# OPERATOR USER'S MANUAL
# for
# COMMON DRIVER TRAINER (CDT)
# WITH VARIANTS
## DEVICE # 17-260

# WARNING SUMMARY

Throughout this publication, there are notes, cautions, and warnings to observe certain special procedures. Notes may precede or follow the applicable instructions. Cautions and Warnings precede the procedure to which they pertain.

**WARNING**

A **warning** statement is used to call attention to an operating procedure or practice that, if not correctly followed, could result in personnel injury or death.

**CAUTION**

A **caution** statement is used to call attention to an operating procedure, practice condition, etc. which, if not strictly observed, will result in damage to or destruction of the equipment.

**NOTE**

A **note** is used for an operating procedure, practice, condition, etc., which is essential to highlight.

**Warning Icons**


**HIGH VOLTAGE**: Use caution when this symbol appears. Electronic equipment using high voltage is accessed during this procedure.

**HEAVY PARTS:** Heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.

# LIST OF EFFECTIVE PAGES

 Note: Zero in the Change No. column indicates an original page.

Date of issue of original manual: 07/02/2010

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# CHANGE TRANSMITTAL PAGE

Technical manual OUM 17-6920-913-10, 20 September 2010, is updated as follows:

1. This change is a result of Government review comments.

2. All pages are at change level 1.

# OPERATOR USER'S MANUAL
# for
# COMMON DRIVER TRAINER (CDT)
# WITH VARIANTS

## VOLUME I: CDT Common

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistakes or know of a way to improve the procedures, please contact us. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual directly to: Program Executive Office, Simulation Training and Instrumentation (PEO STRI), ATTN: SFAE-STRI-PS-Q, 12350 Research Parkway, Orlando, FL 32826-3276. A reply will be furnished to you.

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# How to Use This Manual

## Manual Organization

This manual contains the following volumes:

Volume I CDT Common

Volume II Stryker Variant

Volume III MRAP Variants

Volume IV Tank Variants

## Error Reporting Procedure (DA Form 2028)

The user is encouraged to report errors, omissions and recommendations for improving this publication. Reports shall be submitted on a DA Form 2028 (located at the end of Volume III in the back of this manual) and forwarded to:

US Army Program Executive Office

Simulation Training and Instrumentation

ATTN: PMGCTT/CDT SFAE-PS-Q 12350 Research Parkway

Orlando FL 32826-3276

## Manual Conventions

Throughout the manual, a number of conventions are used to quickly and easily differentiate between commands that should be typed, buttons to be pressed, and screen names. They are as follows: On-screen and keyboard buttons are denoted by type in [ALL CAPITAL LETTERS] and [SURROUNDED BY BRACKETS]. For example: [ENTER] key.

Commands to be typed into the computer are denoted by a different typeface, called Courier. For example, a step in a procedure may require you to type the word "`main`."

Computer prompts are set off by quotation marks. For example: "login:" prompt.

The names of screens at the instructor/operator station are capitalized. For example: Login Screen.

Modes of the simulation are in ALL CAPITAL LETTERS. For example: AGGRESSIVE MODE.

The term "ghosted", "grayed out", and "highlighted" are used frequently throughout the manual. They denote the appearance of the screens on the IOS monitor. "Ghosted" or "grayed out" means that the items on the screen that look faded cannot be selected with the mouse because they are inactive. Ghosting happens after a selection has been made.

"Highlighted" means that the selected button or item has changed color or becomes "boxed" or outlined. This indicates which button or item is currently active.

## Symbols

The following symbols are used throughout this manual to denote warnings, notes, and instructor tips. Users should be familiar with these symbols before setting up the simulator.


**HIGH VOLTAGE**

Use caution when this symbol appears. Electronic equipment using high voltage is accessed during this procedure.

# 1 GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

## 1.1 General Information

### 1.1.1 Scope

The first volume of this manual contains information common to all variations of the Common Driver Trainer (CDT). Specific information for the Stryker variant is located in Volume II. Specific information for the MRAP variants is located in Volume III. Tank variant information is located in Volume IV.

#### 1.1.1.1 CDT Equipment

The CDT consists of the Instructor Operator Station (IOS), up to eight Student Training Stations (STS) including cab variants, the interactive software (including preprogrammed scenarios), and the After Action Review (AAR) station. The CDT can either be housed in a fixed permanent location or in a fully self-contained Mobile Training Facility (MTF).

#### 1.1.1.2 Reading Grade Level

This manual requires a 10th grade reading level.

### 1.1.2 Maintenance Forms, Records, and Reports

Refer to the appropriate Life Cycle Contractor Support documentation for all required maintenance forms, records, and reports.

### 1.1.3 Preparation for Storage or Shipment

Refer to the SMM 17-6920-913-24&P for instructions related to preparation for storage or shipment.

### 1.1.4 List of Abbreviations/Acronyms

| Abbreviation/Acronym | Description |
|---|---|
| A/D | Analog to Digital |
| AAR | After Action Review |
| ABS | Anti-lock Brake System |
| AC | Alternating Current |
| ACC | Accessory |
| AFSS | Automated Fire Suppression System |
| APS | Air Pressure System |
| ASE | Applications Service Element |
| ASSY | Assembly |
| ATP | Acceptance Test Plan/Procedure |
| ATTN | Attention |
| ATV | All Terrain Vehicle |
| AUX | Auxiliary |

| Abbreviation/Acronym | Description |
|---|---|
| AWD | All-Wheel Drive |
| AWG | American Wire Gage |
| B/W | Black and White |
| BAE | British Aerospace Engineering |
| BII | Basic Issue Items |
| BIT | Built In Test |
| BLK | Block |
| BNC | Bayonet Neill Concelman |
| BTM | Basic Transfer Mode |
| CAC | Common Access Card |
| CBRN | Chemical Biological Radiological and Nuclear |
| CCTV | Closed Circuit Television |
| CCW | Counter Clockwise |
| CD | Compact Disc |
| CDT | Common Driver Trainer |
| CES | Common Equipment Set |
| CFM | Code Fragment Manager |
| CIG | Computer Image Generator |
| CJB | Collision Jump Back |
| CL | Capabilities Select |
| CO | Contracting Officer |
| COEI | Components of End Items |
| COTS | Commercial Off the Shelf |
| CP | Communications Protocol |
| CPC | Corrosion Prevention and Control |
| CPI | Communications Processor and Interface |
| CPU | Central Processing Unit |
| CRC | Cyclic Redundancy Check |
| CS | Canadian Standard |
| CTIS | Central Tire Inflation System |
| CTR | Center |
| CVC | Combat Vehicle Crewman |
| DA | Department of Army |
| DIO | Data Input-Output |
| DIP | Dual Inline Pin |
| DOD | Department of Defense |
| DOF | Degrees of Freedom |
| DRV | Drive |

| Abbreviation/Acronym | Description |
|---|---|
| DVD | Digital Versatile Disk |
| DVE | Driver Vision Enhancer |
| DVI | Digital Video Interactive |
| DVR | Digital Video Recorder |
| E&S | Evans and Sutherland |
| ECU | Engine Control Unit |
| EIC | Equipment Identification Code |
| ENCL | Enclosure |
| EPO | Emergency Power Off |
| ESD | Electrostatic Discharge |
| ESDS | Electrostatic Discharge Sensitive |
| E-STOP | Emergency Stop |
| FET | Field Effect Transistor |
| FF | Flip-Flop |
| FFCS | Full Function Crew Station |
| FHWA | Federal Highway Administration |
| FIFO | First in First Out |
| FM | Frequency Modulation |
| FOG | First Osborne Group |
| FS | File Separator |
| FSS | Fire Suppression System |
| FT | Fixed radio Terminal |
| FW | Flat Washer |
| GAP | Generic Access Profile |
| GFE | Government Furnished Equipment |
| GL | Graphics Language |
| GP | Graphics Processor |
| GUI | Graphical User Interface |
| HD | Hard Disk |
| HJNUT | Hex Jam Nut |
| HP | Hewlett-Packard |
| HVAC | Heating, Ventilating & air conditioning |
| HYD | Hydraulics |
| I/O | Input/Output |
| ID | Identification |
| IED | Improvised Explosive Device |
| IG | Image Generator |

| Abbreviation/Acronym | Description |
|---|---|
| IODT | Icon on the Desktop |
| IOS | Instructor Operator Station |
| IP | Internet Protocol |
| IR | Infrared |
| LAN/SNMP | Local Area Network/ Simple Network Management Protocol |
| LAT | Local Access Terminal |
| LCCS | Life Cycle Contractor Support |
| LCD | Liquid Crystal Display |
| LED | Light Emitting Diode |
| M-ATV | MRAP All Terrain Vehicle |
| MB | Megabyte |
| MBC | Motion Base Computer |
| MDA | Motion Drive Algorithm |
| MFT | Master File Table |
| MLVS | Main Vehicle Light Switch |
| MM | Manned Module |
| MPH | Miles per Hour |
| MPS | Minimum Performance Specification |
| MRAP | Mine Resistant Ambush Protected |
| MSC | Message Sequence Chart |
| MTF | Mobile Training Facility |
| MVLS | Main Vehicle Light Switch |
| N/A | Not Applicable |
| NBC | Nuclear, Biological, Chemical |
| NEMA | National Electrical Manufacturers Association |
| NIC | Network Information Center |
| NSN | National Stock Number |
| OD | Over Drive |
| OEM | Original Equipment Manufacturer |
| OPS | Operations |
| OS | Operating System |
| OUM | Operator Users Manual |
| P/N | Part Number |
| PC | Personal Computer |
| PCB | Printed Circuit Board |
| PCI | Peripheral Communications Interface |
| PCS | Patchable Control Store |

