

# frontrow™

lasso



## **INSTALLER GUIDE**

# YOU'RE ABOUT TO MAKE LEARNING MORE FUN

Welcome to FRONTROW — the teacher-friendly way to improve the learning environment in every classroom. With your new classroom sound system, you'll enjoy greater student attention, less teacher fatigue, and very likely better test scores.

To help you start benefiting from your FRONTROW LASSO system right away, we recommend that you first read the section in this guide called Before You Begin, and from there proceed to Steps 1 through 10. Be sure to consult the system user guide as well.

If you follow the steps set out in this Installer Guide and organize everything you need beforehand, you'll find setting up your FRONTROW LASSO system to be quite simple. Of course, if you run into any obstacles, you can always call us at the number below. Our technical support representatives are happy to help.

Thank you for choosing FRONTROW! You're just steps away from a happier, more productive.

## **USA/Global**

FrontRow  
Corporate Headquarters  
2080 Lakeville Highway  
Petaluma, CA 94954-6713  
toll-free: 800.227.0735  
tel: 707.769.1110  
fax: 707.769.9624  
web: [www.gofrontrow.com](http://www.gofrontrow.com)

## **Australia**

Phonic Ear  
12/97 Castlemaine Street  
Milton Qld 4064  
Australia  
freecall: 1 800 PHONIC  
fax: 1300 746 642  
web: [www.gofrontrow.com.au](http://www.gofrontrow.com.au)

## **Canada**

FrontRow  
6950 Creditview Road, Unit 1  
Mississauga, ON L5N 0A6  
toll-free: 800.340.9894  
tel: 905.461.5300  
fax: 905.677.7760  
web: [www.gofrontrow.com](http://www.gofrontrow.com)

## **Scandinavia**

Phonic Ear A/S  
Kongebakken 9  
2765 Smørum  
Denmark  
tel: +45 3917 7101  
fax: +45 3927 7900  
web: [www.gofrontrow.com](http://www.gofrontrow.com)  
[www.phonicear.com](http://www.phonicear.com)

## **New Zealand**

Oticon New Zealand Ltd.  
142 Lambton Quay  
P.O. Box 9128  
Te Aro, Wellington  
toll-free: 800 OTICON  
toll-free fax: 00800 FAX OTICON  
web: [www.oticon.co.nz](http://www.oticon.co.nz)

## **United Kingdom**

PC Werth Limited  
Audiology House  
45 Nightingale Lane  
London SW12 8SP  
tel: 020 8772 2700  
web: [www.soundfield.info](http://www.soundfield.info)

# CONTENTS

Step 1..... Pages 1-6  
Before you begin

Step 2.....Page 7  
Get yourself ready

Step 3..... Pages 8-11  
Plan your installation (Speakers)

Step 4..... Pages 12-14  
Plan your installation (Sensors)

Step 5.....Page 15  
Install the receiver

Step 6..... Pages 16-19  
Install speakers

Step 7..... Pages 20-21  
Install sensors

Step 8..... Pages 22-23  
Route and connect cables

Step 9.....Page 24  
Test system

Appendix A.....Page 25  
Teacher Tips

Appendix B..... Page 26-27  
Special speaker connections

Appendix C.....Page 28  
Troubleshooting

## Read

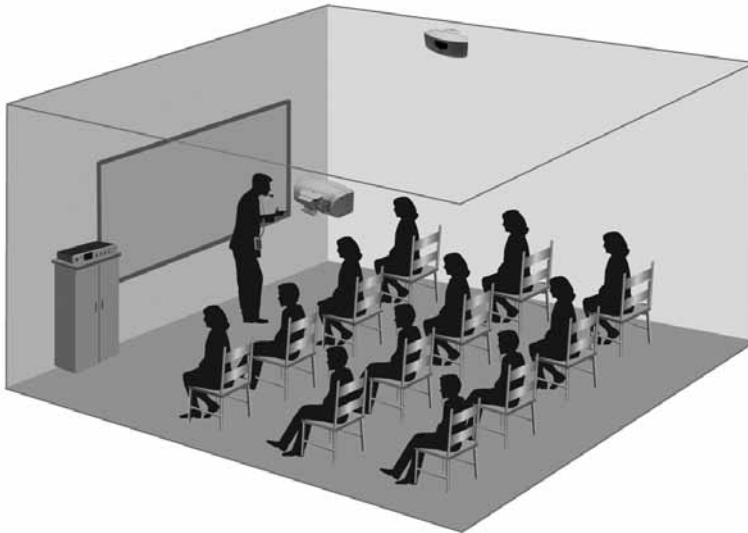
Be sure to read the helpful tip boxes found throughout this guide. Of course, if you need further assistance, you can always call us at one of the numbers found on the previous page.

# Step 1: Before you begin

Make sure you've got everything you need to set up your FRONTROW LASSO system. By taking a few minutes to prepare, you'll help ensure the actual set-up is as quick and problem-free as possible.

## Visualize your goal

When your FRONTROW LASSO system is installed, it will look something like this:



## General safety precautions

- Do not install or use the receiver near water or heat sources
- Clean only with a dry cloth
- Do not block any ventilation openings
- Protect all cables from wear and damage from foot traffic, doors, and other hazards
- Use only accessories specified by FrontRow
- Refer servicing to qualified service personnel
- Wear safety goggles when using power tools
- Follow all safety guidelines when using ladders
- Observe your local building, electrical, and fire codes when installing any electrical equipment
- Use at least 18-gauge plenum speaker wire (included with system)

## Get your classroom ready

### 1. Does your classroom meet the system requirements?

Check the table below to confirm that your classroom is set up properly for the FRONTRow LASSO system you have. In most cases, one ceiling sensor will be sufficient. However, some classrooms may require one or more additional sensors for optimal room coverage. While other classroom configurations may work with your FRONTRow LASSO system, we can only support those listed below.

Size	<input type="radio"/> < 900ft <sup>2</sup>	<input type="radio"/> 900ft <sup>2</sup> –1500ft <sup>2</sup>
Walls	<input type="radio"/> Light colors	<input type="radio"/> Dark colors
Windows	<input type="radio"/> Few	<input type="radio"/> Many (>50% window-to-wall area)
Obstructions (hanging art, tall free-standing bookshelves, suspended lights)	<input type="radio"/> Few	<input type="radio"/> Many
Shape	<input type="radio"/> Simple (Square, Rectangle)	<input type="radio"/> Complex (Alcoves/bays where teachers may walk)

$$\frac{\text{Total}}{\text{Checked}} \times 1 + \frac{\text{Total}}{\text{Checked}} \times 3 = \boxed{\phantom{00}}$$

**If your score is:**

< = 5

6 - 10

11+

**We recommend:**

1 ceiling sensor **OR** IR speakers\*

1 ceiling sensor + 1 wall\*\* sensor **OR** 2 ceiling sensors **OR** IR speakers\*

3 sensors (any combination of wall\*\* or ceiling **OR** IR speaker sensors)

\*IR speakers have a built-in sensor

\*\*Wall sensors can help where there are ceiling obstructions (hanging lights, artwork, etc.)

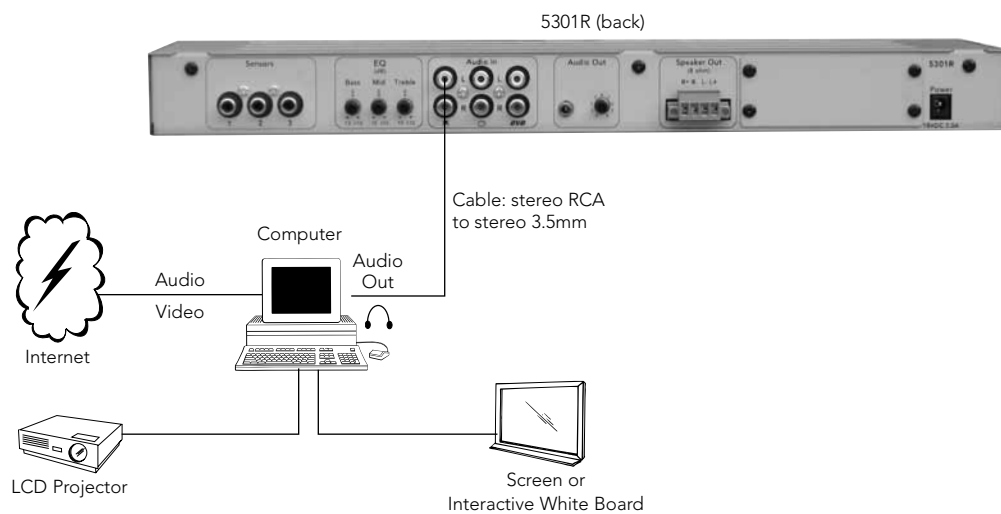
## 2. Think about combining your other teaching technologies

Your FRONTROW LASSO system is the audio center of your classroom. Take advantage of this opportunity to connect your TV, VCR, computer, CD player, MP3 player and other teaching technology to your sound system. This will allow children to hear not only your voice, but also the rich multimedia content you're providing, regardless of where they're seated.

