

# **LONG RANGER II**

## **PORTABLE WIRELESS SOUND SYSTEM**

---

---

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

---

---

**LECTROSONICS, INC.**

Rio Rancho, NM

## INTRODUCTION

Thank you for selecting the LONG RANGER II Portable Wireless Sound System. This system represents over 80 years of combined experience in the design of RF transmitters, receivers and Public Address systems. The LONG RANGER II sets new standards for operational convenience, flexibility and mechanical ruggedness. The built-in wireless receiver, the rechargeable power supply and the high audio output set this system apart from any other portable PA system on the market.

This manual covers the standard LONG RANGER II, optional microphones, transmitters, extension speakers and the "add-on" 170MINI-LR wireless microphone system.

---

## TABLE OF CONTENTS

INTRODUCTION .....	1
GENERAL TECHNICAL DESCRIPTION .....	2
RECHARGEABLE BATTERIES AND EXTERNAL POWER SOURCES .....	2
CONTROLS AND FUNCTIONS .....	3
M170 SERIES TRANSMITTERS .....	5
SYSTEM SETUP RULES .....	6
INITIAL EQUIPMENT ADJUSTMENTS .....	7
USING ADDITIONAL SPEAKERS .....	8
ADDING A SECOND WIRELESS CHANNEL TO YOUR LONG RANGER II .....	9
INITIAL ADJUSTMENTS TO THE 170MINI-LR SYSTEM .....	10
MULTIPLE LONG RANGER II SYSTEMS .....	11
MICROPHONE CHOICES .....	12
ACCESSORIES AND REPLACEMENT PARTS .....	13
TROUBLESHOOTING .....	14
SPECIFICATIONS .....	15
SERVICE AND REPAIR .....	16
RETURNING UNITS FOR REPAIR .....	16
WARRANTY .....	Back cover

## GENERAL TECHNICAL DESCRIPTION

The standard LONG RANGER II Portable Wireless Sound System consists of a combination wireless receiver/amplifier/speaker with a rechargeable battery pack, an M170 belt-pack transmitter and a microphone. Optional microphones, extension speakers and add-on equipment for a second wireless channel are available. These items will be discussed elsewhere in this manual.

The LONG RANGER II features a VHF wireless microphone system with a transmitter-to-receiver operating range of up to 750 feet. The receiver is designed for high selectivity to prevent interference from other transmitted radio signals. The system is designed and constructed for rigorous portable use with the antenna integrated into the horn speaker to eliminate damage.

The LONG RANGER II will operate from 8 to 12 hours from the "on-board" rechargeable battery pack before recharging is necessary. The actual operating time is dependent upon the type of usage....intermittent or continuous. The unit can also be operated from an external 12 Volt DC source. An accessory power cord is available to allow operation from a vehicle cigarette lighter receptacle.

The amplifier produces 33 Watts, RMS, into the 8 Ohm horn speaker. The sound output will cover an area the size of a football field under average outdoor conditions. Several LONG RANGER IIs can be easily connected together to provide even greater area coverage.

## RECHARGEABLE BATTERIES AND EXTERNAL POWER SOURCES

The battery pack in the LONG RANGER II is charged by plugging the CH-40 charger into the jack labeled CH-40 on the control panel of the LONG RANGER II. Connect the charger into a standard 110 Volt AC outlet. The green lamp beneath the jack will light as long as the batteries are charging. When the batteries are almost completely charged the green charging light will go out. You may leave the charger plugged in after the green light has gone out with no danger of damage to the system. In fact, we recommend charging the system whenever it is not in use, then the system will always be "ready to go".

Since the LONG RANGER II consumes more power than the CH-40 charger can supply, the batteries will recharge faster if you turn the LONG RANGER II power off while charging. The batteries normally require 2 to 6 hours to recharge. If the unit is completely run down, it may require as much as 24 hours to fully charge the batteries. Leave the charger plugged in at least until the green lamp just below the CH-40 jack goes out.

The LONG RANGER II can be operated from an external 12 Volt DC source such as an automobile battery or, most commonly, from the cigarette lighter receptacle in your vehicle. To use an external power source it must be connected into the 12V DC POWER INPUT jack on the LONG RANGER II front panel. **CAUTION**--Make sure you comply with the polarity markings on the jack. The correct plug for making the connections is a Switchcraft S-760 which can be obtained through electronic parts suppliers. Lectrosonics cord number 21329 is available through your dealer for connecting your unit to a vehicle cigarette lighter receptacle. When an external power source is connected to the LONG RANGER II, the on-board battery pack is automatically disconnected.

## **CONTROLS AND FUNCTIONS CONTROL PANEL**

### **WIRELESS MICROPHONE VOLUME**

Turns unit power on and off and also functions as the volume control for the internal wireless receiver.