| Abbreviation/Acronym | Description |
|---|---|
| PEO | Program Executive Office |
| PM | Program Manager |
| PMCS | Preventative Maintenance Checks and Service |
| PSI | Pounds per Square Inch |
| PSIG | Pounds per Square Inch Gauge |
| PTO | Private Telecommunications Organizations |
| PVC | Permanent Virtual Circuit |
| PWM | Pulse Width Modulated |
| QC | Quality Control |
| RMS | Record Management Services |
| RT | Real Time |
| SAE | Standard American Equivalent |
| SAIC | Science Applications International Corporation |
| SARA | Simulation Assets Readiness Allocation |
| SDRL | Subcontractor Delivery Requirements List |
| SMM | System Maintenance Manual |
| SN | Serial Number |
| SS | Stainless Steel |
| SSL | Secure Sockets Layer |
| STRI | Simulation Training and Instrumentation |
| STS | Student Training Station |
| SW | Software |
| TBD | To Be Determined |
| TCM | Time Compression Multiplex |
| TCU | Transmission Control Unit |
| TFT | Thin Film Transistor |
| TM | Technical Manual |
| TMDE | Test, Measurement, and Diagnostic Equipment |
| TPSS | Transmission Pushbutton Shift Selector |
| TR | Technical Report |
| UART | Universal Asynchronous Receiver/Transmitter |
| UEI | United Electronic Industries |
| UPC | Universal Product Code |
| UPR | Users Performance Requirements |
| UPS | Uninterruptible Power Supply |
| USB | Universal Serial Bus |
| VCC | Virtual Channel Connection |

| Abbreviation/Acronym | Description |
|---|---|
| VDC | Volts DC |
| VDIS | Virtual Distributed Interactive Simulation |
| VDU | Visual Display Unit |
| VGA | Video Graphics Adapter |
| WLL | Wireless Access Local Loop |
| WS | Weather Station |
| XLR | Balanced Audio Connector |

## 1.1.5 Safety, Care, and Handling

### 1.1.5.1 SAFETY PRECAUTIONS - Motion Base

The motion base is the device that moves the entire cab assembly around. The motion base has a battery backup that is used to safely park the motion base in the event of power failure. See the MOOG Motion System User's Manual (Drawing # C37963) for location and replacement of motion base battery. The motion base can be shut down in emergencies by pressing the large, red emergency stop button inside the cab. An additional emergency stop (E-STOP) button for each STS is located at the IOS. By pressing the emergency stop button, the motion base will return to its home position. The motion base will automatically park if the door or hatch is opened or if the student unbuckles the seatbelt (for variants equipped with seatbelts). To reactivate the motion system after any fault, first correct the problem and then press the [PAUSE] button at the IOS. Press the [PAUSE] button again to reactivate the motion system.

**Reactivating the Motion System Using the Keypad:**

1. At the Main Menu, press the [F1] button to display the Control Menu.
2. Press [F1] to pause. Wait five seconds until the menu appears again, and then press [F1] again to resume. The motion system will reactivate at this time.

### 1.1.5.2 SAFETY PRECAUTIONS - Motion Envelope

The motion envelope is the area around the CDT that represents the trainer's full range of motion. For fixed sites (Lots 1&2), guard rails are provided to prevent bystanders from venturing inside the motion envelope. The guard rails are installed to provide at least a two-foot buffer beyond the edge of the motion envelope. For Mobile Training Facility (MTF) sites, the Student Training Station (STS) compartment acts as the safety perimeter. No one should be allowed in the STS compartment during operation except for the student/driver who is operating the CDT.

In the event of an emergency, there is an emergency stop (E-STOP) button located at the IOS. By pressing the emergency stop button, the motion base will return to its home position. The motion base will automatically shut down if the door is opened or if the student unbuckles the seatbelt. To reactivate the motion system after any fault, correct the problem and press [PAUSE] on the IOS GUI or [F1] on the keypad to resume.

### 1.1.5.3 SAFETY PRECAUTIONS - Quick Change Base Safety System

The CDT has a universal mount plate that is attached to the top of the motion base. This plate allows for the attachment and removal of vehicle variant cabs. This safety system provides a visual warning during cab changeovers of unsafe conditions. Visual warning flags operate on rear mounting bolts.


**Figure 1. Cab Attachment Warning Flag**

The rear quick-change mounting bolts secure the flags in an up position during normal operation. The flags hang down when the bolts are removed or missing. The micro-switches sense the flag position and disable motion if either flag is not secured. The switches are wired into the E-STOP loop.

### 1.1.5.4 SAFETY PRECAUTIONS – Smoke Detector

A smoke detector system triggers a shunt trip relay system to de-energize the electrical system in the STS. The emergency lighting illuminates upon activation. The smoke detector continues to draw power from emergency battery backup after the shunt trip relay system has been activated.

### 1.1.5.5 SAFETY PRECAUTIONS – Emergency Stop Button

There are two buttons labeled “EMERGENCY STOP” included with the CDT; one in the Instructor Operator Station (IOS) and one in the cab. The EMERGENCY STOP button, when activated, parks the motion base and effectively halts the simulation. This button is also known as the E-STOP button.

### 1.1.5.6 SAFETY PRECAUTIONS – Seat Belt

A seat belt replicating the one used in the CDT vehicles is included. In addition, this seatbelt has latch detectors that indicate whether the belt is properly fastened or not. If the belt is not fastened, the motion will not initiate. If the belt becomes unbuckled for any reason during the exercise, the motion base will immediately park, returning safely to the home position.

### 1.1.5.7 SAFETY PRECAUTIONS – Sound

The system contains an audio computer, amplifier and speakers of simulated sounds representing CDT operations and interaction with the environment. The STS speaker system has a volume control that is adjusted as part of the trainer installation. Because training environments vary, having adjustable sound reproduction levels is important.

The intercom system has volume controls at the student and instructor headset plug-in locations.

### 1.1.5.8 SAFETY PRECAUTIONS – Simulator Sickness

Simulator sickness is a phenomenon well studied by the University of Iowa. During the course of their research, it has been discovered that over the spectrum of the general population, 10% will experience some form of distress when operating a simulator. This might be anything from simple eyestrain to nausea, and in very infrequent instances, vomiting. With proper orientation to the simulator device, this percentage can be greatly lowered. In fact, it has been the experience of our users that the incidence rate is in the range of 3% to 5%, depending on gender and age group. Further, upon repeated exposure to the simulator in small segments of time, this group of people is reduced to even a smaller percentage.

The following CDT features mitigate the risk of simulator sickness:

- Ventilation fans are mounted inside the STS driver compartment to maintain good airflow for the student.
- Simulation transport delays are minimized such that the driver controls, visual scene and the cab motion are carefully synchronized.

The user and facilities personnel should perform the following in order to further reduce the risk of simulator sickness:

1. Keep the room temperature cool and maintain good ventilation and air circulation near the driving cabin.
2. Begin new drivers with no more than a 5 to 10 minute driving orientation without traffic present. This should be followed by a break. Gradually increase simulator exposure with breaks as necessary. Students will acclimate at their own rate.
3. Inform new drivers about depth perception. They should continually scan the driving scene with their eyes and avoid staring at any one object. Their eyes should focus toward the center of the screen and not on the road directly in front of the vehicle. They should frequently glance at the side channels and check mirrors while turning. When switching focus from one side screen to the other, have them observe vehicle gauges during the transition. These tips are borrowed from traditional training methods in real vehicles.
4. Warn new drivers about over-steering. It is very common for new simulator drivers to over-steer and constantly have to correct steering wheel position. The disorientation that can result from this is a leading cause of simulator sickness.

### 1.1.5.9 SAFETY PRECAUTIONS – Side Access Door

The CDT platform is designed to allow access to trainer cabs via steps and a left or right side access door. Personnel accessing the training cab in a manner other than through the steps and side access door could potentially expose themselves to a Safety-Critical situation.

The advantages of the side door design include:

- Requires no additional platform for cab entry/exit.
- Minimal build up of cab structure to support door.
- Maintains compatibility with most wheeled vehicle layouts.

- Is not cumbersome to the student and greatly reduces the risk of personal injury and damage to the cab instruments and controls.
- Allows for safest egress.

#### 1.1.5.10 SAFETY PRECAUTIONS – Operating Temperature

The recommended operating temperature is in the range of 65 to 68 degrees Fahrenheit and is directly related to operator and student comfort.

#### 1.1.5.11 MTF SAFETY PRECAUTIONS – Emergency Power Off Button

The EMERGENCY POWER OFF (EPO) button located at the Instructor Operator Station (IOS) in the MTF activates the shunt relay system to shut off all power to the system. The emergency lighting illuminates upon activation. The smoke detector and motion base are still-powered with battery backup. The EPO button is located on the wall adjoining the STS and IOS, directly under the window.

#### 1.1.5.12 MTF SAFETY PRECAUTIONS – Carbon Monoxide Detector (MTF Only)

A carbon monoxide detector provides warning against high levels of carbon monoxide in the air. Keep the Doghouse door closed when using the generator to keep carbon monoxide fumes from entering the Student Training Station (STS) area.

#### 1.1.5.13 MTF SAFETY PRECAUTIONS – Lightning (MTF Only)

The system contains a lightning grounding and air terminal system on the roof of the MTF, grounding system at the front of the trailer to ground the air terminals and a surge arrestor wired into the Power Distribution Panel inside the trailer Doghouse. Personnel disregarding the setup procedures for the lightning arrestor system could potentially expose themselves and others to a Safety-Critical situation.

#### 1.1.5.14 MTF SAFETY PRECAUTIONS – Stair Positioning (MTF Only)

Stair Positioning should allow clear entry/egress to and from the trailer. Ensure that the platform, stairs, and handrails are secure and locked down with bolts or pins where applicable.

#### 1.1.5.15 MTF SAFETY PRECAUTIONS – Doghouse External Access Door and STS Rack (MTF Only)

The Doghouse external access door should not obstruct the generator. Use handrails and retractable footholds when entering or exiting the Doghouse.

To avoid damage to the STS rack from overheating, ensure that the external door between the STS rack and the Doghouse is closed during normal operation, especially when the door between the Doghouse and the student area is closed.

