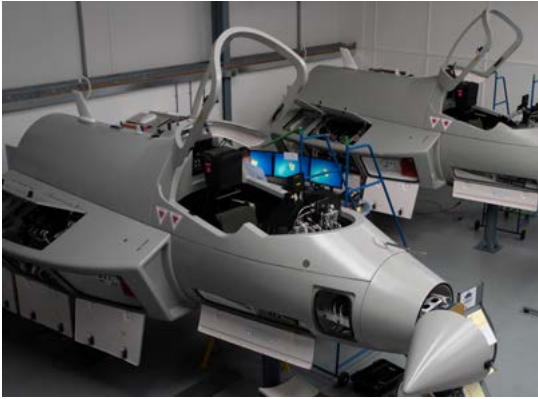


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CATALOGUE**

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CONTENTS

| | |
|---|-----------|
| INTRODUCTION | 4 |
| GENERIC MAINTENANCE TRAINERS | 6 |
| GENERIC FASTENER INSTALLATION TRAINER (GFIT) | 8 |
| BASIC FLYING CONTROL ROD TRAINER (BFCRT) | 10 |
| GENERIC HAND SKILL TRAINER (GENSKILL) | 12 |
| GENERIC HAND SKILL TRAINER MK 2 (GENSKILL MK2) | 14 |
| GENERIC MK2 CONVERSION KIT | 16 |
| AIRCRAFT WIRING BOARD (MAIN ASSY & CONSUMABLES) | 18 |
| HYDRAULIC SYSTEM PRINCIPLES TRAINER (HSPT) | 20 |
| AVIONICS & ELECTRICAL SYSTEM EMULATOR (AESE) | 22 |
| VIRTUAL AIRCRAFT TRAINING SYSTEM (VATS) | 24 |
| GENERIC STORES LOADING TRAINER (GSLT) | 26 |
| GENERIC FLYING CONTROLS TRAINER (GENFLY) | 28 |
| BASIC HELICOPTER MAINTENANCE TRAINER (BHMT) | 30 |
| INTEGRATED AVIONICS MAINTENANCE TRAINER (IAMT) | 32 |
| VIRTUAL REALITY | 34 |
| VIRTUAL MARSHALLING TRAINER (PREVIOUSLY KNOWN AS SEPT) | 36 |
| VIRTUAL LOADMASTER TRAINING SYSTEM (VLTS) | 38 |
| VIRTUAL PARACHUTE TRAINING SYSTEM LITE (VPTS LITE) | 40 |
| ENGINEERED SOLUTIONS | 42 |
| RAIL | 44 |
| VIRTUAL REALITY SHUNTER TRAINER (VRST) | 46 |
| ELECTRICAL CONTROL ROOM (ECR) SWITCHING SIMULATOR | 47 |
| ACCIDENT AND INCIDENT RECONSTRUCTION | 47 |
| OMEGAPS RAIL | 48 |
| TRACK ACCESS SERVICES (TAS) | 49 |
| ROUTE FAMILIARISATION | 50 |
| TRACK ACCESS PORTAL | 51 |
| COMPUTER BASED TRAINING (CBT) | 51 |
| TECHNICAL SERVICES & SUPPORT | 52 |
| TRAINING NEEDS ANALYSIS | 54 |
| COURSEWARE DEVELOPMENT | 54 |
| TECHNICAL PUBLICATIONS | 55 |
| FACILITIES PLANNING | 56 |
| COMPETENCY MAPPING | 56 |
| IN SERVICE SUPPORT, PREVENTATIVE & CORRECTIVE MAINTENANCE | 58 |
| INSTRUCTION AND TRAINING | 58 |
| CONSULTANCY | 59 |
| SPARES & OBSOLESCENCE MANAGEMENT | 59 |
| DISMANTLING AND DISPOSAL | 59 |
| LICENSING | 60 |
| REMEDIATION AND REFURBISHMENT | 60 |
| INSTALLATION & COMMISSIONING | 61 |
| 3RD PARTY ENGINEERING | 61 |
| ADDITIONAL SERVICE INFORMATION | 62 |
| INTEGRATED LOGISTICS SUPPORT (ILS) | 64 |
| R4I | 68 |
| FUTURE INNOVATION | 72 |
| CONTACT | 75 |

INTRODUCTION

Pennant International Group is a leading provider of technology-based training solutions and ILS software & services to the Defence, Aerospace, and safety critical industries in the UK and overseas, as well as rail specific capabilities and educational pathways through ASP. Over recent years, the Group's offering has expanded into civil markets with the alignment and mapping of our training aids to aviation regulations such as EASA/EMAR, FAA, City & Guilds and CASA MEA Units compliant organisations.

An established supplier to the UK MoD and other major defence contractors, Pennant has a proven capability in the Design, Development, Manufacture, Delivery and Support of training solutions and services including:

- Translating and developing a training requirement into a deliverable product
- Providing Subject Matter Expertise in specialist and technical areas
- Virtual Reality (VR), Augmented Reality (AR) & 3D walk-through applications
- Hardware & software based Part Task Trainers (PTT)
- Hardware & software based simulators for Operators and Maintainers
- Computer Based Training (CBT) to include:
 - Multimedia assets
 - Instructor led / Computer Assisted Instruction (CAI)
 - Self-Paced / CBT
 - Screen Based Emulators
 - Integrated Electronic Classrooms
- Through Life Product Support & Services (Integrated Logistics Support)

Pennant equipment offers a modern, blended training solution enabling ab-initio students to benefit from a suite of modern, generic and bespoke training aids offering operation and maintenance savings and improved safety outcomes. These training aids complement training on real equipment and include basic hand skills devices, virtual reality trainers and maintenance emulators for regulated sectors.

This brochure contains details of the full Pennant International Group Capabilities, including; Pennant trainers, bespoke capabilities, ILS, LSAR and S1000D software and service expertise, as well as information on our trusted brands.

Please contact Pennant for details of its bespoke capability.







GENERIC MAINTENANCE TRAINERS

GENERIC MAINTENANCE TRAINERS

Pennant's range of generic training equipment offers a blended solution enabling ab-initio students to benefit from a suite of modern, off-the-shelf training aids which provide operation and maintenance training in a secure training environment before students feel capable and confident to transfer onto real-life equipment, building confidence and developing necessary hand skills. These training aids include:

- basic hand skills devices
- virtual reality procedure trainer for aircraft marshalling and ground handling tasks
- desktop emulators for fixed and rotary wing aircraft
- mechanical and avionic systems for practicing maintenance and fault-finding activities

Students are then equipped to move on and complete their training on high end domain-specific trainers utilising the skills they have learnt on Pennant's Generic Trainers, lessening the step across to working on the real equipment.

The equipment is used at engineering colleges and academies around the world to support both military specific trade training and more recently has been delivered to support EASA/EMAR, FAA, City & Guilds and CASA MEA Units compliant organisations.

GENERIC FASTENER INSTALLATION TRAINER (GFIT)

The Generic Fastener Installation Trainer (GFIT) provides each student with the initial cognitive and manipulative skills required for accurate hardware assembly. It is extremely portable and cost effective, requiring only a limited selection of hand tools and a bench vice. Although primarily designed for the aviation industry, the GFIT can be easily adapted to suit any industry that provides training in simple manufacture and hardware assembly.

KEY FEATURES

- Covers knowledge and learning tasks involved with the following standards & qualifications: EASA/EMAR PT66, FAA, City & Guilds and CASA MEA Units
- Fastener Identification and Operation
- Determination of fits and clearances
- Progressive / Pattern / Torqueing
- Prevailing torque measurement / application
- Lock tab installation
- Application of chemical locking compounds
- Split pinning (cotter pin installation)
- Assembly of all-metal and low temperature lock nuts
- Assembly and locking of an electrical connector
- Single strand locking of black box screws
- Figure 8 safetying with lockwire of MS engine bolts
- Safetying with double strand lockwire of AN type bolts
- Fitment of AN type tube nuts and rigid plumbing

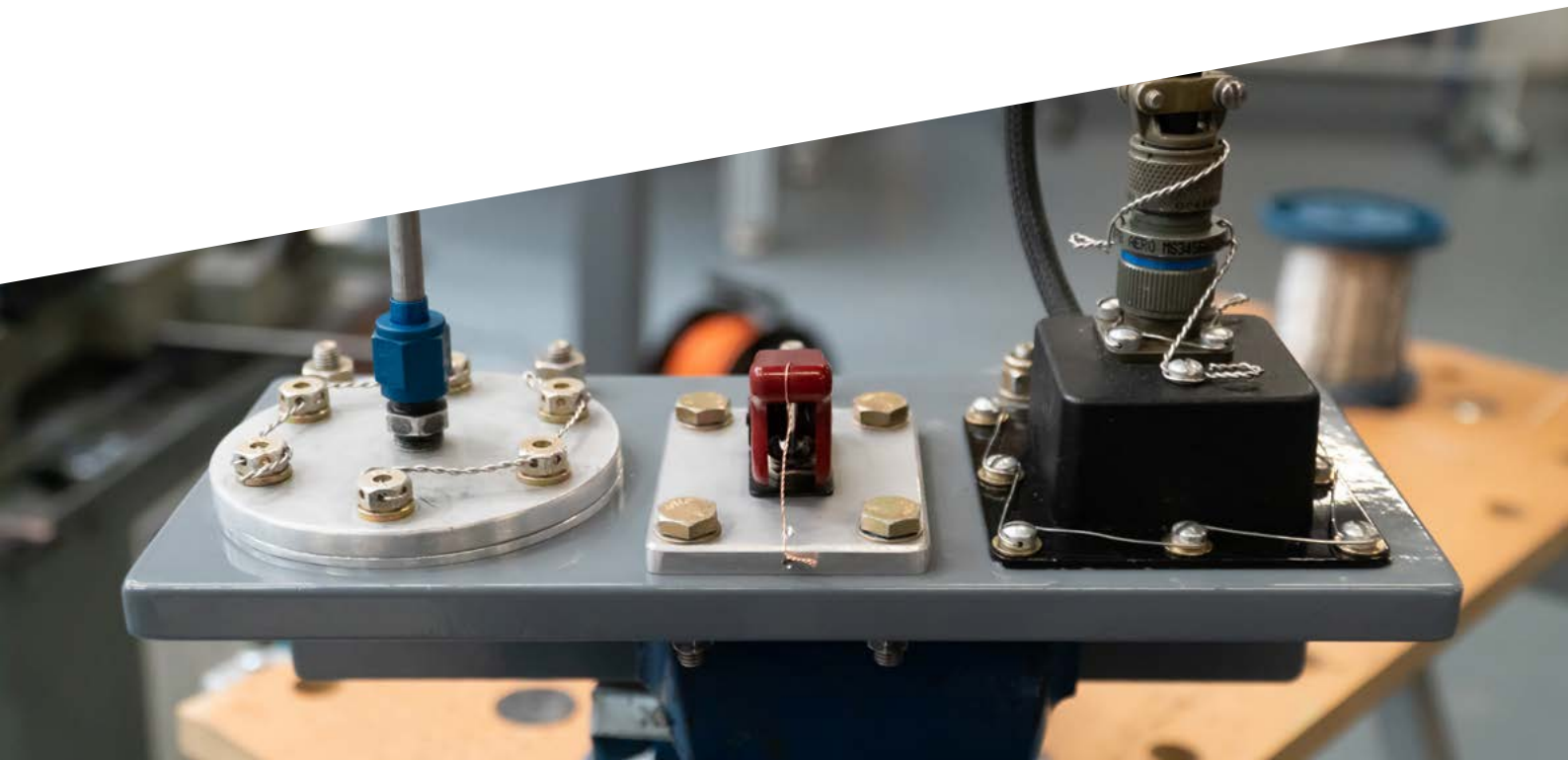


SUPPLIED DOCUMENTATION

| |
|---|
| Operation & Maintenance Manual |
| Student Manual (Technical Publications) |

ORDERING INFORMATION

| | |
|-------------|--|
| 80500-0001A | Generic Fastener Installation Trainer (Imperial) |
| 80501-0001A | Generic Fastener Installation Trainer (Metric) |



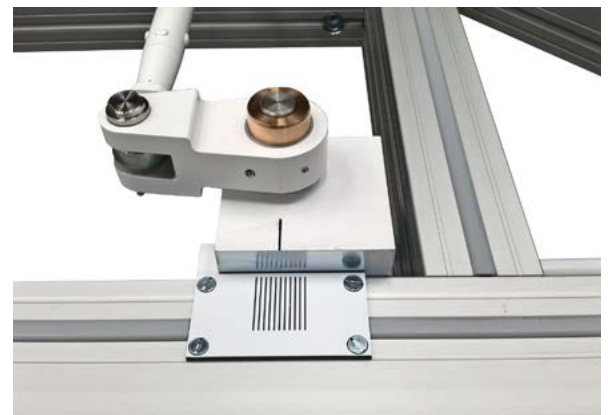
BASIC FLYING CONTROL ROD TRAINER (BFCRT)

The Basic Flying Control Rod Trainer (BFCRT) provides basic training on flying control surface operations and adjustment and rigging of control systems.

The system comprises a representative control column assembly, a short control run with adjustable control rods and stops, rigging pin provision and idler links. The rig terminates with a representative control surface with deflection measuring capability.

