

R175M

Dual Channel Receiver Module

OPERATING INSTRUCTIONS and trouble-shooting guide

LECTROSONICS, INC.
Rio Rancho, NM

INTRODUCTION

The R175M receiver module was designed to simplify the addition of a wireless microphone system to the Modular Audio Processor system. This is a single width module with two discrete receivers on a common circuit board. Separate input/output jacks, controls, and indicators have been provided for each receiver.

The R175M dual receiver is a fixed frequency design utilizing a quartz crystal oscillator. This assures that the frequency will not drift and also eliminates the need to "tune" or adjust the receiver every time it is used. This is the preferred design that professionals have chosen.

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GENERAL TECHNICAL DESCRIPTION

COMPANDOR

The noise reduction compandor is compatible with all Lectrosonics 185 series VHF transmitters. It operates on a 2:1 ratio and is optimized for "voice type" audio signals in a noisy environment.

FRONT-END AND MIXER

The incoming RF signal first passes through RF filter coils coupled with ultra low noise J-FETs. The J-FETs have an extremely high overload threshold, and are used to provide just enough gain to compensate for the losses through each stage of the filters. The output of the front-end is then delivered to a double balanced diode mixer, which produces the IF signal without harmonics. An LC filter stage follows the mixer, and then gain is applied to the signal. The net effect of this design is that the receiver is less prone to produce intermodulation, resists overload caused by nearby high-power RF transmitters (such as a TV station tower), and exhibits extremely high AM rejection.

CRYSTAL CONTROLLED OSCILLATORS

Highly stable crystals are used in the oscillators to minimize drift. These crystals are stable over a very wide temperature range and do not drift over time.

BALANCED AUDIO OUTPUT

The audio outputs are provided on rear panel XLR jacks so that the audio may be patched into the system as required by the system design. Typically, the R175M audio output is connected to an automatic mic pre-amp input. This preserves the automatic operation of the microphone and the associated NOM attenuation provided by the system controller.

SENSITIVITY

The R175M exhibits a 1uV sensitivity, which provides an extended operating range and minimizes drop-outs. This is an important feature, since most of the applications for this unit are likely to be indoors where multi-path is a constant problem. With high sensitivity, the receiver will continue to operate and produce a useable signal to noise ratio even when most of the RF signal has been lost due to phase cancellation caused by multi-path reflections.

The R175M was intended primarily for applications such as churches and courtrooms where a maximum of four wireless channels is sufficient. For multi-channel wireless systems beyond this, (where intermodulation can be a serious problem), it is generally best to utilize separate receiver assemblies with RF distribution and isolation. A number of different 19" rack mount multi-channel wireless systems are offered by Lectrosonics for systems up to 24 channels or more.

RECEIVER FRONT PANEL

AUDIO LEVEL, LIMIT LED and NORM LED

Indicates the modulation (audio level) of the incoming signal - see transmitter manual for proper adjustment of transmitter "MIC LEVEL" or "GAIN." The **NORM** lamp should flicker, or stay lit as you speak into the microphone.

The **LIMIT** lamp is a "peak" indicator showing full modulation. If the gain on the transmitter is too high, the limit lamp will stay on as you speak. It is normal, however, to see an occasional flicker of the **LIMIT** lamp.

AUDIO MUTE SWITCH and ON LED

The **MUTE** switch on each receiver channel will disable the audio output of that channel. The green **ON** LED indicates when the audio output is enabled.

RF LED

Lights when the transmitter is turned on. When the carrier signal from the transmitter is too weak to produce a quiet audio signal, the lamp will go out.

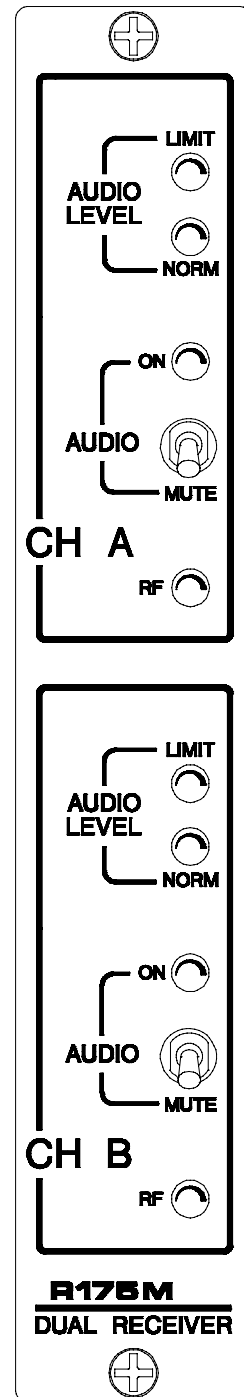


Figure 1 - R175M Front Panel

RECEIVER REAR PANEL

ANTENNA

A standard BNC connector compatible with the supplied A-185BNC coaxial antenna.

OUTPUT

A standard female 3-pin XLR jack which provides a 50 Ohm, balanced audio signal. Pin 1 is ground, and pins 2 and 3 are the output. The output level is approximately 150mV RMS.

