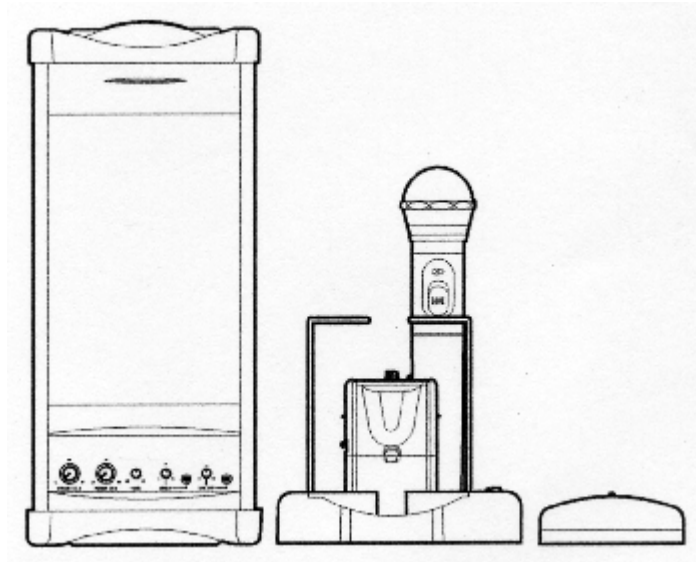


QUANTUM II

Infrared Sound Field System User Guide



TeachLogic 

FORWARD

Congratulations on the purchase of your new **QUANTUM II** sound field system produced by TeachLogic. Be assured that the Quantum has met all manufacturers' specifications and it will fulfill all your expectations. TeachLogic incorporates 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 Quantum II sound field system.

The manual provides a basic explanation on Infrared transmission and its benefits. Then there are some guidelines to help with unit location and installation instruction.

The manual continues with product description, followed by operational and use instructions. The manual concludes with maintenance procedures and trouble shooting analysis.

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

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Brian Van Waay
President

A Brief Explanation of Infrared

Infrared is a light ray that is below the visible light spectrum (you can't see it), just like the sound spectrum extends beyond your hearing ability. The same as; 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 a command to the TV set to perform the command you have programmed into your 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 a sensor located on the top of your Quantum II (that dark shining trim atop the Quantum II). 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 sensor and a coded electronic signal is sent to the receiver in the Quantum II. 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 reproduced by the speaker, creating an audible sound level so all can hear with ease.

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

Some words of caution and limitations of infrared:

Be sure that the path of transmission between the emitter and sensor is not obstructed.

The body-pack transmitter will not function if placed in pocket

Infrared will not work outdoors in sunlight

Dark soft surfaces do not reflect infrared very well and can cause some limitation to distance of transmission (drop outs).

Rooms larger than 2500 Sq. Ft. or have high ceiling can begin to exceed the ultimate performance of the Quantum II.

If you should experience drop outs in certain areas, you could install an additional sensor (**IWS-50**) to extend the system performance.

INVENTORY OF PARTS – WHAT’S IN THE BOX?

IRQ-3000 series Quantum II is comprised of the following components.

- 1 ea. Quantum II single piece self-contained column sound system with a built-in 30-watt integrated amplifier. (IRC – 320)
- 1 ea. AC Power adapter (AC-35)
- 1 ea. One Drop-in Charger Base (BRC-30)
- 1 ea. AC Power supply for Charger (AC-40)
- 1 ea. Body-pack transmitter with rechargeable (NiMH) batteries (IRB-30)
- 1 ea. Microphone to be plugged into the Body-Pack Transmitter
 - Plug-in Mic (LM-300) or
 - Lapel Mic (LM-385) or
 - Collar Mic (CM-835) or
 - Ultra Lite Mic (ULM-835) **optional**
- 1 ea. Handheld Microphone with rechargeable NiMH batteries (IRH-30) **optional**
- 1 ea. “U” shaped wall mounting bracket with mounting hardware

ASSEMBLY and INSTALLATION

Installing the Quantum II

- A. The Quantum II can be operated as a free stance system on a speaker stand. **To use in this mode of operation:**
 - Locate the system off to one side in the front of the room. Point the front of the unit toward the center of the listening area. Find an AC outlet and plug the system in.
 - Side wall location is also acceptable. Locate unit on either side about $\frac{1}{4}$ from front of room. Point the front diagonally across the listening area. Locate an AC outlet and plug it in.

