

Spectrum II



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Infrared Sound Field System

User Guide

TeachLogic

FORWARD

Congratulations on the purchase of your new SPECTRUM II sound field system produced by TeachLogic. We are confident that it will perform as specified and fulfill all your expectations. TeachLogic incorporates the most state of the art technology, employs the most advanced manufacturing methodology and uses only premium quality components to assure you many years of reliable performance. Thank you for your confidence in selecting TeachLogic products and we intend to support our products to your complete satisfaction.

We hope you will take some time to review this manual to familiarize yourself with the product features and help you understand its performance. We are confident that the manual will help you gain the maximum use and benefit of the Spectrum II sound field system.

The manual provides some basic explanation on the principle of Infrared transmission and its benefits. First there will be operation instruction followed by installation instruction. The manual will conclude with maintenance procedures and trouble shooting analysis.

If you should encounter any difficulty or need further assistance, contact TeachLogic customer service department.

Telephone Number: 800-588-0018 or email: customerservice@teachlogic.com

Brian Van Waay
President

How the System Works

A Brief Word About Infrared

Infrared is a light ray that is below the visible light spectrum, just like the sound spectrum extends beyond your hearing ability. Infrared transmission is used in the remote control of your TV set. A beam of infrared light is emitted by a Light Emitting Diode (LED) from the remote control and it is detected by a receiving diode in your TV set. When you push a certain command on your control, the internal electronics causes the infrared light to flicker in a programmed sequential pattern (called modulating the light beam). That pattern is detected by the receiving diode and is electronically decoded to send the command to the TV set.

So how does this apply to the infrared communication system which you are about to start using? Well, the body-pack transmitter or handheld microphone has several Light Emitting Diodes (LED) that emit infrared light beams to the sensor located on the ceiling of your room (that dark round dome). Now, when you talk into the microphone, the internal electronics in the handheld or body-pack transmitter causes the light beam to flicker at the same sequence as your breath varies from your voice when you speak into the microphone. That sequential signal is detected by the dome sensor and a coded electronic signal is sent to the receiver in the Spectrum II amplifier. The receiver decodes the electronic signal and converts it into electronic signal. The signal is routed to the amplifier. The amplifier strengthens (amplifies) the electronic signal and makes it strong enough to cause the speaker to move back and forth at the same variation as your breath varied into the microphone. Now the replicate of your voice is produced by the speaker at a strong level so all can hear with ease.

Due to the number and strength of the diodes in the transmitter and sensitivity of the dome sensor, the IR signal will bounce off the walls, ceiling and floor and be received by the sensor without interruption. However, infrared will not penetrate solid surfaces, therefore; transmission will not go out of the room.

“So what’s said in the room, stays in the room”.

Overview of the Operational Features of the Spectrum System

The Spectrum II is the nucleus of the classroom sound field system. The infrared microphone / transmitter (two transmitters can be used simultaneously) transmits the vocal signal to the dome sensor installed in a central location of the ceiling. The signal is then sent via cable to the sensor input of the Spectrum II. Up to four other audio sources, such as; Computer, DVD, Projector, VCR, or iPod can be plugged into the Spectrum II. The volume level of each input and microphone will be controlled by the individual volume control of each input. The audio will then be fed to the speakers in the room.

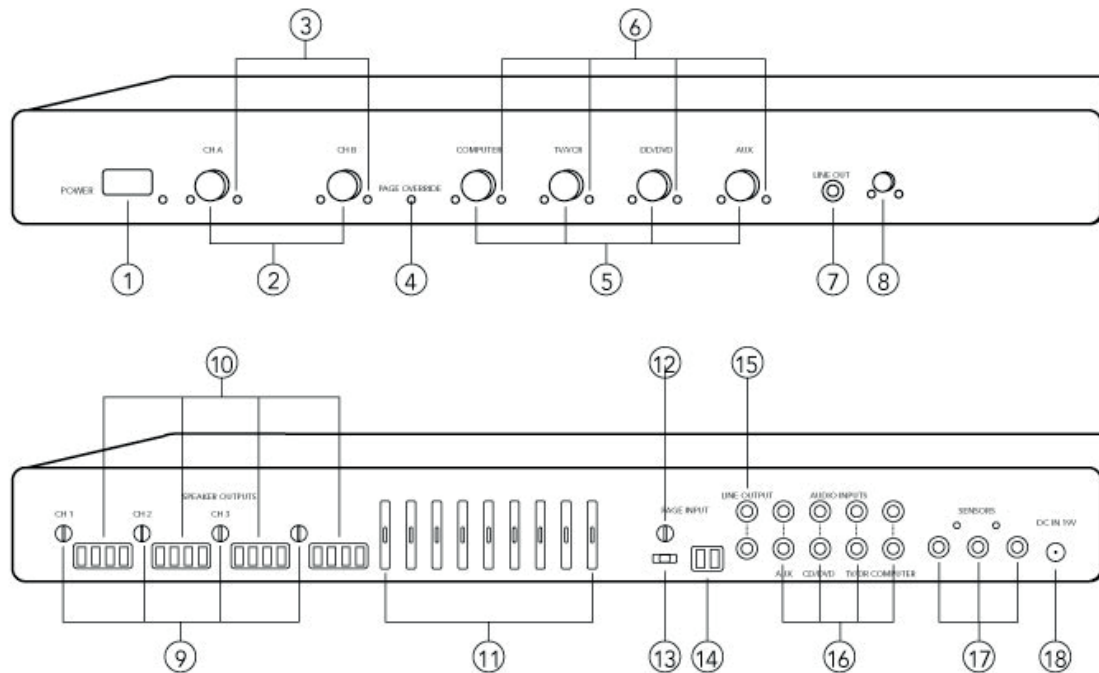
On the front panel of the Spectrum II, there is a 3.5mm output jack for interface with a personal FM listening system (ALS). The gain control adjusts the signal output level to match the input requirement of the personal system.

