- Shared: This is the easiest encryption mode to use while employing a uniquely generated key. This key type offers excellent security and considerable flexibility. Once a key has been created, it can be shared an unlimited number of times with any compatible device which, in turn, can also share the key. This is especially useful when multiple receivers may need to pick up various transmitters.
- Standard: The Standard key type offers enhanced security, at the cost of some complexity. Standard keys are “instance controlled”, which allows the hardware to protect against “differential attacks”. A Standard key can only be sent by the device that created it, and only up to 256 times. Unlike with Shared keys, devices receiving a Stan-dard key cannot pass it on.
- Volatile: The Volatile key type is the most secure, and also the least convenient to use. Volatile keys behave identically to Standard keys, except that they are never stored. Equipment that is turned off while using a Volatile key will come back on with no key. If a key-generating device is left on, the key can be re-shared with units in the system that have lost their keys. Once all equipment having used a given Volatile key is powered off, that key is effectively destroyed. This may be required in some highly secure installations.

WipeKey
This menu item is only available if the Key Type is set to Standard, Shared, or Volatile. Select Yes to wipe the current key and enable the DBSM/DBSMD to receive a new key.

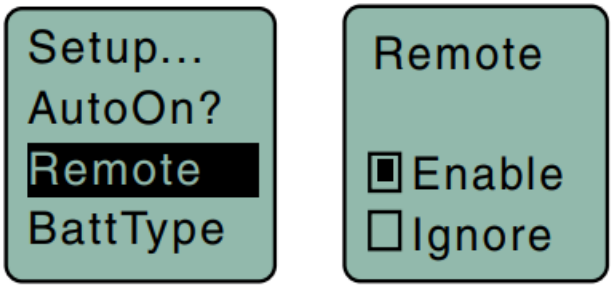


Setup Menu

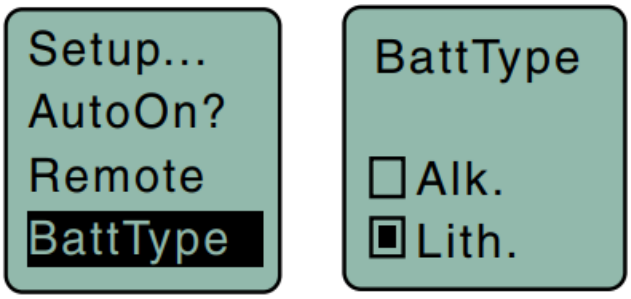
AutoOn
Press MENU/SEL to toggle the AutoOn feature on or off.



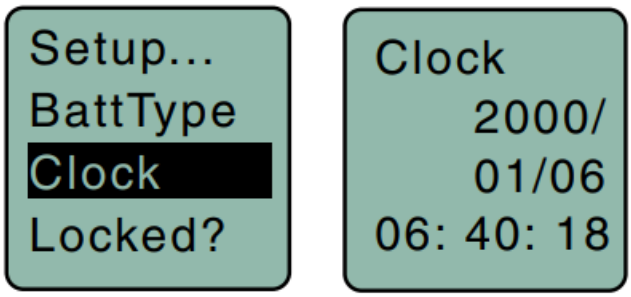
Remote
Press MENU/SEL to toggle the Remote “dweedle tone” feature on or off.



BattType
Press MENU/SEL to select either Alkaline or Lithium bat-tery. Lithium batteries are recommended.



Clock
Press MENU/SEL to set the clock (time and date).

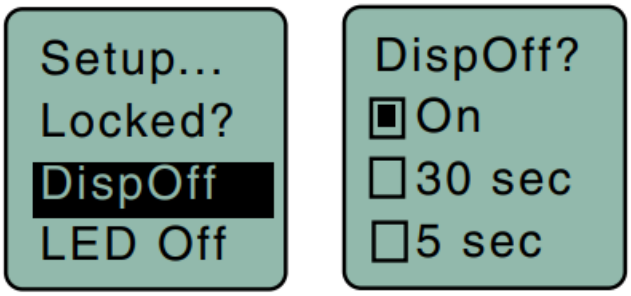


Locking/Unlocking Changes to Settings
Changes to the settings can be locked in the Power Button Menu.

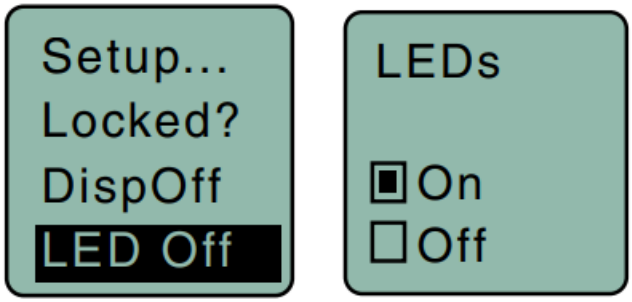
When changes are locked, several controls and actions can still be used:

- Settings can still be unlocked
- Menus can still be browsed
- When locked, POWER CAN ONLY BE TURNED OFF by removing the batteries.
- “Dark” locked mode prevents the display from coming on when buttons are pressed. Exit by holding UP+DOWN for 3 seconds. Unlike regular Locked mode, “Dark” locked mode does not persist through a power cycle.

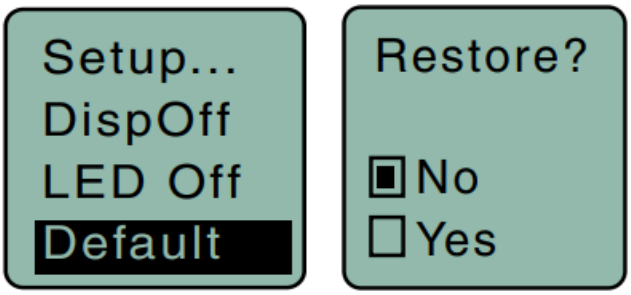
DispOff
Press MENU/SEL to toggle the DisplayOff feature between 5 and 30 seconds, or set it to constantly stay on.



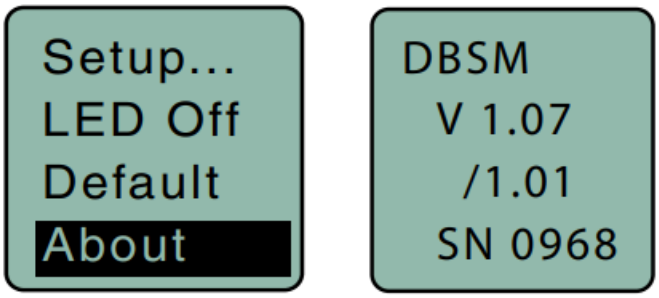
LED Off
From the main menu screen, a quick press of the UP arrow button turns the control panel LEDs on. A quick press of the DOWN arrow button turns them off. The buttons will be disabled if the LOCKED option is selected in the Power Button menu.



Default
Press MENU/SEL to restore the Default (factory) settings.

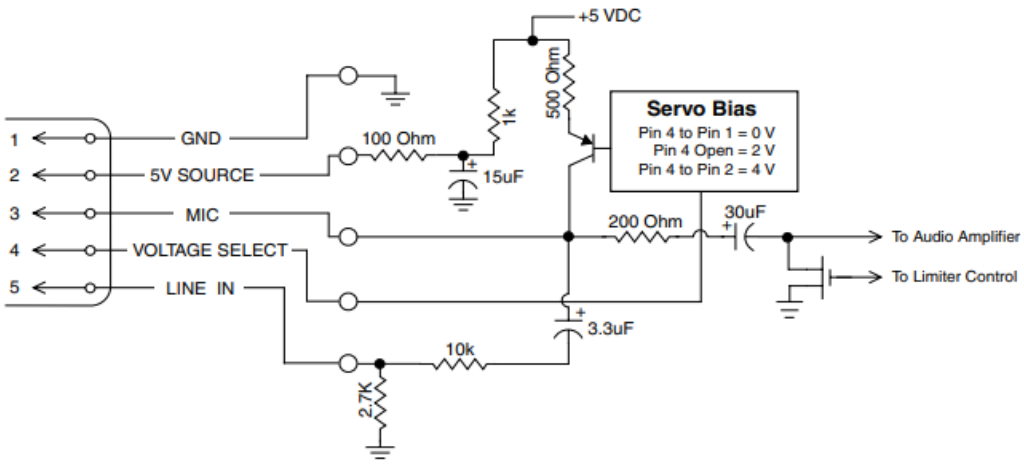


About
Press MENU/SEL to display the model, the firmware version, the software version, and the serial number.