Optional: Folding Tripod Stand SS-300
- B. Mounting the Quantum II on the wall, please review the following guidelines.
 1. Selecting the most appropriate location for the Quantum can be the most challenging. Every room is a little different, but in general the most functional location is installing it on the front wall off to one side or the other approximately $\frac{1}{3}$ from either side wall.

An alternate choice would be on either side wall, located approximately $\frac{1}{4}$ - $\frac{1}{3}$ the distance from the front of the room.

NOTE: Be conscious of an AC outlet requirement for power.

2. Once you’ve decided where to mount the Quantum II, hold the ‘U’ bracket straight up and down against the wall with bottom of the bracket

approximately 5 -6 feet above the floor. Using a level to assure true vertical orientation, mark the two mounting holes.

If installing onto a drywall, drill two ¼” holes and insert a molley bolt provided. With a #2 Phillips head screwdriver, mount the wall bracket.

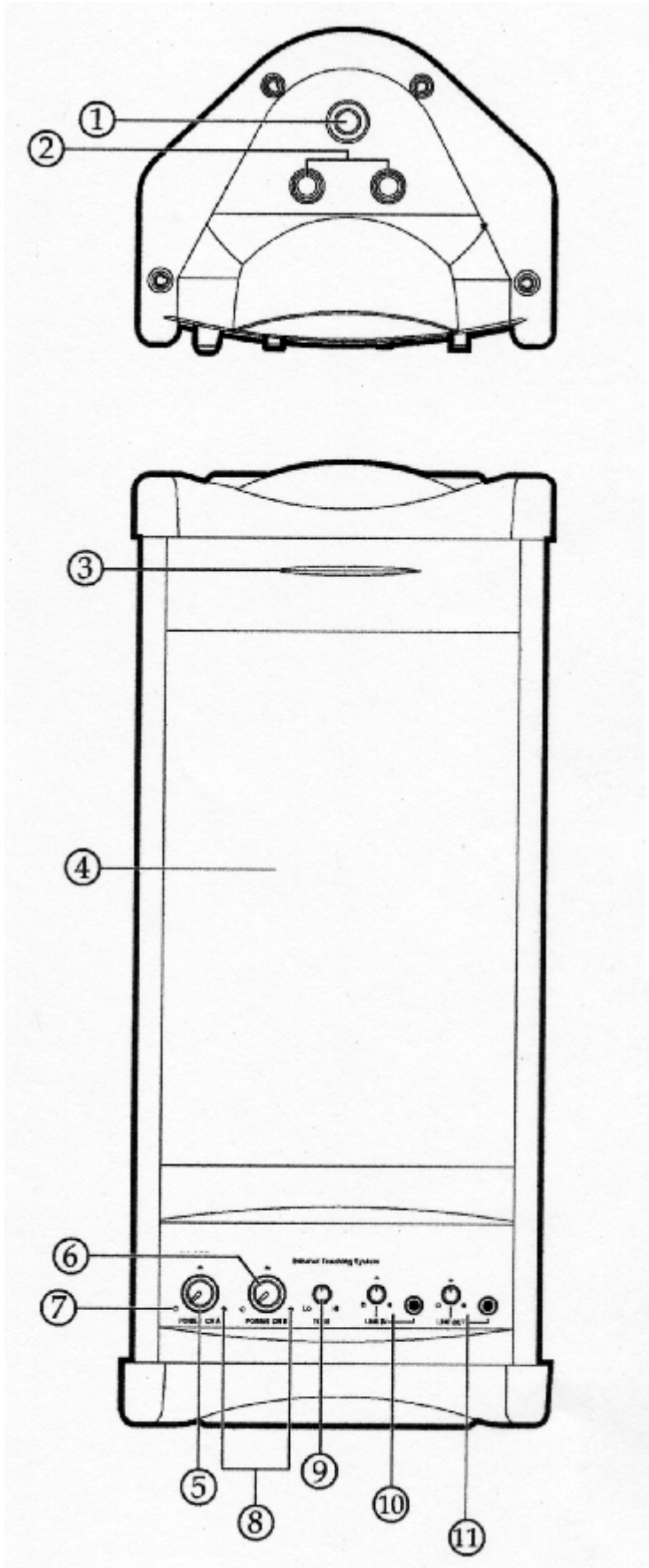
If installing into a wood or like material, use two sheet metal screws with washers to mount the bracket to the wall.