There is a line output on the back of the Spectrum II for recording or to feed a signal to another media devise.

THE SPECTRUM II SYSTEM

Basic Components Common to All Systems

Spectrum II, Receiver/Amplifier/Mixer (IMA – 700) This is the main unit that has two infrared receivers, three sensor inputs, four stereo auxiliary inputs, one dual line output, page over-ride with page pass through feature, nine band equalizer, front panel output for personal FM assistive listening system, four amplifier outputs and an external in-line power supply. The Spectrum amplifier can be rack-mounted or under-shelf mounted with appropriate mounting kit or free stance on a shelf.



1. Power Switch
2. Infrared wireless volume controls (channel A & B)
3. Infrared wireless transmission LED
4. Page over-ride indicator LED
5. Line input volume controls
6. Signal presence indicator LED
7. Line output (3.5mm)
8. Line output gain control
9. Speaker output volume control
10. Speaker output connection
11. Nine band equalizer
12. Gain control for page override
13. Page signal level selector
14. Page over-ride connection
15. Line output connection
16. Line input connection
17. Sensor input connection
18. Power input connection

Infrared Dome Sensor (ICS-55) The ceiling sensor is the preferred infrared sensor for optimum performance. It comes standard with Maxim II, Spectrum II, VoiceLink II and VoiceLink IV packages. This is the unit that needs to be installed on the ceiling. It comes with a mounting/support bracket and 50 feet of plenum rated cable with RCA connector on each end. The ideal location for the dome sensor would be in the center of the ceiling. This will provide a clear signal path for the IR transmission from the transmitter to the dome sensor without obstruction. In addition, you will have 360° coverage and will minimize the transmission distance for more reliable performance. It collects the infrared transmission signal via 6 large detecting diodes. The sensor is connected to the mixer/amplifier via a plenum rated cable terminated with RCA connectors. The mixer/amplifier supplies the power to the sensor.



Drop-in Battery Chargers

The battery chargers were specifically designed to recharge NiMH batteries at an optimum rate to maximize their use. The chargers feature a recycle function, which is used to restore the battery charge capacity and extend their service life.

BRC-50 charger recharges the Crescent (IRT-30) and Body-Pack transmitter (IRB-30). You merely place the Crescent or body-pack in their respective slot. Connection will be made and charging will commence. Charger will automatically control the rate and maintain the charge





BRC-101 and BRC-202 drop-in chargers are for the handheld (IRH-30) and pendant transmitter (IRT-89). The single slot (BRC-101) can charge either or the dual (BRC-202) can charge both simultaneously. In addition, both have a tray to insert two “AA” batteries for recharging.

Infrared Transmitters



Sapphire (IRT-55)

The Sapphire’s vocal clarity is unsurpassed. Its high level output is achieved by the unidirectional (Cardioid) microphone and a unique free air suspension system. With a built-in breath filter, the Sapphire can function as a pass around hand mic. The strategic alignment of the emitting diodes assures reliable connectivity throughout the room without static or drop out. With a tap on the power button, the microphone is muted for private conversation—tap again to restore to normal operation. The auxiliary input allows wireless playback of your iPod™ through the Sapphire. A three-position slide switch provides selection of low, med, or high microphone sensitivity.

Crescent (IRT-30)

The Crescent is a lightweight microphone/transmitter designed to be worn under the chin suspended by an adjustable lanyard. The Crescent shape was designed for efficient performance and user comfort. The dual internal microphones render optimum voice pick up and quality reproduction. The Crescent provides

an auxiliary input (3.5mm) to accommodate the insertion of an iPod™ or similar device for supplementary program material.

A soft touch mute button cuts the microphone “off” for private conversation (the power LED will flash in the mute position). A volume control allows adjustment of the microphone volume. The external battery contacts accommodate the convenient use of a drop-in charger.



Pendant Transmitter (IRT-89) with built-in microphone.

The pendant transmitter is the smallest transmitter and is usually worn around the neck. Two lanyards are provided: one with a safety breakaway clasp and a longer adjustable over the head style. The transmitting diodes are in the top portion and the rechargeable NiMH batteries are housed below. The power switch is accompanied by a battery level LED (Green=Useable, Red=Needs Charge). The A-B switch selects the transmission channel. The pendant can be placed in either the BRC-101 or BRC-202 charger.

An optional Plug-in microphone (PM-505) can be plugged into the top of the pendant for enhanced performance. Although the built-in microphone gives satisfactory performance, the plug-in microphone is a unidirectional element resulting in better vocal quality and much more gain (more volume) before feedback.



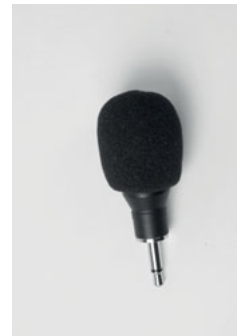
Body-Pack Transmitter (IRB-30), usually worn on the waistband, is the component that transmits the IR signal to the sensor. The IRB-30 has 10 emitting diodes on its front panel and is powered by two rechargeable NiMH batteries. Controls include a power “on/off” switch and a mic gain control. Battery level indicator LED: Green = useable charge, Red = low battery.

It is required to plug in an external microphone. There are several optional microphones available and they plug into the top of the IRB-30. The IRB-30 is equipped with belt clip for waist attachment.