### **POWER**

A red LED that lights when unit power is on.

### **RF**

A green LED that lights when the companion transmitter is turned on and there is sufficient signal for good system operation. Internal circuits monitor both signal level and interference levels and decide if the transmitted signal is strong and "clean" enough for satisfactory operation. If not, the green RF LED will go out and the receiver will "squelch", shutting off the sound output. This action is automatic and requires no user adjustment.

### **MOD LEVEL**

The red and green MOD LEVEL LEDs continuously indicate the modulation level(audio level) of the received signal from the transmitter and are used when making initial adjustments to the transmitter.

### **MIC**

This jack is a standard 1/4" phone jack and is used for plugging in the cord from a dynamic microphone such as the Lectrosonics M121S.

### **LINE**

This mini jack is used for connecting high level, high impedance outputs from tape decks or other amplifiers. It also may be used for connecting the "earphone" output from portable cassette players.

### **AUXILIARY INPUT VOLUME**

Adjusts the volume of the MIC and LINE inputs.

### **AUX IN/OUT**

An RCA phono jack that functions both as a line level input and line level output. This "omnibus" jack is primarily used for interconnecting several LONG RANGER IIs together for simultaneous operation. This jack can also be used with a tape deck to either record from or play back into the LONG RANGER II. When used with a tape deck or other audio source, the sound output level must be controlled by the volume control on the tape deck since there is no volume control on the LONG RANGER II for the AUX IN/out.

### **CH-40**

A special jack used for connecting the CH-40 charger when charging the battery pack. The green LED located under the jack lights when the batteries are charging. This LED automatically goes out when the batteries are almost fully charged.

### **12V DC OUT**

A special jack used to supply power to a SR170-LR receiver when that option is installed.

### **PUSH RE-CIRK-IT**

A resettable circuit breaker which protects the internal circuits from damage due to shorts in the speaker. When the breaker "trips" the center button pops out. To reset the breaker, push the center button back in. Frequent tripping indicates a fault in the equipment which needs attention.

## FRONT PANEL

### 12V DC POWER INPUT

A special jack used to connect an external 12 Volt DC source to the unit to substitute for the "on-board" battery pack. It is most commonly used for connecting the LONG RANGER II to a vehicle cigarette lighter receptacle. When an external power source is connected to this jack, the on-board battery pack is automatically disconnected.

### EXTERNAL 8 OHM SPEAKERS

Two jacks which are used to connect external 8 ohm horns or speakers such as the Lectrosonics H300 horn or ES300 column speaker.

### EXTERNAL ANTENNA

A standard BNC connector provided to allow the use of an external antenna if required. It is suggested that you contact the factory for technical assistance if you plan to use the LONG RANGER II in an operational environment where an external antenna might be needed.



Figure 2 - Control Panel

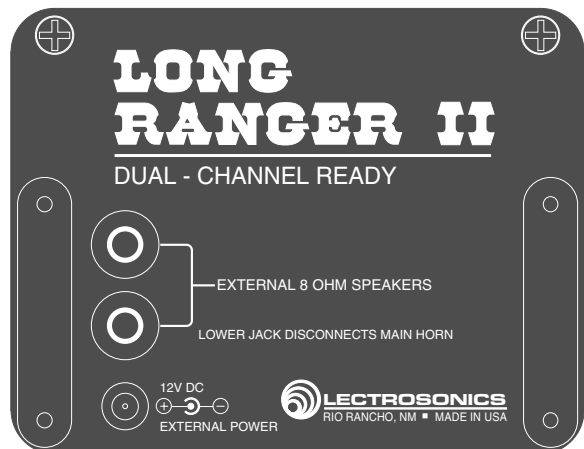


Figure 3 - Front Panel

## M170 SERIES TRANSMITTERS

Standard LONG RANGER II systems include an M170 belt-pack transmitter which is designed to be used with a lavalier or headset microphone. The optional M170-XLR transmitter is similar to the M170 but is equipped with two microphone connectors; a locking micro jack for lavalier or headset microphones and an XLR connector for use with standard low impedance hand held microphones. If you have one of the other optional Lectrosonics transmitters, consult the supplied manual for that transmitter for the description and operating instructions.

The **BATTERY** used in the transmitter should be a 9 Volt **alkaline** or **lithium** battery which will provide up to 15 hours or more of operation. These are available almost anywhere. Carbon zinc batteries, even if marked "heavy duty" or "super heavy duty", will only operate up to 4 hours. Make sure "alkaline" or "lithium" is marked on the battery.

To replace the battery, turn the **THUMB SCREW** counterclockwise and remove the side cover. The battery will not go into the compartment if it is put in backwards. Observe the large and small holes in the battery contact pad.