For concrete wall, you’ll need to acquire and install a plastic insert for a # 8 sheet metal screw and install accordingly.

3. With the bracket mounted, route the plastic wire tie through the two tab holes. Hold the power supply onto the two raised tabs with the AC plug end toward the floor. With the power supply resting on the pegs, tighten the wire tie thus securing the power supply to the bracket.
4. Insert the DC plug into the power input jack and place the Quantum II into the bracket, secure each end with the ⅜” bolt and washer provided.
5. Orient the Quantum with center pointing diagonally across the listening area.
6. Plug the power cord into an AC outlet

THE QUANTUM II CONTROLS

- Channel A turns power “on/off” (red LED indicator) and adjusts the volume of the IR microphone assigned to it. Normally the body-pack transmitter is assigned to channel A. When the transmitter is turned “on” a green LED will light, indicating that an IR signal is being received from the transmitter.
- Channel B also turns power “on/off” and adjusts the volume of the microphone assigned to it. Normally the handheld microphone is assigned to channel B. When the transmitter is turned “on” an amber LED will light indicating an IR signal is being received from the transmitter.
- Tone control adjusts the tonal quality of the sound. You will feel a center indent, turn CCW will boost the bass and turning CW will extenuate the high frequencies.
- Line input jack (3.5mm) facilitates connecting the output of a DVD, Video Projector, ipod, computer and amplifying its signal through the Quantum. The volume can be controlled with the adjacent knob.
- Line output jack (3.5 mm) provides a composite line level output; it can be used to connect to a personal FM assistive listening system or as an output to a recording device. The small knob adjusts the output level to match input of the device connected.
- External speaker output connector is located adjacent to the power plug. An unpowered external speaker can be connected to the Quantum for additional coverage. A companion unpowered Quantum would be the speaker of choice.



Quantum Controls

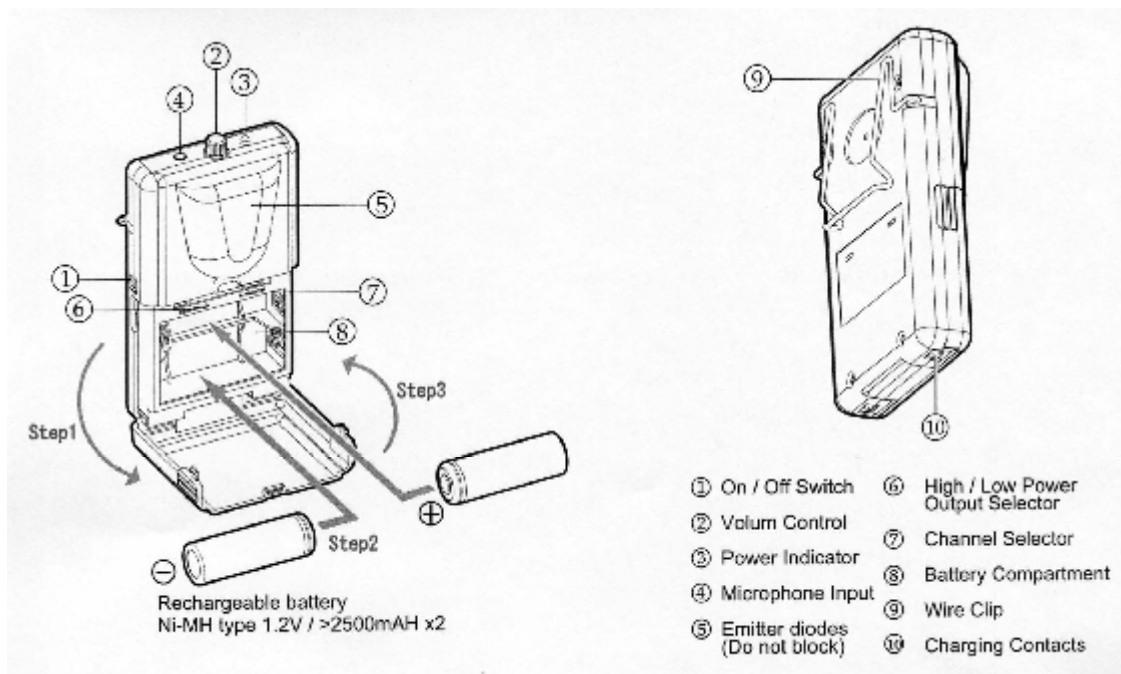
1. Threaded insert for wall mount bracket.
2. External sensor inputs.
3. Internal sensors.
4. Internal speaker.
5. Power switch & Channel A Control.
6. Power switch & Channel B Control.
7. Power indicator LED.
8. Infrared wireless transmission LED.
9. Tone control.
10. Line input volume control.
11. Line output gain control.

