

# FOCUS



## Accurate, authentic and robust

SEOS has over 20 years experience in developing simulation systems that replicate reality... and now those systems are compact enough to be deployable in mobile containers. Read on to see how far we have come...

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# PRODAS<sup>®</sup> – from 8’ containers to 500 seat planetariums and beyond

PRODAS provides the display solution

SEOS is the leading supplier of display system technology. We develop and deliver systems which are versatile, affordable, mobile, and meet the exacting requirements of the application.

We have now developed a transportable option, built within a robust container, that provides you with customized real-image display systems, deployable where you want them.

PRODAS is not a single product, but a solution range comprising an extensive set of enabling technologies. PRODAS incorporates at the one end, low-cost two channel systems, right through to sophisticated full field-of-regard dome systems at the other. Some of our recent solutions are shown here.

At I/ITSEC 2005 SEOS will demonstrate a low maintenance, containerized display solution, with extensive field-of-view, long-life projection optics, high brightness, contrast and resolution. Configured for a fast-jet scenario, this technology can be used for wide-body and rotary-wing flight applications and is fully upgradeable.



CONTAINERIZED PRODAS

DOMESOLUTION, 6 CHANNEL LCD

DOMESOLUTION RAAF F-111, 150°x50°  
COURTESY OF VR SOLUTIONS PTY LTD AUSTRALIA

6 CHANNEL, 30FT DOME, CASA EUROFIGHTER  
RESEARCH SIMULATOR, SPAIN



11 CHANNEL DOME UNDER CONSTRUCTION

## PRODAS

- Wide angle, immersive multi-channel front projected display system
- Projector type selected to satisfy specific requirements
- Extensive front projection screen options including full field-of-regard domes
- Proprietary key technologies for geometry distortion correction, multi-channel blending, pixel management and display set up & control
- Motion compatible
- Unique proven system integration capabilities
- Available as a containerized solution

## Hill Air Force base: PRODAS dome for an F-16 simulator projection system

### Features:

- Very short timescale: 13 weeks from contract to installation of dome and structures
- 8 ft radius spherical dome projection screen and structures
- Unobstructed pilot field-of-view of 300° H x 170° V (+130/-40)
- 7 CRT projectors
- SEOS DigiBlend image blending
- SEOS Navigator reference alignment system
- Display control software
- SEOS Odyssey remote control handset

### F-16 Fighting Falcon

The F-16 Fighting Falcon is a compact, multi-role fighter aircraft. It is highly maneuverable and has proven itself in air-to-air combat and air-to-surface attack. It provides a relatively low-cost, high-performance weapon system for the United States and allied nations.

The cockpit and its bubble canopy give the pilot unobstructed forward and upward vision, and greatly improved vision over the side and to the rear. The seat-back angle was expanded from the usual 13 degrees to 30 degrees, increasing pilot comfort and gravity force tolerance. The pilot has excellent flight control of the F-16 through its 'fly-by-wire' system. Electrical wires relay commands, replacing the usual cables and linkage controls. For easy and accurate control of the aircraft during high G-force

combat maneuvers, a side stick controller is used instead of the conventional center-mounted stick. Hand pressure on the side stick controller sends electrical signals to actuators of flight control surfaces such as ailerons and rudder.

## US Army Aviation and Missile Command, System Simulation and Development Directorate: PRODAS containerized solution for T-BOS\*

\*The T-BOS is a high-fidelity operator simulator for the UH-60L/M helicopter. It trains specified individual and crew skills proficiency in normal, degraded, and emergency modes of operation. The T-BOS will be a transportable training device with a modular design of hardware and software components to support training in both the UH-60L and UH-60M configurations.

### Features:

- 200° x 45° transportable, containerized system for UH-60 simulator
- Four stowable rear-projection display channel modules
- Two real-image chin window displays
- Six SXGA+ projectors
- Switchable projector optical filter system for use with NVGs
- SEOS Odyssey and projector control software
- Able to withstand rigorous temperature and shock testing

### Blackhawk UH-60L/M helicopter

The UH-60 Blackhawk is the only modernized utility/MEDEVAC helicopter in the Army fleet. The ruggedness and survivability of the Blackhawk, combined with its multi-mission flexibility, have made it the world's standard for medium-lift utility helicopters. It is equally important during peacetime to perform disaster relief operations and other critical state missions. The Army is currently developing a program to recapitalize a select number of UH-60As to the newest Blackhawk configuration, the UH-60M.

