

Sources of TV/Radio ElectroMagnetic Interference (EMI)

Application Note
976-0164-10-01 Rev A

Our portable inverters use a 120 kHz switchmode converter to convert low-voltage input power to high-voltage output power. This circuit can produce ElectroMagnetic Interference (EMI), which is composed of higher order harmonic frequencies from 120 kHz up to about 20 MHz (with decreasing amplitude). EMI can be conducted along the DC battery lines or picked up by the TV's antenna, resulting in picture noise "lines," or into the radio, resulting in static. A TV's susceptibility to EMI does vary from model to model as TVs have differing abilities to reject/discriminate against EMI noise. EMI is often installation specific, therefore one solution (filter or installation method) may not work effectively in all situations. The two main forms of EMI are as follows:

- a) Transmitted EMI or through the air (inverter to antenna) can be minimized by a distance of at least 6 ft (2 m) between inverter and TV/Radio. Off-air distant stations may be noisier than nearby stations with stronger signals due to the TV/Radio's AGC circuit greatly amplifying a faint signal along with the EMI (electronic noise).
- b) Conducted EMI is when the high frequency noise travels along the DC lines to the DC-powered TV/Radio. In this case you can add a DC EMI filter module to reduce the noise. An inexpensive RF choke in the DC power line going directly to the TV may be sufficient. Such devices are often available at 2-way radio specialty stores for under \$15. A DC EMI filter module costs less than \$50, and should be available locally. We do not make specific recommendations on these devices as results are dependent on the specific load's ability to filter EMI.

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