DESCRIPTION OF THE IR TRANSMITTERS

The body-pack transmitter is usually pre-set to channel 'A' and the hand-held microphone-transmitter set to channel 'B.' To change the channel on your body-pack transmitter, open battery door, and move the small slide switch above the batteries to desired channel. To change the channel on the handheld microphone, unscrew the lower cover and move the small slide switch along side the battery compartment to the desired channel.

Body-Pack Transmitter (IRB-30) is the component that has 10 emitting diodes on its front panel and transmits the IR signal to the receiving sensor; the glossy panel atop the Quantum front. The IRB-30 is shipped with rechargeable NiMH batteries installed which may require charging prior to use. Controls include a power "on/off" switch and a mic gain control (black knob on top). An external microphone needs to be plugged in, top jack (3.5mm). The IRB-30 can be worn around the neck using a lanyard or clipped onto the waist or other appropriate support.

Remember: The body-pack cannot be placed in pocket.



Microphones Used with the Body-Pack

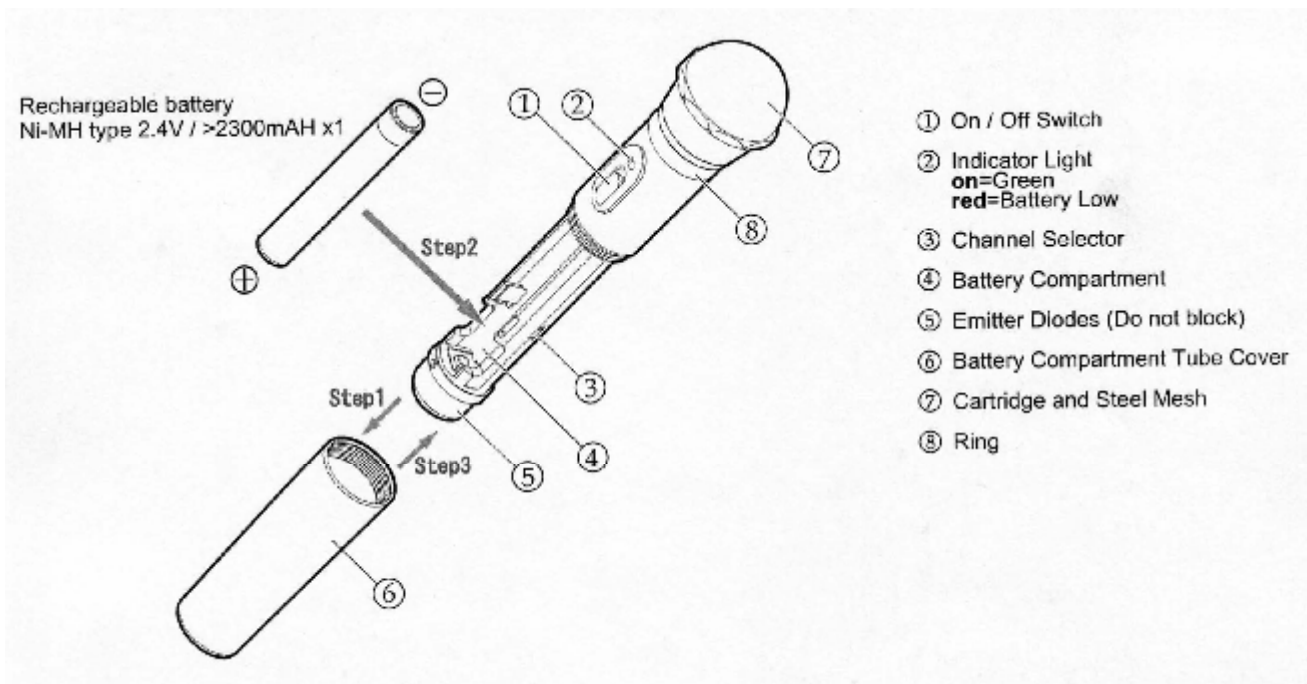
Plug-in Microphone (LM-300) The plug-in microphone is a small capsule size microphone that plugs directly into the top 3.5mm input jack. A lanyard cord is provided to wear the body-pack transmitter around the neck as a pendant microphone. The capsule is unidirectional, thus emphasizing its sensitivity to voice waves across its top surface making it a very functional pendant microphone. A windscreen is provided to reduce breath pops when used in close proximity to the mouth.

