COMPRO COMPUTER SERVICES, INC.

SIMULATION

REAL TIME PRODUCTS

PROFESSIONAL SUPPORT SERVICES

COMPRO

Tomorrow's Success Belongs To Those With The Vision To Redefine The Possible

In the world of evolving technologies, success is achieved by companies willing to challenge established boundaries.

COMPRO's mission is developing products, solutions, and services that provide the speed, power, and reliability required by the most sophisticated and time-sensitive applications in the industry.

COMPRO is constantly developing innovative solutions for emerging real-time markets, including rapid transit, process control, and interactive entertainment systems.

To date, COMPRO has achieved an installed base of over 10,000 systems, representing over 3,000 customers worldwide. These customers are served via our world-wide offices with our Corporate office strategically located in central Florida.

Corporate Commitment:

"Ongoing customer satisfaction with our products and services, with a focus on intelligent solutions"

COMPRO Divisions

COMPRO is divided into three primary divisions which include:

- **Real-Time Products group**
- **Simulation Solutions group**
- **Comprehensive Services group**

COMPRO Real-Time Products

COMPRO developed the LCRS™, RSX, and RT-Lightning™ product lines specifically for the most demanding needs of the real-time market.

Our products have gained a cornerstone reputation in the world's most demanding real-time applications, including simulation, distributed interactive simulation protocol/high level architecture (DIS/HLA), range, and telemetry, energy, and transportation.

COMPRO Simulation Solutions

COMPRO products and software are integral parts of simulation solutions currently in use around the world.

COMPRO training devices incorporate a wide range of advanced features that include simulation exercise planning, simulation exercise generation, monitoring and control, training and playback, and After Action Review management.

COMPRO's key software technologies include our Modular Universal Simulation Environment™ software (MUSE™), which is used in each of our simulator products. MUSE™ provides a complete suite of simulator software and capabilities.

MUSE™ is used today at customer sites as the core component for realistic training devices, and as a prototype tool used to explore aircraft, cockpit, weapon, and avionics system designs.

COMPRO Services

COMPRO provides expert maintenance, repair, and logistics support services for multi-vendor products, including Encore, HP®, SGI®, and Sun®. We maintain a state-of-the-art electronic escalation system to ensure all activities worldwide are monitored and escalated to depot logistics and support personnel.

COMPRO provides Professional Services for complex requirements that are readily available from our world-wide team of skilled and experienced engineers.

The Technological Foundation For Balanced Power

The world of "real-time" demands high-fidelity, high-performance computer systems. Real-time computers must interact with physical events and data, simultaneously analyzing and reacting so quickly that no significant time passes between data acquisition, computation, and response. It is a world in which COMPRO has staked a 45+ year claim as the leader in innovation and dependability.

COMPRO's Real Time Environment (RTE) is comprised of hardware and software layered onto commercial off-the-shelf (COTS) platforms running under Linux® operating system software. RTE provides extremely deterministic and low-latency interrupt system characteristics, meeting critical real-time requirements.

These features were previously available only using custom configurations or proprietary systems. The extremely deterministic, low latency interrupt capabilities that RTE offers is an unparalleled solution for the myriad of high-demand real-time computing challenges of the 21st century.

When properly configured, a COTS system can deliver approximately 12 microseconds of latency with 6 to 15 microseconds determinism.

COMPRO RT-Lightning™

COMPRO has developed the RT-Lightning™ technology specifically for the demanding needs of the real-time market using our RTE product. The RT-Lightning™ product line has gained an enviable reputation by satisfying the world's most demanding applications, including aerospace simulation, range and telemetry, energy, transportation, and process control.

COMPRO's RT-Lightning™ architecture incorporates our RTE software, our Reflective Memory system for high-speed system communications, and the computing power of the AMD Opteron™ system to form a unique and exciting system. RT-Lightning™ provides pure linear scalability, determinism, and I/O bandwidth unmatched in the industry.

RT-Lightning™ clustered nodes can be added independently with zero-

impact to the original computational environment, incrementally expanding to meet future application requirements. This provides a "balanced power" configuration where processing capacity and I/O are tuned to meet specific real-time requirements.