Caution: The body-pack cannot be placed in pocket and the red window cannot be obstructed, those are the emitting diodes.

Plug-in Microphone (PM-505) is a small capsule size microphone that plugs directly into the top of the IRB-30 body-pack. A lanyard cord is provided to accommodate wearing the body-pack transmitter around the neck and utilizing it as a pendant microphone. A windscreen is included to prevent breath pops when used in close proximity to the mouth.



Ultra Lite Microphone (ULM-835) is a miniature boom style microphone supported by a wire around the left ear. The mic boom extends along side of face and has a unidirectional microphone with windscreen. The small ring on the boom prevents perspiration from entering the mic element. Aside from comfort, the boom style mic renders the best performance in terms of sound quality and is not prone to feedback.



Caution: The boom can be formed to fit but it is not a flexible boom, do not bend back and forth. IT WILL BREAK !

Collar Microphone (CM-838) is a flexible rod that is formed around the neck. The end with the microphone and windscreen is then contoured up toward the mouth. The cord exits the rod in the center in back, out of the way, and is plugged into the body-pack. The collar mic utilizes a unidirectional mic element to minimize feedback and renders quality voice reproduction.



Lapel Microphone (LP-835) is a small capsule microphone with a spring clip for securing on to a clothing edge. The lapel microphone is well suited for out of sight application.



However; as a result of the microphone being farther away from the mouth, more gain is required for adequate volume. An omnidirectional microphone element is used to pick up from all directions. These two factors make the lapel microphone most prone to feedback when used near or under a speaker.

Handheld Microphone Transmitter (IRH-30) is most applicable for student use or direct presentation. It has an “on/off” switch and a battery level indicator LED; Green=useable charge, Red=low battery. The transmitter has 10 emitting diodes: 8 around the bottom of the handle, and 2 toward the top of the handle around the bottom of the handle. The metal housing provides low handling noise and insures durable longevity.



Speakers:

Ceiling Speaker (SP-628) is an extended frequency range 6" co-axial speaker housed in a metal back can sealed to the trim ring to form an infinite baffle enclosure. A screw terminal strip provides the external speaker connection. The speakers are equipped with three quick mount clamps for easymounting into a blind hole. The speakers are supplied with a tile bridge for support above the ceiling tile. Plenum rated cable is provided for connecting the speakers to the amplifier.



Specification: SP-628 speaker is ETL plenum rated and meets the UL-2043 plenum code.

1' x 2' Lay in ceiling speaker (SP-628L)

The lay in speaker utilizes the same exact SP-628 coaxial speaker. The speaker is installed in a 1' x 2' support with perforated grill. The "T" bar support is attached for convenient labor saving installation.



Wallmount Speaker (SP-2000) is a two-way speaker housed in a port-tuned enclosure with a 6" woofer and a 1" H.F. domed tweeter. Euro-block connectors provide the speaker connection. Brackets are included for wall mounting. Heavy-duty speaker wire is provided for connecting the speakers to the amplifier.



PRIOR TO INSTALLATION

Be sure to observe all safety precautions

- Wear goggles when using power tools.
- Observe all safety guidelines when using ladders
- Do not install your system near water or heat sources
- Wear proper work clothing, avoid loose tails and sturdy shoes
- Clean all components with a dry cloth
- Use Teachlogic accessories only
- Protect all cables from abrasion, sharp edges, and install in a tidy manner

The following Basic Tools and Supplies will be Required to Install the System

- Safety Goggles
- Power Drill Motor & Drills
- Phillip #2 Screw Driver
- Level & Tape Measure
- Side Cutter & Scissor
- Hammer
- Staple Gun & Staples
- Plastic Cable (zip) Ties
- Plastic or Metal Raceway & Screws (If external wiring is required)
- Aviation Metal Cutters
- Ladder
- Keyhole or Drywall Saw
- Electrical Tape
- Twine or Light Weight Pull Rope

INSTALLATION INSTRUCTION FOR THE SPECTRUM II SYSTEM

Organize and Plan Your Installation

Upon arrival at the jobsite, observe the following Criteria:

- Observe the type of ceiling to determine your method of installing the speakers
- Roughly layout the location of each speaker
- If wall mount speakers are being installed, determine the mounting location.
- Where and how will the Spectrum (Receiver/Amplifier) be installed
- What will be the best routing of the speaker wires
- Where are the Auxiliary Audio Sources located and how will they be Interfaced with the sound system
- Determine the central location of the ceiling for installation of the dome sensor and the routing of the sensor cable to the receiver/amplifier

Installation Procedure

Installation of the Spectrum II Receiver/Amplifier

Placement of the Spectrum amplifier is usually dictated by the other electronic equipment associated with the sound system in a rack and/or the location of the auxiliary audio/video equipment to be integrated with the amplifier. Also, the routing of the speaker and sensor cables will be factor to consider.

Installing the Spectrum II in a standard electronic equipment rack

- Use the RM-700 rack mount kit.
- Mount the tabs on the side of the amplifier
- Install the amplifier in the rack at desired location

Installing the Spectrum II under or above a Shelf or Support

- Use the SM-700 shelf mount kit
- Using either of the mounting holes, mount the four tabs on the sides of the amplifier with the 90° tab pointing either inward or outward.
- Hold the amplifier in position and mark the mounting holes
- Drill the holes for the mounting hardware being used for mounting
- With tabs oriented outward, install the Spectrum II on or under the shelf.
- With tabs oriented inward, remove the tabs and install them on the shelf.
- Mount the amplifier within the mounted tabs

Installation of Speakers

The Spectrum can accommodate up to eight (8□) speakers. Normally, four speakers will be adequate to distribute the sound evenly throughout a normal classroom of approximately 2500 sq. ft.

