

UCR201

DIVERSITY UHF RECEIVER



OPERATING INSTRUCTIONS

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GENERAL TECHNICAL DESCRIPTION

INTRODUCTION

The UCR201 is a portable, high performance, triple-conversion, frequency synthesized, UHF receiver fully compatible with all Lectrosonics 200 series transmitters. The RF performance is extremely stable over a very wide temperature range, making the UCR201 perfectly suited to the rough environmental conditions found in the field. The proprietary audio processing includes a dual-band compandor for very low distortion and a superior signal to noise ratio. The Smart Squelch™ system is operated by a separate pilot tone and mutes the audio output directly at the output connector.

The UCR201 features a menu-driven LCD and a three button control panel (MENU, SELECT Up and SELECT down). The combination of icons and text in the display provides convenient and efficient access to system functions and status using the menu button. For example, the Main Window alone shows the pilot tone indicator, antenna diversity phase, RF level, audio level, receiver battery status and transmitter battery status. It is also possible to bypass the pilot tone from the Main Window. Other windows show operating frequency, audio output level, battery status in tenths of volts, test tone, and provide for selection of levels or functions using the SELECT buttons. The frequency scan mode provides a graphic means to observe all signals “on the air” within the unit’s frequency range in order to find useable operating frequencies free of interference.

SMART DIVERSITY™

The Smart Diversity™ antenna phase switching technique keeps the receiver compact enough for camera mounted or shoulder bag applications. Smart

Diversity™ effectively minimizes dropouts in situations where multi-path reflections can cause serious problems.

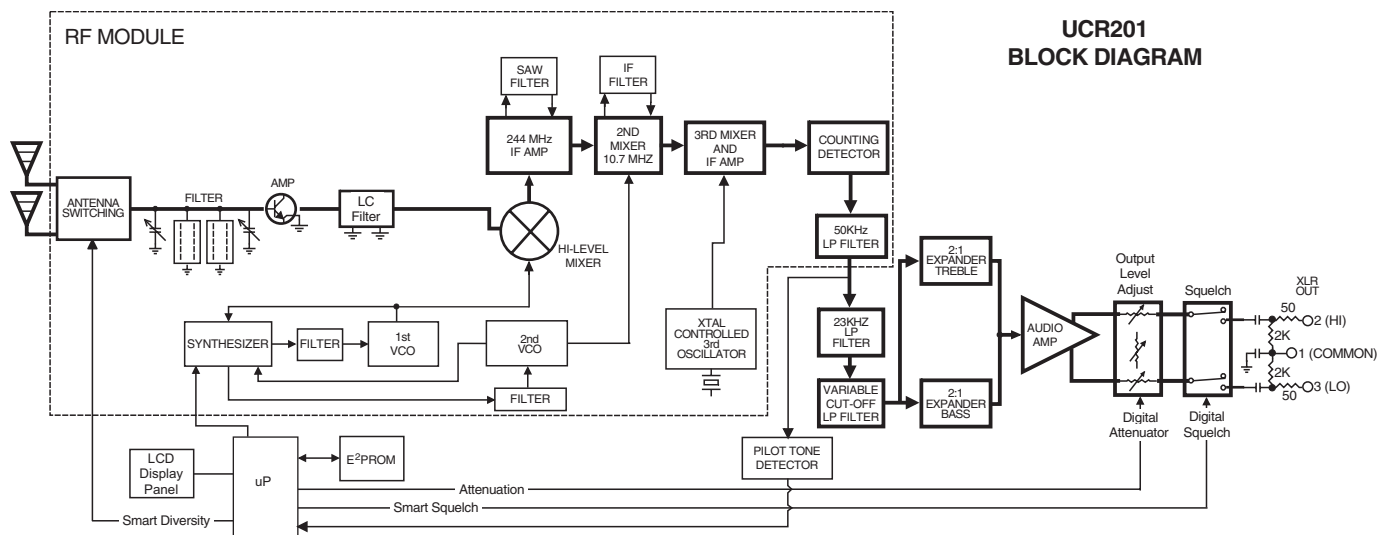
RF MODULE

The UCR201 RF Module retains the stability of fixed frequency designs with the added flexibility of a frequency agile designs. This is done with a robust wideband RF section (30 MHz at -3 dB) with good third order intermodulation performance.

The problem of frequency agility is further compounded because “on the fly” frequency changes cannot be made on any type of wireless system. For example, if there is suddenly an interference problem with a system in use (on stage for instance) a frequency change cannot be made without interrupting the program. In multichannel applications, changing the frequency of one system will usually produce all kinds of new intermodulation problems with the other systems operating in the same location. The UCR201 offers a new approach to frequency agile receiver design.

DOUBLE BALANCED DIODE MIXERS

In all wireless receivers, a mixer is used to convert the carrier frequency to an intermediate frequency, or IF, where most of the filtering and signal amplification (gain) takes place. The UCR201 uses a low noise GaAs mixer having a robust 3rd order of +25 dBm to overcome intermodulation problems common with less sophisticated designs. The unusually high IF frequency output from the first mixer (244 MHz) offers increased image rejection and is followed by low noise amplifiers, SAW filters and two more levels of IF mixing to preserve the superior RF performance



SURFACE ACOUSTIC WAVE (SAW) FILTER

A state-of-the-art SAW filter on the 244 MHz IF amplifier offers sharp skirts, constant group delay, and wide bandwidth in one filter. Though expensive, this special type of filter allows primary filtering as early as possible, at as high a frequency as possible and before high gain is applied to the signal. Since these filters are made of quartz, they are very temperature stable. (Conventional LC filters at these frequencies don't begin to perform as well and in addition would drift unacceptably in the elevated temperatures of an equipment rack or in the field where temperatures are in constant flux.) After the SAW filter, the 244MHz IF signal is converted to 10.7 Mhz IF and then to the low frequency of 300 kHz. Only then is the majority of the gain applied, just before the signal is converted to audio. Although 300 kHz is very unconventional for an IF in a wide deviation (± 75 kHz) system, it offers outstanding AM rejection figure over a very wide range of signal strengths and to produces an excellent noise improvement at low signal strengths (capture ratio).

