Communications Simulation Range (ComSim)

Drumgrange has developed a range of Communication Simulation Training Solutions. ComSim is a radio frequency environment simulator used for the testing, demonstrating and training of military radios within the 1 MHz to 2.5 GHz frequency range. It is in use by Armed Forces and Radio Manufacturers.

The products are scalable from a simple 4 port attenuation matrix to a fully immersive 17 port collective training solution. ComSim replaces the 'live' RF link with physical links controlled by PC software. An operator or instructor controls the RF environment by either automatically or manually setting the attenuation level between individual radios. The Drumgrange developed terrain based software adjusts the attenuation levels by simulating relevant degradation in the quality of communications depending on range, weather conditions and terrain types.

Drumgrange can provide a highly versatile, bespoke communications training solution that allows for safe RF training in live, virtual or constructive environments across HF, VHF, UHF (L and S Band) frequency ranges up to 2.5GHz.

The ComSim product range includes:

ComSim
Drumgrange delivered a comprehensive collective training solution for UK MOD Bowman Radio users with the delivery of 20 classrooms each based on a ComSim 17 port Attenuation Matrix connecting 8 'live' vehicle training aids. The system allows users to be trained on real equipment in a terrain based virtual environment. Using scenario based exercises, trainees maximise their learning time without the need to physically move their training aids to prove communications.

Generic ComSim
Delivered to Radio Manufacturers, Generic ComSim is a RF Simulator that physically connects off the shelf radios through a 4 – 17 port attenuation matrix. Controlled by the ComSim PC software, it creates a safe RF environment to run controlled and repeatable scenarios for radio communication within a lab, office or field environment ideal for radio evaluation, testing and demonstration.

Extended Range Matrix (ERM)
New matrix that provides a frequency extension to the previous Comsim / Generic ComSim Capability up to 2.5 GHz.

Available fully supported or as a COTS delivery with no support after initial user training, the flexible nature of the software and the ease in which it can be easily changed to generate scenario based testing procedures with minimal training has resulted in the use of ComSim products across the spectrum of the development lifecycle.

INNOVATIVE SOLUTIONS FOR DEFENCE AND SECURITY
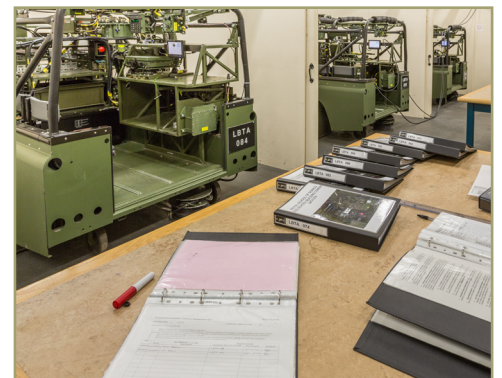
From use in labs by radio manufacturers for early product development and testing through to its application as an advanced training tool for the end user, typical applications Include:

- Test & Development – Allows Radio Manufacturers to test their radios in both a laboratory environment and in the field. Typically a 4 port matrix allowing 4 radios to be joined together.

- Demonstration – Allows Radio Manufacturers and Users to demonstrate & trial radio capabilities in a safe RF environment in the lab or in the field.

- Training – Allows the integration of live radio assets onto a representative platform, creating a training aid that also provides connectivity to others to create a collective training environment controlled through one instructor PC.

However it is used, the Drumgrange ComSim family of products should be the radio frequency training solution of 'choice' through the lifecycle of a radio system from in-house development and evaluation through to customer demonstration and user terrain and tactical training in a safe and realistic environment.

Matrix Specification

Description	Specification	Notes
Operating Frequency Range	1MHz to 30MHz 20MHz to 2.5 GHz	Continuous across frequency band.
RF Impedance	512MHz to 2.5GHz	
Number of ports for RF Attenuation Matrix	Up to 17	1 per radio
Maximum Input Power (Rack) Maximum Input Power (System)	1 Watt (30dBm) 50W (47dBm) with 20dB attenuators.	Fixed attenuators are provided to allow the system to work at the required maximum radio output power.
System Insertion Loss	35 to 41dB (nominal)	Insertion loss at the connectors to the equipment rack.
Additional Variable Attenuation Range	≥100dB in 1dB steps	
Attenuation Accuracy between Ports	≤ ±3dB ≤ ±2dB (typical) ≤ ±1 dB	For any port at any frequency. The attenuation accuracy for a repeated test.
System Isolation	> 160dB	Rack isolation is >120dB. With two 20dB fixed attenuators this gives end to end isolation of >160dB Noise Sources are included to improve the isolation between radios. Therefore two or more radios on the same frequency can be isolated from each other.
Programmable Noise Source	0 to ~30 dB	Level above a nominal radio detection threshold level, set per radio.

Min PC Specification

Windows PC or Laptop with the following minimum specification:
1.6Ghz processor, 2GB RAM, 512MB available disk space, 5400 RPM HD, 1280X1024 display,
100MB Network Adaptor
Window 7 Operating System
ESRI ArcGIS Run-time Engine V10.2.2