Deciding what other devices you'll want to connect to your FrontRow Lasso system now will make positioning the receiver easier in Step 3. There are many ways to approach integration.

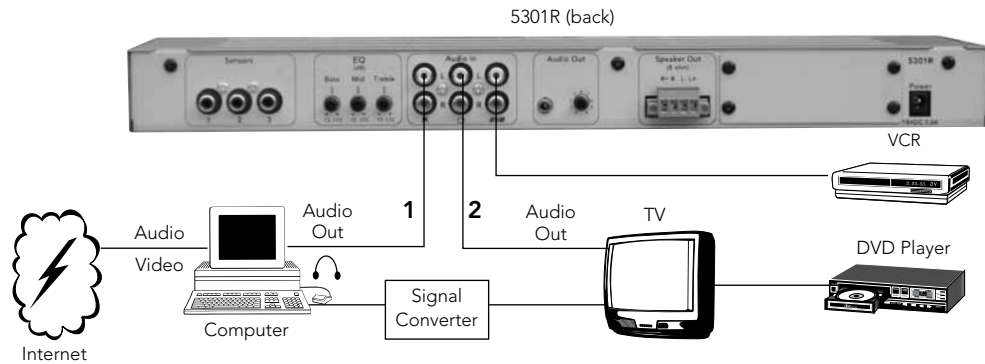
### Example 1

Many classrooms use a computer as a multi-media "hub" that is connected to the internet or school network to download/stream and play all audio and video. For these classrooms, you may only need one audio input connection to the 5301R.



## Example 2

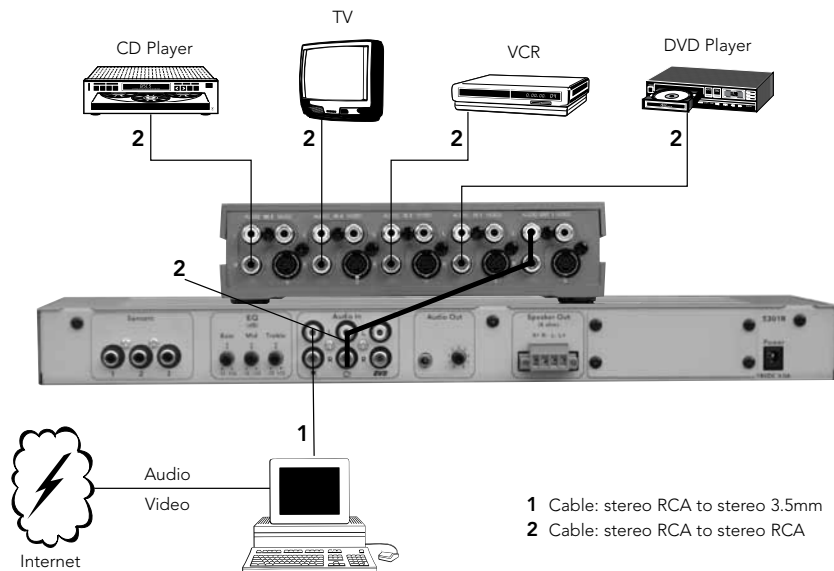
Some classrooms use a computer as the multi-media "hub", but it is connected to a TV instead of an LCD projector. They also occasionally use the TV/DVD/VCR as stand alone media. For these classrooms, you may need to use two or three auxiliary audio input connections to the 5301R.



- 1 Cable: stereo RCA to stereo RCA
- 2 Cable: stereo RCA to stereo 3.5mm

## Example 3

Some classrooms may have many different types of media, but because of the age of the equipment or incompatible input/outputs, they may not integrate with each other. For these classrooms, you may choose to use an auxiliary audio box to connect all the sources to one location, then connect it to one audio input connection to the 5301R.



- 1 Cable: stereo RCA to stereo 3.5mm
- 2 Cable: stereo RCA to stereo RCA

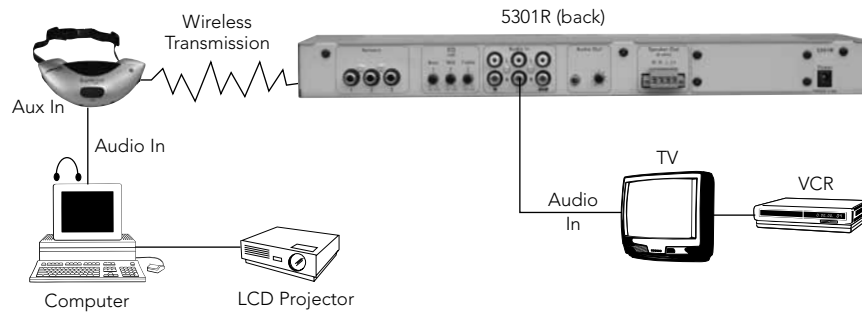
## Example 4

Many teachers have MP3 players, portable CD players or other devices that move around the classroom. To amplify audio from portable electronics, it may be most convenient to connect these as needed through the MP3 jack on the front of the 5301R.



### Example 5

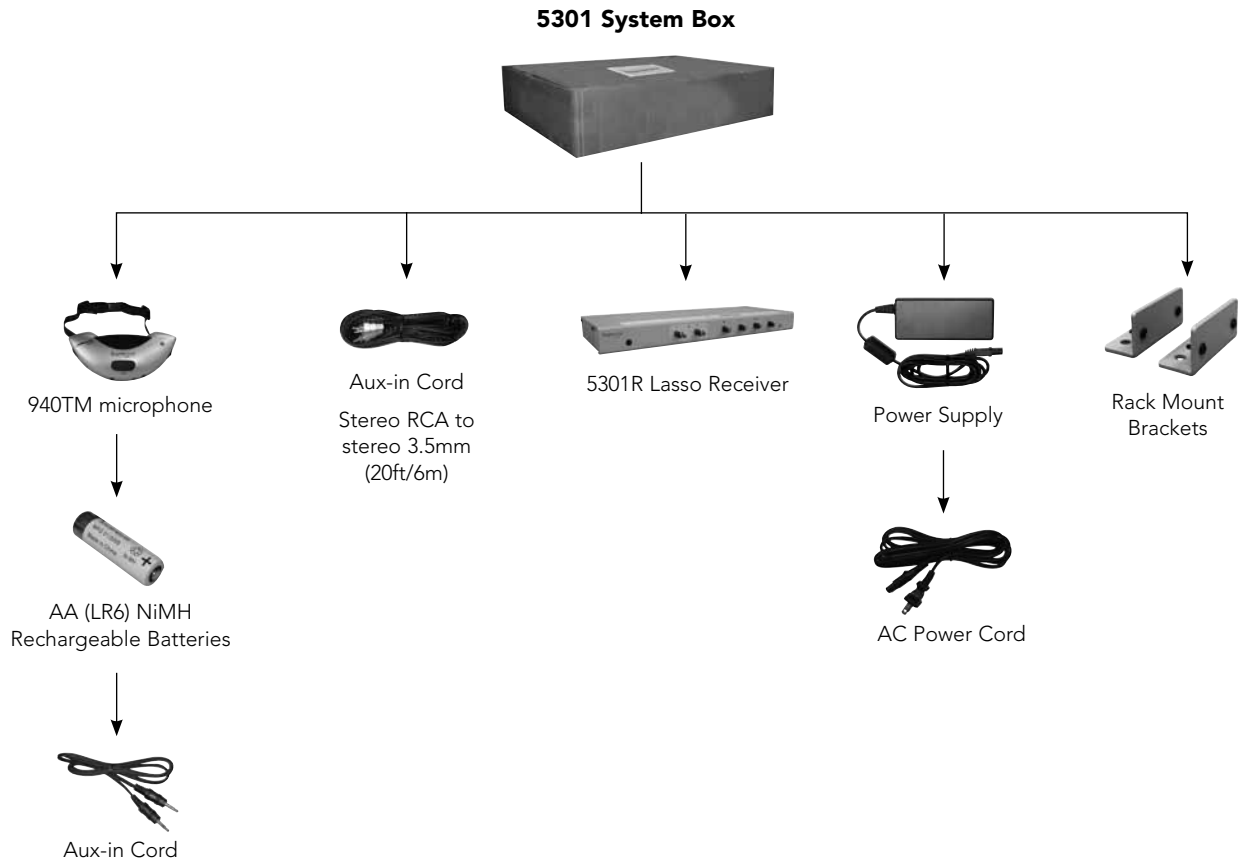
Teachers can also connect either the 940TM or 950H mic to any audio source that's too far from the receiver to conveniently integrate directly.



### 3. Get your FrontRow Lasso parts ready

Check the contents of your FrontRow Lasso installation kit against the parts listed below. To help you stay organized, we recommend that you keep the parts needed for each step separate.