5-Pin Input Jack Wiring

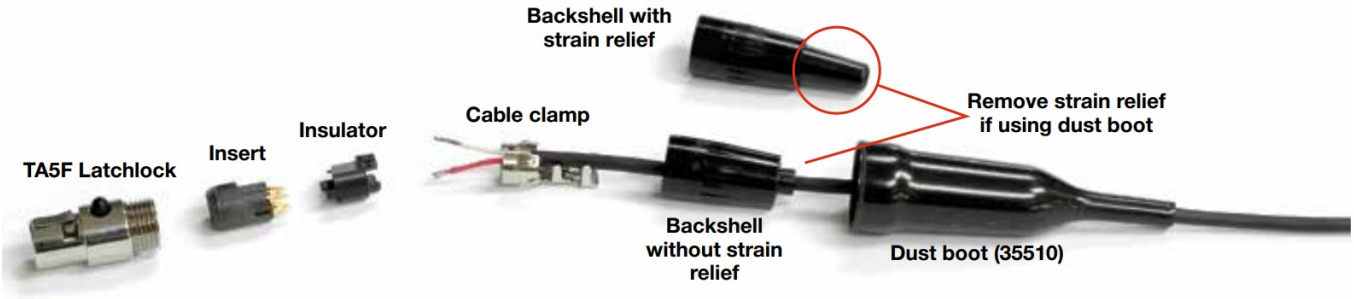
- Lavalier microphones and adapter cabling used with digital bodypack transmitters should have the shield wire connected to the shell of the microphone plug.
- This will reduce the RF energy radiated into the microphone cable shield wire from getting back into the transmitter via the audio input.
- Digital RF carriers contain both FM and AM components and greater microphone shielding is required to overcome induced transmitter radio frequency interference. 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 website at: www.lectrosonics.com.



Audio input jack wiring:

- **PIN 1**
  Shield (ground) for positively biased electret lavaliere microphones. Shield (ground) for dynamic microphones and line-level inputs.
- **PIN 2**
  Bias voltage source for positively 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 the 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, and time code jamming.

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.

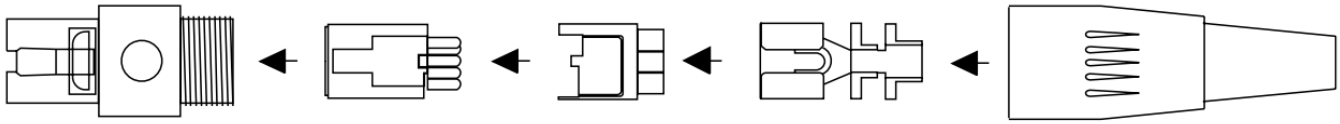


Installing the Connector:

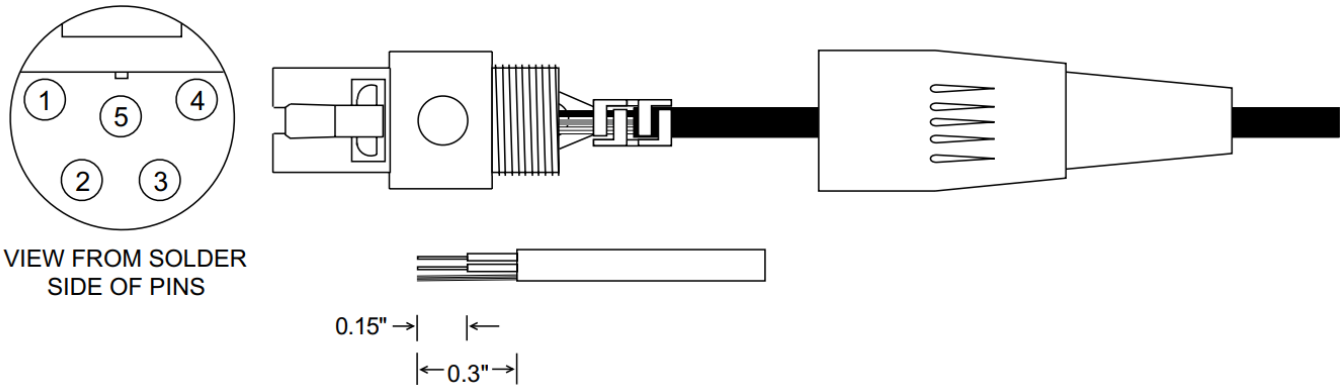
1. If necessary, remove the old connector from the microphone cable.
2. Slide the dust boot onto the microphone cable with the large end facing the connector.
3. If necessary, slide the 1/8-inch black shrink tubing onto the microphone cable. This tubing is needed for some smaller diameter cables to ensure 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 Wir-ing 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 latch lock. Thread the backshell onto the latchlock.

