

EasyListener2™



user guide

230R receiver

 **Phonic Ear®**

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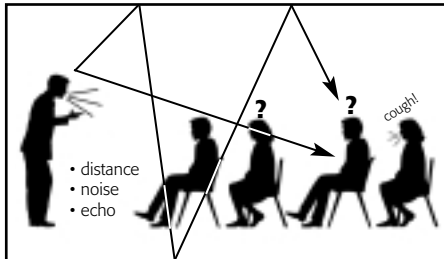
introduction

Congratulations on the purchase of your new 230R sound field receiver! With proper care and use it will become one of your most valuable classroom tools for many years. Students will be able to consistently and easily understand what the teacher is saying, regardless of his/her location in the classroom. Teachers can now speak all day in their normal voice without having to raise their voice to get their students' attention.

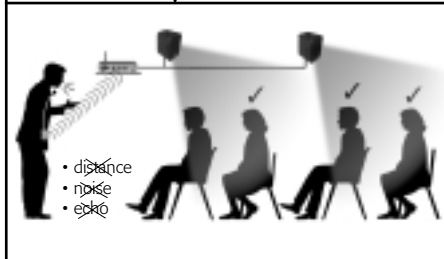
Numerous studies show that classrooms using sound field enjoy better student comprehension, increased student participation, better grades and fewer behavioral referrals.

Read this manual carefully to become familiar with your receiver and to get the most out of its many features and options.

understanding sound field and its benefits



without sound field



with sound field

installation tips

Before you set up your system, take a good look around your room. Where are the outlets located? Where are the computers and other electronic equipment? Where can you put your receiver so it's easy for you to reach, but out of the way of students and main traffic areas? Though each classroom is different, there are some general guidelines for both receiver and speaker placement:

The receiver — should be in the front of the classroom at teacher's eye level when standing, close to a wall outlet.

Compact wall speakers — should be mounted as high as possible and angled down toward the listeners' ears. Place them around the room so there is even coverage in the listening area (where the students are seated). Use as many as needed — four is recommended.*

Distributed ceiling speakers — space them evenly above the students' seating area. A minimum ceiling height of 10 feet is necessary, and 12 feet is even better. Use as many as needed — a minimum of four is recommended.*

Cluster ceiling speaker — should be centered directly over the students' seating area. A minimum ceiling height of 12 feet is recommended, and 14 feet is even better.

* For optimal speaker placement, download Sound field Wizard software from our website at www.phonicear.com.

system guidelines

To help ensure that you get the most out of your new sound field system, we have put together the following list of suggested guidelines:

Speak at a normal level – the system is projecting your voice for you.

Periodically check the volume and OptiVoice settings – these are often set and then forgotten, but if accidentally changed, will affect how your system sounds.

Minimize the effects of feedback – avoid walking too closely to the speakers while using the transmitter and microphone.

Place receiver in an open location – do not place the receiver in, or close to a metal cabinet or enclosure. FM signals are effected by metallic objects and the receiver requires proper cooling and ventilation.

Attach antenna – the receiver will not operate without the FM antenna.

Turn unit off while not in use – turning the unit off when not in use saves energy and still allows the receiver to recharge the 330T transmitter batteries when connected to the rear of the receiver.

system components

1



2



3



4



5



6



7



8



9



10



11



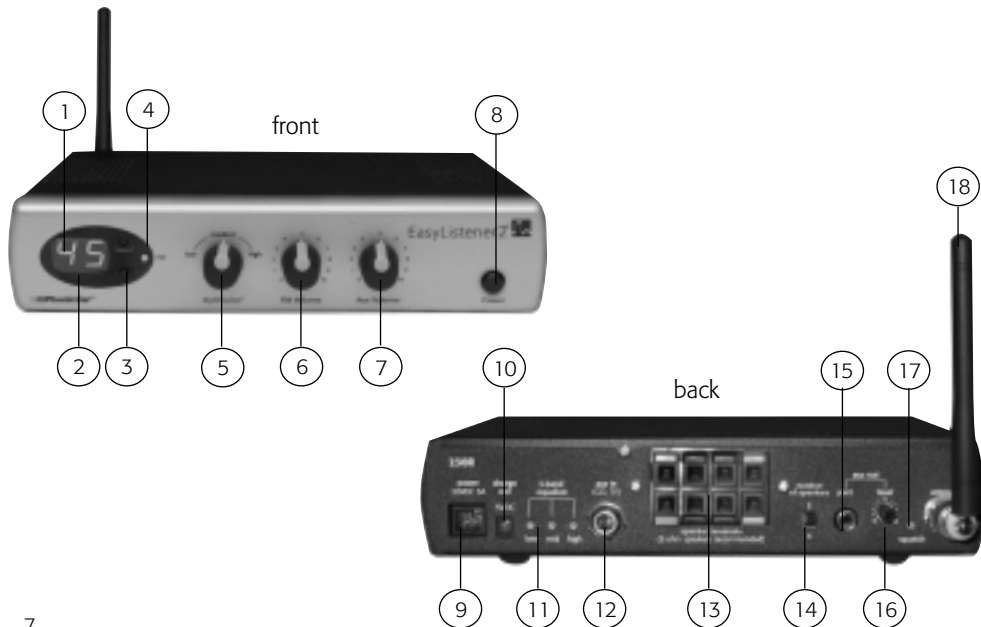
12



- ① 230R base station receiver
- ② body-worn transmitter
(330T shown here)
- ③ speakers (470-2856-119)
(compact wall speaker shown here)
*speakers packaged separately
- ④ microphone/(AT0655 boom
microphone shown here)
- ⑤ power supply
(040-7402-105)
- ⑥ power cord
(AT0787 for USA/Canada)
(AT0787-EN for England)
(AT0787-EU for Europe)
(AT0787-AU for Australia)
- ⑦ antenna
(AT0831)
- ⑧ aux out cable/(RCA 3.5mm)
(AT0805)
- ⑨ aux-in adaptor plug/(1/4 in – Dual RCA)
(310-2544-1342)
- ⑩ aux-out adaptor plug/(3.5mm – 2.5mm)
(310-2544-1341)
- ⑪ 330T transmitter charging cord
(1.3mm – Dual 1.3mm)
(300-6497-105)
- ⑫ speaker wire
(AT0581)
(Plenum rated, 24ft/7.3m, 48ft/14.6m,
60ft/18.3m lengths)

