

### Minimizing Radio Frequency Interference (RFI)

---

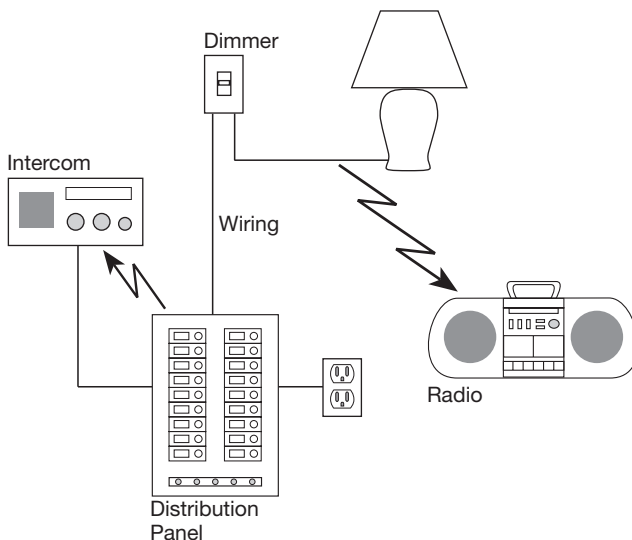
A solid-state dimmer is an electronic switch that rapidly turns the current on and off 120 times per second to achieve the dimming effect. This rapid current switching may cause radio frequency interference (RFI) — an audible buzzing noise — with sensitive audio and radio equipment. Although every Lutron® dimmer contains a filter to suppress RFI, applications with sensitive equipment may require additional filtering. Typical examples of RFI sensitive equipment are AM radios, stereo sound systems, broadcasting equipment, intercom systems, public address systems and wireless telephones. RFI can be transmitted in two ways:

- Radiated
- Conducted

#### Radiated RFI

All wiring that carries dimmer-controlled current can act as an antenna to radiate RFI into the air waves. Any sensitive equipment that is in close proximity to this wiring can pick up the RFI and generate noise into its system. Also, this could occur if the wiring for sensitive equipment runs along side the wiring for the dimmer.

#### Example of Radiated RFI



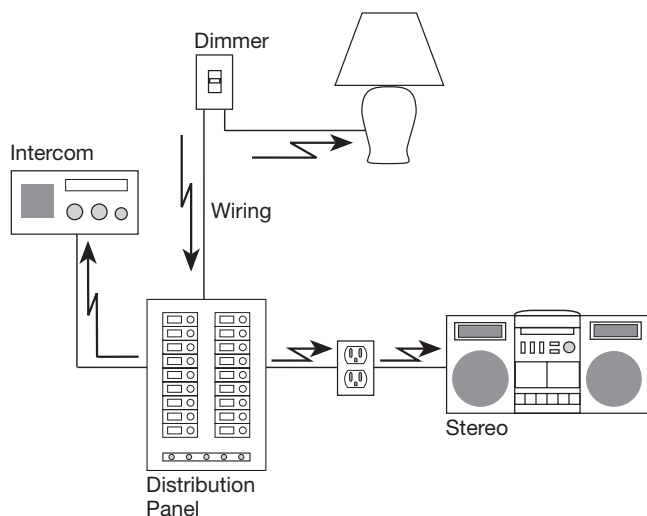
The following are three possible ways to minimize radiated RFI:

- Physically separate the RFI sensitive equipment from the dimmer and dimmer wiring.
- Run dimmer wiring separately in a metal conduit.
- To filter the RFI, use a lamp debuzzing coil (LDC) available from Lutron. See next page for more details.

## Conducted RFI

In some cases, RFI is conducted through the building wiring and directly into the AC power supply of the sensitive equipment.

### Example of Conducted RFI



## Recommendations

Lutron recommends the following methods to avoid RFI.

- Feed sensitive equipment from a circuit without a dimmer on it.
- Add a power-line filter to the sensitive equipment. (Power-line filters may be purchased at most electrical suppliers and distributors.)
- Use shielded wire for all microphones and input cables. Also, use low-impedance balanced microphone cables, because they are less susceptible to interference than high-impedance cables.
- Make sure all equipment is grounded. Connect all shields to ground at one point. Ground lighting fixture metal housings properly.
- To filter the RFI, use a lamp debuzzing coil (LDC) available from Lutron. Refer to the next page.