In a technical world that has seen "order of magnitude" processor performance increases yearly and little progress in open bus technology, RT-Lightning™ clusters guarantee balanced system growth.

COMPRO fully understands that in the real-time industry you only get one shot to get it right, and we have put real value in the RT-Lightning™ system architecture to achieve that goal.

COMPRO Legacy Computer Replacement System (LCRS™)

LCRS™ ushers legacy SEL/Gould/Encore customers into a current "Commercial-Off-The-Shelf" (COTS) computer replacement solution.

LCRS™ simulates, in a software environment, legacy Concept hardware and runs existing binary applications while retaining inherent system timing. LCRS™ executes MPX-32 Operating System software, utility programs like volume manager, assemblers, compilers, and user application (FORTRAN and Assembly) object code, all running on a COTS configuration.

COMPRO

Simulation Products

COMPRO is a turn-key provider of simulation products and services. We offer a wide range of training product solutions for military and commercial customers ranging from fast jets to classroom learning systems.

COMPRO's main simulator products include:

- **MUSE™ simulation runtime software**
- **Tactical Procedures Trainer (TPT)**
- **Part Task Trainer (PTT)**
- **Virtual Cockpit Simulator**

MUSE™ – The heart of Simulation

The Modular Universal Simulation Environment (MUSE™) software is a unique simulator and real-time code development environment. The philosophy behind MUSE™ addresses a critical industry need – a way to develop simulation and training devices where major components can be conveniently reused and adapted to meet new requirements.

MUSE™ is designed to facilitate customer code reuse. MUSE™ can be used to model common weapons platforms or mission systems in aerial vehicles (fixed wing or rotary/UAV), land vehicles, and sea-borne vessels.

MUSE™ benefits include:

- **Significant reduction in development cost**
- **Shorter development schedule**
- **Realistic dynamic aircraft simulation**
- **Realistic threat environment simulation**
- **Mission scenario development**
- **Real-world digital terrain database**
- **Out-the-Window (OTW) visual scene**
- **Reconfigurable cockpit displays**

MUSE's™ tactical mission environments expose the simulated weapons system to realistic threat stimuli while performing a mission. The threat stimuli are generated via the simulation of enemy defense systems. These threats are in the form of surface-to-air, air-to-surface, and air-to-air engagements, generated wholly within MUSE™ or multiple Man-In-The-Loop (MITL) simulators.

MUSE™ lets you define the initial mission conditions (scenario parameters) for the environment and players, and model the operation of sensors and countermeasure equipment, weapons, and enemy defense systems.

The head-up/head-down view is selectable, which allows toggling between those two views (most useful on a MUSE™ single-display system). Event logging can be turned on and off, giving you the flexibility to selectively record any portion of the mission, or the entire mission, for analysis or debriefing at a later time.

Tactics and Procedures Trainers (TPT)

One of the challenges facing the commercial and armed services arenas is how to provide a cost-effective training environment for today's complex aircraft. COMPRO's Tactics and Procedures Trainer (TPT) is a direct response to that challenge.

COMPRO's TPT provides high fidelity, high-performance training solutions at a fraction of the cost of other training devices that use real air craft avionics. Our TPT simulates the functionality and appearance of actual aircraft parts or subsystems, resulting in a far less complex environment to provide the training.

Our TPT flight controls and displays are driven by realistic computer simulations of the actual aircraft's systems, providing accurate reponses to pilot inputs. By simulating the aircraft's systems, autopilot, and navigational and operational instruments, COMPRO's TPT allows a large number of pilots to be trained to a consistently high level of competence in a short time.

COMPRO's TPT products include support training in emergency procedures, instrument flight, and air-to-air and air-to-ground combat within a dense threat environment.

Part Task Trainers (PTT)

COMPRO's Part Task Trainer (PTT) offers an economical way for training pilots on selected avionics systems, weapons systems or maintenance subsystems. The PTT features commercial off-the-shelf (COTS), Linux®-based hardware and software that runs our high-fidelity MUSE™ simulations.

All PTT functional controls, instrument panels, and cockpit hardware used are representative of the actual aircraft parts and reflect the same mechanical characteristics; that is, look, feel, and operate like the actual aircraft components.