NOTE: Refer to part number cross-reference list

230R receiver features

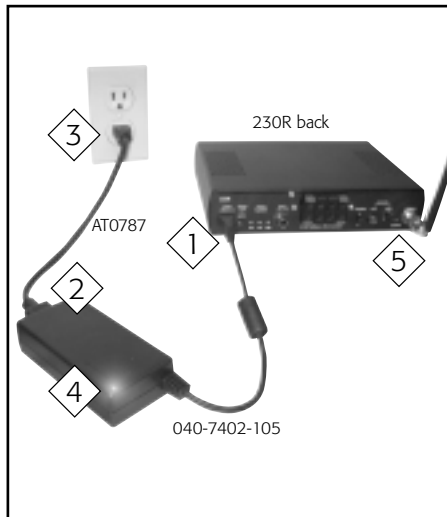


- ① channel display
- ② sleep/standby power indicator light
- ③ channel adjustment button
- ④ FM receiver signal light
- ⑤ OptiVoice™ control
- ⑥ FM Volume control
- ⑦ aux Volume control
- ⑧ power button
- ⑨ power cord jack
- ⑩ transmitter charge jack (1.3mm)
- ⑪ 3-band equalizer adjustment
- ⑫ aux in jack (1/4 in)
- ⑬ speaker wire terminals
- ⑭ number of speakers switch
- ⑮ aux out port (RCA)
- ⑯ aux out level control
- ⑰ squelch adjustment
- ⑱ antenna

1

setup and operation

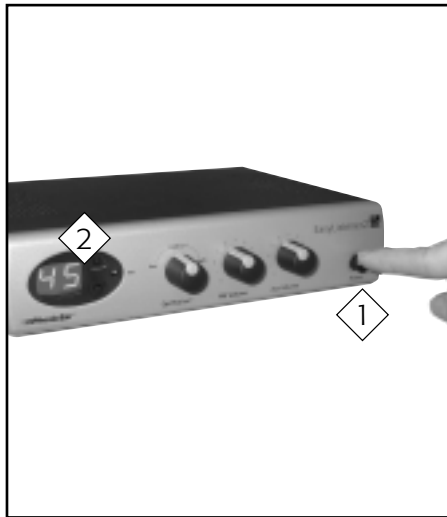
connecting power to 230R receiver



- 1 Plug power supply (040-7402-105) into **power** port on back of 230R receiver
- 2 Plug power cord (AT0787) into power supply unit (040-7402-105)
- 3 Plug power cord (AT0787) into wall socket
- 4 Check to see that green light is on, indicating that unit has power
- 5 Attach antenna to antenna port on back of 230R receiver

2

turning on 230R receiver



1

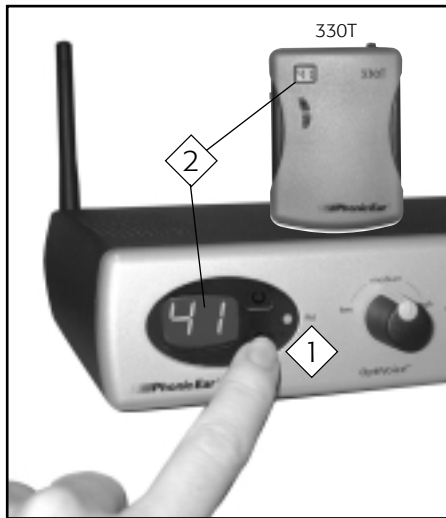
Push **power** button

2

Confirm that LED channel display lights

3

adjusting channel setting



1

Push up or down channel adjustment buttons to set channel on receiver to match transmitter channel

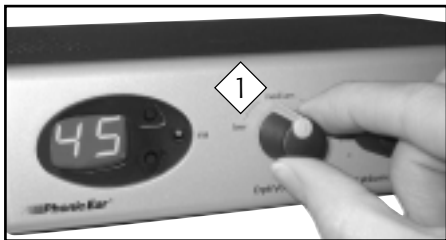
2

Make sure that receiver channel matches transmitter channel

NOTE: See “EasyListener2 channel numbers and corresponding frequencies” section for a complete list of Phonic Ear channel numbers and corresponding frequencies.

4

adjusting OptiVoice™ setting



1

Set **OptiVoice** switch to **medium**

OptiVoice is a 3-position switch that automatically adjusts the sound quality of the primary speaker's voice. It allows teachers to shape the sound of their voice and helps to ensure maximum speech clarity in low, medium and high noise levels.

low: Recommended for use in low-noise situations and for most natural voice quality.

medium: Recommended for everyday use. Best setting for average classrooms where low-medium noise levels are present.



high: Recommended for use in high noise levels. Helps to ensure top comprehension during critical tasks such as test-taking or hearing impaired instruction.

NOTE: With each increase in level, there is an increase of approximately 3dB in gain (volume). This may require you to decrease your volume setting to avoid potential microphone/speaker feedback.

5

setting FM volume



Follow steps  or  below to adjust **FM volume** setting to proper level. Two people are needed to set the volume level. It is difficult to hear your own voice and make adjustments to it.

NOTE: The average volume setting is between 4–5, but may change depending on room acoustics and noise level.

 1

With a sound level meter - Take a level reading in the “A” setting in the center of the room during normal classroom activity, and another reading of the teacher's amplified voice (without the class activity). The level of the teacher's voice should be set between 10-15 decibels above room noise level.

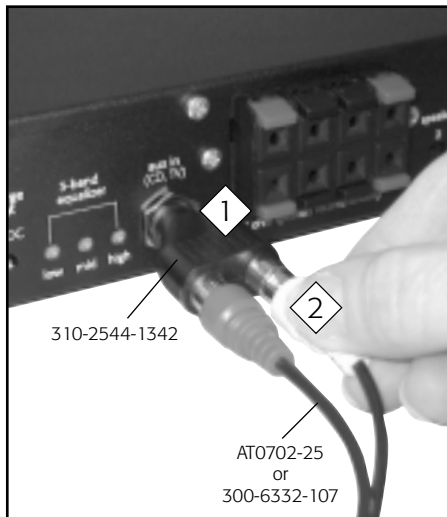
 2

Without a sound level meter - First, ask someone other than yourself (if you are the teacher) to listen to the amplified voice and make volume adjustments. An ideal volume level is achieved when the listener can hear the amplified voice at a comfortable level and the volume level from the speaker and teacher's mouth is comparable. If you can hear yourself through the loudspeakers, the volume setting is too high and should be decreased

6

auxiliary input (aux-in)

connecting CD, TV and other audio sources (optional)



