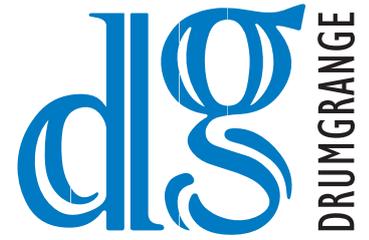


# Generic ComSim



RF Simulator allowing safe, controlled and repeatable scenarios for radio communication within an office or classroom environment.

Generic ComSim creates and manages a safe electromagnetic RF environment among the radios connected to it. The system allows an operator, using a PC, to control the RF environment by either automatically or manually setting the attenuation level between individual radios.

The simulator operates by having radios connected, via suitable attenuators, to an Attenuation Matrix. The control PC positions each radio location on a map or grid to simulate the separation between radios, the software then calculates the expected path loss between the radios and applies this level of attenuation between them based on an attenuation model. The radio operators can then be given various tasks to exercise the performance of the radios and the network in which they find themselves. These scenarios are repeatable and can be replayed as needed. The system can be used for radio evaluation and test or operator training.

## Scenario Preparation

- Create, amend, save and delete Scenarios
- Add, insert and delete Scenes within a Scenario
- Add and remove Assets (radios) from a Scene
- Change attributes of Scenes (Duration, Propagation Model)
- Change attributes of Assets (Transmission Frequency, Location, Antenna height above ground)
- Path Profile Analysis

## Scenario Control and Monitoring

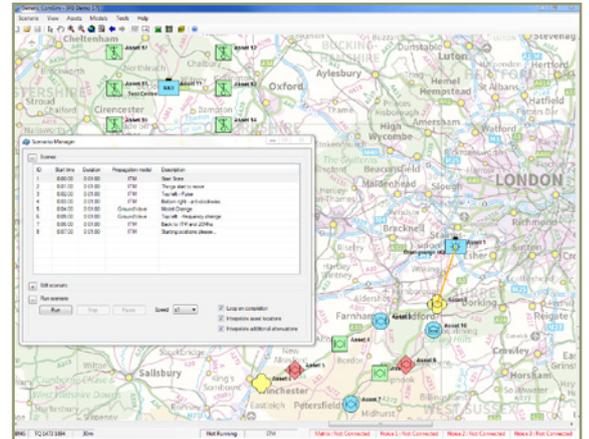
- Run, pause, stop and restart
- Run at various speeds
- Asset location and attenuation interpolation between Scenes
- Communication Status between all Assets

## Attenuation Models

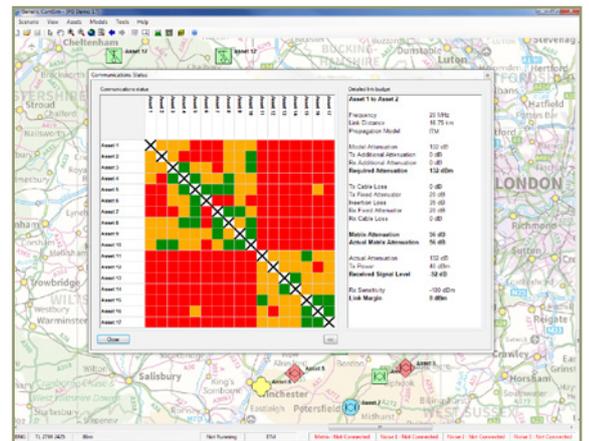
- Manual, ITM, Free Space Loss, EGLI,  $1/R^n$
- Traffic Light (Red, Amber, Green) to indicate the link status with user selectable thresholds
- Additional attenuation can be added to calculated values

## Mapping Facilities

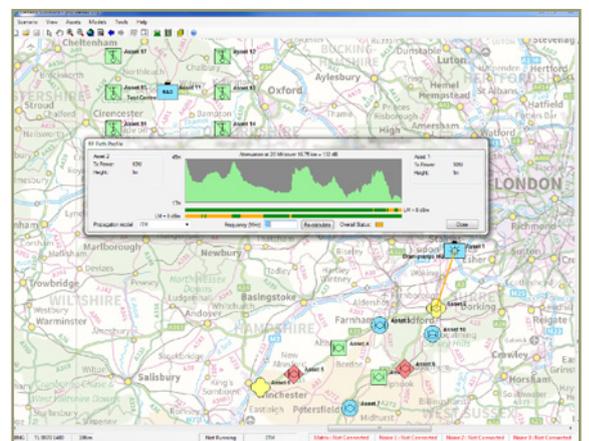
- ESRI MXD documents
- Grid layers (e.g. 1 km and 5km)
- Elevation layer for terrain profiles
- Asset Symbology including APP6A and MIL-STD-2525B
- Standard map pan and zoom facilities
- Lat/Long, MGRS, UTM and BNG co-ordinate systems
- Map layer control (toggle on/off, transparency)



Scenario Management



Communication Status



Path Profile Analysis

## Matrix Specification

| Description                               | Specification                         | Notes  |
|---|---------------------------------------|--|
| Operating Frequency Range                 | 1MHz to 30MHz<br>20MHz to 512MHz      | Continuous across frequency band.  |
| RF Impedance                              | 50Ω                                   |  |
| Number of ports for RF Attenuation Matrix | Up to 17                              | 1 per radio  |
| Maximum Input Power (Rack)                | 1 Watt (30dBm)                        | Fixed attenuators are provided to allow the system to work at the required maximum radio output power.   |
| Maximum Input Power (System)              | 50W (47dBm) with 20dB attenuators.    |  |
| System Insertion Loss                     | 35 to 41 dB (nominal)                 | Insertion loss at the connectors to the equipment rack.  |
| Additional Variable Attenuation Range     | ≥ 100dB in 1dB steps                  |  |
| Attenuation Accuracy between Ports        | ≤ ±3dB<br>≤ ±2dB (typical)<br>≤ ±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.  |



## 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  
 Windows XP or Window 7 Operating System  
 ESRI ArcGIS Run-time Engine V9.2

*“We design, develop and manufacture innovative products and are also experts at integrating existing technology to create successful, cost effective solutions.”*



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