LightSPEED
Technologies Incorporated

LES 400 Series
Listening Enhancement System™

For

Sound-Field Classroom Amplification

Users Manual

Introduction

Several recent studies validated by the U.S. Department of Education and the Educational Audiology Association have verified that poor classroom acoustics, high ambient noise levels, and a high incidence of mild hearing loss among pre-adolescents are placing significant numbers of students at risk academically.

The purpose of Sound-Field FM Classroom Amplification is not so much to increase the loudness of the teachers' voice as it is to increase the clarity of the teacher's voice for every student no matter where a student is seated relative to the teacher.

It is now well established that raising the teacher's voice just 5 to 9 decibels and distributing the voice level evenly throughout the classroom usually overcomes mild hearing loss, and most internal and external ambient noise. The result is that teachers are able hold students attention significantly better.

The documented outcomes of using sound-field classroom amplification are:

improved speech recognition skills
improved classroom management
improved academic achievement
greatly reduced teacher voice fatigue and throat illnesses

The following pages provide:

Now we hope you will enjoy using what many principals, teachers and students are calling one of the most effective teaching aids introduced in the decade.

LES 400 Series Operating Instructions

A) Powering up the LES 400 Receiver/Amplifier

1. Make sure that both front panel volume controls on the LES Receiver/Amplifier are set to minimum (turned fully counter-clockwise), The AC/DC power adapter is connected, and the speaker system is connected *as described in the **Installation Instructions**.*

2. Depress POWER switch on front panel of LES 400. The red power indicator near POWER switch should light up.

B) Powering up the BP-200 Belt pack transmitter and microphone
Note: The rechargeable batteries have not been charged prior to delivery. Use alkaline battery for initial operation.

1. To install the alkaline battery in the belt pack transmitter, remove the lower plastic cover by sliding it down as indicated on the cover. Insert battery (paying attention to polarity as indicated inside the case) and then reinstall the lower cover by sliding up from the bottom.

2. To attach the microphone to the transmitter pack, align microphone plug over the matching belt-pack connector, slowly rotate the plug, while gently pressing them together, when the plug drops down into the transmitter connector press firmly until the plug "locks" in place. To remove the microphone simply slide the plug barrel up and separate the plug from the transmitter connector.

3. The microphone is activated by a switch on the top of the transmitter case. When turned on, the red battery condition indicator will momentarily flash. ***When the indicator remains lit continuously, the battery is getting too low and should be changed to a new or fully charged battery.*** There is a delay of about one second from the time the transmitter switch is turned on, to when the receiver will send the signal to the amplifier. This is normal.

When the transmitter power is turned off, the microphone audio to the speakers is automatically muted.

The transmitter power can be turned off and on without experiencing any "on-off shock" noise.

C) Adjusting the microphone position

After the microphone is connected to the belt pack transmitter, position the microphone as described below:

1. Collar Microphone. The collar microphone should be hung around the neck as shown. The gooseneck of the microphone should adjusted so that the microphone is directly below and within 3" of the chin as illustrated in Figure 7.

2. Lapel Microphone. Attach the lapel microphone with clothing clip to clothing directly below and within 4" inches of the chin as illustrated in Figure 8.

Figure 7
Collar Microphone Positioning

Figure 8
Lapel Microphone Positioning

3. Noise-cancelling headset microphone. The headset microphone is placed from behind the head over both ears (It is like putting a pair of glasses on backwards). The microphone gooseneck boom is then adjusted to come down along the jaw line with the microphone element positioned about 3/4" from the chin. as shown in Figure 9.

Figure 9 Headset Microphone Positioning

D) Adjusting the wireless microphone volume

1. Make sure the LES 400 Receiver/Amplifier is switched on and the microphone is properly attached to the belt-pack transmitter.

2. Switch the transmitter to the "on" position. The red battery condition indicator will momentarily flash. The red RF SIGNAL INDICATOR on the front panel of the LES 400 should light, indicating that it is receiving the transmitter signal and is ready for use.

3. When speaking at a normal voice level, the green AF SIGNAL INDICATOR (on the LES 400 front panel) should flash off and on as the voice level goes up and down. While speaking at a normal voice level, slowly turn the MIC. VOLUME control clockwise to increase the loudness of the speakers until the sound level is adequate for the room.

Note: *Feedback or "squealing" can occur if the volume is set too high. Feedback can be eliminated by reducing the loudness of the speakers with the volume control.*

E) Optional Powering up the Q309 Hand-held Microphone

Note: *The rechargeable batteries have not been charged prior to delivery. Use alkaline battery for initial operation.*

1. To install the alkaline battery in the hand-held transmitter, unscrew the lower cover of the microphone handle . Insert battery (paying attention to polarity as indicated inside the case) and then reinstall the lower cover, screwing the end cover back in place.