KEY FEATURES

- Lightweight portable frame
- Representative control column assembly
- Spring feel unit
- Various bell cranks and links
- Primary stops
- Adjustable control rods



SUPPLIED DOCUMENTATION

| |
|---------------------------------------|
| Operation Manual & Maintenance Manual |
|---------------------------------------|

OPTIONAL ACCESSORIES

| |
|----------------------------------|
| Student Toolkit |
| Spares Kit (Scaled at 1-5 BFCRT) |
| Consumables Starter Pack |

ORDERING INFORMATION

| | |
|-------------|----------------------------------|
| 97710-0001A | Basic Flying Control Rod Trainer |
| 97710-3020 | Consumables Starter Pack |
| 97710-3021 | Spares Pack |
| P001289 | Student Toolkit |



GENERIC HAND SKILL TRAINER (GenSkill)

GenSkill is a freestanding physical representation of a typical Flying Control Run. The Generic Hand Skills Trainer (GenSkill) provides training in the hand skills necessary to work on aircraft components in confined spaces through access panels in an aircraft fuselage.

The internal components are typical of aircraft systems and includes:

- Control system – control rods, pivot blocks, pivot arm, torque tube
- Hydraulic components – PFCU, rigid pipes, flexible pipes, manifold valves
- Avionic LRU – cable, connectors, mounting tray.

KEY FEATURES

- EASA/EMAR PT66, FAA, City & Guilds and CASA MEA Units
- Fuselage shaped shell containing access panels secured with a range of aircraft fasteners
- Internal components typical of aircraft systems suitable for remove and install tasks:
 - Control system (Control rods, pivot blocks, pivot arm. Torque tube)
 - Hydraulic components (PFCU, Rigid Pipes, Manifolds and Valves)
 - Avionic LRU (Cable, Connectors, Mounting Tray with aircraft tie-downs, LRU)
- Aircraft Component Recognition
- Safetying by lock wire, split pin and torquing
- Fastener recognition / identification
- Control Linkage Rigging
- Does not require expensive aircraft parts
- Designed to allow the observation of repetitive tasks in training
- Interactive Electronic Technical Publication, S1000D laid out in ATA2200 format with performance support material



SUPPLIED DOCUMENTATION

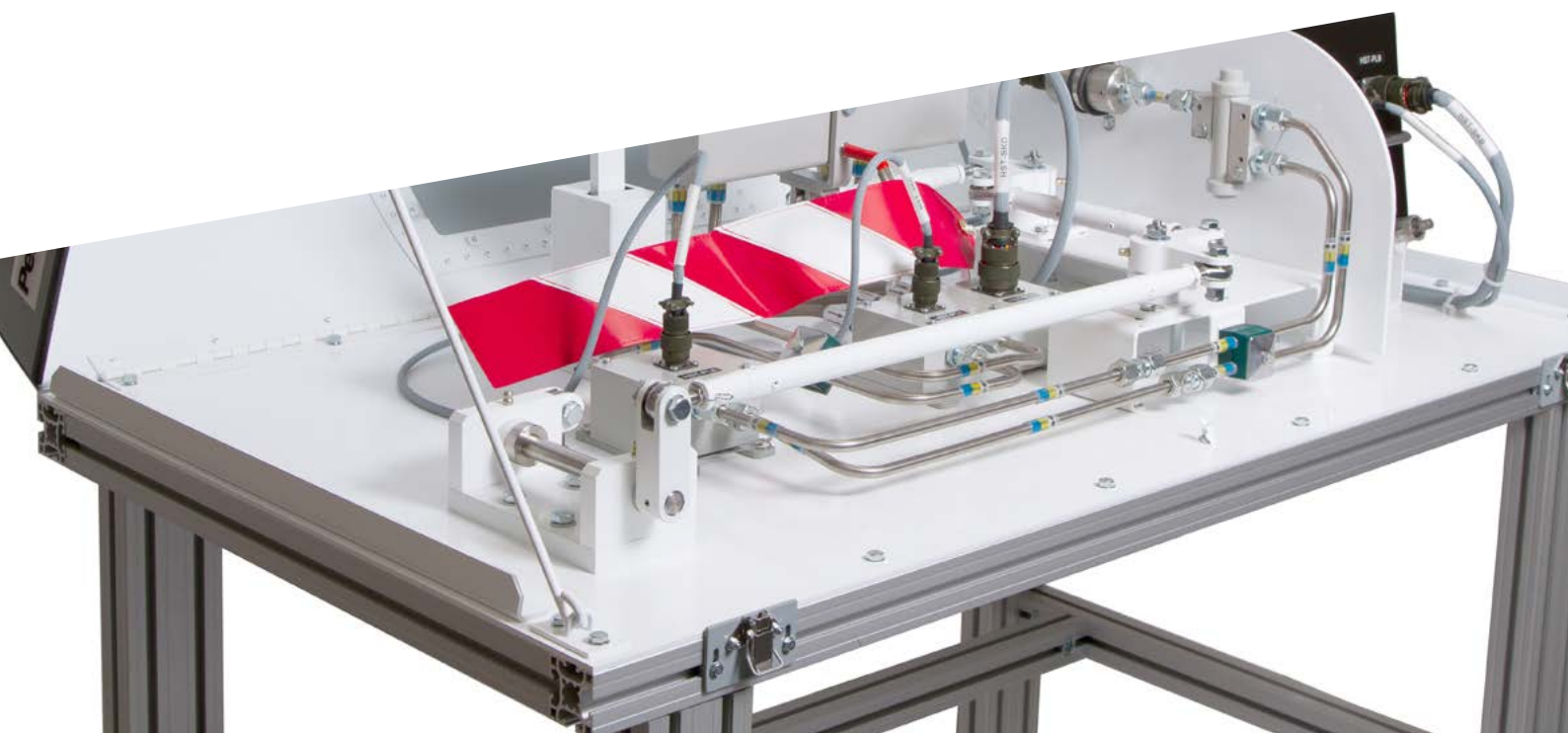
Interactive Electronic Technical Publication (IETP)

OPTIONAL ACCESSORIES

| |
|--|
| Student Toolkit |
| Spares Pack (Scaled at 1-5 Genskills) |
| Consumables Starter Pack |
| GenSkill Joining Kit (Join two single Genskills together end to end) |

ORDERING INFORMATION

| | |
|-------------|-----------------------------|
| 97510-0001A | Generic Hand Skills Trainer |
| 97510-3020 | Consumables Starter Pack |
| 97510-3021 | Spares Pack |
| P002565 | Student Toolkit |
| 97500-0055A | Joining Kit |



GENERIC HAND SKILL TRAINER MK2

[GenSkill MK2]

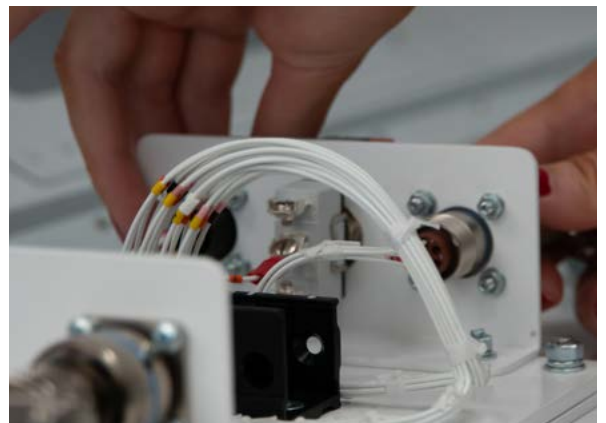
Alongside the Generic Hand Skills Trainer (GenSkill), the Mark 2 builds on and enhances the training capability of the standard GenSkill training device by introducing a functioning low voltage aircraft circuit as a fabrication and modification embodiment to extend training to avionic skills.

The GenSkill MK2 provides students with the opportunity to:-

- Carry out and inspect electrical compartment of LRU
- Remove and install line replaceable unit
- Carry out electrical harness continuity checks
- Troubleshoot and fault tree analysis
- Perform sheet metal and harness fabrications

KEY FEATURES

- Fuselage shaped shell containing access panels secured with a range of aircraft fasteners
- Internal components typical of aircraft systems:
 - Control system (Control rods, pivot blocks, pivot arm, Torque tube)
 - Hydraulic components (PFCU, Rigid Pipes, Manifolds and Valves)
 - Avionic LRU (Cable, Connectors, Mounting Tray with aircraft tie-downs, LRU)
- Aircraft Component Recognition
- Safetying by lock wire, split pin and torquing
- Fastener recognition / identification
- Control Linkage Rigging
- Does not require expensive aircraft parts
- Designed to allow the observation of repetitive tasks in training



KEY FEATURES (GENSKILL MK2 ADDITION)

- Covers knowledge and learning tasks involved with the following standards & qualifications: EASA/EMAR pt66, FAA, City & Guilds and CASA MEA Units
- Introduction of a functioning low voltage aircraft circuit
- Carry out a service bulletin which incorporates embodiment of an avionic modification
- Electrical harness fabrication & sheet metal fabrication
- Testing of the system with a portable test set
- Instructor controlled fault harness replaces the student harness with in-built faults
- Interactive Electronic Technical Publication, S1000D laid out in ATA2200 format with performance support material

SUPPLIED DOCUMENTATION

Interactive Electronic Technical Publication (IETP)

OPTIONAL ACCESSORIES

Spares Pack (Scaled at 1-5 Genskills)

Consumables Starter Kit

GenSkill Joining Kit (Join two single Genskills together end to end)

Additional Test Set

Additional Fault Harness

Student Toolkit (Mark 1 Only)

ORDERING INFORMATION

| | |
|-------------|--|
| 97520-0001A | Generic Hand Skills Trainer Mk2 |
| 97520-0002A | Mk2 Modification Kit |
| 97520-3020 | Consumables Starter Pack |
| 97520-3021 | Spares Pack |
| 97520-3022 | Ground Support Equipment (GSE) Kit (Includes Test Set and Fault Harness) |
| P002565 | Student Toolkit (Mark 1 Only) |
| 97500-0055A | Joining Kit |



GENERIC MK2 MODIFICATION KIT

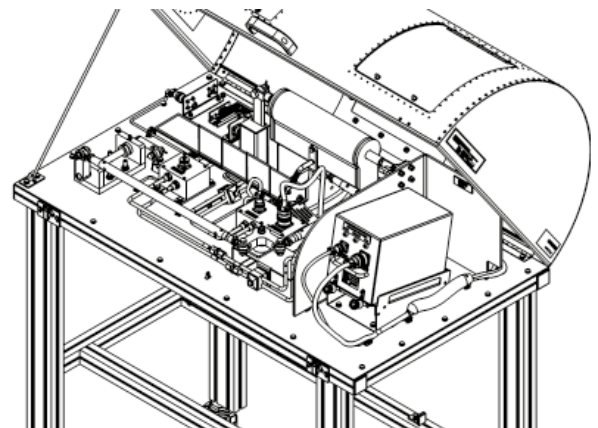
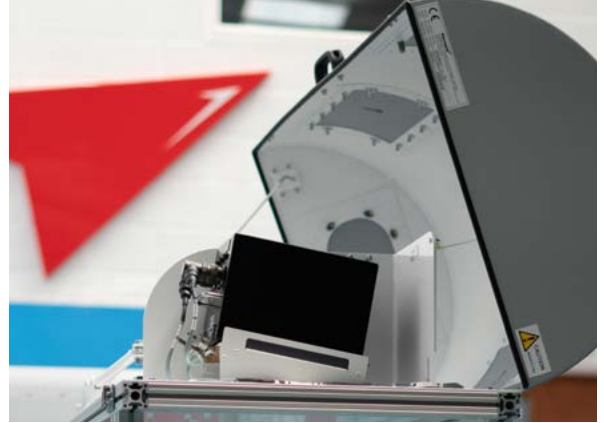
The Modification (MOD) Kit required to transform an existing GenSkill into a GenSkill MK2 enhances the training capabilities by introducing a functioning low voltage aircraft circuit as a fabrication and modification embodiment to extend training to avionic skills.

The MOD kit can be purchased separately to convert existing GenSkill in to the new MK2 modifications.

The MOD kit can be added by either instructor or student ready for teaching. The MOD kit provides the option for students to build the LRU section for the embodiment of the modification, which instructors can then test with the provided Ground Support Equipment and if needed later on switch out the student built LRU for the supplied harness with faults, to carry out additional learning tasks and fault findings.

KEY FEATURES

- Testing of the system with a portable test set
- Instructor controlled fault harness replaces the student harness with in-built faults
- Interactive Electronic Technical Publication, S1000D laid out in ATA2200 format with performance support material
- Additional practical tasks the modification kit includes and delivers are:
 - Electrical soldering & crimping techniques
 - Troubleshoot/ Fault tree analysis
 - Sheet metal fabrication
 - Harness fabrication
 - Embody/Dis-embody an avionic modification
- Plus all the existing tasks the GenSkill already offers



SUPPLIED DOCUMENTATION

Integrated Electronic Technical Publication (IETP)

OPTIONAL ACCESSORIES

| |
|--------------------------|
| Additional Test Set |
| Additional Fault Harness |

ORDERING INFORMATION

| | |
|-------------|--|
| 97520-0002A | Mk2 Modification Kit |
| 97520-3022 | Ground Support Equipment (GSE) Kit (Includes Test Set and Fault Harness) |
| P002565 | Student Toolkit (Mark 1 Only) |



AIRCRAFT WIRING BOARD (MAIN ASSY & CONSUMABLES)

Pennant has developed a suite of free standing Wiring Board Trainers, including Aircraft - a basic aviation electrical installation principles trainer, Automotive / Marine - replicating typical automotive and marine environment circuits using industry standard wire types, connectors & terminations and Domestic / Industrial - a basic electrical installation principles trainer.