1

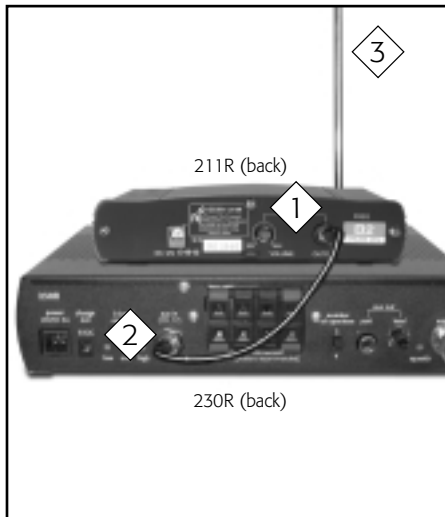
For most connections from CD player, TV, stereo or other audio sources, insert aux-in adaptor plug (310-2544-1342) into **aux in** port

2

Connect audio source to adaptor plug using AT0702-25 or 300-6332-107 (optional accessories – not included with system. See “**Optional accessories**” list)

7

team-teaching with 211 receiver and handheld microphone system



1

Connect one end of the AT0573-1 cable to **Output** jack on back of 211R unit

2

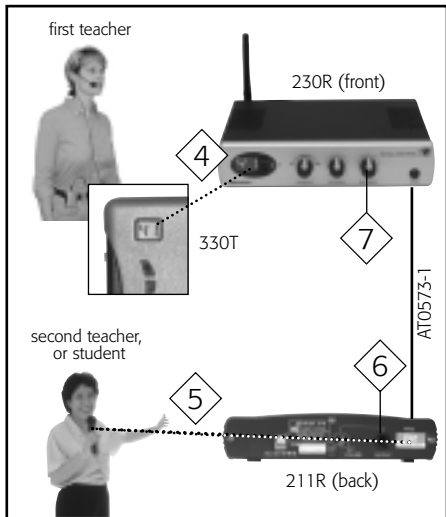
Connect the other end to the **aux in** jack on back of the 230R receiver

3

Extend 211R receiver antenna

8

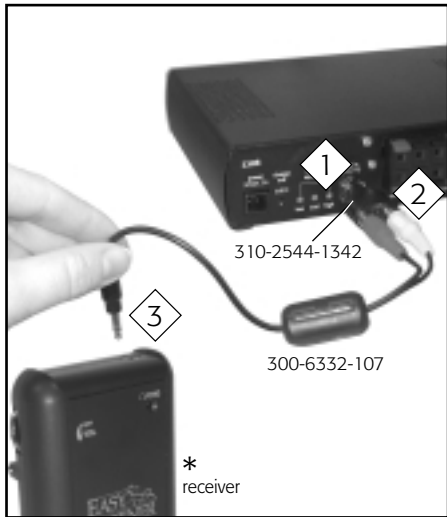
team-teaching with 211 receiver and handheld microphone system (cont'd)



- 4 Make sure that channel numbers indicated on front of 230R receiver matches channel number on the 330T unit
- 5 No channel change is necessary on the 211R and handheld mic – they are factory set to match
- 6 Set **Volume** control on back of 211R to approximately $\frac{1}{3}$ of the way to it's highest level setting
- 7 Adjust the **Aux Volume** control on front of 230R to proper level

9a

team-teaching with body-worn personal receiver & transmitter units



1 Insert aux-in adaptor plug (310-2544-1342) into **aux in** port on back of 230R

2 Connect aux-in adaptor cord (300-6332-107) to adaptor plug. (Match red to red and white to white.)

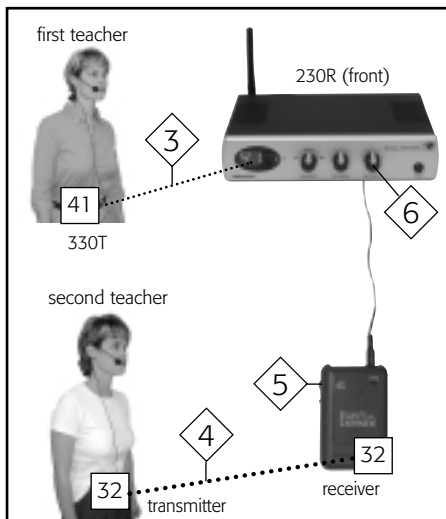
3 Plug other end of aux-in adaptor plug into **aux** jack on body-worn receiver

**If a different receiver is used, a different adaptor cord may be required.*

NOTE: Second teacher should be wearing a transmitter on same channel as receiver (see diagram on next page)

9b

team-teaching with body-worn personal receiver & transmitter units (cont'd)



3

First Teacher

Make sure that channel number setting on the front of 230R receiver matches the channel number of your 330T (or other transmitter)

4

Second Teacher*

Make sure that channel number indicated on receiver matches channel number on the transmitter

5

Set volume level on team-teaching receiver to $\frac{2}{3}$ max (6-7 out of 10).

6

Set **aux volume** on 230R to comfortable level (usually 4-5).

* Refer to the following page for channel pair combinations not recommended with a 72MHz system.

9c

team-teaching channel pairs

possible Phonic Ear receivers and transmitter combinations for team-teaching

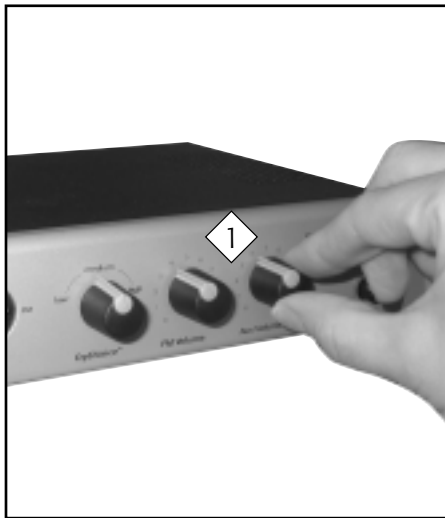
transmitters	300R	571R	575R
300T	•	•	•
300TS	•	•	•
300TS-216			
330T			
571T	•	•	•

When team-teaching with a 72MHz transmitter, make sure to avoid the following 72MHz/216MHz channel combinations:

72MHz band frequency	216MHz band frequency effected
72.025MHz (Ch1)	216.075MHz (Ch42)
72.075MHz (Ch2)	216.225MHz (Ch45)
72.125MHz (Ch3)	216.375MHz (Ch48)
72.175MHz (Ch4)	216.525MHz (Ch51)
72.225MHz (Ch5)	216.675MHz (Ch54)
72.275MHz (Ch6)	216.825MHz (Ch57)
72.325MHz (Ch7)	216.975MHz (Ch60)

10

adjusting aux volume control



1

Turn **aux volume** control to adjust CD, TV, stereo and other audio sources plugged into **aux in**.

