Signals Intelligence (SIGINT) is gathering intelligence from communications intelligence (COMINT) between people (i.e radio) and Electronic intelligence (ELINT), not involving communication between people (i.e radar). Decryption and traffic analysis of these signals can provide valuable information about the Electronic Order of Battle (EOB) of the red forces, their command structure and intent. The Track Manager of the air picture uses the identify and intent of red forces to classify and prioritise threats.

This presentation aims to demonstrate the uses of SIGINT sensors in Agent Based Modeling. This will enhance current **conventional warfare** and **border safeguarding** projects.

The **Track Management** project rolls up tracks from the battery to the regiment. Track numbers are then authorised by the Sector Control Centre in order to have the same track number for the same object across all air pictures.

The **Border Safeguarding** effort plug and plays different sensors (radar and cameras) onto the border area and computes the best surveillance configuration. This project is also a step towards Threat Evaluation Weapon Assignment (TEWA) by matching blue forces to specific red forces.

The **Dynamic Path Planning** project computes the best route for red forces avoiding obstacles and blue forces.

Agent Based Modeling consists of multiple individual agents and groups of agents. The agent groups simulated are blue forces, red forces, infantry, radar and obstacles. Obstacles are borders, rivers, roads, mountains or objects barring Line Of Sight.

Each **agent** has its own behaviour, properties, presentation and movements. An agent can act on the environment and interacts with other agents. An agent can make decisions and learn, with the goal of making more economic decisions.

A principle of agent based simulation is to **keep it simple stupid (KISS)** by starting with the smallest objects. These objects are then placed on the checker board to build a virtual battle space. Another agent based modeling concept is that **the whole is bigger than the parts.** Individual agents acting in their own interest are placed on the scenario to learn about the system as a whole.

The **elements** of the war-game are red forces, blue forces and the environment. The **red forces** encompass aerial tracks with emitters, infantry with emitters and static radar. An **environment** consists of a map and properties like time of day and weather conditions. The **blue forces** consist of Infantry patrolling the border and a number of radars. The goal is to identify the forces (blue, yellow, green or red) and to soft kill or hard kill (bomb) the red forces.

Tests from previous experiments will be conducted to produce **results** of performance enhancement of Track Management caused by the SIGINT Sensors.

In **conclusion** the SIGINT sensors were used in this experiment to expand the possibilities of Agent Based simulation in conventional warfare and border safeguarding operations.

More work is planned using Constraint Programming for pairing blue and red forces (Threat Evaluation Weapons Assignment).