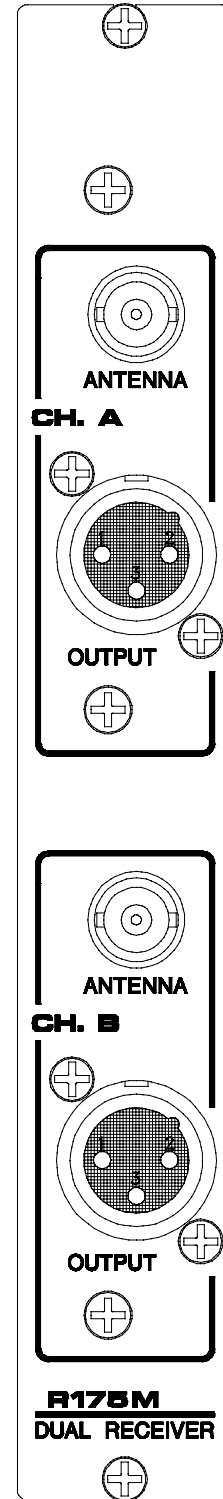


Figure 2 - R175M Rear Panel

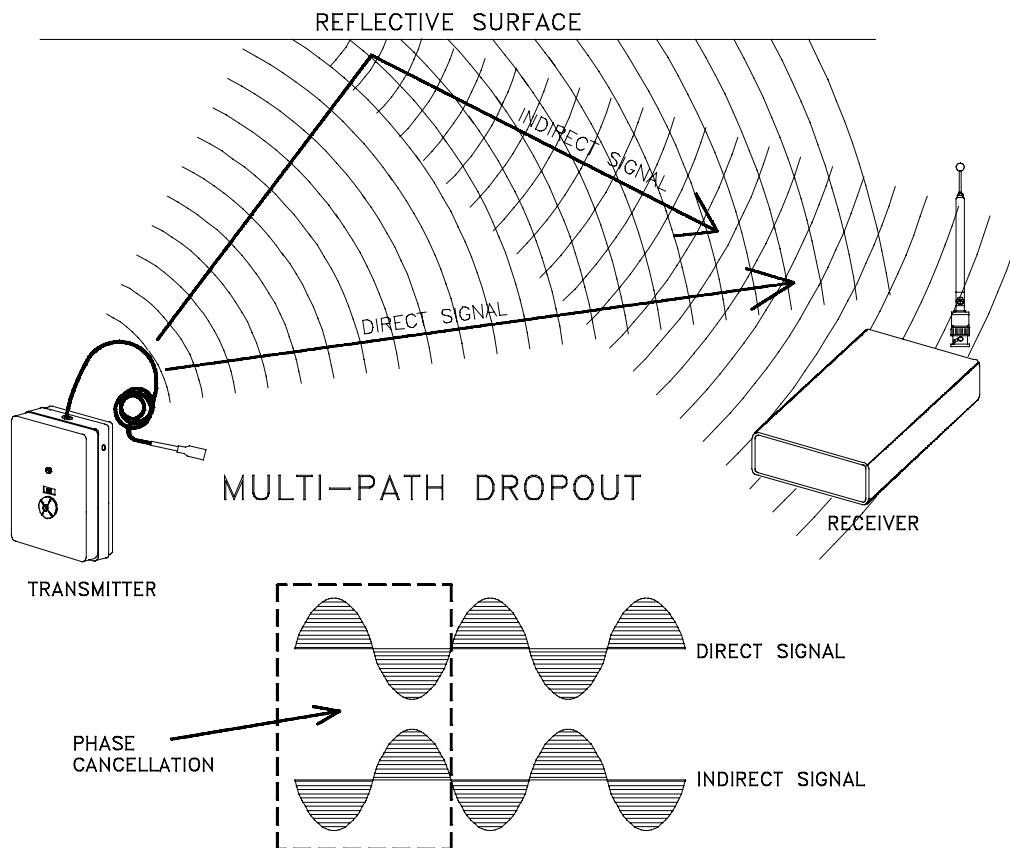
ANTENNA USE AND PLACEMENT

Connect the antenna to the rear panel jack. Position the stripped end of the antenna so that it is not touching or within 3 or 4 feet of large metal surfaces. It is also good practice to position the antenna so that there is a direct "line of sight" between the transmitter and the antenna.

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 "dropout." A dropout sounds like either audible noise (hiss), or in severe cases, may result in a complete loss of the sound when the transmitter is positioned in certain locations in the room. A dropout 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 dropout situation may be either better or worse as the crowd fills and/or leaves the room.

In the event 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 dropout problem. If dropouts are still a problem, try moving the antenna to an entirely different location in the room.

Lectrosonics transmitters radiate more power, and the receivers are more sensitive than any other on the market. This reduces dropouts to an insignificant level. If, however, you do encounter dropouts frequently, call the factory. There is probably a simple solution.



