

Redefining Potential



**ST Training &
Simulation**



**Singapore Technologies
Electronics**

A company of Singapore Technologies Engineering

At STTS, we pursue the quest of learning with a relentless passion. By constantly developing new and innovative simulation and training systems, we enable organisations to further their learning processes and training standards, ultimately redefining the boundaries of human potential.

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Vision

To be a Global World-class Training & Simulation Provider

Mission

To provide innovative training and learning solutions to accelerate and maximise human potential to its fullest

Our Company

ST Training & Simulation Pte Ltd (STTS) is a wholly-owned subsidiary of Singapore Technologies Electronics Limited (ST Elect), which is one of the largest electronics system houses in the region.

ST Elect specialises in the design, development and integration of advanced electronics systems for commercial, defence and industrial applications worldwide. Established in 1969, ST Elect has achieved a firm global presence covering mainly the Asia Pacific region, marketing its products to more than 50 locations worldwide. Its expertise spans three business groups: Communication and Sensor Systems, Software Systems and Large-Scale Systems. STTS contributes to the group's capabilities under the Software Systems Group.

STTS is a Singapore-based hi-tech company dedicated to the development of highly sophisticated simulation and training systems. As the premier simulation house in the Asia Pacific, we design and

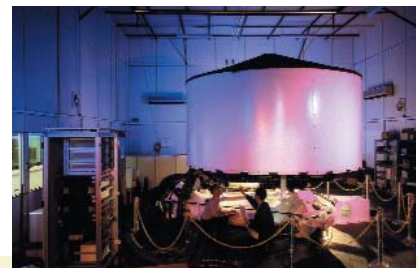
develop real-time distributed trainers and simulators. We strive to bring simulation to reality by providing a one-stop complete life-cycle solution; from the design and development of new innovative training systems to the maintenance and upgrade of legacy training systems.

With over two decades of experience, we have established ourselves as a recognised leader in the military and commercial sectors. In both areas, STTS has consistently demonstrated technological competency by delivering quality and state-of-the-art Fixed Wing, Rotary Wing, Ground and Commercial Simulators and instrumented solutions for aircraft, naval ships and ground forces. Our High Level Architecture (HLA) compliant simulators and instrumented products allow for joint air, land and sea training.

STTS' systems cover a range of comprehensive training features that include exercise planning, simulation exercise generation, monitoring

and control, training indoctrination and playback and review management. All training systems delivered by us are individually crafted and customised to support specific exercise needs and objectives. We ensure that our technologies and design applications meet the demands and stringent requirements of customised simulation and training systems and solutions.

Our professional maintenance team provides maintenance and upgrade services for our live, virtual and constructive training systems, including legacy systems.



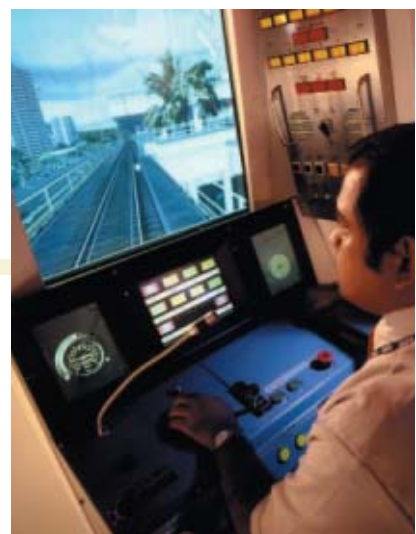
Our Philosophy

As a dynamic and innovative organisation, we place great emphasis on developing our people. It is through the skills and dedication of our employees that we have achieved many firsts, both in Asia and in the world.

In the world of business today, delivering the best value-added package to the customer above the competition is what separates the leader from the pack. Our strategic advantage lies in our people and their commitment to delivering innovative training and learning solutions to our customers.

The driving force behind the continuing success of STTS is our people. They are our key asset. As a dynamic and innovative organisation, we place great emphasis on developing our people. It is through the skills and dedication of our employees that we have achieved many firsts, both in Asia and in the world. It is only through

investing and developing our people to the highest of their potential, that we are able to create that added value for our stakeholders and firmly establish ourself as a world-class competitor in the global market.





**Engineered for
Training Excellence**

STTS Business Solutions

Our core business:

- Turnkey Solutions Provider
- Large Scale Systems Development & Integration
- System Enhancements / Upgrades / Modifications
- Comprehensive Customer Support (On-site / On-Call)
- Consultancy

BUSINESS AREAS

STTS focuses on a number of key areas in training and simulation.