#### Open your main component box



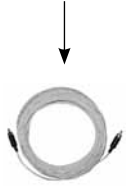
## Open your sensor box



940CS Ceiling Sensor Kit  
204-01-006-00



(1) 940CS Ceiling Sensor  
with mounting bracket



(1) Sensor Cable

or



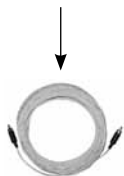
950WS Wall Sensor Kit  
204-01-007-00



(2) 950WS Wall Sensor



(2) Mounting Brackets



(2) Sensor Cables

## Open other optional items



950H Student Mic Kit  
202-01-420-00



950H Student Microphone



950C Charger



940C Power Supply

## Open your speaker box

This box should contain:

ceiling speaker



Plenum-rated tile bridge/  
Plenum-rated speaker cover



or

IR speaker



mounting bracket



# Step 2: Get yourself ready

Nearly everything you need to install your FrontRow Lasso system is included in the boxes we shipped. You will need some basic tools and materials, depending on how your classroom is built:

## 1. What kind of walls do you have?

For drywall installations (similar to most houses) gather the following tools:

Drill	Wall anchors
Drill bits	Cable tacks/staples
Phillips #2 driver bit	Plastic cable (zip) ties
Level or ruler/tape measure	Plastic raceway with screws
Crimp pliers or scissors	Tin snips (optional)
Hammer	Ladder
Staple gun	Safety goggles

For concrete walls, assemble the following tools:

Hammer drill	Hammer
Masonry drill bits	Plastic cable (zip) ties
Phillips #2 driver bit	Plastic raceway with adhesive
Level or ruler/tape measure	Tin snips (optional)
Crimp pliers or scissors	Ladder
Concrete screws	Safety goggles

## 2. Are you installing ceiling speakers?

If so, you'll also need:

Keyhole saw or sabre saw or RotoZip

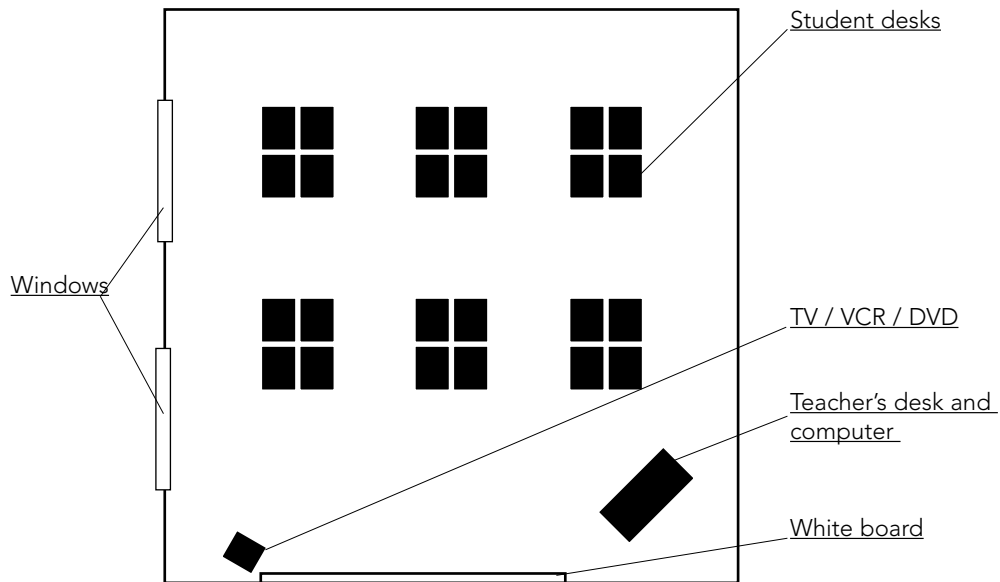
Electrical tape

Short length of string or twine

# Step 3: Plan your installation (Speakers)

## **Estimated time for this step: 5-10 minutes**

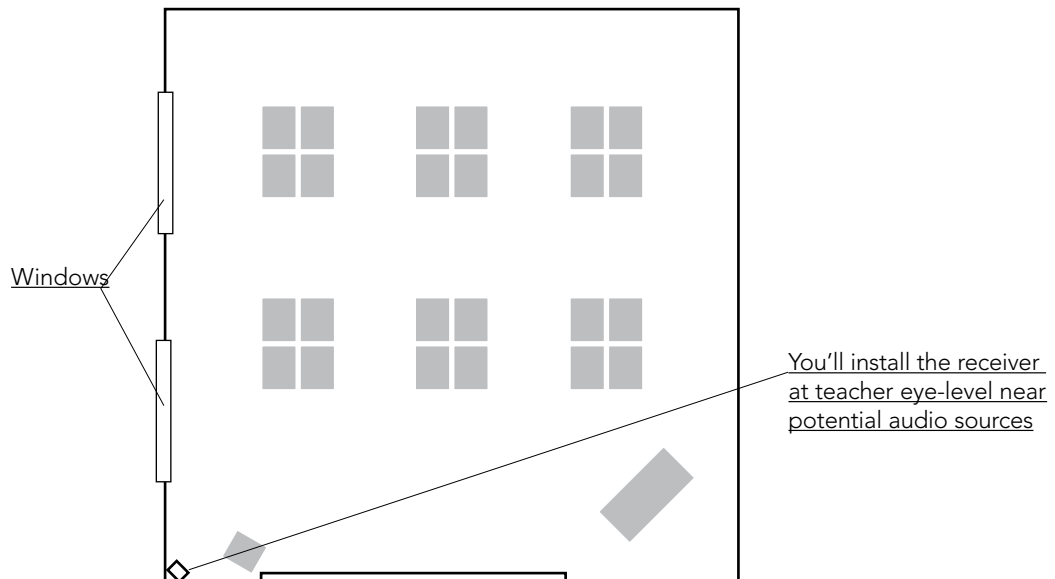
Your classroom is ready and you've organized all the parts and tools you'll need to set up your classroom amplification system. Now it's time to decide where you'll place major components. To help you decide, we'll use the following layout of a typical classroom as an example:



Top view of an example classroom

### **1. Decide where to put the receiver**

We recommend locating the receiver near the majority of your potential audio sources — DVD player, computer, etc. This will make it easier to connect multimedia sources, and there are probably convenient power sources near these as well.



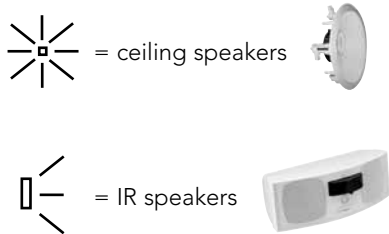
A good place for the receiver

## 2. Plan speaker placement

Proper speaker placement is critical to getting optimum benefit from any classroom amplification system. Improperly chosen or installed speakers can actually harm intelligibility, so please take the time to plan this step thoroughly.

It's useful to imagine each speaker as a flashlight, and that your goal is to light up the areas where students are sitting. Speakers should therefore be focused on the students and facing them.

Speaker symbols:



There may be cases in which you want to install more speakers than normal (e.g. the room is very large) or connect speakers in series (e.g. to save cable length). Refer to Appendix B for guidance.