When installing ceiling speakers in a dropped ceiling, layout the speakers equidistant above the listening area.

Installing the SP-628 Ceiling Speaker

- After cleaning hands, remove the tile bridge from ceiling grid
- Lay ceiling tile face down on clean flat surface
- Center the large hole of the tile bridge on the ceiling tile
- Trace and then cut the circle in the tile using a keyhole or drywall saw
- While the ceiling tile is removed, place the speaker cable in ceiling plenum and advance the roll to the next speaker location while holding the end to be connected to the speaker
- Remove the speaker grille using a pointed tool to lift out of trim ring
- Insert speaker into ceiling tile and place tile bridge over speaker
- With tile bridge in place, tighten the three quick clamps to snug
- Connect speaker wire to speaker; Wire inscribed “TeachLogic” is designated as the “Positive” lead. It is important to observe speaker polarity to maintain proper phasing between speakers and amplifier.
- Reinstall ceiling tile and speaker grille.
- Remove any soil and fingerprints
- Repeat the process for each speaker while routing the individual speaker cables toward location of the Spectrum amplifier

Installing the SP-2000 Wall Mount Speakers

- First observe: shape of the room, ceiling height, door locations, windows, mounting surfaces and seating area. In a rectangular or square room, you would try to locate the front two speakers (one on each side) approximately even with the front row listeners. Locate the other pair approximately mid-way to the rear of the listening area.
- Mount the speakers at least 6 feet above the floor. Using the most appropriate fastener, mount the speaker brackets on the wall in vertical orientation.
- Mount the speakers in the brackets and direct them toward the center and pointed mid way toward the rear.
- Connect the speaker wires, observing the lead with Teachlogic imprinted is the positive polarity.
- Routed the speaker wires to the Spectrum amplifier, observing safe and protective enclosure.
- Remove any soil, fingerprints and debris.

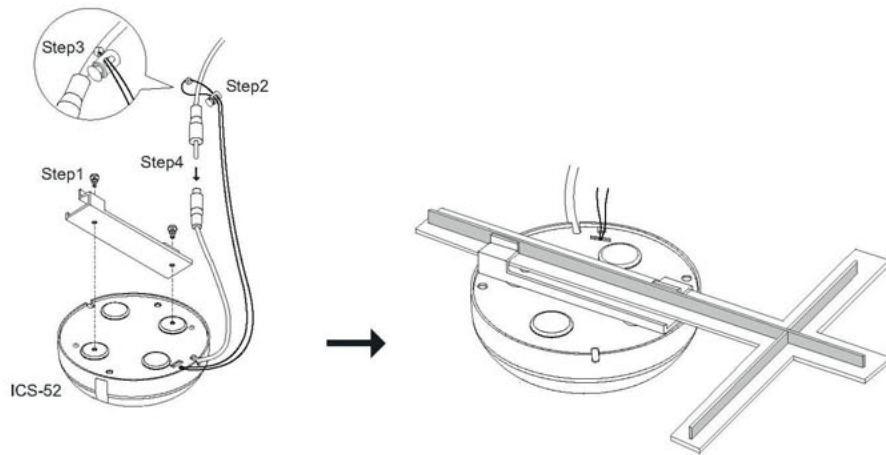
Installation of the Dome Sensor

The ideal location for the dome sensor would be in the center of the ceiling. This will provide a clear signal path for the IR transmission from the transmitter to the dome sensor without obstruction. In addition, you will have 360° coverage and will minimize the transmission distance for more reliable performance.

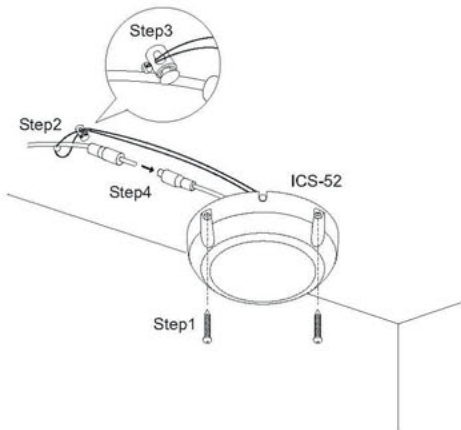
INSTALLING THE INFRARED SENSOR

Attaching the infrared ceiling sensor

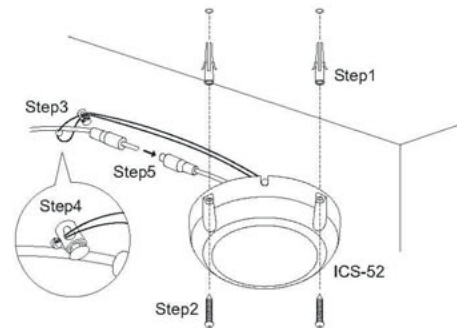
Installation 1 ----- Attach to T-bar Rail



Installation 2 ----- Attach to wood surface



Installation 3 ----- Attach to concrete surface



Final Connection of the System

With all the speaker wires and the sensor cable neatly routed to the amplifier, we are ready to complete the installation.