Ultra Lite Mic (ULM-835) The ULM-835 is a miniature boom style microphone supported by a wire around the ear. The mic is worn on the left side and is plugged into the 3.5mm jack. The ULM-835 features a unidirectional element for excellent acoustic qualities and virtually eliminates the hazard of feedback. The light weight for comfort, size and natural color for visual; makes the Ultra Lite Mic a very desirable choice.

Collar Mic (CM-835) The collar microphone is a flexible rod with a microphone installed in one end. The rod is formed around the neck and the mic element oriented upward in proximity of the mouth. A windscreen is provided to eliminate breath noise. The cord extends from the center in back of neck and extends down out of the way to the body-pack. The collar mic also incorporates a unidirectional element thus preventing feedback.

Lapel Microphone (LM-835) The lapel microphone is a small capsule like microphone with a spring clip for securing on to a clothing edge. The lapel microphone is well suited for use as a mic away from the face. The lapel mic is also equipped with a unidirectional element for better pickup across its top. If the lapel mic is worn reasonably close the mouth it will provide very satisfactory performance. However; the lapel microphone is the mic most prone to feedback when used near or under a speaker.

Handheld Microphone Transmitter (IRH-30) The handheld microphone is most applicable for student use or for direct presentation. It is equipped with rechargeable NiHM batteries and has 10 emitting diodes on the bottom of the barrel. It has an on/off switch and a green “on” and battery level LED indicator. If LED is red, the batteries will have to be charged before using.



You are now ready to test the system

To test the system, we are going to use a wireless body-pack transmitter with microphone, handheld microphone and an auxiliary audio source (DVD, CD Player, etc.)

Turn the Quantum “on”, using either large knob

- Red LED will light to indicate power
- Set the Ch. A and Ch. B controls to 12 O'clock

Using the Body – Pack Transmitter and Microphone

- Set the body-pack gain control (black knob on top) to minimum, fully CCW
- Turn the body-pack “on” via the slide switch on the side of the body-pack.
- Observe the Green LED on top of body-pack transmitter. (If Red, batteries must be charged or replaced).
- Observe the Green LED adjacent to Ch. A volume control, it indicates that an IR signal is being received from the body-pack.
- If the Ch. B LED turns “on”, remove the battery cover of the body-pack 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
- If additional volume is required, turn Ch. A control clockwise
- While talking, walk around the perimeter of the room to verify 100% reception of the signal.
- Upon completion of the test, put the belt-pack in the charger for recharging

Handheld Microphone Transmitter and its Features

- Turn “on” the microphone with slide switch and observe the Green LED (If Red, batteries will require a charge or be replaced)
- Observe the amber LED next to Ch. B volume control, it indicates that an IR signal is being received from the microphone.
- 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 control on Quantum.
- While talking, venture around the room, you should experience 100% reception throughout the area.
- Upon completion of test, put the microphone in the charger for recharging

Check the Auxiliary Line Input

- Connect a DVD player, computer audio output, or iPod using a 3.5 mm patch cable to the line input.

