

## User Group Presentation

### What is a User Group ?

A User Group is a group of different people and organizations making use of a common technology. Their common goal is to share experience on the technology and create a community of knowledge to better use the technology.

A User Group is made of different people and organizations, which have the willing to further develop and improve the technology they use. Their goal is to share ideas and create a research and development community around the technology.

A User Group is made of different people and organizations having in common, number of requirements on the technology. Their goal is to share the requirements, define the development priorities and secure the necessary funding.

A User Group is not a place to share data or confidential information. Each participant keeps its confidential know-how and confidential application of the technology. In the same way, a User Group is not the “office of the complaints” against Oktal-SE.

Finally, a User Group is not a commercial platform for any participant.

### The shared technology

All members of the User Group make use of software involved in the suite of multi-sensor simulation tools: SE-Workbench. This SE-Workbench suite of tools has two main applications for infrared (SE-Workbench-IR) and electromagnetic (SE-Workbench-EM) simulation. Lot of software components are shared between SE-Workbench-IR and SE-Workbench-EM. The technology, the database format, the ray-tracing kernel and many other technical aspects are the same for infrared and electromagnetic simulation.

The shared technology used by all the users of the User Group consists in the list of software from the SE-Workbench. This list is given in **Annex 1** of this document in the Software Catalog of Oktal-SE.

The User Group will focus on the software technology improvement and development for a better application and usage. Under no circumstances the User Group will focus on data exchange. For example, physical material data are excluded from the common discussions.

## **The key for success**

The first key for success is “independence”. In order to be efficient, a User Group shall be able to discuss most of the issues without the intervention of Oktal-SE. The independent discussion makes sure that the foreseen technological development really fit the users needs.

The second key for success is “coordinated conclusions”. The independent discussions among the users need to be summarized in a conclusion. This conclusion can then be presented to Oktal-SE and discussed to assess the feasibility and the future developments road map.

The third and last key for success is “secure funding”. After the discussion of the User Group conclusion, the technology road map can be defined as a common goal. This goal can only be achieved if the User Group is able to secure the necessary funding needed for the associated development.

## **Organization principles**

As it is in 2006, two groups are foreseen in the User Group: one infrared related group focusing on SE-Workbench-IR technology and one electromagnetic simulation related group focusing on SE-Workbench-EM technology. One leader (a person or an organization) will be designated for each group.

Each group will have enough time to discuss its concerns, requirements, wishes, recommendations, potential funding. This discussion will be motivated by the group leader and can be independent of Oktal-SE. The group leader will be responsible for the summary and conclusions of it group. For this discussion, no formal meetings are planned.

Finally, the conclusions of the groups are reviewed, presented and discussed with Oktal-SE during the User Group Meeting. The conclusions of the two groups are also coordinated at this occasion. For this purpose, the User Group Meeting, organized over two days, is divided in three parts: first day: morning, status of the technology by Oktal-SE; afternoon, working sessions of the groups without Oktal-SE; second day: conclusion presentation and action plan with Oktal-SE.

## **Potential Agenda**

Oktal-SE expects to get the Agreement Form of all the users wishing to participate to the User Group and User Group Meeting before the end of April 2006.

This date is necessary to open a 6 months period of independent discussions among the users, until September 2006.

A two days User Group Meeting can take place in October or November 2006 in Toulouse or any other convenient location.