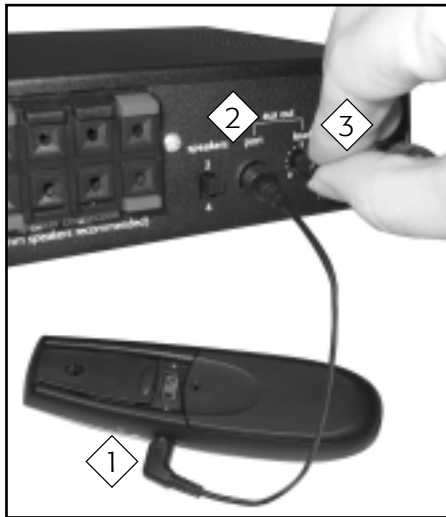
Depending on setup, you may have to adjust volume of external audio source.

NOTE: OptiVoice does not affect **aux** sound.

11

auxiliary output (aux out)

rebroadcasting to other receivers







The auxiliary output feature allows transmission, or rebroadcasting of the primary teacher's voice directly to a student's personal FM receiver, regardless of their channel or frequency.

- 1 Using AT0805 cord, attach 3.5mm end of cord into **aux in** port of transmitter. **NOTE:** (Lexis transmitter shown here. See chart on next page for list of compatible products and input adaptor plug sizes. Adaptor plug 310-2544-1341 may be required).
- 2 Using AT0805 cord, attach transmitter to **aux out** port
- 3 Adjust **level** setting for transmitter using compatibility chart on following page

12

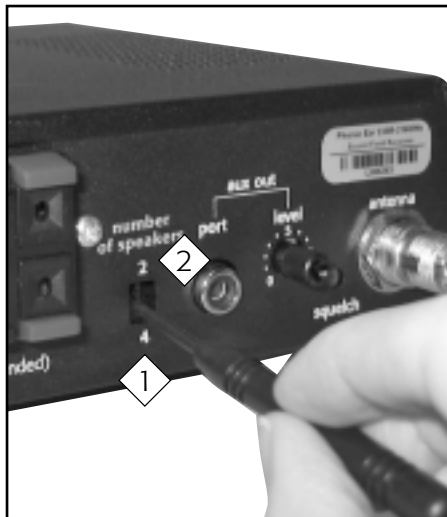
aux out rebroadcasting to other transmitters from 230R receiver

★★★★ = most compatible

transmitter	level of compatibility	adaptor cord(s) needed	aux out level setting	comments
330T 	★★★★	AT0805	2	
300TE-173 Easy Listener 	★★★★	AT0805	2	<ul style="list-style-type: none"> requires use of external antenna for range (AT0529A)
571T-173 Solaris 	★★★★	AT0805	5	<ul style="list-style-type: none"> requires use of external antenna for range (AT0529A-26)
Lexis Transmitter 	★★★★	AT0805	2	<ul style="list-style-type: none"> set the aux input sensitivity setting to LO (consult Lexis user guide) requires use of external antenna for range (389-02-120-02)
Phonak HandyMic TX3	★★★	handmic aux input cord (europlug to 3.5mm (M) (Phonak P/N 052-0117)	2	<ul style="list-style-type: none"> requires RCA (M) to 3.5mm (F) adaptor to interface to handymic aux input cord (Radio Shack P/N 274-387)
Phonak Campus S TX5	★★★	AT0805	2	
Phonak MicroVox TX2	★★★	requires 2.5mm(male) stereo to RCA (male) adaptor cord	2	<ul style="list-style-type: none"> must use external antenna (Phonak P/N 052-0116)

13

setting number of speakers



1

Verify **number of speakers** switch is set to **4** if using 4 speakers

2

Set switch to **2** if using 1 single cluster ceiling speaker or a 1-3 daisy-chaining speaker configuration

Selecting the proper setting allows for:

- optimal speaker power distribution and optimal system performance

number of speakers

2

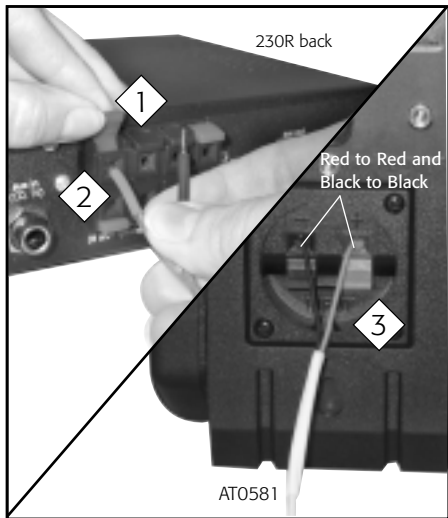
4

Verify the **number of speakers** switch is set to **4** on back of 230R

14

speaker setup

connecting speaker wires to 230R

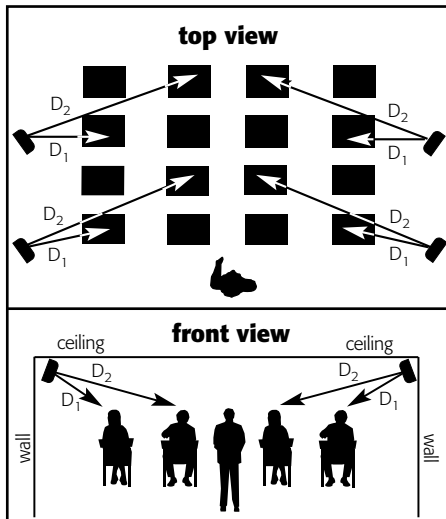


- 1 Lift speaker cable connector tab
- 2 Insert exposed cable wire as far as it will go into connector hole (**red to red; black to black**), then push tab down to secure cable. Pull on cable slightly to make sure connection is secure.
- 3 Attach AT0581 speaker cable to back of speaker. Insert red-tipped cable into red speaker connector and black-tipped cable into black speaker terminal.

NOTE: Use at least 18 GA Plenum speaker wire (included with system)

15

where to mount compact wall speakers



Based on your classroom acoustics and seating arrangement, speaker placement will vary.

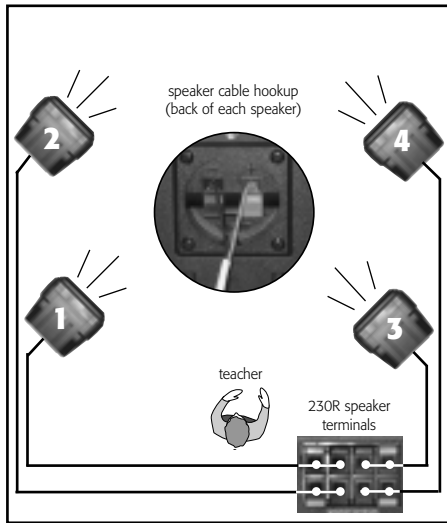
- For an average sized classroom, 4 speakers are recommended
- Mount on walls, ceiling beams, or other structure
- Place speakers as high up as possible
- Aim speakers down toward listeners' faces.
- The farthest listener each speaker can serve should be less than twice as far away as the closest listener. ($D_2 < 2D_1$ in diagram)

For optimal speaker placement, download our **sound field wizard** software from our web site at www.phonicear.com.

