

# **DR175NC**

## **RATIO DIVERSITY RECEIVER**

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### **OPERATING INSTRUCTIONS and trouble-shooting guide**

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**LECTROSONICS, INC.**  
Rio Rancho, NM

# INTRODUCTION

Thank you for selecting the Lectrosonics system.

The DR175 represents over 70 years of combined experience in the design of RF and audio devices and sets new standards for RF performance and flexibility. This receiver utilizes a "maximal ratio combining" technique, providing a very effective type of diversity reception. This is the first high performance receiver on the market to utilize this technique to combine the outputs of two separate receivers without hard-switching. The result is seamless audio reproduction without dropouts and superb, noise-free operation, even in weak overall signal conditions.

This is a "true diversity" receiver in the purest sense. The audio outputs of two separate receivers are mixed via a non-switching circuit that blends the two audio signals together in an optimum ratio. The ratio of this mixture is controlled by a circuit that monitors the comparative signal to noise ratios in both receivers and then "pans" back and forth to regulate the mixture. The receiver with the least high frequency noise is favored in the resultant blend.

The DR175 receiver was designed for professional users who demand outstanding performance and flexibility. It is compatible with all Lectrosonics high band transmitters.

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## FRONT PANEL CONTROLS AND FUNCTIONS

**MODULATION INDICATORS** Two (2) LEDs indicate the audio level (modulation) of the incoming signal, which are typically used for proper adjustment of the transmitter's "MIC LEVEL" or "GAIN". The -20 LED (green) lights during normal modulation. The 0dB (red) LED indicates maximum modulation and that the transmitter audio input may be "limiting." Occasional flickering of this LED is normal. It should not stay on for long periods, however.

**OFF/ON** This switch turns the receiver power off and on.

**CODE** Not active on this model (DR175NC.)

**OPTI-BLEND LEDs** The audio outputs of two separate receivers are mixed together in a "ratio" that is regulated by comparing the signal to noise ratios in the two receivers. The mixture ratio of the two audio signals is indicated on the front panel by two LEDs that vary in brightness. As a build-up of noise occurs in one receiver, the corresponding LED for that receiver dims or goes out as the circuitry pans to the other receiver. Since the mixture ratio of the two audio signals is determined by a comparison of their signal to noise ratios, the "blending" action occurs regardless of how strong (or weak) the incoming RF signals are. This is the distinct advantage of this receiver design over any other type of diversity system available.

**AUDIO LEVEL** This control knob adjusts the audio level of the XLR output on the rear panel.



Figure 1 - DR175NC Front Panel

## REAR PANEL CONTROLS AND FUNCTIONS

**ANTENNA INPUTS** These inputs connect to any 50 ohm antenna with a BNC type connector.

**12 VDC IN** This input connects to the supplied CH-12 AC adapter for powering the receiver from a 110/120V AC source. The receiver may also be powered from external 12 volt DC sources using the correct plug (Switchcraft S-760 power plug). The center pin is positive. (+).

### AUDIO OUT

This XLR type connector supplies a balanced, low impedance output at microphone level. The audio signal is present on pins 2 and 3, while pin 1 is ground. The output level of this jack is controlled by the AUDIO LEVEL control on the front panel of the receiver. Pin 2 is "hot" in terms of polarity.

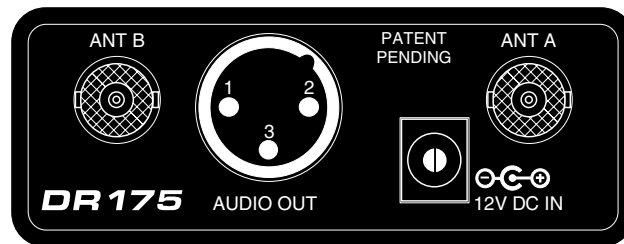


Figure 2 - DR175 Rear Panel

## ANTENNA USE AND PLACEMENT

There are two antennas included with this receiver. The A170 AC is a whip antenna that connects to either terminal on the rear panel of the DR175 receiver.

Position the antennas so that they are not within 3 or 4 feet of large metal surfaces. If this is not possible, try to position the antennas so that they are as far away from the metal surface as is practical. It is also 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 50 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 either audible noise (hiss), or in severe cases, may result in a complete loss of the carrier and the sound when the transmitter is positioned in certain locations in the room. A drop-out normally sounds like "hum" or "hiss." Moving the transmitter even a few inches will change the sound of the hum or hiss, or eliminate it. A drop-out situation may be either better or worse as the crowd fills and/or leaves the room, or when the transmitter or receiver is operated in a different location.