## Spherical virtual reality environments – in other words, the V-Dome!

Our years of experience in the simulation market have enabled us to develop visual display systems that are world class. In many cases their application in training systems has called for unique solutions that have 'raised the bar' in terms of optical accuracy.

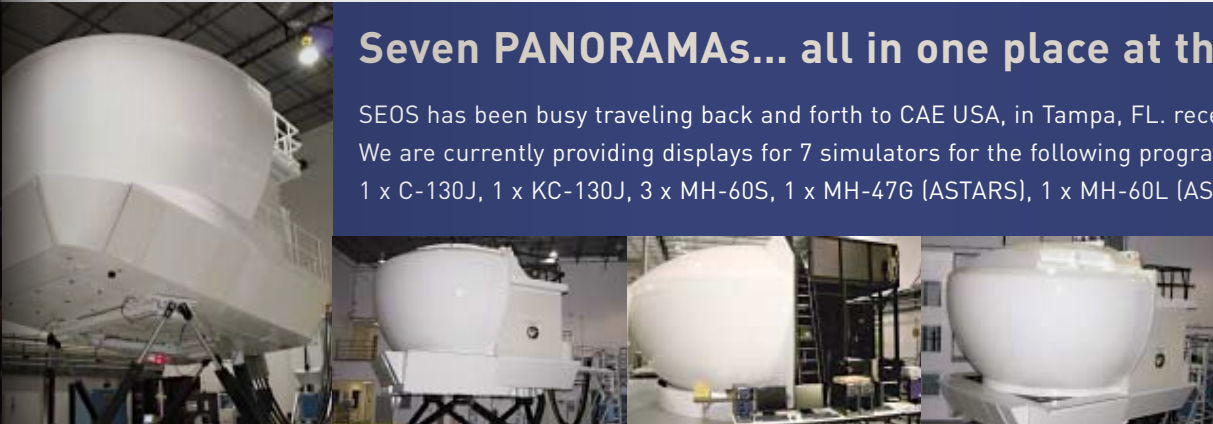
We have transferred our knowledge and skill to visualization applications in the supply, project management and integration of some of the most complex V-Domes in use today.

The technical challenges associated with the projection of real-time images across huge hemispheres are many times more complex than those presented by conventional VR environments.

SEOS has worked on some of the world's most prestigious installations, including Chabot Space & Science Center, Gates Planetarium, Hayden Planetarium and Smithsonian Institution. Hundreds of people every day view science and the universe through one of our displays.



SEOS 11 CHANNEL V-DOME  
IMAGE COURTESY OF GATES PLANETARIUM, DENVER MUSEUM OF NATURE & SCIENCE



DID YOU KNOW? VENUS IS THE ONLY PLANET THAT ROTATES CLOCKWISE

For a list of reasons why you should buy PANORAMA, see the article on page seven.



# The mark of Zorro®

The Zorro® projector has been specially developed by SEOS to meet the demands of both the commercial airline market and military training and mission rehearsal using night vision enhancement devices. We have designed a fixed-matrix projector that uses more stable technology and requires lower maintenance, as well as supporting Level D compatible display systems.

The Zorro® projector represents a significantly lower cost investment than other comparable projectors on the market.

Zorro® is based around a COTS projector and employs a SEOS-patented RGBK four-panel projection engine architecture. The main benefit of this technology is that the sequential contrast (full-screen white:black contrast) is far higher in orders of magnitude than any other light-valve based projector. The panels used are latest-generation Liquid Crystal on Silicon devices that are used in volume TV and cinema markets.

A contrast ratio of 1,000:1 to 2,000:1 is the standard in the market. The new Zorro® 1410 is capable of achieving 250,000:1, and its unmatched dynamic range offers excellent light performance, is compatible with NVGs and allows all-electronic blending.