Virtual Simulation

In our Virtual Simulation products, we create highly realistic virtual environments for the trainees. This virtual environment is synthesised by a variety of means, including the use of actual systems or their facsimiles. The equipment provides the basic interface to the trainee or man-in-the-loop and reaction is based on a software model of its operation.

Such a system requires a complex and responsive interplay between a myriad of hardware and software sub-systems. STTS is able to realise this by exploiting state-of-the-art technologies in the areas of

distributed real-time computing, systems modeling and high-speed networking.

These systems also feature inter-operability using the High Level Architecture (HLA) standard, enhancing training from the unit to the team level – a significant multiplier of training value.

Products featured in this category include Fixed Wing Simulators, Rotary Wing Simulators, and Land and Vehicle Simulators.

Constructive Simulation

In the area of Constructive Simulation, we offer our customers access to a higher level of command training. These simulators are used for training as well as for command and control. They feature simulation of large and complex environments with sizeable entities, each driven by software agents to provide them with realistic behavioural characteristics.

Constructive Simulators are also employed in training scenarios, together with Virtual Simulators to

provide a multi-layered training environment, extending team training to command and joint training. To enhance the training value, Constructive Simulators also espouse the use of inter-operability standards, such as the HLA.

Commercial and defence products in this category include Mission Planning Systems, Operations Training and War Gaming.

Training Instrumentation

In the Virtual and Constructive training environments, the trainee uses simulated equipment in a simulated environment. With Training Instrumentation, the trainee can use real equipment in a semi-real environment, enabling performance benchmarking and providing a performance gauge to identify and improve skills and techniques. Our Training Instrumentation systems are seamlessly integrated into existing platform systems to provide real-time, rangeless instrumentation.



Our range of products in this category includes the Fleet Instrumented Sea Training Systems (FISTS™) and the Advanced Combat Systems Emulator (ACE).

The cutting-edge system provides a single seamless system for naval operational training ranging from Surface-to-Surface Operations to Surface-to-Air Operations to Virtual, Live and Hybrid Training. Engaging powerful computers and long-range transceivers with expanded channel frequencies, STTS FISTS™ monitors the Command, Control, Combat and Communications systems of naval engagements in real-time. Improved data link algorithms allow optimal use of transmission time slots and solid-state components for robustness and longer monitoring range of exercises conducted at sea.

Complementing its sea instrumented training, STTS also introduces the latest generation of naval training emulators known as the Advanced Combat Systems Emulator (ACE). Where the Combat System cannot be instrumented, the ACE will emulate the combat facilities such as the

Action Information System and fire control system. While the FISTS™ provides the Navies a complete operational training, the introduction of the ACE and its integration with FISTS™, will offer full-scale, cost-effective inter-operability training system for the navy crews.

Interactive Virtual Reality

Virtual reality environments provide a new solution paradigm for training and simulation. With our highly creative visualisation team, STTS creates high fidelity and realistic immersive virtual training environments for training and evaluation purposes.

We also develop highly realistic visual entities such as humans, fauna and flora adding a high level of realism to the training environment and enhancing the overall training experience.

SIMULATION TECHNOLOGIES, APPLICATIONS AND PRODUCTS

Simulation Technologies

Over the years, STTS has built a whole suite of capabilities that allow us to develop and deliver cost-

effective solutions in the shortest time-to-product cycle, with a scalable and future-proof architecture. These core competencies include the following:

Software

- Domain-specific Simulation & Modelling
- Computer Generated Forces (CGF)
- Software Re-use & Repository

Simulation Framework

- Distributed Object-oriented Simulation Engine (DOSE™)
- High Level Architecture (HLA)
- Distributed Interactive Simulation (DIS)
- Training Assessment and Management Information System (TAMIS)
- After-Action Review (AAR) and "What-if" Re-simulation

Communication & Network

- Real Time Computing & Networking
- Real Time Data Link Communication

Visualisation & Graphics

- Computer Generated Imagery (CGI)
- Visual Database Modelling
- Virtual Reality



With our highly creative visualisation team, STTS creates high fidelity and realistic immersive virtual training environments for training and evaluation purposes.

STTS' systems improve operator performance while reducing training time on actual commercial and military equipment. The systems are specifically designed to reduce the initial operational training cycle, to improve the skill levels of trainees and prevent equipment loss. Our vast array of cost-effective simulation products and services ranges from desktop Computer-Based Trainers (CBT) to sophisticated procedural, tactical and mission training systems for air, land and sea environments.