Microphone Cable Termination for Non-Lectrosonics Microphones

TA5F Connector Assembly

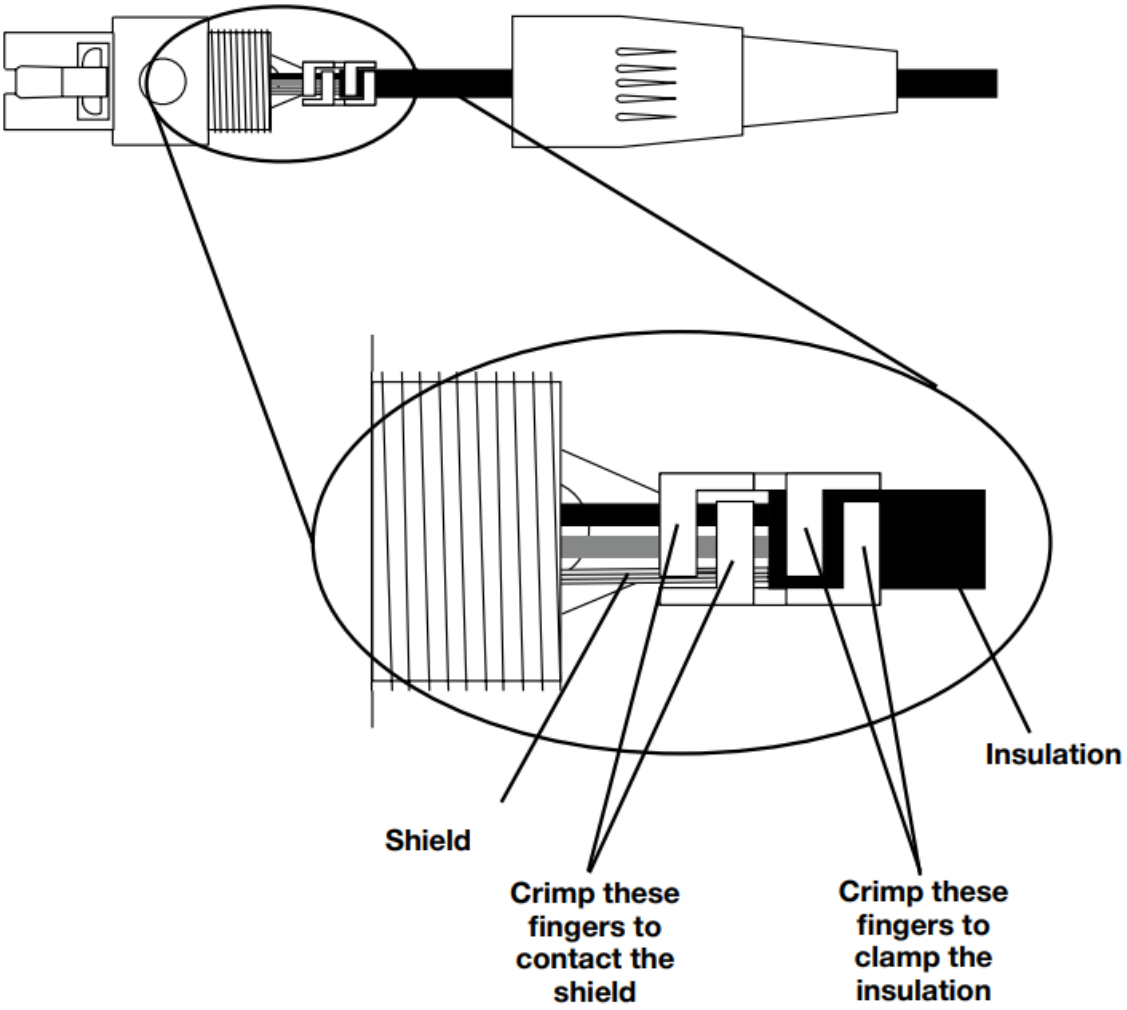


Mic Cord Stripping Instructions



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. M152/7005P are wired with a shield to the connector shell as shown.

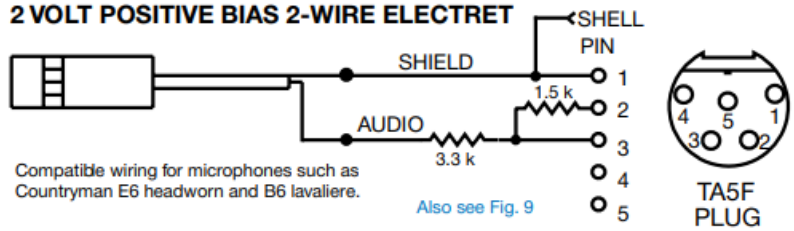
Input Jack Wiring for Different Sources

- 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 website 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

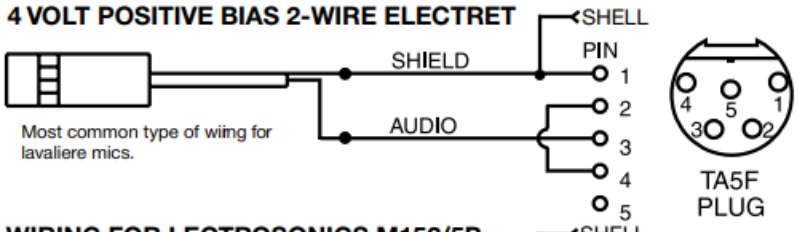


Compatible wiring for microphones such as Countryman E6 headworn and B6 lavaliere.

Also see Fig. 9

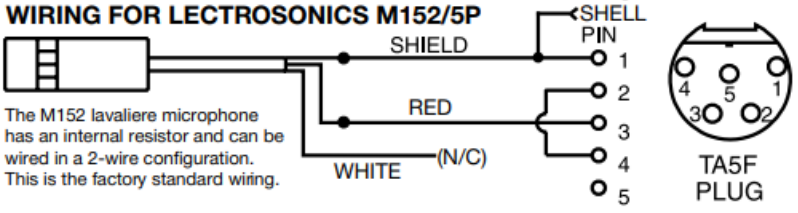
Fig. 2

4 VOLT POSITIVE BIAS 2-WIRE ELECTRET



Most common type of wiring for lavaliere mics.

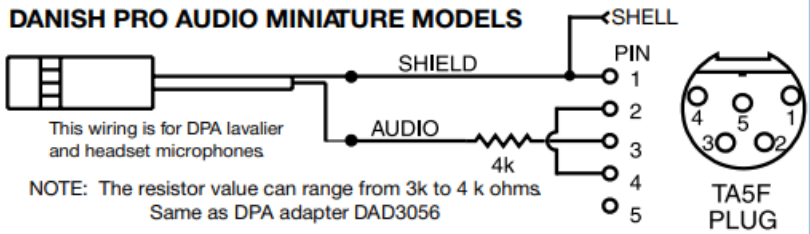
WIRING FOR LECTROSONICS M152/5P



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

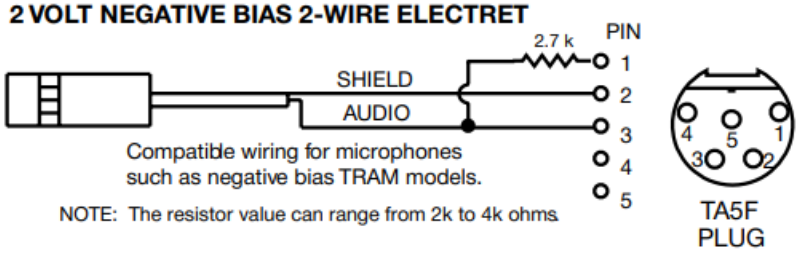


Fig. 5 - Sanken COS-11 and others

4 VOLT POSITIVE BIAS 3-WIRE ELECTRET WITH EXTERNAL RESISTOR

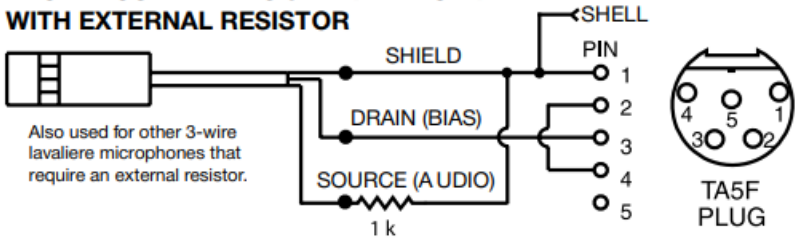
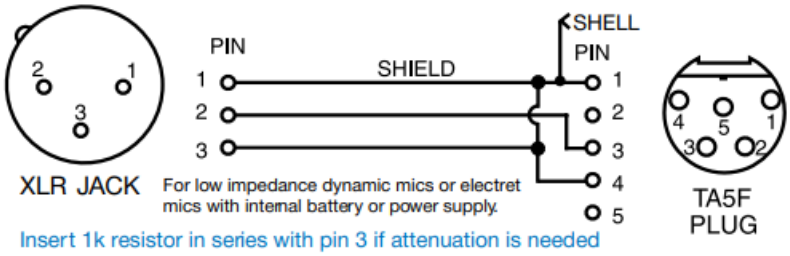


Fig. 6

LO-Z MICROPHONE LEVEL SIGNALS



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

Fig. 7

BALANCED AND FLOATING LINE LEVEL SIGNALS

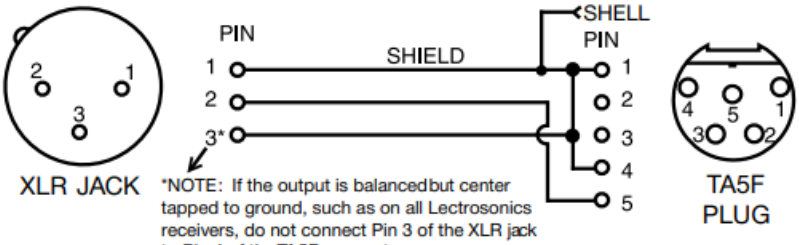
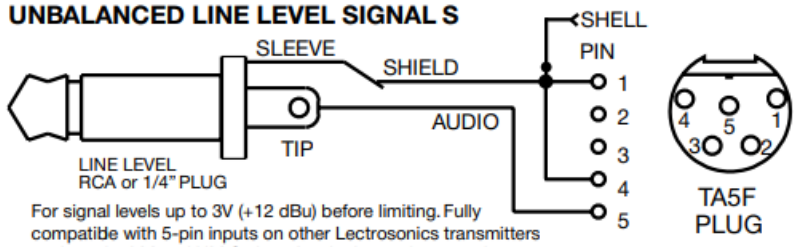
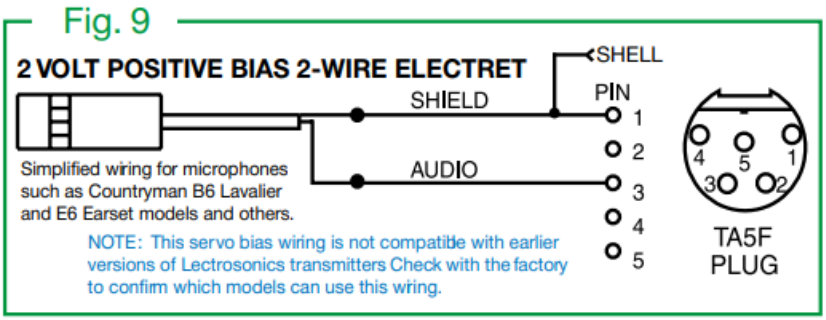