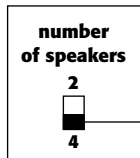
16a

standard four-speaker setup

For other speaker connection options, see page 49



- For average-sized rooms (30 x 30 ft)



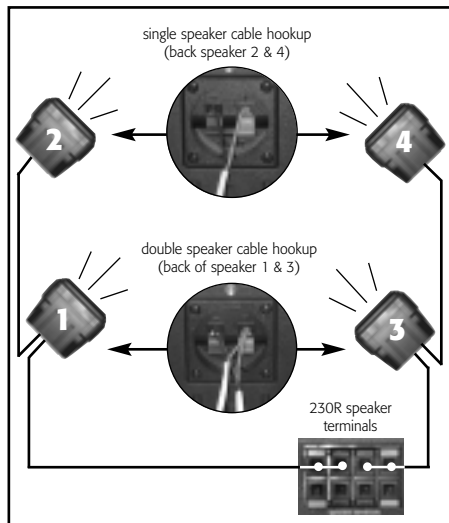
Verify the **number of speakers** switch is set to **4** on back of 230R

- Sound will not come through until all speakers have been hooked up.

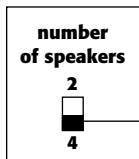
NOTE: When installing compact wall or ceiling speakers, keep cord flush to wall and away from foot traffic.

16b

standard four-speaker daisy-chaining option
refer to advanced system setup section for advanced speaker connection options



- Daisy-chaining allows setup with shorter cable lengths
- For optimum performance, daisy chain speakers in pairs: e.g. speakers 1-2, then 3-4 rather than 1-2-3-4 separately



Verify the **number of speakers** switch is set to **4** on back of 230R

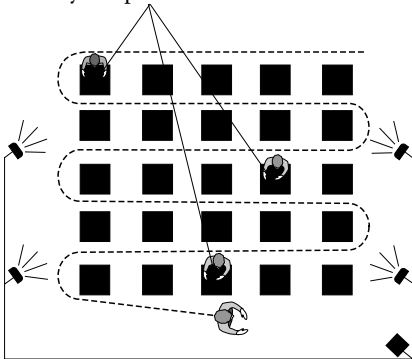
NOTE: Be sure to plug one speaker set on right, and one speaker set on left side of terminal.

17

walk, talk, and listen to quality

(Initial setup only; reangle speakers towards listeners' ears if necessary.)

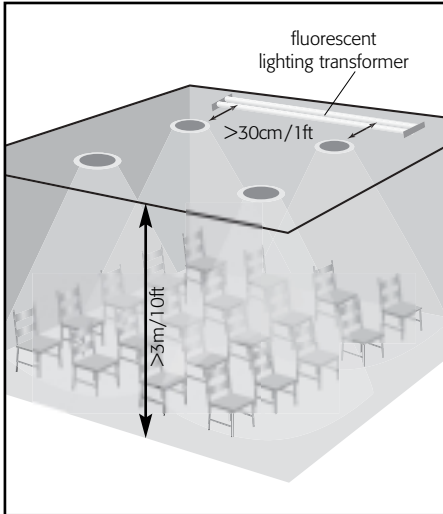
Ask another person to assess volume levels from front and back of room while you speak

**top view**

- Make certain that speakers are angled down toward student seating area.
- Adjust **FM volume** setting as necessary

18

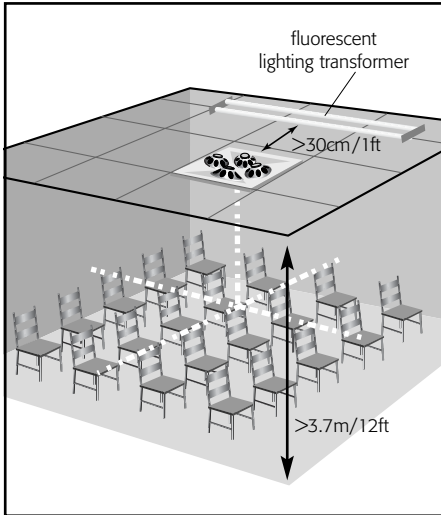
where to mount distributed ceiling speakers



- Space speakers evenly over listening area
- >3m/10ft minimum ceiling height recommended
- >30cm/1ft distance from fluorescent lighting transformer is recommended

19

where to mount cluster ceiling speaker



- Center speaker over listening area
- >3.7m/12ft minimum ceiling height is recommended
- >30cm/1ft distance from fluorescent lighting transformer is recommended

