Overview of Jammer System Design

Introduction

The acronym “IED” stands for improvised explosive device. IED Jamming Systems are an emerging subset of the electronic warfare (EW) market. The objective is to create a relatively small, wideband communication jammer that would create a 30-500 meter jamming bubble around the vehicle or soldier. In the US, these devices fall under the umbrella of the JCREW (Joint Counter Radio-controlled-improvised-explosive-device Electronic Warfare) program. IED Jammers come in mounted, dismounted or man-pack versions. Man-packs account for perhaps as much as 60% of the total unit volume deployed. Mounted and dismounted jammers make up the rest of the deployed units. Frequencies are DC-500 MHz, 500-2500 MHz, and 2.5-6.0 GHz. Typical output power (at the antennas) can be between 20-50 Watts, however some of the newer man-pack systems may be 10W or less. Larger mounted systems can have RF power output over 2,000 Watts (military convoy jammers).

Jammer systems:

- Require maximum RF transmitted power in a broadband application.
- Are required to operate in harsh conditions and survive high VSWR.
- Need three critical parameters – gain, efficiency, and broadband performance – working together to produce an effective, long-lasting EW device.

As a result, the two main technologies for IED Jammer RF Power devices are LDMOS and GaN (Gallium Nitride). Engineering design trade-offs between these two competing technologies can be made based on the specific jammer application.

Background Information

An IED Jammer, commonly referred to as a Bomb Jammer™ (See Note 1, below), works in a similar capacity to other RF Jammers. They are essentially RF Transmitters tuned to the specific frequencies most commonly used for harmful or illegal activities including bomb triggers and activation. IED jammers are designed to transmit primarily on a variety of common commercial and military frequencies, primarily between 20 and 2500 MHz (with an additional band between 2.5-6.0 GHz). They also generally operate with output power between 10 and 500 watts. IED Jammers generally require much more sophisticated software than standard RF Jammers.

IED Jamming systems most commonly work to jam receiver devices at a range of 30-500 meters but in some cases have been capable of jamming up to 30 square miles.

IED Jamming systems typically broadcast their output power simultaneously over the most commonly used communication frequency bands, including cellular (CDMA, TDMA, GSM, etc.), satellite, walky-talky (VHF/UHF), and data networking frequency bands (WLAN, Wi-Fi, Bluetooth, etc.). The actual frequencies and specific methods used are, of course, classified.

Additional IED Jammer Information (Non-Classified)

There are numerous RF Jamming technologies in operation today, including Swept Continuous Wave (CW) Jamming, Intelligent Spot Jamming, and Barrage (Random Swept CW) Jamming. The most effective means in use today is the Barrage Jamming technique. For more information, please see: ***www.bombjammer.com/media/ppt/bombjammerpresentation.ppt*** (See Note 2, below)

Contact your local sales representative or learn more about Richardson RFPD online at www.richardsonrfpd.com.

Overview of Jammer System Design (cont.)

Notes

1. Bomb Jammer™ – is a trademark of Homeland Security Strategies GB (ALL RIGHTS RESERVED).
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Resources

Much of the information presented here was garnered from the various IED Jammer manufacturer websites:

www.bombjammer.com
www.sncorp.com
www.srcinc.com
www.thalesgroup.com

Additional information can be found at this Department of Defense website:***https://www.jieddo.dod.mil/defeat.aspx***.