

G2-1-1

QUIETNESS FLOODESIGHT LAMP INTERFERENCE

Occasionally, you find irritating noise elements in a house sometimes dubbed the "hiss bridges" of radio mainly because they sound like the pop, crackle and pop of the breakfast cereal. However, if you do not want to share your cereal's sounds with your radio, then this article is for you.

The noise is actually heard to goodness radio interference by big as life radio waves coming from the lamp itself.

The waves are generated by a very "fry" are which occurs when electrical circuits are made or broken. The noise heard is usually of two types. First of all, there is the sharp crackling noise heard at starting. This noise is typical of any circuit and this we can ignore. The second noise is the steady buzz heard when the lamp is in operation. The buzz reaches your radio and hi-fi gear in one of three ways:

- (1) It can be radiated either directly from the lamp or indirectly by bounce from a nearby metallic object.
- (2) It can be radiated by the a.c. line supplying the lamp.
- (3) It can be conducted along the a.c. line to your equipment power plug.

Radiation over 15 feet is very unusual and doesn't concern us here, except when a very weak station is trying to be heard. Eventually though, the annoying buzz can overcome anybody's patience.

The first step in the removal of the noise is to determine where it is coming from. This can be accomplished by turning off all the lamps in the house and then systematically turning on the individual lamps.

After you have located the culprit, should be eliminated at the crime source or the radio itself. Ideally, interference should be eliminated at the source but since this is not always possible let's try an easier approach.

- (1) Reverse the plug of the radio if possible and if this doesn't help, try outside, the plug at the lamp. Do one, but not both.
- (2) Remove the bulb and rotate it 180° or swap it end for end. However, this may only give temporary relief.
- (3) Install a new bulb since older ones are more likely to be noisy.
- (4) Try moving either the radio or the lamp or both. You might find that even moving them a few feet will make a dramatic difference.

If when you swap out the antenna to ground, the noise stops, then the interference is probably being radiated over space.

If you determine that the noise is of the radiated type then we can approach this problem as follows:

- (1) Shorten the a.c. cord minimizing the antenna action of these cords.
- (2) Make sure any metal wires are installed properly.
- (3) Try an outside antenna if one isn't used already.
- (4) Ground each piece of hi-fi gear to a heavy duty water pipe, but make sure that they are only connected together at the water pipe itself.

If, after attempting to quiet all the noise by the above methods, the noise still persists, there is still one other possible remedy.

Obviously the noise is being conducted along the a.c. line and this type of noise might be eliminated by the following:

- (1) Plug the affected equipment into separate a.c. outlets which would take advantage of the minimizing effect of the longer a.c. path.
- (2) Check for open line filter capacitors in the radio or amplifier. To avoid the possibility of a shock, when replacing the capacitor, keep it at about 0.02 u.f. 5000 volts.

The lamp itself might present loose contacts which would also cause noise. Also check for grounding. Make sure the lamp is grounded. Don't confuse, however, the audible buzzing with the r.f. interference. These are two different animals.

I would like to offer my bit to some who are "weeping" and gnashing their teeth over interference of the man-made nature. I do not pretend to know all the answers. To Nick Hall-Patch and others with sewing machine interference and small fractional H.P. motor caused radiation, I will say that the cheap \$1 and \$2 condenser type suppressors will not be adequate. The effective type contains inductors and is rather costly and not stocked by many radio and TV distributors for that reason. I looked in five national catalogues and all had the ineffective kind except one company. I will suggest Cornell-Dubilier "Quietone" type IP-18 or IP-19 and Hallory 28 which are plug-in types. This device must be used at the motor. They cost net around \$5. They may need grounding to the machine and in severe cases earth ground helps. I have found that one must use some tact in telling the person who has the noise producing device. It's like telling a man about his barking dog. Some people are easily offended, so go easy as you need their co-operation. I would loan the device. Some cities have an ordinance on electrical interference and it would pay

to find out. Some can force the non-co-operating person to allow it to be suppressed and the bill charged to them with their taxes. TV interference requires work on the set, in most cases. A line filter can help some but in severe cases the chassis radiates directly. Sets with steel case may need aluminum foil on inside of back with holes punched in it for ventilation. Most sets have line-by-pass capacitors where the cheaper plugs in. Lightning sometimes blows these and causes the set to radiate. Underwriters Lab. specifies they be 600 volt rating at least and non-burning type. Ceramic disc type will be very satisfactory. The capacity is 0.1 in most sets. In some sets with power transformer where one side of AC line has a resistor to ground and the other side condenser to ground the condenser capacity value is critical or set will radiate. This is true of 1955 CBS TV sets and experimentation with a couple of different capacity values can cut radiation. The CBS sets were made with wrong value. Wood cabinet sets will need foil inside of cabinet with back foil all grounded to chassis as well as screen wire on bottom of set. Make sure aqua-dag coating on picture tube is grounded for sets with glass tubes. The yoke leads can be shielded but shielding needs to be kept away from them about a half inch with adequate insulation as shorts will develop. I see that many are bothered with TVI and also high line interference. I have helped utility companies with this problem and usually they are not so hard to stop if the spot can be found where it originates. Larry Schwartz of San Diego: Hi. We are both Larry and chemists, although after getting a degree I didn't follow it up but took further schooling in electronics. I am surprised your noise has not been eliminated being the lamp causing it is located. Wish I could be on the location with your company to see the set up. Sounds like a thermal leakage to ground. The leak is usually by ground wire, guy or metal pole to ground. The cool of night and coolness of winter and contraction takes place and humidity is greater and leakage takes place. Cut off blocks and a damaged lightning arrester I have seen do this. A wood power pipe where the primary makes a tee or goes in four directions and the cross arm braces touch a brace wire or ground wire and the voltage induced in the cross arm braces jumps to ground. Tightening the cross arm bolt can stop it. Hope this may help you and others too. Remember that only company men --- properly equipped --- work with this stuff should you get any ideas.

Lawrence H. Foster