

Classroom Amplification System



User Manual



SAFETY INSTRUCTIONS



CAUTION



RISK OF ELECTRIC SHOCK DO NOT OPEN

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED PERSONNEL**



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be sufficient magnitude to constitute a risk of electric shock.

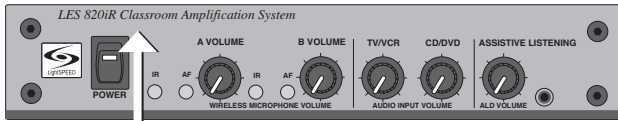


The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

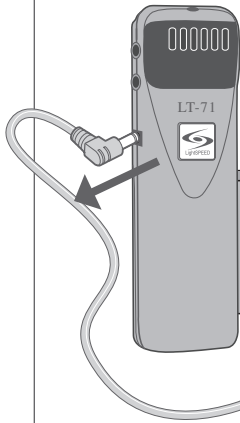
- 1. Read Instructions**—All the safety and operation instructions should be read before this LightSPEED product is operated.
- 2. Retain Instructions**—The safety and operating instructions should be kept for future reference.
- 3. Heed Warning**—All warnings on this LightSPEED product and in these instructions should be followed.
- 4. Follow Instructions**—All operating and other instructions should be followed.
- 5. Water and Moisture**—This LightSPEED product should not be used near water.
- 6. Heat**—This LightSPEED product should be situated away from heat sources such as radiators, etc.
- 7. Power Sources**—This LightSPEED product should be connected to a power supply only of the type described in these operation instructions or as marked on this LightSPEED product.
- 8. Power Cord Protection**—Power supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them.
- 9. Object and Liquid Entry**—Care should be taken so that objects do not fall onto and liquids are not spilled into the inside of this LightSPEED product.
- 10. Damage Requiring Service**—This LightSPEED product should be serviced only by qualified service personnel. The user should not attempt to service this LightSPEED product.
- 11. Prevent Electric Shock**—do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

DAILY USE INSTRUCTIONS

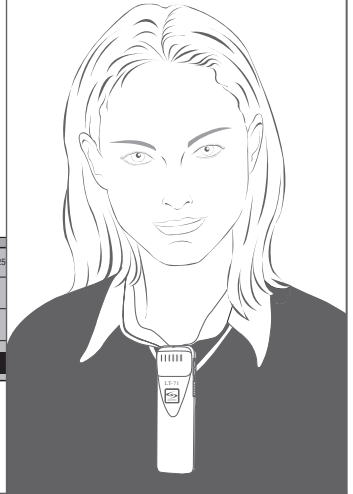
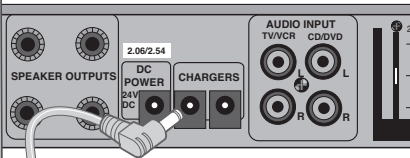
TURN ON THE 820iR



POSITION THE LIGHTMIC

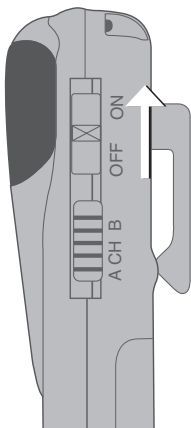


Unplug the LightMic from the charging cable and place it around your neck. Adjust the neck strap so the top of the microphone rests just below your collarbone.



TURN ON THE LIGHTMIC

Turn the microphone ON using the ON/OFF switch on the side of the LightMic and speak normally.



CHARGE BATTERIES

Plug the LightMic back into the charging cable to recharge at the end of the day.

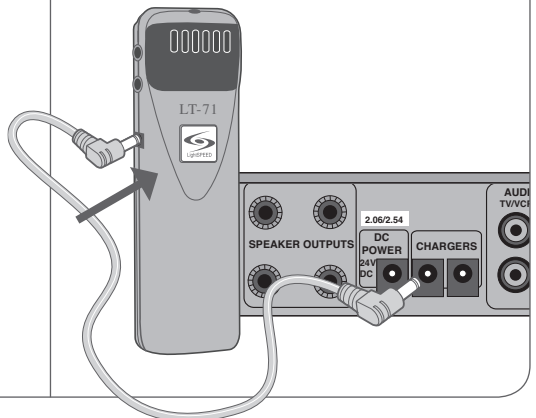


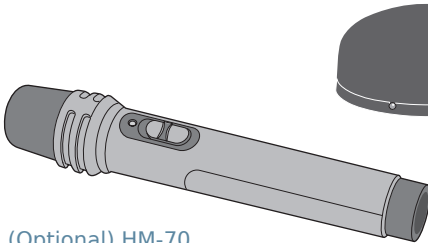
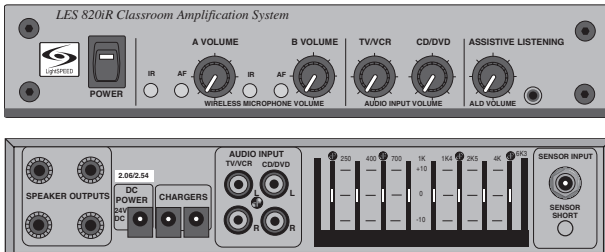
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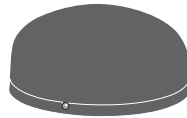
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820iR CLASSROOM AMPLIFICATION SYSTEM

820iR Receiver/Amplifier



(Optional) HM-70
Handheld Microphone



SR-70F
iR Sensor



LT-71™
LightMic
Transmitter

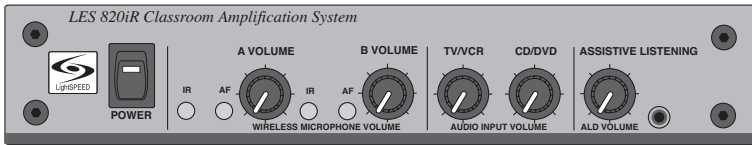
Congratulations on your purchase of the 820iR Classroom Amplification System! This simple, yet powerful technology provides crystal-clear sound throughout the classroom, allowing every child to hear every word every time.