Synthetic Environment Workbench technology

## User Group Agreement Form

### Contact details:

Title: \_\_\_\_\_  
Name: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_  
Country: \_\_\_\_\_  
e-mail: \_\_\_\_\_  
Phone: \_\_\_\_\_

### Agreement:

Here undersigned Mr / Mrs \_\_\_\_\_ representing \_\_\_\_\_ agrees:

- to participate to the User Group around the SE-Workbench technology YES  NO
- to share its contact details and company/organization name with other members of the User Group YES  NO
- to share information related to the SE-Workbench technology used by its company/organization YES  NO
- to participate to a User Group Meeting with all other members of the User Group YES  NO
- to participate to the Infrared User Group (SE-Workbench-IR) YES  NO
- to participate to the Electromagnetic User Group (SE-Workbench-EM) YES  NO

### Date and Signature:

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

*To be sent to the attention of André JOLY by fax: +33 (0)5 62 11 93 63 or by mail at the address below.*

## Synthetic Environment Workbench technology

### Annex 1: list of software

#### LINE SE-WORKBENCH Terrain Modelling

##### Software description

##### SE-AGETIM

*Windows NT/2000/XP*

Use: Complete 3D terrain generation, adapted to the OKTAL-SE multi-sensor simulation software  
Description: Integrated software dedicated to the generation of 3D synthetic environment with a user specified resolution and realism. It provides the user with a unique way of integrating heterogeneous geographical data to produce a coherent 3D database. Corrections and enhancements can be applied on source data, based on a state of the art GIS user interface.

Required software: none

##### SE-FFT

*SGI IRIX 6.5, Windows NT/2000/XP*

Use: Integration and conversion utility to use existing 3D objects or terrain in the OKTAL-SE simulation software

Description: Set of bi-directional conversion tools used for the import/export from/to SDM format (working format of OKTAL-SE simulation software) from/to other standards like FLT, VRML, PFB.

Required software: none

#### LINE SE-WORKBENCH Physical data modelling

##### Software description

##### SE-PHYSICAL-MODELER

*SGI IRIX 6.5, Windows NT/2000/XP et licence Open !v*

Use: Physical modelling software for 3D terrain and objects integration in multi-sensor simulation  
Description: Interactive 3D software, used for the visualization and the edition of physical properties of materials through user interface offering a palette of materials, curves with spectral and thermal characteristics graphic display. Materials can be attached to 3D objects or polygons through a 3D graphical modeler.

Required software: none

##### SE-CLASSIFICATION

*Windows NT/2000/XP*

Use : Association of physical material data to a visible texture

Description: The classification panel enables the selection of a color by picking on the picture; the association of a physical material is based on photo-interpretation. To check the spectral behavior of materials in use, and the result of the classification, a visualization panel enables the pre-view of the resulting multispectral image.

Required software: none

**LINE SE-WORKBENCH Thermal modelling****Software description****SE-THERMAL***SGI IRIX 6.5, Windows NT/2000/XP*

Use: Computation of the thermal state of a 3D scene

Description: Software dedicated to the calculation of all the possible temperature states of a scene at a given time of the day for given atmospheric conditions. The software takes into account the history of thermal and atmospheric conditions for shadow-effects computation.

Required software: none

**SE-THERMAL-SHADOWS***SGI IRIX 6.5, Windows NT/2000/XP*

Use: Computation of the scene thermal shadows

Description: Module dedicated to the computation of thermal shadows. Thermal shadows are radiance contrasts, resulting from a temperature difference that has been produced by the solar irradiance, during the circadian cycle preceding the simulation time.

Required software: additional module of SE-THERMAL

**LINE SE-WORKBENCH Atmosphere modelling****Software description****SE-ATMOSPHERE***SGI IRIX 6.5, Windows Windows NT/2000/XP*

Use: Atmospheric-conditions modelling, adapted to the OKTAL-SE multi-sensor simulation software

Description: Atmospheric condition computation and modelling, by taking into account some parameters (localization on the sphere, altitude, type of climate, weather, date, hour...). The software base contains a simple model of empirical propagation and can operate with module interface for other propagation codes.

Required software: none

**SE-ATMOSPHERE-LOWTRAN***SGI IRIX 6.5, Windows NT/2000/XP*

Use: Integration and manipulation of the LOWTRAN code data, using the SE-ATMOSPHERE user interface

Description: Interface module enabling to set the parameters of the LOWTRAN code easier. The LOWTRAN code needs to be directly acquired by the user.