Connecting the Dome Sensor

- Coil up the excess cable (if there is excess) and place it out of view
- Plug the sensor into any one of the sensor input jacks (RCA)

Connect the auxiliary audio sources

- The auxiliary input jacks are dual RCA. They are labeled on the back corresponding to the volume control on the front panel. Interconnect to each source using a shielded cable with the proper connectors.
- You can use stereo connectors into the Spectrum's dual inputs. The two channels will be summed so both channels will be passed through

Connecting the Speakers

- Cut the speaker wires to the proper length.
- Split the cable and strip approximately $\frac{1}{4}$ inch off each wire.
- Twist the stranded wire and if you have a soldering iron, it is a good practice to tin the wire ends.
- It is important to observe speaker polarity
- Unplug the phoenix connector and insert the positive wire (one with TeachLogic imprinted) into either outside screw terminal. Insert other wire into the next slot. Tighten the set screw. Do same for all speakers.
 - If you are using more than four speakers, connect the additional speaker into the other two slots of the phoenix connector. Be sure to observe the polarity, insert the labeled lead configuration will parallel the two speakers connected.
 - Plug speaker phoenix block into the amplifier speaker output terminal.

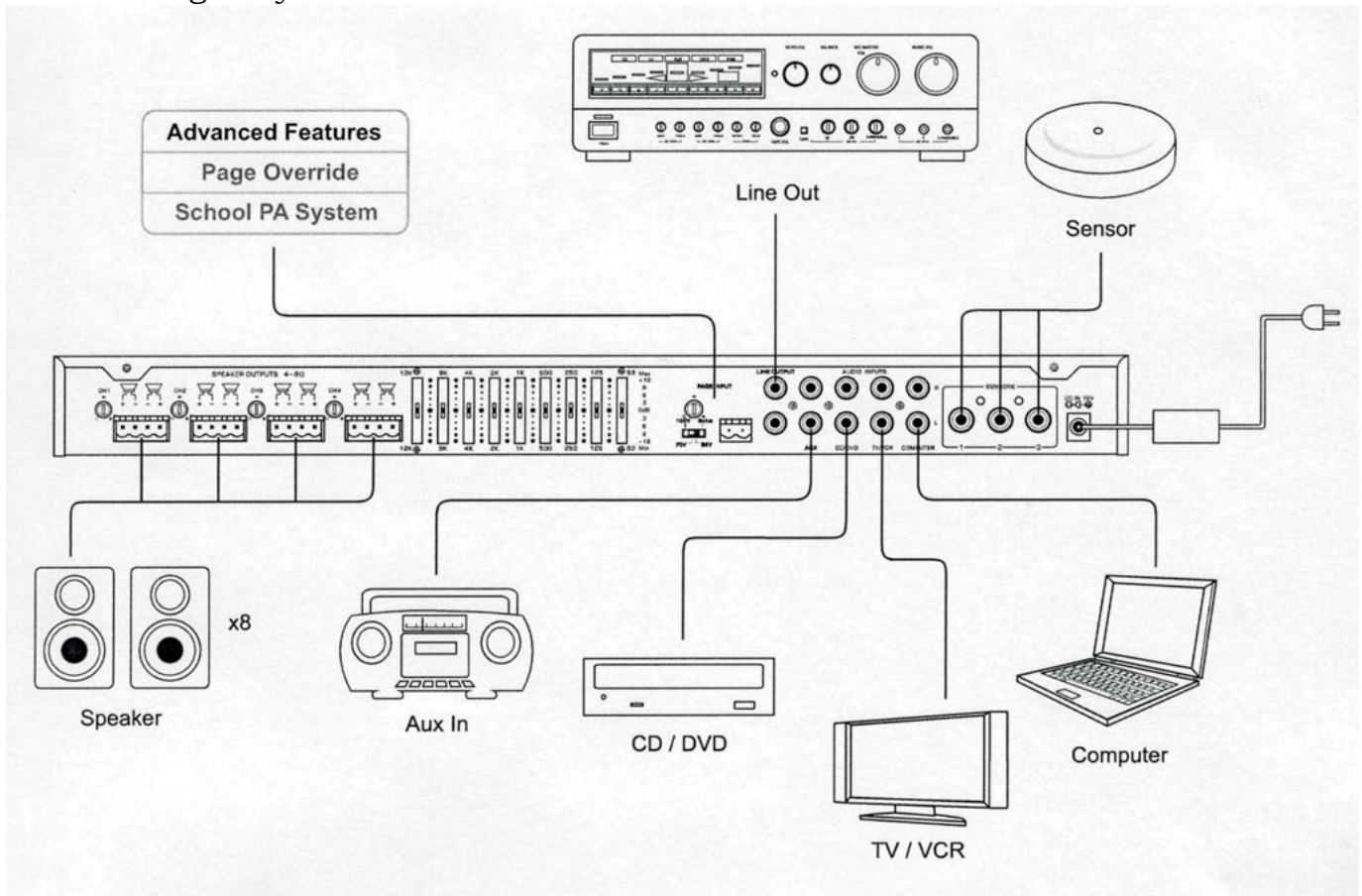
Page Over-ride / Pass Through Feature

The page over-ride feature allows you to connect a speaker level signal to the page over-ride input and the system will mute all the inputs and pass the page through into the classroom.

- Unplug the two-terminal phoenix connector.
- Connect the speaker cable from the paging system to the phoenix connector.
- Determine the signal level of the paging system (8 Ω , 25 v, 70 v, or 100 v).
- Set the slide switch to the appropriate speaker level setting.
- Plug the phoenix connector into the page over-ride jack
- With the Spectrum II turned "ON", send a page signal through the page input.
- Adjust the page volume in the room to the desired listening level using the gain control on back panel.

Nine Band Equalizer

If you have a pink noise generator and an octave analyzer, you can adjust the sound spectrum to your desired listening criterion. Without instruments you will have to rely on your listening ability and experience. Adjust the equalizer to compensate for the room acoustics to achieve maximum clarity and intelligibility.