## a Installing ceiling speakers?

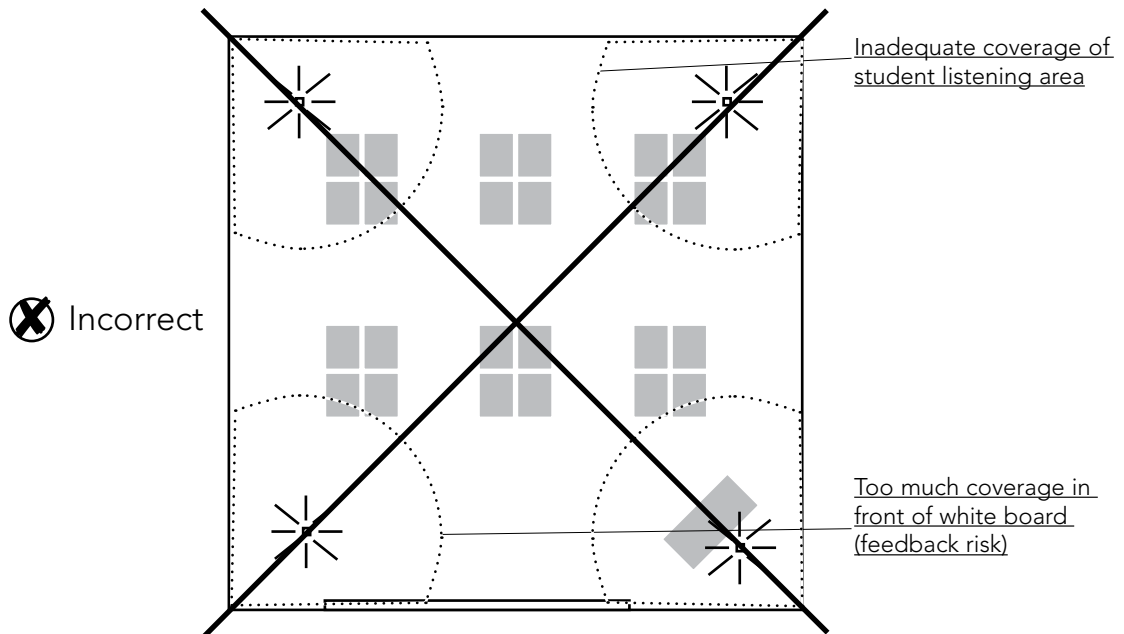
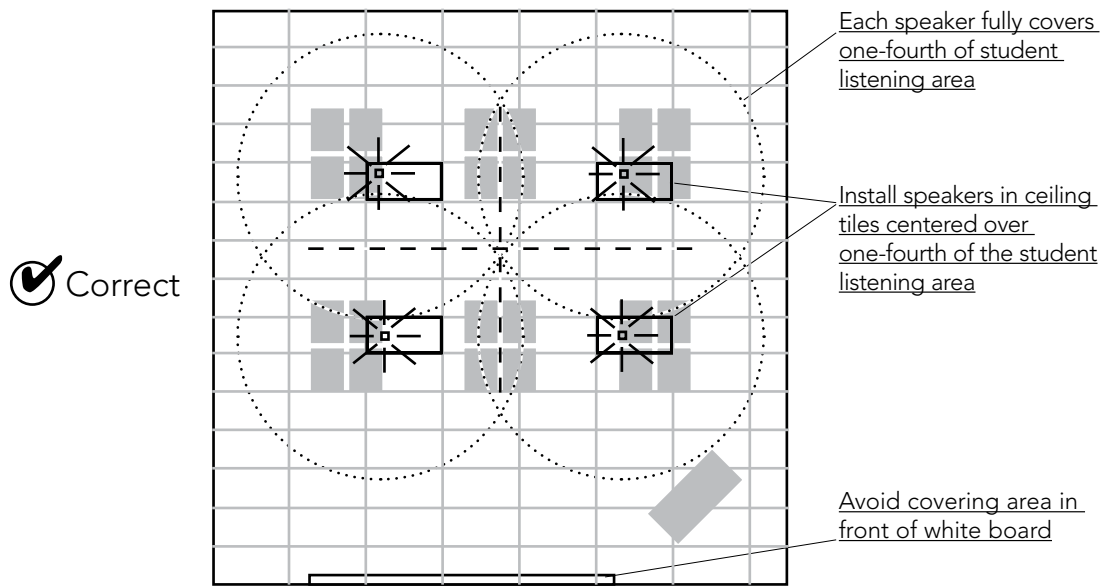
Use the following guidelines when choosing where to put your ceiling speakers:

Define the area where students are sitting — this is the area you want to cover with speakers; not the entire room.

Divide this area into four equal sections.

Using a piece of tape, mark a ceiling tile in the center of each of the four sections — these are the tiles where you'll mount your ceiling speakers.

Avoid installing speakers directly in front of the white board — this not only covers an area used less often by students but increases the chance of feedback.

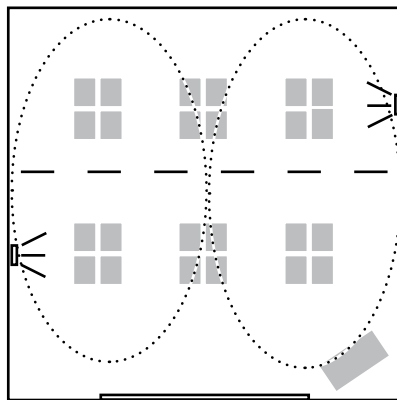


## b Installing IR speakers?

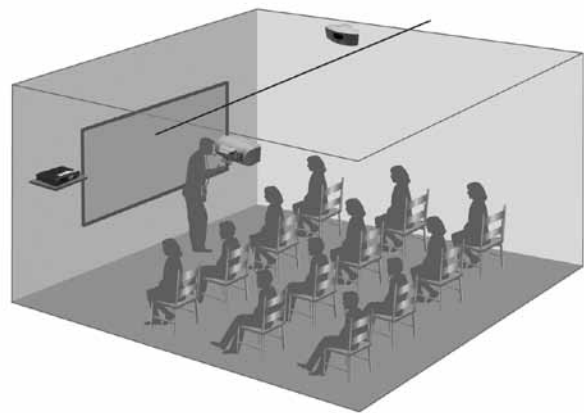
Use the following guidelines when choosing where to put your IR-Speakers:

- Define the area where students are sitting — this is the area you want to cover with speakers; not the entire room.
- Mentally divide this area into two equal sections running parallel to the whiteboard/main lecture area.
- Using a piece of tape, mark a desk in the center of each of the sections — these are the targets at which you'll aim each of your IR-Speakers.
- Speakers should only be placed on the side walls of the classroom.
- Walls should have a space approximately 10in wide by 5in tall (25 x 13cm) to solidly mount the wall bracket.
- If the room has drop lighting, the speaker should be placed just below the bottom of the lights — the teacher should be able to see at least one speaker from all parts of the room.
- Avoid installing speakers directly in front of the white board — this not only covers an area used less often by students but increases the chance of feedback.
- IR speakers have a built-in sensor. Be sure to read the general guidelines for sensor and sensor cable installation on page 12.

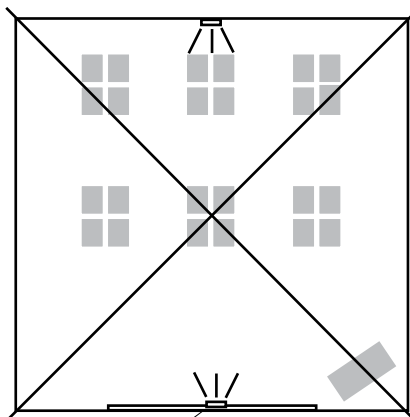
 Correct



Avoid covering area in front of whiteboard



 Incorrect



Too much coverage in front of whiteboard (feedback risk)

# Step 4: Plan your installation (Sensors)

The FrontRow Lasso system uses infrared light to transmit the voice signal from the microphone to the sensor in the ceiling/wall sensors. Proper placement of the sensors is critical for optimal system performance.

Sensor symbols:



## SENSOR CABLE

The sensor cables are sensitive to electrical noise.

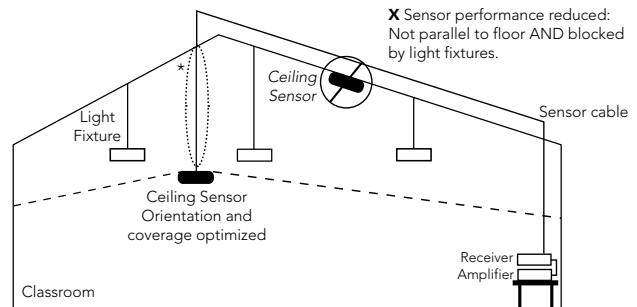
- **DO NOT** use a splitter with the sensor cable.
- **AVOID** routing the sensor cable next to other cables or electrical systems (e.g., other electrical conduit, Ethernet cable, video cable, fluorescent light ballast, etc.). Leave at least 6 in. (15cm) space around the sensor cable.
- Excess cable can be coiled, tied and placed safely in a plenum space. **DO NOT** place the sensor coil near other cables or electrical systems (e.g., other electrical conduit, Ethernet cable, video cable, fluorescent light ballast, etc.).
- Local regulations may require plenum-rated cable if used in a plenum space.
- FrontRow recommends using the factory-supplied sensor cables; however, if you need to shorten or lengthen cables to meet the needs of a specific job, observe the following guidelines for best results:

SENSOR TYPE	GUIDELINE	EXAMPLES
IR Speakers only	Lengths can differ by up to 40ft/12m	Combo A is 50 feet • Combo B is 10 feet Combo A is 70 feet • Combo B is 30 feet
Ceiling sensor only	Lengths can differ by up to 30ft/9m	Ceiling Cable A is 50 ft • Ceiling Cable B is 20 ft Ceiling Cable A is 50 ft • Ceiling Cable B is 80 ft Ceiling Cable A is 40 ft • Ceiling Cable B is 10 ft
IR Speaker with 1 ceiling sensor	Ceiling sensor cable can be 25ft shorter than up to 50ft longer than the <b>shortest</b> IR Speaker cable	Combo A is 50 ft • Combo B is 50ft • Ceiling Cable is 25ft Combo A is 50 ft • Combo B is 50ft • Ceiling Cable is 100ft Combo A is 50 ft • Combo B is 25ft • Ceiling Cable is 75ft Combo A is 30 ft • Combo B is 60ft • Ceiling Cable is 80ft

**CAVEATS:** Avoid lengths >100ft/30.5m • Any extensions must be RG-59U with at least 90% shielding (double recommended) with proper connectors • FrontRow is not responsible for performance when cables are altered.

## Sensor Mounting

- **DO NOT** mount the ceiling sensor or wall sensors in direct sunlight as it will greatly reduce performance.
- The ceiling sensor must have a clear view of the coverage area and must be mounted parallel to the floor to function optimally (see figure). If drop lights are used in the room, wall sensors or IR speakers may be a better option. Or, a drop mount\* may be used to lower the ceiling sensor.