2. The microphone is activated by a switch on the side of the transmitter case. When turned on, the red battery condition indicator will momentarily flash. ***When the indicator remains lit continuously, the battery is getting too low and should be changed to a new or fully charged battery.*** There is a delay of about one second from the time the transmitter switch is turned on, to when the receiver will send the signal to the amplifier. This is normal.

F) Optional Adjusting the hand-held microphone volume

1. Make sure the LES 400 Receiver/Amplifier is switched on.

2. Switch the transmitter to the "on" position. The red battery condition indicator will momentarily flash. The red RF SIGNAL INDICATOR on the front panel of the LES 400 should light, indicating that it is receiving the transmitter signal and is ready for use.

Note:*The hand-held must be held within 1 to 2 inches of the mouth in order to pick up the voice of a child*

3. When speaking at a normal voice level, the green AF SIGNAL INDICATOR (on the LES 400 front panel) should flash off and on as the voice level goes up and down. While speaking at a normal voice level, slowly turn the MIC. VOLUME control on the LES 400 clockwise to increase the loudness of the speakers until the sound level is adequate for the room.

F) Charging the BC-2 Nickel Metal Hydride (NiMH) Battery .

The LES 400 comes with a BC-2 NiMH Battery Charger and one (1) NiMH rechargeable battery (two if a Q309 hand-held microphone is provided).

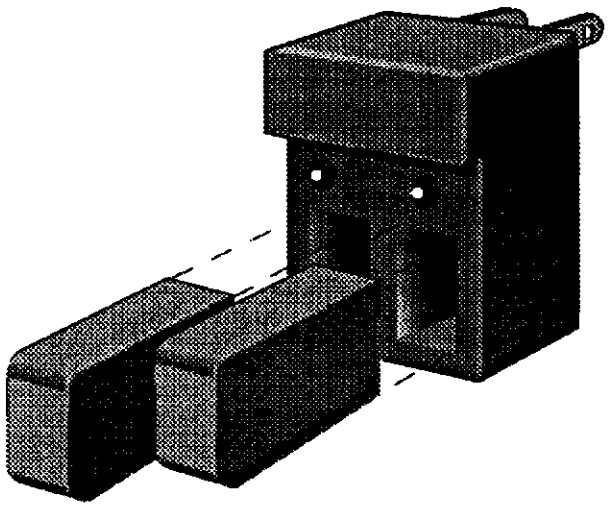

Figure 10 BC-2 Nickel Metal Hydride Dual Battery Charger.

1. Place 9 Volt NiMH batteries into charger noting the polarity (+ -).

2. Connect the power plugs of charger to a 110/120 VAC outlet or power strip. When the battery makes good contact, the red LED light. This indicates that charging has started.

3. The batteries will fully charge in approximately 14-16 hours.

4. It is best to leave batteries on the charger until used, since there is a small amount of discharge after 48 hours.

5. It is best <u>not</u> to leave batteries in the charger for long periods. Leaving the batteries on the charger more than 1 week without use can shorten the life of the battery.

6. NiMH batteries will usually maintain their charge for a full day of normal classroom use. Always switch belt pack transmitter off when not in use (lunch hour, quiet times, etc.).

We recommend only Nickel Metal Hydride (NiMH) 9 Volt batteries for rechargable battery applications. Unlike NiCad batteries NiMH batteries do not develop a "memory" which eventually limits its usable time. If for some reason rechargeable batteries are lost or are not available, we recommend DURACELL™ or PANASONIC™ 9 Volt Alkaline batteries for the longest useable time.

Special System Features

Step 5. Connecting another audio source such as a CD, audio cassette,VCR,TV monitor, etc. to the LES 400.

(A) Connect line level output of the audio source to the AUX Input on the back of the LES 400 using an RCA type male connector.

Note: The AUX input is a monoral input. If a stereo source like a CD, VCR or tape player is used, a common stereo to mono adapter is necessary to convert the stereo signal to mono for input to the AUX input of the LES 400.

(B) With the LES 400 turned on, slowly increase AUX volume control on the front panel of the LES 400. Audio from the the audio source should be heard over the loadspeaker.

Step 6. Connecting the Mixed Audio Output to an Assistive Listening Device (ALD).

(A) Turn the Mixed Audio Output Adjust (on rear panel) fully counter-clockwise.
(B) Connect the Mixed Audio Output of the LES 400 to the input of the desired output device using a cable with an RCA type male connector on one end. Connect the other end of cable to the ALD transmitter. Different manufacturers use different audio input jacks to their transmitters. For example PhonicEar and Telex use a 2.5 and 3.5mm audio input jacks on their transmitters.
(C) With the LES 400 turned on, increase the Mixed Audio Output Adjust clockwise in small steps. Checking after each adjustment to see if the output level is high enough for proper operation of a tape recorder or assistive listening device.