DIGITAL PULSE COUNTING DETECTOR

The UCR201 receiver uses an advanced digital pulse detector to demodulate the FM signal, rather than a conventional quadrature detector. The common problem with quadrature detectors is thermal drift, particularly those that operate at higher frequencies like 10.7 MHz.

The UCR201 design presents an elegantly simple, yet highly effective solution to this age old problem. A stream of precision pulses is generated at 300kHz and locked to the FM signal coming from the 300 kHz IF section. The pulse width is constant, but the timing between pulses varies with the frequency shift of the FM signal. The integrated voltage of the pulses within any given time interval varies in direct proportion to the frequency modulation of the radio signal. Another way of describing it is that as the FM modulation increases the frequency, the circuit produces more pulses and as the modulation decreases the frequency, the circuit produces fewer pulses. More pulses produce a higher voltage and fewer pulses a lower voltage. The resultant varying voltage is the audio signal.

This type of detector eliminates the traditional problems with quadrature detectors and provides very low audio distortion, high temperature stability and stable audio level. The counting detector also adds additional AM rejection. Since the detector pulse amplitudes are constant, level differences in the IF signal do not affect them.

TRI MODE DYNAMIC FILTER

The detected audio signal is passed through a "dynamic noise reduction circuit," which automatically adjusts the filter's cutoff frequency by measuring the amplitude and frequency of the audio signal and the quality of the RF signal. The audio bandwidth is held only to that point

necessary to pass the highest frequency audio signal present at the time. If the RF level is weak, then the filter becomes more aggressive. This results in a dramatic reduction of "hiss" at all times. During passages with a high frequency content, this filter gets completely "out of the way" and passes the signal with no decrease in high-frequency response.

PILOT TONE MUTE

The UCR201 uses a pilot tone muting technique in order to protect against the reception of stray signals. The Lectrosonics transmitter adds an inaudible signal, known as the pilot tone, to the transmitted signal. The receiver detects (and removes) the pilot tone, and is thus able to identify the desired signal and mute all others.

When the receiver is powered up, receive audio is muted unless a proper pilot tone is detected. The pilot tone must be present for approximately one second before the signal is accepted.

A PILOT TONE BYPASS mode is available. In this mode, the received audio remains unmuted regardless of the presence or absence of a pilot tone. This mode is useful for locating a clear frequency, since any potential interference may be heard. Because this mode disables the squelch, it may also be used in situations where squelching behavior is undesirable.

SMART SQUELCH™

The UCR201 employs a sophisticated squelching system to deliver the cleanest possible audio during marginal conditions of reception. Any squelching system faces inevitable trade-offs: squelch too much and valuable audio information may be lost, squelch too little and excessive noise may be heard; respond too rapidly and the audio sounds "choppy", respond too sluggishly and syllables or entire words are cut off.

SmartSquelch™ achieves an optimal balance of these trade-offs by combining several techniques that remove distracting noise without the squelching action itself becoming a distraction. These include: waiting for a complete word or syllable before squelching, assessing recent squelching history and RF signal strength and assessing audio content to determine available masking.

By adjusting squelching behavior dynamically for the optimal result under varying conditions, the receiver can deliver acceptable audio quality from otherwise unusable signals.

OUTPUT LEVEL ADJUST

Convenient front panel controls allow adjusting the audio output in 1dB steps from -50 to +9 dBu.

POWER SUPPLY

The UCR201 may powered by a 9 VDC battery, or from an external DC source (see Specifications and Features section for allowed voltages.) A built in Poly-Fuse

protects the unit when an external power source is used. This fuse resets if the power supply is disconnected for 15 seconds or longer.

LCD

The front panel LCD offers four primary windows. Pressing the MENU button rotates through each of these windows.

If the battery gets low on either the UCR201 or the associated transmitter, a message will interrupt the display every few seconds stating "LOW RX BATTERY" or "LOW TX BATTERY."

Regardless of which window or setup screen is active during operations, after power is removed, the unit defaults to the Main Window and to the most recent frequency and audio settings. These settings are retained even if the battery is removed.

The display backlight is always on when the unit is plugged into an external power source. It will turn off after five minutes if no keypress activity is detected when operating on the internal battery.

POWER UP SEQUENCE

It takes about two seconds after the UCR201 is initially turned on for it to become fully operational; however, audio will pass through during the start up phase if there is an active transmitter on the same frequency as the UCR201.

At power-up, the LCD will automatically scroll through a series of messages to confirm proper operation and inform you of its state. First it will show if the unit is LOCKED or UNLOCKED. (See LOCKING AND UNLOCKING THE UCR201) Following messages will state Lectrosonics (we like our name), UCR201, the firmware revision of the internal programming and the frequency block assigned to the receiver. The Main Window displays after these introductory messages.