Ceiling Sensor Installation

\*drop mount not supplied by FrontRow

## Interference and IR Coverage

- Adjacent classrooms that use FrontRow infrared systems can interfere with each other if the rooms are separated by windows. The windows allow the infrared light to “escape” from the classroom only to be picked up by the sensors in the adjacent classroom, causing interference and “cross talk”. Be sure to recommend window coverings to the greatest extent practical when using the system.
- Infrared light reflects better off of white and glossy surfaces. The ceiling sensor can be placed to help provide coverage in areas where the signal may be weak due to insufficient infrared reflection.

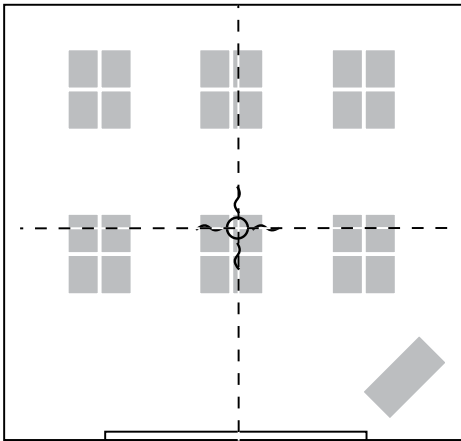
## 1. Positioning ceiling sensors

### Installing one ceiling sensor

Locate the center of the room as shown.

Use a piece of tape to mark a spot on the ceiling in the center of the room.

**NOTE:** The sensor must be able to "see" the entire room — do not block the sensor with projector mounts, lighting, hanging art, or other obstructions. If the teacher can see the sensor from all parts of the room, you've probably chosen a good spot.

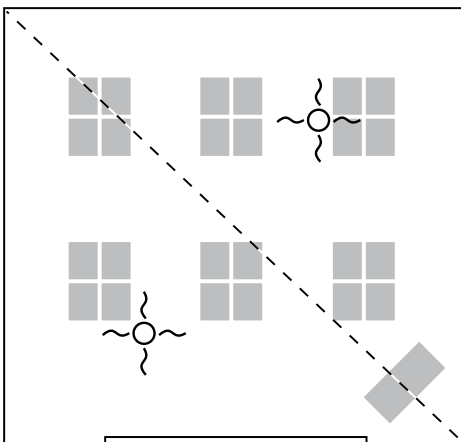


### Installing two ceiling sensors

Mentally divide the room half and locate the center of each half as shown.

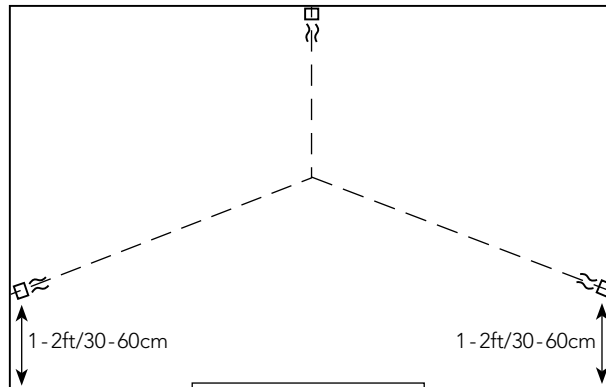
Use a piece of tape to mark the spots in each half of the room.

**NOTE:** The sensors must be able to "see" the entire room — do not block them with projector mounts, lighting, hanging art, or other obstructions. If the teacher can see a sensor from all parts of the room, you've probably chosen a good spot.



## 2. Positioning wall sensors

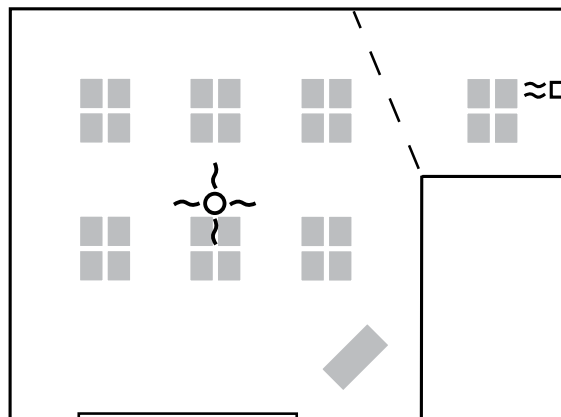
- Mentally divide a large room into 3 sections as shown.
- Use a piece of tape to mark a spot for each of the wall sensors. The spots you choose should be:
  - on a wall
  - in a position such that the teacher can see at least one sensor from all parts of the room.
  - Two of the sensors should flank the whiteboard/main lecture area at right angles to the board, 1-2ft/30-60cm from the whiteboard wall



three wall sensor placement (larger room size)

## 3. Positioning ceiling and wall sensors

- Mentally divide an odd-shaped room into sections as shown. The ceiling sensor should cover the larger section of the room and the wall sensor should cover the alcove or smaller section.
- Use a piece of tape to mark a spot on the ceiling that is centered in the large section of the room – this is where you will install the ceiling sensor.
- Use a piece of tape to mark a spot for the wall sensor. The spot you choose should be:
  - on a wall
  - in a position such that the teacher can see at least one sensor from all parts of the room.



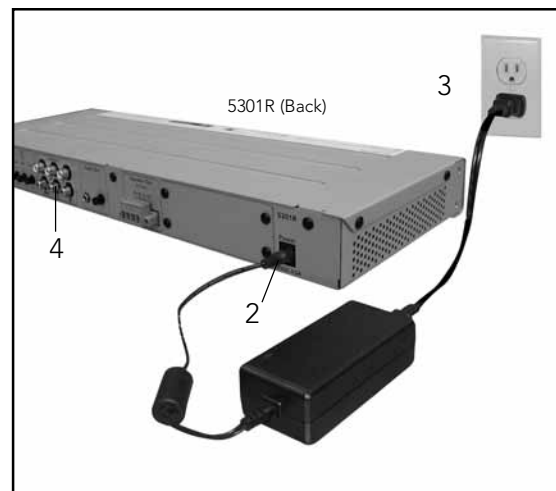
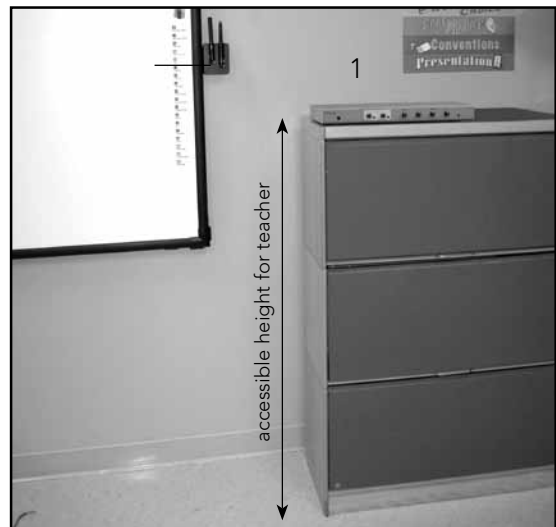
single ceiling & wall sensor placement  
(odd-shaped room)

# Step 5: Install the receiver

**Estimated time for this step: 15 minutes**

With the positions of all your major components settled, you can now install your receiver.

1. Place the receiver at a level that is accessible to the instructor. The receiver may be placed on a shelf, in a rack, or in a cabinet. Ensure the receiver is installed to comply with ADA standards.
2. Plug power supply into receiver.
  - a. **DO NOT** bundle the FrontRow power supply (or any power supply) along with the speaker or sensor cable.
  - b. **DO NOT** bundle the FrontRow power supply (or any power supply) directly next to OR on top of the receiver.
3. Plug power supply into wall socket.
4. Connect any other teaching technology — TV / VCR / DVD, teacher's computer, etc. — to your FRONTROW system through the Audio In jacks. Review Step 1 for guidance.



## Rackmounting

The LASSO receiver may be placed in a rack using a standard shelf that accommodates the physical dimensions of the receiver using the rack mount brackets supplied. Airflow should not be restricted in the rack.

## Tip

If you are installing the optional page override module, you may wish to do so now.

# Step 6: Install speakers

**Estimated time for this step: 30 minutes**

Now that your cables are in place, you're ready to install your speakers.

## 1. Plenum-rated listed ceiling speaker



If you're putting in ceiling speakers, do the following:

### a. Take down the ceiling tiles you marked in Step 3.

### b. Cut ceiling tiles

Lay each bridge on its tile so that the ends of the bridge are flush with both edges of the tile.

Use the bridge as a template to trace a circle on the ceiling tile.

Using a keyhole saw, cut the traced circle out of the tile.

Repeat for your other speaker tiles.



### Tip

Local building codes may require a safety line attached to speaker/tile bridge assembly.

### c. Assemble speakers, bridges, and tiles

1. Remove the front grill from a speaker. Insert the back of the speaker up through the hole you've cut in the tile and then through the hole in the tile bridge. Be sure the finished side of the tile is facing downward (toward the front of the speaker) and that the ends of the tile bridge are flush with the edges of the tile.