Virtual Cockpit Simulator

COMPRO's Virtual Cockpit Simulator (VCS) features the same high-fidelity simulations available in our fully tactile-based TPT and PTT simulators. However, the VCS provides a lower cost, highly maintainable virtual cockpit that uses LCD screens in place of the replicated controls of the FTD. Our VCS cockpit features touch screen, fully-interactive, 2D representations of the cockpit environment.

COMPRO's VCS provides you with a detailed training and engineering environment in the virtual cockpit

environment. The VCS is configured for close replication of a specific cockpit layout and switch/gauge logic. The VCS uses our MUSE™ simulation software and can be configured to meet your specific training requirements.

Portable Desktop Simulator

COMPRO's Portable Desktop Simulator (PDS) is a downsized version of our PTT simulator. It targets more specific task training and is based on a lightweight PC laptop computer.

Our portable, affordable Desktop Simulator delivers real-time high quality training in the technical aspects of aircraft operation without custom hardware. The whole system operates using standard PC architecture with software models consistent with MUSE™ simulators.

Training Products/ Options

COMPRO has a long tradition of supporting your training needs with a comprehensive suite of options.

MUSE™ GUI Designer

Because of its simplified design, programmers in any industry can use the MUSE™ GUI designer to create state-of-the-art, reusable 2D or 3D GUIs for operating, maintaining, or replicating the most complex systems including military/civil aircraft cockpit displays, IOS control stations, diagnostic pages, and system displays.

MUSE™ Logic Builder

To effectively design a simulated control system and accurately predict its performance, designers must understand the behavior of the entire system in which the control system will reside. The MUSE™ Logic Builder forms the core environment for logic-based design for creating accurate models of a system's behavior.

The graphical, block-diagram approach of the MUSE™ Logic Builder environment lets you drag-and-drop predefined modeling elements, connect them together, and create models of logical systems. These dynamic systems can be adjusted in real-time, multi-rate, discrete-time, or virtually any combination of the three.

Instructor/Operator Station (IOS)

COMPRO's IOS provides a powerful, user-friendly interface through which training scenarios can be easily monitored, controlled, and changed. Our IOS is a flexible and versatile solution for military and commercial applications and is based upon COTS systems and GUI standards.

The IOS has a display library from which you can configure and develop mission pages. The display library contains the most common avionics and navigation instruments; unclassified versions of military tactical and weapon systems can be displayed as needed by the instructor.

Aural Cueing System (ACS)

The ACS is our low-cost hardware and software system to control and mix voice and digitally stored sounds. COMPRO uses the ACS in its training devices; it also is applicable to a wide variety of applications in the simulation, training, research, and entertainment industries.

COMPRO

COMPRO SimBright™
"Simulation in a New Light"

Commercial simulation is now more relevant than ever. The usage of many existing training devices has lasted far beyond their original projected life cycle.

Many of today's commercial simulators are well over 15 years old and need updates to bring them into regulatory standards compliance. To address this growing need, COMPRO has now developed our SimBright™ commercial simulation products for users wishing to rejuvenate legacy training devices under regulatory certifications.

SimBright™ products are specifically designed to provide affordable solutions, allowing users to extend the life or meet regulatory mandates of their training simulators and retain, where possible, the existing legacy certification of the device.

SimBright™ customers can choose the technology needed to stay current and competitive with today's training markets with minimal impact to training schedules.

COMPRO's SimBright™ products and services specialize in many areas which include:

- **Visual System upgrade/ replacement**
- **Host migration to COTS- based systems**
- **IOS upgrade**
- **Database modeling**
- **Regulatory certification assistance**
- **Collimated mirror upgrades**
- **Mirror extension from 150 to 220 HFOV**

Services

COMPRO's total systems approach to service and support offers diverse standard and customized programs that can be fine-tuned to your computing environment. The following services will ensure your success no matter what level of support is required.

Maintenance

COMPRO offers a variety of maintenance programs to ensure maximum uptime of your computing environment. From highly sophisticated users requiring minimal support to the critical needs of multi-vendor, high-demand users, COMPRO works with you to develop the most appropriate plan.

