

# UPC-21

Infrared Transmitter & Accessories

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# INSTRUCTION MANUAL



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### **One Year Limited Warranty**



USL, Inc. warrants that each product manufactured by it will be free from defects in material and workmanship under normal usage for a period of one (1) year after its purchase new from an authorized dealer. Our obligation under this warranty is limited to repairing or replacing any product or component which we are satisfied does not conform with the foregoing warranty and which is returned to our factory, freight paid, or serviced by one of our authorized contractors. The foregoing warranty is exclusive and in lieu of all other warranties, whether expressed or implied. Such warranty shall not apply to any product or component (A) repaired or altered by anyone other than USL, Inc. or an authorized service contractor; (B) tampered with or altered in any way or subjected to misuse, negligence or accident or (C) which has been improperly connected installed or adjusted other than in accordance with USL, Inc.'s instruction.

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## IMPORTANT SAFETY INSTRUCTIONS

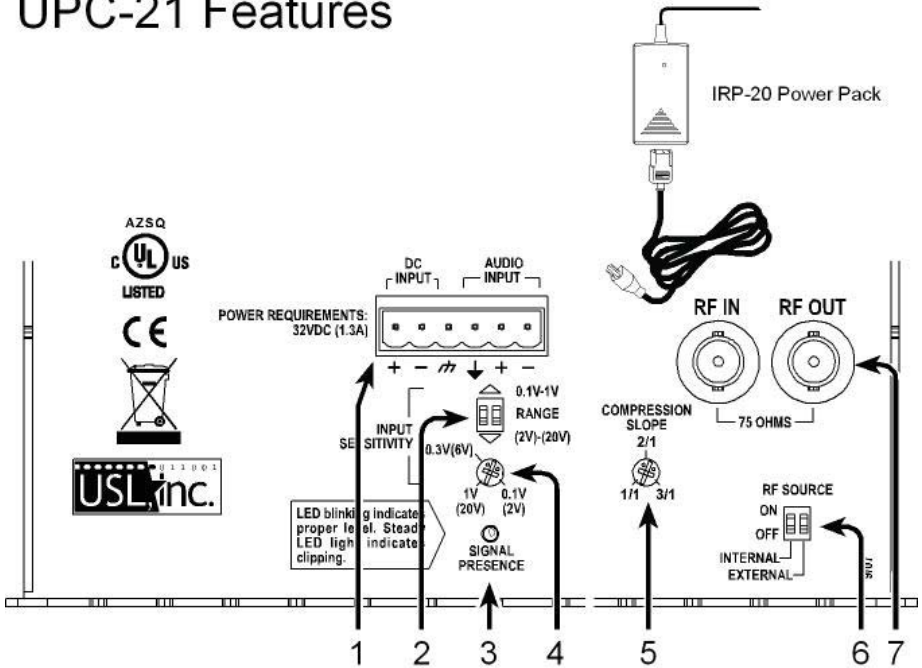
- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



### WARNING

To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

# UPC-21 Features



## 1. Main Connector; consisting of the following:

- a. **Pins 1 & 2:** DC Power Input Terminals.  
Connect the output leads of the USL supplied 32VDC power supply to pins 1 and 2. Connect the red wire to pin 1.
- b. **Pin 3:** AC Ground Terminal.  
This terminal may be connect to an earth ground connection if required by local building codes.
- c. **Pin 4:** Audio System Ground.  
Connect to the shield of shielded-pair input cable.
- d. **Pin 5 & 6:** Audio Input Terminals.  
Balanced, differential input. Connect the two wires of a shielded pair input cable to these terminals. If the source is unbalanced, connect one of the wires to the shield at the source end of the cable to minimize ground loop noise.

## 2. Input Range Selector.

With both switches in the upper position, the audio channel input level range is 0.1 to 1.0 Vrms. With both switches in the lower position, the input range is from 2 to 20 Vrms (suitable for speaker amplifier output levels).

## 3. Signal Presence Indicator.

Indicates proper audio level when light blinks at the peaks of the sound.

**4. Audio Input level Adjustment.**

Adjust input level so that only the peaks of the audio signal light the LED "Signal Presence" indicator. If the LED is on constantly, the audio level is too high and the channel is clipping.

**5. Compression Slope Adjustment.**

Adjusts compression from 1:1 to 3:1 with 2:1 at the approximate center of the range. Improves intelligibility of low level dialog.

**6. RF Source Switch.**

Selects source of IR RF modulation to be radiated by this emitter panel. The left switch feeds the local audio modulated RF to the emitter panel. The right switch connects the emitter panel to an external source, such as another IRC-21 located in another corner of the auditorium.

**7. RF Input and Output BNC Connectors.**

The RF Input connector accepts RF from another IRC-21 for radiation from this emitter panel. The RF output connector feeds the modulated RF output from this modulator to another panel.