Required software: additional module of SE-ATMOSPHERE and LOWTRAN code

**SE-ATMOSPHERE-MODTRAN***SGI IRIX 6.5, Windows NT/2000/XP*

Use: Integration and manipulation of the MODTRAN code data, using the SE-ATMOSPHERE user interface

Description: Interface module enabling to set the parameters of the LOWTRAN code easier. The MODTRAN code can be distributed by OKTAL-SE under the signature of an NDA between the final user and the code provider.

Required software: additional module of SE-ATMOSPHERE

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**LINE SE-WORKBENCH Scenario edition**
**Software description**
**SE-SCENARIO**
*Windows NT/2000/XP*

Use: Generation of complex scenarios compatible with the multi-sensor scene generator software of OKTAL-SE

Description: Software for preparation of complex scenarios taking into account physical data, objects, atmospheric conditions, targets, sensors with their the respective properties and trajectories. The generated scenarios are ready to be used by the multi-sensor scene generator software of OKTAL-SE. The software contains preview, record and playback functions as well as video sequence generation utilities.

Required software: none

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**LINE SE-WORKBENCH Host application integration**
**Software description**
**SE-TOOLKIT**
*SGI IRIX 6.5, Windows NT/2000/XP*

Use: Integration of the OKTAL-SE-scene-generation utilities in customer applications

Description: Set of C++ libraries allowing the integration and the control of the scenarios in a user application. The same API is used to control scenarios of the fast and advanced time modes. It allows the integration of the scene generators of OKTAL-SE in "Software In the Loop" and "Hardware In the Loop" applications.

Required software: SE-FAST-SCENE or SE-ADVANCED-SCENE package

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**LINE SE-WORKBENCH Advanced scene generation (SE\_ADVANCED\_SCENE)**
**Software description**
**SE-RAY**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0,*

Use: Software base for the different multi-sensor computation kernels

Description: Common ray tracing services

Required software: none

**SE-RAY-IR**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0,*

Use: Advanced infrared and intensification of light scene generation (study applications)

Description: Software based on the ray tracing technology, dedicated to spectral physical image computation from complex scenarios (3D virtual mock-up, atmospheric conditions, sensor definition, trajectories, targets, ...)

Required software: SE-RAY

**SE-RAY-EM**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Generic electromagnetic simulation kernel, based on the ray tracing technology (study applications)

Description: Electromagnetic simulation software based on the ray tracing technology taking into account physical effects of diffusion, reflection, diffraction, dielectric management of materials. This software associates geometrical optics and physical optics for the computation of EM fields at high frequencies: RADAR, antennas, propagation, ECM and telecom applications.

Required software: SE-RAY

**SE-RAY-RCS**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: RCS simulation kernel, based on the ray tracing technology (study applications)

Description: Software dedicated to the simple computation of RCS (Radar Cross Section) of very complex 3D objects at high frequencies. The computation is based on asymptotic methods.

Required software: SE-RAY

**SE-RAY-DISTRIBUTED**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Distribution of the SE-RAY computation on one additional node

Description: Module offering two modes of computation distribution: "sequence distribution" which makes it possible to distribute calculations of a sequence of images on several CPU, and "image distribution" which makes it possible to distribute the calculation of one image on several CPU. The distribution can be made equally on the same platform or on distinct and heterogeneous platforms.

Required software: SE-RAY

**SE-RAY-PHOTON-MAP**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Global illumination of 3D scenes based on Photon Map techniques

Description: Module for the computation and the rendering of complex 3D scene surface interactions depending on the active sources and the reflectivity of the surfaces.

Required software: SE-RAY

**LINE SE-WORKBENCH Special modules for advanced scene generation**
**Software description**
**SE-RAY-IR-FLARES**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0,*

Use: Infrared countermeasure modelling and simulation for study applications

Description: Library dedicated to the exploitation of infrared countermeasure description files. This library includes functions for countermeasure generation (Modelling phase) and rendering functions (Exploitation phase).