- Key features:
- Display solution for full Level C qualification (and Level D WAC windows with grandfather rights)
  - COTS host chassis
  - DVI interface
  - Lightweight
  - Compatible with SEOS auto alignment system
  - Motion compatible
  - Applications in military and civil flight

At I/ITSEC 2005 in Orlando SEOS will demonstrate two new COTS-based Zorro® 1410 projectors in a 2-channel display. Projecting onto a SEOS high-gain dome segment, a Scorpion scripted show will demonstrate their phenomenal contrast ratio.

We will also show the new Zorro® 1410 in a DPM variant fitted to a SEOS 26" zero gap collimator. Especially for the show a pair of NVGs will be fitted to the front. The DPM will show full compatibility with the goggles, essential for replacement monitor upgrades

on military simulators running night-time training employing NVGs. DPM is therefore a natural choice for Level C/D WAC window systems, whether new or upgrade.

## DPM®

**Our Digital Projection Monitor [DPM] is a new approach to resolving the issue of replacing 26" CRT monitor displays. The DPM is already in operational service providing primary OTW and chin window displays. It's cost effective and can be retrofit for the WAC window market.**

The DPM comprises a projection engine and lens, and a specially developed curved screen. The projection engine is a unique, high-performance fixed matrix LCoS projector, based on our Zorro® projector. The screen uses novel black-screen technology and is designed for optimum curvature. The optical components are housed in

a robust enclosure designed to withstand a dynamic environment. Securing brackets and light-tighting ensure an effective interface to the collimator units. The technology used in the DPM enables it to display dusk and night scenes (including light points) with correct dynamic range and bridges one of the main areas of deficiency that have existed between CRT devices and light-valve alternatives.

More than 200 units have been shipped to date and in December SEOS will be delivering the first DPM 1410-HC for a 6-channel flight simulator.



ZORRO IS A REGISTERED TRADE MARK OF ZORRO PRODUCTIONS INC., AND IS USED UNDER LICENSE BY SEOS LTD

## Seamless shows at the touch of a button

If you want to optimize the high resolution capability of a SEOS display system, you need a high performance, high resolution pixel delivery system. The choice in this area is boundless, but SEOS has done the homework for you and we've come up with what we consider to be the best solution. Introducing the SEOS Media Server...



SEOS MEDIA DIRECTOR - GUI



SEOS MEDIA PLAYER - PLAYBACK WINDOW

SEOS Media Server was successfully demonstrated at the Western Alliance Conference of Planetaria in September.

- SEOS Media Server & Player**
- Robust & reliable
  - Compatible with off the shelf/commodity hardware which means lower cost and higher performance
  - Easy to use
  - Creates complex shows at the last minute from a variety of content such as movies, static imagery, audio, text titling and live video
  - Built-in transition effects, multiple composition layers and interactive editing
- SEOS Media Director**
- Extensive & comprehensive
  - GUI - drag & drop interface
  - Preview of the content/show
  - Fast & easy to produce shows
  - Reduces need for experts
  - Accepts media in many formats
  - Can record shows in many formats
  - Creates complex shows through the SEOS Media Server GUI and saves them to disk

- The SEOS Media Server is multi-channel graphics hardware that supports SEOS Media Player (SMP) and SEOS Media Director (SMD).**
- Can generate multiple output video streams formatted for your display, whether flat screen projection, plasma screens, curved screen projection or fulldome display systems
  - Can serve high resolution, high frame rate movies (1600 x 1200 @ 60Hz)
  - Mixes with other media types such as images, text, live RGB or video capture, with integrated special effects and display-matching features
  - Has unique 3D capabilities
  - Integrated edge blending, geometric correction and color correction can be used without impacting on playback performance

GUI definition: GRAPHICAL USER INTERFACE. A program interface that uses a computer's graphics capabilities to make the program easier to use. Graphical interfaces use a pointing device to select objects, including icons, menus, text boxes, etc. A GUI includes standard formats for representing text and graphics.