The **BATTERY INDICATOR** will light when the transmitter is turned on and will stay lit as long as the battery is good. If the battery is low, the battery indicator will grow dim and finally go out. Even after the indicator goes out, there may still be up to an hour or more of use remaining. When the battery is too low for proper operation, the sound from the wireless system may be intermittent or totally absent. When the transmitter is first turned on, it may require several minutes to get a "true" battery reading.

The **MIC JACK** is a locking micro jack that supplies phantom power for electret microphones such as the M140 lavalier model and the headset models. Insert the microphone plug into this jack and rotate it clockwise to lock it.

*Caution* - If the microphone plug is not screwed in tightly, the audio may become "crackly" as the mic cord is moved.

The microphone cord is the antenna for the transmitter. The standard 3-pin **XLR CONNECTOR** is designed for best performance with standard, balanced, 50 to 600 ohm impedance microphones, although it will work with high impedance microphones. If your microphone has selectable impedance, set or wire it for 150 or 200 ohms, or set it to the "low impedance" position.

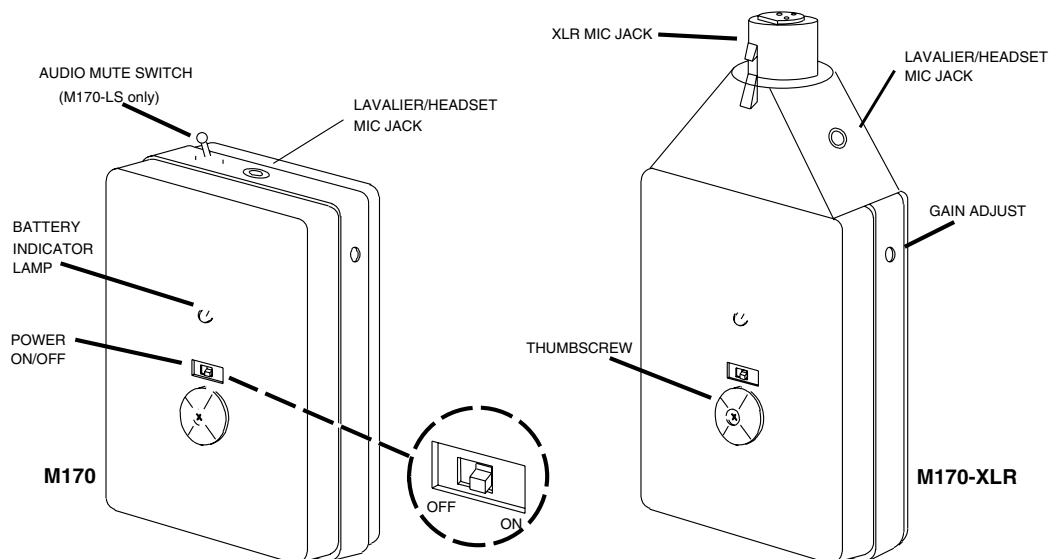


Figure 4 - M170 Transmitters

## SYSTEM SETUP RULES

This section includes some basic rules that will ensure trouble-free operation of your LONG RANGER II system:

- 1) Make sure the transmitter battery is good, or better yet, new.
- 2) Charge up the battery pack in the LONG RANGER II fully before you use the system. Charge until the green charging lamp underneath the CH-40 jack on the LONG RANGER II control panel goes out.
- 3) Set up the system so that the LONG RANGER II is as far from large metal surfaces as possible. Metal surfaces under the unit (such as pickup truck cabs) are generally no problem but large metal surfaces alongside the LONG RANGER II may interfere with reception.
- 4) If you have more than one transmitter on the same frequency, turn on only one transmitter at a time. You cannot use the two transmitters at the same time with a single LONG RANGER II. You will need to "alternate" back and forth between the transmitters. Failure to do so will result in an obnoxious whining sound from the system, and the audio will probably not be understandable.
- 5) Use the minimum volume that will enable everyone to hear. It doesn't have to be loud to be heard.
- 6) Always turn the power off before connecting or disconnecting external speakers.
- 7) The LONG RANGER II should be elevated for best coverage. The unit should ideally be at least 2 feet higher than the audience. For example, with an audience standing on flat ground, the number of people that can hear clearly will double if you raise the unit from 5 feet above the ground to 7 feet above the ground.
- 8) During actual operation the LONG RANGER II should be located at least 20 feet away from the person using the microphone and aimed so that the sound from the speaker is directed toward the audience and away from the microphone. This will reduce feedback problems. "Feedback" is a loud squealing sound coming from the speaker when the volume is too high or the microphone is too close to the LONG RANGER II. Feedback is generally much more of a problem when using lavalier (lapel) type microphones. The headset models are recommended for use with the LONG RANGER II system since they place the microphone pickup much closer to your mouth.