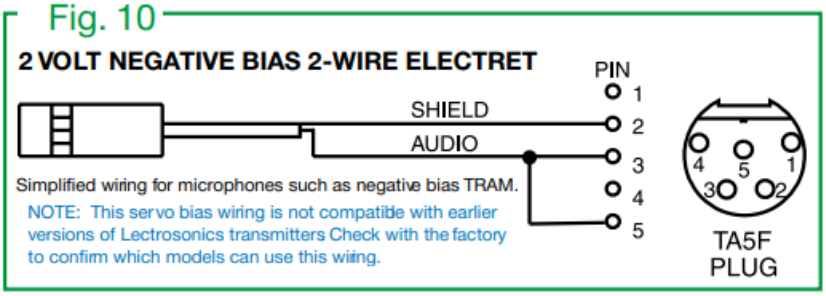
Fig. 8

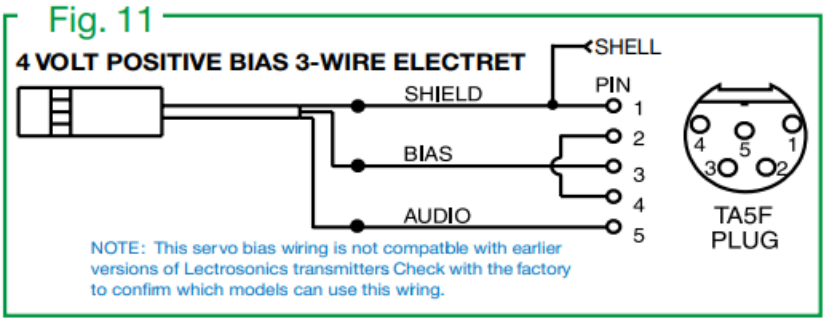
UNBALANCED LINE LEVEL SIGNALS



Simple Wiring – Can ONLY be used with Servo Bias Inputs:
Servo Bias was introduced in 2005 and all trans-mitters with 5-pin inputs have been built with this feature since 2007.







Microphone RF Bypassing

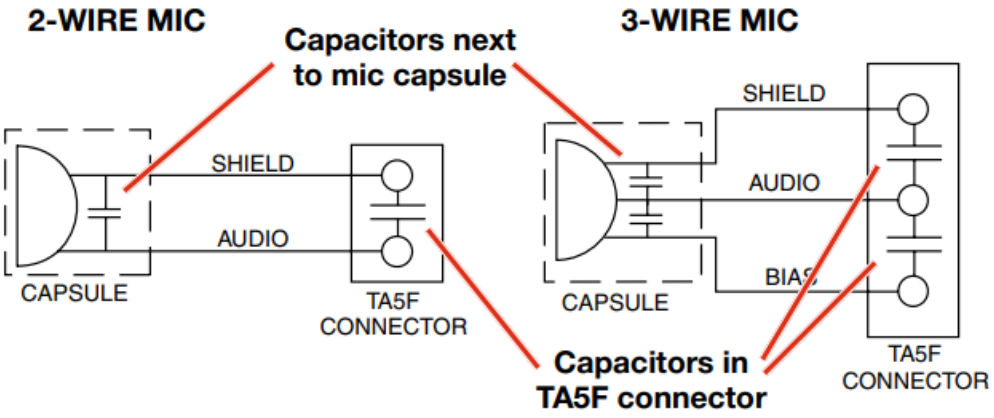
When used on a wireless transmitter, the microphone element is in the proximity of the RF coming from the transmitter. The nature of electret microphones makes them sensitive to RF, which can cause problems with microphone/transmitter compatibility. If the electret microphone is not designed properly 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 location 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.

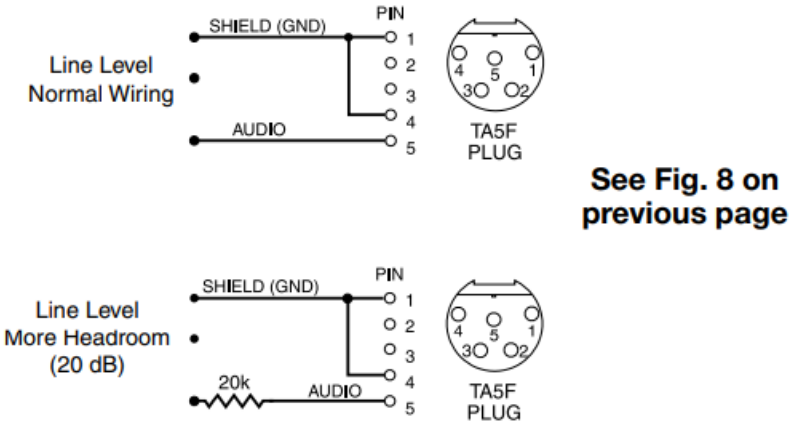


Line Level Signals
The wiring for line level and instrument signals is:

- 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 the instrument.



See Fig. 8 on previous page

Firmware Update

Firmware updates are made using a microSDHC memory card. Check the Revision history on the website to determine which update you need to perform.

NOTE:
Ensure that you have fresh batteries in your unit before beginning the update process. Battery failure will interrupt and possibly corrupt the update file.

Download the pertinent firmware version. Unzip and copy the following firmware update files to a drive on your computer:

- dbsm vX_xx.hex is the firmware update file, where “X_xx” is the revision number.

- dbsm_fpga_vX.mcs is the companion board update file, where “X” is the revision number.

On the computer:

1. Perform a Quick Format of the card. On a Windows-based system, this will automatically format the card to the FAT32 format, which is the Windows standard. On a Mac, you may be given several options. If the card is already formatted in Windows (FAT32) – it will be greyed out – then you do not need to do anything. If the card is in another format, choose Windows (FAT32) and then click “Erase”. When the quick format on the computer is complete, close the dialogue box and open the file browser.
2. Copy the dbsm vX_xx.hex and dbsm_fpga_ vX.mcs files to the memory card, then safely eject the card from the computer.

In the DBSM:

1. Leave the DBSM turned off and insert the microS-DHC memory card into the slot.
2. Hold down both the UP and DOWN arrow buttons on the recorder and turn the power on.
3. The recorder will boot up into the firmware update mode with the following options on the LCD:
    - Update – Displays a scrollable list of the update files on the card.
    - Power Off – Exits the update mode and turns the power off.

    NOTE: If the unit screen shows FORMAT CARD? power the unit off and repeat step 2. You were not properly pressing UP, DOWN, and Power at the same time.
4. Use the arrow buttons to select Update. Use the UP and DOWN arrow buttons to select the desired file (they need to be updated individually) and press MENU/SEL to install the firmware. The LCD will display status messages while the firmware is being updated.
5. When the update is complete, the LCD will display this message: UPDATE SUCCESSFUL REMOVE CARD. Open the battery door, remove the memory card, then place it back in and close the door.
6. Repeat steps 1-5 to update the other file.
7. Power the unit back on. Verify that the firmware version was updated by opening the Power Button Menu and navigating to the About item. See page 6.
8. As you re-insert the updated card and turn the power back on, the LCD will display a message prompting you to format the card:

    Format Card? (files lost)
    - No
    - Yes

The card defaults to DATA format after updating. If you wish to record audio on the card, you must re-format it. Select Yes and press MENU/SEL to format the card. When the process is complete, the LCD will return to the Main Window and be ready for normal operation. If you choose to keep the card as is (DATA), you may remove the card at this time and update the other file if needed.