These trainers enable the student to undertake a range of cable harness manufacturing and testing practices. Students gain experience in the use of common range of electrical test equipment by the testing and fault diagnosis of cable harnesses.

KEY FEATURES

- Range of different Cable Manufacture, Installation and Termination Methods
- Practical experience of Aviation Cable Harness numbering systems
- Practical identification and investigation of defects on DC circuits
- Practical experience in a range of tooling and test equipment
- Integral Storage
- Mobile Student Wiring Board Station
- Independent Test Facility





AVIATION MOBILE TEST BOX

NAVIGATION LIGHTS

STROBE

STROBE

OFF

NAV

PORT

STARBOARD

LAMP TEST

POWER
FUSE
2.5A

F1

F2

SYSTEM
FUSE
5A

POWER
ON

OFF

POWER
ON

SYSTEM
AVAILABLE

SYSTEM
ON

OFF

SYSTEM
ON

OFF

TB-2

TB-1B

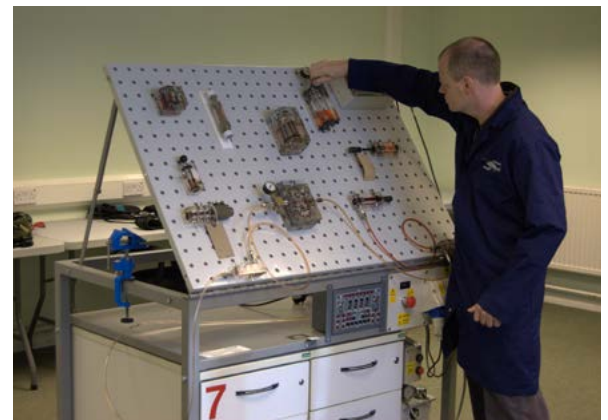
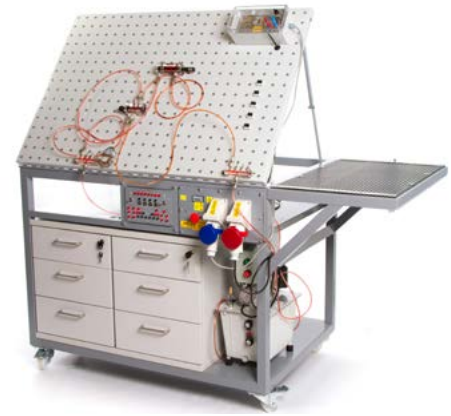
HYDRAULIC SYSTEM PRINCIPLES TRAINER (HSPT)

The Hydraulic Systems Principles Trainer (HSPT) enables practical hydraulic principles to be taught by either instructor demonstration or independent practical exercises for the student. Students are able to carry out a range of practical training exercises, enabling progressive understanding of the fundamental principles of hydraulics.

The HSPT has the flexibility to allow construction of systems from basics to the more advanced systems of modern aircraft.

KEY FEATURES

- Transparent “Plexiglass” hydraulic modules
- Self-sealing transparent interconnecting hydraulic hoses
- Specially coloured hydraulic mineral oil to assist observations
- Self-generating low pressure hydraulics
- Integral low voltage power supply
- Integral storage
- Instructor Hydraulics Demonstration Set



SUPPLIED DOCUMENTATION

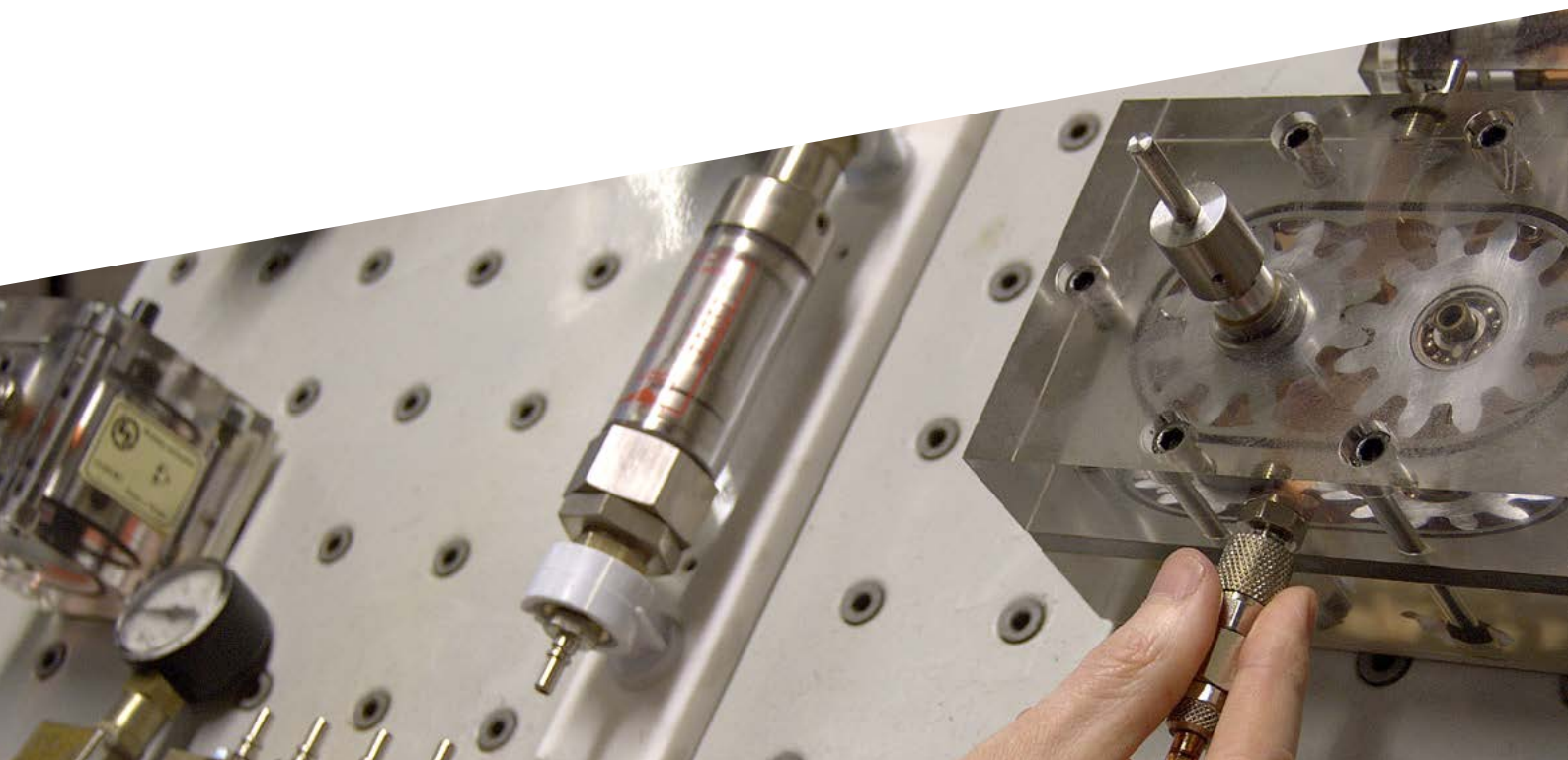
| |
|--|
| Operation Manual & Maintenance Manual |
| Student Manual (Technical Publication) |

OPTIONAL ACCESSORIES

| |
|---------------------------------|
| Instructor Demonstration Set |
| Spares Kit (Scaled at 1-5 HSPT) |
| Consumables Starter Pack |

ORDERING INFORMATION

| | |
|-------------|---|
| 97410-0001A | Hydraulic Systems Principles Trainer (50Hz) |
| 97420-0001A | Hydraulic Systems Principles Trainer (60Hz) |
| 97410-3020 | Consumables Starter Pack |
| 97410-3021 | Spares Pack |
| 97410-3022 | Instructor Demonstration Set |



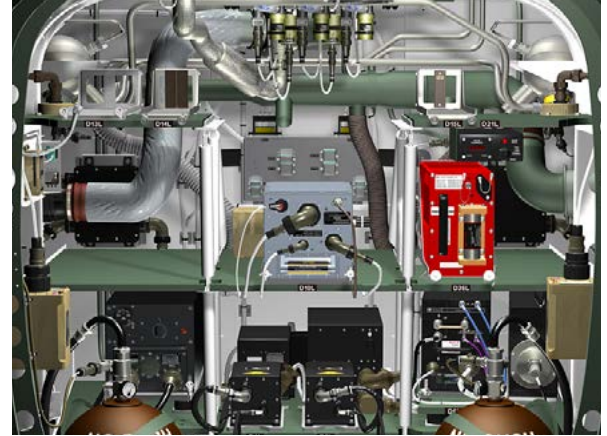
AVIONICS & ELECTRICAL SYSTEM EMULATOR (AESE)

Developed very much in the same vein as the Virtual Aircraft Training System (VATS) product, the AESE enables students to develop and practice the skills required to maintain a modern rotary aircraft.

The AESE is a classroom desk-top trainer which presents a graphical representation of the aircraft which the student can interact with, using virtual test equipment.

While majoring on the avionic and electrical trades, the trainer covers all systems on the aircraft to allow students to:

- Locate and identify system components
- Practise the normal operation of the aircraft avionic and electrical systems for ground based activities
- Perform functional tests on the active systems
- Observe equipment and system malfunctions and perform fault diagnosis and rectification





VIRTUAL AIRCRAFT TRAINING SYSTEM (VATS)

The Virtual Aircraft Training System (VATS) enables typical aircraft functional tests and fault-diagnosis procedures to be taught by either instructor demonstration or by student self-paced learning. Students will be able to carry out a range of practical training exercises through interaction with a virtual fixed wing aircraft, thus enabling progressive understanding of aircraft systems.

VATS is designed to support training methods that may be used to satisfy the theoretical training element in the classroom.

KEY FEATURES

- Virtual aircraft with:
 - Intuitive navigation and operation
 - Detailed aircraft bays and LRUs
 - Integrated aircraft systems simulation
 - Realistic real-time aircraft responses
 - 3D visuals
- Training management system for:
 - Training scenario creation
 - Planning, delivery and real-time monitoring of training scenarios
 - Automatic student assessment and report generation
- Electronic technical publications suite for the virtual aircraft
- Can be installed on a standalone Windows PC or networked for use in a classroom environment



SUPPLIED DOCUMENTATION

| |
|------------------|
| Operators Manual |
|------------------|

| |
|---------------------------------|
| Aircraft Technical Publications |
|---------------------------------|

OPTIONAL ACCESSORIES

Pennant will be happy to provide support services to assist with installation on End User equipment or to provision, install and commission appropriate PC equipment at the End User site.

ORDERING INFORMATION

| | |
|-----------------|----------------------------------|
| 99100-000-0001A | Virtual Aircraft Training System |
|-----------------|----------------------------------|



GENERIC STORES LOADING TRAINER (GSLT)

The Generic Stores Loading Trainer (GSLT) is a part task trainer designed to train students in carrying out procedures for loading and unloading stores in a safe environment. The GSLT comprises a fixed wing installation on the one side of the trainer and a rotary wing installation on the other.

The fixed wing is presented to the student at a realistic height and size to provide operational realism and hazards. The wing may be fitted with two pylons to which dummy missiles and bombs may be loaded and tested.

The rotary wing installation has a carrier to which dummy depth charges, missiles & torpedoes may be loaded and tested. A Counter measures and Defensive Aids System (CMDS) is included and may be loaded with dummy Chaff and Flare.

Animated schematics allow the student to observe the weapon system control circuits, whilst an Instructors console enables scenarios to be set, faults to be injected and the students' progress monitored.