As the teacher speaks into the LightMic pendant-style transmitter, his or her voice is transmitted to the 820iR and then amplified through the loudspeaker(s). The standard system includes the 820iR infrared receiver/amplifier, LT-71 LightMic™ transmitter, SR-70 infrared sensor and speaker package.

The 820iR is a two-channel receiver amplifier that allows the use of up to two microphones simultaneously and up to two additional audio input sources (such as TV, VCR, DVD, CD, MP3, etc.). In addition, LightSPEED offers various speaker options that are included with your system to provide optimal sound in rooms of all shapes and sizes.

The LT-71 LightMic is a wireless, pendant-style transmitter. This two-channel, rechargeable unit is clipped to a lavalier cord and worn around the neck for teacher use, or it can be used like a standard handheld microphone for the students to pass around when speaking.

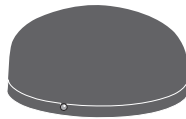
SYSTEM COMPONENTS



820iR Infrared Receiver/Amplifier



**LT-71 LightMic™
Transmitter**

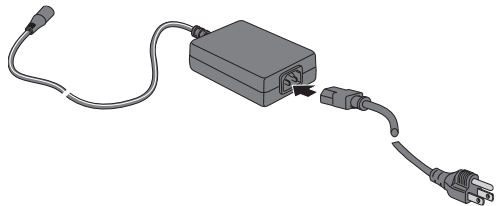


**SR-70F Infrared
Sensor**

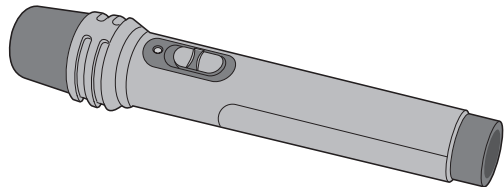
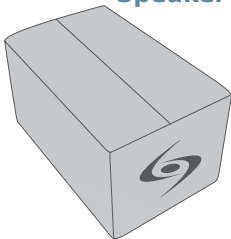
Sensor Cable



Power Supply



Speakers and Speaker Wire



Optional HM-70 Handheld Microphone



Helpful Hint

Keep ALL packaging materials. If the system must be returned, it will be quick, convenient and undamaged.

SYSTEM INSTALLATION

Unpacking Your System

- **Ensure that you have received all of the components of your system.**
 - **820iR Receiver/Amplifier and power supply**
 - **LT-71 LightMic™ Transmitter**
 - **SR-70F Infrared Sensor and cable**
 - **Speaker(s) and speaker wire**

Location of the Receiver/Amplifier

- Place the 820iR on a flat surface like a bookcase, countertop or optional Light-SPEED wall shelf (part#AC-800WB).
- **Select** a location that is close to a standard wall electrical outlet.
 - **Wires** will be routed back to the amplifier, so select a location that is free from obstructions that may make routing wire difficult. (Example: under a whiteboard or bulletin board.)

IR Sensor Placement

Sensor location is very important for optimum performance of the 820iR Classroom Amplification System.

- **BEST:** On the ceiling at or near the middle of the classroom.
- **GOOD:** High and centered on the long wall.
- **AVOID:** Locations in corners, on walls at heights lower than 7 feet, or in places where the line of sight is or could be obstructed.



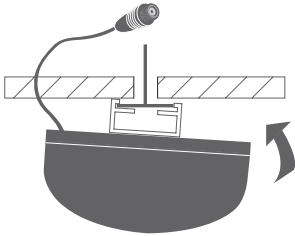
Helpful Hint

Fine-tuning the Graphic Equalizer:

1. **Verify** that the EQ is set to match the recommended setting for the specific speakers installed in the classroom (settings included with the speaker install guide).
2. **Walk** around room (near speakers) and listen for squealing or feedback.
3. **Lower** the 2K5 and/or 4K sliders if a high-pitched squealing is present.
4. **Lower** the 400 or 700 sliders if a low-pitched ring is present.
5. **Reduce** volume if feedback is still present.

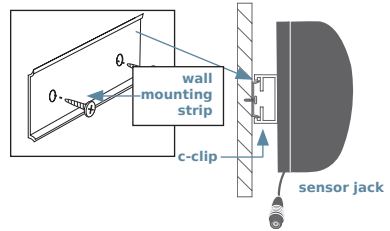
IR SENSOR INSTALLATION

Suspended Ceiling Mount



- Lift** the ceiling tile nearest the grid rail in your desired sensor location. Guide one side of the C-clip over one edge of the grid rail. Providing firm support to the back of the grid rail with one hand (to prevent bending), firmly and carefully snap the second side of the C-clip over the edge of the rail.
- Uncoil** sensor wire. Connect one end of the sensor cable to the plug on the sensor. Loosely secure wire overhead and route it back to the 820iR.
- Connect** the other end of the sensor cable into one the sensor input on the back of the 820iR.

