The SEA Radar Stimulator/Simulator (RSS) is a high performance system that allows users to stimulate radar display / track extractor equipments with video and azimuth signals in response to complex scenarios that can be input either remotely or locally.

The Radar Stimulator / Simulator is derived from LARSIM, developed by SEA for the UK Ministry of Defence. LARSIM is deployed at the T23 Shore Integration Facility (SIF), Land Based Test Site (LBTS), Portsdown. It forms part of the complex and comprehensive system at the SIF, to provide a representative and real time simulation of the Radar T1007 and RRB equipment. The LARSIM contribution to this system is to provide stimulation, by the generation and distribution of T1007 / RRB interface signals, in place of the antenna inputs. This is done either under control of the Scenario Generator (SG), via the Scenario Generator Highway (SGH) or by the use of locally generated scenarios.

The Radar Stimulator / Simulator system is a CE marked free standing system and comprises two sub-systems, which are interfaced through an Ethernet link:

- The Radar Stimulator / Simulator Control Unit (RSCU) – 19” rack mounted assembly

Key Features

RSCU Functionality

Tracks and Virtual Playing Area

The virtual 3D playing area can support hundreds of simulated tracks. A collection of tracks, their characteristics and their movements are referred to as a scenario. Scenarios can be sent to the RSCU from the RSCT via an Ethernet link, or via an external scenario controller. Tracks are characterised by the following information:

- Track Type
- X,Y & Z Position
- Track Velocity
- Other platform characteristics such as transponder information

The scenario also provides the information about the radar host (i.e. the platform on which the radar is mounted). The stimulator will control the movement of each track in the scenario. This is calculated from track movement vectors generated as part of the scenario and the movement of the radar host. All track movements are time stamped ensuring that a track does not move until it is the correct time to do so; this provides deterministic and repeatable scenario runs.
Radar Engine
The radar engine provides configurable radar model. Configuration parameters include:
- Rotation Speed
- Multiple Pulse Settings and Widths
- Power Settings and Frequency
- Antenna Beam angles and vertical height
- Mast blanking arc
Other radar characteristics can be added to provide alternative engines, making the RSS configurable to customer's requirements.

Visibility Algorithm
The visibility algorithm will determine if each of the tracks in a scenario is visible as the radar beam passes over it, including the option for tracks to be over the horizon. Visibility parameters include:
- A number of configurable blanking arcs
- Minimum and maximum ranges
- Beam angle
Further to these parameters, each track has a configurable reflective cross section area providing realistic radar returns to the visibility algorithm.

PC Control Terminal
The RSCU is a PC based application providing features, including:
- Design, store, preview and play scenarios
- Configuration screens for the radar engine and visibility algorithm parameters
- Live scenario output on a traditional radar style display in both Host Centric and North Centric configurations
- Controls for 'on the fly' radar changes
- Data logging for position, visibility and error data

Stimulation Hardware Back End
The radar simulator has the ability to stimulate a number of different real radar equipment interfaces such as displays and transponders.

Radar Signal Interfaces
- Analogue radar sync pulses
- Analogue radar video data
- Transponder IFF and RRB data

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System Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>LCU: 401mm(h) x 484mm(w) x 500mm(d)</th>
<th>LCT: COTS Free Standing PC and Monitor - may be selected to suit space available, within the constraints of required processing power and LCT display resolution.</th>
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<tbody>
<tr>
<td>Size</td>
<td>LCU: 30kg LCT: 30kg</td>
<td></td>
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<tr>
<td>Power Requirements</td>
<td>LCU: 115VAC 60Hz or 230 VAC 50Hz, 250W LCT: 115VAC 60Hz or 230 VAC 50Hz, 750W</td>
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<tr>
<td>EMC</td>
<td>BS EN 61326-1</td>
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<tr>
<td>CE</td>
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