Flight Simulators

STTS' family of advanced Air Combat Simulators are networked trainers capable of improving air-to-air and air-to-ground combat proficiency in the areas of switchology, situational awareness, tactical decision making, mission training, radar and weapon systems operation, navigation, attack and defence and malfunction handling.

User-friendly Human Machine Interface (HMI) allows non-programmers to set up scenarios, configure entities and manage the training through intuitive interfaces.

Interactive and artificial intelligence-based combat adversaries provide realistic behaviour and tactically correct manoeuvres against ownship and other computer generated forces. Our visual graphics consist of full colour photo-textured, geo-specific 3-D satellite imagery.

Our HLA compliance allows interfacing with other simulators to participate in large simulated combined force exercises in real-time.

Our training systems provide a wide range of comprehensive training features that include exercise planning, simulation exercise generation, monitoring and control,

training indoctrination and playback, and After Action Review (AAR) management.

The Instructor Operating Station allows the trainer to plan, control and monitor ongoing exercises. Using Plan View Display, the instructors can launch and direct training exercises, record and playback scenarios, review students' performance, insert malfunctions and change environmental conditions.

STTS' product line for Fixed-wing and Rotary-wing Simulators are:

- A4SU Mission Trainer and Operational Flight Trainer (OFT)
- F5 Part-Task Trainer (PTT) and Operational Full Mission Trainer (OFT)
- Air Distributed Mission Trainers (ADMT) for F16C and F5 aircraft
- Distributed Mission Fighter Station (DMFS)
- AS550 Helicopter Cockpit Procedure Trainer
- Super Puma Helicopter Full Mission Simulator (FMS)
- Unmanned Aerial Vehicle (UAV) Simulator



Land Based Simulators

Tank Simulators

STTS' Armour Gunnery and Tactical Simulator (AGTS) is the latest in armour training system. It is the flagship simulation system that allows interactive training of simulators with the air, land and sea forces in a virtual simulated war-gaming environment. Trainees are treated to a realistic and immersive war-gaming environment with 360 degrees Horizontal Field of View (HOV) visuals.

The AGTS is a roll-in-roll-out multi-vehicular platform simulator that trains Armour Commanders and Gunners from individual precision gunnery training through to combat team participant exercises and mission planning. Each vehicle station replicates actual equipment and out-of-the-hatch views.

The system is a pioneer state-of-the-art simulator in many aspects. The first HLA-compliant simulation system in Singapore, it features a unique concept of re-configurable "plug-and-play" crew stations that provide gunnery training for a wide

range of platforms/weapon systems. Its modular and flexible set-up facilitates training from individual gunnery to combat team tactical manoeuvres. The use of Dismounted Infantry Computer Generated Forces (CGF), that can mount and dismount from vehicle platforms, coupled with realistic geo-specific terrain, has brought the training to a higher level of realism.

The AGTS also offers a Training Analysis Management and Information System (TAMIS) which facilitates advanced analysis, including data-mining on archived performance and other trainee data.

The Instructor Operating Station allows the trainer to plan, control and monitor on-going exercises. Using Plan View Display, the instructors can launch and direct training exercise, record and playback scenarios, review students' performance, insert malfunctions and change weather conditions or time of day.

STTS' HLA compliance allows interfacing with other simulators to participate in a large simulated combined force exercise in real-time.