#### 1.1.5.16 MTF SAFETY PRECAUTIONS – Condensation (MTF Only)

Do not open the large external doors or leave personnel access doors open when a large temperature/humidity difference is present between the trailer's internal environment and the external environment. If condensation is observed on the training device, do not power up.

#### 1.1.5.17 Care of Mylar® Mirrors in Visual Display Unit

**CAUTION**

To prevent severe panel shrinkage, do **NOT** wash the Mylar® panels or allow them to come in contact with water.

## 1.2 Equipment Description and Data

**CDT Product Line Concept:**

The CDT Product Line simulators provide operational training for land vehicles including the Stryker, MRAP variants, and Abrams tank. This family of simulators enables the simulated operation of these vehicles in different geographical areas, with dynamic environmental effects and in situations that replicate those encountered in the actual usage of these vehicles in varying circumstances and environments. The Product Line variants are built upon a common architecture, and as such reuse legacy designs, COTS products, and a common baseline of software components. These hardware (HW) and software (SW) components evolve based on 1) new customer-directed variant-specific requirements, 2) injection of product line improvements, and 3) COTS end-of-life events. Variations in HW and SW are analyzed, approved, designed and documented as part of the new variant program and are ultimately captured in the technical documentation to include the Operator User's Manual and the System Maintenance Manual.

### 1.2.1 Differences Between Models

This manual has been designed to address the different CDT models (variants) on a per-volume basis. Items common to all CDT models, such as Class Manager, are covered in the Common Volume (Volume I). Information specific to the Stryker variant is covered in Volume II, Stryker. MRAP-specific information for all of the MRAP variants is covered in Volume III, MRAP. Volume IV contains the information for the M1A1 and M1A2 Tank variants.

**Differences Between Variants:**

The following CDT system components differ between variant products:

- Installation, i.e. fixed customer site (Lots 1&2 and CES) vs. MTF.
- Motion base attachment mechanism (concrete floor lag bolt and anchor vs. BigFoot mount).
- Variant driver cabs, associated removable driver compartment panels, STS computer rack configurations, and headsets (Stryker, MRAP, and Tank).
- I/O subsystems (Stryker – FAAC proprietary, MRAP – UEI, Tank – WAGO).
- IOS and STS computer models: Due to the pace at which computer and PC card technology advances and models go "end-of-life," each variant has different models of computers, graphics cards, audio cards, DVR cards and printers. These are all functionally equivalent as we replace them with current models and are backwards compatible. Regression testing of legacy variant software baselines and cab HW insures compatibility.
- Video Display Units (VDUs) projectors: projector models have gone end-of-life over the product line lifecycle, so these vary across the variant products. Projector mounting plates also vary to accommodate different projector shapes and attachment HW. MRAP

MTF has specific variations to the VDU frame to accommodate reduced service/working areas inside the MTF.

- Local versus Common Data Servers: Within the CDT, there are two types of database servers utilized; a Local server or a Common Data Server (CDS). Both servers provide storage of student records, class data, scenario and POI data. Local servers are housed on the IOS, whereas the CDS's location is site-specific. The main difference between the servers is that while the Local server stores the records of an individual trainer, the CDS stores all the records for those sites with multiple trainers. Storing the data on the CDS consolidates all of the records and reports into one central location.

To further define the systems referenced throughout these manuals, the following terms and definitions have been provided.

- **Fixed Site** – refers to sites that are permanent buildings or semi-permanent compounds.
- **Mobile** – refers to trailer facilities which house the movable CDT units.
- **Lots 1 & 2** – refers to the fourteen fixed site systems delivered under the Stryker contract.
- **MTF** – refers to the thirteen mobile trailer site systems delivered under the MRAP contract.
- **CES** – refers to the two fixed systems delivered under the MRAP contract.
- **TV –** refers to the 18 fixed systems delivered under the Tank contract.

## 1.2.2 Equipment Characteristics, Capabilities, and Features

### 1.2.2.1 Software Performance Characteristics

All of the CDT variant trainers incorporate realistic simulations of the power train (i.e. engine, clutch if applicable, transmission, and axle ratios), the suspension system (i.e. springs and shock absorbers), the brake system, the steering system (i.e., steering ratios and tire forces), and the trailer characteristics. The dynamic model accounts for all external conditions that affect the calculation of forces and momentum on the vehicle (i.e. wind and road surface friction), as well as the internal forces created by the student actions (i.e. steering, engine, brakes, etc.). Because the simulator was developed specifically for training in environments that are hazardous, the model has been directed toward high-fidelity solutions that will accurately simulate conditions such as rolling over. The simulator can replicate malfunctions where an inappropriate driver response would damage the engine or vehicle or could jeopardize the safety of the operator or surrounding traffic. As a result, the performance characteristics of the simulator match those of an actual vehicle.

For example, consider the following:

The simulated steering system will provide turning radii that are very similar to those experienced in the simulated vehicles under similar loading and speed conditions. A force feedback (motor-controlled) system provides the feel of sudden tire position changes like striking a curb.

The braking system will produce deceleration rates and stopping distances like the actual vehicle, including variation with load. As the vehicle climbs uphill, its speed will decrease

relative to the hill grade and the increased load on the engine. The sound of the engine will also change as the engine speed decreases.

If the driver goes over the curb or into a roadside ditch, the suspension system will react to the change in tire position and cause the vehicle to pitch and roll appropriately. In fact, the suspension system is so detailed that the vehicle can roll over if the driver creates a situation that would cause such a reaction. If the driver allows the trailer to swing wildly on a wet surface, or brakes poorly with an awkward load, a jack-knifing condition may occur.

#### 1.2.2.2 Environmental Characteristics

The recommended operating temperature for the CDT is in the range of 65 to 68 degrees Fahrenheit and is directly related to operator and student comfort.

The MTF is broken up into three independent areas partitioned off by walls. Two of the three areas are climate controlled. Located in the IOS room is an independent thermostat control with a matching unit located on the opposite wall in the STS area. These two units can be independently controlled creating the ideal operating environment for either the instructor or student. The recommended operating temperature is in the range of 65 to 68 degrees Fahrenheit and is directly related to operator and student comfort.

### 1.2.3 Equipment Data

#### 1.2.3.1 Functional Description

The US Army requirement to develop a common line of individual soldier driver training platforms for the different tracked, wheeled, and heavy equipment vehicles resulted in the Common Driver Training (CDT) training system. This manual addresses the Mine Resistant Ambush Protected (MRAP) CDT variants, specifically the RG33L, MaxxPro, RG31MkV, Caiman, and M-ATV (Volume III), as well as the Stryker variant (Volume II), and Tank variants (Volume IV). MRAP vehicles are designed from the ground up to protect soldiers from IEDs in a combat environment. Their unique design provides excellent protection for crew and passengers against anti-tank landmine detonations and ballistic threats. The design is based on the armored V-shaped hull which deflects the explosive blast outward from the vehicle increasing the chance of survival for soldiers inside the vehicle.

**NOTE**

All of the CDT variants are discussed in detail in their respective volumes.

#### 1.2.3.2 Security Classification

The CDT and its variants have been developed without any classified data or equipment.

#### 1.2.3.3 Purpose and Capability

The purpose of the CDT trainers is to train soldiers to drive all CDT variants, including Stryker, MRAP variants, and Tank variants. The CDT trainers provide students with continuous practice of critical driving skills. The CDT provides realistic and challenging training through simulation of various weather and visibility conditions. The CDT is used to train all driving conditions on various types of terrain, to include, but not limited to: desert, woodland, urban, and mountainous, as well as cold weather and other weather related environments. The system database consists of nine task regions. Each region permits

students to drive in traffic and in terrain that varies from steep mountains to flat plains, urban, rural and city settings. Within the built-up area, students will be exposed to small arms fire, Improvised Explosive Device (IEDs) and Rocket- Propelled Grenades (RPGs).

#### 1.2.3.4 CDT Training System

The CDT Training System is comprised of the Student Training Station (STS), Instructor Operator Station (IOS) and an After Action Review (AAR) Station. There are currently five configurations of the CDT Training System: Lots 1&2 that include fixed-site trainers delivered under the Stryker contract, Common Equipment Set (CES) that includes fixed systems delivered under the MRAP contract, the Mobile Training Facility (MTF), also delivered under MRAP contracts, and Tank that includes fixed systems delivered under the Tank contract. The MTF configuration is housed in a trailer that is designed to be moved to different training locations as required. Although both fixed-site and mobile configurations were designed to provide the same training capabilities there are distinct differences. These differences are discussed throughout this manual.

**NOTE**

Throughout this manual, the terms “student” and “driver” are considered to be interchangeable.

### 1.2.4 Location and Description of Major Components

#### 1.2.4.1 Instructor Operator Station (IOS)

The Instructor Operator Station (IOS) is designed to allow the Instructor/Operator the capability to initiate and control the simulated exercises provided to the student via the STS. The components of an IOS are shown below. Note that there are two possible monitor configurations, a three-monitor setup (fixed sites only) and a seven-monitor setup (MTF only).