Operating the System

Now that the system has been installed and adjusted per the instructions above, we are now ready to test the input side of the system. The inputs will include the wireless infrared microphones and auxiliary audio sources.

Body – Pack Transmitter and its Features

- A microphone needs to be plugged into the Body-Pack
 - The Plug-in microphone is a small capsule that plugs directly into the top of the body-pack transmitter. Then install the lanyard (included) under the spring clip and slip it over your head to be worn as a pendent type microphone.
 - The Lapel microphone plugs into the mic input and then the lapel mic is clipped on to your clothing.
 - The Collar microphone plugs into the mic input and the collar is formed around the neck with the microphone element oriented toward your mouth.
 - The Ultra Lite Mic is fitted around the ear and the cable plugged into the mic input.
- The body-pack is powered by two rechargeable NiMH batteries which need to be fully charged for optimum performance
- Turn “on” the body-pack via slide switch on side of the body-pack
- Observe the Green LED on top of transmitter (Good charge on battery)
- Also observe the LED next to Ch. A volume control indicating IR signal being received when the body-pack is turned “on”
- If the Ch. B LED turns “on”, remove the battery cover and slide the channel selector switch to Ch. A.
- Speak into the microphone and adjust the volume using the gain control on top of the body-pack and Ch. A volume control on the Spectrum II.
- While talking, walk around the perimeter of the room to verify 100% reception of the signal.
- Upon completion of test, put the belt-pack in the charger for recharging

Handheld Microphone Transmitter and its Features

- The handheld microphone is powered by two rechargeable NiMH batteries which need to be fully charged for optimum performance
- Turn “on” the microphone with slide switch and observe the Green LED
- Also, observe the LED next to Ch. B volume control indicating IR signal being received when the body-pack is turned “on”
- If the Ch. A LED turns “on”, unscrew the bottom half of the handheld and slide the channel selector switch to Ch. B.
- Speak into the microphone and adjust the volume using Ch. B volume control on the Spectrum II.
- While talking, walk around the perimeter of the room to verify 100% reception of the signal.
- Upon completion of test, put the microphone in the charger for recharging

Drop-in Battery Charger

The battery charger is a rather sophisticated charger. It will charge the NiMH batteries at the optimum charge rate, maintain full charge, and will recycle the batteries for extended battery service life.

- Plug the charger into an AC outlet
- Place handheld microphone and/or body-pack transmitter into their appropriate slot
- When a microphone is being charged, a Red LED will light indicating unit is being charged
- When the batteries are fully charged, the LED will change to Green.
- There is an audible buzzer which will buzz an alert when the batteries are fully charged. The buzzer can be turned “on or off” with the slide switch located on the bottom of the charger. (The charger is normally shipped with the switch in the “off” position).

Congratulations, this completes the installation and it is now time to show the user how to use the system

User Instruction

- Turn “on” the Spectrum via the power switch at the lower / left corner, red LED will light
- Plug a microphone into the body-pack and set the gain control at zero (max. CCW)
- Turn the body-pack transmitter “on” via slide switch on the side of transmitter
- Observe the Green LED on the body-pack indicating a useable charge on the batteries
- Observe the Red LED near the Ch. A volume control, it indicates a signal being received from the body-pack
- Turn Ch. A volume to approximately mid scale (12 o'clock)
- While talking into the microphone, slowly turn the gain control CW until you've achieved a comfortable listening level
- Using the Handheld microphone, turn it “on” the Green LED will light and the Red LED adjacent to the Ch. B control will light indicating signal presence from the handheld microphone
- Slowly turn the Ch. B volume control CW until the desired listening is achieved
- Now venture around the room while alternately talking into each microphone. Observe no interruption or drop outs while moving about
- Connect the auxiliary audio sources (computer, projector, DVD player, VCR) using a shielded cable with appropriate connectors, plugging into the designated RCA jacks
- Turn each audio source “on” and engage their operation. Adjust the volume level of each auxiliary input to the desired listening level. If the output is distorted or overly sensitive, it is probably due to the signal output of the audio device being too strong and is over driving the auxiliary input of the Spectrum II.
- Once all the auxiliary inputs have been verified and adjusted, the system is ready for full operation

Trouble Shooting

- System is turned “on” but there is no sound
 - Verify the AC power; the red LED is not lit.
 - Check if system has been unplugged
 - Check circuit breaker
 - Call maintenance for assistance
 - System has power but still no sound
 - Turn “on” microphone and check for signal presence (Green LED next to volume control)
 - No signal presence, LED not lit
 - Check Green LED in center of dome sensor
 - If sensor LED is not lit, the dome sensor has either been disconnected or the power for the sensor has failed
 - If LED is lit but there is no sound
 - If either condition is not resolved, send unit in for repair
- When using the microphone, the voice is distorted and / or signal drop out occurs
 - Check the charge on your batteries
 - Recycle the batteries by placing the transmitter in the charger and press the grey button and hold for 3-5 seconds
 - The yellow LED will light and the charger will automatically discharge the batteries and then recharge to full charge. (Time required 4 -6 hours)
 - Recheck the system after cycling the batteries
 - If the problem persists, replace the batteries
- When using the body-pack transmitter and microphone, the voice is intermittent and / or has a static like sound
 - Try moving the cable back and forth at the plug-in connector or where it is connected to the microphone
 - If the noise and intermittent connection is associated with the movement of the cable, the cable connection needs to be repaired

If your problem persists and this guide has not resolved the issue, call our customer service department for additional assistance. (800) 588-0018

