

AFI 5030

ANTENNA FEEDER ISOLATOR

The **AFI 5030** is a receiver antenna feeder isolator that reduces noise by isolating the antenna feeder from the receiver/mains earth. The AFI 5030 solves the problem of noise being coupled to the antenna/feeder due to Mains borne interference. The AFI 5030 is most effective when used with Longwire type antennas and "Longwire Baluns".

AFI 5030 FEATURES

- **High isolation, reduces Mains borne noise in the antenna return path**
- **Reduces Mains borne noise from being radiated by the antenna feeder to the antenna**
- **40dB typical noise rejection at low frequencies**
- **Can be used with active antennas**
- **Frequency range 50kHz to 30 MHz**
- **BNC connectors, rugged construction**
- **50 ohm input and output impedance**
- **Static discharge path to earth**
- **Terminal for a separate earth**

MAINS BORNE INTERFERENCE

Interference from the Mains Supply is becoming a problem with the increased use of TVs, computers and other electronic equipments. This interference is likely to get worse, because of the greater use of electronic equipment. Also the European EMC directives do not give much protection to users of the HF bands. Mains borne interference appears at the receiver in two ways:-

1) Noise from Mains wiring and cabling connected to the Mains Earth, such as **antenna feeders**, radiating noise directly to the receiver's antenna.

2) Interference due to the receiver/mains earth being the return path of the antenna. This interference current is in series with the antenna and it is usually more of a problem with unbalanced or Longwire antennas.

This interference problem is sometimes difficult to understand. It is easy to assume that because the interference disappears when the antenna is disconnected, then the problem is not mains borne. However this is not the case, because by disconnecting the antenna there is no return path for the mains borne noise to enter the receiver. The use of a commercial Mains filter for the radio receiver does not usually solve the problem.

Most Mains filters simply decouple the Live and Neutral noise to the Mains Earth and generally no filtering is provided for the Earth line. Therefore the filter has little effect in reducing noise.

In most domestic wiring installations, the Earth cabling is run with noisy Live and Neutral wires and the earth impedance is too high at HF frequencies to be effective in reducing noise.

Also the current practice of bonding all fixed pipe and metal work to the Mains Earth can increase the Mains noise radiation.

AFI 5030 DESIGN

The origin of isolating the antenna feeder's earth return or counterpoise, goes back to the earliest days of radio. It was common practice with valve communications receivers to isolate the earth side of the antenna coils in the RF section. This allowed the use of a balanced or doublet antenna and provided a low noise earth return path for a Longwire antenna.

Sadly this feature is omitted from many of today's radios. The AFI 5030 is based on the same front end design principle, except that the antenna feeder earth isolation is performed by using a special wide band transformer with the earth side of the input connected to a separate earth. This isolator also has high isolation when used without a separate earth and still provides a static discharge path to the receiver's/mains earth. This is an essential feature where it is not possible for the user to provide a separate earth.

AFI 5030 INSTALLATION

The AFI 5030 should be connected at the junction of the antenna feeder cable and the radio receiver. A short wire (2.5mm²) from the noise free earth should be connected to the Earth Terminal of the AFI 5030. The antenna feeder must be mated to the BNC connector at the same end as the Earth Terminal. When using a long wire antenna, an impedance matching "Balun" should be used, with coaxial feeder to AFI 5030 and the receiver.

The separate earth should be provided by driving a 4ft copper earth rod into wet ground away from buried Gas mains, Electricity cables and other utilities.

WARNING: 1) Under no circumstances must a transmitter/transceiver be applied to the AFI 5030 or any dc. voltage

Note: 1) The AFI 5030 will not reduce noise that is being picked up directly by the antenna.

2) In some cases the power supply of an active antenna may reduce the isolation.

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