## INITIAL EQUIPMENT ADJUSTMENTS

This section covers the initial adjustments to the transmitter and LONG RANGER II that must be made before the system is placed into operation. The step-by-step procedures are listed in the order in which they should be performed:

- 1) Turn LONG RANGER II power on - The POWER lamp lights.
- 2) Rotate both volume controls counter-clockwise to their minimum settings.
- 3) Position yourself behind the LONG RANGER II so that the sound from the speaker will be directed away from the microphone.
- 4) Plug your microphone into the transmitter. Rotate the plug clockwise to make sure the connection is locked.
- 5) Turn the transmitter power on and verify that the red lamp on it lights. If the lamp is very dim or does not light, replace the battery.
- 6) Observe that the green RF lamp on the LONG RANGER II control panel is lighted. This verifies that the unit is receiving a useable signal from the transmitter.
- 7) Position the microphone on your person in the location it will be during actual operation. The microphone should be within 3 inches of the mouth to minimize the possibility of "feedback". If the headset mic is being used, position the mic element at the corner of the mouth and rotate the white volume control knob fully clockwise.
- 8) A small screwdriver is supplied with the transmitter. The screwdriver is used to adjust the audio gain of the transmitter to match your microphone and your voice. The adjustment is made while observing the MOD LEVEL lamps on the LONG RANGER II control panel:
  - a) Speak at the voice level you will be using during actual operation.
  - b) While speaking, adjust the transmitter gain until the green MOD LEVEL lamp is lighted or flickers and the red MOD LEVEL lamp blinks only on the loudest words. Raise and lower your voice while observing the lamps. The red lamp should only blink occasionally.

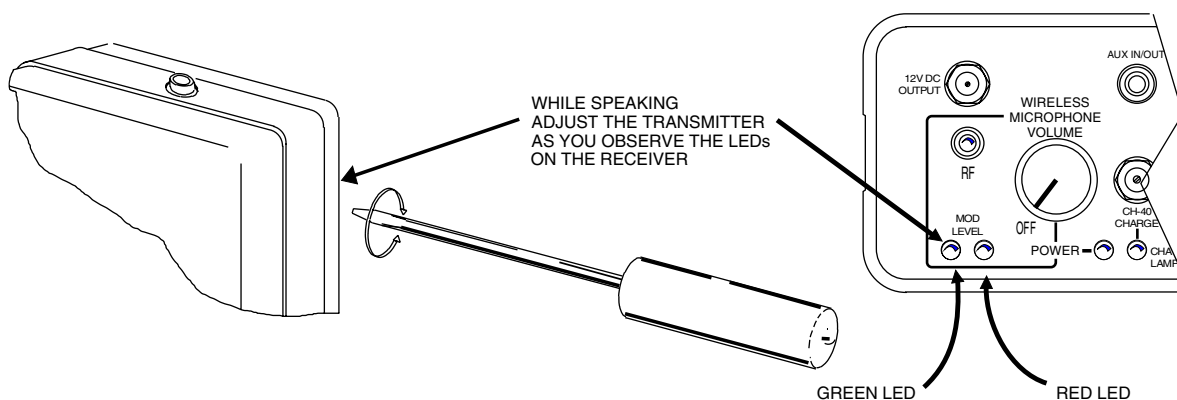


Figure 5 - Transmitter Gain Adjustment



- 9) You may now adjust the WIRELESS MICROPHONE VOLUME control on the control panel to a level where everyone can hear. You will probably have to do this in several steps. If you attempt to adjust the volume yourself while standing and transmitting just behind the unit, you will likely have a "feedback" problem. It is convenient to have another person adjust the volume while you transmit from a position 20 feet or more behind the unit.

REMEMBER--the transmitter gain control is used only to adjust for proper MOD LEVEL lamp indications. DO NOT use it to adjust the output volume of the LONG RANGER II speaker. Different voices and different microphones will usually require readjustment of the transmitter gain control, so check the adjustment frequently. If several different people will be using the system and there is not time to make the adjustment for each individual, adjust it for the loudest voice.

## **USING ADDITIONAL SPEAKERS**

### **CAUTION**

#### **ALWAYS TURN THE LONG RANGER II POWER OFF BEFORE PLUGGING IN OR UNPLUGGING EXTERNAL SPEAKERS**

In some cases, the proper coverage of an audience requires a second speaker. The optional H300 is identical to the LONG RANGER II speaker and can be used to spread the sound over a larger area.