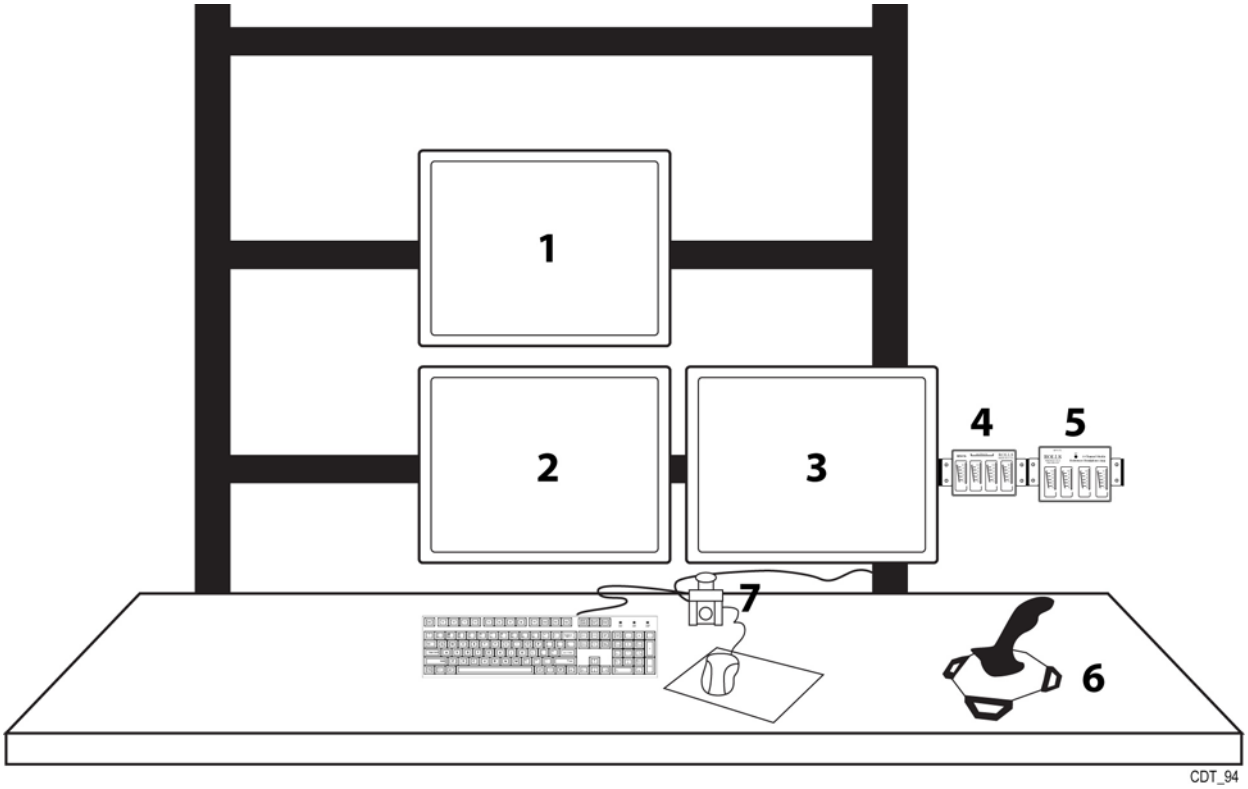



**Figure 2. IOS Three-Monitor Layout – Lots 1&2**

**Table 1. IOS Three-Monitor Layout – Lots 1&2**

| Item | Control or Indicator | Description |
|---|---|---|
| 1 | Stealth view | Bird's eye view of vehicle |
| 2 | IOS scenario monitor | Monitor that IOS Application is run from |
| 3 | CCTV | Closed Circuit Television |
| 4 | Mixer | 4-Channel Stereo Mixer |
| 5 | Amp | 4-Channel Headphone Amplifier |
| 6 | Joy stick | IOS override control |
| 7 | E-STOP | Motion only stop |

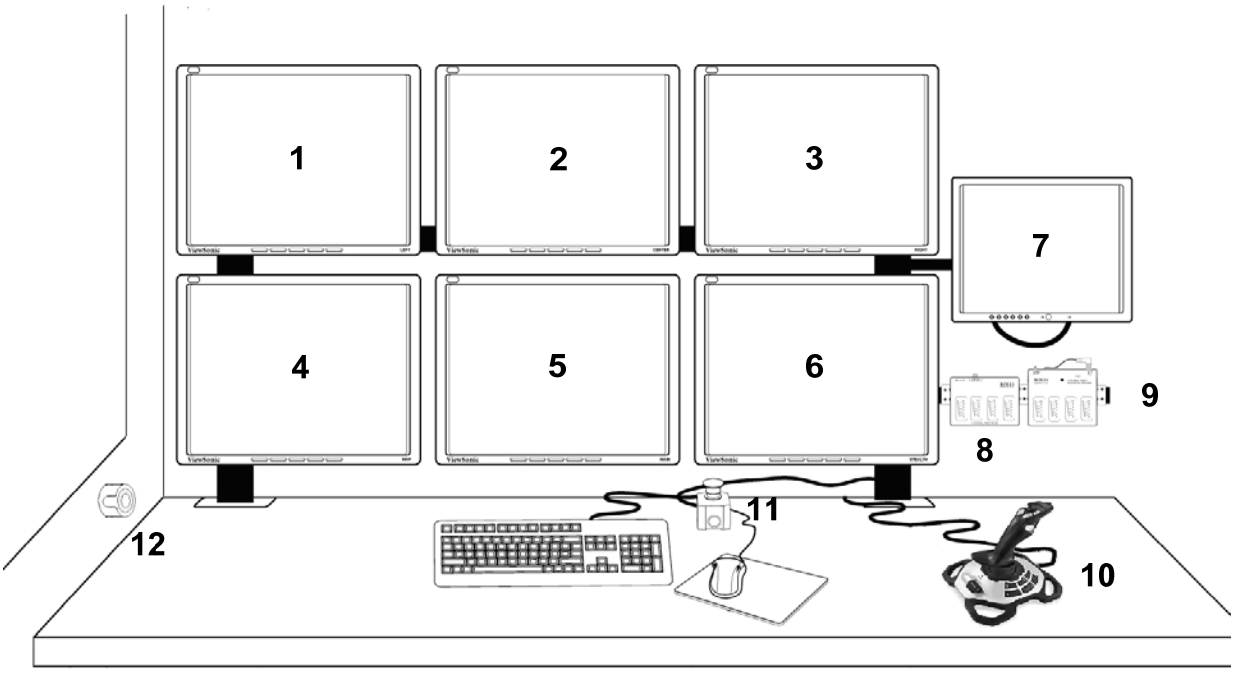



**Figure 3. IOS Seven-Monitor Layout – MTF/CES**

**Table 2. IOS Seven-Monitor Layout – MTF/CES**

| Item | Control or Indicator | Description |
|---|---|---|
| 1 | Left view | Repeater monitor from drivers left view |
| 2 | Center view | Repeater monitor from drivers center view |
| 3 | Right view | Repeater monitor from drivers right view |
| 4 | Topographical map | Display scenario driver route |
| 5 | IOS scenario monitor | Monitor that IOS Application is run from |
| 6 | Stealth view | Bird's eye view of vehicle |
| 7 | CCTV | Closed Circuit Television |
| 8 | Mixer | 4-Channel Stereo Mixer |
| 9 | Amp | 4-Channel Headphone Amplifier |
| 10 | Joy stick | IOS override control |
| 11 | E-STOP | Motion only stop |
| 12 | EPO | Emergency Power off (MTF only) |

The Instructor/Operator initiates a training exercise by first selecting a preprogrammed scenario and then customizing, to meet the needs of the student, by modifying the vehicle configuration, traffic conditions and environmental conditions. The keyboard is used to enter passwords, instructor and student names and instructor comments on the training exercise and student performance. The mouse is used to navigate through set-up menus, define the conditions and begin the training of the exercise. The mouse is also used to monitor and control the simulation during operation and to stop the exercise. The training exercise can be reviewed through a series of score screens that are automatically generated by the simulator. Printed copies of score sheets can also be produced.

#### 1.2.4.2 IOS Rack

The IOS computer rack (Figure 4 through Figure 6) located at the IOS contains the IOS computer systems, image generator, power distribution units, and Uninterruptible Power Supply (UPS). Most of the components mounted on the rack are not accessible to the driver or instructor. If the components malfunction, notify a qualified maintenance technician immediately. Maintenance personnel are typically located on-site at the user training facility.

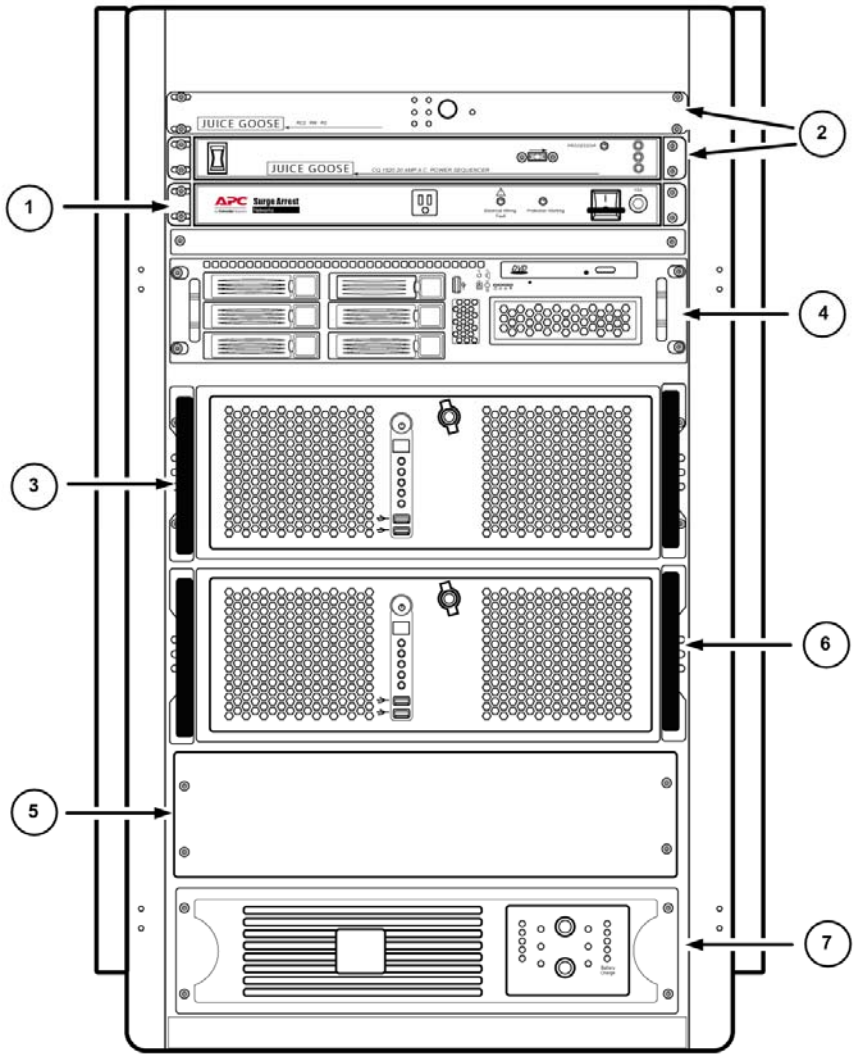



**Figure 4. Instructor Operator Station Rack – Lots 1&2**

**Table 3. Instructor Operator Station Rack – Lots 1&2**

| Item | Description |
|---|---|
| 1 | Surge Protector |
| 2 | Juice Goose |
| 3 | IOS System |
| 4 | RT/GP Image Generator |
| 5 | 4U slot for future expansion |
| 6 | IOS – STS computer |
| 7 | UPS Power Supply |

**NOTE**

The attached printer is located on the top of the rack for fixed sites (Lots 1&2).