Bootloader Files:
The firmware update process is managed by a bootload-er program – on very rare occasions, you might need to update the bootloader.

WARNING:
Updating the bootloader can corrupt your unit if interrupted. Don’t update the bootloader unless advised to do so

by the factory.

- dbsm_boot vX_xx.hex is the bootloader file

Follow the same process as with a firmware update and select the dbsm_boot file.

Recovery Process

In the event of a battery failure, while the unit is recording, a recovery process is available to restore the recording in proper format. When a new battery is installed and the unit is turned back on, the recorder will detect the missing data and prompt you to run the recovery process. The file must be recovered or the card will not be usable in the DBSM/DBSMD.

First, it will read:
Interrupted Recording Found

The LCD message will ask:

Recover?
for safe use see manual

You will have the choice of No or Yes (No is selected as the default). If you wish to recover the file, use the DOWN arrow button to select Yes, then press MENU/SEL. The next window will give you the option to recover all or part of the file. The default times shown are the best guess by the processor where the file stopped recording. The hours will be highlighted and you can either accept the value shown or select a longer or shorter time. If you are unsure, simply accept the value shown as the default.

Press MENU/SEL and the minutes are then highlighted. You can increase or decrease the time to be recovered. In most cases you can simply accept the values shown and the file will be recovered. After you have made your time choices, press MENU/SEL again. A small GO! sym-bol will appear next to the DOWN arrow button. Pressing the button will initiate the file recovery. The recovery will happen quickly and you will see:

Recovery Successful

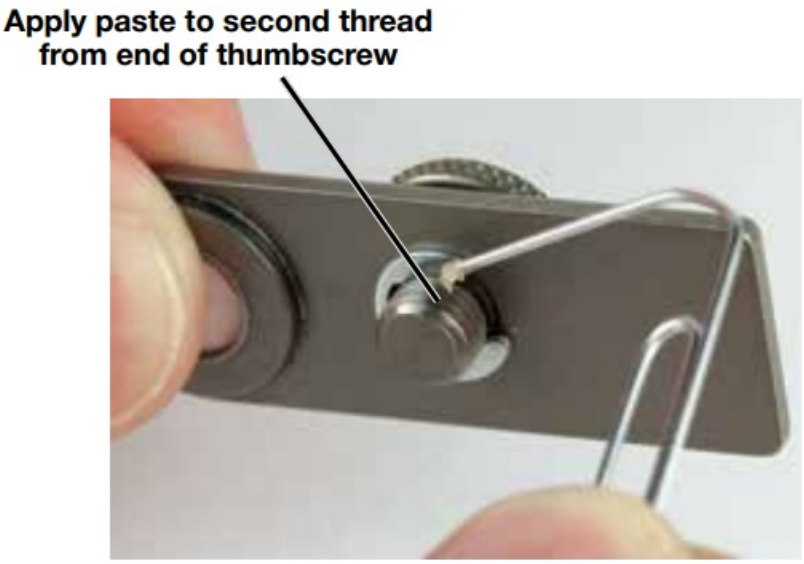
Special Note:
Files under 4 minutes long may recover with additional data “tacked on” to the end of the file (from previous recordings or data if the card had been used previously). This can be effectively eliminated in the post with a simple delete of the unwanted extra “noise” at the end of the clip. The minimum recovered length will be one minute. For example, if the recording is only 20 seconds long, and you have selected one minute there will be the desired 20 recorded seconds with an additional 40 seconds of other data and or artifacts in the file. If you are uncertain about the length of the recording you can save a longer file – there will simply be more “junk” at the end of the clip. This “junk” may include audio data recorded in earlier sessions that were discarded. This “extra” information can be easily deleted in post-production editing software at a later time.

Silver Paste on Transmitter Thumbscrews

Silver paste is applied to thumbscrew threads on new units at the factory to improve the electrical connection from the battery compartment through the housing on any DBSM/DBSMD transmitter. This applies to the stan-dard battery door and the battery eliminator.

The small enclosed vial contains a tiny amount (25 mg) of silver conductive paste. A small speck of this paste will improve the conductivity between the battery cover plate thumbscrew and the case of the DBSM/DBSMD.

- With improved conductivity (lower resistance) more of the battery voltage can get to the internal power supplies causing reduced current drain and longer battery life. Though the amount seems very small, it is enough for years of use.
- It is, in fact, 25 times the amount that we use on the thumbscrews at the factory.
- To apply the silver paste, first, completely remove the cover plate from the housing by backing the thumbscrew completely out of the case. Use a clean, soft cloth to clean the threads of the thumbscrew.
- **NOTE:** Do NOT use alcohol or a liquid cleaner.
- Simply hold the cloth around the threads and turn the thumbscrew. Move to a new spot on the cloth and do it again. Do this until the cloth remains clean. Now, clean the threads in the case by using a dry cotton swab (Q-tip) or equivalent. Again, clean the case threads until a fresh cotton swab comes away clean.
- Open the vial, and transfer a pinhead speck of silver paste to the second thread from the end of the thumbscrew. An easy way to pick up a speck of paste is to partially unfold a paper clip and use the end of the wire to acquire a tiny bit of paste. A toothpick will also work. An amount that covers the end of the wire is sufficient.



- It is not necessary to spread the paste more than a little bit on the thread as the paste will spread itself every time the thumbscrew is screwed in and out of the case during battery changes.
- Do not apply the paste to any other surfaces. The cover plate itself can be cleaned with a clean cloth by rubbing the slightly raised rings on the plate where it contacts the battery terminal. All you want to do is to remove any oils or dirt on the rings. Do not abrade these surfaces with a harsh material such as a pencil eraser, emery paper, etc., as this will remove the conductive nickel plating and expose the underlying aluminum, which is a poor contact conductor.

Straight Whip Antennas

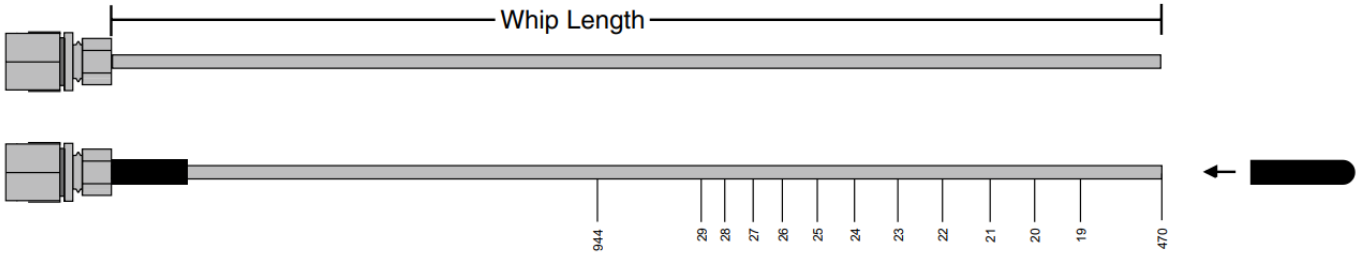
Antennas are supplied by the factory according to the following table:

BAND	BLOCKS COVERED	SUPPLIED ANTENNA
A1	470, 19, 20	AMM19
B1	21, 22, 23	AMM22
C1	24, 25, 26	AMM25

The supplied caps can be used in several different ways:

1. A color cap on the end of the whip
2. A color sleeve next to the connector with a black cap on the end of the whip (trim the closed end of the colored cap off with scissors to make a sleeve).
3. A color sleeve and color cap (cut the cap in half with scissors).

This is a full-size cutting template used to cut the length of the whip for a particular frequency. Lay the uncut antenna on top of this drawing and trim the whip length to the desired frequency. After cutting the antenna to the desired length, mark the antenna by installing a color cap or sleeve to indicate the frequency. Factory labeling and marking are listed in the table below.



