

## Suppression devices

### Intended radiators

For intended radiators we have indicated the attention to good engineering practices will prevent and eliminate sources of interference. Even radio frequency 'intentional radiators' like ISM (industrial scientific and medical) equipment are required to be in the appropriate place in the spectrum.

### Unintended radiators

For unintended radiators considerable material has been produced on suppressing interfering equipment and this may be accessed in numerous articles and text books.

The following process and considerations should be noted when suppressing these devices.

1. Before fitting filters determine that the installation has not developed a fault condition, and that it has been installed using sound practices. Instability often occurs where correct practices are not followed e.g. RF distribution systems act like random transmitting aerials where correct matching is not employed through out.
  2. For the product in question check with the supplier / manufacturer as they may have custom suppression available or know the fix already.
  3. In the majority of product cases a filter made from RF rated inductive and capacitive components may be employed. The secret is to select the components of the correct value and performance and fit them in the correct place e.g. for brush feed commentator motors the components should be attached directly to the brushes with short pigtailed.
  4. Fitting filters away from the exact source of the noise is usually ineffective due to radiation from the wiring between the interference source and the filter.
  5. Low frequency interference will require higher value inductors and capacitors. Note that these components will likely be ineffective at high frequencies due to capacitive and inductive reactance which is as a result of their size.
  6. Filters and filter components are available in New Zealand. See your equipment supplier for information on these.
  7. Some products are difficult to suppress i.e. thyristor controlled devices and microprocessors controlled devices as it is often difficult to get close to the sources of the interference. Suppression may also affect the operation of the device so it is suggested you check with the supplier before proceeding. Caution!, electrical safety may also be compromised.
  8. Attention to earthing and screening when considering suppression of devices capable of being contained in a metal housing is recommended.
  9. RF sources often have a low impedance thus any filtering must be designed with this characteristic impedance in mind. A capacitor alone will not usually be sufficient.
- Even the most innocent of devices may be a major source of interference. For Example; Radio Spectrum Management dealt with an interfering 121.5 MHz signal, blocking the 121.5 Emergency Locator beacon receivers aboard satellites some 300 miles above us.

The source was a cumulative one, traced to tens of thousands of satellite receivers used in New Zealand (these receivers have a 121.5MHz oscillator on the mother board).

Awareness of the need for suppression and suppression techniques is important.