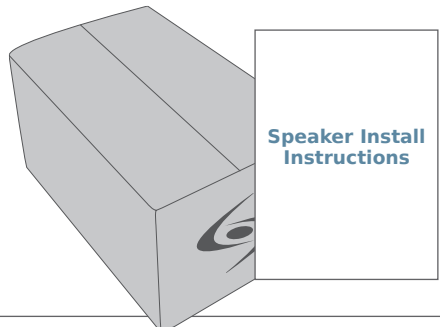
Wall/Solid Ceiling Mount



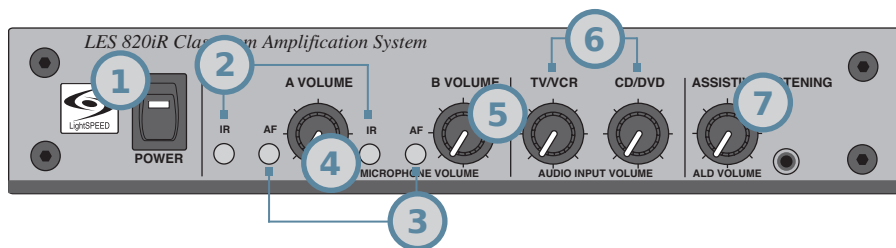
- Screw** the plastic mounting strip to a place high on the wall or in the middle of the solid ceiling. Mount the strip horizontally as shown above.
- Firmly** snap the C-clip on the back of the IR sensor onto the plastic mounting strip with the sensor plug hanging down (if a wall mount) or toward the receiver location (if ceiling mount).
- Uncoil** the sensor wire. Screw one end of the sensor cable to the plug on the sensor. Route the wire back to the 820iR, securing it along the way.
- Connect** the other end of the sensor cable to the sensor input on the back of the 820iR.

Speaker Installation

- Locate** the speaker installation instructions packed with your speaker(s).
- Follow** instructions and mount speaker(s).
- Return** to this manual to complete the set up of your system.



FRONT PANEL CONTROLS

**1. POWER Switch/POWER Indicator:**

This switch is used to turn the 820iR ON (switch up), or OFF (switch down). When the POWER switch is in the ON position, the red POWER light will glow.

2. IR Indicators (IR): These lights will glow red when the corresponding microphone is turned on. This light confirms the 820iR is receiving the infrared signal.

3. AF Indicators (AF): These lights flash green when audio (voice) from the microphone is detected.

4. A VOLUME: Controls the volume level of the teacher microphone that is switched to Channel A. Rotating the knob clockwise increases output level.

5. B VOLUME: Controls the volume level of the optional second microphone that is switched to Channel B. Rotating the knob clockwise increases output level.

6. AUDIO INPUT VOLUME:

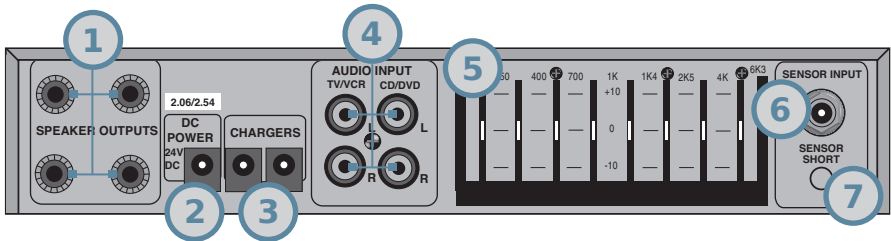
- **TV/VCR:** Controls the volume of a TV/VCR connected to the TV/VCR INPUT.

- **CD/DVD:** Controls the volume of a CD/DVD player connected to the CD/DVD INPUT.

7. ASSISTIVE LISTENING VOLUME:

Controls the volume level of an assistive listening device.

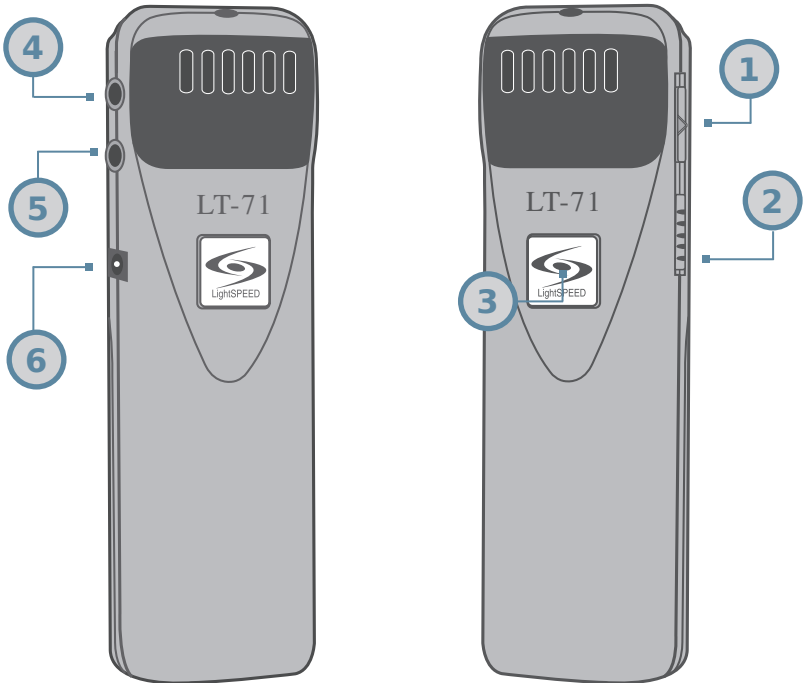
REAR PANEL CONTROLS



- 1. SPEAKER OUTPUTS (1-4):** These binding post connectors are used to connect the 820iR to the loudspeakers. Depending on speaker, all outputs may not be used.
- 2. DC POWER:** Plug the 24 V power supply into this jack.
- 3. CHARGERS:** These jacks charge the LightMic(s) and optional handheld microphone with the supplied charging cable(s).
- 4. AUDIO INPUTS:**

