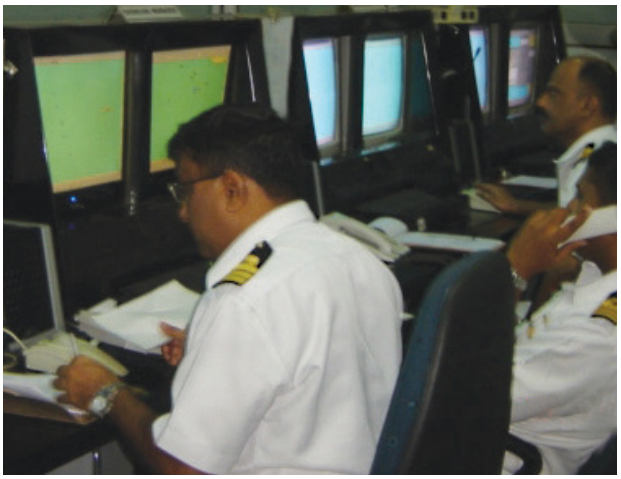
Action Speed Tactical Trainer

The CAE action speed tactical trainer (ASTT) is a comprehensive simulation-based system that facilitates the conduct of realistic naval operations training. The ASTT comprises a network of computers used as player workstations, and game control station. The player workstations can be configured to simulate ships, submarines, aircraft, or shore-based sites. The game controller defines a scenario that includes the gaming area, atmospheric conditions, ocean conditions, composition of friendly and enemy forces, inventory of sensors and weapon systems, initial positions, mission objectives, and constraints.

The primary purpose of the ASTT system is for the command teams of ships, submarines, and aircraft to communicate effectively in a realistic training scenario and rehearse the application of tactical doctrine in situations considered typical at sea. The system caters to three levels of exercise control. The force controller can monitor their own forces while the instructor controller typically directs staff. The highest level of control is the exercise manager who can see the entire scenario unfold and has complete control privileges.



Features

The ASTT system is made up almost entirely of commercial-off-the-shelf (COTS) hardware and high-fidelity simulation software. Features of the ASTT system include:

- PC-based system operating on a local area network (LAN)
- Detailed database and scenario generation facility
- Authentic depiction of coastline, depth, and topography (2048 nautical miles x 2048nm)
- Realistic platform dynamics modelling
- Virtual and constructive sensor modelling based on physics as well as environmental and hydrological conditions
- Damage modelling
- Modelling of various types of weapons and decoys
- Logistics model capable of simulating replenishment and repair
- Communications model replicating realistic communications at sea
- Scalability giving you the ability to tailor the number of forces in a scenario
- Scripts for automation at the platform level
- Comprehensive brief and de-brief facilities
- Automatic generation of reports for evaluation and analysis
- Compatible with distributed interactive simulation (DIS) standard

Hardware and software architecture

The ASTT system uses DIS to network the student and controller consoles. The simulation software runs on standard Windows-based workstations and includes simulation of the platforms, weapons, sensors, and countermeasures. The standard hardware configuration includes 12 student cubicles with each cubicle consisting of four workstations that can be configured to simulate ships, submarines, aircraft, or communications centres. There are typically four additional cubicles with five or six workstations each to represent the command centre and exercise controller.

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Weapons

Weapons can be of the tracked or non-tracked type. Tracked weapons include missiles and torpedoes. Their trajectories are updated and the positions are transmitted across the network so that they can be tracked by radar or sonar. Other weapons such as guns, bombs, and depth charges are modelled as non-tracked weapons. Targets can be engaged visually or by using the associated fire control system. Mines are modelled as individual mines laid down during the game or as minefields laid down before the training exercise starts. A minesweeping capability can be assigned to ships and helicopters. The ASTT system includes a number of expendable and towed active and passive decoys as well as countermeasures.

MAD, and satellite are available with the ASTT system, and physics-based modelling ensures a high-fidelity sensor simulation. Communications play a key role in naval operations so the ASTT system provides voice and data communications across a wide range of frequencies. In addition to computing hit probabilities, a tactical simulator must determine the extent of damage to a platform. The ASTT system includes a detailed damage module to simulate various damage states. The ASTT system also includes a comprehensive logistics module to track consumables such as fuel, weapons, and decoys. The system takes into account the time it takes to replenish these supplies from other ships or from the shore. Ships are able to enter the harbor for replenishment or repair, and the time for replenishment or repair can be defined in the system. Finally, the costs of platforms, weapons, sensors, and decoys are input to the database so that the logistics module can compute the estimated cost of an operation.

Other ASTT system modules

Platform dynamics such as acceleration, deceleration, turning rates, and fuel consumption in different conditions are built into the ASTT system. Static characteristics such as dimensions, variation of cross section with aspect, and sensor heights have also been considered. Sensors including radar, sonar, electronic warfare, IFF, IR,

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