



# BARRETT 2050

Advanced HF SSB Transceiver

## BCA20008/BCA90017 Interference Suppression Kit

### 1. General

Satisfactory suppression cannot be achieved if faults exist in the vehicle/vessel to be suppressed. Cracked distributor caps, worn commutators or burnt contacts may not yet be seriously degrading vehicle performance but will generate very high radio frequency noise levels. Before attempting to suppress noise, problems described above should be sought out and rectified.

### 2. Ignition Systems

Audible as a 'popping' noise - frequency varies with engine speed.

#### 2.1 High Tension

High tension wiring should be of the impregnated neoprene type. Suppression cables using graphite powder in a paper core are not reliable. If necessary replace with a suitable set of suppression cables recommended for the vehicle. All high tension wiring should be separated from any other wiring and should be placed as close to the metal block of the motor as practical to reduce radiation of any RF noise.

#### 2.2 Low Tension

Ensure that the wire from the distributor points to the ignition coil is as short as possible and that it is not loomed together with any other cables. If the wire length exceeds 200mm it should be replaced by a screened wire. This may be coaxial cable with the shield connected to ground or simply consist of a twisted pair of wires, one used for the distribution/coil connection and the other earthed at both ends. Keep all wiring as short as possible.

In some cases the wiring from battery to coil may require suppression. In this case use the FI-07630 noise filter supplied in this kit.

### 3. Battery Charging Systems

#### 3.1 Alternator or generator

Audible as a whine - frequency dependant on engine speed.

Fit an FI-07630 noise filter as supplied in this kit in series with the main charging output of the alternator. If a satisfactory earth point cannot be found on or immediately adjacent to the alternator then the alternator/filter connection should be screened as in section 2.2 above.

Generators are treated in the same way as alternators.

## 3.2 Charge regulator

Audible as a 'sizzling' noise above engine idle speed. The alternator/regulator control ('field') wire should be removed from any other wiring by replacing with screened wire as in section 2.2 above. Capacitors should not be connected between this wire and ground as they may damage the regulator.

## 4. Instrumentation

Some vehicles use thermal chopping regulators and/or sensors within their instrument systems. These may be heard as a noise similar to the charge regulator which starts 5 to 20 seconds after the engine is started. This can be suppressed using capacitors on the supply side and screening on the switched side of the device.

## 5. Accessories

Windscreen wipers, fans and all other electrical accessories should be checked to ensure they do not contribute RF noise. They can be suppressed using FI-07631 filters or capacitors and the installation method given in the FI-07631 application note.

## 6. Bonding

All metal objects on a vehicle/vessel should be bonded to one common earth with reliable connections. Ensure that the body of a vehicle is connected to chassis bypassing rubber mounts.

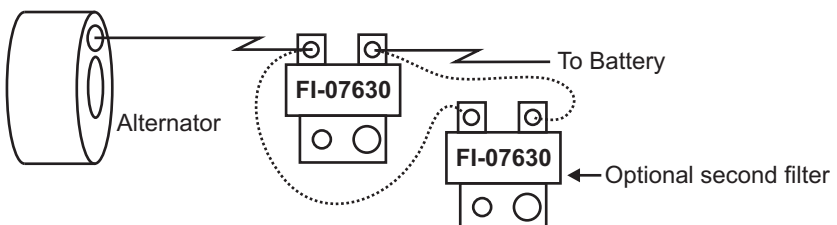
Heavy duty earth straps and copper braid are supplied for this purpose.

## FI-07630 Alternator noise filter Application Notes

Alternators can produce substantial amounts of noise that interferes with HF transceivers. The interference varies in pitch with engine speed, and it may be readily distinguished from the rough buzz of normal petrol engine ignition noise.

The FI-07630 filter is specifically designed to control alternator or generator radio frequency interference. It is a pi-type LC filter using self-fusing metalised-film capacitors and solid epoxy incapsulation for reliable service in the severest auto or marine environment. Each will handle up to 60 amps continuously. Filters may be paralleled to handle higher currents.