KEY FEATURES

- Fixed wing Installation:
 - Load and Unload Missiles and Bombs
 - Remove and Install Pylons
 - Remove and Install Launchers
 - Remove and Install Ejector Release Unit (ERU)
- Rotary wing installation:
 - Load and Unload Missiles, Depth charges and Torpedoes
 - Remove and Install Electromechanical Release Unit (EMRU)
 - Load and Unload Chaff and Flare
- Dummy Weapons (Supplied):
 - Air to Air Missile (AAM)
 - Air to Ground Missile (AGM)
 - Laser Guided Bomb (LGB)
 - Torpedo
 - Depth Charge

➤ General:

- Safe handling procedures
- No Volts Checks
- Instructors console for scenario setting and injection of faults
- Animated schematics for observation of weapon system control circuits
- Supplied with Test equipment and Ground Support Equipment (GSE)
- Supplied Technical Publications

SUPPLIED DOCUMENTATION

Operation Manual

Maintenance Manual

Student Manual (Technical Publication)

OPTIONAL ACCESSORIES

Spares Kit

ORDERING INFORMATION

98610-000-0001A GSLT

98610-3021 Spares Kit



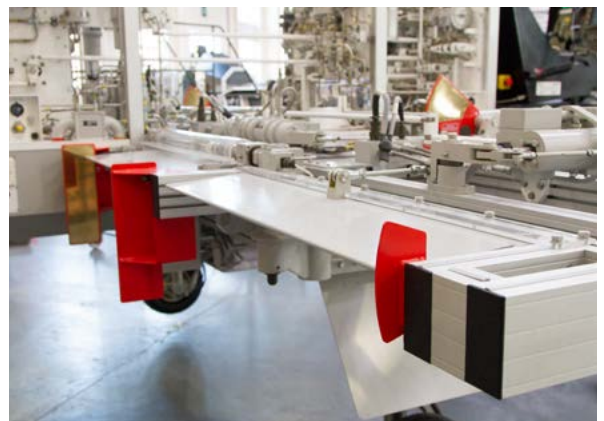
GENERIC FLYING CONTROLS TRAINER (GENFLY)

The Generic Flying Controls Trainer (GenFly) is a facsimile airframe to enable fast, realistic, effective training and to impart a thorough understanding of the principles and practices related to aircraft hydraulic, landing gear and flying control maintenance.

GenFly training rigs enable students to do progressive and demanding exercises. The training rigs allow the instructor to demonstrate and for each student to perform realistic maintenance tasks with a high degree of independence to consolidate and complement their theoretical knowledge.

KEY FEATURES

- Covers knowledge and learning tasks involved with the following standards & qualifications: EASA/EMAR PT66, FAA, City & Guilds and CASA MEA Units
- Synthetic training device with modular open frame structure
- Representative cockpit incorporating controls and indicators
- Control surfaces and landing gear activated by electro-mechanical systems to simulate hydraulic actuators
- Access to the cockpit area is affected by the provision of servicing stepped platforms; all other areas are accessible from the floor level



SUPPLIED DOCUMENTATION

| |
|---|
| Operation Manual |
| Maintenance Manual |
| Student Manual (Technical Publications) |

OPTIONAL ACCESSORIES

| |
|-------------------------|
| Student Toolkit |
| Spares Kit |
| Consumables Starter Kit |

ORDERING INFORMATION

| | |
|-------------|--|
| 97610-0001A | Generic Flying Controls Trainer (GENFLY) |
| 97610-3021 | Spares |
| 97610-3020 | Consumables |
| P000836 | Student Toolkit |



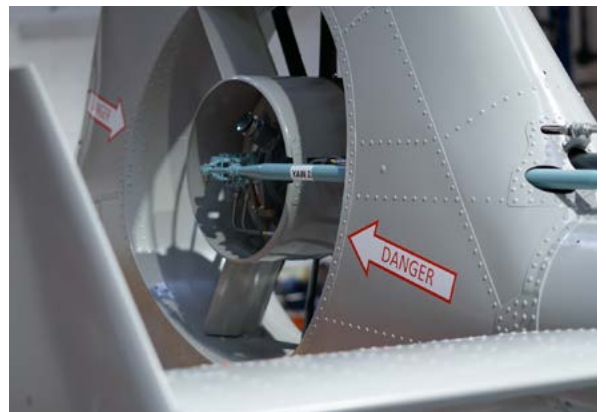
BASIC HELICOPTER MAINTENANCE TRAINER (BHMT)

The Basic Helicopter Maintenance Trainer (BHMT) is a freestanding helicopter trainer enabling students to carry out practical training by performing standard maintenance procedures associated with rotary wing aircraft. There are many systems on which the student can carry out functional testing, fault diagnosis and remove/install procedures.

The BHMT uses an optimum mix of high-fidelity replica and real aircraft components installed in a refurbished airframe representative of a generic rotary wing aircraft. The equipment enhances the training given by allowing the instructor to demonstrate at ground level, operation of systems e.g. cockpit layout, instrumentation, Gas Turbine Engine remove and install, flying controls etc. thereby underpinning the students' knowledge of these systems.

KEY FEATURES

- Covers knowledge and learning tasks involved with the following standards & qualifications: EASA/EMAR PT66, FAA, City & Guilds and CASA MEA Units
- Airframe structure with easily visible cockpit area
- Gas Turbine Engine
- Main Rotor and Tail Rotor Transmission
- Rotors flight control system, with collective, cyclic and yaw channels visible during operation
- Hydraulic power supply providing flight control via hydraulic assisted servo actuators
- Electrical supplies
- Generic glass cockpit featuring electronic flight instrument display
- Replicated stand by analogue flight instruments
- Student perform practical tasks using aircraft manuals, standard tools and test equipment
- Instructor operating station provides overall control, monitors activity and input of faults during simulated engine and rotor start training tasks
- Includes Ground Support Equipment and Specialist tools



SUPPLIED DOCUMENTATION

Operational Manual

Maintenance Manual

Student Manual (Technical Publications)

OPTIONAL ACCESSORIES

Spares Kit

ORDERING INFORMATION

| | |
|-----------------|--------------------------------------|
| 99310-000-0001A | Basic Maintenance Helicopter Trainer |
| 99310-3021 | Spares Kit |



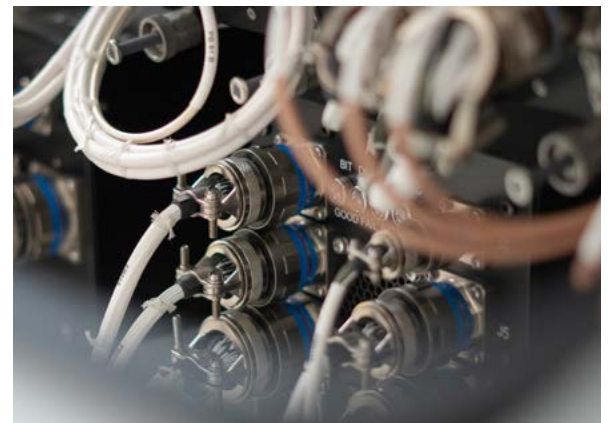
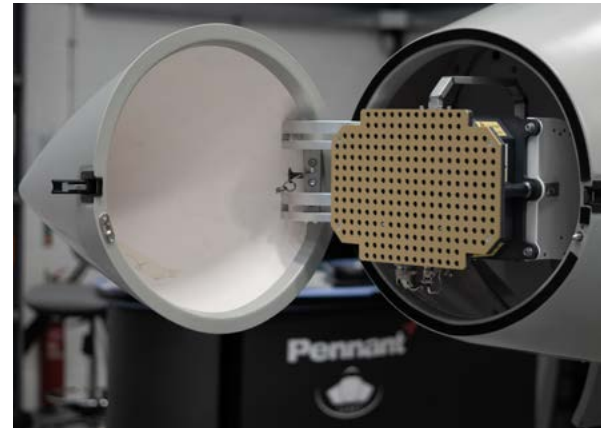
INTEGRATED AVIONICS MAINTENANCE TRAINER (IAMT)

The Integrated Avionics Maintenance Trainer (IAMT) is an avionics part task trainer that enables practical avionics maintenance tasks to be taught by either instructor demonstration or independent, practical exercises for the student.

The IAMT leverages the fully integrated aircraft systems software simulation that underpins Pennant's desktop emulation trainer to provide consistent, real-time aircraft responses to user interactions and access to virtual ground support and test equipment (GSE and STTE).

KEY FEATURES

- Covers knowledge and learning tasks involved with the following standards & qualifications: EASA/EMAR PT66, FAA, City & Guilds and CASA MEA Units
- High fidelity simulated cockpit
- Partial aircraft structure
- Functional testing of avionics systems
- Operation of avionics systems and their controls
- Removal and Installation of aircraft LRU's
- Instructor operating station for fault insertion and aircraft parameter setting
- Virtual GSE and STTE
- Aircraft Technical publications suite for the generic aircraft



SUPPLIED DOCUMENTATION

| |
|------------------|
| Operation Manual |
|------------------|

| |
|--------------------|
| Maintenance Manual |
|--------------------|

| |
|--|
| Student Manual (Technical Publication) |
|--|

OPTIONAL ACCESSORIES

| |
|-----------------|
| Student Toolkit |
|-----------------|

| |
|------------|
| Spares Kit |
|------------|

| |
|--------------------------|
| Consumables Starter Pack |
|--------------------------|

ORDERING INFORMATION

| | |
|-------------|---|
| 97910-0001A | Integrated Avionics Maintenance Trainer |
|-------------|---|

| | |
|------------|-------------------------|
| 97910-3020 | Consumables Starter Kit |
|------------|-------------------------|

| | |
|------------|------------|
| 97910-3021 | Spares Kit |
|------------|------------|

| | |
|---------|-----------------|
| P000835 | Student Toolkit |
|---------|-----------------|





**VIRTUAL
REALITY**

VIRTUAL REALITY

Pennant's move into VR since 2006 was a natural progression from the Computer Based Training (CBT), e-learning and 3D media products for which we have established a solid reputation across a range of sectors. Development of our VR capability has been progressive and we now have a core team of highly skilled VR designers and technologists.

A VR product combines high fidelity 3D media, the latest Head-Mounted Display (HMD) technology and motion tracking techniques with advanced software which has its origins in the gaming arena. VR provides a fully immersive training experience they would expect from the real world, but in a danger-free environment. The virtual world allows trainees to practice operation and maintenance routines, do familiarisation walkabouts etc without the requirement to take vital equipment and plant out of active service for training purposes. VR also provides the opportunity to subject candidates to early aptitude testing when selecting students for more advanced training tasks, perhaps using live equipment in live scenarios.

The Instructor is provided with the ability to inject live emergency situations, such as component failure, to test the student's competence and reactions. All training exercises can be recorded for later playback and analysis. It is also possible to create a multiple user virtual world, within which a number of trainees are immersed together: all trainees experiencing the same virtual world and interacting with their fellow trainees.

Pennant has developed a number of bespoke VR systems for military and non-military applications. The requirement to achieve very high levels of realism was imperative to ensure the best outcome for the students and the training organisations.

VR technology is developing rapidly and Pennant, like other businesses, uses the latest technology available. The systems we use are designed to incorporate room-scale technology and allow the user to walk around and use motion-tracked hand-held controllers to realistically manipulate objects, interact with precision, communicate and experience immersive environments.

VIRTUAL MARSHALLING TRAINER

(Previously known as SEPT)

The Virtual Marshalling Trainer (previously known as SEPT) provides training in marshalling and ground handling of aircraft in an immersive safe environment, without the cost of using real aircraft.

After classroom instruction, students consolidate their learning through practical exercises on the trainer in preparation for the real situation.

Training scenarios are highly customisable and delivered under instructor supervision and control.

KEY FEATURES

- 150 Degree wrap around screen for total student immersion
- Instructor Station allowing control of:
 - Pilot signals
 - Marshaller signals
 - Aircraft movement
 - Hazards and emergencies
 - Aircraft malfunctions providing visual cues for students
 - 6 degrees of freedom camera control in the scene for scenario monitoring
 - Changeable weather / Environment conditions
 - Creation of custom scenarios
- Simulated Features include:
 - Fixed and Rotary wing aircraft
 - Male and Female marshallers with and without marshalling wands
 - Fixed and mobile airfield hazards
 - Time of day and weather condition selection
 - A selection of typical training areas and regional contexts
 - Aircraft, vehicle and environment lighting
 - A selection of ready-made marshalling scenario layouts, ground handling procedures and emergency drills
- Integrated surround sound system
- Video capture facility recording student actions for playback / debrief
- Remote screen for observers
- Signals modelled in accordance with NATO and STANAG 3117
- Over 25 ready made training scenarios covering fixed and rotary wing



SUPPLIED DOCUMENTATION

Operation Manual

Maintenance Manual

Training Scenario Catalogue

OPTIONAL ACCESSORIES

Spares Package

ORDERING INFORMATION

| | |
|-------------|---|
| 97810-0001A | Synthetic Environment Procedural Trainer (Small Screen ~ 2225H x 5331W x 2061D) |
| 97820-0001A | Synthetic Environment Procedural Trainer (Large Screen ~ 3000H x 7727W x 2964D) |
| 97810-3021 | Spares Pack |

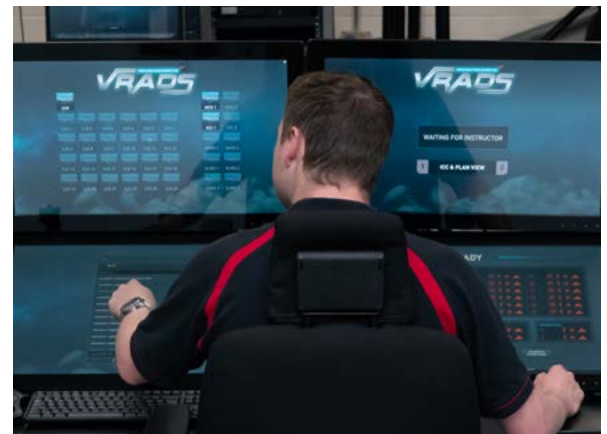


VIRTUAL LOADMASTER TRAINING SYSTEM (VLTS)

The Virtual Loadmaster Training System (VLTS) has been developed by Pennant in partnership with Capewell Aerial Systems.