## UPC-21 Installation

**Unpack the carton and verify that all materials are present.**

**There should be:**

- One system manual
- One IRC-21 Emitter Panel
- One IRP-20 32VDC Power Supply
- One Mounting Bracket composed of 1 ea. IRBS-20 & IRBE-20
- Two 10-32 x 5/8 machine screws for attaching the emitter panel to the mounting bracket.

**You will need to supply the following materials:**

- A small jeweler's type flat blade screwdriver or trim pot alignment tool for adjusting the input audio levels.
- A medium flat blade screwdriver for attaching the mounting bracket.
- Shielded, two conductor audio cable for connection of the IRC-21 to the program source.
- If the cord on the IRP-20 power supply is not long enough, you will need additional #18 AWG or larger two or three conductor cable to extend the DC output cable. If three conductor cable is used, the third conductor can make the safety ground connection
- Tools and hardware to attach the mounting bracket to the wall
- One IRH-501 or IRH-701 receiver.

## CONNECT THE AUDIO INPUT LINE

Connect the center channel speaker terminals to the + and - (ground) audio input terminals on the IRC-21 as in Fig C. If the center channel is bi-amped, you must construct a resistor network, as in Fig. D, that sums the high and low frequency signals, then feed the output of the network to the IRC-21 audio input. You also may connect the IRC-21 input to the output of a monitor or a processor.

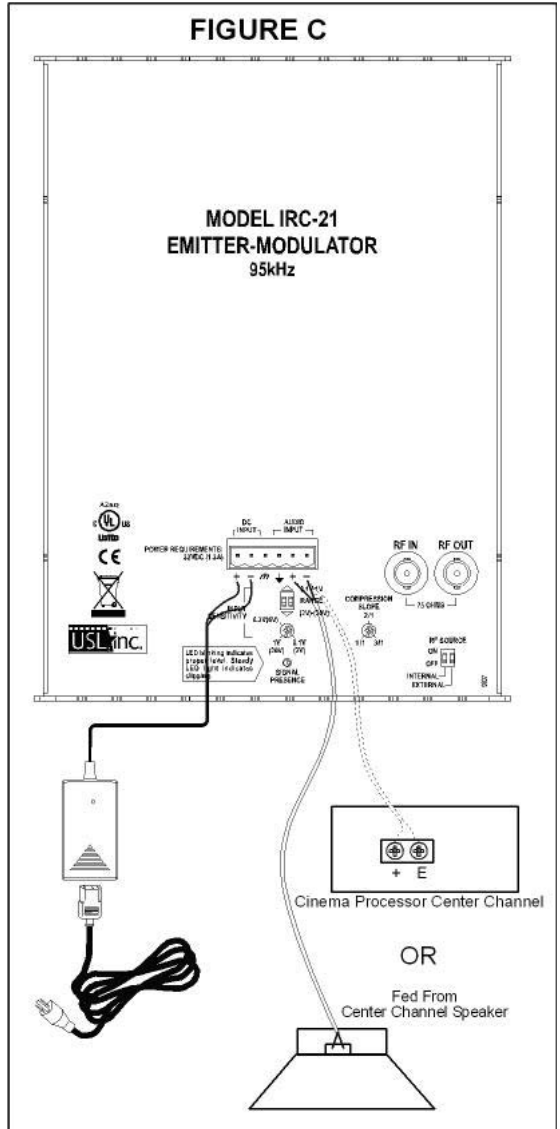
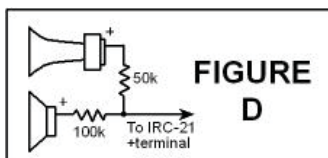
## CONNECT THE IRP-20 DC POWER PACK

Connect the provided IRP-20 DC power supply to the IRC-21 power input terminals (1 and 2). If the DC supply cable needs to be extended, refer to table 1 for suggested wire sizes. Make sure there are no loose wire strands at the terminals to avoid potential short circuits.

**⚠ DO NOT SHORT THE POWER SUPPLY!**

Connect the power supply to an AC outlet (100 - 240VAC, 50/60Hz) using the supplied or a standard IEC power cord.

TABLE 1		
Maximum lengths and suggested wire sizes (AWG) for a cable extending the DC power from the power supply to the IRC-21.		
60'	@	18 ga
100'	@	16 ga
150'	@	14 ga
200'	@	12 ga



## ➡ PRELIMINARY LEVEL SETTING

Run program material with HI audio. Set the compression slope to 2:1. Adjust the appropriate DIP switches and input level controls to cause the audio level LEDs to flash during normal programming, but not to stay lit continuously. Try listening on IR headphones. If necessary, adjust compression to bring up low levels or reduce noise.