**number
of speakers**

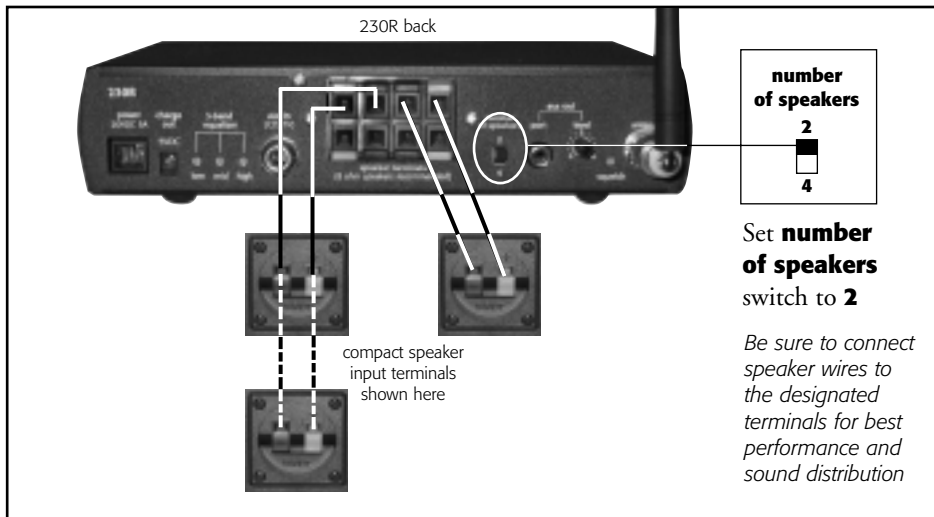
2
 4

Set **number of speakers**
switch to **2** on back of 230R

20a

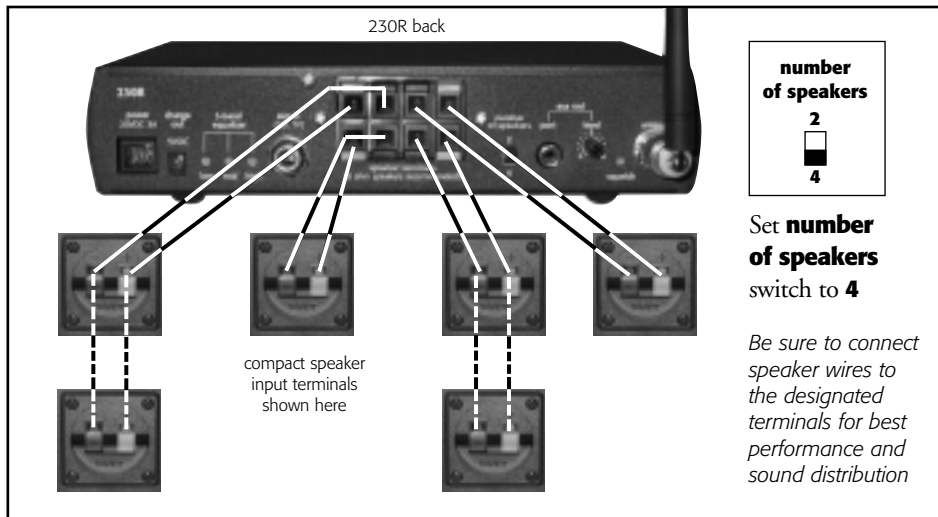
advanced system setup

daisy-chaining with 3 speakers



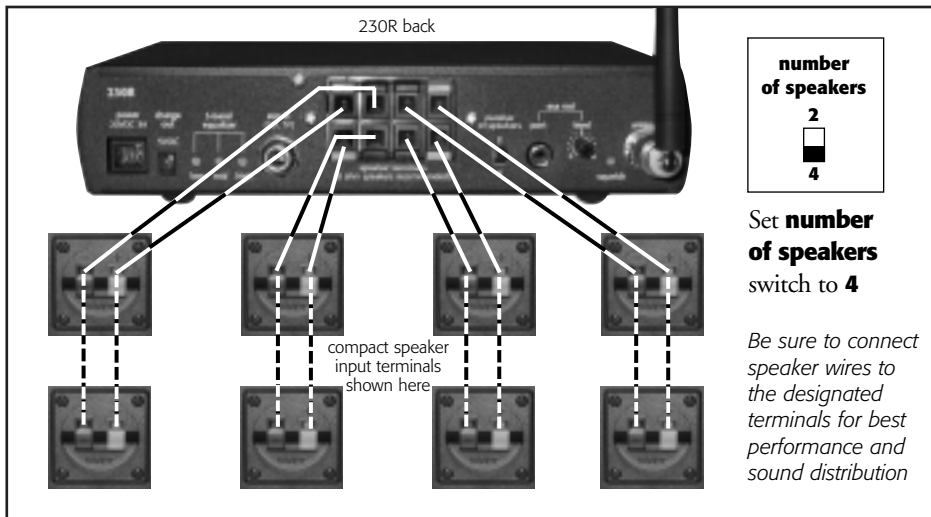
20b

daisy-chaining with 6 speakers



20c

daisy-chaining with 8 speakers



21

adjusting 3-band equalizer

(This setting should be adjusted by sound professionals ONLY)



ATTENTION: If you are not a sound professional, we do not recommend that you alter the 3-band equalizer settings.

1 Use screwdriver to adjust the **low**, **mid** and **high** settings. Turn to the right to add base, mid and high tones. Turn left to decrease.

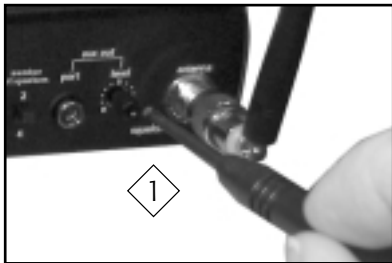
A properly adjusted equalizer optimizes the system's sound quality and reduces feedback.

Making improper adjustments could result in a degradation in sound quality and performance.

22

adjusting squelch

(This setting should be adjusted by sound professionals ONLY)



1

Using a screwdriver turn the control slightly to the left (counter clockwise) to increase the system's range and to the right (clockwise) to decrease the system's range.

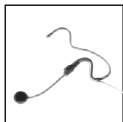
The squelch setting increases or decreases the system's range by disabling the receiver audio when the transmitter signal is below the threshold point. It also allows the ability to re-use a channel, provided that systems are installed more than 200ft

apart (indoors). For best results, ask someone to help you by wearing the transmitter and walking away from the base station receiver towards the perimeters of the room. When you begin to hear noisy static, you know you've reached the system's internal range limits. Increase or decrease the range slightly, and re-test by repeating this step. (In most cases the system's range will go well beyond the typical classroom.)

If noise or signal interference persists, make sure systems in adjacent classrooms are turned off. Re-test range and set squelch for the minimum system range to reduce external interference. Contact Phonic Ear Service if extra assistance is required.

optional accessories

microphone styles



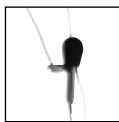
AT0655
behind-the-neck
boom microphone



AT0814
earhook microphone

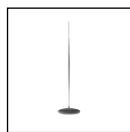


AT0816
FM collar microphone
with mute switch

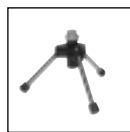


AT0291-L
directional microphone
with lavalier cord

speaker accessories



AT0579
speaker floor stand
(requires AT0582
stand adaptor)

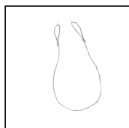


AT0579-T
table-top stand
(requires AT0582
stand adaptor)

transmitter accessories



AT0749
wall transformer/
charger for 330T



AT0512-BK
lavalier cord

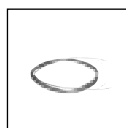
receiver accessories



AT0801
aux-box (adds four
additional audio
inputs)



211
wireless microphone
system for team-
teaching and student
pass-around use



AT0581
speaker wire
(Plenum rated,
24ft/7.3m, 48ft/14.6m,
60ft/18.3m lengths available)

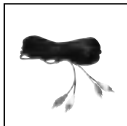
NOTE: Refer to part number cross-reference list

optional accessories (cont'd)

auxiliary input adaptor cords



384-01-210-08
aux-in adaptor cord
(3.5mm–3.5mm)
330T to external
audio, TV, VCR,
DVD, computer, etc.