Another optional speaker is the ES300, a column speaker designed for high quality voice or music reproduction at lower sound levels than the H300 mentioned above. The ES300 is ideal for many indoor applications where the sound level from the regular horn may be excessive. The H300 and ES300 will not work well together since the H300 is so much louder than the ES300.

The output jacks for the optional speakers are located on the LONG RANGER II front panel. The upper and lower jacks operate differently. The upper jack does not disconnect the built-in speaker when a speaker is plugged into it. This means that the built-in speaker and the auxiliary speaker will both operate together. The lower output jack disconnects the built-in speaker and powers only the external speaker. Internal circuits and switching networks keep track of the number of speakers hooked up and select the amplifier impedance so that the full power of the amplifier is always available. It is important that you use only an 8 ohm speaker in these jacks. If you are not using Lectrosonics extension speakers, check the speaker for the proper rating before connecting to the LONG RANGER II.

The H300 speaker is typically used in conjunction with the built-in speaker to increase sound coverage. This is done by plugging the H300 into the upper speaker jack. The ES300 column speaker, on the other hand, will not be nearly as loud as the built in horn, so it is normally used by itself, plugged into the lower jack on the LONG RANGER II front panel.

When using two external speakers simultaneously, the built-in speaker will be automatically disconnected to prevent overload of the amplifier.

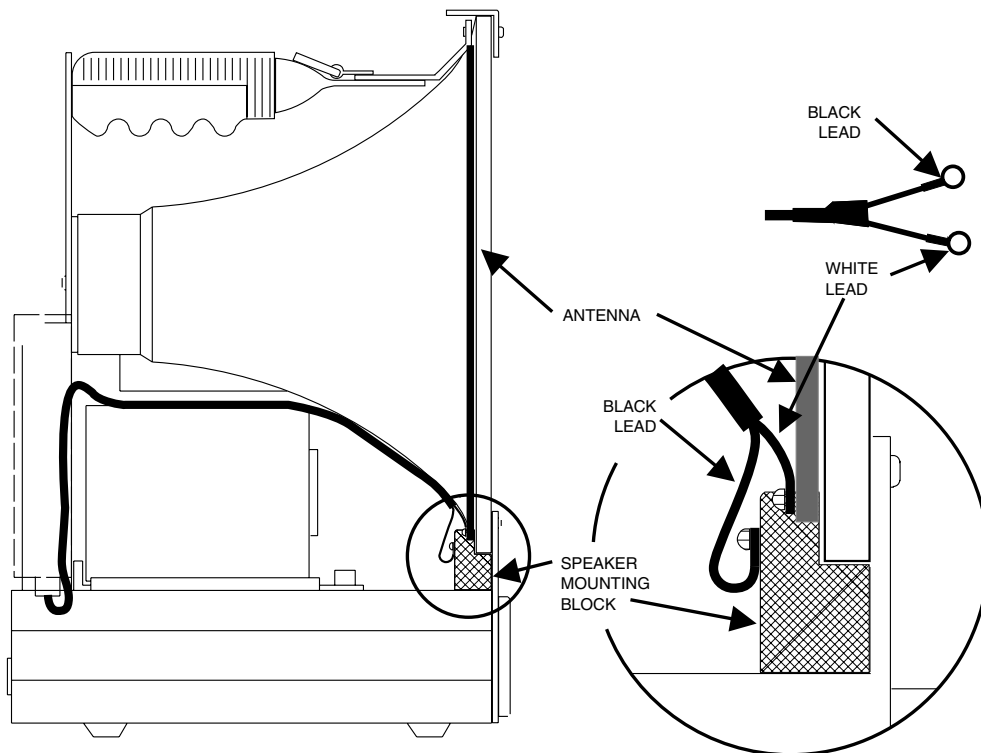
In a large area, such as a football field, try to arrange the speakers so that the listeners are not in the direct sound field of both speakers. If a listener can hear two speakers located at different distances, a distracting echo effect occurs. Put them together on the 50 yard line and aim them in opposite directions.

## ADDING A SECOND WIRELESS CHANNEL TO YOUR LONG RANGER II

A very popular feature of the LONG RANGER II is the ability to add a second wireless channel to an existing system in the field. The Lectrosonics 170 MINI-LR system was expressly designed for that purpose. The standard system consists of a SR170-LR receiver, an M170 transmitter and a microphone. Options include the M170-XLR transmitter and a number of other microphones.