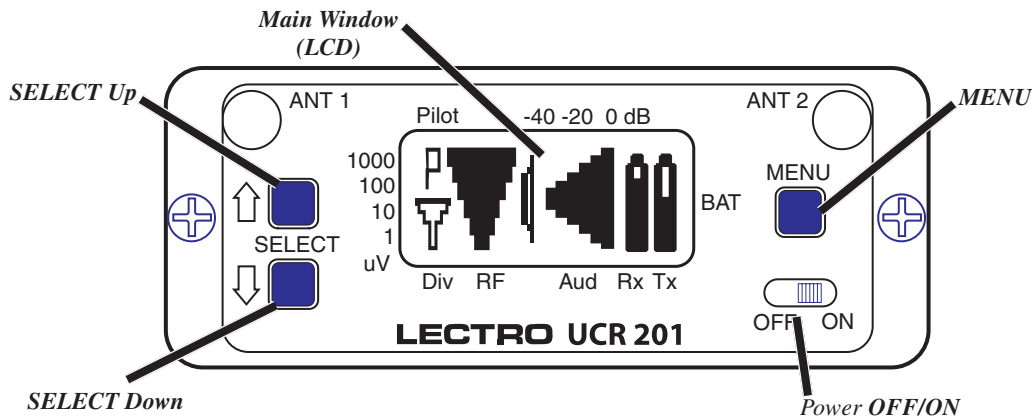
Note

UCR201s with Firmware Version 4.1 or later have a quick tune shortcut. See Menu Selections From Main Window, Frequency Window for details.

POWER OFF SEQUENCE

When the unit is turned off, the audio output is instantly muted (squelched) and a window displays "POWERING OFF" just before actually switching off the power.

FRONT PANEL CONTROLS AND INDICATORS



LCD SCREEN

The LCD Screen is a graphics-type Liquid Crystal Display that is used to monitor system operation and configure the UCR201.

MENU BUTTON

The MENU button steps through the four primary windows and setup screens.

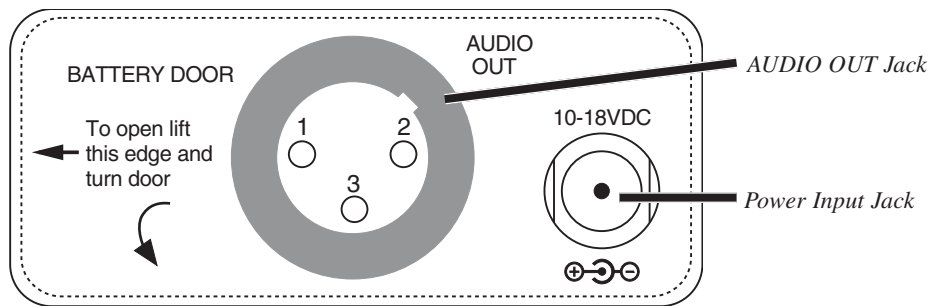
SELECT UP/DOWN BUTTONS

The SELECT Up/Down buttons are used to select various options within each display selection and for setting the operating frequency of the receiver.

POWER ON/OFF SWITCH

The Power ON/OFF switch is used to applied battery or external power to the unit.

REAR PANEL FEATURES

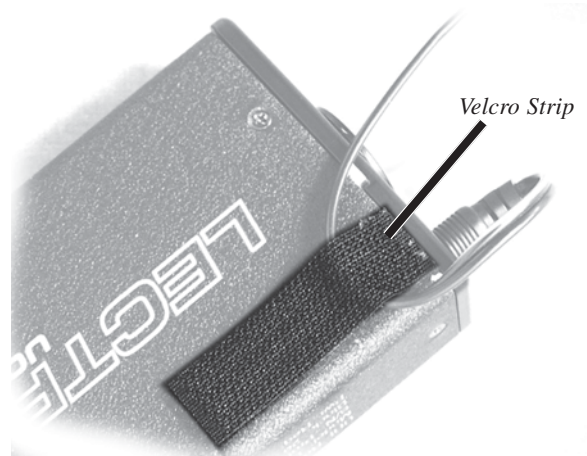


XLR AUDIO OUTPUT JACK

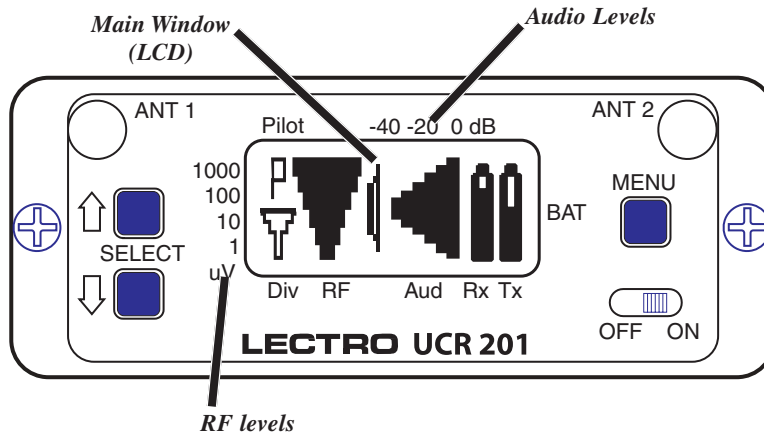
The audio output is balanced but not floating. Pin 2 is in phase with the input pins on 200 series transmitters. However, phasing can vary from brand to brand of lavalier microphone.

POWER INPUT JACK

The power input jack can accept 10-18 VDC - the center pin is positive and sleeve is ground. The input is diode protected to prevent damage if the power is applied with reversed polarity, but the unit will not work until the reversed polarity condition is fixed. Strain relief to avoid accidental disconnection can be provided with the included small hook and loop strip. (See illustration to the right.) Attach the adhesive strip side to the side of the receiver or mount with the opening end of the strip up - place the cable in the strip and secure.