***Note: The IRC-20 has an automatic shutoff circuit. The unit will shut itself off after a thirty-minute absence of audio input. When the audio resumes, the panel will switch on immediately.***

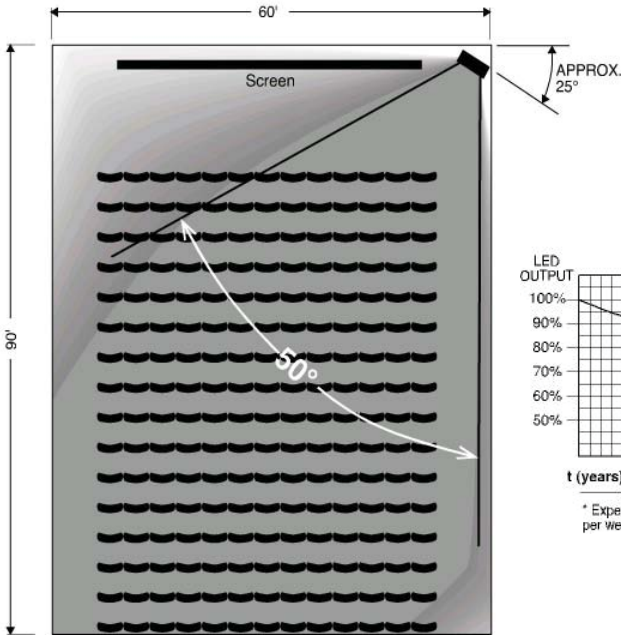
## ➡ Mounting the Emitter/Modulator at the front of the auditorium

(See Figures F and G) Attach the supplied mounting bracket to the wall surface and use the supplied screws to attach the bracket to the emitter. Allow free airflow around the emitter and be sure to have at least eight inches clearance from all surfaces, preferably more if at all possible. The rear panel is used as a heat sink and the heat must be allowed to dissipate. The unit should be mounted to the side of the screen/stage area, 12 to 15 feet above the audience's heads and pointed downward and into the seating area.

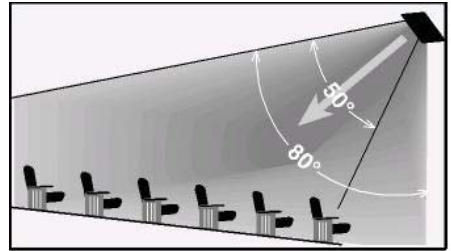
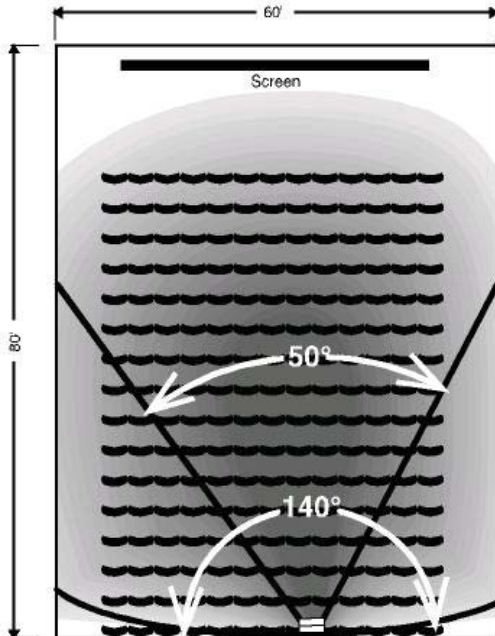
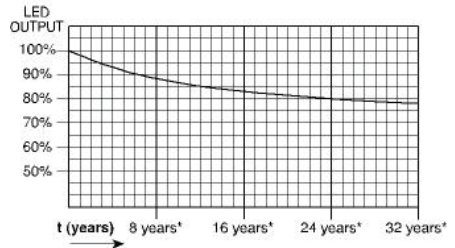
## ➡ Mounting the Emitter/Modulator at the rear of the auditorium

Attach the supplied mounting bracket to the wall surface and use the supplied screws to attach the bracket to the emitter. Allow free airflow around the emitter and be sure to have at least four inches clearance from all surfaces, preferably more. The rear panel is used as a heat sink and must be allowed to dissipate heat. The emitter will cover up to 5,500 square feet (60 x 84 feet). The emitter is typically mounted near the projector window. The panel should be "aimed" towards the screen. This typically results in the panel being vertical and parallel to the rear wall of the auditorium. Aiming the panel towards the screen provides additional auditorium coverage from screen reflection.