The SR170-LR receiver is supplied with velcro attaching strips and is equipped with the necessary cabling for making the connections to the LONG RANGER II. The receiver is installed on the LONG RANGER II by performing the following steps as shown in the diagram:

- 1) The antenna cable for the SR170-LR is packed in a zip-lock plastic bag together with screws, lock washers and the velcro strips. The antenna cable is terminated with two ring lugs. Feed the lug end of this cable through the hole in the LONG RANGER II rear panel upright. Dress the cable along the top of the battery pack along with the speaker wires as shown in the figure below.
- 2) Remove and discard the two black Phillips head screws from the bottom of the antenna strip on the right-hand side of the speaker and from the speaker mounting block. Using the supplied bright screws and lockwashers, connect the shield ring lug (identified by the hump in the insulation) to the speaker mounting block. Connect the center conductor ring lug to the antenna. Tighten both screws securely.



**Figure 6 - SR170-LR Antenna Connections**

- 3) The SR170-LR receiver is to be mounted on the LONG RANGER II upright with velcro. The receiver should be positioned, control panel up, between the horn mounting screw and the screw which secures the battery pack to the upright. Remove the paper backing from one side of the velcro and affix it to the back of the receiver. Remove the remaining paper backing and affix the receiver to the upright.
- 4) Connect the antenna plug to the BNC connector on the SR170-LR receiver. Connect the remaining two cables to the 12V DC OUT jack and the LINE input jack on the control panel.

### **INITIAL ADJUSTMENTS TO THE 170 MINI-LR SYSTEM**

- 1) Set up the Long Ranger II system according to the instructions on page 7 of the Long Ranger II manual.
- 2) Leave the Long Ranger II power turned on. Set both volume controls on the Long Ranger II control panel to minimum.
- 3) Turn the add-on SR170LR receiver power switch to "ON." Check to see that the power lamp comes on.
- 4) Plug the microphone into the transmitter that is on the same frequency as the SR170LR receiver. The plug on the microphone is a twist-lock connector. Make sure there is a good connection. If you are using the headset microphone, turn the white level control knob on the headset fully clockwise (maximum).
- 5) Install the 9 Volt battery into the transmitter, turn the transmitter on and make sure the red lamp on the transmitter glows brightly.
- 6) Check to see that the yellow "RF" LED on the add-on receiver glows steadily. This verifies that the receiver is picking up a good radio signal from the transmitter.
- 7) **This is the most important step in the set up procedure.** Place the microphone in the exact position where you will be using it. Speak at the same voice level that you will use during actual operation. While you speak, use the supplied screwdriver to adjust the gain control on the transmitter side panel while you observe the MODULATION LEDs on the add-on receiver front panel. The green "-20" lamp should flicker or stay lit as you speak. The red "0dB" lamp should blink only on louder words.
- 8) Adjust the AUXILIARY INPUT VOLUME control on the Long Ranger II control panel for the necessary loudness. If the transmitter gain controls have been correctly set on both the Longer Ranger II and the add-on system, both volume control knobs on the Longer Ranger II panel will be in about the same position for equal loudness on both systems. It is not unusual, however, that one of the volume controls may be slightly higher or lower than the other in normal use.

### **SPECIAL NOTE TO DUAL CHANNEL USERS**

If you are only using one of the two wireless systems, it is best to use the wireless system built into the Long Ranger II and leave the add-on receiver turned off. This will prevent unwanted noise, hiss or static that could occur in the unused receiver from entering the Long Ranger II.

If it is necessary to use the add-on receiver by itself, turn the WIRELESS MICROPHONE VOLUME control knob on the Long Ranger II control panel to minimum. Then set the AUXILIARY INPUT VOLUME for the necessary loudness of the add-on system.

## MULTIPLE LONG RANGER II SYSTEMS

A unique use of the AUX IN/OUT jack is for connecting two (or more) LONG RANGER II systems together for simultaneous use. When the LONG RANGER IIs are interconnected in this manner, they will operate like a **single system**. You will have two (or more) wireless microphone inputs, two hard-wired mic inputs and much more audience coverage. The sound from all the LONG RANGER IIs will be the same. The required MM-36 interconnecting cord for this application is available through your dealer.

When using a single transmitter with two LONG RANGER IIs on the same frequency connected in this manner, turn the WIRELESS VOLUME CONTROL knob on one of the LONG RANGER IIs counter-clockwise to its lowest position. The volume of both systems can then be adjusted with the control knob on just one LONG RANGER II.

If the LONG RANGER IIs are both on the same frequency, only one transmitter can be used at a time. REMEMBER that if two transmitters on the same frequency are turned on at the same time, the receiver will not receive either of them properly. You will need to "alternate" the use of the transmitters.

When LONG RANGER IIs on two different frequencies ("A" and "B") will be operated by two separate transmitters, the INITIAL EQUIPMENT ADJUSTMENTS should be performed on each system individually before the AUX IN/OUT interconnections are made. After the interconnections are made, adjust the system sound output level as follows:

- 1) Adjust the sound output level for frequency "A" with the WIRELESS MICROPHONE VOLUME control on LONG RANGER II "A".
- 2) Adjust the sound output level for frequency "B" with the WIRELESS MICROPHONE VOLUME control on LONG RANGER II "B".