### Installation



Find a point on the alternator or within 200mm of it on the engine where the filter can be mounted. Orientate the filter to allow access to its terminals after it is mounted. Carefully clean any paint or scale around the mounting area so as to assure good electrical contact between the filter case and the alternator case or engine block. Mount the filter.

**Disconnect the negative terminal of the battery.** Locate the heavy positive (red) output lead from the alternator. Cut this wire where it runs near the filter. Strip the insulation back by about 10mm, crimp and solder suitable ring lugs and secure to the filter terminals. **Reconnect the battery.**  
NOT WARRANTED OR FAA-EVALUATED FOR USE ON AIRCRAFT

## FI-07631 Electrical accessory filter Application Notes

Noise from accessories such as small DC motors used for bait pumps, fuel pumps, bilge pumps, windshield wipers, electric heads and the like can also interfere with HF radio systems. These sources of the noise are easily identified by turning the accessories involved on and off while listening to the HF transceiver. The interference will sound much like the motor itself.

Motors - Fig. 1 shows the FI-07631 filter installed to suppress a small DC motor. The filter base plate is mounted to the motor frame or mounting plate. Paint or scale must be cleaned away in order to provide a good electrical contact between the filter and the motor frame. Where the two motor wires (+ and -) pass near the filter, carefully strip off about 10mm of the insulation and secure the bared wire under a filter terminal screw. Be sure each wire runs from the motor to a filter terminal and then continues from that filter terminal to the battery.

Voltage regulators - older mechanical type voltage regulator used with both generators and alternators generates substantial radio interference. This type usually has a removable sheet-metal case whereas the solid-state type is most often encapsulated in a smaller metal case. The interference sounds like an intermittent frying noise, and it will change in nature and severity as the battery is brought to full charge.

Most of the new solid-state transistorised voltage regulators used with alternators do not produce objectionable radio interference. The few that do are treated the same as the mechanical types.

### Installation

Fig. 1

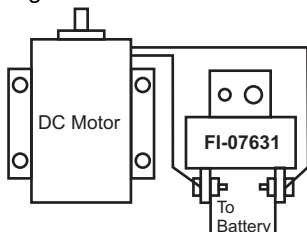
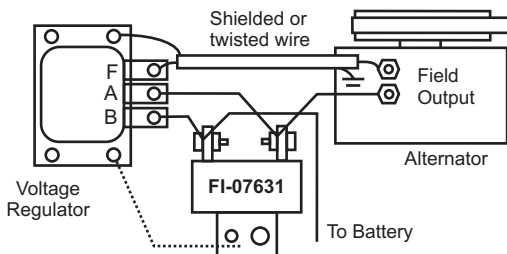


Fig. 2



Mount the FI-07631 filter on the regulator frame itself as indicted in Fig. 2, cleaning away any paint or scale so as to assure a good electrical contact to the filter case. Where each of the wires from the regulator except the field wire passes near the filter, strip the insulation from 10mm or so and secure the wire to a filter terminal screw.

Field wire - the wire connecting the alternator or generator field to the regulator should not be connected to a filter as above. Shielded wire may be substituted for a single conductor, grounding the shield at both ends. Alternatively, a second wire can act as a shield if it is twisted around the field wire (perhaps one turn per 25mm) and grounded at both ends.

#### **INTERFERENCE SUPPRESSION KIT CONTAINS:**

<b>ITEM</b>	<b>QTY</b>	<b>DESCRIPTION</b>	<b>BARRETT P/N</b>
1	1	Noise Filter FI-07630	FI-07630
2	1	Noise Filter FI-07631	FI-07631
3	1	Earth Strap	PO-07633
4	1m	Earth Cable	CA-06518
5	4	8mm Terminal Lugs	CN-07640
6	4	10mm Terminal Lugs	CN-07641
7	4	Capacitors	CP-01515
8	1	Suppressor	NB-04563
9	1	Clamp	NB-04565