VLTS is the first aerial delivery simulator developed specifically for Fixed Wing & Rotary Loadmasters. The system enhances the training curriculum by providing students with experience in a range of scenarios from normal operations to the most critical emergencies.

VLTS provides high fidelity VR training experience without exposing the trainee or instructor to potential danger and without the need to take operational equipment off-line for training purposes.



KEY FEATURES

- Low level gravity extraction
- Low level parachute extraction
- Heavy equipment drop
- Container Delivery System (CDS) air drop
- Crew Resource Management (CRM)
- Pre-flight inspection
- Tailor scenarios to student experience level
- Classroom sized lessons or one-on-one instruction
- Change loads, location, time of day, and weather
- Small training footprint



SUPPLIED DOCUMENTATION

VRADS Operator's Manual

OPTIONAL ACCESSORIES

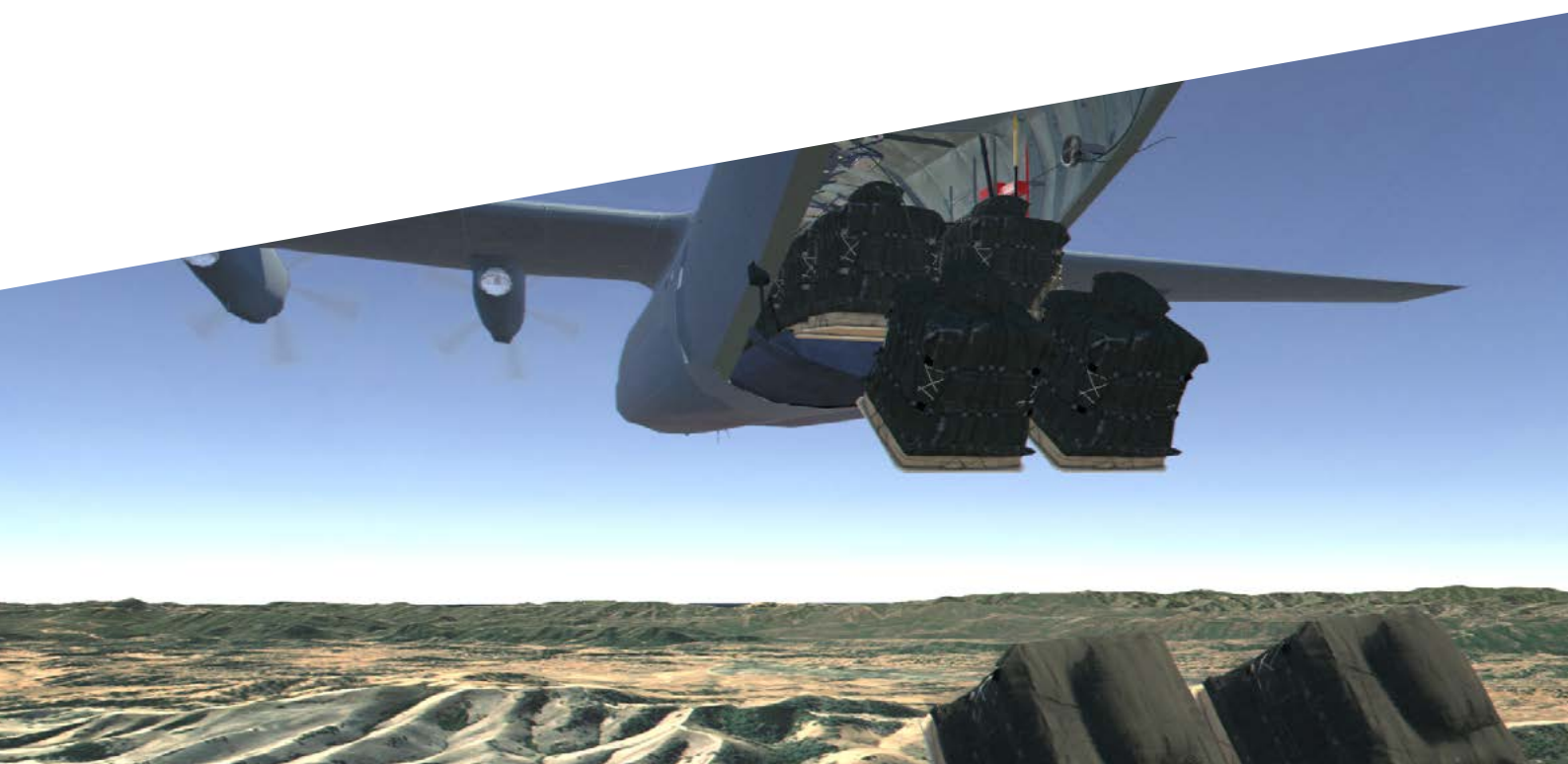
Wireless Kit

Cable Management System

ORDERING INFORMATION

TBA - Virtual Loadmaster Training System

TBA - Spares Kit

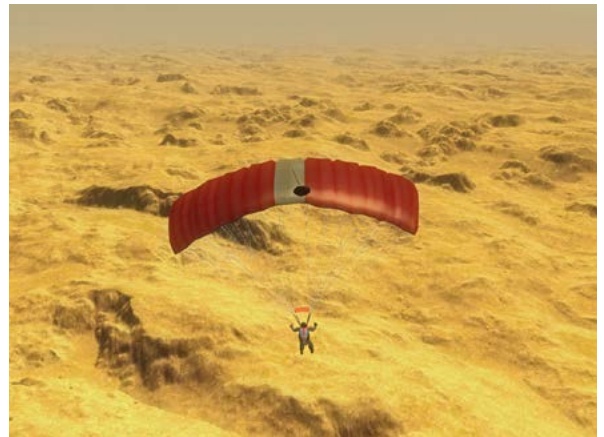


VIRTUAL PARACHUTE TRAINING SYSTEM LITE (VPTS LITE)

The Virtual Parachute Training Simulator (VPTS) Lite is an immersive training system capable of supporting initial canopy control training and malfunction recognition through to mission planning and rehearsal.

KEY FEATURES

- Mission planning and rehearsal
- Malfunction recognition training for a variety of malfunctions and nuisance factors
- Pre-set scenarios including:
 - Back man in stick not making DZ
 - Collision avoidance in clouds
 - Tight DZ with minimal outs
 - Mixed stick FF followed by SL
 - Member of stick has unrecoverable nuisance factor
 - HALO, HAHO and HAMO scenarios
- Pre-Jump parachutists brief from exiting the aircraft to landing on DZ
- Selectable Parachute Types
- Selectable Weather Conditions (rain, snow, fog & cloud height)
- Selectable Time of Day (Dawn, Midday, Evening, Night)
- NVG mode to allow mission rehearsals at night
- Selectable Wind Speed (may differ with Altitude)
- Selectable Virtual Environment and customisable Geospecific Terrain databases
- Body tracking system to allow altimeter checks under canopy
- Integrated communications between students and instructor
- Intuitive, easy to use modern User Interface (UI)
- Assessment module to check student competency
- After-Action replay
- Scalable system, up to 24 jump stations
- Character customization allowing end user to setup jumpers
- Commercial Off the Shelf (COTS) gaming engine allowing rapid integration of new VR hardware and visual effects
- Increased student through put (Quick change)



KEY FEATURES (OPTIONS)

- Dynamic steering tension lines allowing tension configuration per canopy type
- Riser steering
- Multi-view Client

SUPPLIED DOCUMENTATION

Operation Manual

Maintenance Manual

Installation Manual

OPTIONAL ACCESSORIES

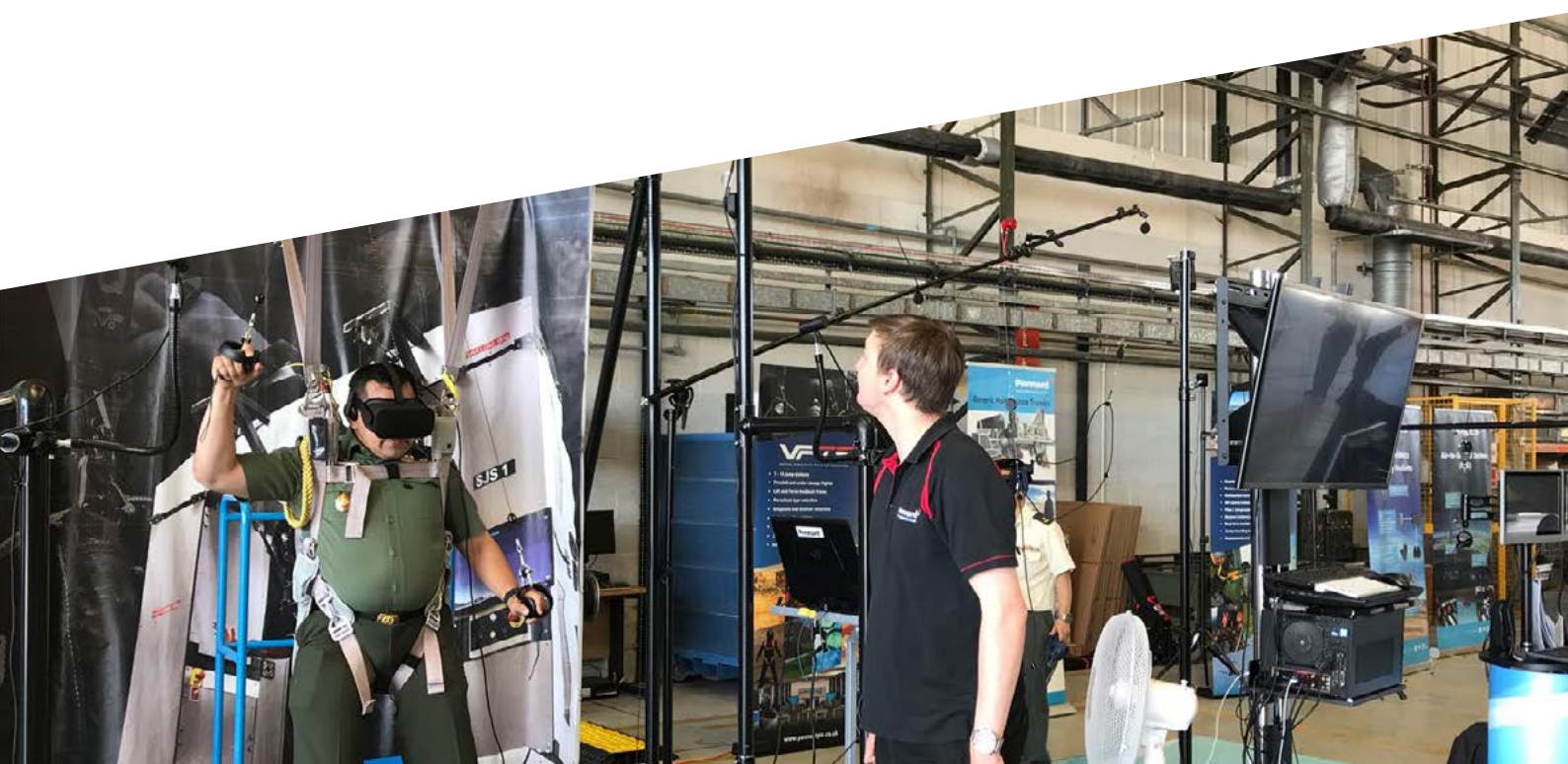
Dynamic steering tension lines

Riser steering

Multiview client

ORDERING INFORMATION

| | |
|-----------------|--|
| 98510-000-0001A | Virtual Parachute Training System (Lite) |
| 98510-3021 | Spares Kit |





ENGINEERED
SOLUTIONS

ENGINEERED SOLUTIONS

Pennant has an experienced team of hardware and software engineers that are able to analyse, design and manufacture bespoke engineering solutions to satisfy a training need. Pennant has produced a range of equipment that are platform specific or custom-built to satisfy a variety of operational and maintenance tasks. These include simulators, part task trainers and procedural trainers for both defence and civil customers.

The training devices which realistically replicate a piece of plant, component or system, enable trainees to become competent and confident prior to advancing to fully immersive simulator or live equipment.

This approach generates considerable savings by reducing the time operational equipment is out of service for training purposes and limiting the time required in mission simulators – which is usually at a premium – in addition to providing the obvious safety benefits.

Previous work includes:

- Cockpit Procedure Trainers
- Combat Engineering Tractor (CET)
- Weapon Trainers



RAIL

RAIL

Pennant has over 45 years' experience working with rail industry primes and their supply chain, adding value through experience, capability and versatility, producing successful completion of manuals and training contracts across the world, including:

➤ **Operator & Maintenance Manuals and IPC**

Deliveries include Operation & Maintenance Manuals to meet international standards across different industries and delivery requirements. Overhaul & Running Maintenance, Work Manuals & User Guides.

Illustrated Parts Catalogues -prepared to the appropriate maintenance level from LRU to Level 4 full breakdown in accordance with the maintenance philosophy required by the operator.

➤ **Training – Design Development & Delivery**

To satisfy the requirements of the Operator, Pennant work with the Car Builder to design & develop the appropriate Operator and Maintenance Courses. Deliveries include: Training Courseware and On-site delivery.

