

ICE 7201

Multi-Radio Interference Cancellation System

Cobham Antenna Systems

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COBHAM



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RF Interference Cancellation

RF interference cancellation is one of the Integrated Communications Environment (ICE) technologies developed by Cobham to optimise the installed performance of multiple radios, jammers and intercom systems operating simultaneously on the same platform.

The Problem

The multi-radio interference problem arises when there are multiple transmitters/receivers operating in close proximity, typically with multiple antennas mounted on the same platform with limited separation. This can result in receiver saturation and the introduction of broadband noise in radio receivers. The combination of these effects reduces the sensitivity of radio equipment and can have a very significant adverse impact on the range of the radio system, degrading both operational effectiveness and safety.

In order to restore the receiver sensitivity to an acceptable operational level it is necessary to not only reduce the large 'off-channel' signal coupled into the receiver from the neighbouring transmitter, but also to decrease the 'on-channel' interference from the transmitter's noise sidebands.

The Solution

Cobham has developed an innovative RF interference cancellation technology offering a breakthrough in the level of sensitivity restoration which can be achieved in the receiving radios. This is realised by cancelling both the large transmit signal as well as the associated noise sidebands.

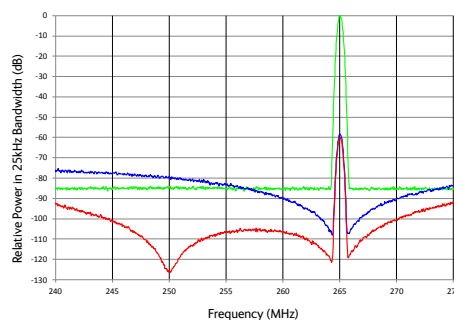
ICE 7201

Figure 1 shows typical results for ICE 7201 covering the band 240 MHz – 275 MHz, based on relative power levels.

The green trace in Figure 1 shows the main transmit signal centred at 265 MHz, with broadband noise of approximately -85 dBc (measured in a 25 kHz bandwidth). The receiver is heavily desensitised due to the large transmit signal being coupled into the receiver antenna.

ICE 7201 cancels the main transmit signal by -58 dB, resulting in a residual shown by the blue trace in Figure 1. The receiver radio is now no longer desensitised, but the receive channel is blocked by broadband transmitter noise.

ICE 7201 now inserts a null in the noise over the receive channel (which in this example is centred at 250 MHz) to further improve the receiver sensitivity. This results in the overall residual interference shown by the red trace in Figure 1. The depth of the null in this case is 40 dB, giving an additional improvement in radio sensitivity of 40 dB compared with the case when only the large transmit signal is cancelled.



▲ Figure 1: Cancellation of Main Transmit Signal at 265MHz and Transmitter Noise at 250MHz

Green - Main transmit signal centred at 265MHz with noise of approx -85dBc.

Blue - Transmit signal cancelled by 58dB.

Red - Null inserted, centred at 250MHz, in the noise over the receive channel.

ELECTRICAL SPECIFICATION

Configuration

2-radio RF interference cancellation system

Cancellation Frequency Range

30 – 512 MHz

Cancellation Performance

Main Transmit Signal: 60dB (Typical)

Noise Sidebands: 40dB (Typical)

Power

Working Voltage: 22 – 29 V DC

Power Rating: <18 W

VSWR 1.5:1

Input Impedance 50 ohm

RF Connectors

Antenna and Receiver: TNC Female

Transmit Sample: N Female

Alternative connector types may be requested



▲ ICE 7201 Multi-Radio Cancellation System removes Large Signal and Noise Interference

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