EP®-80 image generation system

Today’s immersive military and commercial aviation training requires high-definition synthetic visual simulations with highly representative flight and ground environments to achieve maximum training value. The complexity of these training environments demands realistic, adaptable and affordable commercial off-the-shelf (COTS) PC image generation.

To meet these demands, COTS PC image generators must provide fully scalable performance, from desktop brief/debrief stations to full-field-of-regard simulators. These image generators must also render unprecedented, near eye-limited picture quality databases while protecting the customers’ significant investments in database development and ownership.

Rockwell Collins’ EP®-80 image generation system leverages the latest COTS PC and graphics technologies while employing breakthrough, second-generation EP2™ Real-Time Software for full functionality. All capabilities operate within a high-resolution, whole-earth environment.

Because the EP-80 is compatible across the line of Rockwell Collins image generators, you can combine multiple systems at appropriate price points. Users can share common, real-time software, databases and host interfaces to support varying levels of training requirements.

The EP-80 is ideally suited for applications requiring high scene fidelity and complex graphic effects. It is in use in the industry’s most complex simulation environments, such as the F-35 Lightning II.

**KEY BENEFITS**

- The most realistic scene fidelity, image quality and performance available using COTS PCs and graphics cards
- Integration with existing host systems through common host interfaces
- Continuity with other EP products/common databases, and short conversion path for other databases
- Deterministic update rates and robust scene load management
- Enhanced realism of sensors and environmental effects through use of advanced shaders and particle effects
- Mission Function Engine option for high frequency and accuracy of mission function tests
- Highly realistic regional weather and environmental simulation using textured, layered and 3D clouds, ground fog, storm effects, physics-based atmospheric light scattering, etc.
CONFIGURATIONS

- **EP-80 Desktop** – Uses a single computer to perform non-deterministic, real-time computing and scene processing for less demanding applications
- **EP-80 Standard** – Uses a single PC for real-time, deterministic computing and a separate PC for each channel, with a commercial graphics card for scene processing
- **EP-80 Combiner** – Uses a single PC for real-time, deterministic computing and two PCs per channel for scene processing, which are combined in a Video Stream Manager (VSM) for increased channel performance

TERRAIN PROCESSING

- Continuous, multiple level of detail terrain created from source elevation data in real time
- Models and 3D features automatically conform to the terrain

DATABASE MANAGEMENT

- Elevation data, terrain texture, vector features and 3D models are created, edited and stored as independent source-data layers
- EP2 Real-Time Software composes the scene in real time from source layers, eliminating lengthy compilation off line
- High-resolution gaming areas are automatically inserted and blended within the whole-earth environment
- Rapid database updating with new source data and only edited files copied to the image-generation database directory
- Supports options for large volume disk arrays

ATMOSPHERIC EFFECTS

- Real-world lighting with advanced, physics-based atmospheric light scattering and particle effects
- Regional weather, including storm fronts and weather patterns localized to areas of the database
- Pixel rate, wind-affected cloud shadows

TEXTURE

- Up to 32 gigabytes unified memory (8 gigabytes typical) with optional texture compression
- Continuous texture with automatic, multiple-resolution texture blending
- Two to 16 sample selectable anisotropic filtering

OCCULTING/ANTIALIASING

- Configurable from eight to 16 samples per pixel
- Full-screen antialiasing with selectable filter methods

LIGHTING

- Gouraud or Phong lighting model (Phong lighting typical)
- Pixel-rate landing lights, steerable searchlights, flares, headlights
- Pixel-rate area light maps to render multiple light illuminations over large areas

MISSION FUNCTIONS

- Collision detection, including swept line segments against any object
- Height above terrain and height of terrain
- Line-of-sight ranging
- Laser range finding
- Intervisibility calculation

HIGH-PRECISION SENSOR SIMULATION

- Sensor and radar domains that are fully correlated with the out-the-window environment
- Long and medium wave IR, EVS, NVG, EO and LLTV simulation
- Contrast and target area tracking with image stabilization
- Physics-based atmospheric light scattering
- Sensor video format up to 1920 x 1080
- 16-bit resolution video output to optional device effects generator
- Radar Terrain Server option

OVERLOAD MANAGEMENT

- Dynamic level of detail range adjustment

UPDATE RATE

- Programmable update rate (30 Hz to 60 Hz typical)
- Real-time determinism guaranteed for multiple channel configurations

DISPLAY FORMAT

- Non-interlaced raster
- Programmable output to 2560 pixels x 1600 lines (WQXGA)
- DisplayPort video output (typical)
- Programmable refresh rate, 60 Hz typical

INTERCHANNEL SYNCHRONIZATION

- Rockwell Collins software EPLock™, COTS add-on sync module or Video Stream Manager genlock

HARDWARE

- Real-time computer: COTS dual hex-core CPUs
- Scene processor: COTS hex-core CPU (typical), COTS PCIe graphics card

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Building trust every day.

Rockwell Collins delivers innovative aviation and high-integrity solutions to commercial and government customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

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