



**Government
of Canada**

Department of Communications

TRC - 36

TELECOMMUNICATIONS REGULATION CIRCULAR

**SUPPRESSION OF INDUCTIVE INTERFERENCE
FROM FLUORESCENT LIGHTING**

**MARCH 31, 1977
(REPLACES S11-10-42 OF AUGUST 1, 1971)**

TELECOMMUNICATION REGULATORY SERVICE

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SUPPRESSION OF INDUCTIVE INTERFERENCEFROM FLUORESCENT LIGHTING

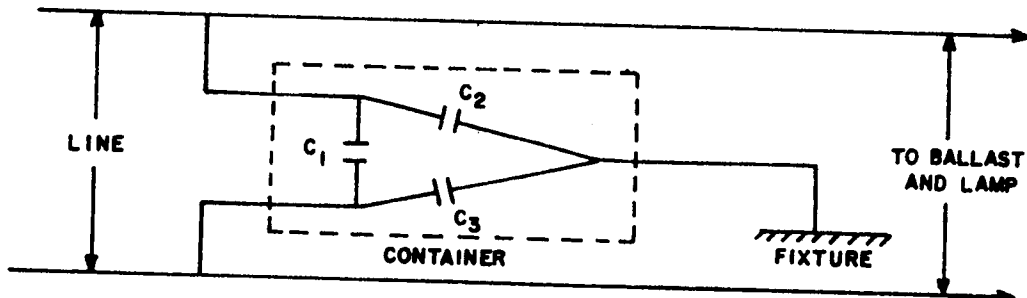
1. Fluorescent lights have long been known as a potent cause of radio interference. Fortunately in the early days most installations were in industrial areas where the general noise level was high and radio owners few. Nowadays suppression of fluorescent fixtures is necessary for proper radio reception. Only in rare cases is the television affected.
2. It is of prime importance that all parts of the lighting system be operating properly and any defective parts be replaced. For example, flashing bulbs should be left off until replacement is made. All bulb contacts should be examined carefully to ensure that the contact is firm and that no arcing takes place. Interference from fluorescent lighting may at times be very erratic and repeated checks are necessary before it may be considered that any particular installation is interference-free.
3. The radio interference from fluorescent lighting may reach the radio in any or all of the following ways:
 - (a) Direct radiation from the bulb to the radio antenna circuit;
 - (b) Direct radiation from the lamp supply line, fixture, etc., to the radio antenna circuit,
 - (c) Line feedback from the lamp through common service wiring to the receiver.
4. The method to be used to suppress radio interference depends upon the path it takes in reaching the radio:
 - (a) Bulb Radiation
 - (i) The receiver antenna should, if possible, be outside the bulb radiation range (about 3 metres). For sets with built-in antenna, an external antenna may be necessary and is generally helpful.
 - (ii) Use a shielded lead-in or a doublet or similar type antenna with twisted-pair leads.
 - (iii) Provide a good r.f. ground for the radio.
 - (iv) A metal screen, bonded to the reflector unit, may be necessary in bench-type fluorescent fixtures, as for example in radio service shops.

(b) Line Radiation

- (i) The effective field of line radiation corresponds roughly to that of bulb radiation and proper application of the precautions regarding bulb radiation will serve to deal with this source of interference as well. The electrical disturbance may, however, be conducted for a considerable distance and may be radiated at many points, near or far.

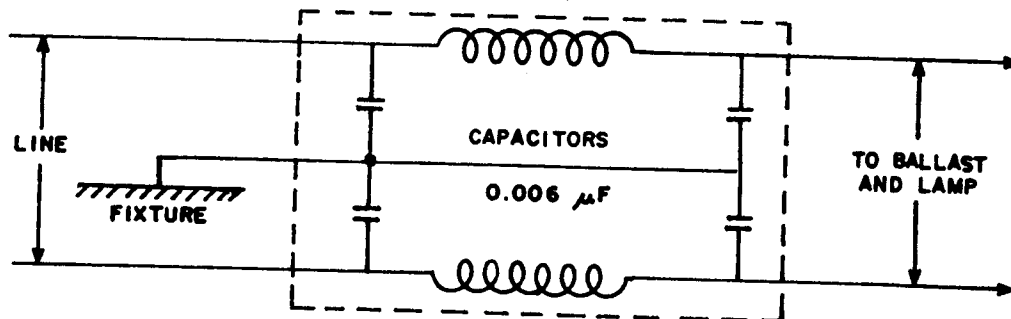
(c) Line Feedback

- (i) The interference reaching the radio via this path must be suppressed at the point of origin and by-passed to ground.
- (ii) Experience has shown that best results are obtained if each fixture is individually suppressed.
- (iii) The simplest form of filter is the 3-section capacitor.



For BX cable, all capacitors are approximately $0.07 \mu\text{F}$; for open wiring C_1 is $0.02 \mu\text{F}$ and C_2 and C_3 are $0.002 \mu\text{F}$.

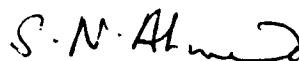
- (iv) If a high order of elimination of line noise is desirable an inductor - capacitor type of filter may be necessary.



- (v) In many cases a split capacitor of $0.1 \mu\text{F}$ capacitance for each section may be connected at the entrance to the fixture, with the centre point connected to the fixture and the other two leads to the lines. This may be found to give adequate suppression.

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- (vi) Where only one or two radios are located near a fluorescent installation and the antenna circuit has been properly shielded from bulb and line radiation, a single line filter located at the radio power outlet will usually suffice.
 - (vii) Where radios located in buildings adjoining the fluorescent lighting installation are receiving line feedback it is practical to install a single filter at each panel box feeding the fluorescent lamp circuits.
5. All suppressors must be approved under the Canadian Electrical Code. Care must also be taken that the capacitor ratings are suitable for the particular voltage of the circuit to which they are applied.
 6. Where the usual methods of interference elimination fail, the Department will be pleased to advise special methods on receipt of a complete description of the interfering apparatus.



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