Note: Check the scale of your printout. This line should be 6.00 inches long (152.4 mm).

Factory Marking and Labeling

BLOCK	FREQUENCY RANGE	CAP/SLEEVE COLOR	ANTENNA LENGTH
470	470.100 – 495.600	Black w/ Label	5.67 in./144.00 mm.
19	486.400 – 511.900	Black w/ Label	5.23 in./132.80 mm.
20	512.000 – 537.575	Black w/ Label	4.98 in./126.50 mm.
21	537.600 – 563.100	Brown w/ Label	4.74 in./120.40 mm.
22	563.200 – 588.700	Red w/ Label	4.48 in./113.80 mm.
23	588.800 – 607.950	Orange w/ Label	4.24 in./107.70 mm.
24	614.400 – 639.900	Yellow w/ Label	4.01 in./101.85 mm.
25	640.000 – 665.500	Green w/ Label	3.81 in./96.77 mm.
26	665.600 – 691.100	Blue w/ Label	3.62 in./91.94 mm.

Shaded cells are factory-supplied antennas

NOTE:
Not all Lectrosonics products are built on all of the blocks covered in this table. Factory-supplied antennas precut to length include a label with the frequency range.

Belt Clips and Pouches

DBSM Single Battery Model

SMWBBCUP

Wire clip for single battery model; antenna points UP when unit is worn on a belt. **Supplied with unit, if DBSM is ordered.**

SMWBBCDN

Wire clip for single battery model; antenna points DOWN when unit is worn on a belt.

SMWBBCUPSL

Spring-loaded clip; antenna points UP when unit is worn on a belt.

SMWBBCDNSL

Spring-loaded clip; antenna points DOWN when unit is worn on a belt.

PSMWB

Sewn leatherette pouch for single battery model; plastic window allows access to control panel. **Supplied with unit, if DBSM is ordered.**

DBSMD Dual Battery Model

SMDWBBCSL

Wire clip for dual battery model antenna points UP when unit is worn on a belt; can be installed for UP or DOWN antenna. **Supplied with unit, if DBSM is ordered.**

SMDWBBCSL

Spring-loaded clip for dual battery model; can be installed for UP or DOWN antenna.

PSMDWB

Sewn leatherette pouch for dual battery model; plastic window allows access to control panel. **Supplied with unit, if DBSMD is ordered.**

NOTE: Belt clips and pouches for SMWB/SMDWB series units that you may also own will fit the DBSM/DBSMD.

Supplied Accessories

Mic cable not included

SMSILVER

Small vial of silver paste for use on battery door retaining knob threads

55010

MicroSDHC memory card with SD adapter. UHS-I; Class 10. Brand and capacity may vary.

35924

Foam insulating pads attached to the side of the transmitter when it is worn very close to or on the user's skin. Pkg of two.

AMM19

Whip Antenna with Standard SMA Connector, Block 19

AMM22

Whip Antenna with Standard SMA Connector, Block 22

40073 Lithium Batteries

DBSM is shipped with one battery: DBSMD is shipped with two (2) batteries. Brand may vary.

Optional Accessories

TA5F to BNC cable for timecode jamming. 12 inches long

MCTCA5LEMO5

TA5F to LEMO cable for timecode jamming. 12 inches long

SMBATELIM

External power adapter (battery eliminator) for all SM Series transmitters. 6 to 36 volt external sources. Handles up to 1 amp consumption. Protected against shorts and reverse polarity.

To install the battery eliminator, loosen the thumbscrew completely and remove the battery door. Insert the battery eliminator and tighten the thumbscrew.

NOTE:
Although leatherette pouches and wire belt clips are included with your initial unit order, additional pouches or clips may be ordered using the same part number shown on the opposite page.

LectroRM

By New Endian LLC

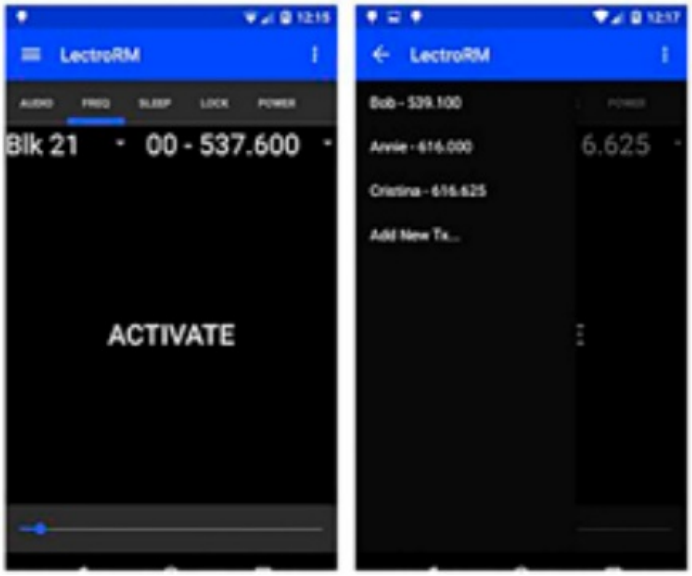
- LectroRM is a mobile application for iOS and Android smartphone operating systems. Its purpose is to make changes to the settings on select Lectrosonics transmitters by delivering encoded audio tones to the microphone attached to the transmitter. When the tone enters the transmitter, it is decoded to make a change to a variety of different settings such as input gain, frequency, and a number of others.
- The app was released by New Endian, LLC in September 2011. It is available for download (bundled with PDR Remote) and sells for about $25 on the Apple App Store and Google Play Store.
- The settings and values that can be changed vary from one transmitter model to another. The complete list of available tones in the app is as follows:
    - Input gain
    - Frequency
    - Sleep Mode
    - Panel LOCK/UNLOCK
    - RF output power
    - Low-frequency audio roll-off
    - LEDs ON/OFF

The user interface involves selecting the audio sequence related to the desired change. Each version has an interface for selecting the desired setting and the desired option for that setting. Each version also has a mechanism to prevent accidental activation of the tone.

iOS

The iPhone version keeps each available setting on a separate page with the list of options for that setting. On iOS, the “Activate” toggle switch must be enabled to show the button which will then activate the tone. The iOS version’s default orientation is upside-down but can be configured to orient right-side up. The purpose of this is to orient the phone’s speaker, which is at the bottom of the device, closer to the transmitter microphone.

Android



The Android version keeps all settings on the same page and allows the user to toggle between the activation buttons for each setting. The activation button must be pressed and held to activate the tone. The Android ver-sion also allows users to keep a configurable list of full sets of settings.

Activation
For a transmitter to respond to remote control audio tones, the transmitter must meet certain requirements:

- The transmitter must be turned on.
- The transmitter must have firmware version 1.5 or later for Audio, Frequency, Sleep, and Lock changes.
- The transmitter microphone must be within range.

- The remote control function must be enabled on the transmitter.