## UNITED AIRLINES CHOOSE OUR HEADS!

At the 2005 Flight Simulation Engineering and Maintenance Conference (FSEMC) in Seattle, SEOS revealed that it had successfully completed the first installation of Replacement Projector Head Units for launch customer United Airlines, Inc. (UAL). The installation was on the B747-400 No. 1 simulator at

the United Airlines Flight Training Center, Denver, CO. and the contract also includes a second upgrade that will be carried out on UAL's B747-400 No. 2 simulator. Following completion of the upgrade, the B747-400 No.1 simulator was successfully recertified to FAA AC120-40B Level D approval standards.



"This solution meets the requirements of Image Generator flexibility, cost of ownership and supportability that satisfies our strategic plan going forward."

PETER GRAY, SENIOR STAFF ENGINEER AT UAL

The SEOS RPHU provides a cost effective method of reducing life cycle costs and increasing the overall performance of the visual system display by replacing the existing SupraLux tubes in RSL projectors. It is an upgrade that can be made to existing Rediffusion Simulation Ltd (RSL) display projector heads on Full Flight Simulators fitted with SPX type image generators.

The SEOS solution, which incorporates refractive optics, replaces the existing Schmidt Optics tubes with industry standard 9-inch CRTs, combined with modifications to existing electronic units within the projector head to maximize phosphor utilization. The remote control and adjustment of the projectors does not change and, for future upgrade consideration, the RPHU is also compatible with the Evans & Sutherland ESIG and EP range of image generators.

- The benefits of the SEOS Replacement Projector Head Unit**
- Lower cost of operation and ownership
  - Higher resolution
  - Higher brightness
  - CRT life improvement
  - Better image stability (eliminates day to dusk convergence drift)
  - More secure long term source for CRTs
  - Improved color range
  - Shorter projector warm-up time
  - No secondary images
  - Improved image focus (Scheimpflug adjustment)





# Meet Richard Layfield... and our Program Account Managers



RICHARD LAYFIELD MANAGES SIMULATION RELATED SALES IN NORTH AMERICA. PRIME RESPONSIBILITY INCLUDES SALES TO BOTH THE MILITARY AND COMMERCIAL END-USERS AS WELL AS TO SYSTEM INTEGRATORS. IN ADDITION, HIS RESPONSIBILITIES INCLUDE THE SUPERVISION OF THE PROGRAM ACCOUNT MANAGERS THAT MANAGE SEOS' STRATEGIC CUSTOMERS.

RICHARD RECEIVED A BACHELOR OF SCIENCE (BSc) DEGREE IN BUSINESS MANAGEMENT FROM THE UNIVERSITY OF MARYLAND AND HAS TAKEN NUMEROUS GRADUATE LEVEL PROGRAMS AND COURSES. HE SPEAKS FLUENT GERMAN AND HAS AN AIR TRANSPORT PILOT (ATP) LICENSE WITH MULTI-ENGINE RATING. HE'S A KEEN SAILOR IN HIS SPARE TIME.

"I BEGAN WITH B-52s, BUT AS A CIVILIAN I CAN'T REALLY AFFORD TO FLY AIRPLANES ANYMORE. SAILING HOWEVER, IS A DIFFERENT THING - THE PRINCIPLES ARE JUST THE SAME AS FLYING - AND I GET TO PLAY WITH A BIG TOY!"  
RICHARD HAS RECENTLY COMPLETED HIS BAREBOAT CRUISING CERTIFICATION IN TAMPA BAY AND THE GULF OF MEXICO.

## Richard C. Layfield... from B-52 Aircraft Commander to Vice President, Sales, USA, with a little bit of sailing thrown in!

Richard Layfield cut his teeth during the cold war on the huge, 8 engined B-52 - spending much of his time traveling the world as a check pilot and flight examiner. "My job was to evaluate the performance of young pilots, taking them through a series of safety procedures that included shutting three engines down and landing in a smoke filled cabin - all under simulation of course!"

And that's where Richard's fascination for the simulation industry began. "In the early 70s, we were working with pretty poor visual simulation, with only two windows and very simplistic graphics. It was a poor substitute for the real thing, but it was the best we had."