The DR175 receiver offers a sophisticated diversity design which overcomes drop-out problems in almost any imaginable situation. In the event, however, that you do encounter a dropout problem, first try moving the antenna at least 3 or 4 feet from where it was. This may alleviate the drop-out problem on that antenna. If drop-outs are still a problem, try moving the antenna to an entirely different location in the room or moving the antennas in closer to the transmitter location. By observing the OPTI-BLEND LEDs on the front panel, you can determine which antenna is suffering weak signals.

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.

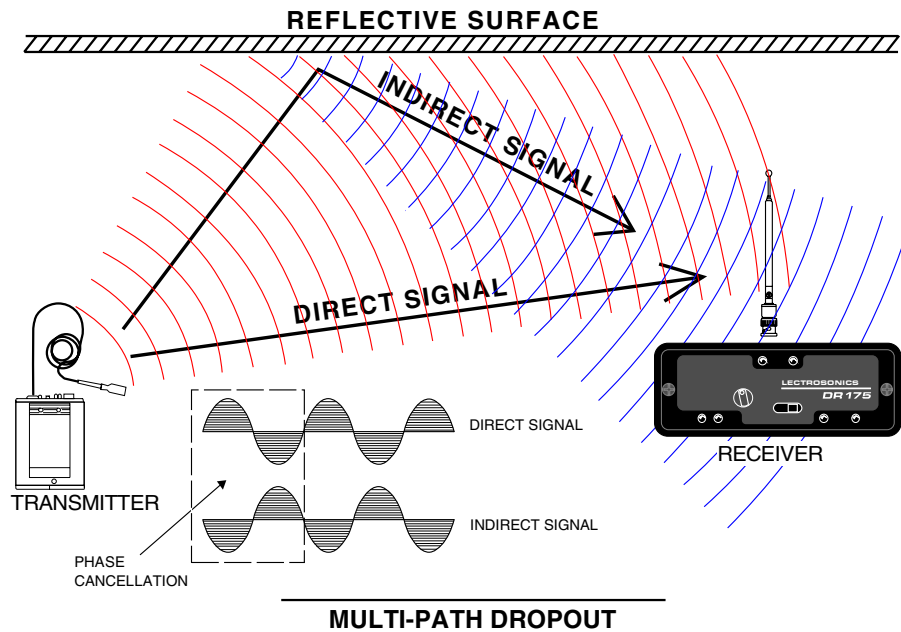


Figure 3 - Drop-outs

## OPERATING INSTRUCTIONS

- 1) Connect the power supply.
- 2) Attach and place the antennas.
- 3) Connect the audio cable.
- 4) Set the front panel AUDIO LEVEL control fully counter-clockwise and set the POWER switch to ON. Check to see that the red POWER LED lights up.
- 5) Adjust the transmitter "gain". THIS IS PERHAPS THE MOST IMPORTANT STEP IN THE SET UP PROCEDURE. See your transmitter manual (Operating Instructions section) for specific directions on the proper gain adjustment of your particular transmitter.
- 6) After adjusting the transmitter gain, set the AUDIO LEVEL to a comfortable listening position.
- 7) Operate the system and adjust the receiver output level as required for your equipment. The input levels on different VCR's and PA equipment vary, which may require that you set the OUTPUT ATTENUATOR control in 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.

## INDICATOR QUICK REFERENCE

**CODE LED** - Not active on this model (DR175NC.)

**POWER** - This red LED lights up when the receiver is properly connected to a power supply and switched on.

**MODULATION** -- The audio level is indicated by these two LEDs, -20 and 0dB. The normal operating level occurs when the -20 (green) LED is lighting up with the audio. The 0dB LED (red) lights up when the audio level is high and the signal is being compressed in the transmitter. An extremely high audio level may cause distortion. If neither LED lights up when audio is being produced through the system, the audio level is too low, which may produce audible background noise (hiss) in the audio. The audio level is adjusted with the transmitter GAIN or MIC LEVEL control.

**OPTI-BLEND LEDs** -- These green LEDs indicate the blending action of the panning circuit in response to the comparison of signal to noise ratios in the two receivers. The audio from either receiver is being mixed into the blend when the corresponding LED lights up. The brightness of these LEDs varies in proportion to the amount of audio being utilized from the associated receiver.