 - **TV/VCR:** Accepts stereo signal from TV/VCR via RCA cable.
 - **CD/DVD:** Accepts stereo signal from CD/DVD player via RCA cable.
- 5. 8-BAND GRAPHIC EQUALIZER:** The sliding controls adjust the levels of the various audio frequencies. This allows the installer to properly equalize the system to produce optimum sound quality.
- 6. SENSOR INPUT:** The IR sensor cable connects to the sensor input. Connect additional sensors to the 820iR to cover large or odd-shaped classrooms.
- 7. SENSOR SHORT:** This LED glows when there is a short in one of the sensor cables.

LIGHTMIC CONTROLS AND CONNECTIONS



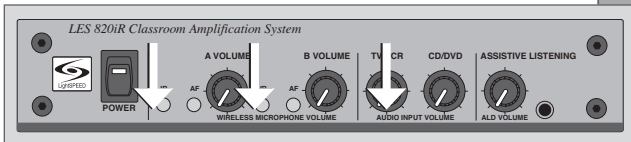
- 1. ON/OFF/MUTE Switch:** This switch, located on the side of the LightMic, turns the unit on or off/mute.
- 2. Channel Select Switch (CH A/B):** This switch allows for selection between Channel A or B. If you are using a single microphone/transmitter for your system, we recommend using Channel A.
- 3. Power/Charge LED Indicator:** The light glows blue when the LightMic is powered ON, red when plugged into the charging cable.
- 4. External Microphone Input (MIC):** Use the 3.5 mm MIC jack for the optional TK-250 headset microphone (part# MC-TK250LTM).
- 5. Auxiliary (AUX):** Plug a laptop, MP3 player or other audio source into this jack to wirelessly transmit the audio signal to be played through the 820iR.
- 6. Charger Input (CHARGER):** Plug the charging cable from the 820iR into this jack for daily charging. The LED on the front will glow red to indicate charging.

INITIAL SET-UP

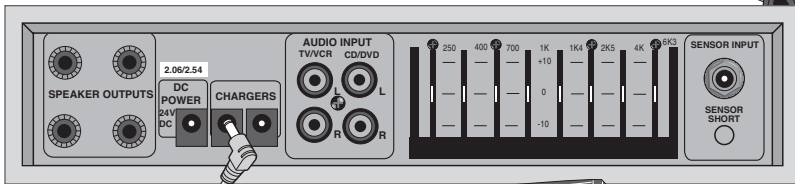
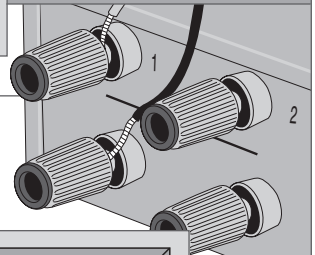
FINALIZING RECEIVER/AMPLIFIER CONNECTIONS

- 1. Ensure** the power switch is in the "OFF" position and all front panel volume controls are turned fully counter-clockwise. ⌵

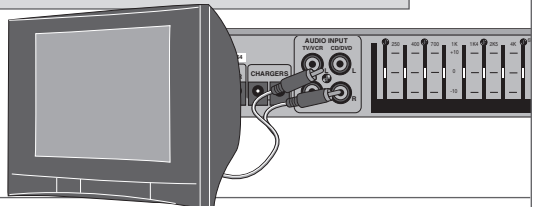
- 2. Ensure** speaker wire connections are secure and not frayed. ⌵



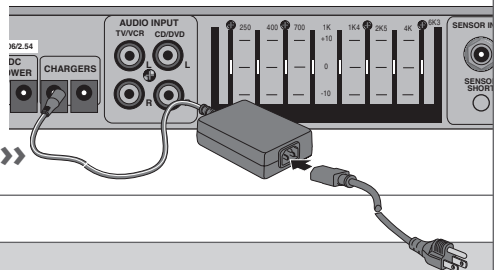
- 3. Connect** the charging cables to yellow charging jacks labeled "CHARGERS." The loose end will be connected to the charger input on the microphone. ⌵



- 4. Connect** any auxiliary audio sources to corresponding labeled input. >>
- 5. Ensure** sensor cable is attached securely.



- 6. Connect** DC end of power supply to the black power jack labeled "DC POWER."
- 7. Connect** the black AC power cable from the power supply to a wall outlet. >>



FINAL CHECK

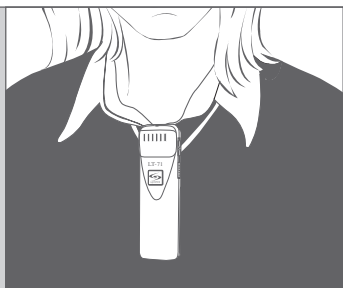
- 1. Ensure** all cables are appropriately routed out of walking paths and work areas to prevent safety hazards to individuals in the room.
- 2. The amplifier** packing material should be kept for warranty shipping purposes. Dispose of remaining system-packing material in the appropriate refuse containers.