When adjusted as prescribed above, the sound level will be the same regardless of which transmitter is on.

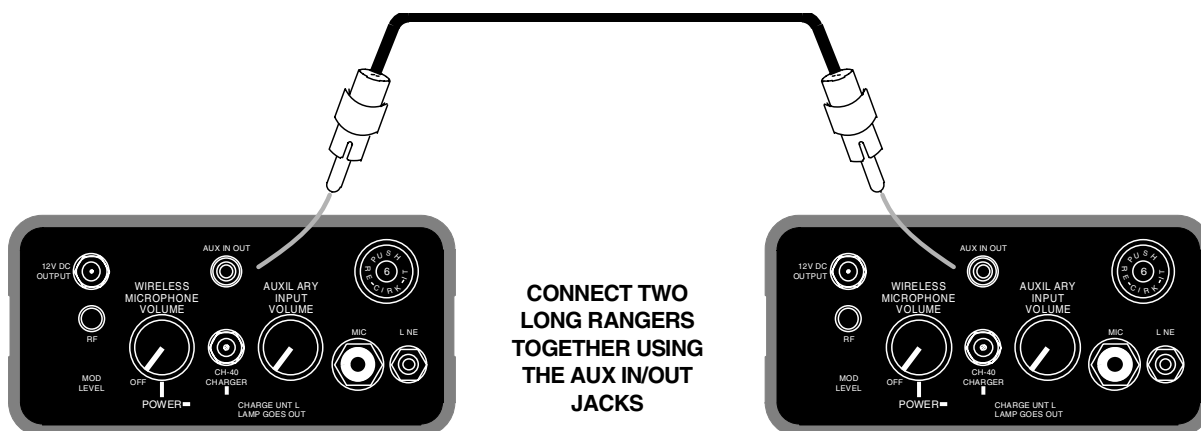


Figure 7 - Multiple Long Rangers

## MICROPHONE CHOICES

**M119** - This is a very small, omni-directional mic used only as a lavalier ("lapel") microphone. It may be prone to feedback since it is usually placed so far away from the users mouth; however it has a very flat response and excellent tone quality. The M119 generally works best with the LONG RANGER II and an ES300 column speaker indoors at a lower volume setting. As is true of most omni-directional type microphones, the M119 is very free from wind noise and clothing "rattle".

**M140** - A cardioid (directional) microphone for lavalier ("lapel") use. Due to the directional pickup pattern, this model will generally provide more gain (loudness) before feedback than the M119 omni-directional model. The M140 has a "brighter" sound than the M119 (the treble is boosted). This crisper sound normally improves the clarity that is sometimes lost with lavalier type microphones. The M140 is subject to wind noise and generally works best indoors, however it is supplied with a foam windscreen which helps to prevent noise caused by wind.

**M121S** - This is a directional, dynamic hand-held microphone. It can be plugged directly into the MIC jack on the control panel of the LONG RANGER II using a standard microphone cord (MM-16 or MC-16C).

**HM142V** - This single-band headset microphone is normally worn on the head, but can also be worn around the neck for hands-free operation. It provides maximum gain before feedback since the microphone is very close to the user's mouth. The built-in volume control helps control feedback in difficult environments, such as when the user must be close to the LONG RANGER II. Worn on the head, the microphone will remain at a constant distance from the user's mouth, which keeps the volume of the sound system constant as your head moves.

**HM152V** - A double-band headset microphone intended to be worn on the head. The pickup element and tonal characteristics are the same as the single-band HM142V, but it is more securely mounted and in most cases, more comfortable, due to the fully adjustable dual headband. The same volume control is provided to help control feedback.

The best matched microphones are:

For hand-held use:

M121S dynamic cardioid, with ON/OFF switch

For headset use:

HM142V single headband model

HM152V double headband model

For lavalier use:

M140-micro

Other brands of microphones may be used, provided they are the correct type, with an appropriate connector. Consult the factory or your dealer if you are not sure. A mis-matched microphone will generally cause background noise (hiss).