2. Fold out the speaker support tabs.

3. Tighten the mounting screws to compress the tile bridge and tile between the mounting tabs and the speaker front. The speaker should be snug against the tile and bridge.

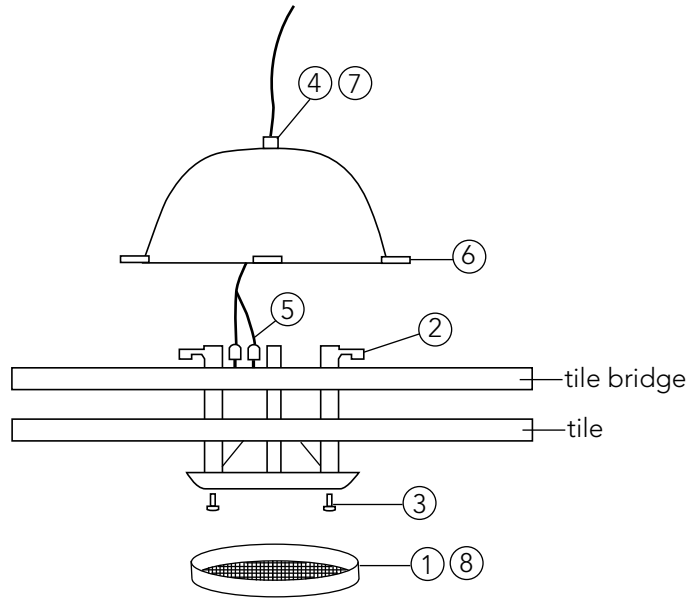
4. Feed speaker wire through opening at the top of the speaker back can.

5. Attach speaker wire to terminals. Be sure to match red wire to red terminal and black wire to black terminal.

6. Secure back can to tile bridge by folding clips into the four slots in the bridge.

7. Tighten wire clamp to secure speaker wire.

8. Reattach speaker front grill.



### d. Replace tiles

Drop the tile/speaker assembly back into position in the tile grid by tilting it slightly, lifting it above the framework, and letting it fall into place. Be certain that the two short sides of the metal tile bridge are resting on top of the T-bar rails holding the ceiling tiles in place, and that the speaker wire is free for routing in Step 8.

### e. Speaker wires

a. **MINIMIZE** speaker wiring and save time by daisy-chaining in parallel left and right speakers. Running individual speaker wire from each speaker to the terminal block on the receiver is not required.

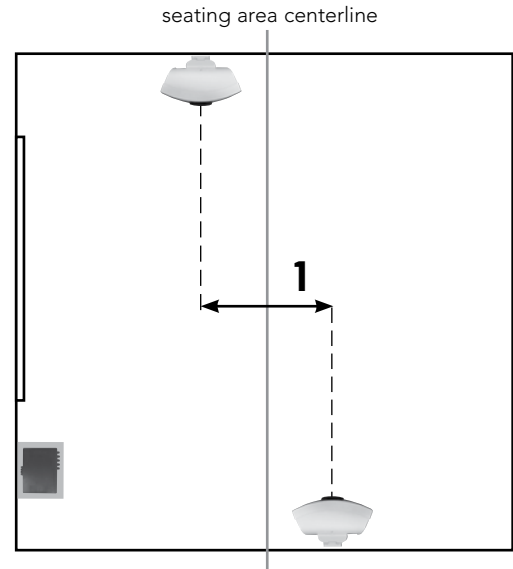
b. **DO NOT** coil up the excess speaker wire. Excess speaker wire should be trimmed and used for other speakers, if possible.

c. **AVOID** bundling sensor cables and speaker wires together (except for final run from ceiling to receiver unit). We recommend leaving at least 6 in. (15cm) between the two whenever possible.

## 2. IR SPEAKERS

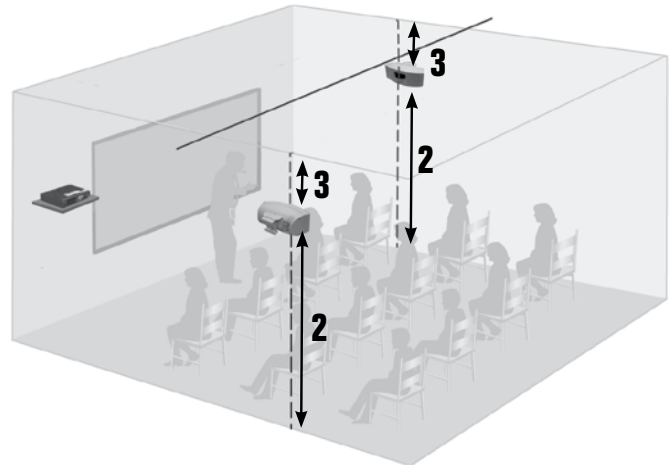
### a. IMPORTANT INFORMATION

- Speakers should only be placed on the side walls of the classroom.
- Walls should have a space approximately 10in wide by 5in tall (25 x 13cm) to solidly mount the wall bracket.
- If the room has drop lighting, the speaker should be placed just below the bottom of the lights.
- **DO NOT** use a splitter or adaptor with sensor cables.
- These speakers incorporate sensors that must be visible to the teacher from all parts of the room. **DO NOT** block sensors.
- If you must alter cable length, observe the guidelines on page 12.

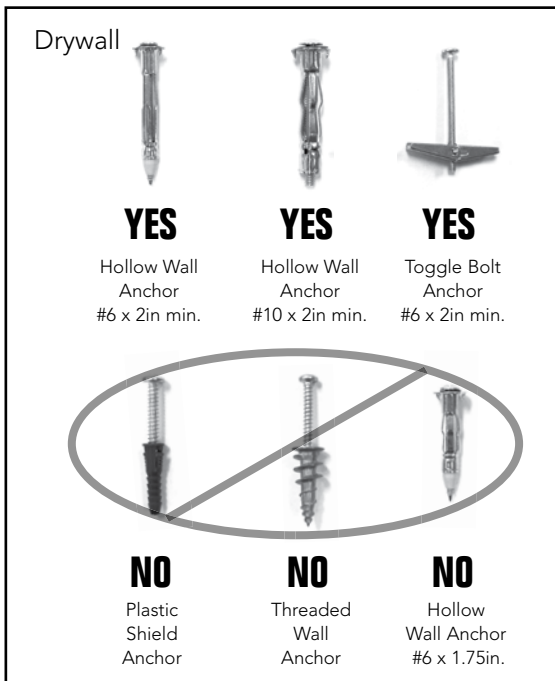


### B. INSTALLATION DIMENSIONS

- 1 Speakers should be offset 3 to 6ft. (1 to 2m) from each other, CENTER TO CENTER.  
**NOTE:** Do NOT place directly opposite each other.
- 2 Speakers should be mounted between 7.5 to 10ft (2.3 to 3m) from the floor.
- 3 Speakers should be mounted at least 5in (13cm) from the ceiling.

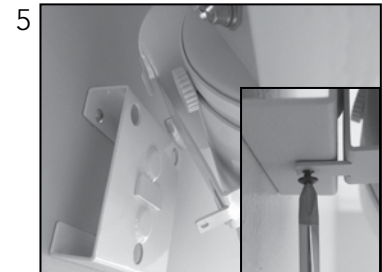
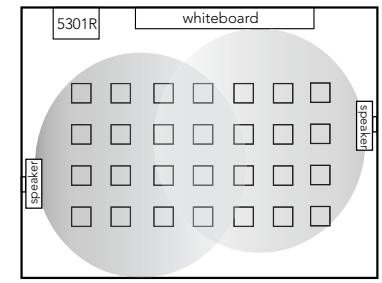
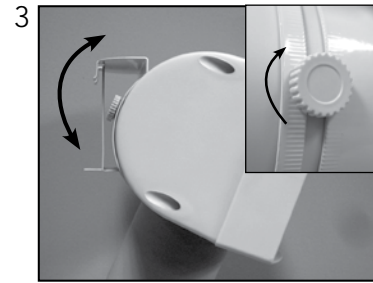
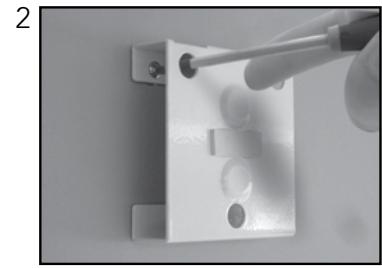
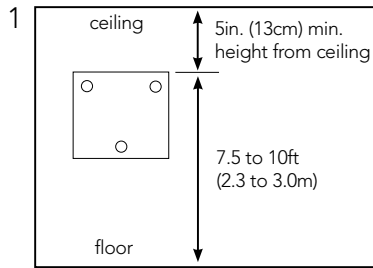


**We recommend the following hardware to mount your speakers:**



## C. INSTALLATION STEPS

1. Mark drill holes using template from speaker box.
2. Mount wall plate  
**NOTE:** Use hardware appropriate for your wall type.
3. Angle speaker so that it will point toward the center of the closest half of the classroom when mounted. Tighten knob.
4. Attach cables as shown.
5. Attach speaker to wall plate and install set screw.