GENERAL SPECIFICATIONS:

IMA-700 SPECTRUM II RECEIVER/AMPLIFIER

Receiver Input	Infrared FM
Modulation	FM Wide-band
Reception Frequencies	Ch. A: 2.08 MHz Ch. B: 2.54 MHz
Infrared	850 nm
Wavelength	Ch. A: 32.768 KHz
Tone Signal	50 μ s
De-emphasis	40 Hz, -18KHz, \pm 3dB
Frequency Response	\pm 65 dB
S/N Ratio	\pm 1% @1KHz
THD	\pm 10 KHz
Nominal Deviation	\pm 25 KHz
Maximum Deviation	Three, RCA
External Sensor Input	2,500 Sq. Ft.
Connectivity Coverage	Four Aux, Line Level, Dual RCA
Aux Inputs	One Aux, Line Level, Dual RCA
Aux Outputs	3.5mm with Gain Control, Front
Line Output	Panel
Page Over-Ride	Input: 8 Ω , 25V, 70V, 100V
Equalization	Nine-Band \pm 12dB
Output Power	Four Amplifiers, 18 Watts ea. (RMS) 72 Watts total (RMS)
Output Impedance	4 Ω
Output Connection	Four Phoenix Connectors
Power Supply	19VDC / 4.75A / 90W CE, CSA and UL Listed
Dimensions	17" W x 1 $\frac{3}{4}$ " H x 7 $\frac{1}{2}$ " D
Weight	5.2 lbs.

GENERAL TRANSMITTER SPECIFICATIONS

Transmission Carrier	Infrared
Transmission Frequencies	2.08 MHz & 2.54 MHz
Channel Switchable A or B	Field Switchable
Transmitting Diodes	Ten
Modulation	FM Wide-Band
Pilot Tone Frequency	32.768 KHz
Peak Deviation	± 25KHz
Operating Range	2500 Ft ² . 60 Ft.
Power Switch (Slide)	On/Off
Battery Charge Level (LED)	Green, (Useable Charge) Red, (Needs Charging)
Battery Life	Approx. 7 Hr./Charge
External Battery Contact	Charger Connection

IRT-89 PENDANT TRANSMITTER

Adjustable Lanyard	Safety Breakaway Clasp
Transmission Angle	180°
Input	Top/Center
Microphone Input	3.5mm Jack, Lo-z
Waist Band Clip	Tension Wire
Dimensions	5.25" H x 1.5" W x 1" D
Weight	4.8 oz. w/ Batteries
PM-505	Plug-In Microphone
Mic Type	Electret/Condenser
Pick-Up Pattern	Unidirectional
Connector	Male, 3.5 mm
Frequency Response	100 Hz-16 kHz
Windscreen	Pop Filter

IRB-30 BODY-PACK TRANSMITTER

Transmission Angle	180°
User Controls	User Controls
Power Output	Mic. Volume Power On/Off IR Power Output: (Hi/Lo) CH. Select (A or B)
External Mic. Input	Lo-z, 3.5mm
Waist Band Clip	Heavy Spring Wire
Dimensions	4¾" H x 2¾" W x ¾" D
Weight	4.8 oz. w/ Batteries

IRH-30 HANDHELD TRANSMITTER

Compander Circuit	Yes
Pre-emphasis	50 μ S
IR Emitter Location	Built-in
Transmission Angle	360°
Current Consumption	330ma
Microphone Element	Unidirectional, Dynamic
Battery	Two Rechargeable NiMH, 1.2v / 2400mAH
Battery Life	Approximately 6 Hours
Housing	Aluminum
Dimensions	10" L x 1½" Dia.
Weight	11.4 oz. (with batteries)

IRT-55 SAPPHIRE TRANSMITTER

Transmitting Diodes	6
Operating Range	1,500 Ft ² . 60 Ft. Line of Sight
Battery Discharge Indicator	
Blue	Full
Purple	Medium
Red	Low
Flashing Red	Very Low Battery
Battery Used	Lithium-ion (3.7V / 620mAh)
Battery Life	Approx. 8-9 Hrs/Charge
External Power Charger	DC +5V, Micro USB Connector
Transmission Angle	180° Conical
User Controls	
Power Switch (push)	On/Off
Mute Switch (push)	On/Off
Mic Switch (3 position)	+6db, Normal, -3db
Aux. Vol./Gain	Increase, Decrease
Channel Select	(A or B) in battery compartment
External Aux. Input	3.5mm Stereo Line Level
Dimensions	3 ⅝" H x 1¼" W x ¾" D
Weight	1.4 oz. Including battery

IRT-30 CRESCENT TRANSMITTER

Shape	Crescent, Under Chin
Lanyard Attachment	Snap-In, Top (Safety)
Transmission Angle	180°, Conical
Emitting Diodes	Six
Mute Switch	Momentary, On/Off
Aux. Input (3.5mm)	Switchable, Mic. or Line Level
Volume Control	Thumb, Rotary
Two Microphone Elements	Condenser Type, Unidirectional
Battery	Single "AA" NiMH, Rechargeable
Power Consumption	300 mA@1.2Volt
Battery Life	6-7 Hours
Battery LED	Green—Useable Red—Needs Charging
Dimensions	4¾" W x 1" D x 1¾" H
Weight	3.0 oz. w/ Battery

BRC-50 DROP-IN BATTERY CHARGER

Charging Slots	Two Handheld, Slots A & C One Crescent, Slot B One Body-Pack, Slot D
Charging Mode	Switching
Charging Current	1700ma ±10%
Discharge Rate	350ma
Red LED Indicator	Batteries being Charged
Green LED Indicator	Batteries Fully Charged
Yellow LED Indicator	Batteries being Discharged
Audible Alert	Intermittent Buzz - Batteries Fully Charged
Recycle Button (Grey)	Press for Full Discharge and Auto Recharge
Auto Switching	Switch from Discharge to Charge Mode
Charging Time	1.5Hr./Slot
Power Supply	12VDC/1.5A (Fuse protected)
Dimensions	6½" L x 3 3/8" W x 1 1/8" H
Weight	12.2 oz.