# TROUBLESHOOTING

Before going through the following chart, be sure that you have a good battery in the transmitter and that the transmitter power LED is indicating normally.

| <b>SYMPTOM</b>                              | <b>POSSIBLE CAUSE</b>   |
|---|---|
| <b>NO POWER LED</b>                         | <ol style="list-style-type: none"><li>1) Receiver switch in "OFF" position</li><li>2) External 12 Volt power disconnected</li><li>3) CH-12 AC adapter disconnected</li></ol>  |
| <b>NO CODE LED</b>                          | Normal for this model (DR175NC.)  |
| <b>NO SOUND<br/>AND NO MODULATION LEDS</b>  | <ol style="list-style-type: none"><li>1) Transmitter switch in "MUTE" position</li><li>2) Possible malfunction in the audio section of the transmitter (See transmitter manual)</li><li>3) Check transmitter modulation LEDs for possible transmitter problem</li></ol> |
| <b>MODULATION LED's ON<br/>BUT NO SOUND</b> | <ol style="list-style-type: none"><li>1) Receiver LEVEL control turned down</li><li>2) Audio cable disconnected</li><li>3) Recorder or sound system off, or not properly adjusted</li></ol>   |

## DR175 REPLACEMENT PARTS and ACCESSORIES

| <b><u>Part No.</u></b> | <b><u>Description</u></b>  |
|------------------------|--|
| <b>CH-12</b>           | 110 Volt AC adapter for DR175 receiver.  |
| <b>A-170 AC</b>        | 1/4 wave whip on a right angle BNC connector.  |
| <b>A-185 Coax</b>      | Remote, folded-dipole antenna with coaxial cable.  |
| <b>A-185-BNC</b>       | Telescoping 1/4 wave whip on a swiveling BNC connector.  |
| <b>A-200</b>           | Remote dipole antenna with aluminum mounting block; supplied with one built-in telescoping whip and one detachable telescoping whip. |

# SPECIFICATIONS AND FEATURES

|                               |   |
|-------------------------------|---|
| <b>Operating frequencies:</b> | 150 to 216MHz, crystal controlled   |
| <b>Sensitivity:</b>           | -110dBm for 20dB Sinad (0.7uV)  |
| <b>Signal/noise ratio:</b>    | 96dB flat; 99dB A-weighted  |
| <b>Squelch quieting:</b>      | Greater than 109dB  |
| <b>AM rejection:</b>          | Below the noise at all input levels   |
| <b>Modulation acceptance:</b> | Greater than $\pm 15$ kHz   |
| <b>IF Selectivity:</b>        | 150kHz interference bandwidth<br>-30dB @ $\pm 200$ kHz  |
| <b>Third order intercept:</b> | +5dBm   |
| <b>Diversity technique:</b>   | Dual receiver "opti-blend" audio combining  |
| <b>Audio outputs:</b>         | XLR: 200 Ohm bal.; 100mV max.   |
| <b>Antenna inputs:</b>        | Dual BNC female; 50 Ohm impedance   |
| <b>Controls:</b>              | <ul style="list-style-type: none"><li>• Front panel attenuator controls balanced outputs</li><li>• Power switch</li></ul>   |
| <b>Indicators:</b>            | <ul style="list-style-type: none"><li>• Red LED for power "ON"</li><li>• Dual modulation LEDs show transmitter audio level</li><li>• Dual "opti-blend" LEDs display mixture ratio</li></ul> |
| <b>Power requirements:</b>    | <ul style="list-style-type: none"><li>• 12V DC (rear panel jack)</li><li>• 110V AC (using supplied CH-12 AC adapter)</li></ul>  |
| <b>Power consumption:</b>     | 170mA max   |
| <b>Weight:</b>                | 10.1 ozs  |
| <b>Dimensions:</b>            | 3¼" wide, 1¼" high, 5¼" deep  |

## 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 inter-connecting cords and then go through the TROUBLE SHOOTING 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.**

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

You 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:  
(505) 892-4501  
(800) 821-1121  
FAX: (505) 892-6243

**World Wide Web:** <http://www.lectrosonics.com>

**email:** [sales@lectrosonics.com](mailto: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, we will, at our option, repair or replace any defective parts without charge for either parts or labor. If we cannot correct the defect in your equipment, we will replace it at no charge with a similar new item. We will pay for the cost of returning your merchandise to you.

This warranty applies only to items returned to us, shipping costs prepaid, within one year from the date of purchase.

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

**LECTROSONICS, INC.**

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