Our helicopter training product range extends from classroom and computer based systems, through basic and procedural trainers to type specific devices designed to comply with the full scope of civilian regulatory requirements. The product range contains a number of specialised Spatial Disorientation trainers, but all of our devices benefit from having some degree of SD capability.

Building upon years of experience, ETC has developed SD scenarios tailored specifically for helicopter pilots, particularly those that occur at lower speeds and altitudes and are related to hovering and multidirectional movement. Hovering near the ground can result in whiteouts, brownouts and false sense of motion. Vection illusions can occur when helicopters slide slowly near other moving objects or when rotating strobe beacons reflect from a cloud base. Helicopter operations in poor weather such as driving or swirling snow create many SD risks as well. Flight over a variety of terrains such as: water, forests, jungles, desert, hills, and mountains in day or night present specific risks.

ETC has scripted a number of complete and realistic scenario profiles from taxi/takeoff to landing, with appropriate SD situations on route to be encountered, experienced, flown through and mastered. These can be supplied as standard examples or role/region specific scenarios created to meet customer requirements.

90% of Spatial Disorientation Mishaps are Fatal. 15%–17% of General Aviation Mishaps Involve Spatial Disorientation.

**SHOULDN’T YOU INCLUDE SPATIAL DISORIENTATION INSTRUCTION IN YOUR TRAINING PROGRAMME?**

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**Tasks Supported by ETC’s Range of Training Devices**


*Some training options may be subject to U.S. export licensing regulations.*
**BASIC TRAINERS**

These simple, basic cockpit mock-ups can be configured to represent various generic aircraft types as required by the customer and are used for a range of basic training, procedural and familiarity activities including ab-initio and instrument training. The basic cockpit module can also be used as a component in a Pilot Selection System.

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**CBT AND CLASSROOM BASED SYSTEMS**

ETC’s Computer Based Training (CBT) presents self-paced learning activities via a computer or a handheld device and is based on the SCORM standard—the de facto industry standard for e-learning. Presented linearly, ETC’s CBT system is based on the Multimedia Interactive Training System (MITS):

- Highly flexible
- Customisable to reflect local requirements
- Fully secured, licensed software

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**3 LEVELS OF TRAINING CONTENT**

1) Training Development Manuals

- Can be tailored for different personnel specialties and education levels
- Can be used by the instructor for lectures as an audio/visual support
- Can be individually paced to provide greater interactivity by the student

2) Computer Managed Instruction

- Can be tailored for different personnel specialties and education levels
- Can be used by the instructor for lectures as an audio/visual support
- Can be individually paced to provide greater interactivity by the student

3) Examination Platform

- Exams and tests can be administered at any point in the process
- Modifiable
- Uses traditional questions and tasks
- Questions and tasks are presented in random order on trainee workstations
- Responses are able to be monitored for subsequent course adaptation and feedback
All of our devices use a high proportion of Commercial-Off-The-Shelf (COTS) technology to achieve cost effective solutions with minimal operating, support and maintenance costs. Systems are built on modular principles and allow each device to be precisely tailored to meet the customer’s technical, training and budgetary requirements. The scalable nature of the designs allow for easy and seamless extension of the systems over time. This allows time to reflect on various requirements, changing training needs or fleet upgrades. This gives the Customer ultimate flexibility to tailor the system to his training needs, minimise entry costs and only invest in additional capability to cater for additional training load as necessary.

CUSTOMER SPECIFIC VISUAL DATABASES

Customer specific visual databases can be added to allow Line Orientated Flight Training and route/area familiarisation – an important feature for teaching crews particular hazards or operational requirements associated with routes that they may have to fly for your organisation – and of course the value and realism of these training activities are reinforced by the Spatial Disorientation training scenarios built into every ETC device and which again can be tailored to support your specific operating environment.
ETC’s specialised SD trainers all incorporate unique motion platform designs which enable the full range of motion based SD illusions to be experienced by pilots. Whatever configuration is chosen, these systems provide a hands-on, realistic SD training experience, exposing the pilot to a variety of selected disorienting illusions. Unlike traditional disorientation demonstrators, in which the pilot is passive, a pilot in one of ETC’s SD devices has full closed loop control of the simulation before, during, and after the disorienting illusion. This capability creates a fully interactive learning environment since the pilot must maintain control of the simulator and fly through the illusion to a successful resolution during his/her training.