Driver Simulators

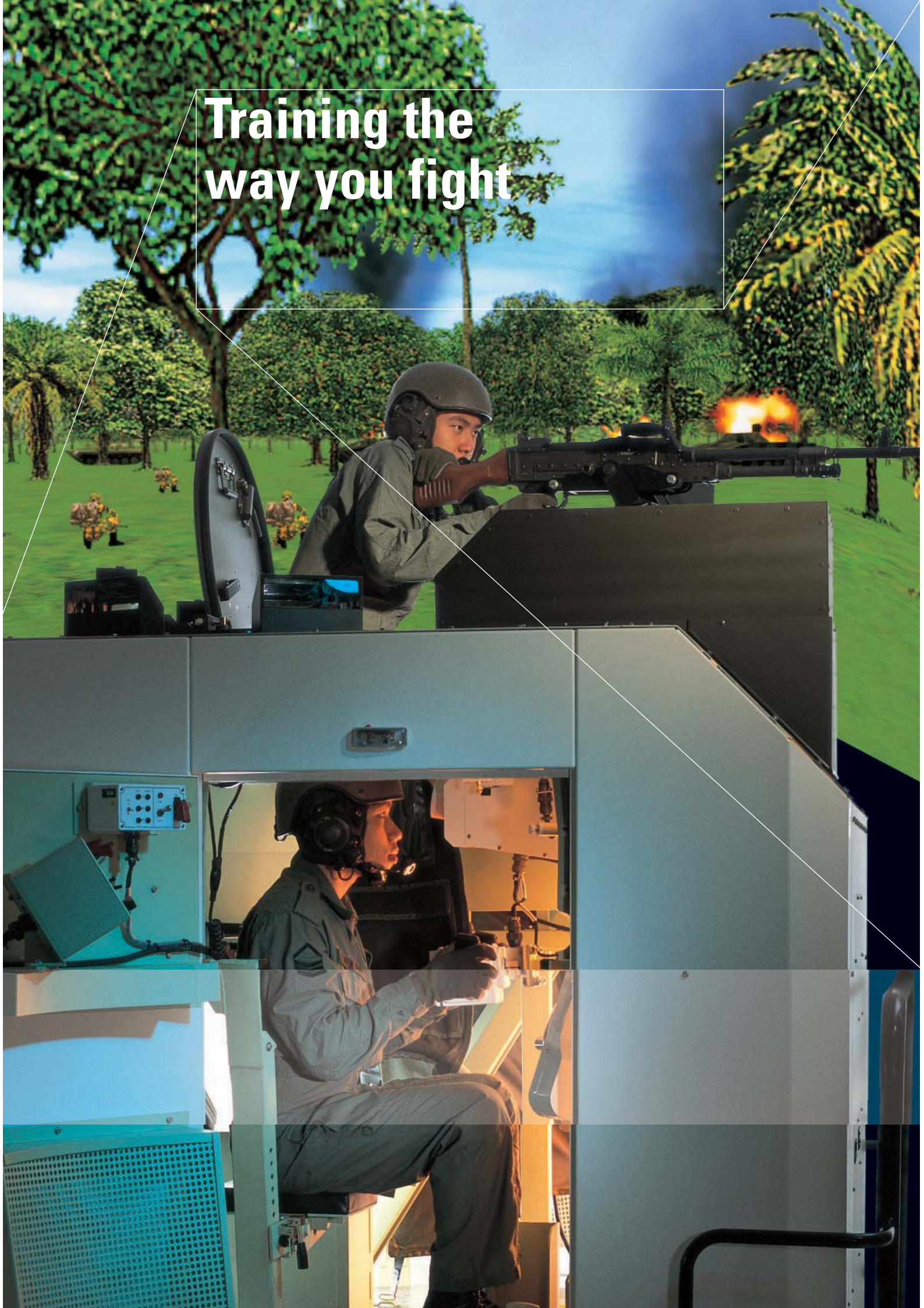
STTS maintains a cluster of truck driving simulators which are mounted on six-degree-of-freedom motion platforms to provide real driving motion cues.

Key training features of STTS' Land Based Simulator are:

- Precision Driving
- Realistic 3D Modelling
- Photo-textured Imagery
- Checks & Procedures
- Emergency / Malfunction Procedures
- One or more Force-on-Force Training
- Mission Planning & Rehearsal
- Tactics and Doctrine Development
- Fully Functional Replication
- After Action Review to provide in-depth Crew's Performance Assessment
- Intelligent Computer Generated Forces
- Night Vision Procedures
- Positive Training Transfer
- Potential Growth for New Types of Vehicle



Training the way you fight



Naval Simulation

STTS has produced a number of naval trainers, including Combat Information Centre trainers, Naval Tactical Trainers and Remotely Operated Vessel (ROV) Trainers. In addition, we have also developed an Instrumented Training system – the Fleet Instrumented Sea Training System (FISTS™), which features real-time simulation of weapons engagements, multi-level training and training debriefing for Surface-to-Air operational training. Comprehensive maintenance services for the FISTS™ are also provided by STTS.

Key features of FISTS™ are:

- Fleet Management
- Checks & Procedures

- Emergency / Malfunction Procedures
- Mission Planning & Rehearsal
- Tactics and Doctrine Development
- Navigation & Ship Handling
- Weapons Handling
- Experimentation

Commercial Simulators

Based on real, effective military applications, STTS makes use of commercial-off-the-shelf (COTS) components to design and develop affordable commercial training solutions, such as the Train Cabin Simulators and the Quay/Tower Crane Simulators.

STTS' Train Cabin simulation offers basic and advanced training to Passenger Train Operators, in both

stand-alone mode (consisting of one simulator) and integrated training mode (consisting of two or more simulators).