MAIN WINDOW (LCD)

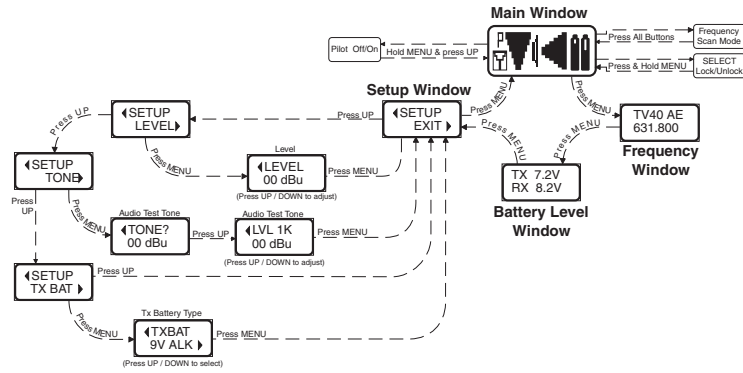


The Main Window displays information concerning the condition of the Pilot Tone, antenna phase, RF and audio signal levels and battery conditions for both the receiver and the associated transmitter. It is also the access

portal to menu selections for setting up the receiver and searching for clear frequency channels. (See Menu Selections from Main Window and Frequency Scan Mode.)

Icon	Description
	Pilot tone indicator - A steady “P” icon is displayed when a pilot tone from the associated transmitter is present. The icon flashes if no pilot tone is detected and will change to a small “b” if the pilot tone has been bypassed. To bypass the pilot tone, press and hold MENU, then press the SELECT Up button. Press and hold MENU and press SELECT UP again to restore normal pilot tone squelch.
	Antenna Phase indicator - Shows antenna phase switching activity. As the antenna phase is switched, the symbol will flip vertically.
	RF level - Changes in size vertically to indicate the strength of the incoming RF signal. RF levels are engraved from 1 uV to 1000 uV on the bezel to the left of the LCD.
	Audio Levels - Changes in size horizontally to indicate the audio level (modulation) of the signal received from the transmitter. The icon changes to a solid rectangular block when the audio signal is being limited in the transmitter. Levels in dB are engraved into the bezel above the LCD.
	Battery Levels - Rx indicates the receiver battery condition and will flash when approximately one hour of operational time is remaining. The Tx symbol works in the same manner to indicate the transmitter battery condition. The Tx icon usually appears 5 to 10 seconds after the transmitter signal is acquired. When external power is being used, the Rx battery icon changes to look like a power plug.

MENU SELECTIONS FROM MAIN WINDOW



From the Main Window, users can navigate to the Frequency, Battery Level and Setup windows. They can also access Frequency Scan Mode, Lock or Unlock the receiver and turn on/off the Pilot Tone. These functions are accessed via the MENU and SELECT buttons.

FREQUENCY WINDOW

The Frequency Window displays the current TV channel, the transmitter switch settings and the receiver's operating frequency.

TVxx - the television broadcast channel the receiver is currently turned.

TV40 AE
631.800

Transmitter switch settings - the correct settings for the frequency switches on the corresponding transmitter. (Refer to the transmitter instruction manual.)

Frequency - the current frequency the receiver is tuned. Pressing the SELECT Up or Down buttons will change the receiver's frequency. As it changes, the displayed transmitter switch settings will also change. Ensure the transmitter's frequency is changed to match the receiver's operating frequency.

For units with firmware version 4.1 or later, holding the MENU button down while pressing either the SELECT UP or DOWN arrow, moves the frequency 16 channels at a time.

BATTERY LEVEL WINDOW

Displays the transmitter (TX) and receiver (RX) battery voltage in tenth volt increments. The icons flash when the voltages drops below suggested optimum working levels. Typically, there will be about one hour operating time remaining after the indicators begin to flash. RX changes to EX when operating on external power and displays the external power source voltage. (Disclaimer: We don't guarantee 0.1 Volt accuracy.)

TX 7.2V
RX 8.2V

SETUP WINDOW

In the SETUP window, the SELECT Up and Down buttons scroll through a list of four possible destinations: EXIT,

◀ SETUP
EXIT ▶

LEVEL, TONE and TXBAT. Each destination allows the user to customize the receiver's operating parameters.

LEVEL

The LEVEL setup screen displays the audio output level of the receiver in dBu. Use SELECT Up or Down to change this level. (Range is from -50 to +9 dBu in 1dB steps.) Press MENU to exit this screen.

◀ LEVEL
-50 dBu

TONE

The TONE setup screen enables an audio test tone at the receiver output for precise level matching with other equipment. The first screen prompts you to press SELECT Up to enable the tone at the receiver output. Press SELECT Up again to access the LVL screen that allows the tone level to be adjusted in 1 dB steps using the SELECT Up and Down buttons. When the audio test tone is enabled, the received audio is muted and an internally generated 1 kHz test tone is routed to the XLR connector. Since there is only one audio output level setting for both received audio and tone, the level set here will supersede the setting made via the LEVEL setup screen. (It may be necessary to reset the receiver's audio output level through the LEVEL setup screen.) The test tone has 5% distortion and is intended for confirmation of output levels only. Press MENU to stop the tone and leave this screen.

◀ TONE?
00 dBu

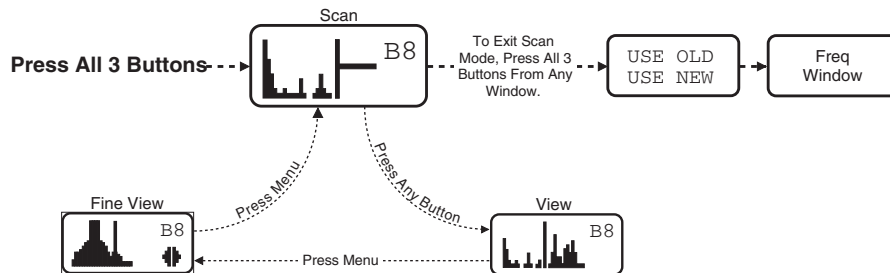
◀ LVL 1K
00 dBu

TXBAT

The TXBAT setup screen allows users to select the exact battery being used in the transmitter for accurate battery level monitoring. Four different types of batteries are commonly used in Lectrosonics transmitters: 9 volt alkaline, 9 volt lithium, AA alkaline, and AA lithium. Correctly set, this will ensure that the information in the MAIN and BATTERY LEVEL windows will be accurate and adequate warning will be provided in advance of battery failure. Press MENU to exit this screen.