AT0702-25
aux-in adaptor cord
(dual RCA–dual RCA)
230R to external audio,
TV, VCR, DVD, etc.



300-6332-107
aux-in adaptor cord
(3.5mm–dual RCA)
330T to external audio,
or team-teaching



AT0529A
antenna (for use with
auxiliary input only)

NOTE: Refer to part number cross-reference list

230R part number cross-reference list

Description	part numbers	
	Phonic Ear, Inc. (USA)	Phonic Ear A/S (Intl.)
230R receiver <ul style="list-style-type: none"> • 216MHz • 173MHz 	230R-216USA 230R-173	NA 202-00-001-00
330T body-worn transmitter <ul style="list-style-type: none"> • 216MHz • 173MHz 	330T-216USAXX 330T-173	NA 202-01-001-00
speaker (compact wall speaker)	470-2856-119	-470-2856-119
power supply	040-7402-105	890-88-004-00
AC power cord (US) <ul style="list-style-type: none"> • England • Europe • Australia 	AT0787 AT0787-EN AT0787-EU AT0787-AU	NA -AT0787-EN -AT0787-EU -AT0787-AU
antenna (216 & 173MHz)	AT0831	-AT0831
kit, plugs and cords (includes) <ul style="list-style-type: none"> • aux-out cable (RCA-3.5mm) • aux-in adaptor plug (1/4in - dual RCA) • aux-out adaptor plug (3.5mm - 2.5mm) • charging cord (1.3mm - dual 1.3mm) 	595-6440-101 AT0805 310-2544-1342 310-2544-1341 300-6497-105	890-88-005-00 Kit Kit Kit Kit
behind-the-neck boom microphone	AT0655	-AT0655

230R part number cross-reference list (cont'd)

Description	part numbers	
	Phonic Ear, Inc. (USA)	Phonic Ear A/S (Intl.)
earhook microphone	AT0814	-5-300-400-110
FM collar microphone	AT0816	-AT0816
directional microphone with lavalier cord	AT0291-L	-AT0291-L
wall transformer (for 330T charging)	AT0749	NA
lavalier cord	AT0512-BK	-AT0512-BK
aux-box (4 audio input device)	AT0801	-AT0801
wireless microphone system (team teach/pass around mic)	211	NA
aux-in adaptor cord (3.5mm-3.5mm)	384-01-210-08	384-01-210-08
aux-in adaptor cord (dual RCA - dual RCA, 25ft)	AT0702-25	-AT0702-25
aux-in adaptor cord (3.5mm - dual RCA)	300-6332-107	384-88-005-00
speaker wire (plenum rated) <ul style="list-style-type: none"> • 24ft/7.3m length • 48ft/14.6m length • 60ft/18.3m length 	AT0581-24 AT0581-48 AT0581-60	-AT0581-24 -AT0581-48 -AT0581-60
antenna, auxiliary	AT0529A	-AT0529A
speaker floor stand	AT0579	-AT0579
table-top speaker stand	AT0579-T	-AT0579-T
230R user guide/instructions for use	821-6440-107	921-00-310-00

troubleshooting

no FM reception (green FM indicator light on front of receiver is not on)

- Verify the receiver is turned on
- Verify the frequency number on the receiver matches the frequency number on transmitter
- Verify that receiver antenna is connected

weak sound from speaker(s)

- Make sure AT0655 boom microphone (or other microphone) is being worn correctly
- Increase FM and/or Aux Vol control
- Reposition the microphone closer to the speaker's mouth
- Check that none of the speakers are blocked or covered
- Verify that the speaker wires are properly connected to 230R speaker terminals (reinsert each one deep into terminal socket)
- Reposition speakers closer to the listeners

troubleshooting (cont'd)

receiver is receiving a signal but no sound is coming from speaker

- Verify microphone is connected properly to transmitter and is working correctly
- Confirm that transmitter mute switch is in off position (un-depressed)

feedback from speaker(s)

- Turn down the volume on the 230R receiver
- Reposition mic closer to mouth
- Make sure the person wearing the transmitter is not too close to the speaker(s)
- Make sure AT0655 boom microphone (or other mic) is being worn correctly

speaker(s) is picking up FM interference or hum

- Check to make sure no other wireless systems are operating on similar frequencies
- Check to make sure the system is placed more than 6ft from a computer
- Check to make sure metal objects are not placed too close to transmitter or speaker(s) (i.e. jewelry, metal shelves)

caring for your system

cleaning

Clean as needed, using a soft, damp cloth.

other important notes

- Protect your sound field system from excessive moisture, heat, and mechanical shocks.
- Clean with a soft damp cloth.
- The case bottom and top of the 230R and the 040-7402-105 receiver power supply can get warm under normal operation.

transmitters that are compatible with the 230R receiver

★★★★ = most compatible

transmitter	compatible (no adaptor cord required)	performance rating	accessory needed	comments
330T-216/173	✓	★★★★	none	
300TS-216 Sprite	✓	★★★★	none	
300TE-173 Easy Listener	✓	★★★★	none	
Lexis transmitter (as mic) 216 & 173	✓	★★★	✓	a) Lexis requires the use of AT0655R boom mic b) may require use of external antenna for better range (389-02-120-02) c) set microphone to omni mode 🏠 d) set sensitivity level to high
Phonak Handymic TX3 (as mic)	N/A	N/A	N/A	a) built-in mic has high level of feedback b) requires use of external mic, which the Handymic will not accommodate
Phonak Campus S TX5	✓	★★★	✓	a) omni mic has extreme feedback issues b) recommend use of external boom mic from Phonak
Phonak MicroVox TX2	✓	★★★	✓	recommend boom mic

EasyListener 2 channel numbers and corresponding frequencies

216MHz (U.S.)