And of course since the 70s, as technology and hardware have improved, simulation has replaced actual aircraft training not only in the training of new pilots, but also in training experienced pilots to fly different aircraft types. "It may be expensive to develop ever more sophisticated simulation facilities, but it's far less costly and safer than using real fuel with real planes. The more authentic the flight experience, the more effective and accurate the training can be," comments Richard.

Richard joined SEOS in March 2003 and works from our Orlando office. "My relationship with SEOS goes back a long way; in the late 80s I was working with IVEX Corporation in Atlanta who manufactured image generators. Frequently these would be used in SEOS tailored solutions and our paths were frequently crossing."

So for Richard, the journey from U.S. Air Force pilot to flight examiner to flight simulation sales has been very much a logical progression. "Having been on the other side of the fence as a military commander, I am very familiar with the training requirements. I also know how important it is to keep developing the quality of our simulation solutions - keeping ahead of training needs."

"It's also true to say that the quality of military pilot training has a big impact on the civil industry too," comments Richard, "if you ask where most commercial pilots come from you'll find that they have a military background and we're proud that many of them will have trained on our systems."

At the end of 2004 SEOS launched a new customer focused initiative that saw the introduction of the Program Account Manager. This team is headed up by Richard Layfield. Richard has been managing the USA simulation sales activities for over two years and has been in the simulation industry for 10 years, so he knows a thing or two about what our customers want. The Program Account Managers will further support our continued efforts to align systems delivery and sales, and their presence 'on the ground' will help SEOS maintain a strong customer focus.

### The benefits of a SEOS Program Account Manager

- One point of contact post-contract for the customer enabling easy feedback and communication
- Consistency of approach for our customers
- Alignment of program managers to key accounts
- Located in the UK, Orlando and Canada
- Program managers retain a close relationship with the customer
- Responsible for understanding the requirements of key customers
- Offer a combination of systems delivery and sales support activities
- Ensure that a strong customer focus is maintained from order through to system delivery
- A team of project managers support all simulation and visualization contracts and take their project direction from the Program Account Managers
- Delivery of a seamless, global service
- Improved system quality and customer satisfaction

"We believe that by focusing on the co-ordination of a total program, from initial enquiry, right through to commissioning, we will not only do our jobs better in terms of customer service, but that we will gain a closer understanding of the industry and its needs in the future."



ANTON WHITE



STEVE GOBEY



MARY STEER



LARRY BRUMBACK



ANNE-MARIE MANHEIM

## A new arrival ...

SEOS has completed installation of its 50th 11ft (60°V) PANORAMA. Ordered by J F Taylor Inc. in the United States, this display system will be used by Lockheed Martin on the MH-60S Tactical Operation Flight Trainer for NAVAIR.

THE SYSTEM IS GENTLY MANEUVERED INTO PLACE.

## Our 50th 11ft PANORAMA®

The MH-60S simulator provides a 200°H x 60°V (+20/-40) field of view. Cross cockpit viewing provides the visual cues necessary to support normal and emergency operation of all MH-60S aircraft systems from start up to shutdown.

The 11ft radius PANORAMA display system has five split-head raster projectors, fitted with SEOS DigiBlend edge blending, and supports NVG stimulation. The system also has a SEOS Odyssey remote control handset with customizable software and a Navigator reference alignment system.

### Schedule

**October 2003:** order received  
**June 2004:** factory acceptance test of the display system at SEOS' Pennsylvania facility - display system delivered to Lockheed Martin Maritime Systems and Sensors facility in Manassas, VA.  
**February 2005:** final installation at NAS North Island, CA.  
**February 2005:** completed SEOS 'Authorization to Proceed'  
**April 2005:** Government acceptance

### Why buy PANORAMA?

With over 400 systems delivered to date, this solution offers unrivalled features:

- Wide angle multi channel collimated projected display system
- The only display to repeatedly achieve helicopter Level D certification
- Fields of view to 225°H x 60°V
- Extensive range of sizes
- Film mirrors with glass-like optical performance
- High performance CRT raster and raster/calligraphic, LCD and DLP™ projection options
- Mechanical structures to interface to all simulator types, new and upgrade
- Motion compatible
- PANORAMA Lightning provides low cost, high performance option

SEOS would like to wish all FOCUS readers a happy holiday season, whether you're celebrating a religious festival or just taking a well earned break. We have chosen not to send greetings cards, opting instead to donate the money to a charity, to support those in need over the festive period. We're sure you'll understand. This year our chosen charity is the British Heart Foundation.