Services are available for both hardware and software, and each can be tailored to the specific needs of the user.

Logistics Support

COMPRO offers logistics programs to support any level of customer need for equipment spare parts and repair services. Experienced logistics professionals – skilled at working with large, long-term programs – work with you to determine the right program for your location.

We offer:

- **Exclusive source for installation of ECOs and FCNs for multiple products**
- **Repair capacity for multiple vendors (SGI®, Encore, Gould, SEL, Sun®)**
- **ISO 9001:2008 compliance**
- **The only authorized repair center for all Encore, Gould, and SEL products**

The diverse applications in use by COMPRO's customer base create a need for customized support. COMPRO stands ready to assist its customers with either off-the-shelf or proprietary software.

COMPRO's technical capabilities for multi-vendor software and hardware support services are time-proven. In fact, we've been excelling in supporting the most demanding applications in the world for over 45 years.

Additional COMPRO Product Offerings

Because of changing technologies and requirements, COMPRO strives to meet customers' evolving needs by continually providing new and enhanced product offerings.

Information Assurance (IA) Solutions

Legacy host computers in the U.S. Department of Defense (DoD) and international military installations worldwide must comply with recent Information Assurance (IA) security requirements. COMPRO offers two options to address security risk management:

- **Secure Linux® Gateway (SLG) for 3rd-party legacy host replacements (such as DEC®, SGI® and IBM®)**
- **Secure Legacy Computer Replacement System (S-LCRS) for any existing or future LCRS configuration**

Both options provide a separate single-point-of access Secure Linux® Gateway (SLG) computer system running an IA-approved version of Linux®. The SLG provides a single entry point for system control, while capturing, logging and storing all human I/O activity to meet IA requirements.

Under the SLG option, a host-dependent link, such as serial, Reflective Memory®, or Ethernet®

is established with the 3rd-party host replacement system and managed by a special application running in the SLG. This link carries command information between the SLG and host for overall system control.

Under the S-LCRS option, the SLG connects to one or more Embedded LCRS/Application Processors (ELAPs) that execute legacy SEL/Gould/Encore application code. All console traffic to the ELAPs is via the SLG; therefore all system access is captured, logged, and archived.

Visual Image Generator Solution

COMPRO can provide visual image generator (IG) solutions that are capable of meeting FAA and JAA Level D certification requirements.

The image generators are capable of providing over 60,000 polygons and up to 30,000 light points in day/night/dusk at an IG update rate of 60 Hz. when hosted on state-of-the-art PCs using current NVIDIA® class graphics boards.

Data Acquisition Solution

COMPRO's Human Interface Data Access System (HIDAS™) is a low-cost, flexible, data acquisition system for connecting physical switches, dials, potentiometers, encoders, lamps, displays, gauges, and other custom devices to a PC or workstation via a Peripheral Component Interconnect (PCI) bus interface controller.

The HIDAS™ uses Field Programmable Gate Array (FPGA) technology, making it quickly adaptable for custom interfaces.

The features and benefits include of the HIDAS™ include:

- **A token ring design that ensures reliable, deterministic data acquisition**
- **Built-in features for lamp test and back lit panel dimming**
- **High signal count per board type which simplifies cabling**
- **Easy fault isolation and troubleshooting**
- **A modular design which is easily expandable**
- **Custom serial interfaces for typical cockpit LED and 7-segment displays**
- **Effective separation of logical software engineering and physical device considerations**
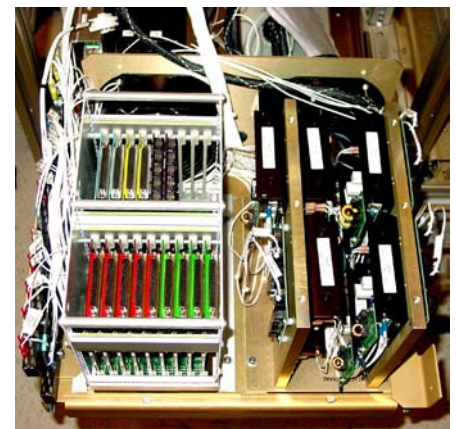
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