SETUP AND OPERATION

- 1) Insert the module into the frame and ensure that the connector is fully seated. Secure the module to the frame with the two phillips head screws at the top and bottom of the rear panel.
- 2) Connect the antennas to the rear panel ANTENNA jacks and the audio output cables from the OUTPUT XLR jacks to the AP4 (or MP4) INPUT jacks.
- 3) Place the front panel MUTE switches into the MUTE positions for steps 4 and 5.
- 4) Turn on the Modular Audio Processor and the transmitter
- 5) Speak into the mic and adjust the transmitter gain control (see your transmitter manual for details on how to adjust the gain) until the LIMIT LED on the front of the R175M lights during loudest peaks in the audio. Now back off on the transmitter gain until the LIMIT LED is flashing only occasionally on the voice peaks and the NORM LED is flashing constantly. The limit LED should not stay lit constantly, but blink occasionally during normal use.
- 6) Set the AP4 OUTPUT LEVEL to minimum and switch the R175M MUTE switch to ON. Slowly adjust the INPUT TRIM and the OUTPUT LEVEL on the AP4 for the proper and desired system level while speaking into the microphone.

INDICATORS

RF

This yellow LED lights up when the transmitter is turned on. This indicates that the receiver is getting an adequate RF signal (carrier) from the transmitter.

AUDIO ON

A green LED that, when lit, indicates that the audio output is NOT muted.

AUDIO LEVEL, NORM

This green LED works in conjunction with the LIMIT LED and lights when the transmitter modulation (audio level) is at an adequate level to produce a good signal to noise ratio.

AUDIO LEVEL, LIMIT

The LIMIT LED is red and indicates, when lit, that the transmitter modulation (audio level) is too high and is being compressed in the transmitter. An extremely high audio level may also cause distortion. This lamp should blink occasionally during normal use. (See step 5 above.)

**REVIEW THE TRANSMITTER INSTRUCTION MANUAL FOR PROPER ADJUSTMENT
AND SETUP OF THE TRANSMITTER MIC LEVEL.**

TROUBLESHOOTING

Before going through the following chart, be sure that you have a good battery in the transmitter. It is important that you follow these steps in the sequence listed.

SYMPTOM	POSSIBLE CAUSE
RECEIVER RF LAMP OFF	<ol style="list-style-type: none"> 1) Transmitter not turned on. 2) Transmitter battery is dead. 3) Receiver antenna missing or improperly positioned. 4) Transmitter and receiver not on same frequency. Check labels on transmitter and receiver. 5) Operating range is too great.
NO SOUND AND RECEIVER AUDIO LEVEL LEDs ARE OFF	<ol style="list-style-type: none"> 1) Transmitter audio muted. Check to see that the audio is not muted on your transmitter, if this feature is available.
NO SOUND BUT RECEIVER AUDIO LEVEL LEDs ARE ON	<ol style="list-style-type: none"> 1) Receiver audio is muted. Check front panel AUDIO MUTE switch. 2) Receiver audio output is disconnected or cable is defective or mis-wired. 3) Sound system or recorder input is turned down.
DISTORTED SOUND	<ol style="list-style-type: none"> 1) Transmitter gain (audio level) is too high. Speak or sing into the transmitter and check mod level lamps on transmitter and/or receiver. 3) Excessive wind noise or breath "pops."
HISS AND NOISE - AUDIBLE DROPOUTS	<ol style="list-style-type: none"> 1) Transmitter gain (audio level) too low. 2) Receiver antenna missing or obstructed. 3) Operating range too great.
EXCESSIVE FEEDBACK	<ol style="list-style-type: none"> 1) Transmitter gain (audio level) too high. Check gain adjustment and/or reduce receiver output. 2) Transmitter too close to speaker system. 3) Transmitter too far from the user's mouth.

REPLACEMENT PARTS and ACCESSORIES

<u>Part No.</u>	<u>Description</u>
A-185 COAX-BNC	Coaxial folded dipole antenna
A-200	Remote dipole antenna
A-9775	10" coax cable assy with BNCs for A-200

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
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Shipping address:

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

Telephones:

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

R175M SPECIFICATIONS AND FEATURES

Type:	Dual receiver module for Modular Audio Processor
Operating frequencies:	150 to 216 MHz crystal controlled
Sensitivity:	1.0uV for 20dB SINAD 2.0uV for 50dB S/N ratio
Signal/noise ratio:	96dB flat, 100dB A-weighted
Squelch quieting:	greater than 100dB
AM Rejection:	-40 dB (10uV to 0.1 Volts)
Modulation acceptance:	±15kHz
Image and spurious rejection:	greater than 100 dB
Audio outputs:	Rear panel XLR jacks, fixed 150mV RMS, one per channel
Antenna input:	Rear panel BNC connector, one per channel
Controls:	Front panel mute switch, one per channel
Indicators:	2 LEDs for modulation level "RF" LED for transmitter "ON" Audio output "ON" LED
Power requirements:	Powered from Modular Audio Processor main power bus
Weight:	12.7 ozs.
Dimensions:	1.25"W x 8.75"H x 11.25"D

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.

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