# Step 7: Install sensors

**(If you are using IR Speakers, you may be able to skip this step)**

**Estimated time for this step: 10 minutes**

You're almost done.

## 1. CEILING SENSOR

### a. If you're installing a ceiling sensor and have an acoustic tile ceiling (or "drop ceiling"):

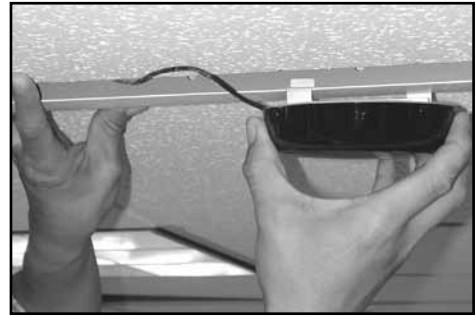
1. Locate the tile you marked in Step 4 for sensor placement.
2. Slide and twist the ceiling sensor bracket onto the T-bar rail until it rests on the rail or mount directly to the ceiling tile if not using the T-bar supports.
3. Attach the sensor to the cable leading to the receiver.
4. Replace the ceiling tile, making sure that the sides of the tiles prevent the sensor bracket from twisting.

### b. If you're installing a ceiling sensor and have a sheetrock ceiling:

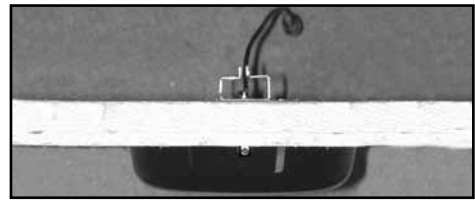
1. Locate the spot you marked in Step 4 for sensor placement.
2. Mount the ceiling sensor directly to the sheetrock ceiling using the screws provided.
3. Attach the sensor to the cable leading to the receiver.

**NOTE:** The ceiling sensor bracket comes pre-installed with non-metallic screws and washers to electrically isolate the sensor from the T-bar. Do not replace with metal screws as system performance may be reduced.

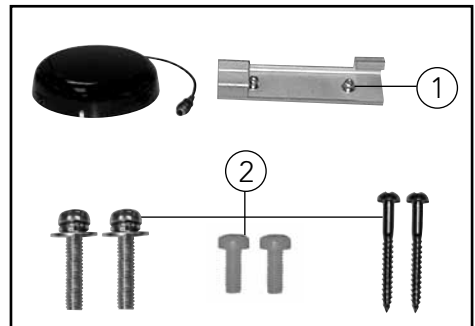
T-bar support rail



ceiling tile mount



ceiling sensor features



① ceiling tile mount bracket

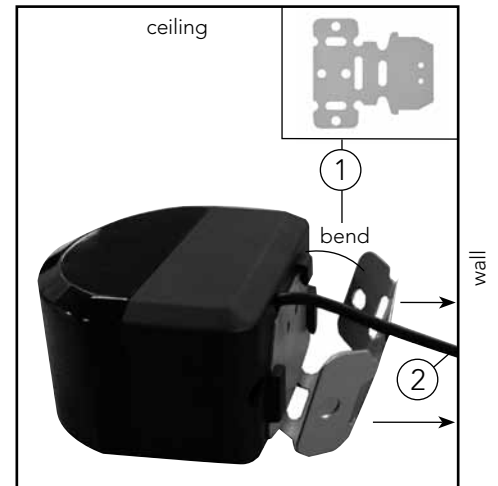
② mounting screws

## 2. WALL SENSOR

If you're installing wall sensors:

- a. Locate the spots you marked in Step 4 for sensor placement.
- b. Bend sensor bracket so that when placed on the wall, the sensor will face the center of the section of the room it's serving (see Step 4).
- c. Slide bracket onto the back of the sensor.
- d. Attach the sensor to the cable leading to the receiver.
- e. Press the bracket onto the wall firmly. Use mounting screws provided to secure bracket to wall.

wall sensor features



① wall sensor bracket (bent)

② sensor connector

# Step 8: Route and connect cables

## **Estimated time for this step: 45 minutes**

With your receiver installed, you now have a base for routing your cables.

### **1. DROP-CEILING ROUTING**

If you want to run cables above a drop (acoustic tile) ceiling, follow the guidelines below. (If you just want to run cables along the wall, follow the instructions under **Wall Routing** below.)

#### **A. Remove selected ceiling tiles**

Remove a ceiling tile next to each speaker to give yourself access to the cable.

Remove the ceiling tiles directly above the sensor or IR speaker locations you marked in **Step 4**.

Remove the ceiling tile directly above the receiver you mounted in **Step 5**.

#### **B. Prepare and route cable**

Tie an object, such as a roll of electrical tape, to some twine to use as a pull line. This will help you more accurately direct the cable in the area above the ceiling.

Standing on a ladder with your head and shoulders in the space next to a speaker, toss the weighted end of your twine through the ceiling space into the open tile hole above your receiver.

Connect the other end of the twine to the speaker cable. Pull cable through to the receiver.

Your goal is to have the cable entirely above the ceiling, with only the end protruding from the open space above the receiver.

Repeat these steps for the other speakers and for your sensors.

**Note: If you must shorten or lengthen the sensor cable, observe the guidelines on page 12.**



## Tip

### **Can't get the pull line to the receiver in one throw?**

Get the weighted end of the pull line as close to the receiver as you can. Then move your ladder under the tile where your cable stopped, remove that tile, and repeat until you've hit the mark.

## C. Install raceway

You can neatly conceal all cables running between the receiver and the ceiling space using widely-available plastic raceway.

Cut enough raceway to extend from just behind your mounted receiver to the ceiling.

Using a level or tape measure to ensure straightness, attach the raceway to the wall.

Route all speaker and sensor cables in raceway and close.



## D. Support cables

Ensure cables are installed in adherence to local and national electric codes. Speaker and sensor cables should not rest on the ceiling. Lift them off the ceiling and use cable/zip ties to secure them loosely to beams, anchor bolts, or other support structures in the ceiling (do not attach them to ductwork, plumbing, or other secondary work).

## 2. WALL ROUTING

If you're routing cables along walls, follow these guidelines:

### A. Tack cable

Starting from your speaker, begin securing speaker cable to the wall with professional cable tacks. For a neat installation, try to keep the cable as close to the ceiling as possible.

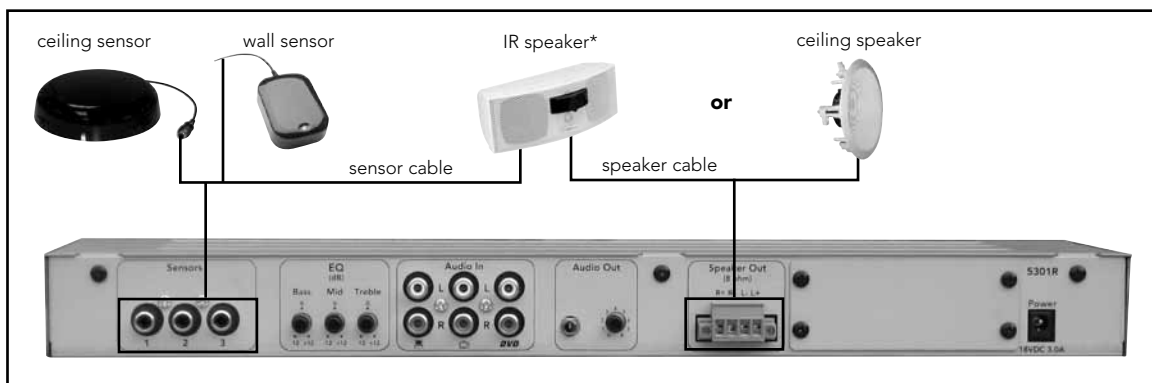
Make your way back toward the receiver.

Repeat for the other speakers and sensors in the room.

## 3. CONNECT CABLES TO RECEIVER

To ensure faithful reproduction of stereo auxiliary inputs, be sure to properly match the red (+)/black (-) and left/right speaker wires to the proper receiver terminals.

Connect all speaker and sensor cables as shown:



\*When using IR speakers, remember to connect one speaker to the left channel and one to the right channel.