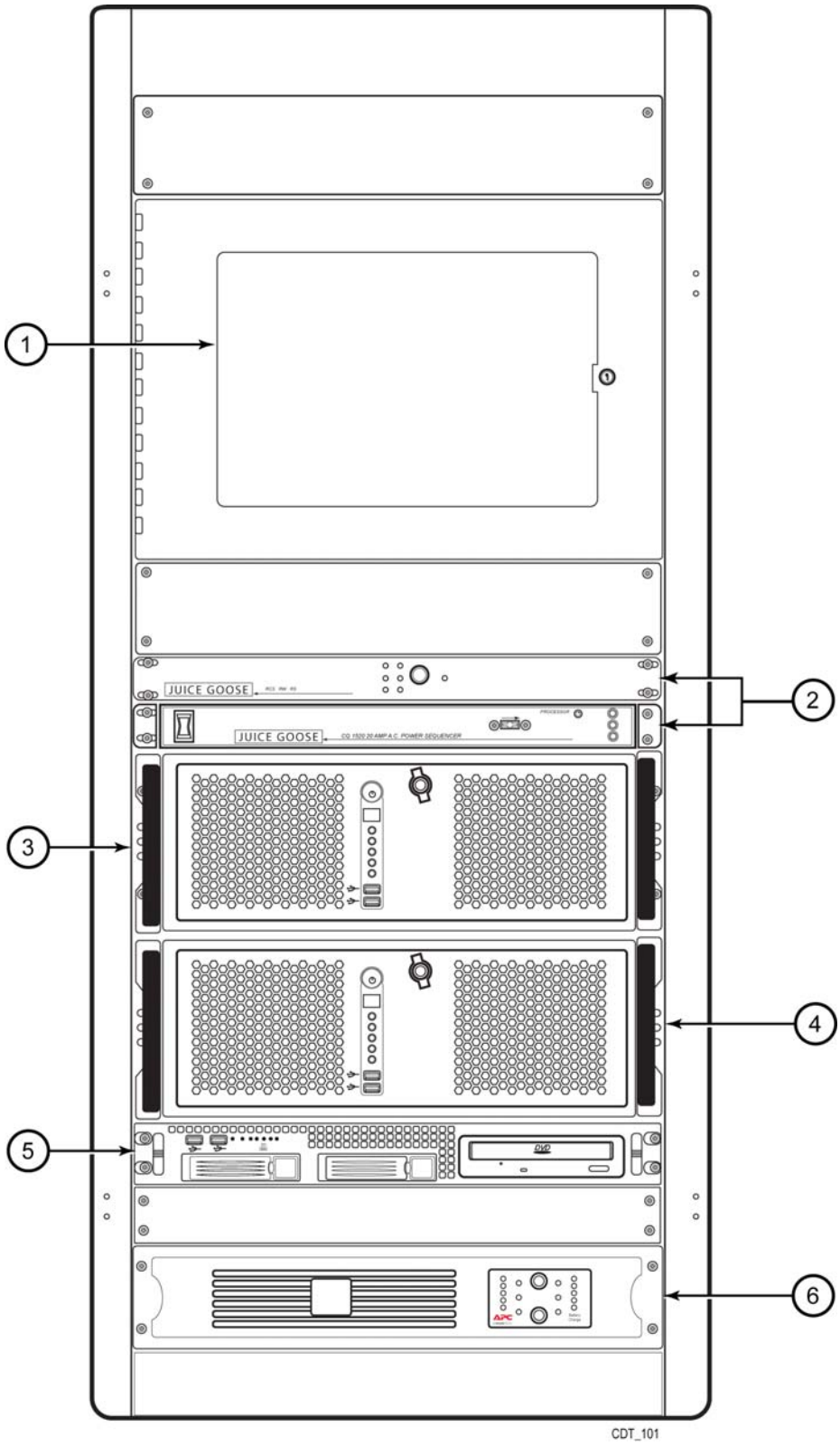



**Figure 5. Instructor Operator Station Rack – CES/Tank**

**Table 4. Instructor Operator Station Rack – CES/Tank**

| Item | Description |
|---|---|
| 1 | Printer |
| 2 | Juice Goose |
| 3 | IOS Linux Computer |
| 4 | IOS Windows Computer |
| 5 | Stealth Computer |
| 6 | UPS Power Supply |

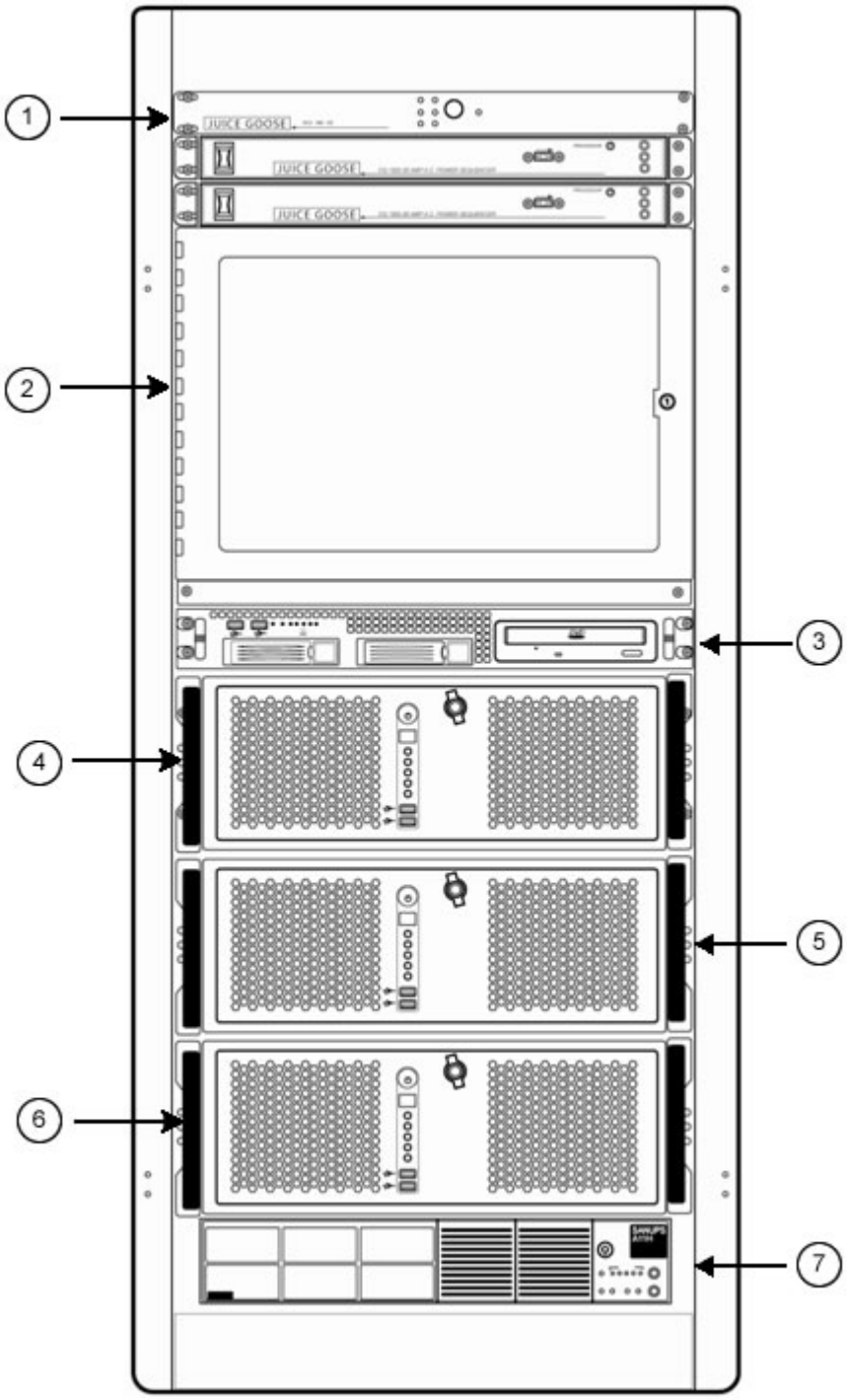



**Figure 6. Instructor Operator Station Rack - MTF**

**Table 5. Instructor Operator Station Rack - MTF**

| Item | Description |
|---|---|
| 1 | Juice Goose |
| 2 | Printer |
| 3 | RT/GP Image Generator |
| 4 | IOS System |
| 5 | IOS – STS computer |
| 6 | AAR System |
| 7 | UPS Power Supply |

#### 1.2.4.3 Student Training Station (STS)

The STS comprises the system that students engage when practicing driving scenarios. The STS has four major components: the driver cab, visual display system, motion system and computer rack. Figure 7 is representative of the driver's compartment, visual system and the motion base.