## **ACCESSORIES AND REPLACEMENT PARTS**

<b><u>ITEM</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>USE</u></b>
CH-40	Battery Charger	Replacement
HM142V	Single headband Headset Microphone	With locking micro plug for M170 series transmitters.
HM152V	Headset Microphone	Double adjustable headband. With micro plug for M170 series transmitters.
M121S	Dynamic Microphone	For hand-held use plugged into the auxiliary MIC input of the LONG RANGER II(cord not supplied).
MC-16C	Microphone Cord	16 ft. coil cord (1/4" male to male) for M121S
MC-44	Microphone Cord	1/4" male to locking micro male; adapts M121S to M170
MM-16	Microphone Cord	Straight cord (1/4" male to male) for M121S
MM-36	Patch Cord	36" RCA (male to male) For interconnecting AUX IN/OUT jacks.
RK-51	Wind Screen	For M121S microphone
RK-119	Wind Screen	For M119 and M140 microphones
RK-142	Wind Screen	HM142V and HM152V headset microphones
14040	Shoulder Strap	For carrying LONG RANGER II
21329	Power Adapter Cord	For connecting LONG RANGER II to vehicle cigarette lighter adapter.

## TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE
LONG RANGER II red POWER lamp not on	<ol style="list-style-type: none"> <li>1) WIRELESS MICROPHONE VOLUME or dim control in OFF position</li> <li>2) Batteries completely discharged</li> <li>3) PUSH-RE-CIRK-IT tripped</li> <li>4) Battery connectors loose</li> </ol>
LONG RANGER II green RF lamp not on	<ol style="list-style-type: none"> <li>1) Transmitter not on</li> <li>2) Dead battery in transmitter</li> <li>3) Transmitter and receiver not on same frequency</li> </ol>
LONG RANGER II red POWER lamp and green RF lamp on, but no sound	
A) MOD LEVEL lamps dark	<ol style="list-style-type: none"> <li>1) Transmitter is not getting an audio signal. Defective mic or cable.</li> <li>2) Transmitter gain control set much too low</li> </ol>
B) MOD LEVEL lamps appear	<ol style="list-style-type: none"> <li>1) WIRELESS MICROPHONE VOLUME control normal turned completely down</li> <li>2) Defective horn or speaker</li> </ol>
System operation normal except for high hiss or hum level	
A) Green MOD LEVEL lamp	<ol style="list-style-type: none"> <li>1) Transmitter gain control dark or barely flickers set too low</li> </ol>
B) MOD LEVEL lamps appear	<ol style="list-style-type: none"> <li>1) Noisy microphone or mic cable. To verify normal replace with known good microphone.</li> <li>2) Hiss in sound system connected to LONG RANGER II. Turn off the LONG RANGER II. If hiss remains, problem is sound system.</li> <li>3) Hiss can be caused by poorly shielded computers, phone systems, older electronic organs, etc. Try turning off suspect equipment.</li> </ol>
System operation normal except for "feedback" and red MOD LEVEL lamp on or blinking frequently	Transmitter gain set too high.
Weak, distorted sound. Power lamp flickers. "Motorboating"	Batteries very low. Recharge.

## SPECIFICATIONS

### LONG RANGER II

Operating frequency:	150 to 216 MHz
Audio power output:	33 Watts, RMS, into 8 Ohms
Distortion:	less than 1%
Amplifier freq. response:	50Hz - 20kHz; +0, -3 dB
Max. audio output(SPL):	140 dB at 3 feet
FM deviation:	±15kHz
Wireless operating range:	Up to 750 feet
RF signal-to-noise ratio:	96dB, A weighted
Speaker:	6" x 12" re-entrant horn
Weight:	16 lbs., 13 ozs.
Dimensions:	15" high, 6 3/4" wide, 9 1/4" deep

### M170 TRANSMITTER

Operating Frequency:	150 to 216 MHz
RF Power Output:	50 mW
Deviation:	±15kHz
Spurious radiation:	60dB below carrier
Frequency stability:	±0.002%
Equivalent input noise:	-126dB
Input sensitivity:	8mV to 1.6V for full modulation
Input compressor:	Soft compressor; 12dB range
Electret bias:	+5 Volts DC (positive bias)
Antenna:	Input cord or microphone
Size:	1.1 x 2.3 x 3.3 inches
Weight:	4 ozs. including battery

M170 and M170-XLR transmitters are FCC type accepted under the following parts:

Part 90 (150-172 MHz)  
Part 74 (174-216 MHz)

### SR170-LR "ADD-ON" RECEIVER

Operating frequencies:	150 to 216 MHz, crystal controlled
Sensitivity:	1.0uV for 20dB SINAD 2.0uV for 50dB S/N ratio
Signal/noise ratio:	90dB flat; 96dB A-weighted
Squelch quieting:	Greater than 96dB
AM rejection:	-40dB (10 uV to 0.1 V input levels)
Modulation acceptance:	±15kHz
Spurious/image rejection:	Greater than 100dB
Power requirements:	External 12V DC
Power consumption:	40mA
Weight:	7.4 ounces
Dimensions:	1.1 x 2.8 x 4.6 inches



## 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.**

---

**581 LASER ROAD  
RIO RANCHO, NM 87124 USA**

July 7, 1999