◀ TXBAT
9V ALK ▶

FREQUENCY SCAN MODE



SCAN & VIEW WINDOW ELEMENTS

Cursor - shows relative position of the scanner within the 25Mhz band of the receiver

Switch Settings - shows the transmitter switch settings - will change rapidly while the unit is scanning.

Scan level indications - showing relative level of RF activity across the 25MHz bandwidth of the receiver.

Remaining unscanned part of band.

FINE VIEW WINDOW ELEMENTS

Cursor (center bar)

Transmitter Switch Settings

RF Level indicators

SCROLL reminders

To use the integrated spectrum scanning function, press both SELECT Up and Down buttons and the MENU button simultaneously. The Main Window switches to the Scan Window and immediately begins scanning across the frequency block. Data gathered during a scan is stored until it is purposely erased or the receiver is powered down. Subsequent scans can be made to search for additional signals or to accumulate higher peaks without erasing information discovered during previous scans.

To stop scanning, press any button once. The scanning will stop immediately, and the display will switch to the VIEW window. In VIEW, the entire spectrum for one frequency block is displayed with each vertical band representing 8 frequency bands (800 kHz). Pressing SELECT Up or Down scrolls the cursor coarsely across the tuning range. The transmitter switch settings matching the frequency indicated by the cursor are shown in the upper right corner of the screen.

Spectrum data is collected only when the receiver is scanning. Successive scanning with repeated passes through the tuning range will accumulate the highest peaks encountered to aid in finding clear frequencies. (To clear the scan memory without leaving scan mode, quickly turn the receiver power off and on.)

Pressing the MENU button once opens the FINE VIEW window which displays an expanded portion of the spectrum around the cursor. In FINE VIEW, each vertical band represents one frequency band (100 KHz). The upper right corner shows the transmitter switch settings for the frequency at the cursor location.

Underneath the transmitter switch settings are two arrows to remind users that this is a partial picture of the spectrum. Use the SELECT Up or Down buttons to scroll left or right for view other portions of the frequency block (SELECT Up for higher frequencies and SELECT Down for lower frequencies.) The cursor remains in place while the display scrolls left or right.

In addition to assessing the congestion within the RF tuning range of the receiver, the scanning mode is also used to find a clear operating frequency. Scroll through the screen and find a frequency where no RF signals are present (or in the worst case, only very weak RF signals). With the cursor on this frequency, press the UP, DOWN and MENU buttons at the same time to leave the scan mode.

When leaving the scan mode, you are given the option of using the frequency the unit was set to before entering the scan mode, or replacing it with the open frequency discovered in the scan mode. The display shows USE OLD and USE NEW to prompt you to make a frequency selection. To accept the new frequency from the scan mode, press SELECT Down to select USE NEW. To return to the frequency you were using before entering the scan mode, press SELECT Up button for USE OLD. (The MENU button defaults to USE OLD).

The Frequency Window is displayed upon leaving Frequency Scan Mode. Set the associated transmitter Frequency Select Switches to the same settings as shown on the display and your system will be ready for operation.

ANTENNA USE AND PLACEMENT

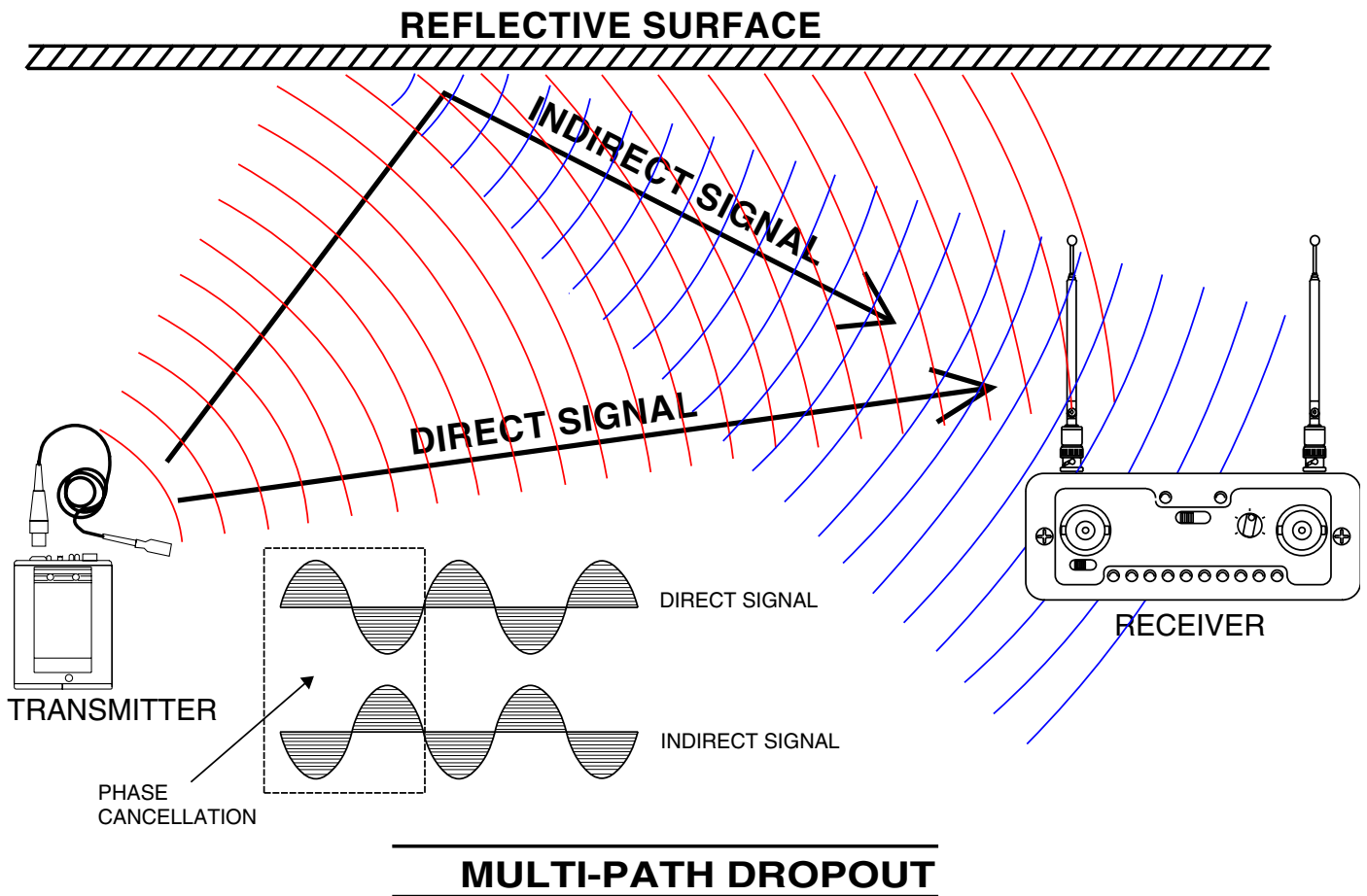
The receiver is supplied with two fixed antennas. It is good to position the receiver so that there is a direct “line of sight” between the transmitter and the receiver antenna. In situations where the operating range is less than about 100 feet, the antenna positioning is much less critical.