HELOFLIGHT SD
The HELOFLIGHT SD is a mid range SD trainer with a state of the art, 4 degree of freedom motion base (+25° Pitch, ±30° Roll, ±360° continuous Yaw, ±5° Heave), allowing a greater number of SD illusions to create a more compelling and immersive experience. Cockpits are generic and single seat but can be reconfigured based upon customer specified aircraft types, allowing a degree of type representation, both in the hardware and flight model. The visual display has 3 flat screens. The HELOFLIGHT SD is aimed at relatively inexperienced pilots and supports basic instrument/navigation training, aircraft transition training and emergency procedures.

GAT HELO SD
The GAT HELO SD is a cost effective platform for customers wishing to demonstrate a stylised selection of both visual and motion based SD illusions to the ab-initio/experienced pilot. The GAT HELO SD is an entry level device consisting of a simple generic, single seat, rotary wing cockpit with customisable, single panel LCD instruments, single channel, projected visual display system and 3 axis motion platform (+12° Pitch, ±20° Roll, ±360° continuous Yaw). The GAT HELO SD is highly mobile, and has a small footprint.

SPECIALISED SD TRAINING

Supporting Your Research Needs
Add a Medical Monitoring and Data Acquisition System to conduct in-depth research:
- Motion Sickness
- Physiology of SD
- Situational Awareness Maintenance

ALL COCKPITS ARE NIGHT VISION COMPATIBLE and provided with appropriate flight models and outside world visual databases.
ETC’s ADVANCED HELOFLIGHT SD is a highly versatile and adaptable training device which utilises a unique electro-mechanical motion base onto which is fitted a cockpit, outer enclosure and visual system. The tailored cockpit supports the customer’s training requirements, whether as a generic trainer or a highly type specific rotary wing aircraft for military or civilian rotary wing trainer purposes.

Cockpits are Night Vision compatible and provided with appropriate flight models and outside world visual databases that can be either generic, allowing general aviation training under IFR and VFR conditions or highly representative, allowing a full range of type and role specific training to be carried out to internationally recognised standards such as FAA and EASA.

The ADVANCED HELOFLIGHT SD electro-mechanical motion base offers extreme stiffness, high reliability and low operation and maintenance costs. The ADVANCED HELOFLIGHT SD incorporates all of the benefits of a 6 DoF hexapod plus continuous yaw motion cueing, stimulating the pilot’s vestibular system in pitch, roll, yaw, heave, sway and surge. ETC’s advanced motion control system creates exceptionally high quality vestibular illusions by providing precise multi-axis control of linear and angular accelerations at both detectable and undetectable (sub-threshold) rates.

The ADVANCED HELOFLIGHT SD trainer has all the capabilities of the GAT HELO SD and HELOFLIGHT SD and can demonstrate high fidelity SD illusions as scripted, stylised events to the inexperienced pilot. The real strength of this device however, is that it is the first to bridge the gap between a predominantly SD trainer and a conventional simulator. Experienced pilots fly a variety of realistic, role-specific scenarios, in realistic cockpit environments, where several SD illusions are combined as they would be in a real operation. Many different realistic scenarios are available including EMS, SAR (including mountain and alpine rescue) and offshore oil and gas environments.

COCKPIT AND VISUAL SYSTEM OPTIONS INCLUDE:

**SINGLE SEAT COCKPIT:**
Partial dome visual system utilising a single high resolution LCD projector with proprietary lens providing 120° azimuth x 90° vertical field of view.