Required software: SE-RAY-IR

**SE-RAY-IR-CLOUDS**
*SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0,*

Use: Clouds and advanced atmospheric-effects modelling and simulation for study applications

Description: Library dedicated to the exploitation of cloud description files. This library includes functions for cloud generation (Modelling phase) and rendering functions (Exploitation phase). The library also includes a cloud layer generation tool (CLG: CloudLayerGenerator) that enables the generation of cloud layers for SE-RAY-IR. The tool CLG generated a set of BDD files (.bdd, .mat, .cmt, .ips) that defines completely cloud layers.

Required software: SE-RAY-IR

**SE-RAY-IR-PARTICLES***SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0,*

Use: Special-effects modelling and simulation for study applications

Description: Library for special-effects modelling and computation, applied to study applications. The computation of the special effects is based on the dynamic of particle systems.

Required software: SE-RAY-IR

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**LINE SE-WORKBENCH Fast time scene generation (SE\_FAST\_SCENE)****Software description****SE-FAST***Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Visual application development based on Performer

Description: Library allowing to develop in a simple and fast way three-dimensional visual applications. This C++ library facilitates the construction, the animation and the visualization of 3D scenes in the visible and infra-red fields. The scenes are made up of 3D objects, one environment and a camera. The camera corresponds to the point of view of the observer. The camera as well as the objects of the scene can be animated (trajectories or external controls).

Required software: none (Right to Use in the case of re-sale to a third party customer)

**SE-FAST-IR***SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Fast time infrared and intensification of light simulation and visualisation

Description: Set of software and libraries allowing first to prepare and to visualize 3D data base in fast time for the optronic domain. This software applies both for training applications and for hardware in the loop very demanding applications.

Required software: additional module of SE-FAST or plugin of VEGA, SE-THERMAL for thermal computation

**LINE SE-WORKBENCH Special modules for the Fast Time generation****Software description****SE-FAST-IR-FLARES***SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Infrared countermeasure modelling and simulation for fast time applications

Description: Library dedicated to the exploitation of infrared countermeasure description files. This library includes functions for countermeasure generation (Modelling phase) and rendering functions (Exploitation phase).

Required software: SE-FAST-IR

**SE-FAST-IR-CLOUDS***SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Clouds and advanced atmospheric effects modelling and simulation for fast time applications

Description: Library dedicated to the exploitation of clouds description files. This library includes functions for clouds generation (Modelling phase) and rendering functions (Exploitation phase). The library also includes a cloud layers generation tool (CLG: CloudLayerGenerator) that enables the generation of clouds layers for SE-FAST-IR. The tool CLG generated a set of BDD files (.bdd, .mat, .cmt, .ips) that defines completely cloud layers.

Required software: SE-FAST-IR

**SE-FAST-IR-PARTICLES***SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Special-effect modelling and simulation for fast time applications

Description: Library for special-effect modelling and computation, applied to fast time applications. The computation of the special effects is based on the dynamic of particle systems.

Required software: SE-FAST-IR

**LINE SE-WORKBENCH Sensor modelling and integration for advanced applications****Software description****SE-RAY-IR-SENSOR***SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Optronic sensor modelling for advanced applications

Description: Library of first order modelling of generic optronic sensor technology. This library eases the way to integrate sensor effects in the advanced scene generator of OKTAL-SE.

Required software: SE-TOOLKIT

**LINE SE-WORKBENCH Sensor modelling and integration for fast time applications****Software description****SE-FAST-IR-SENSOR***SGI IRIX 6.5, Windows NT/2000/XP, Linux Red Hat 9.0*

Use: Optronic sensor modelling for fast time applications, coupled with 3D scene fast rendering tools

Description: Library of first order modelling of generic optronic sensor technology. This library eases the way to integrate sensor effects in the fast time scene generator of OKTAL-SE.

Required software: SE-TOOLKIT