A wireless transmitter sends a radio signal out in all directions. This signal will often bounce off nearby walls, ceilings, etc. and a strong reflection can arrive at the receiver antenna along with the direct signal. If the direct and reflected signals are out of phase with each other a cancellation may occur. The result would be a “drop-out.” A drop-out sounds like audible noise (hiss or swishing), or in severe cases when the transmitter is positioned in certain locations in the room, it may result in complete loss of the carrier and the sound. Moving the receiver even a few inches will change the drop-out sound, or eliminate it completely. A drop-out situation

may also improve or deteriorate as the crowd fills or empties the room, or when the transmitter or receiver is moved to a different location.

The UCR201 receiver offers a sophisticated diversity design which overcomes drop-out problems in almost any situation. However, in the event that you do encounter a drop-out problem, first try moving the receiver at least 3-to-4 feet from where it original location. This may alleviate the drop-out problem at that location. If drop-outs still exist, try moving the receiver to an entirely different location in the room or closer to the transmitter location.

Lectrosonics transmitters radiate power very efficiently, and the receivers are very sensitive. This reduces drop-outs to an insignificant level. If, however, you do encounter drop-outs frequently, call the factory or consult your dealer. There is probably a simple solution.



INSTALLATION AND OPERATING INSTRUCTIONS

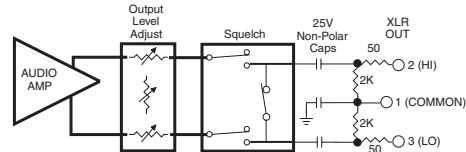
1. Install a fresh battery or connect an external power source to the UCR201.
2. Unless frequency settings have been previously assigned, scan for an open frequency and set both the receiver and transmitter to that frequency. (See Finding Clear Frequencies.)
3. Connect the audio cable to the Receiver Audio Out XLR jack.
4. Set the Power ON/OFF switch to ON and verify that the LCD panel activates.
5. Adjust the transmitter gain. **THIS IS PERHAPS THE MOST IMPORTANT STEP IN THE SET UP PROCEDURE.** Refer to your transmitter manual's Operating Instructions section for details on how to adjust the transmitter gain. In general, adjust the transmitter gain so that the voice peaks will cause the audio modulation indicators on the receiver and transmitter to show full modulation on the loudest peak audio levels. Normal levels should cause the UCR201's audio level icon to fluctuate fully. This will result in the best possible signal to noise ratio for the system.

Note

A common mistake at this point is to use the transmitter audio gain control to set the overall audio level of the entire audio system. The transmitter gain control is not a volume control and must be set independently of the overall system audio level. The transmitter gain control is only used to set the proper modulation of the transmitter. To explain it another way, it is used to match the transmitter to the type of microphone and the sound levels that will be present at that microphone. We encourage users to either disconnect the rest of the sound system or turn the sound system gain to minimum to prevent feedback or overload as the transmitter gain is set. That way, feedback from the sound system or overload of other equipment does not get in the way of setting the transmitter gain properly. Only after the transmitter gain control is set should the gain of the rest of the audio system be adjusted to achieve the desired sound or signal levels.

6. Adjust the Audio Output according to the type of input on your equipment. Use the LEVEL menu and adjust the level with the SELECT Up and Down buttons.

The input levels of different cameras, VCRs, and PA equipment vary, which may require that you adjust the AUDIO OUT to an intermediate position. Try different settings and listen to the results. If the output of the receiver is too high, you may hear distortion or a loss of the natural dynamics of the audio signal. If the output is too low, you may hear steady noise (hiss) along with the audio. The UCR201 audio output is designed to drive any audio input device from microphone level to +9 dBu line level.



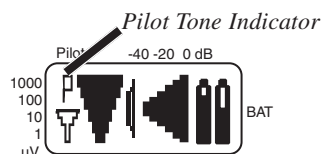
UCR201 Simplified Audio Output Circuit

FINDING CLEAR FREQUENCIES

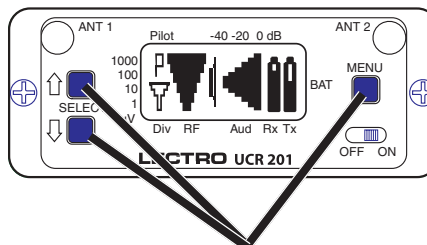
The following procedure will help you identify RF signals in the area and find clear channels for operating the wireless system.