We are recognised members of the Rail Industry Association (RIA) and are a verified supplier on the Railway Industry Supplier Qualification Scheme (RISQS), Supplier ID 3491.

Virtual Reality development and utilising the HTC Vive enables students to navigate around virtual vehicles and interact with LRUs and perform maintenance tasks. Instructor and student modes are available.

OmegaPS Rail has been developed by our specialist team to enable manufactures and owner/operators of complex rail equipment to reduce cost. This is a development on the Integrated Logistics Support software that OmegaPS and Analyzer serve.

Track Access Services is part of the Pennant Group and has been operating in the UK and Ireland for over 15 years, supplying a wide variety of services to road and rail industries in the transportation sector. TAS's current projects include:

- Rail Driver Training
- Film and Media Production
- Rail Survey Services
- 3D Track Models
- Signal Sighting Systems
- TAS RISQS Supplier IS 2968

VIRTUAL REALITY SHUNTER TRAINER (VRST)

The Virtual Reality Shunter Training is a virtual simulation of a fully working train yard, complete with multiple siding lines, complex rolling stock and general hazards.

The training is led by the instructor who can preload scenarios for the student or create their own setups. The instructor control station allows the instructor to control all elements of the training exercise, from train movement to weather controls, they are also presented with a real and virtual world representation of the student. The trainer is looking for the student to perform certain actions to progress the lesson.

The student wears a virtual reality headset that immerses them into the shunting world. They control their movements and interactions through a handheld controller.



KEY FEATURES

- Fully Immersive Generic Shunting Depot
- Variety of Rolling Stock
- Instructor Injected Hazards
- Time of Day and Weather effects
- Realistic student control via input controller

CASE STUDY

A TYPICAL CASE STUDY FROM OUR MANY RAIL PROJECTS COVERING MANUALS & TRAINING

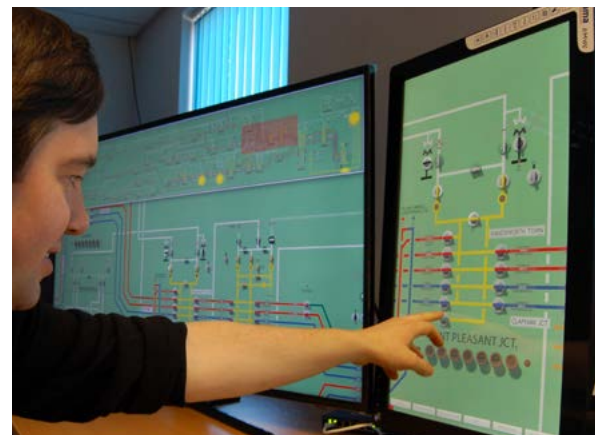
NEW YORK CITY TRANSIT - R188 CAR CLASS – CONTRACT DELIVERIES

- Heavy repair manual
- Running maintenance manual
- Overhaul manuals
- Illustrated parts catalogue
- Special tools and test equipment manuals
- Integrated schematic manual
- Production of training material including: Courseware, CBT and delivery of instructor led courses in maintenance depot



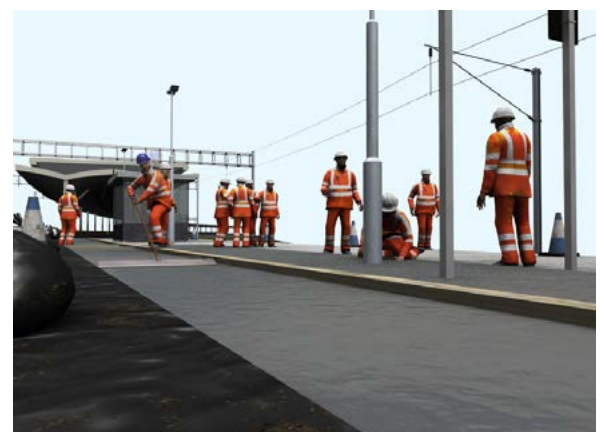
ELECTRICAL CONTROL ROOM (ECR) SWITCHING SIMULATOR

The simulator is designed to replicate the physical layout and operational scenarios of the specific ECR in a region for Electro-Mech and Cromos Control Systems. The full electrical simulation offers extensive scenario control and fault list training, as well as full interaction & communication capture and playback capabilities.



ACCIDENT AND INCIDENT RECONSTRUCTION

Requirement to produce reconstructions in short time scales for briefing staff on Accidents and Incidents. Pennant's development for web deliverable includes data capture, media design, storyboard, 3D modelling, animation, voice-over and programming. All content signed-off by Network Rail due to nature of information.



A new innovative software product that has been designed to enable manufacturers and owner/operators of complex rail equipment to reduce cost.

OmegaPS Rail offers “a whole product” solution that integrates logistics product data from OEM and system integrators into technical publications or IETMs, with media distribution, to meet customer requirements. Starting with initial engineering design, logistics product data is incorporated throughout design and build, forming the analytical basis to optimize maintenance requirements while delivering required operational availability. OmegaPS Rail is one example of how through partnerships and strong customer relationships great products that can save cost are created and delivered.



KEY FEATURES

- Complies with EN 15380, EN 50126, DIN EN 60812, DIN EN 60300-3-11 standards
- Linked to OmegaPS Analyzer LCC, LoRA & Spares optimisation modelling
- Excel & XML input and output





**TRACK ACCESS
SERVICES (TAS)**

TRACK ACCESS SERVICES (TAS)



Track Access Services (TAS) was established in 2002 and began by producing cab-ride videos to show the driver's eye view of the railway throughout the UK. This quickly became recognised as a valuable tool for Network Rail and the Train and Freight Operating Companies to improve driver route knowledge and safety on the railways, a focus TAS maintains to this day. In July 2019 Pennant were pleased to announce the acquisition of TAS.

TAS developed the first PC program for delivery of Driver Route Learning material with their Route Player application, which synchronises driver's eye video to its location on an interactive map. TAS have recently developed an online version of the application, TrackAccessPortal.com, to deliver the material to any platform, PC, MAC, tablet or mobile via the web browser.

Other capabilities include:

- Realistic Simulation Modelling used to visualise enhancements and renewals of railway infrastructure
- Provide operational briefing to drivers prior to commissioning
- Possession planning and signal sighting work to be carried out from desktop environments

ROUTE FAMILIARISATION

Driver's Eye Video Footage

Driver's Eye Video Footage is used widely in the industry for familiarisation and driver route learning. It is in cab HD route filming that is collected from the driver's cab of in-service trains.

- Augmented with new signalling
- On-screen information graphics
- Professional script and recorded commentary
- Used for TOC and FOC briefing for Network Change prior to commissioning



Driver Route Maps

Driver Route Maps and route information booklets are available to accompany videos.

- Familiar schematic format shows only information relevant to drivers
- Produced digitally for use in TAS Computer Routes and as printed booklets
- Signal route tables and pictures
- Universal symbol library



TRACK ACCESS PORTAL

A secure browser-based distribution platform offering access to a range of training and surveying services. The online portable is suitable of both large and mobile devices. Users will have a secure individual login to access such things as: HD Video in LH Window, Moving Zoomable Map and/or asset index in RH Window and management facilities statistics.



COMPUTER BASED TRAINING (CBT)

- Web and server-based e-learning
- Collaboration with government departments and global industry
- Access to anytime, anywhere training modules





**TECHNICAL SERVICES
& SUPPORT**

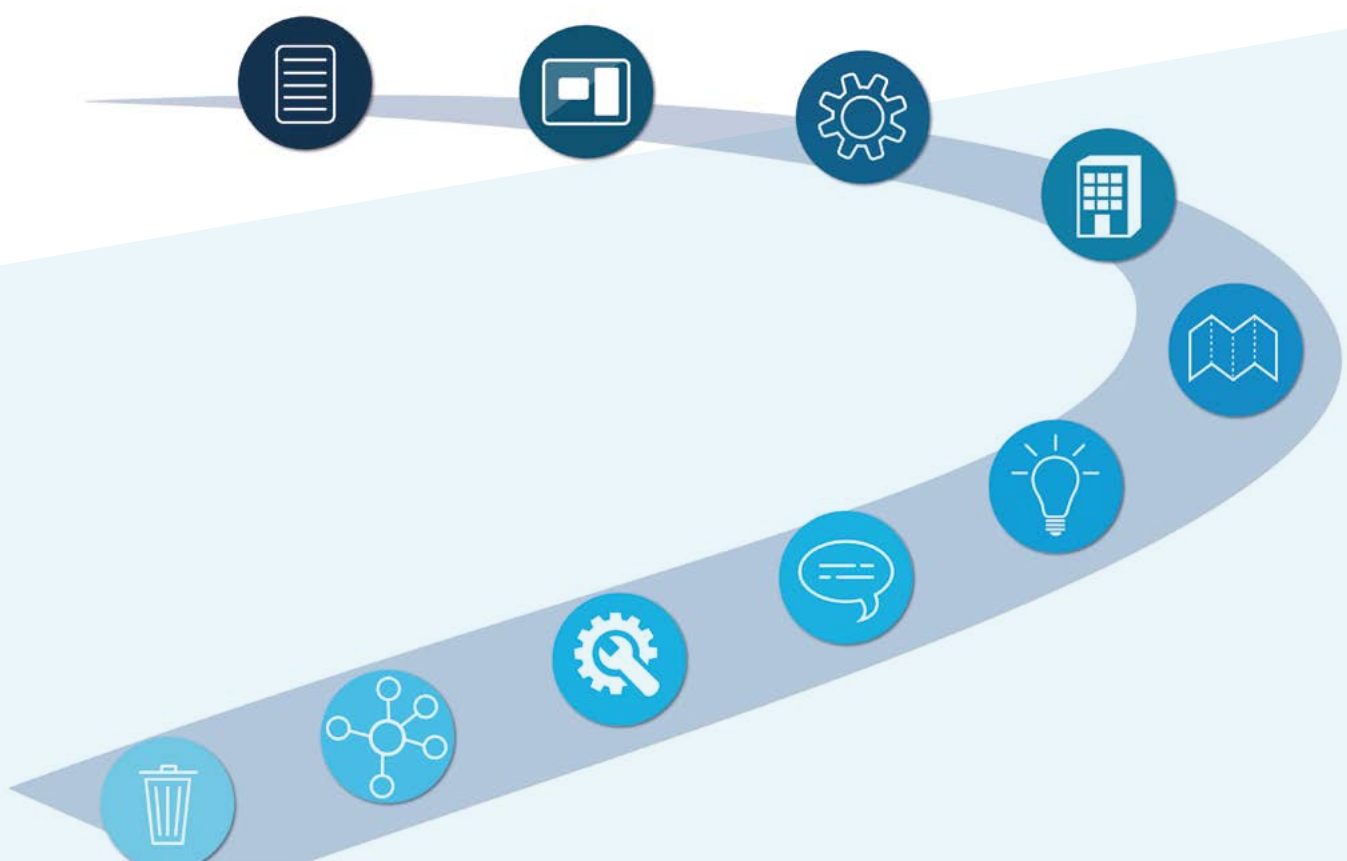
TECHNICAL SERVICES & SUPPORT

Pennant takes a “Through Life Support” approach to Technical Services and Support for both Pennant and third-party training systems in the regulated sectors. From TNA Development to final disposal, Pennant can plan, implement and manage every stage of your support life cycle.

Our dedicated support services department has a core level of qualified and experienced engineers, providing us with the skills and knowledge to establish Pennant’s reputation for delivering highly professional, reliable and cost-effective customer support services. Pennant’s proven track record in providing support services across a wide range of training solutions. When Pennant design new equipment the support and training requirements are a major consideration.

Our capabilities include:

- Training Needs Analysis (TNA)
- Courseware Development
- Technical Publications, IETMS, S1000D etc.
- Facilities Planning
- Competency Mapping to EASA, EMAR, City of Guilds etc.
- In Service Support, Preventative and Corrective Maintenance
- Instruction and Training
- Consultancy
- Spares and Obsolescence Management
- Dismantling and Disposal



TRAINING NEEDS ANALYSIS

The success of the company depends upon the quality of its training assets, so it is essential to establish the need for training at the earliest opportunity. It is the role of Technical Training Solutions (TTS) to demonstrate an identifiable and measurable need for training before management provides funds for the solution design. It is the role of TTS to provide cost-effective and efficient recommendations, training or otherwise, that support company and customer operational missions and goals.

TTS is responsible for the step by step approach when conducting Training Needs Analysis for both new and existing training assets to ascertain the requirement; is a new or modified training asset needed; and, if so, what kind? Our three-stage process begins with the production of a Scoping Exercise Report, and then does the analysis, and finishes with the training need evaluation. If required, detailed system analysis is done to identify training needed by each job, position and employee to perform duties to the desired standard under the recommended conditions. The company also provide a training pathway mapping service to assist customers with the training exposition in aligning training assets with competencies in the most cost-efficient method.

COURSEWARE DEVELOPMENT

Courseware Development is another capability in Pennant's portfolio. Pennant has many years' experience in the design and development of Computer Based Training (CBT) for both classroom and self-paced delivery on desktop and mobile platforms.