Note If you have any questions regarding the connection of assistive listening devices feel free to call LightSPEED for technical assistance.

Step 7. Connecting the Wireless Microphone Audio Output to a large amplifier/speaker system.

(A) Turn the Microphone Audio Output Level Adjust fully counter-clockwise.
(B) Connect Microphone Audio Output of the LES 400 to the line level input of a audio mixer or amplifier using a standard 1/4" audio plug.
(C) With LES 400 turned on and the transmitter turned on, adjust Microphone Audio Output level as necessary for input of the audio mixer or amplifier.

Helpful Suggestions
For Using The LES 400 Series
Classroom Amplification System

The following suggestions are provided to classroom teachers for maximizing the successful use of the system:

• Involve the students in the process from the beginning. When setting the volume, Ask the students, "What is the correct volume?" (Each level will seem "louder" for them than you.) Ask, "When should we use the hand-held microphone?" (Some teachers introduce the system by passing the hand-held mic around the room for each student to say hello.)

• Position the microphone 4-5 inches from your mouth. This allows a good signal to be picked up, and is far enough from the mouth for atten uation of extraneous noises generated during speech. Keep the wind- screen over the microphone to help reduce additional noise.

• Speak in a natural voice. A normal conversational speech level should provide an adequate speech signal. It is not necessary to increase the intensity of your voice because the FM system is providing adequate amplification (approximately 5-10 dB) above your normal voice level.

• Avoid wearing the type of jewelry that may rub or hit against the microphone or microphone cord and produce unwanted noise.

• Locate a safe, secure place away from excessive heat, cold or dampness for overnight storage of the transmitter and hand-held microphone.

• Use the on/off control on the transmitter to mute the system when needed, such as during private conversations with a student, parent, or other classroom visitors. Since this equipment is capable of transmitting more than 100 feet , private conversations in the hallway, in the staff room or on the playground may also be broadcast to the class if the transmitter is not turned off.

• Turn the body-pack transmitter and/or the hand-held microphone off whenever leaving the classroom.

• Recharge the batteries each night. The operating time (actual usage) for the transmitter when using the rechargeable batteries is slightly more than five hours. These rechargeable batteries will last over a year if properly cared for. (Do not recharge disposable batteries as they may damage the charger.)

• Avoid bumping or dropping the microphone/transmitter. Treat cords (particularly near the attachments), microphones, and batteries gently. These are usually the areas that tend to malfunction first from misuse.

• Avoid winding the microphone connector cable around the body-pack transmitter. This could result in a break in the connecting cord which will produce static or noise in the FM system.

• Avoid blowing in the microphone when testing it. Instead, rub fingers over the windscreen, or snap fingers near the microphone. Or, conduct a consonant test by saying "ah, bah, s, sh, th", etc.. These consonant sounds represent some of the softer frequency ranges of speech.

• The receiver/amplifier has an auxiliary sound source input jack that may be used to amplify additional complimentary audio from a VCR, CD ROM, computer, cassette tape player, etc., with a simple connecting cable.

• On any difficulty or question, please contact LightSPEED immediately.