The state-of-the-art system is built on the latest COTS software system. The utilisation of COTS packages, with its open system architecture, allows easy system re-configurability, while keeping maintenance and operational costs at affordable levels.

Crane Simulator

Our Crane Simulator provides a computer-simulated environment, allowing trainees to improve their skills and practise safety operational procedures that cannot be replicated in a real-life situation.

We continuously invest in leading-edge technology to ensure innovative, value-added and state-of-the-art simulation solutions for our defence and commercial customers.



STTS SUBSIDIARIES

STTS has a number of subsidiaries that focus on specific expertise. This allows STTS to offer customers a one-stop comprehensive training solution to meet their specific needs.

We continuously invest in leading-edge technology to ensure innovative, value-added and state-of-the-art simulation solutions for our defence and commercial customers.

Interactive Visual Laboratory Pte Ltd (iVLab)

iVLab focuses on Computer Graphics Visualisation (CGV) business with indigenous capabilities spanning from real time graphics performance engineering to interactive media to high quality pre-rendered modelling. The company provides computer graphics imagery (CGI) for STTS simulation, and creates synergies such as games techniques and technologies for simulation, cost effective COTS interactive devices, and artistic solutions to resolve

polygon budget issues. Putting together the best of both engineering and creative worlds, the iVLab team provides realistic and engaging CGI and CGV solutions for a wide variety of markets beyond simulation for the military, education, training and entertainment fields.

Knowledge Alive Pte Ltd (KAPL)

Knowledge Alive Pte Ltd (KAPL) is a joint-venture company between STTS and mainboard-listed Horizon Education & Technologies Limited. Established as a corporate training and tertiary education company with its headquarters in Singapore, KAPL prides itself in offering differentiating learning solutions to its corporate and tertiary education clients to enhance their business performance. KAPL's customers include Fortune 500 and multinational companies, tertiary education institutions and small and medium enterprises, in the private and public sectors, across various industries, in Singapore and the region. KAPL relentlessly

pursues innovative learning solutions to value-add to our clients, shareholders and partners; and to strengthen Singapore as the trusted e-Learning hub for the Asia-Pacific Region.

ST Education and Training Pte Ltd (STET)

ST Education & Training Pte Ltd (STET) provides education and training, management and consultancy services for operational and technical domains of maritime, aerospace and land services and industries. STET is the commercial strategic training partner of the Republic of Singapore Navy in imparting education and training to Navy training institutions and schools. Providing STTS a means to expand into the maritime training business, STET complements STTS' core business in simulation and e-learning businesses.



Awards and Achievements

STTS delivers innovative systems through proven development methodologies and compliance to the Singapore Quality Class and ISO 9001 quality standards.

We have also received the People Excellence Award – the highest accolade given to organisations in Singapore in recognition of our outstanding people development approach and significant contribution to business excellence. By making considerable investment in our people and infrastructure, we deliver state-of-the-art training and simulation systems, on time and on budget.

STTS is a subsidiary of Singapore Technologies Electronics which is part of the Singapore Technologies Engineering Group, that achieved the Singapore Quality Award in 2002 – the most prestigious award in Singapore for business excellence.

MILESTONES

- 1997 – ISO9001:1994 Certification
- 1999 – People Developer Standard Award
- 2000 – Inducted into Singapore Quality Class (SQC)

- 2001 – ISO9001:2000 Certification
 - PSB NQCC Award
 - ST Business Progress Award – Best Business Cash-flow
 - ST Quest Outstanding Suggestion Commendation Award
 - ST Quest Gold Star Award
 - ST Elect QC Convention Gold Award
 - ST Elect Most Improved EVA Award (Gold) – Engineering
 - ST Elect Most Improved EVA Award (Silver) – Services

- 2002 – People Excellence Award
 - People Developer Standard Award
 - Singapore 50 Fastest Growing Certification 2001/2002
 - CIO 100 Honouree
 - National Productivity Award
 - SPRING NQCC Awards
 - ST Engineering Singapore Quality Award (SQA)
 - ST Quest Most Outstanding Suggestion Award
 - ST Quest Most Outstanding Suggestion Coordinator Award
 - ST Elect Most Improved EVA Award
 - ST Elect Best EVA Per Employee Award

- 2003 – ST QUEST Four Stars Award in Business Excellence
 - ST Elect Group Suggestion Award – Suggestion Challenge Trophy
 - ISO9001:2000 Certification (ST Education & Training Pte Ltd)
 - ST Elect IQC Convention (Silver)
 - ST QUEST Top Suggestion Award
 - ST QUEST Outstanding Suggestion Co-ordinator Award



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