Our innovative design team have provided fully immersive interactive training solutions covering a wide and varied subject matter, from engineering and maintenance on the latest military hardware to the emulation of point of sale terminals for a major high street electrical retailer. All our courseware is developed bespoke to the customers technical and training requirements and can be managed using both SCORM and xAPI tracking.

We make continual improvements to our courseware as we understand that courseware and media training needs to be innovative and immersive. Training delivery material includes:

- Animated schematics
- Cutaway of components
- Video (Remove/Install/Test/Operate)
- Storyboard/Course Notes



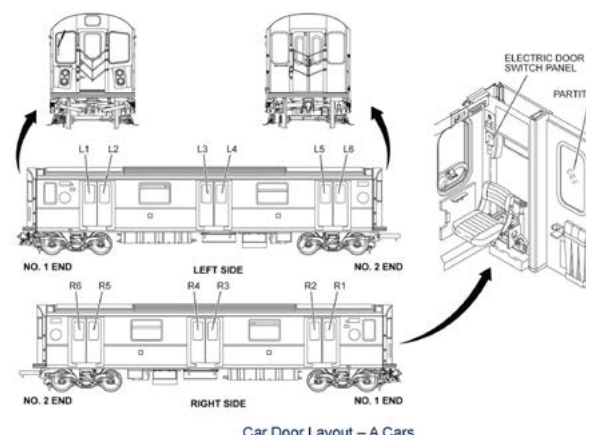
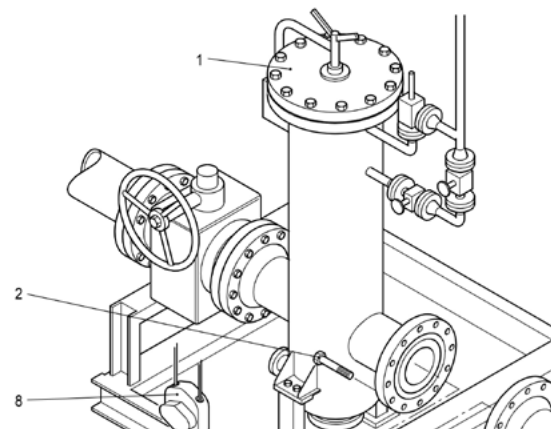
TECHNICAL PUBLICATIONS

To Pennant the term 'technical publications' means anything from a concise owner's handbook, printed on paper and presented in a ring binder to an interactive electronic technical manual (IETM), including intelligent 3D graphics, compliant with S1000D, accessible over the internet on a range of mobile devices.

Regardless of the requirement, the core skill of our experienced team of technical illustrators and authors is the ability to convert complex source technical data into User Handbooks, Operation & Maintenance Manuals, Parts Catalogues and training courseware.

We have more than 50 years' experience and progressive technical development in the field and we are confident that our offer is comprehensive, professional and competitive.

We are proud of our hard-won reputation across a wide range of industry, government and commercial sectors, both in the UK and worldwide, including Defence, Aerospace, Rail, Automotive, IT & Communications, Power Generation, Utilities, Nuclear, Petro Chem and Gas, and many more.



WE HAVE WORKED WITH:



FACILITIES PLANNING

Pennant provides comprehensive facilities planning support when supplying its training products into service. Whether it's a new college or re-use of exiting facilities Pennant engages with its customers such that the training products can be installed with minimal disruption and down time and ultimately that the facility supports the training needs.

Working with the customer Pennant will establish any specific requirements and constraints, undertaking on site surveys as required, and providing detailed documents and drawings, identifying equipment layouts and any work needed prior to and during installation.

COMPETENCY MAPPING

Pennant has undertaken activity mapping practical training tasks on Pennant manufactured training aids against EASA/EMAR Pt66, City & Guilds , FAA and CASA MEA units.

These tasks provided the customer with a concise list of the practical competencies covered by our suite of training products for both the avionic & mechanical pathways. This training analysis provided a matrix outlining the maintenance tasks and what learning outcomes and assessment criteria can be covered. This information provides the training organisation with clear visibility of how knowledge and practical competence instructions can be covered by Pennant training aids.





IN SERVICE SUPPORT, PREVENTATIVE & CORRECTIVE MAINTENANCE

Pennant's dedicated team of Support Engineers come from varied backgrounds, but all have extensive experience, knowledge and competence in maintaining, repairing and modifying Pennant and third party training devices. Our Engineers can demonstrate their ability to perform maintenance tasks safely and follow appropriate written/documentated instructions.

Pennant can offer a combination of the following services:

- Monthly Health Checks
- Regional/Remote Support (Pennant team offsite via Help Desk)
- Regular maintenance visits
- Consumables provisioning
- Tooling provisioning
- Post Design Services (Enhancements/upgrades to equipment)
- Support Management and the development of a Support Infrastructure
- Training (knowledge transfer for Operators and Maintainers)
- Hardware and software maintenance (preventative [including certification] and corrective)
- Information and access to Pennant's Engineering and Software technical teams

Pennant has an established help desk facility that has been implemented to support various customers. Pennant will provide technical support and will endeavour to provide an initial response.

INSTRUCTION & TRAINING

Pennant can provide specialist instructors who deliver a range of training on our training aids and virtual training devices. Pennant instructors have a wealth of experience and provide a hands-on approach to vocational training which is student centred, providing the knowledge and skill set customers require of their staff.



CONSULTANCY

As a supplier of market leading products and services, Pennant believe the defining and implementing of key objectives is vital in the success of delivering projects and initiatives. Pennant have always been at the forefront in adopting advances in technology and has taken great pride in being able to offer our customers a diverse range of products and services. As consultants, Pennant can work with our customers to ensure accurate advice and recommendations are presented, resulting in the long term success in the deployment of our products and services.



SPARES & OBSOLESCENCE MANAGEMENT

Correctly defining and delivering an accurate and efficient spares and obsolescence management service is critical to the through life success of training systems. Pennant has the pedigree and capability to accurately define and deliver an effective spares and obsolescence management process, on both Pennant manufactured devices and third party equipment. Where obsolescence has been identified, Pennant can engineer a tailored solution utilising our extensive in-house capabilities, whilst ensuring a value for money service to our customers.



DISMANTLING & DISPOSAL

Pennant can provide dismantling and disposal of training devices, training aid aircraft and other legacy products. Careful planning, consideration for regulatory requirements and adherence to local environmental laws are all required to ensure a dismantling and disposal is carried out in a safe manner. In addition, Pennant can harvest components from dismantled devices and equipment to address obsolescence issues and extend the usability of devices and equipment.



LICENSING

Pennant understands that not every client uses equipment and software in the same way and so we offer a flexible approach to licensing software and technical publications which can be tailored to match your specific requirements. Taking the Virtual Aircraft Training System (VATS) as an example.

Pennant has license agreements which cover both software and user technical publications and include:

- individual licenses for a named computer
- server license for one or a number of classrooms
- licenses specific to a named location or site
- licenses which can be deployed in a named territory
- licenses for a specific service or user group

In addition all licenses can be time bound or perpetual and can include a Service Level Agreement (SLA) to cover ongoing maintenance, enhancements and upgrades.

At Pennant we believe that if you've made an investment in our products, you should not be unreasonably prevented from making a return on that investment.

REMEDIATION AND REFURBISHMENT

Pennant staff perform remediation and refurbishment programs. Within training environments there is a requirement to ensure that student exposure to Hazmat and Hazchem is removed or reduced to an acceptable level. Pennant explore all options including removal of hazardous items, substitution of components with benign replicas and replacement of components with newer safe-to-use authentic alternatives.

Remediation activities include the removal of hazardous materials and chemicals such as:

- Zinc & Hexavalent Chromates
- Asbestos Containing Material (ACM)
- Avtur & Avgas
- Synthetic Fibre Material (SFM)
- Cadmium



Pennant's technical workforce regularly refurbishes training aid aircraft and training devices. This work includes:

- Re-wiring and re-loomng of electrical and avionics systems
- Stripping and re-painting components
- Replacement of obsolete components with suitable alternatives
- Retrofitting with engineered components to broaden use of training devices

INSTALLATION & COMMISSIONING

As a complimentary service to Pennant's diverse range of training products, or as a standalone service, Pennant can complete the installation and commissioning of training equipment. Pennant has successfully installed and commissioned a range of software and hardware based products globally. A core team of multi-skilled and dedicated staff are maintained to ensure this highly professional service can fulfil the demands of our customers and their end-users.



3RD PARTY ENGINEERING

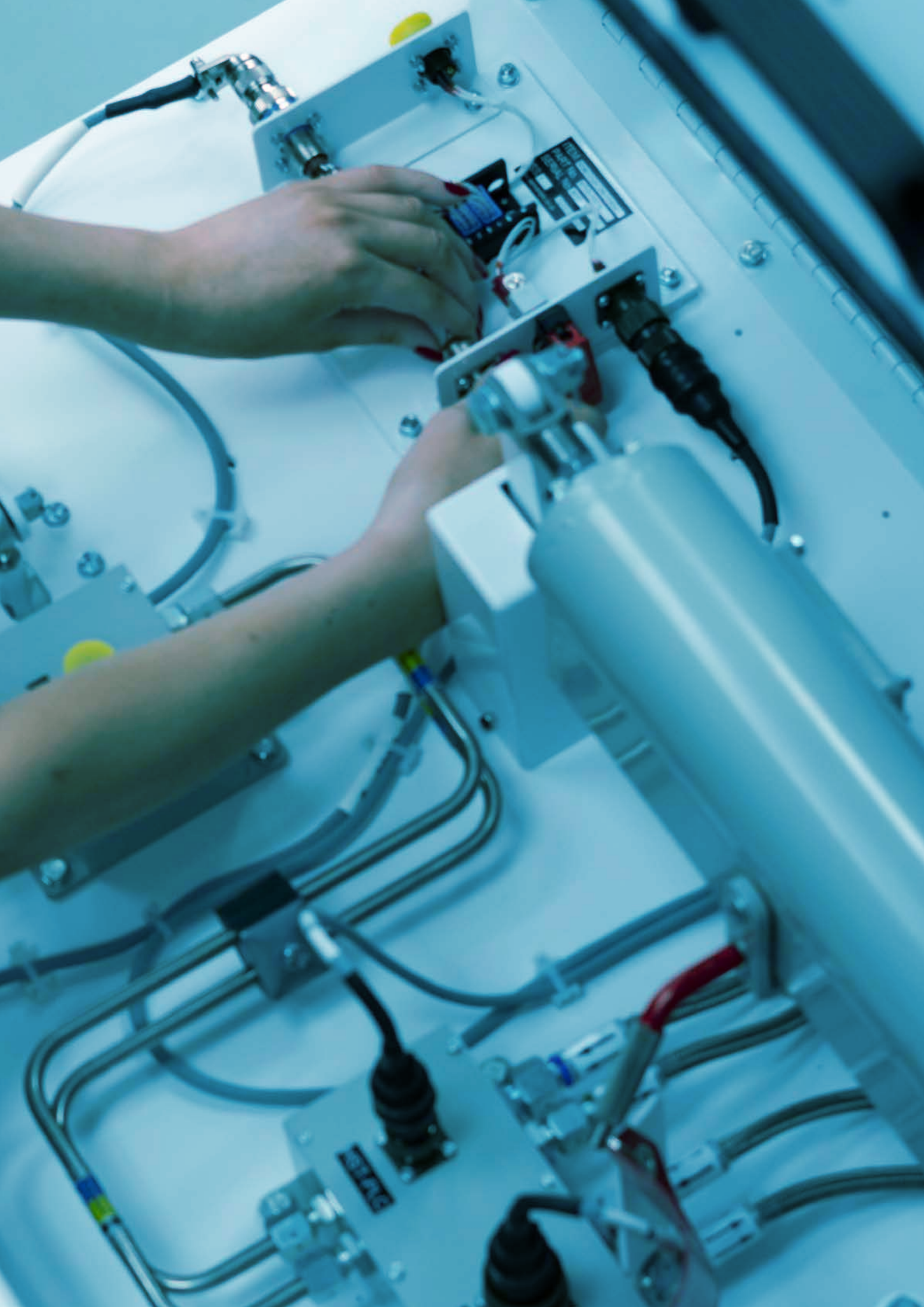
Pennant can offer an in-house engineering and support service for third party equipment where Pennant is not the Original Equipment Manufacturer (OEM). The services offered can range from completing maintenance tasks on the equipment, to reverse engineering of equipment and the provisioning of missing technical data on software and/or hardware platforms. Pennant has proven capability across a range of sectors for customers of small equipment through to high-fidelity larger devices.