Leave microphones charging so they are ready for use. Microphones will need to be charged on a daily basis.

SYSTEM OPERATION

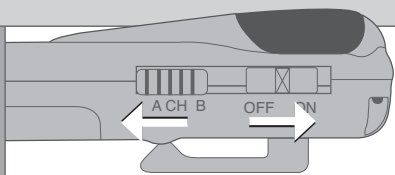
TURNING THE SYSTEM ON

1. Turn the 820iR switch to the ON position. The red LED on the switch will glow. >>



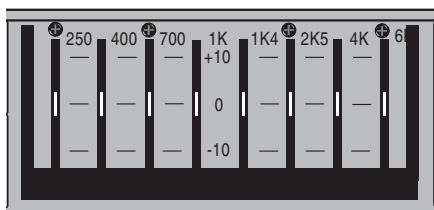
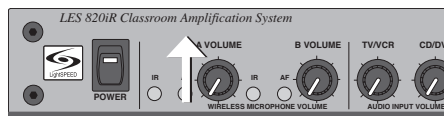
2. Slip the LT-71 LightMic with lanyard around the neck and position the top of the microphone just below the collarbone. Note: Positioning of the LightMic is critical << for proper volume adjustment.

3. Turn on the LightMic and set the operating channel to "A." This microphone will be designated as the "Teacher Mic." >>



4. While speaking in a normal voice, >> increase the A VOLUME level until your voice is barely audible.

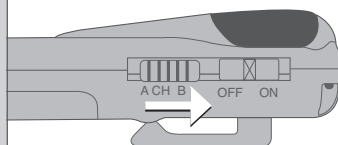
Remember! This equipment is designed to supplement and distribute the end user's voice so they are able to speak at a conversational tone. Having the volume set too high will result in feedback and listener fatigue.



See page 3 for hints on setting the EQ.

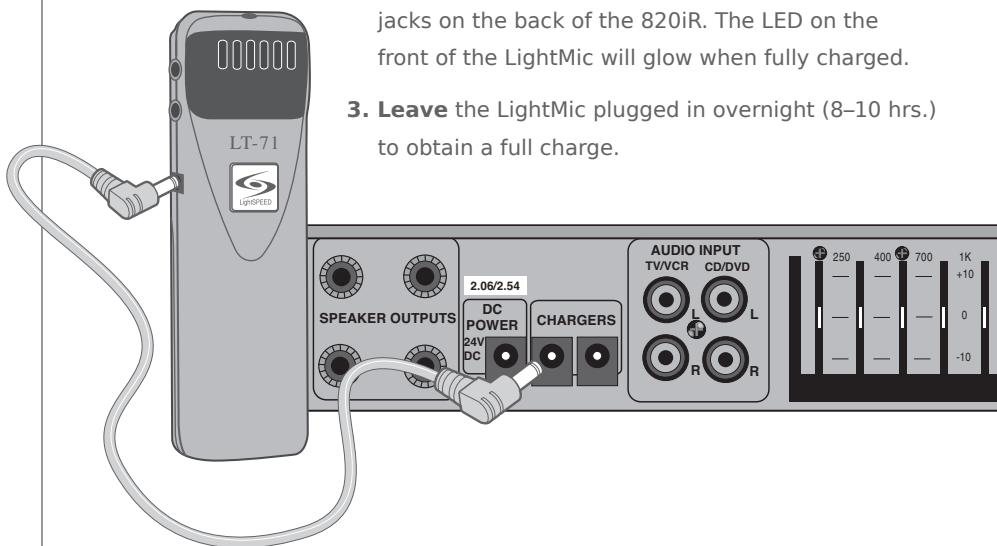
5. Once initial volume level is set, walk around the room and listen for audio dropout and overall audio quality. Fine-tuning the audio is accomplished by making minor adjustments to the 8-Band Graphic Equalizer on the back panel of the receiver/amplifier.

6. If a second student pass-around microphone was purchased with system, repeat steps 3-4 but set the operating channel to "B." >> (If a HM-70 was purchased, see page 16.)