CH	FREQUENCY
41	216.025
42	216.075
43	216.125
44	216.175
45	216.225
46	216.275
47	216.325
48	216.375
49	216.425
50	not available
51	216.525
52	216.575
53	216.625
54	216.675
55	216.725
56	216.775
57	216.825
58	216.875
59	216.925
60	216.975
total: 19	

169-176MHz (EU)

United Kingdom

CH	FREQUENCY	CH	FREQUENCY
13	173.3500	50	174.4000
15	173.4000	52	174.4500
17	173.4500	53	174.5000
21	173.5000	54	174.5500
24	173.5500	55	174.6000
25	173.6000	57	174.6500
27	173.6500	59	174.7000
29	173.7000	60	174.7500
30	173.7500	62	174.8000
32	173.8000	63	174.8500
34	173.8500	65	174.9000
35	173.9000	66	174.9500
36	173.9500	67	175.0000
37	174.0000	71	175.0500
38	174.0500	total: 35	
40	174.1000		
42	174.1500		
44	174.2000		
45	174.2500		
47	174.3000		
48	174.3500		

EasyListener 2 channel numbers and corresponding frequencies (cont'd)

New Zealand

CH	FREQUENCY
A1	173.0000
A2	173.0500
A3	173.1000
A4	173.1500
A5	173.2000
A6	173.2500
A7	173.3000
13	173.3500
15	173.4000
19	173.4650
23	173.5450
26	173.6400
28	173.6950
31	173.7550
91	173.8125
33	173.8250
35	173.9000
36	173.9500
93	173.9625
69	173.9900
37	174.0000

total: 21

Australia

CH	FREQUENCY
13	173.3500
15	173.4000
19	173.4650
23	173.5450
26	173.6400
28	173.6950
31	173.7550
91	173.8125
35	173.9000
36	173.9500
37	174.0000
38	174.0500
41	174.1200
77	174.1750
86	174.2250
87	174.2750
78	174.3250
88	174.3750
89	174.4250
79	174.4750
90	174.5250

CH	FREQUENCY
55	174.6000
57	174.6500
59	174.7000
61	174.7700
63	174.8500
65	174.9000
66	174.9500
67	175.0000
94	175.5000
95	175.6000
2	175.7000
9	175.8000
97	175.8500
10	175.9500
11	176.0000

total: 36

For a complete list of the available channels in each country, please contact Phonic Ear International.

product specifications

base station receiver: 230R

receiving frequency	169-176MHz, synthesized (International)
frequency stability	$\pm 500\text{Hz}$ 0° to 50°C
modulation	FM narrow-band
AF frequency response	20Hz - 20kHz, -3dB (Aux in) 70Hz - 10kHz, -3dB (FM in)
power output	14W into 8Ω /28W into 4Ω
auxiliary input level	300mV _{rms} (-10dBV) 0.25in stereo
auxiliary output	0-1V _{rms} adjustable via rear panel, RCA
aux input impedance	47k Ω
FM signal-to-noise	> 63dB, A weighted
THD	< 3% @ 1kHz maximum output
nominal deviation	$\pm 5\text{kHz}$
maximum deviation	$\pm 10\text{kHz}$
squelch	RSSI-type
squelch level	adjustable via rear panel
power supply	20VDC @ 3A
charge port	5VDC, 200mA

user controls (front)	on/off, FM volume, Aux volume, OptiVoice, channel up/down
installer controls	3-band equalizer, squelch, speaker configuration selector
displays	2 digit channel LED display and LED for "FM signal"
dimensions (WXHXD)	21.9 x 5.4 x 16.2 cm/ 8.6 x 2.1 x 6.4 in
weight	1.11kg/2.45lb
case	steel, powder coat finish

warranty

time period of warranty

This warranty will go into effect upon the date of purchase and will stay in effect as long as the instrument remains the property of the original owner. EASYLISTENER 2™, VOCALIGHT™ and ONWAVE™ have a 3-year warranty. All other products have a 1 year warranty.

what is covered by this warranty

Any electronic component, which because of workmanship, manufacturing or design defects, fails to function properly under normal use during the life of this warranty will be replaced or repaired at no charge for parts or labor, when returned to the factory service center. Transportation in and out is paid by the customer. If it is determined that repair is not feasible, the entire unit may be replaced with an equivalent unit upon mutual agreement of the manufacturer and customer.

what is not covered by this warranty

This limited warranty does not apply to:

- 1.** Malfunctions resulting from abuse, neglect or accident
- 2.** Instruments connected, installed, used or adjusted in any manner contrary to instructions provided by the manufacturer
- 3.** Consequential damages and damages resulting from delay or loss of this instrument. The exclusive remedy under this warranty is strictly limited to repair or replacement as herein provided
- 4.** Products damaged in transit unless investigated by the shipper and returned to the warrantor with the investigation report
- 5.** Peripheral accessories as itemized within the product specification sheet as applicable, when such items are returned within 1 year from original purchase
- 6.** Batteries if applicable

warranty (cont'd)

Phonic Ear Inc. reserves the right to make changes in the design or construction of any of its instruments at any time without incurring any obligation to make any changes whatsoever on units previously purchased.

This warranty is in lieu of all other expressed warranties. All expressed and implied warranties will terminate upon the expiration of this written warranty. No representative or person is authorized to represent or assume for us any liability in connection with the sale or use of our products other than as set forth above.

what to do if you need service

If you require service under the warranty terms, obtain a service order form either online at **www.phonicear.com/support.asp** or through our U.S. customer service department at **800.227.0735, then press 7** (or +1.707.769.1110 outside the U.S.). Fill the form out completely remembering to include:

- 1.** Description of the problem
- 2.** Your billing address
- 3.** Your shipping address (if different from billing address)
- 4.** Contact name and phone number
- 5.** A P.O. number if the equipment is not under a warranty or service contract

warranty (cont'd)

Then, carefully package the equipment in the original shipping container to prevent damage and send it postpaid to the service center near you:

USA:

Phonic Ear Inc.

3880 Cypress Drive
Petaluma, CA 94954-7600
U.S.A.

In Canada:

Phonic Ear Ltd.

10-7475 Kimbel Street
Mississauga, Ontario
L5S 1E7 Canada

International:

Phonic Ear A/S

Distribution Centre
Tilstedvej 73
7700 Thisted
Denmark

what to do if you have questions

If you have any questions about service, call the U.S.A. service department at **800.227.0735, then press 7** or **+1.707.769.1110** outside the U.S.A.

about your batteries

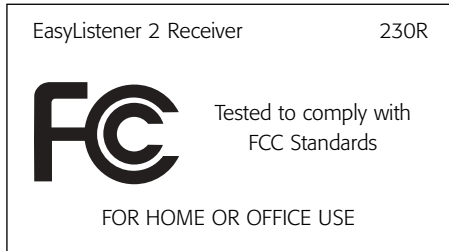
To ensure that your batteries are as fresh as possible upon arrival, we have intentionally not installed them in your equipment.

battery replacement

It is recommended to re-order new rechargeable AAA NiMH batteries from Phonic Ear annually.

regulatory compliance

receiver: part 15, subpart B



The term "IC:" before the radio certification number only signifies that Industry of Canada technical specifications were met.

CE This product conforms with the essential requirements of European Union Directive 1999/5/CE R&TTE Directive

u.s.a. **800.227.0735**, then press **5** • canada **800.263.8700** • international **+45 3917 7101**

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