ADDITIONAL SERVICE INFORMATION

As part of the Pennant support offering, Pennant can supply several support packages tailored to the user requirements. The 'standard' Warranty supplied on all products is 12 months.

| Features | Bronze | Silver | Gold | Platinum |
|--|--------|--------|------|----------|
| Remote Support via Help Desk and Remote Tool | ✓ | ✓ | ✓ | ✓ |
| Software Updates (where applicable) | ✓ | ✓ | ✓ | ✓ |
| Obsolescence Management | ✓ | ✓ | ✓ | ✓ |
| Annual Maintenance Visit | ✗ | ✓ | ✓ | ✓ |
| Monthly Visits | ✗ | ✗ | ✓ | ✓ |
| Inclusive Call Outs | ✗ | ✗ | ✓ | ✓ |
| Permanent On-Site Engineer(s) | ✗ | ✗ | ✗ | ✓ |





**INTEGRATED LOGISTICS
SUPPORT (ILS)**

INTEGRATED LOGISTICS SUPPORT (ILS)

Pennant is proud to produce innovative Integrated Logistics Support software solutions that are incorporated within our OmegaPS Suite. Our software is sold world wide, and offers industry and government users a suite of applications to efficiently manage logistic support data. Additionally, users can conduct leading edge supportability analyses that enable optimized equipment support decisions over the entire product life cycle. Focusing on client requirements, organizations can save time and resources, with the effective management of product support enabled by our software. Focusing on client requirements, organizations can save time and resources, with the effective management of product support enabled by our software.

OMEGAPS SOFTWARE

OmegaPS is an integrated database that efficiently organizes logistics data as it is defined and managed throughout the equipment life-cycle. It contains all the logistic product support information – both vendor and client data – that describes the equipment your organization manages, including how it is maintained, and how to fix it should it fail.



OmegaPS ILS are modernizing our GUI, and strengthening OmegaPS capability to create value added outputs to help customers to efficiently manage their equipment fleets. Features include:

- Manages Logistics Support Analysis (LSA) data in accordance with SAE-GEIASTD 0007, Mil Std 1388-2B, Def Stan 0060 and Def Aust 5692. It is also compatible with S3000L Standards
- Maintains detailed configuration of complex equipment
- Identifies how to fix or prevent failures (planned maintenance tasks)
- Reliability Centered Maintenance (RCM) with multiple user defined logic trees embedded (e.g. MSG 3, RCM2, etc) for engineers to analyse & optimise preventative maintenance
- Identifies how often each maintenance action will occur
- Interfaces with ERP Systems
- Compatible with S1000D publishing standard

OMEGAPS ANALYZER

OmegaPS Analyzer is a Windows based product that provides the power of an intuitive GUI and the sophistication of embedded and proven algorithms developed for the Canadian Department of National Defence. The primary functions include Life Cycle Cost (LCC) Optimization, Level of Repair Analysis (LORA), Spares Optimization, and Availability Modelling. User benefits include:



- Make support decisions based upon proven data algorithms
- Support operational availability design review assessments
- Simulate availability impacts across multiple mission scenarios
- Optimize spare part inventory holdings
- Determine the most cost-efficient in-service support approach
- Conduct sensitivity analysis to support risk assessment

ILS CONSULTANCY SERVICES

We are an Integrated Logistics Support software and services company that specializes in helping our clients manage and support their equipment as to achieve & improve operational effectiveness while reducing the total cost of ownership. Our service includes:

- Program and Project Consulting
- Equipment Support Project Management
- Life Cycle Costing Analysis (LCC)
- Equipment Support Requirement Definition (RCM/LORA/Publications)
- Supply Chain Optimization (sparing and distribution)
- Logistic Support Analysis Record (LSAR), development and use
- Equipment Baseline Management (Data and Configuration)
- Maintenance Effectiveness Reviews (RCM / In-Service Data Analysis)
- Sustainment Business Case Analysis
- Support System Modelling
- ILS/Supportability Training
- Data Services





R4i



In March 2020, Pennant International Group PLC completed the acquisition of the organisation ADG (Absolute Data Group), now known as R4i. R4i specializes in creating, managing and leveraging technical data and maintenance information for clients across a variety of industries.

R4i CSDB SERVER - SECURE, MANAGE, DELIVER

The R4i Common Source Database (CSDB) Server enables organizations to create, manage and publish maintenance and operational content electronically (as Interactive Electronic Technical Manuals) or in hard copy as PDFs.

The R4i CSDB product suite is for customers that need:

- Technical or field information to comply with industry specifications such as ASD S1000D, ATA iSpec 2200, MIL-STD and others.
- To re-use information across multiple platforms or projects.
- To extend beyond traditional paper documents in the field.
- To deliver content to multiple devices or formats including paper, web, touch devices, in-vehicle console, on-line and off-line.

R4i BINDER - DESIGN, DEFINE, PUBLISH

R4i Binder product suite is a powerful suite of productivity tools for building customized manuals, handbooks, operating procedures and more. The product suite includes R4i Binder Professional, R4i Binder Standard, R4i Binder Server/Client and R4i Binder Personal Edition for those customers that do not have an R4i CSDB Server.

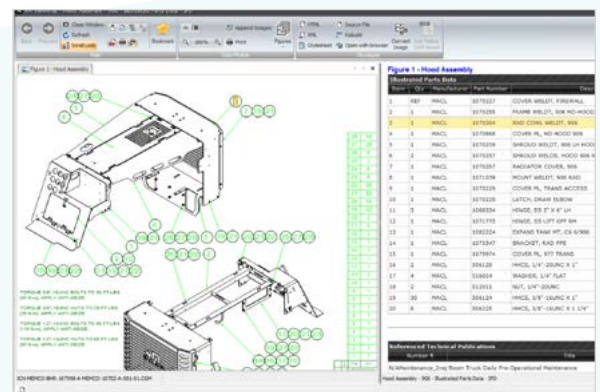
R4i VIEWER - SMART, SECURE, FREE

The R4i Viewer is an intelligent content access tool that provides operators and maintainers with an interactive and unified view of manuals, e-learning courseware and maintenance job tasking.

Generated data packages from the R4i CSDB Server are in turn 'read' by the R4i Viewer.

Two versions of the Viewer are available - a smart installable IETM Viewer for Microsoft Windows and a 100% browser-based Viewer that works without Active-X or Java plug-ins. Both are licensed as free to distribute for R4i CSDB Server customers.

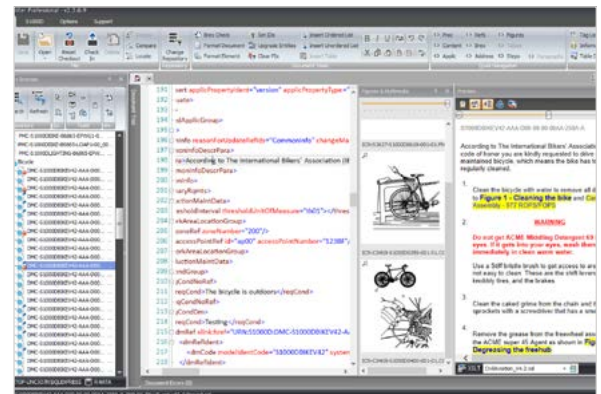
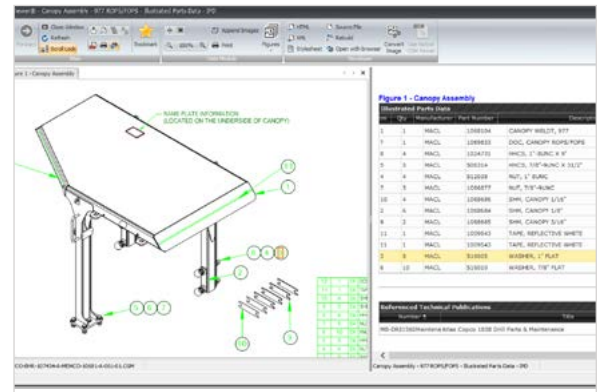
The R4i Viewer supports the dynamic presentation of SGML, XML and PDF formats, as well as audio, video and written content. It is utilized by leading organizations and Defense Department's around the world, including, the U.S. Air Force, the Italian Air Force and the Australian Department of Defense.



- CONNECT, CREATE, VALIDATE

R4i Writer is the most advanced XML Authoring Tool for Technical Writers required to create mission critical content. Write S1000D data modules faster with drag & drop references, automatic hotspots and live document previews.

R4i Writer is optimized for the S1000D data formats and installs “Ready to Write” with schemas and stylesheets for S1000D versions 2.0 to latest included. Fully integrated with the R4i CSDB, writers can now easily create high quality operational and maintainer information for PDF, HTML and IETM delivery.



R4I IPD MANAGER - IMPORT, CREATE, DELIVER

The design and production of an asset starts with engineering information in the form of drawings, Bill of Materials and supporting technical information. As soon as the design is approved, technical writers, illustrators and engineers need to collaborate to produce intelligent parts information that is supported by in depth operating and servicing information.

Traditionally spread sheets hold parts information while illustrations are stored in repositories or on network drives. The collation, editing and publishing of the required data can be complex and time consuming.

R4i (IPD) Illustrated Parts Data Manager automates the process of parts data creation, speeding time to market and eliminating human error from the parts data production cycle. Designed to connect to disparate information systems, Microsoft Excel spread sheets and SQL Databases, IPD Manager authors simply map the data fields to their required export data sets.

R4I MOBILE TP - ONLINE, OFFLINE, ANYWHERE

Leverage your technical and operational content with R4i MobieTP, the mobile IETP Viewer App for Android and iPad. Mobile IETP's frees technicians, operators and crews from desktop PC's and bulky laptops at minimum cost to an organization.

The R4i Mobile IETP Viewer for Android and iPad utilizes single source IETP packages generated from the R4i CSDB Server. Optimized for small screens and large fingers, the native Mobile IETP Viewer is simple to use and can access content in both online and offline modes.

IETP's are distributed to mobile devices via the R4i CDMS (Content Distribution Management System). The CDMS resides between the CSDB and the IETP user and manages R4i MobieTP software upgrades and IETP package downloads. The R4i CDMS is an optional licensed component in the R4i S1000D Product suite.

R4i LTS - ENGAGE, COLLABORATE, ENABLE

The R4i LTS tool is able to extract Logistics Support Analysis (LSA) or Logistics Product Data (LPD) information and dynamically generate engineering approved ASD S1000D compliant content.

Before the development of an asset or piece of equipment, engineering teams may go through an analysis process and then prepare their data in Logistics Support Analysis (LSA) or Logistics using database solution such as OmegaPS.

With an OmegaPS database being able to conform to latest industry data structures of SAE GEIA-STD-0007 and ASD S3000L, the R4i LTS tool is able to extract expected information and dynamically generate engineering approved ASD S1000D compliant content.

Once in S1000D, the other tools in the R4i S1000D Product Suite can be utilized to deliver to an S1000D Data Delivery, HTML IETM, PDF or advanced IETP's with the free MobieTP and R4i Viewer. The same content can also be delivered into SCORM based e-Learning solutions and controlled distribution to touch devices via R4i CDMS, the Content Distribution and Management Server.

R4i CDMS - PUBLISH, DISTRIBUTE, CONTROL

The R4i Viewer and R4i MobieTP IETP's can optionally be distributed and managed via the R4i Content Distribution Management System (CDMS). The R4i CDMS resides between the CSDB and the IETM user and manages R4i MobieTP software upgrades and IETP package downloads.

The R4i CDMS application is an optionally licensed component in the R4i S1000D Product suite. The CDMS application comprises of a management console, server component and distribution nodes.

The R4i CDMS receives published publications from R4i CSDB Server. Administrators can define the publication properties of the IETM including online and offline access.

Easy to use, the R4i CDMS enables publishing teams the flexibility to publish, update and revoke IETMs directly generated from the technical repository.

Benefits of CDMS:

- Reduce IT staff load
- Stage IETMs
- Easy IETM access
- Content Security



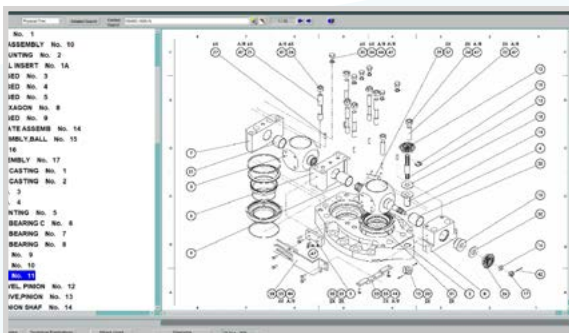
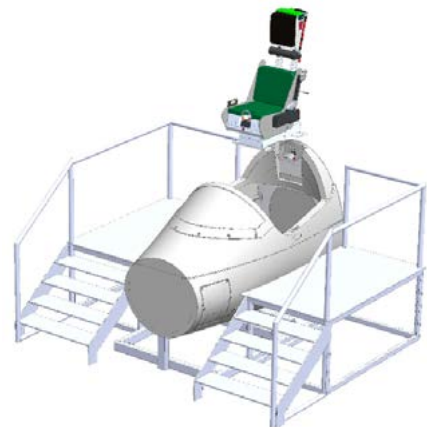
FUTURE INNOVATION

FUTURE INNOVATION

Pennant is continually reviewing the training market to identify any gaps or opportunities where the enhancement to an existing system or addition of a new product can enhance Pennant's offering. The company takes on board feedback from its customer base and ideas from its own team to drive future innovation.

The following examples highlight the investment being made in the development to hardware, software and VR products:

- Virtual Ground-handling Training System
- Engine Starting System Trainer
- Crew Escape System Trainer
- OmegaPS Rail - Point of Maintenance ("POM")
- OmegaPS ILS are modernizing our GUI, and strengthening OmegaPS capability to create value added outputs to help customers to efficiently manage their equipment fleets





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