CHARGING THE LIGHTMIC

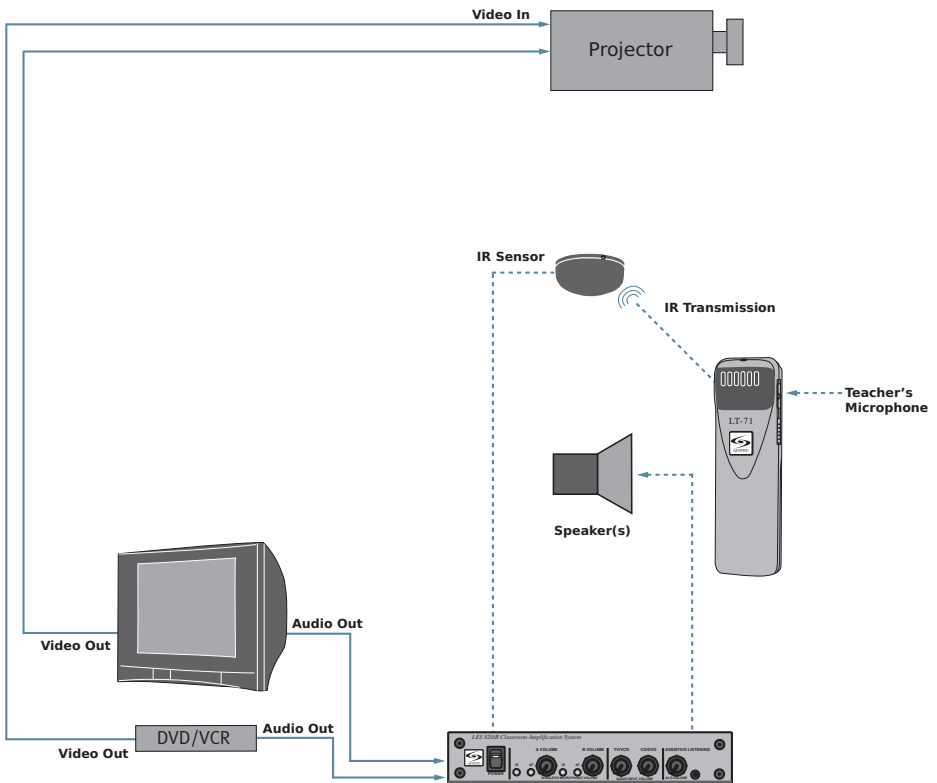
- 1. Ensure** that the LightMic is turned OFF.
- 2. Connect** one end of the charging cable to the LightMic and the other end to one of the charger jacks on the back of the 820iR. The LED on the front of the LightMic will glow when fully charged.
- 3. Leave** the LightMic plugged in overnight (8–10 hrs.) to obtain a full charge.



Helpful Hint

Do not attempt to charge alkaline batteries. They can overheat and expand, creating a significant hazard and damaging the LightMic. (This is not covered by the warranty.)

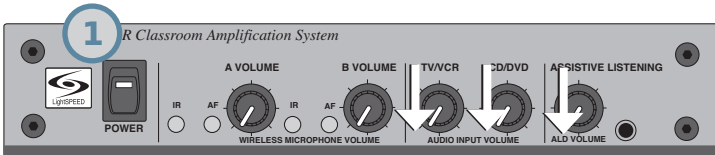
SYSTEM INTEGRATION DIAGRAM



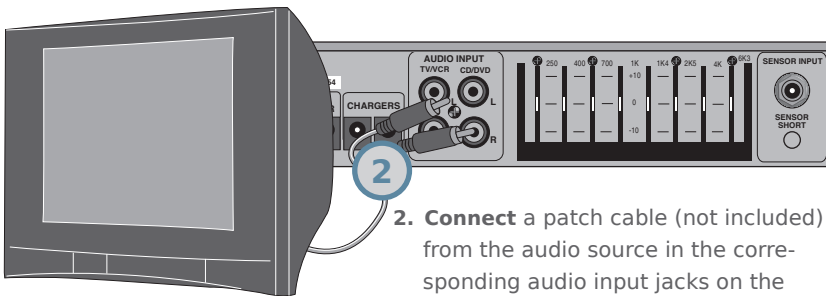
LightSPEED amplifier controls the volume of each source individually (one volume control for each source).

INPUT FROM EXTERNAL AUDIO EQUIPMENT

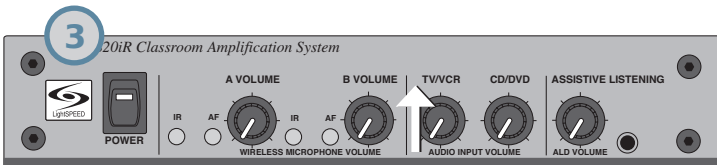
Below are instructions on how to connect an external audio device like a TV/VCR, CD/DVD or computer.



1. Turn the audio input volume controls on the front panel all the way down (fully counterclockwise).



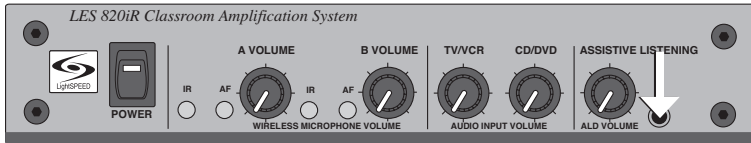
2. Connect a patch cable (not included) from the audio source in the corresponding audio input jacks on the back of the 820iR.



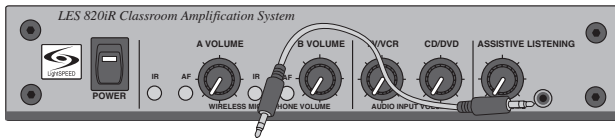
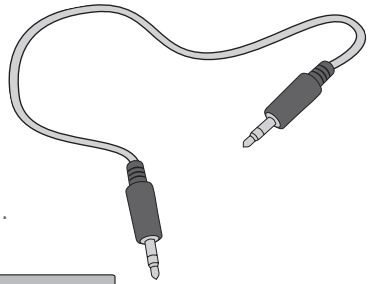
3. With both the 820iR and audio source power on, adjust the corresponding volume control on the front panel until the desired level is achieved. **NOTE!** Be careful to not overdrive the volume to the loudspeaker(s), as this can cause potential damage.

OUTPUT TO PERSONAL FM TRANSMITTER

1. **Turn** the ALD (Assistive Listening Device) volume control on the front panel all the way down (fully counterclockwise).