PDRRemote
Convenient remote control for the recording function of the DBSM is provided by a phone app (bundled with LectroRM) available on the AppStore and Google Play. The app uses audio tones (“tweedle tones”) played through the phone’s speaker that are interpreted by the recorder to make changes to the recorder settings:

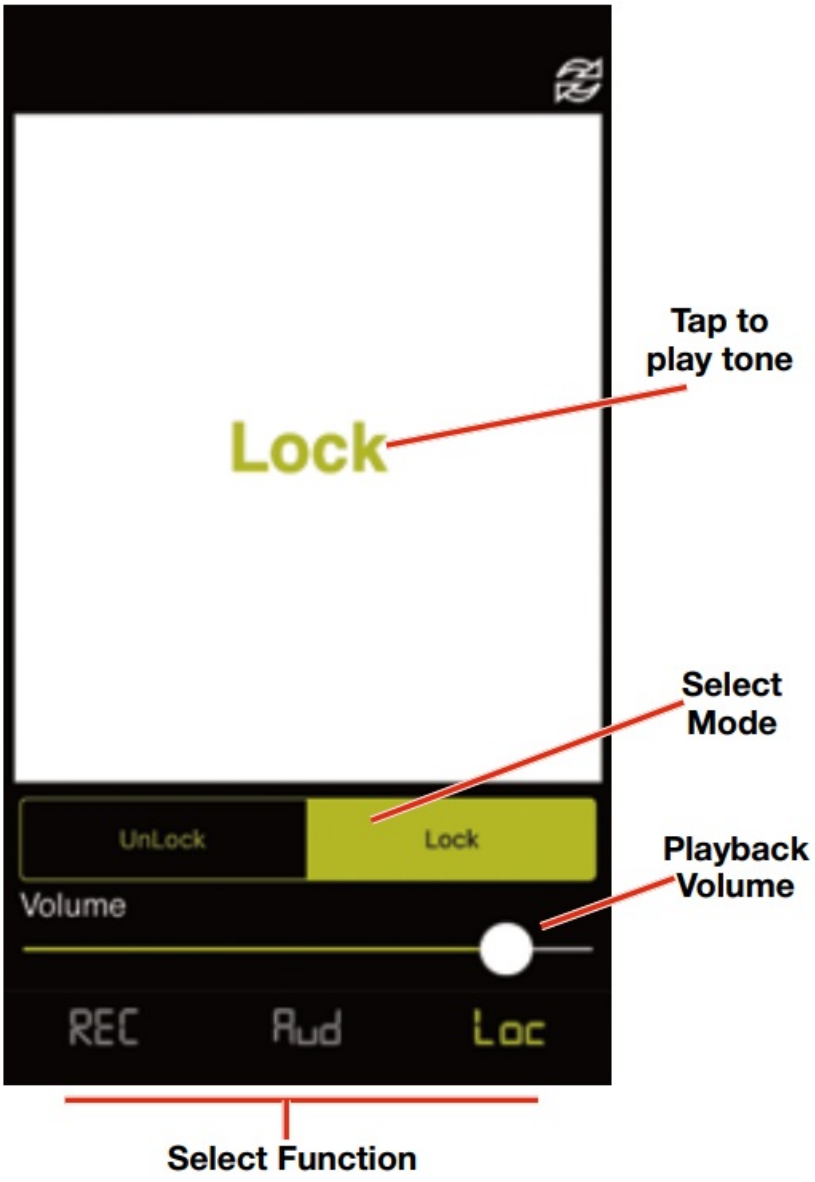
- Record Start/Stop
- Mic Gain Level
- Lock/Unlock

The MTCR tones are unique to the MTCR and will not react to “tweedle tones” meant for Lectrosonics transmitters. The screens appear differently for iOS and Android phones but perform the same functions.

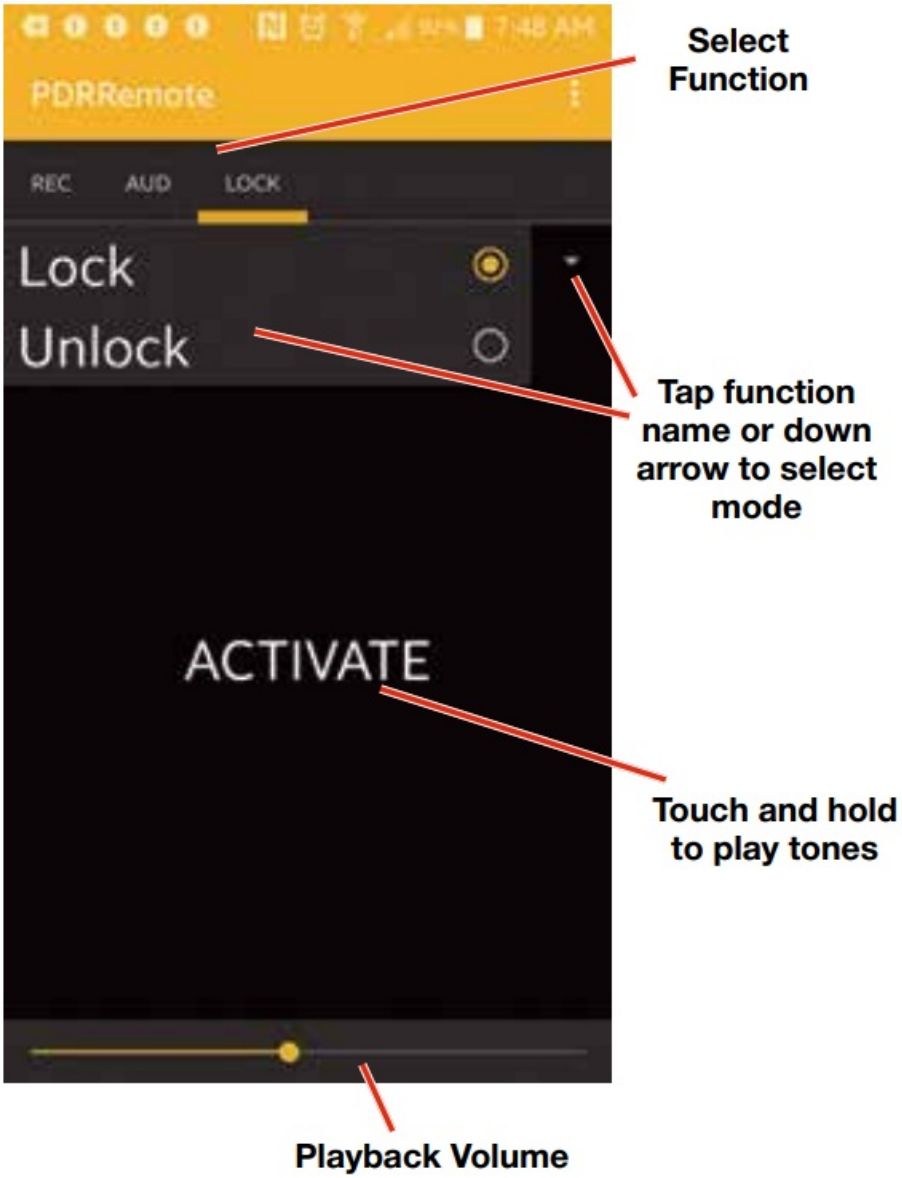
For Best Results
The following conditions are required:

- The microphone must be within range.
- The recorder must be configured to enable remote control activation. See Remote on the menu.

iOS Version



Android Version



- Please be aware these apps are not Lectrosonics products.
- LectroRM and PDRRemote are privately owned and operated by New Endian LLC, www.newendian.com.
- Refer to their website for additional technical and support resources.

Specifications

Operating frequencies:

- DBSM(D)-A1B1: Band A1-B1: 470.100 – 607.950
- DBSM(D)/E01-A1B1: Band A1-B1: 470.100 – 614.375
- DBSM(D)/E01-B1C1: Band B1-C1: 537.600 – 691.175
- DBSM (D)/E09-A1B1 Band A1-B1: 470.100 – 614-375
- DBSMD (D)/E09-A1B1 Band A1-B1: 470.100 – 614-375

NOTE:
It's the user's responsibility to select the approved frequencies for the region where the transmitter is operating