Caution: Be sure you are connecting to a line level output

- With the quantum turned “on”, turn “on” or engage your auxiliary source.
- Adjust the volume on the Quantum to about mid scale and then adjust the output (if its not a fixed line output) of the auxiliary source.
- Verify quality of sound and adjust to desired volume.

Line Output / Control

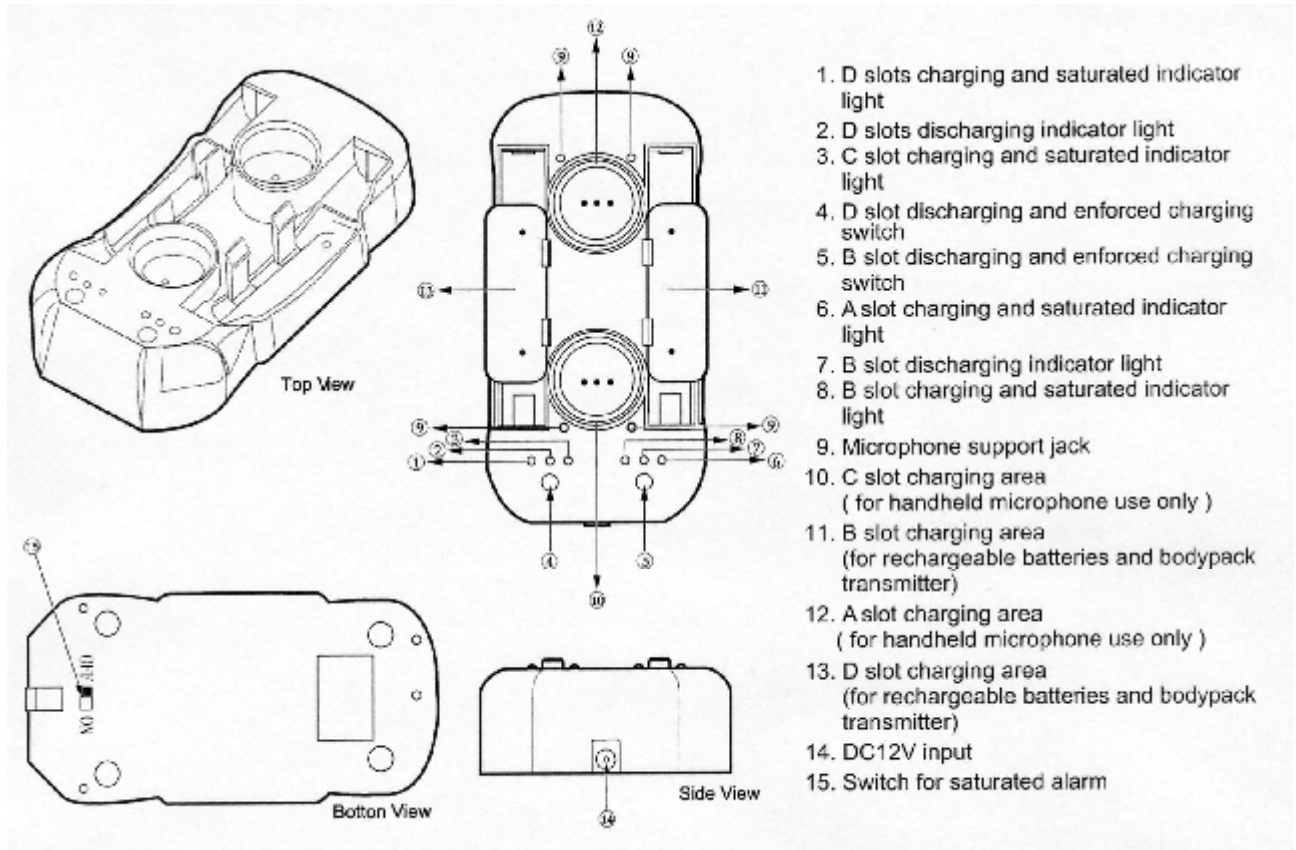
- The line output delivers a composite audio signal to be fed into another device i.e. a recorder, iPod, or the input of an assisted listening system.
- The adjacent knob adjusts the level of the output signal.