**Note:** The suggestions in this application note will help minimize RFI; however, they do not guarantee that RFI will be completely eliminated.

## Lamp Debuzzing Coils (LDCs)<sup>1</sup>

The most effective way to reduce RFI is to install an LDC into the lighting circuit. When an LDC is wired in series with the dimmer, it slows down the inrush of current during the rapid switching cycle of the dimmer. As the current inrush is slowed down, the effect of RFI on sensitive equipment is reduced.

Lutron has four LDC models available to help reduce RFI. The type of LDC required depends on the total wattage of the lighting load. Listed below are the model numbers and their respective capacities.

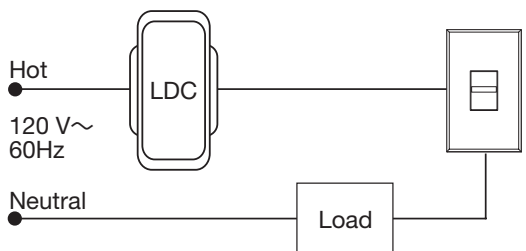
| Model       | Ratings    |
|-------------|------------|
| CPW0035     | 100—200 W  |
| CPW0036     | 200—400 W  |
| CPW0037     | 400—800 W  |
| CPW1346-OCP | 600—1200 W |

**Note:** For loads over 1200 W, call Lutron® Technical Support at 1.800.523.9466

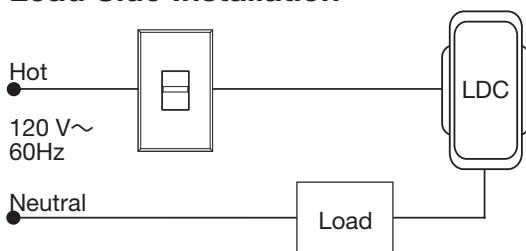
## LDC Installation

LDCs may be wired in series with the dimmer on the line side or load side. Each dimmer requires its own LDC. During normal operation, LDCs may make an audible buzz and, therefore, should be mounted in an area where the noise will not be objectionable (e.g., an electrical closet, a basement, or above a drop ceiling). LDCs are designed to easily mount onto a standard 4" x 4" junction box.

### Line Side Installation



### Load Side Installation



<sup>1</sup> LDCs are not to be used with reverse-phase dimmers

Lutron is a trademark of Lutron Electronics Co., Inc.

---

## **Lutron Contact Numbers**

### **WORLD HEADQUARTERS USA**

**Lutron Electronics Co., Inc.**  
**7200 Suter Road**  
**Coopersburg, PA 18036-1299**  
TEL: +1.610.282.3800  
FAX: +1.610.282.1243  
Toll-Free: 1.888.LUTRON1  
Technical Support: 1.800.523.9466  
intsales@lutron.com

### **EUROPEAN HEADQUARTERS United Kingdom**

**Lutron EA Ltd.**  
**6 Sovereign Close**  
**London, E1W 3JF United Kingdom**  
TEL: +44.(0)20.7702.0657  
FAX: +44.(0)20.7480.6899  
FREEPHONE (UK): 0800.282.107  
Technical Support: +44.(0)20.7680.4481  
lutronlondon@lutron.com

### **ASIAN HEADQUARTERS Singapore**

**Lutron GL Ltd.**  
**15 Hoe Chiang Road**  
**#07-03, Tower 15**  
**Singapore 089316**  
TEL: +65.6220.4666  
FAX: +65.6220.4333  
Technical Support: 800.120.4491  
lutronsea@lutron.com

### **North & South America Technical Hotlines**

**USA, Canada, Caribbean:**  
1.800.523.9466  
**Mexico:**  
+1.888.235.2910  
**Central/South America:**  
+1.610.282.6701

### **Asia Technical Hotlines**

Northern China: 10.800.712.1536  
Southern China: 10.800.120.1536  
Hong Kong: 800.901.849  
Indonesia: 001.803.011.3994  
Japan: +81.3.5575.8411  
Macau: 0800.401  
Taiwan: 00.801.137.737  
Thailand: 001.800.120.665853  
Other Countries: +65.6220.4666