# It's all about partnership

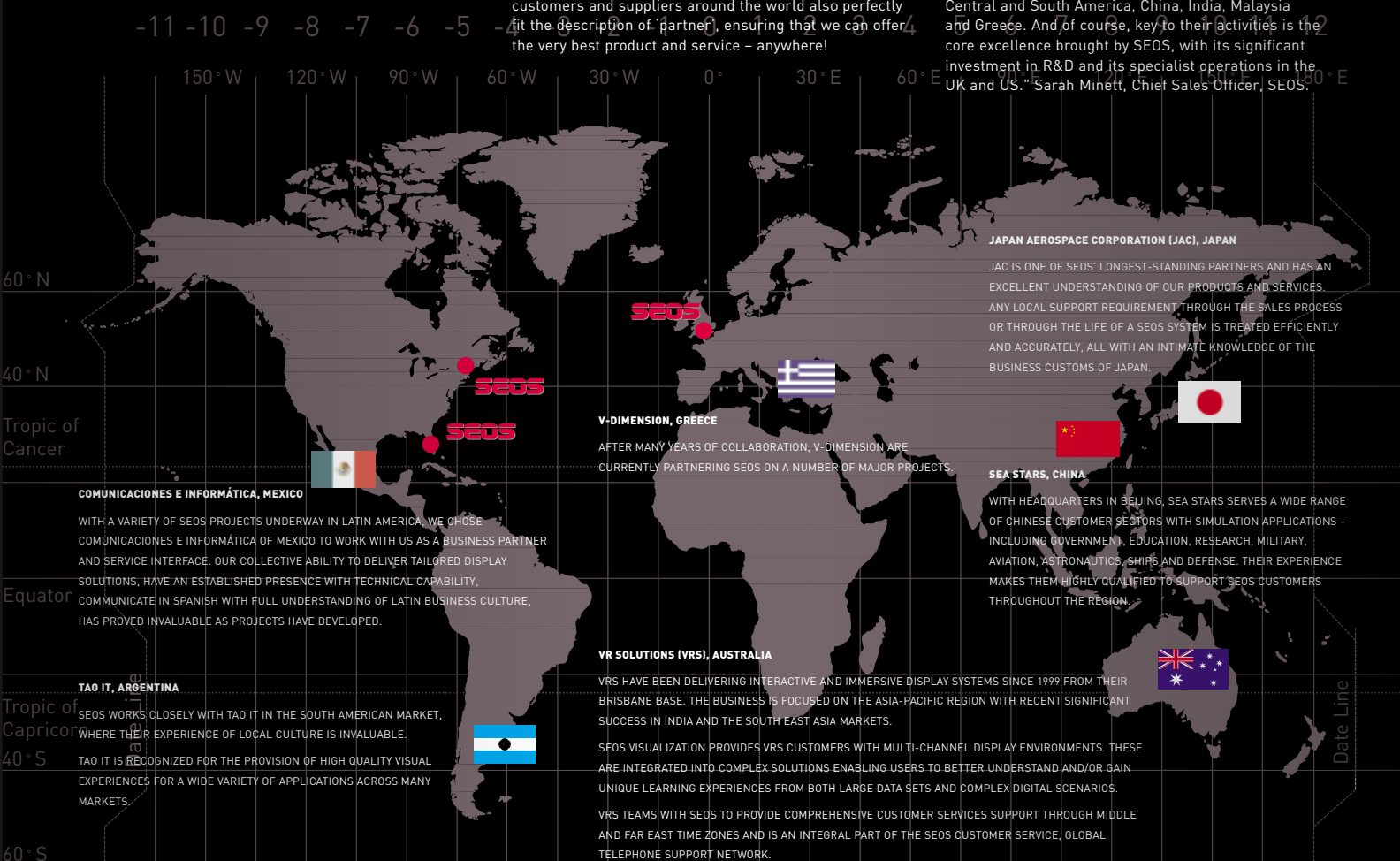
Yes, we're all human. Even global players at the top of their game have to sleep sometimes, and if you are reading FOCUS during office hours in Australia, chances are your USA or UK contact at SEOS may just be taking a well earned nap.