Drop-in Battery Charger

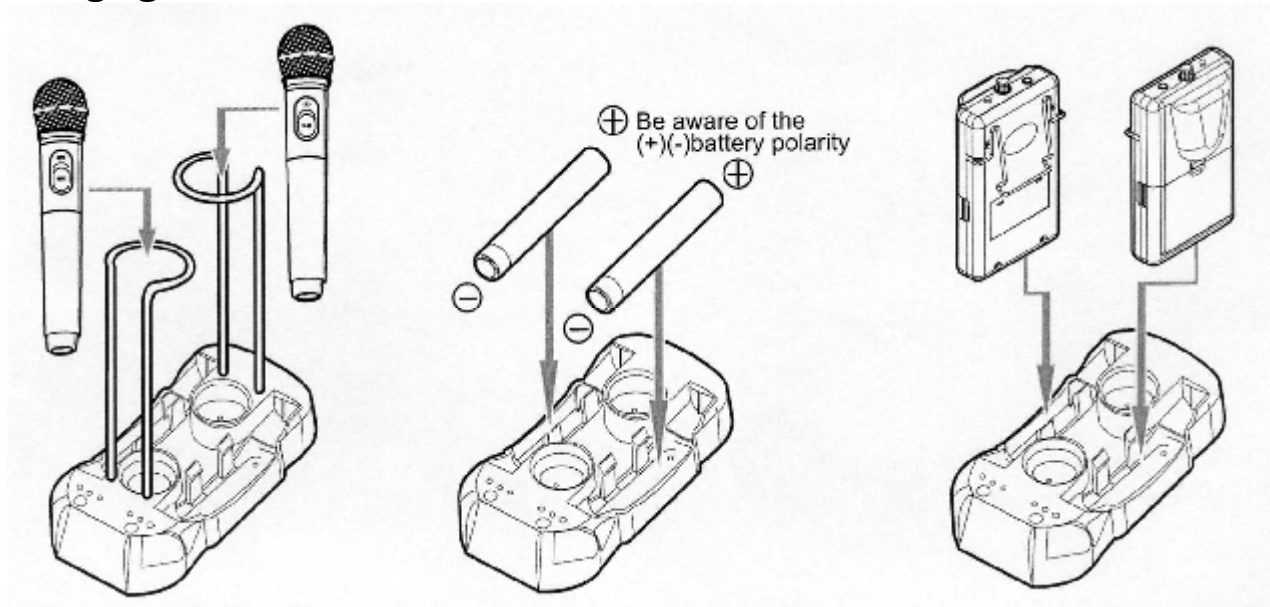
The battery charger is a rather sophisticated charger. It will charge the NiMH batteries at the optimum charge rate, maintain full charge, and can recycle the batteries to extend their service life.

- 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).
- To recycle rechargeable NiMH batteries, push and hold for momentarily the grey button. A YELLOW LED will light indicating the batteries are being discharged. When the batteries are exhausted, the charger will reverse and charge the batteries to full capacity. Recycling the batteries on a monthly basis will extend the service life of the batteries.
- If non-rechargeable batteries are placed in the charger, it will sense the non-rechargeable batteries and will not charge them. The red LED will commence blinking continuously.

Caution: Do not attempt to recharge non-rechargeable batteries such as Alkaline or similar. The charger will sense most conditions, however; there are certain conditions that are not detectable.



Charging



We would like to congratulate you with your successful installation and learning experience. We hope you experience many years of satisfactory service and performance of your system.