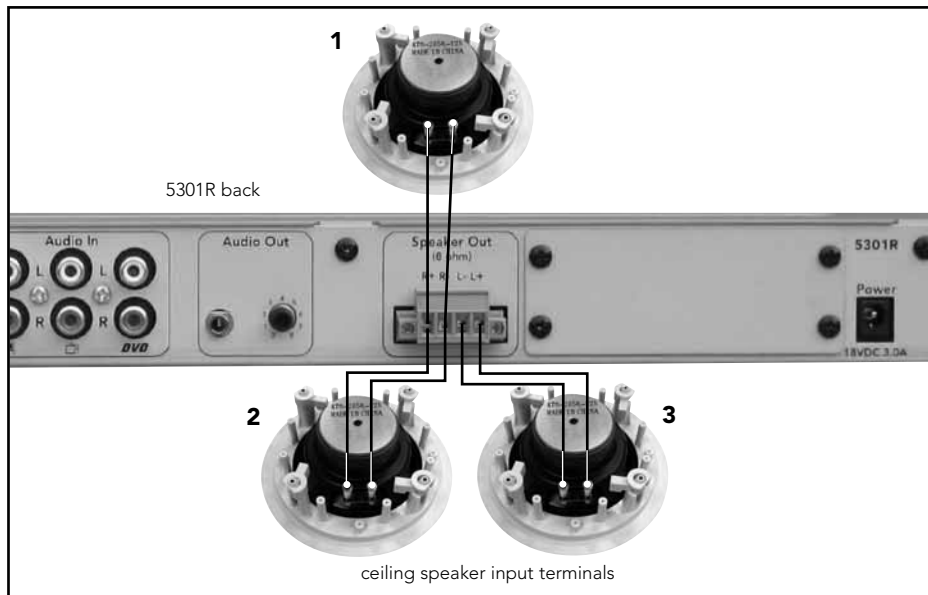


# Appendix B: Special ceiling speaker connections

## Using three ceiling speakers instead of four\*

If your room is too small for four ceiling speakers, connect three.

Connect speaker wires to the terminals as shown below for best power and sound distribution



connection with 3-speaker connection grid

Speakers 1 and 2 should be in the larger listening area.

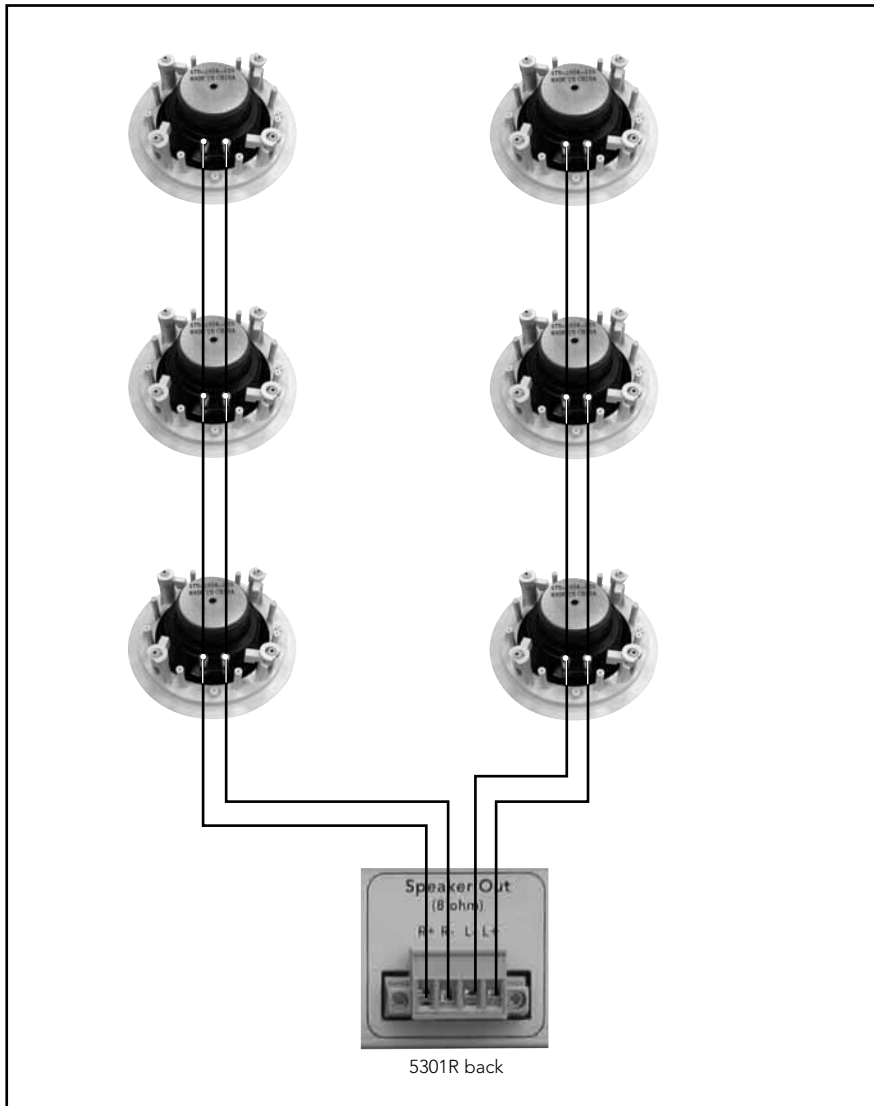
**\*Note:** Applies to 8 ohm ceiling speakers only. Use of more than two IR speakers is not possible.

### Daisy-chaining four or six ceiling speakers:\*

Daisy-chaining allows setup with shorter cable lengths.

Daisy chain speakers in pairs: e.g. speakers 1-2, then 3-4 separately.

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



**\*Note:** Applies to 8 ohm ceiling speakers only. Use of more than two IR speakers or more than six ceiling speakers is not possible. Constant use of six speakers at very high volume levels is not recommended.

# Appendix C: Troubleshooting

## **Receiver won't turn on (power light doesn't turn on)**

- Verify that the power supply is plugged into both the receiver and a working wall outlet
  - Test with another power supply
- 

## **'Dead spots' or microphone crackling/noise**

- Verify that you are not blocking either the emitters on the microphone or the sensors mounted around room
  - If reception is interrupted or noisy when facing a certain direction, install an additional sensor in that area of the room
  - If using more than one microphone, verify that they are not on the same channel
  - Recharge or replace the microphone batteries
- 

## **No signal reception (channel indicator light on receiver is red)**

- Check that the microphone is on
  - Check that the microphone is not muted (940TM only)
  - Verify that you are not blocking either the emitters on the microphone or the sensors mounted around the room
  - If reception is interrupted when facing a certain direction, install an additional sensor in that area of the room
  - If using more than one microphone, verify that they are not on the same channel
  - Recharge or replace the microphone batteries
- 

## **Feedback (squealing)**

- Lower the Microphone A or B Volume control(s) on the receiver
  - Make sure that speakers are mounted as close as possible to the ceiling and to the listening area; avoid mounting speakers in the teacher's primary lecture area
  - Position the microphone closer to mouth
  - Set the gain switch on the pass-around microphone to "mid" or "low"
  - Reduce treble setting on EQ (rear panel)
- 

## **Weak or no output from speaker(s)**

- Increase the Microphone A or B Volume or Audio In Volume control(s) on the receiver, or audio device
  - Position the microphone closer to mouth
  - Set the gain switch on the pass-around microphone to "mid" or "high"
  - Verify that the speakers have been properly installed
- 

## **High or low pitched whine or hum coming through speakers**

- There may be a ground loop with the system. Install a ground loop isolator
  - There may be "noisy" electrical wiring. Install an AC line filter
- 

## **Charger light won't come on or is blinking red**

- Check that the charger is connected to a working power outlet
- The charger can charge only 950H and 940TM microphones with charge contacts.
- You may be attempting to charge an alkaline battery or a rechargeable battery that has reached the end of its useful life. Check the battery and replace with a FrontRow "silver sleeve" rechargeable battery.

# frontrow™

FRONTROW is a division of



## **USA/Global**

FrontRow  
Corporate Headquarters  
2080 Lakeville Highway  
Petaluma, CA 94954-6713  
toll-free: 800.227.0735  
tel: 707.769.1110  
fax: 707.769.9624  
web: [www.gofrontrow.com](http://www.gofrontrow.com)

## **Canada**

FrontRow  
6950 Creditview Road, Unit 1  
Mississauga, ON L5N 0A6  
toll-free: 800.340.9894  
tel: 905.461.5300  
fax: 905.677.7760  
web: [www.gofrontrow.com](http://www.gofrontrow.com)

## **New Zealand**

Oticon New Zealand Ltd.  
142 Lambton Quay  
P.O. Box 9128  
Te Aro, Wellington  
toll-free: 800 OTICON  
toll-free fax: 00800 FAX OTICON  
web: [www.oticon.co.nz](http://www.oticon.co.nz)

## **Australia**

Phonic Ear  
12/97 Castlemaine Street  
Milton Qld 4064  
Australia  
freecall: 1 800 PHONIC  
fax: 1300 746 642  
web: [www.gofrontrow.com.au](http://www.gofrontrow.com.au)

## **Scandinavia**

Phonic Ear A/S  
Kongebakken 9  
2765 Smørum  
Denmark  
tel: +45 3917 7101  
fax: +45 3927 7900  
web: [www.gofrontrow.com](http://www.gofrontrow.com)  
[www.phonicear.com](http://www.phonicear.com)

## **United Kingdom**

PC Werth Limited  
Audiology House  
45 Nightingale Lane  
London SW12 8SP  
tel: 020 8772 2700  
web: [www.soundfield.info](http://www.soundfield.info)