SINGLE-INSERT CHARGER (BRC-101)

Charging Port (Single)	Pendant or Handheld
Flashing Red LED	Batteries being charged
Solid Green LED	Batteries fully charged
Dimensions	5" W x 3¾" D x 1½" H
Weight	7.4 oz.

DUAL DROP-IN CHARGER (BRC-202)

Charging Ports (Two)	Pendant or Handheld
Flashing Red LED	Batteries being charged
Solid Green LED	Batteries fully charged
Dimensions	7½" W x 3¾" D x 1½" H
Weight	14.8 oz.

ICS-55 CEILING DOME SENSOR

Operating Frequency	2MHz to 2.6 MHz
Number of IR LED's	30 Radial Spaced
Interconnection	50Ft. Plenum Rated Shielded Cable, RCA Connectors
Operating Range	50-60 Feet Line of Sight
Reception Area	2500 Ft. ²
Power Indicator	Green LED
Reception Angle	360° Semi-Spherical Coverage
Dimensions	5" D x 1½" H
Weight (with 50' cable)	1.2 lbs.

SP-2000 2-WAY MALL-MOUNT SPEAKER

Frequency Range	80 Hz to 16 kHz, ± 6dB
Power	30 watts Continuous
Sensitivity	88 dB SPL
Impedance	8 Ω
Crossover Frequency:	6 kHz
Nominal Coverage	90° x 90°
LF Driver	(5.25 in) Polycarbonate / rubber
HF Driver	High efficient 1" Mylar domed tweeter
Enclosure Material	Structural reinforced ABS enclosure
Termination	with metal mesh grille
Dimensions (H x W x D)	Spring terminal for secure speaker wire connection
Net Weight (ea)	5.5 x 7.25 x 4.25 in
Shipping Weight (pr)	5 lbs 2 oz
Included Accessories	10 lbs 9 oz
	Wall mount bracket

SP-628 2-WAY CEILING SPEAKER

Frequency Range	80 Hz to 15 kHz, \pm 6dB
Power	30 Watts Continuous
Sensitivity	89dB SPL (1W/1M)
Impedance	8 Ω
Crossover Frequency	6 kHz
Nominal Coverage	90° x 90°
LF Driver	(5.25 in) Polymica / rubber
Magnet	10 oz
HF Driver	High efficient 1" domed tweeter, neodymium
Enclosure Material Infinite	Air Sealed Metal Backcan Infinite Baffle
Termination	Screw terminals for secure speaker wire connection
Mounting	Three Quick-Mount Clamps
Dimensions (H x W x D)	5.5 x 7.25 x 4.25 in
Net Weight (ea)	5 lbs 2 oz
Shipping Weight (pr)	10 lbs 9 oz
Included Accessories	Powder Coated Steel Tile Bridge

SP-628L 2-WAY LAY-IN CEILING SPEAKER

Frequency Range	80 Hz to 15 kHz, \pm 6dB
Power	30 Watts Continuous
Sensitivity	89dB SPL (1W/1M)
Impedance	8 Ω
Crossover Frequency	6 kHz
Nominal Coverage	90° x 90°
LF Driver	(5.25 in) Polymica / rubber
Magnet	10 oz
HF Driver	High efficient 1" domed tweeter, neodymium
Enclosure Material	Air Sealed Metal Backcan Infinite Baffle
Termination	Screw terminals for secure speaker wire connection
Mounting	1' x 2' Lay-in speaker assembly Attached "T" Bar support
Dimensions (H x W x D)	12.25 x 23.75 x 6.25 in 13" with "T" Bar support 5/8" panel thickness
Net Weight (ea)	8 lbs
Shipping Weight (box of 4)	39 lbs

Five Year Limited Warranty

TeachLogic Infrared products are guaranteed to be free of defects in workmanship or material for a period of five (5) years from date of original purchase, subject to the following conditions:

1. Warranty excludes defects caused by normal use and wear, any abuse, or failure to use the product in accordance per instructions.
2. Warranty is void if damage occurred because of misuse, or attempted repair or modification by unauthorized personnel.
3. Warranty on batteries, cables, and cable connections are limited to one (1) year.
4. Warranty on microphones/microphone elements is limited to one (1) year.
5. Warranty does not extend to finish or appearance past ninety (90) days.
6. All warranty service will be provided by TeachLogic or authorized service center
7. Warranty is made to the original purchaser and may not be transferred another user.
8. Warranty service rendered will be on a repair basis or replacement, which ever TeachLogic deems to be most prudent for customer satisfaction and economic feasibility.

TeachLogic will only accept warranty shipments accompanied by Return Authorization Number previously assigned by TeachLogic personnel. Advance warranty replacements will be made per the discretion of TeachLogic personnel.

TeachLogic will pay return shipping cost on all warranty repairs or replacements.

For Warranty Service: TeachLogic, Inc.

Tel: (800) 588-0018 or (760) 631-7800

Customer Service Department

1688 Ord Way




Oceanside, CA 92056

Tel: (800) 588-0018 or (760) 631-7800

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