We've listened hard to our customers around the world who want the benefit of our unique technical expertise as the creators and suppliers of their systems. However, they also need a local point of liaison, hands-on technical support and an understanding of their particular culture and language, on a continuous basis. And all during normal working hours!

So, for the last decade or so, we've built a formidable international sales and support team through carefully chosen partner organizations, across our global fields of operation. Each of our partners has a thorough knowledge of SEOS solutions and has worked closely with us on world-leading visualization or simulation installations – or both.

Our partnerships extend beyond local representation. Our customers and suppliers around the world also perfectly fit the description of 'partner', ensuring that we can offer the very best product and service – anywhere!

"Our global network of partners is a valuable strategic asset for us. Our partners can take on a variety of roles, from pre-sales consultancy through to delivery and installation activities, and finally after-sales support. Enhancing our ability to provide fast and efficient support is a high priority for us and is at the heart of our international business planning. We have partner expertise 'on-tap' in both simulation and visualization worldwide, with representation in Japan, Australia, Central and South America, China, India, Malaysia and Greece. And of course, key to their activities is the core excellence brought by SEOS, with its significant investment in R&D and its specialist operations in the UK and US." Sarah Minett, Chief Sales Officer, SEOS



happenings

## I/ITSEC 2005

**28 November – 1 December 2005 Booth 1768**  
**Orange County Convention Center, Orlando, FL**  
[www.iitsec.org](http://www.iitsec.org)

The Interservice/Industry Training, Simulation and Education Conference (I/ITSEC) promotes cooperation among the Armed Services, Industry, Academia and various Government agencies in pursuit of improved training and education programs, identification of common training issues and development of multiservice programs.

SEOS will demonstrate a low maintenance, containerized display solution, with extensive field of view, long-life projection optics, high brightness and resolution. Configured for a fast-jet scenario, this technology can be used for wide-body and rotary-wing flight applications and is fully upgradeable.

Also on show will be our new COTS-based Zorro® projectors in both a 2-channel display and a DPM variant, fitted to a 26" zero gap collimator system – demonstrating Level D and NVG compatibility, night training and high dynamic range.

## WATS/RATS 2006

**4 – 6 April 2006 Booth 703**  
**Rosen Center Hotel, Orlando, FL**  
[www.hatldale.com](http://www.hatldale.com)

WATS/RATS is an intensive event which gives international delegates and industry experts the opportunity to advance the art and science of airline simulation and training, renew contacts and realize significant business opportunities. The event combines three conference streams with an exhibition of key players from the civil airline training and simulation industry.

## ITEC 2006

**16 – 18 May 2006 Booth 630**  
**ExCeL, London, UK**  
[www.itec.co.uk](http://www.itec.co.uk)

ITEC is Europe's premier conference and exhibition for all issues related to education and training and the training media, modeling and simulation initiatives that support them. Showcasing new defense training and simulation products, applications and technology, the ITEC exhibition attracts exhibitors and delegates from all over the world. Product briefings and demonstrations take place on the show floor and networking opportunities are aplenty.

## Head Office

SEOS, Edward Way, Burgess Hill  
West Sussex, RH15 9UE, UK  
Tel +44 (0)1444 870888  
Fax +44 (0)1444 870777  
email [info@seos.com](mailto:info@seos.com)

## North American Office

SEOS, 3451 Technological Avenue  
Suite 1, Orlando, FL 32817, USA  
Tel +1 (407) 262 0013  
Fax +1 (407) 262 0021  
email [info@seos.com](mailto:info@seos.com)

## Talk to us!

If you have a tale to tell, fascinating facts or stranger than fiction stories let us know! Email [info@seos.com](mailto:info@seos.com) and your story could be in the next issue of FOCUS!