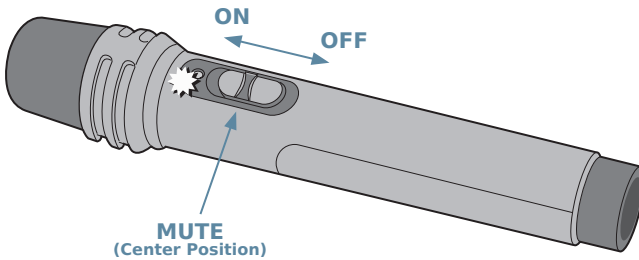
2. **Determine** the size and type of audio input jack on the device as many manufacturers' products differ in connector size and shape. The LightSPEED LES-370 Personal FM System requires a 3.5 mm to 3.5 mm patch cable (part# CA-MMC3535, not included).



3. **Connect** a patch cable from the ALD's microphone jack or AUX input to the 3.5 mm "ASSISTIVE LISTENING" jack on the front of the 820iR.

4. **Adjust** the volume control on the ALD's receiver to maximum output. **NOTE!** This is to set the maximum allowable signal from the 820iR.
5. **With** the 820iR and ALD turned on, speak into the LightMic and slowly adjust the corresponding "ALD VOLUME" control until the appropriate audio level is attained in the ALD's receiver headphones.

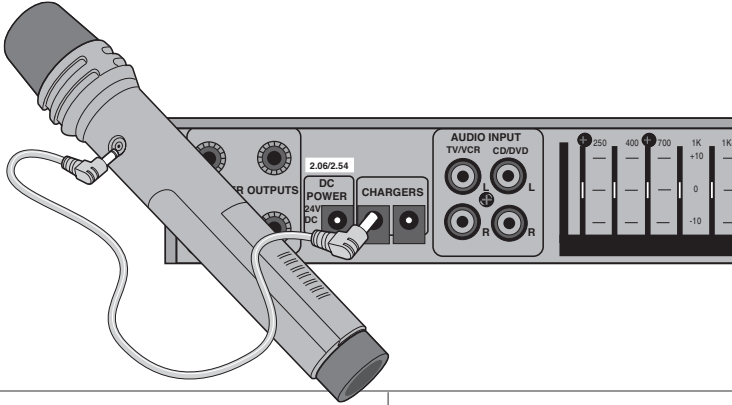
OPERATING THE OPTIONAL HM-70 HANDHELD MIC



The Channel A/B switch is located inside the battery compartment. The switch is set to Channel B at the factory.

- 1. Slide** the power switch on the side of the HM-70 all the way up. The power indicator LED will glow red and stay on.
- 2. The center** position of the power switch is MUTE. When in this mode, the HM-70 is transmitting a signal, but no audio can be heard through the system. This is useful if you wish to temporarily turn audio off during a private conversation.
- 3. Grip** the barrel of the HM-70 in the center section just below the power switch. Avoid gripping the HM-70 around the bottom, covering the infrared emitters circling the base. This could interrupt signal transmission from the microphone to the receiver.
- 4. Speak** directly into the microphone at a normal level. Slowly increase the B VOLUME until you can just hear your voice.
- 5. Slide** the switch to the OFF position to turn off the HM-70. (Make sure the power indicator light is off.)

CHARGING THE HM-70 HANDHELD MIC



- 1. Ensure** the HM-70 handheld microphone is turned OFF (ON/OFF switch on the side of the unit). The 820iR can be left on, but must be connected to AC power in order to charge the microphone.
- 2. Connect** the loose end of the charging cable into the jack labeled CHARGER on the side of the HM-70. Connect the larger end of the charging cable to one of the CHARGERS jacks on the back of the 820iR. The HM-70's rechargeable batteries are factory installed.
- 3. The power** indicator light next to the power switch glows green when the cable is connected and charging correctly. The light goes out when fully charged. Batteries will charge in 8 to 12 hours. A fully charged battery will run for up to 8 hours of continuous operation.
- 4. The HM-70** can remain charging for up to 10 days. Overcharging will shorten battery life.



Helpful Hint

The HM-70 does not use a cradle for charging. The charging cable must be plugged directly into the charging jack in the transmitter.

TIPS ON CLASSROOM AMPLIFICATION

1

Speak in a natural voice. A normal conversational speech level will provide an adequate signal. It is not necessary to increase the intensity of your voice—the amplification system provides adequate amplification (approximately 5 – 10 dB) above ambient room noises.

2

Avoid wearing jewelry that may rub or bump against the microphone.

3

Turn the LightMic off during private conversations with a student, parent, or other classroom visitor. You can also cover the LED lens on top of the LightMic to block the signal.

4

Recharge batteries each night. When recharged nightly, operating time (actual usage) for the transmitters will last through a typical school day.

Five-year Limited Warranty

LightSPEED Classroom Amplification Systems are guaranteed against malfunction due to defects in materials and workmanship for a period of FIVE (5) YEARS, beginning at the date of the purchase invoice. If such malfunction occurs, the product will be repaired or replaced (at LightSPEED's option) without charge during the period and under the limitations stipulated in the data sheet or the user's manual.