Trouble Shooting

- System does not work
 - Verify AC power; the LED lights when turned “on”.
 - System has power but no sound
 - Verify charged batteries in body-pack (Green LED when turned “on”).
 - With body-pack turned “on”, check for signal presence (LED adjacent to the volume control).
 - LED is lit but there is no sound, check microphone plugged into body-pack.
 - Replace microphone.
 - Try with handheld microphone or another body-pack
 - Still inoperative and LED on Quantum is lit, send Quantum in for evaluation.
- 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 connects to the microphone
 - If the noise and intermittent connection is associated with the movement of the cable, the cable connection needs to be repaired.
- When plugging a CD player output into the auxiliary input, I get distorted sound
 - You may have connected to the earphone output of the CD player rather than the line level output and its volume is too high.
 - The earphone output can be used but the volume level of the CD player is very critical and must be held to a very low level.

IRC-320 Quantum II General Specifications

Signal Reception	Infrared Carrier
No. of Channels	Two
Receiving Range	60 Feet Line of Sight
Transmission Frequencies	Channel A: 2.08 MHz Channel B: 2.54 MHz
Infrared Wavelength	850 nm
Modulation	FM wide-band
De-emphasis	50 μS
Frequency Response	50Hz - 15KHz
S/N Ratio	>65dB
THD	1%@1KHz
Nominal Deviation	\pm10KHz
Maximum Deviation	\pm25KHz
Line Input Level	1V / 1KΩ
Line Output Level	2.5V / 47KΩ
Line Output Mode	3.5mm mini jack
External Sensor Input	Two (RCA)
External Speaker Output	10W / 4Ω
External Speaker Connection	Two Terminal Phoenix
Amplifier Output Power	30 Watts
Power Supply	15V / 2.3A (34.5 watt)
Size	6$\frac{1}{4}$" W x 14" H x 4$\frac{3}{4}$" D
Weight	4 lbs.

IRB - 30 BODY-PACK TRANSMITTER

Transmission Carrier	Infrared Ray
Carrier Frequency	Channel A: 2.08 MHz (field switchable) Channel B: 2.54 MHz
Modulation	FM wide-band
Pilotone Frequency	32.768KHZ
IR Wavelength	850 nm
Peak Deviation	\pm25KHz
No. of Emitting Diodes	Ten
Compander Circuit	Yes
Pre-emphasis	50μS
IR Emitter Location	Built-in
Transmission Angle	360$^\circ$
IR Power Output	High - Low Selectable
Current Consumption	Hi - 400ma Lo - 330 ma
Range	Hi about 30 yds. Lo about 20 yds
Microphone Input	3.5mm jack, Lo-z
Battery	Two Rechargeable NiMH, 1.2v / 2300mAh
Battery Life	Approximately 7 Hours
Dimensions	4$\frac{3}{8}$" H x 2$\frac{5}{8}$" W x $\frac{3}{4}$" D
Weight	4.8 oz. (with batteries)

IRH - 30 HANDHELD TRANSMITTER

Transmission Carrier	Infrared Ray
Carrier Frequency (switchable)	Channel A: 2.08 MHz Channel B: 2.54 MHz
Modulation	FM wide-band
Pilotone Frequency	32.768KHZ
IR Wavelength	850 nm
Peak Deviation	±25KHz
No. of Emitting Diodes	Ten
Compander Circuit	Yes
Pre-emphasis	50µS
IR Emitter Location	Built-in
Transmission Angle	360°
Current Consumption	330ma
Microphone Element	Unidirectional, Dynamic
Battery	Two Rechargeable NiMH, 1.2v / 2300mAH
Battery Life	Approximately 6 Hours
Housing	Aluminum
Dimensions	10" L x 1½" Dia.
Weight	11.4 oz. (with batteries)

BRC - 30 DROP- IN BATTERY CHARGER

Charging Slots	Two Handheld, Slots A & C Two Body-Pack, Slots B & 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	1.5 - 3Hr.
Power Supply	12VDC / 1.5A (Fuse protected)
Dimensions	6½" L x 3⅜" W x 1½" H
Weight	12.2 oz.

IWS-50 OPTIONAL: WALL SENSOR

Operating Frequency	2MHz - 2.6 MHz
Operating Range	6 - 8 Feet Line of Sight
Connection	RCA
Number IR Diodes	Ten
Reception Angle	120 Horizontal / 120 vertical
Power Indicator	Red LED
Dimensions	Oval - 2" x 3¼"
Weight	160 grams