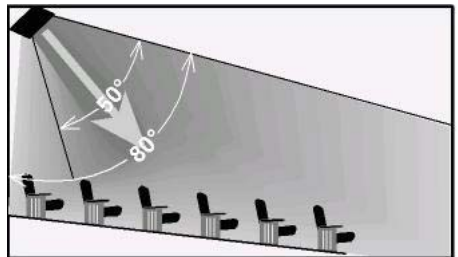
***CAUTION: The rear panel may get quite warm to the touch. This is normal.***



UPC-21 Emitter / Modulator System  
Infrared Diode Output versus Time



Front mounted emitter - side view

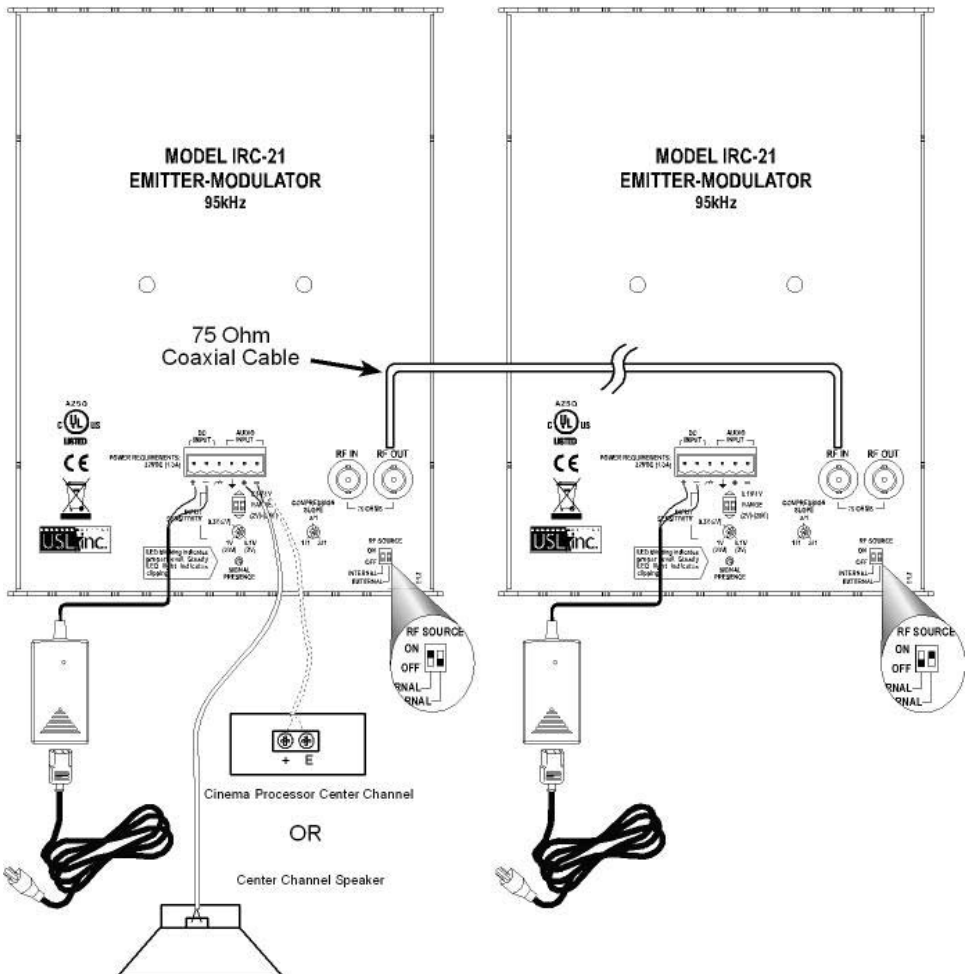


Rear mounted emitter - side view



## AN INSTALLATION USING TWO IRC-21S

Connect an IRP-20 DC power supply to each of the IRC-21s. Connect a 75 ohm coaxial cable from the RF OUT connector on the unit being driven with audio (the master) to the RF IN connector on the slave unit. Additional slave panels may be similarly cascaded from the first slave panel. On the master panel, turn on the internal RF Source switch, and turn off the external RF Source switch. On slave panels, turn on the external RF Source switch and turn off the internal RF source switch.



## FACTS ABOUT INFRARED TRANSMISSION SYSTEMS

The UPC-21 Infrared Transmission Systems use light emitting diodes frequency modulated at 95kHz, the international standard.

The modulated waves radiate from the emitter panels primarily in straight lines. Depending on the lightness of the wall color, some of this energy may be reflected and bounce around the room. Infrared energy does not penetrate walls. The modulated waves remain within the room where the emitter is placed. This feature makes it perfect for use in multiplex theatre units and for use in hotel and convention center meeting rooms and auditoriums. Additionally, this characteristic of infrared transmission makes it ideal for meetings requiring security of the signal.

USL, Inc. provides the following 95kHz headsets:

IRH-501 – an over-the-head receiver designed with a 360° pickup.

IRH-701 – an under-the-chin receiver with a 180° pickup.





Precision Sound • Light • Color

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