1. Limited exclusions specifically apply to all microphone elements, rechargeable batteries, battery chargers and their assemblies, as well as external cables and wires.
2. Warranty on microphones/microphone elements is limited to original manufacturer's warranty (usually ONE (1) YEAR).
3. Warranty on LightSPEED NiMH AA rechargeable batteries is ONE (1) YEAR.
3. Warranty on LightMic's internal microphone is FIVE (5) YEARS.
4. Prepaid shipping label provided by LightSPEED factory or an authorized warranty service center.
5. Warranty does not extend to finish, appearance items, or malfunctions due to abuse or operation other than specified conditions, nor does it extend to incidental or consequential damages. Repair by other than LightSPEED or its authorized service agencies will void this guarantee. Information on authorized service agencies is available from LightSPEED Technologies, Inc.

Our Service Department (800.732.8999, 6:30 a.m. – 5 p.m., PST) will handle all your repair/replacement needs.

TROUBLESHOOTING GUIDE

Note: Most problems are directly related to low battery power. Please run through the "Battery Check" items first. For remaining troubleshooting, use known good, fully-charged batteries.

Battery Check

- **Confirm** batteries are charged each night.
- **Make** sure the LT-71 is turned off while charging so that it will attain a full charge. Full charge will last eight hours.
- **Make** sure the charge cord is connected to the cradle charger.
- **Inspect** the battery contacts. Clean and adjust if necessary.

Hearing Static

- **Ensure** sensor is in optimum location (refer to sensor placement in manual). A single sensor will cover a 1600 sq. ft. enclosed classroom.
- **Ensure** that no other LT-71/HM70 is operating on the same channel.
- **If** an external microphone is in use, try another LightMic that is known to be working (if available) to isolate the problem. If static persists with "known good" microphone, the LT-71 input jack has damage and will need service.

Low Volume or Feedback

- **Ensure** microphone is positioned appropriately, just below the collarbone. If a headset microphone is in use, the end of the mic boom should be positioned at the corner of the mouth.
- **Check** volume level on the amplifier. If the volume is too high, feedback WILL occur. Adjust accordingly.

No Sound From Speaker

- **Turn** the 820iR on. Confirm that the POWER light located on the front panel switch is on.
- **Confirm** signal is being received at the amplifier. The IR signal light will be lit (red) indicating a signal is being received.
- **Confirm** microphone is functioning. Next to the IR signal light is the AF signal light. This light will flicker (green) as audio is picked up by the microphone indicating activity.
- **Confirm** that the speaker wires are connected correctly to the back of the 820iR (refer to speaker install guide).

If you review these instructions and still have questions, write down the serial number and model number of your system and call LightSPEED Technical Services at 800.732.8999, 6:30 a.m. – 5 p.m. PST.

SYSTEM SPECIFICATIONS

OVERALL SPECIFICATIONS

Power Output	12 W per channel (24 W total)
Amplifier Frequency Response	40 Hz to 20 kHz \pm 3 dB
Carrier Frequencies (IR).....	2.06/2.54; 3.2/3.7 MHz
Signal-to-Noise Ratio	> 73 dB
Dynamic Range	> 73 dB
Maximum Deviation	\pm 50 dB

RECEIVER SPECIFICATIONS

Receiver Type	Superheterodyne
Receiver Sensitivity	6 μ V for 60 dB S/N
Image and Spurious Rejection.....	> 70 dB
Dimensions (W x D x H)	17.3" x 8.5" x 1.75"
Weight	7 lbs.

TRANSMITTER SPECIFICATIONS

Audio Distortion	< 1 %
Built-in Microphone	Uni-directional Electret
Battery Power (1-year warranty)	2 AA NiMH Rechargeable
Inputs	Mic Level 3.5 mm Line Level 3.5 mm
Dimensions (W x D x H)	1.375" x .75" x 4.625"
Weight	3.7 oz

IR SENSOR SPECIFICATIONS

Working Range	Up to 1600 square feet per sensor
Cable	50 ft., Plenum-rated
Mounting	Ceiling clip/Wall bracket
Dimensions (W x D x H).....	4.25" (Diam.) x 2.0" (H)
Weight	4.5 oz

INDIVIDUAL COMPONENTS & OPTIONAL ACCESSORIES

Part Number	Description
RX-820	Infrared receiver/amplifier/mixer w/built-in charger
LT71	LightMic™ rechargeable microphone/transmitter w/lavaliere cord, batteries and charging cable
HM70	Handheld microphone/transmitter w/batteries and charging cable
BA-NH1	Rechargeable AA battery (Nickel Metal Hydride)
AC-TCC7	Charging cable for LT-71 and HM-70 microphones
AC-LTCB	Lavaliere cord for LT-71
PS-24V-2.5	Power supply/battery charger for 820iR
SR70F	Infrared sensor with cable and wall or ceiling mounting bracket
AC-71CC	Cradle charger
SPEAKERS	Contact LightSPEED at 800.732.8999 for loudspeaker information
Optional Accessories	
MC-TK250LTM	Noise-canceling headset microphone used with LT-71
BC-TXLT	Wall charger
AC-800WB	Wall shelf
CA-RCA6	6' dual RCA audio cable
CA-RCA24	24' dual RCA audio cable
CA-MMC3535	3.5 mm mono to 3.5 mm mono audio cable
CA-MMC2535	Audio patch cable (2.5 mm mono to 3.5 mm mono)

USER NOTES

Record your system serial numbers and purchase information. This is helpful when ordering additional components, accessories, and/or warranty service.

Components	Serial Number
820iR	
Microphones	
Sensors	
Speakers	
Purchase Information	
Your School/Organization	
District	
Purchase Date	
Invoice	

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