1. Ensure transmitter is turned off. Turn on the receiver and wait a few seconds until the Main Window appears on the LCD

2. Ensure the receiver is not in PILOT TONE BYPASS mode. (A "P" will be blinking in the upper left corner of the Main Window.)

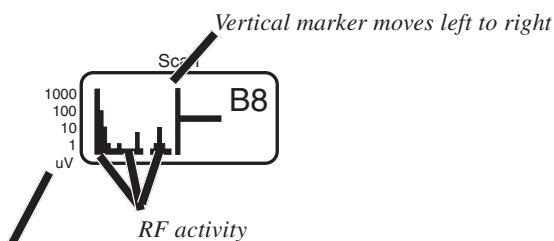


3. Simultaneously press the MENU and SELECT Up and Down buttons to enter Scan Mode.



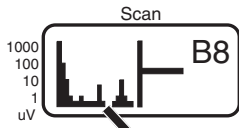
Press all three buttons at the same time and the receiver will start scanning.

4. View the LCD while the receiver is scanning. The vertical marker will move across the display from left to right. RF activity will be indicated by dark areas in the display.



Strength of RF activity is indicated in microvolts with markings on the front panel

5. RF signal strength is indicated by markings in microvolts on the front panel to the left of the LCD. Look for clear channels in the spectrum where there is no RF activity. Scanning will repeat and continue until a button is pressed.



No RF activity (clear channel)

- If necessary, press the MENU button to zoom in for greater detail for fine adjustment.



Fine adjustment can be made when zoomed closer

- Then press the SEL Up and Down arrows to move the marker to the middle of a clear area where there is no RF activity. If an area with no RF activity cannot be found anywhere in the spectrum, locate one with the least amount of RF activity.



Move marker to area with no RF activity

- Press all three buttons (SEL Up and Down and MENU) to move to the next screen. Two options will be shown.

Press the SEL Down arrow button to select the USE NEW option and set the receiver to the new frequency just found in scanning.

Press the SEL Up arrow button to select USE OLD and return to the frequency that was set before scanning.



Use the SEL Up and Down arrow buttons to select the old or new frequency.

LOCKING AND UNLOCKING THE UCR201 FRONT PANEL CONTROLS

The front panel controls can be “LOCKED” to prevent accidental changes being made during operation and handling.

To LOCK - Press and hold the MENU button until a bar tracks horizontally across the LCD screen and the word “LOCKED” appears. If the MENU button is released before the word “LOCKED” appears, the unit will remain

UNLOCKED. When in a LOCKED state, the pilot tone bypass toggle is also defeated.

In LOCKED state, the use of the MENU and SELECT Up/Down buttons are limited to “view only” and attempts to change selections will result in a screen displaying the word “LOCKED.” The unit cannot be used for RF scanning when it is set in the LOCKED state.

To UNLOCK - Press and hold the MENU button until a bar tracks horizontally across the screen and the word “UNLOCKED” appears. When the unit is UNLOCKED, all settings can be altered.

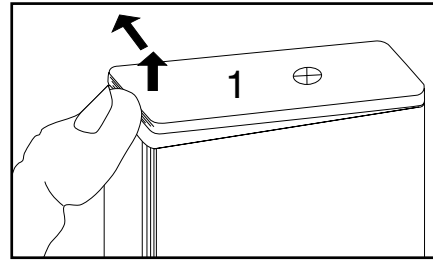
The receiver can be LOCKED or UNLOCKED from any of the four primary windows. It cannot be LOCKED from the scanning mode or from other subordinate screens.

REPLACING THE BATTERY

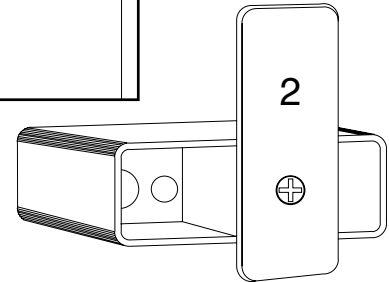
Lift and open the bottom battery door cover with your thumb, rotate the door clockwise until it is perpendicular with the case and allow the battery to fall out of the compartment into your hand. Retaining pins will prevent you from opening too far. It is difficult to install the battery backwards. Observe the large and small holes in the battery contact pad before inserting a new battery. Insert the contact end of the battery first, making sure the contacts are aligned with the holes in the contact pad, and then swing the door closed. You will feel it snap into place when it is fully closed.

CAUTION

Lithium batteries will expand and swell if allowed to go into a deep discharge. Be sure to remove lithium batteries as soon as the display starts flashing. If lithium batteries are allowed to fully discharge while still inside the battery compartment, they may be very difficult to remove. Stuck lithium batteries can be avoided by removing the battery label wrapping before use. This will allow the battery to swell but will still leave enough room in the compartment for the battery to fall out normally.



To open the battery compartment door, push the door up and away from the case with your thumb, then swing open.



UCR201 REPLACEMENT PARTS and ACCESSORIES

Part No.	Description
32251	Velcro mounting strips
CCMIN	Zippered, padded vinyl system pouch
CH12	AC power supply
VSR1	Thin velcro loop for power cable strain relief.

TROUBLESHOOTING

POWER SUPPLY AND FUSE LCD display not active

- External power supply disconnected or inadequate.
- Main power supply fuse tripped. Turn the receiver off, remove the cause of the overload and turn the receiver back on.
- Wrong polarity power source. The external DC in requires POSITIVE to be on the center pin.
- Battery may be low. Try a fresh battery

PILOT TONE SQUELCH PILOT indicator is solid “P”, but no sound

- Audio output cable bad or disconnected.
- Audio Output level set too low. Use the built-in test tone to verify levels.