- Channel Spacing: 25 kHz

- RF Power output:
  - DBSM: 2 (HDM only), 10, 25 or 50 mW
  - DBSMD: 2 (HDM only), 10, 25 or 50 mW
  - DBSM(D)/E01-A1B1: 2 (HDM only), 10, 25 or 50 mW
  - DBSMD(D)/E01-B1C1: 2 (HDM only), 10, 25 or 50mW
  - DBSM/E09-A1B1: 2 (HDM only), 10, 25 mW
  - DBSMD/E09-A1B1: 2 (HDM only), 10, 25 mW
- Compatibility Modes: DBSM/DBSMD: D2 digital with encryption, and HDM high-density digital with encryption
- Modulation Type: 8 PSK
- Encryption Type: AES-256 in CTR mode
- Frequency stability: ± 0.002%
- Spurious radiation: Compliant with ETSI EN 300 422-1
- Equivalent input noise: –125 dBV, A-weighted
- **Input level:**
  - If set for dynamic mic: 0.5 mV to 50 mV before limiting Greater than 1 V with limiting
  - If set for electret lavaliere mic: 1.7 uA to 170 uA before limiting Greater than 5000 uA (5 mA) with limiting
  - Line level input: 17 mV to 1.7 V before limiting Greater than 50 V with limiting
- **Input impedance:**
  - Dynamic mic: 300 Ohms
  - Electret lavaliere: Input is virtual ground with servo adjusted constant current bias
  - Line level: 2.7 k ohms
- Input limiter: Soft limiter, 30 dB range
- Bias voltages: Fixed 5 V at up to 5 mA
  Selectable 2 V or 4 V servo bias for any electret lavaliere
- Gain control range: -7 to 44 dB; panel-mounted membrane switches
- Modulation indicators: Dual bicolor LEDs indicate modulation –20, -10, 0, +10 dB referenced to full modulation
- Controls: Control panel w/ LCD and 4 membrane switches
- Low-frequency roll-off: Adjustable from 20 to 150 Hz
- Input Type: Analog mic/line level compatible; servo bias preamp for 2V and 4V Lavaliere microphones
- **Input level:**
  - Dynamic mic: 0.5 mV to 50 mV
  - Electret mic: Nominal 2 mV to 300 mV
  - Line level: 17 mV to 1.7 V
- Input connector: TA5M 5-pin male
- **Audio Performance**
  - Frequency response: 20Hz to 20kHz, +/- 1dB: D2 Mode 20Hz to 16KHz, +/- 3dB: High Density (HDM) Mode
  - Dynamic range: 112 dB (A)
  - Distortion: < 0.035%
- Antenna: Flexible, unbreakable steel cable.
- Battery: AA (+1.5 VDC), disposable, Lithium recommended

	Lithium	Alkaline	NiMH
DBSM-A1B1 (1 AA):	2 mw – 8:55 10 mw – 7:25 25 mw – 6:35 50 mw – 4:45	2 mw – 2:15 10 mw – 2:00 25 mw – 1:25 50 mw – 1:10	2 mw – 5:25 10 mw – 4:55 25 mw – 4:25 50 mw – 4:20
DBSMD-A1B1 (2 AA):	2 mw – 18:20 10 mw – 16:35 25 mw – 15:10 50 mw – 12:10	2 mw – 7:45 10 mw – 7:10 25 mw – 6:20 50 mw – 4:30	2 mw – 10:55 10 mw – 10:30 25 mw – 9:20 50 mw – 7:25

- **Weight w/ battery(s):**
  - DBSM-A1B1: 3.2 oz. (90.719 grams)
  - DBSMD-A1B1: 4.8 oz. (136.078 grams)
- **Overall Dimensions:**
  - DBSM-A1B1: 2.366 x 1.954 x 0.642 inches; (without microphone) 60.096 x 49.632 x 16.307 mm
  - DBSMD-A1B1: 2.366 x 2.475 x 0.642 inches; 60.096 x 62.865 x 16.307 mm
- **Emission Designator:**
  - DBSM-A1B1/DBSMD-A1B1: 170KG1E (D2 mode)
  - DBSM-A1B1/DBSMD-A1B1: 110KG1E (HD mode)

Recorder

- Storage media: microSDHC memory card
- File format: .wav files (BWF)
- A/D converter: 24-bit
- Sampling rate: 48 kHz
- **Recording modes/Bit rate:**
  - HD mono mode: 24 bit – 144 kbytes/s

Input

- Type: Analog mic/line level compatible; servo bias preamp for 2V and 4V Lavaliere microphones
- **Input level:**
  - Dynamic mic: 0.5 mV to 50 mV
  - Electret mic: Nominal 2 mV to 300 mV
  - Line level: 17 mV to 1.7 V
- Input connector: TA5M 5-pin male
- **Audio Performance**
  - Frequency response: 20Hz to 20kHz, +/- 1dB:
  - Dynamic range: 112 dB (A)

- Distortion: < 0.035%

- **Operating temperature range**
  - Celsius: -20 to 50
  - Fahrenheit: -5 to 122

Specifications are subject to change without notice.

Available Recording Time
Using a microSDHC* memory card, the approximate recording times are as follows. The actual time may vary slightly from the values listed in the tables.

(HD mono mode)

Size	**Hrs:Min**
8GB	11:10
16GB	23:00
32GB	46:10

Troubleshooting

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 encryption key type is selected.
Receiver RF Indicator Off	1. Ensure that the transmitter and receiver are set to the same frequency. 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 6.
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 or not enabled.
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. RF interference. Reset both transmitter and receiver to a clear channel. Use scanning function on receiver if available. 4. Transmitter is at the edge of the useable range for that frequency.
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. Receiver antenna missing or obstructed. 2. Operating distance too great. 3. RF interference. Reset both transmitter and receiver to a clear channel. Use scanning function on receiver if available. 4. Musical instrument output set too low. 5. Microphone capsule picking up RF noise. See item on page 19 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.

Slow Card Warning While Recording

1. This error alerts the user to the fact that the card is unable to keep up with the speed at which the DBSM is recording data.
2. This creates tiny gaps in the recording.
3. This may present an issue when the recording is to be synchronized with other audio or video.

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 by 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 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:

- 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).
- 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.
- Pack the equipment carefully and ship it to us, shipping costs are 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.
- 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
- **Web:** www.lectrosonics.com

Lectrosonics Canada:

- **Mailing Address:**

  720 Spadina Avenue, Suite 600 Toronto, Ontario M5S 2T9
- **Shipping address:**

  Lectrosonics, Inc. 581 Laser Rd. Rio Rancho, NM 87124 USA
- **E-mail:**

  sales@lectrosonics.com
- **Telephone:**
  - **416-596-2202**
  - **877-753-2876** Toll-free
  - (877-7LECTRO)
  - **416-596-6648** Fax
- **Telephone:**
  - **505-892-4501**
  - **800-821-1121** Toll-free
  - **505-892-6243** Fax
- **E-mail:**
  - **Sales: colinb@lectrosonics.com**
  - **Service: joeb@lectrosonics.com**.

Self-Help Options for Non-Urgent Concerns
Our Facebook groups and web lists are a wealth of knowledge for user questions and information. Refer to:

- Lectrosonics General Facebook Group: **https://www.facebook.com/groups/69511015699**
- D Squared, Venue 2 and Wireless Designer Group: **https://www.facebook.com/groups/104052953321109**
- The Wire Lists: **https://lectrosonics.com/the-wire-lists.html**.

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.

ISEDC Notices:

Per RSS-210
This device operates on a no-protection no-interference basis. Should the user seek to obtain protec-tion from other radio services operating in the same TV bands, a radio licence is required. Please consult Industry Canada's document CPC-2-1-28, Optional Licensing for Low-Power Radio Apparatus in the TV Bands, for details.

Per RSS-Gen
This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference
2. This device must accept any interference, including interference that may cause undesired operation of the device.

LIMITED ONE-YEAR WARRANTY

The equipment is warranted for one year from the date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment that 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.

- 581 Laser Road NE • Rio Rancho, NM 87124 USA
- www.lectrosonics.com
- 505-892-4501
- 800-821-1121
- fax 505-892-6243
- sales@lectrosonics.com.

Documents / Resources

	LECTROSONICS DBSM-A1B1 Digital Transcorder [pdf] Instruction Manual DBSM-A1B1, DBSM-E01-A1B1, DBSM-E01-B1C1, DBSMD-A1B1, DBSMD-E01-A1B1, DBSM D-E01-B1C1, DBSM-E09-A1B1, DBSMD-E09-A1B1, DBSM-A1B1 Digital Transcorder, DBSM-A 1B1, Digital Transcorde, Transcorder

References

- New Endian
- User Manual