Access to the driver's compartment is dependent on the vehicle variant that is being simulated. The driver's compartment houses the driver's seat, steering mechanism, communications equipment, vehicle dashboard, instruments, and controls to include the appropriate foot controls. The cab is equipped with a sound system and closed circuit television cameras (CCTV).

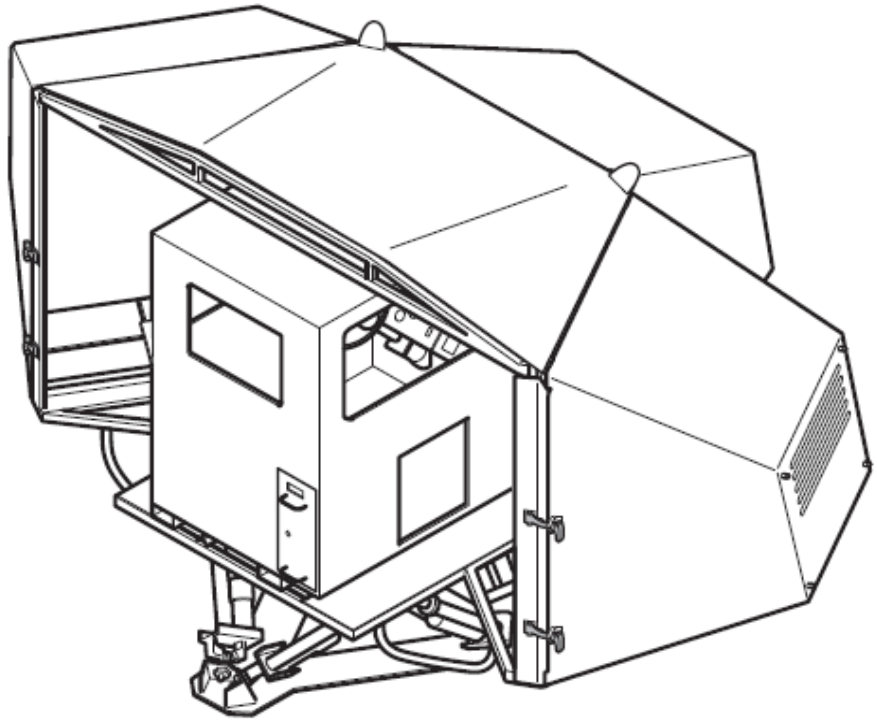


**Figure 7. Student Training Station Assembly**

#### 1.2.4.3.1 Visual Display System

The simulated training visual environment is created by state-of-the-art computer image generation. The simulator Visual System (Figure 8) features include a synthetic terrain with natural features, buildings, trails, roads, other vehicles, people and animals. The capabilities to create various environmental conditions such as snow, rain, fog dust levels, and varying light levels to simulate different times of day or night are provided. The scenes are displayed on three 60-inch (diagonal measurement) rear-projection monitors. The total forward viewing area is 180°. When combined with embedded rearview mirrors, the driver has all normal sight lines available. As the driver maneuvers through a scenario exercise area, autonomous traffic can be utilized.

The Image Generator (IG) sends an image to the LCD projector. The projector shoots the image forward to the Mylar mirror. The image reflects off of the Mylar mirror rearward to the Plexiglas screen where the student sees the final image.

**CAUTION**

To prevent severe panel shrinkage, do NOT wash the panels or allow them to come in contact with water.

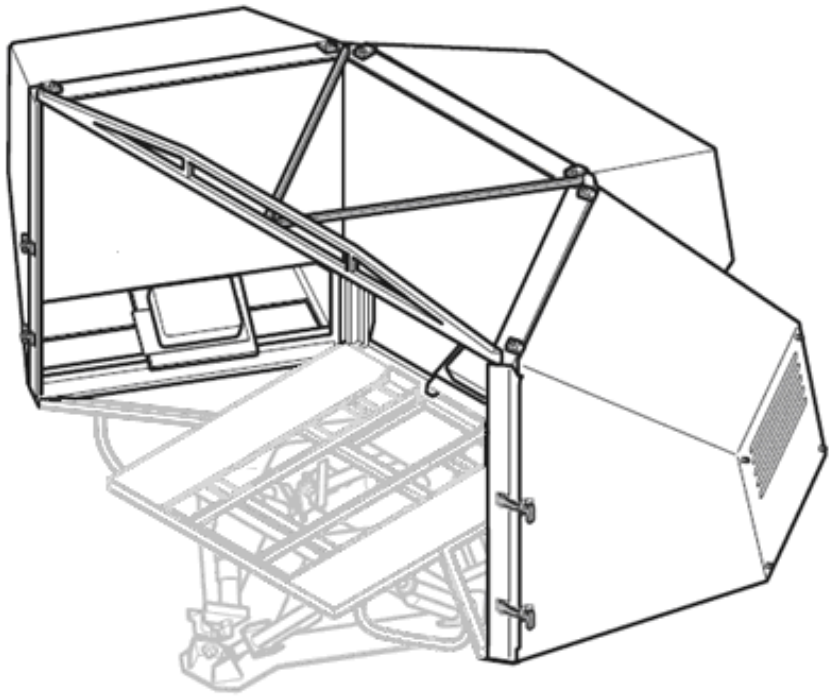


**Figure 8. Visual System**

The visual display system (Figure 9) consists of the following components:

1. Three Visual Display Units (VDUs) to enable left, center and right projection (metal frames with carbon fiber covers)
2. Three LCD projectors
3. Three Mylar mirrors
4. Three Plexiglas rear projector screens
5. Three canvas VDU covers

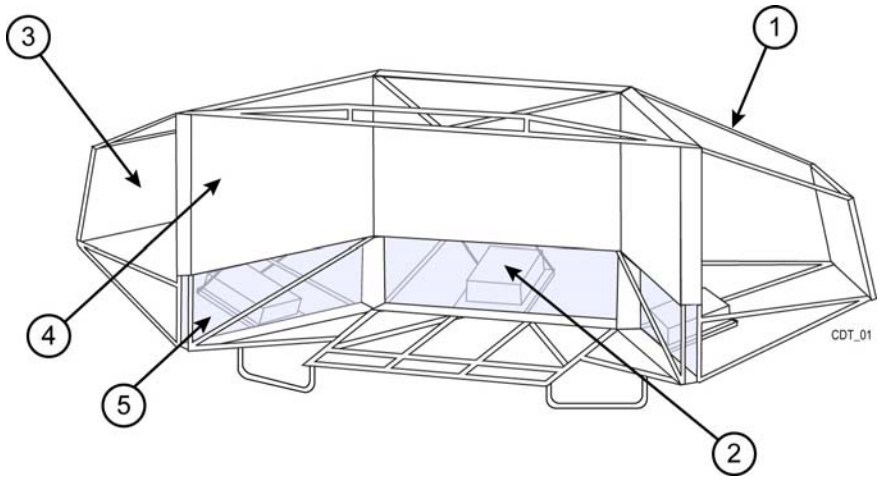



**Figure 9. Visual System Components**

#### 1.2.4.3.2 Motion Base

The motion base, as shown in Figure 10, is a device that moves the driver's compartment to simulate acceleration, deceleration, turning forces and any motion resulting from terrain and environment interaction. The motion base provides driver acceleration and angular cueing. It positions itself as the vehicle travels up and down the slopes so the driver will sense the feeling of being on a slope. It is capable of a limited acceleration feeling. As the vehicle attempts a stop, it will provide an abrupt forward movement. The motion base will deliver the feel of the initial acceleration feel and slowly return to zero.

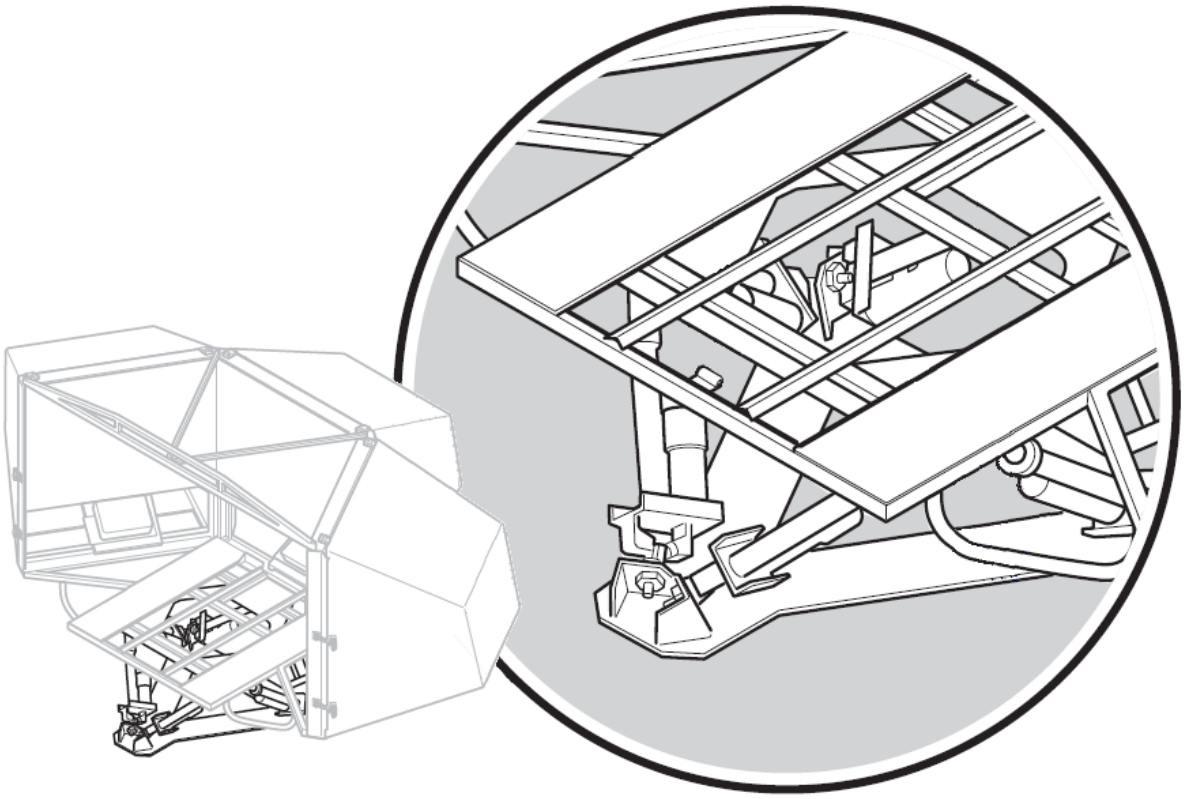


**Figure 10. Motion Base**

#### 1.2.4.4 STS Rack

The STS computer rack (Figure 11 through Figure 13), contains the STS computer systems, sound generation equipment, Image Generators (IGs), power distribution units, and network switches required to run each STS. Most of the components mounted on the rack are not accessible to the driver or instructor. If the components malfunction, notify a qualified maintenance technician. Maintenance personnel are typically located on-site at the user training facility.