**DUAL SEAT COCKPIT:**
Larger dome-based visual system enclosing multiple projectors providing typically 220° azimuth x 65° vertical field of view and twin seat rotary wing cockpit.
PILOT SELECTION SYSTEM

Why Pilot Selection?
- Cost of training pilots in modern aircraft is escalating as aircraft acquisition, operation and maintenance costs increase.
- Pilot training attrition rates typically range from 15% - 25% with some air forces experiencing as high as 38%.
- Cost of candidate washout (failure to successfully complete training) is a major factor in the expense of training.
- This translates directly into lost training resources that could be used to improve your training programs.
- ETC’s Pilot Selection System saves valuable training resources while selecting the most qualified candidates.

The Pilot Selection Process

ETC’s Pilot Selection Process Can Utilise a Wide Range of Training Devices.

We evaluate the candidate’s ability to execute conscious attention management in a dynamic, multi-tasked environment using one of the following ETC Trainers:

**Basic Trainer**
- Fixed Base simulator
- Realistic Cockpit
- 270° horizontal x 60° vertical FOV
- Immersive Environment

**GAT HELO SD**
- Three axes of motion simulator with continuous yaw
- Realistic enclosed cockpit
- Bezeled flight instrument display
- Single-channel visual scene
- SD training capabilities

**ADVANCED HELOFLIGHT SD**
- 6+1 DoF motion simulator with continuous yaw
- Realistic enclosed cockpit
- Bezeled flight instrument display
- 220° horizontal x 65° vertical FOV
- SD training capabilities

All trainers are offered with customer’s choice of generic or aircraft specific configuration.

**Measurement Objectives:**
- Pilots’ Psychomotor Ability
- Sensory Control
- Motor Coordination
- Perceptual Speed Ability
- Cross Control Ability
- Time Sharing
- Perceptual Depth
- Pattern Recognition
- Sensation of Kinesthetic Memory
- Tracking
- Speed Control
- Reaction Time
- Spatial Orientation Skills

SUCCESSFUL CANDIDATES

PILOT CANDIDATES

All testing and questions are customised for cultural diversity.

ETC’s Pilot Selection System can be customised to suit the number of billets available at flight school.
WATER SURVIVAL SYSTEM

ETC’s Water Survival System is a specifically designed in-ground swimming pool located indoors or outdoors, for water survival training. The specialised design locates the Helicopter Underwater Escape Trainer (HUET) at one end and the Helicopter Rescue Hoist Trainer (HRHT) at the other. Two wind machines generate wind conditions within the pool, a wave machine and current jets simulate water conditions and currents. Each of these elements can also be purchased individually.

The pool is equipped with audio, visual and rain effect nozzles to recreate rain and other weather effects including helicopter rotor downwash and day or night conditions. Audio and visual effects include fog, thunder, helicopter sounds, boats and other survival/rescue related sounds.

Helicopter Rescue Hoist Trainer (HRHT)

The Helicopter Rescue Hoist Trainer is a hoist mechanism that simulates the hoisting of a trainee into the rescue helicopter. The HRHT main platform is 10 feet high and supports the hoist mechanism and the rotor downwash sprayers. The instructor uses a remote control to operate the winch that drives the hoist mechanism from this platform. The instructor controls the activation, speed and direction of the hoist winch.

Helicopter Underwater Escape Trainer (HUET)

The Helicopter Underwater Escape Trainer simulates typical underwater disorientation caused by a rapidly sinking inverted helicopter. A variety of helicopters from within the customer’s fleet can be simulated. All exits and windows are correctly sized for the aircraft being simulated. The HUET provides aircrew the opportunity to train using different cabin exit points under day and night time conditions.

ETC’S Standard Water Survival Training System includes:

- Training Pool
- Wind Machine
- Wave Machine
- Current Jets
- Rain Effects
- Audio & Visual Effects
- Integrated Instructor Control System
- Helicopter Rescue Hoist Trainer (HRHT)
- Reconfigurable Helicopter Underwater Escape Trainer (HUET)
The Helicopter Training
Regional Directors

Contact Steve Jackson (sjackson@etcusa.com) ETC’s head of helicopter training products, for further information or to arrange a one-to-one consultation.

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ETC—Over 40 Years, in 86 Countries and Counting…