Reference Guide: Controls & Functions

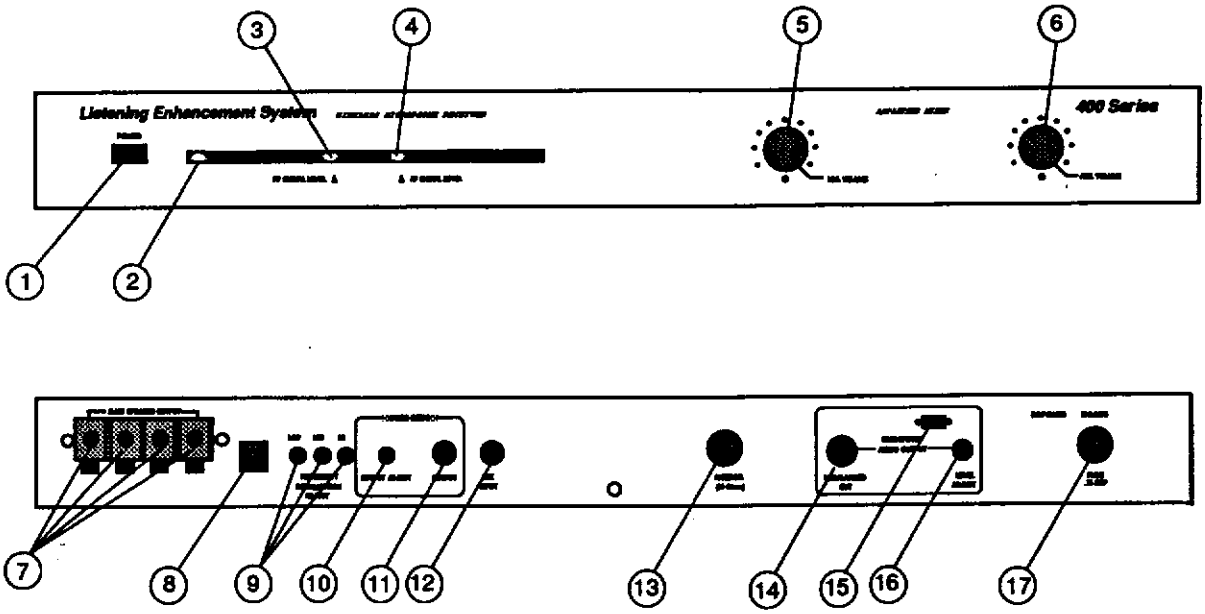

Figure 1 Control & Function Diagram

1. Power Switch:
Push ON; push OFF.

2. Power Indicator:
When power is switched on, the RED power indicator will light up.

3. Radio Frequency Indicator:
The Radio Frequency Indicator displays that the LES-400 is receiving a radio signal from the instructor's body-pack transmitter. When the body-pack transmitter is turned on, the RED Radio Frequency Indicator will light up.

4. Audio Frequency Indicator:
The Audio Frequency Indicator displays that the voice level of the instructor is active and at an adequate level. When the body-pack is turned on, the GREEN audio frequency indicator will flash off and on as the instructor's voice is detected.

5. Microphone Volume Control
Rotating the Microphone Volume Control clockwise increases the loudness of the instructor's voice through the speaker system.

6. Auxiliary Volume Control
Rotating the Auxiliary Volume Control clockwise increases the loudness of the audio connected to the Auxiliary Input Jack that is located on the back panel.

7. Speaker Output Connectors
The Speaker Output Connectors are used to connect the wires from the loudspeaker system to the LES-400 Receiver/Amplifier.

8. DC Power Connector
The LES 400 requires a 12 volt, 1.2 Amp DC power supply. The center conductor is positive (+) polarity. ***Caution:*** *Power supplies from different manufacturers have various output voltages, current ratings, and polarity. Connecting the wrong type of power supply can result in damage to the LES 400.*

9. Frequency Equalization Adjustments
The three Frequency Equalization Adjustments are factory set for a normal classroom environment. Sometimes adjustments to the high, medium, or low frequencies are necessary to allow increased gain before feedback.

10. Mixed Audio Output Level Adjust
Rotating the Mixed Audio Output Adjust clockwise increases the loudness of the audio connected to the Audio Out Jack that is located on the back panel.

11. Mixed Audio Output Jack
The Mixed Audio Output Jack provides the same audio information that is being supplied to the speaker system. This output may be connected to a tape recorder for recording purposes or to an assistive listening device like the optional LightSPEED Infrared Personal Listening Enhancement System.

12. Auxiliary Input Jack
The Auxiliary Input Jack may be connected to an external audio source such as a tape player or VCR to mix with the audio from the wireless microphone.

13. Antenna Connector:
The chrome telescoping antenna is connected directly to the Antenna Connector.

14. Wireless Microphone Unbalanced Audio Output Jack:
The wireless microphone Unbalanced Audio Output Jack is not used for normal classroom applications. This jack is used when desiring to use the wireless microphone section of the LES-400 with a larger amplifier and speaker system. The Unbalanced Out Jack may be connected to a line level input of a external audio amplifier or mixing console. The audio output connection is made with a standard 1/4 inch audio plug.

15. RF Test Switch:
In normal operation the switch is positioned to the left (green dot). To test for interference, the switch is positioned to the right (red dot). Interference will cause the RED Radio Frequency Indicator to light when the belt pack transmitter is off.

16. Microphone Audio Output Level Adjustment:
The adjustment of the Microphone Audio Output Level Adjust increases the audio level of the Unbalanced Out as it is rotated clockwise.

17. Fuse: Use .75 Amp, 250 Volt.

LightSPEED
5 Year Limited Warranty
To The Original Purchaser

LightSPEED 400 Series Classroom Amplification Systems are guaranteed against malfunction due to defects in materials and workmanship for a period of 5 years, beginning at the date of the purchase invoice. If such malfunction occurs, the product will be repaired or replaced (at our option) without charge during the period and under the limitations or specifications stipulated in the data sheet or owners manual (if any) for that individual product. Limited exclusions specifically apply to the microphone elements, rechargable batteries, battery charger and their assemblies, also external cables and wires. Warranty on microphones/microphone elements is limited to the original manufacturer's warranty (usually 1 year). If delivered prepaid to the LightSPEED factory or an authorized warranty service center, the unit will be returned prepaid. The 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 the LightSPEED factory.

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