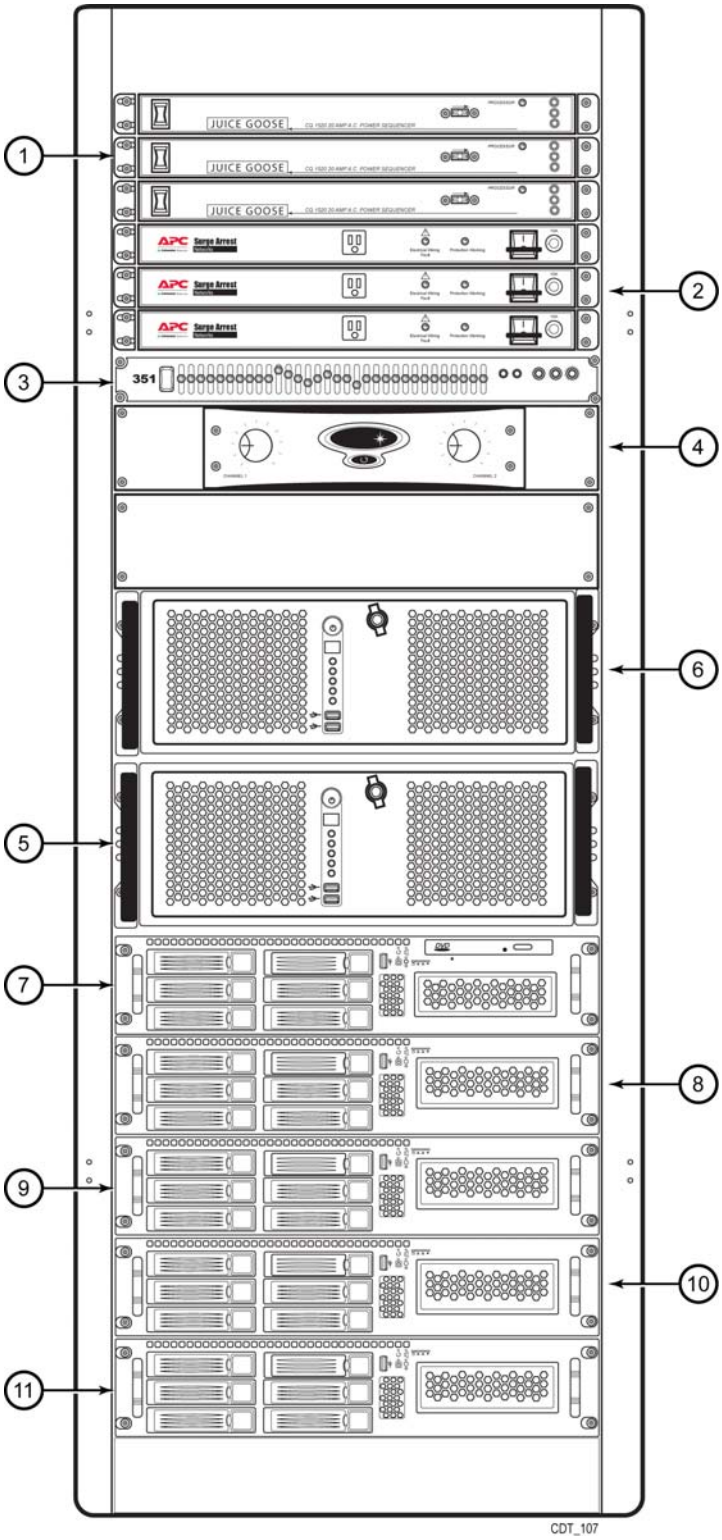



**Figure 11. Student Training Station Rack – Lots 1&2**

**Table 6. Student Training Station Rack - Lots 1&2**

| Item | Description |
|---|---|
| 1 | Juice Goose Power Sequencers (3) |
| 2 | Surge Protectors (3) |
| 3 | Equalizer |
| 4 | Amplifier |
| 5 | Audio Computer |
| 6 | SGS Computer |
| 7 | RT (Real Time) Image Generator |
| 8 | GP1 (Graphics Processor 1) Image Generator |
| 9 | GP2 Image Generator |
| 10 | GP3 Image Generator |
| 11 | GP4 Image Generator |

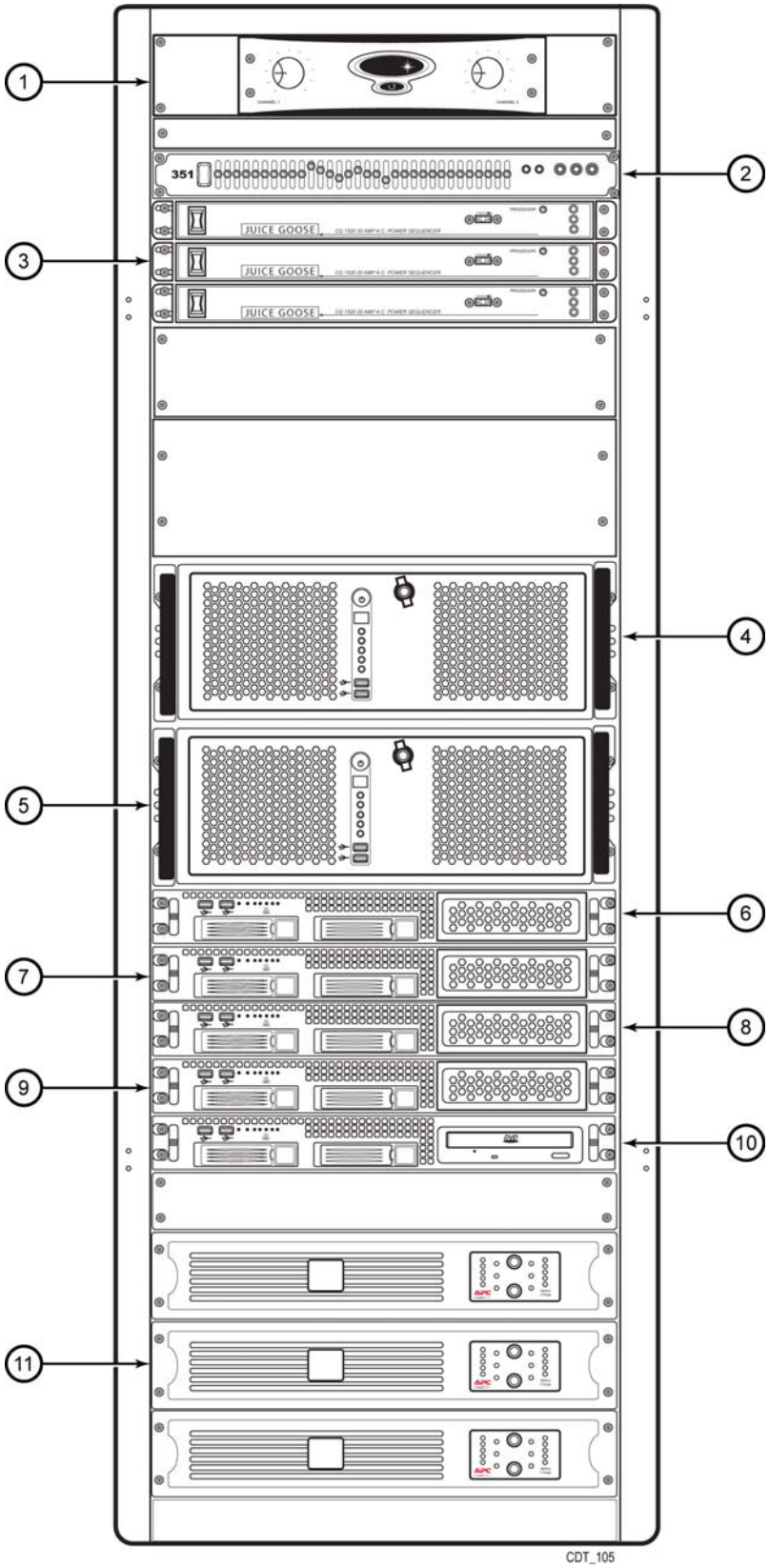



**Figure 12. Student Training Station Rack – CES/TV**

**Table 7. Student Training Station Rack – CES/TV**

| Item | Description |
|---|---|
| 1 | Amplifier |
| 2 | Equalizer |
| 3 | Juice Goose Power Sequencers (3) |
| 4 | Spare STS Computer (CES) / STS Computer (TV) |
| 5 | Audio Computer |
| 6 | GP03 (Graphics Processor 1) Image Generator |
| 7 | GP02 Image Generator |
| 8 | GP01 Image Generator |
| 9 | GP00 Image Generator |
| 10 | RT (Real Time) Image Generator |
| 11 | Surge Protectors (3) |