PILOT “P” keeps flashing when transmitter audio switch is turned on

- It takes several seconds for the relay to actuate the PILOT. Turn on the transmitter power (and the audio switch on some models) and wait 3 to 5 seconds for the “P” to indicate steadily.
- Transmitter and receiver not on same frequency.

Noise on audio and Pilot indicator is “b”

- The pilot tone bypass has been activated. Hold MENU and press UP to reset (works only from the Main Window).

Note

The PILOT indicator on the front panel shows as a solid “P” to indicate that the audio has been turned on at the transmitter, and that the audio output on the receiver is enabled. When the “P” is on, the audio is enabled. If the “P” is flashing the pilot tone is not detected and the audio will be muted (squelched). When the pilot tone is bypassed, the “P” icon changes to a “b” shape.

ANTENNAS AND RF SIGNAL STRENGTH RF Level is weak

- Receiver may need to be moved or reoriented.
- Transmitter antenna may be defective or poorly connected
- Improper length of antenna, or wrong antenna on transmitter. (UHF whip antennas are generally about 3 to 5 inches long. UHF helical antennas may be shorter, but are often less efficient.

No RF Signal

- Make certain frequency switches on transmitter match the receiver frequency setting.
- Check battery in transmitter

AUDIO SIGNAL QUALITY Poor signal to noise ratio

- Transmitter gain set too low
- The noise may not be in the wireless system. Turn the transmitter audio gain all the way down and see if the noise remains. If the noise remains, then turn the power off at the transmitter and see if it remains. If the noise is still present, then the problem is not in the transmitter.
- If noise is still present when the transmitter is turned off, try lowering the audio output level on the UCR201 and see if the noise lowers correspondingly. If the noise remains, the problem is not in the receiver.
- Receiver output is too low for the input of the device it is feeding. Try increasing the output level of the UCR201 and lowering the input gain on the device the UCR201 is feeding.

Distortion

- Transmitter input gain too high. Check and/or readjust input gain on transmitter according to the LEDs on the transmitter and then verify the setting with the audio meter in the main window.
- Audio output level too high for the device the UCR201 is feeding. Lower the output level of the UCR201.

SPECIFICATIONS AND FEATURES

Operating Frequencies (MHz):

Block 21	537.600 - 563.100	Block 24	614.400 - 639.900	Block 27	691.200 - 716.700
Block 22	563.200 - 588.700	Block 25	640.000 - 665.500	Block 28	716.800 - 742.300
Block 23	588.800 - 614.300	Block 26	665.600 - 691.100	Block 29	742.400 - 767.900

Frequency Adjustment Range:	25.5 MHz in 100 kHz steps
Receiver Type:	Triple conversion, superheterodyne, 244 MHz , 10.7 MHz and 300 kHz
Frequency Stability:	±0.001 %
Front end bandwidth:	30 MHz @ -3 dB
Sensitivity	
20 dB Sinad:	0.9 uV (-108 dBm), A weighted
60 dB Quieting:	1.12 uV (-106 dBm), A weighted
Squelch quieting:	Greater than 125 dB
AM rejection:	Greater than 60 dB, 2 uV to 1 volt (Undetectable after processing)
Modulation acceptance:	85 kHz
Image and spurious rejection:	70 dB
Third order intercept:	0 dBm
Diversity method:	Phased antenna diversity
FM Detector:	Digital Pulse Counting Detector operating at 300 kHz
Antenna inputs:	Dual fixed - made of marine phosphor bronze
Audio outputs	
Rear Panel XLR:	Adjustable from -50 dBu to +9 dBu in 1 dB steps. Calibrated into a typical 10K Ohm balanced load. Actual output impedance max 500 Ohms, min 200 Ohms.
Front Panel Controls and Indicators	LCD control panel - menus include:
Main window:	Pilot tone; antenna phase, receiver battery level; transmitter battery level; audio level, RF level
Frequency window:	Frequency, TV channel; Transmitter switch setting
Audio output level adjustment:	-50 dBu to +9 dBu
Battery level tracking:	Both transmitter and receiver in 1/10th volt steps, accuracy +/- 10%.
Scanning mode:	Coarse and fine modes for spectrum check
Audio test tone:	1 kHz, -50 dBu to +9 dBu output, < 5% THD
Transmitter battery type selection:	9V alkaline, 9V lithium, AA alkaline, AA lithium
Rear Panel Controls and features:	XLR audio output jack; External DC input; Battery compartment access
Power Options:	
Ext DC:	Minimum 10 volts to maximum 18 VDC; 1.6 W, 100 mA at 12 VDC
Int Batt:	9V alkaline or lithium (90 mA @ 9V, 120 mA @ 6V)
Battery Life:	
9V alkaline	3.5 hours continuous, 4 hours intermittent
9V lithium	Up to 7 hours (continuous and intermittent usage are the same)
Weight:	11.3 oz with battery
Dimensions:	2.83" wide x 1.25" high x 4.64" deep
System Audio Specifications (UCR201 Receiver / UM200B Transmitter)	
Signal to Noise Ratio:	108 dB; A-weighted at full quieting
Distortion:	Less than 0.5% at 50% modulation, 1 kHz
Frequency Response:	+/- 3 dB from 40 Hz to 18 kHz

Specifications subject to change without notice.

SERVICE AND REPAIR

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

The 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

ou will save yourself time and trouble if you will follow the steps below:

A. DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 am to 4 pm (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.

Mailing address:

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

Shipping address:

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

Telephones:

Regular: (505) 892-4501
Toll Free (800) 821-1121
FAX: (505) 892-6243

Web: <http://www.lectrosonics.com>

Email: sales@lectrosonics.com

LIMITED ONE YEAR WARRANTY

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

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

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

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

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



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