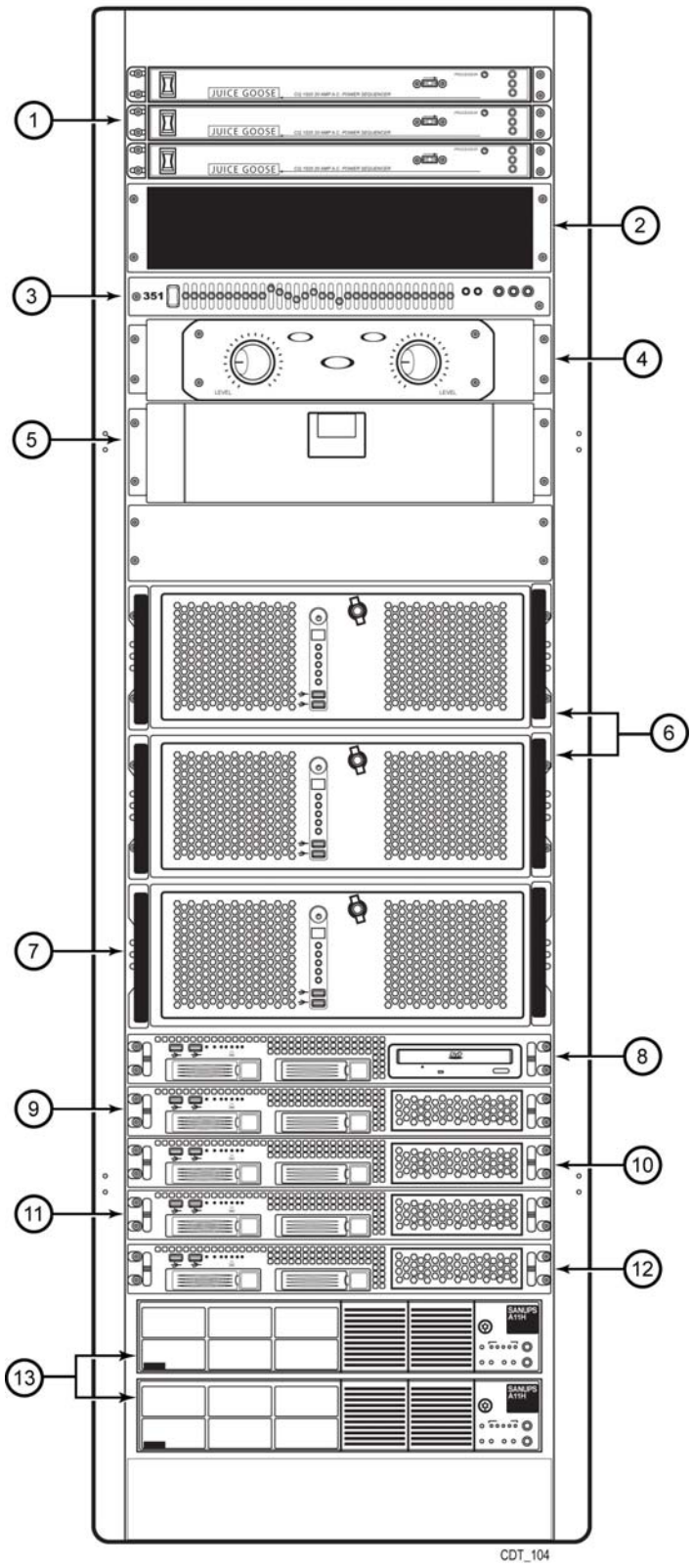



**Figure 13. Student Training Station Rack - MTF**

**Table 8. Student Training Station Rack - MTF**

| Item | Description |
|---|---|
| 1 | Juice Goose Power Sequencers (3) |
| 2 | 3U Expansion Slot |
| 3 | Equalizer |
| 4 | Amplifier |
| 5 | Utility Drawer |
| 6 | Spare Computer |
| 7 | RT (Real Time) Image Generator |
| 8 | GP1 (Graphics Processor 1) Image Generator |
| 9 | GP2 Image Generator |
| 10 | GP3 Image Generator |
| 11 | GP4 Image Generator |
| 12 | GP5 Image Generator |
| 13 | UPS Power Supply (2) |

#### 1.2.4.5 After Action Review Station

The After Action Review (AAR) Station, as shown in Figure 14 and Figure 15, consists of a table, color monitor, computer, speakers, keyboard, and mouse. The purpose of the AAR Station is to allow an off-line review of training results after the instructor has halted the training scenario. The AAR GUI supports playback of all or part of the scenario. The Instructor/Operator is able to pause, rewind, and fast forward (2x, 4x and 8x) the exercise from the AAR GUI page. The playback of a training scenario provides the visual, aural and instrumentation cues of the original execution through recorded video and sound. AAR capabilities are only available after an exercise has been completed and are not part of the run-time IOS system. As such, the AAR function may be utilized during (in parallel with) training sessions.

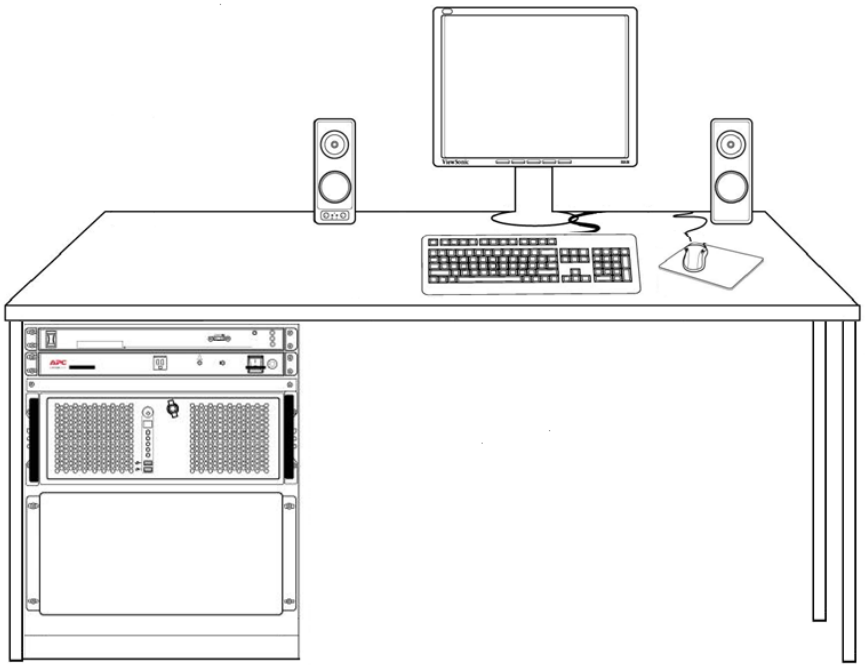


**Figure 14. After Action Review Station – Lots 1&2 / CES**

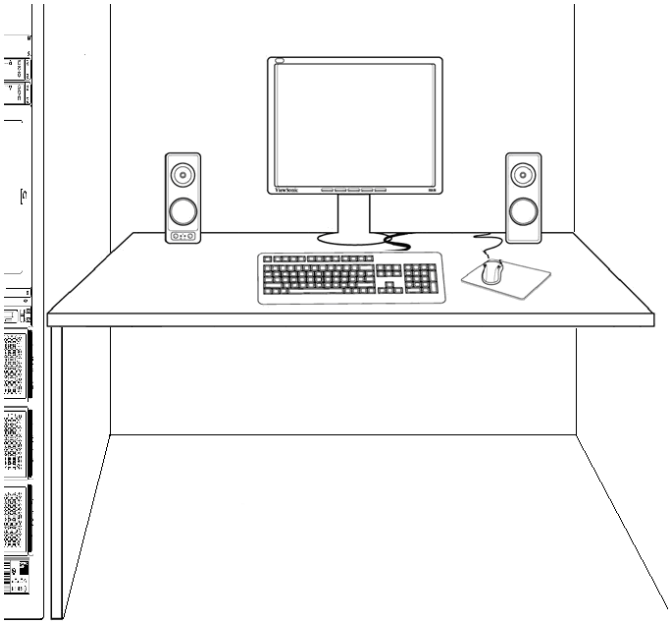


**Figure 15. After Action Review Station – MTF**

### 1.2.4.6 Card Scanner

Students can login by swiping their Common Access Card (CAC) through the card scanner (Figure 16) located adjacent to each STS trainer or by the instructor manually entering their 9-digit number or driver ID into the Driver Login screen at the IOS. The card scanner is collocated with the Remote Instructor keypad.

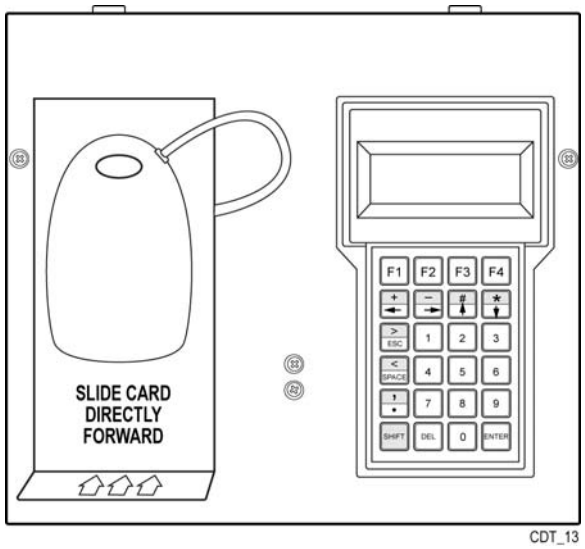



**Figure 16. Student Card Scanner and Remote Instructor Keypad**

The student must log in. An error message will appear if a student ID is entered that is not in the records database.

#### 1.2.4.7 Cab Variant Overview

The cab variants (Stryker, MRAP and Tank) are a full scale three-dimensional mockup representing approximately three quarters of the drivers actual cab area. The base MRAP cab is modeled after the RG33L variant. The MRAP cab is comprised of the tactical vehicle driver's seat, the tactical steering column and steering wheel, gas and brake pedals along with the Driver Vision Enhancer (DVE). As part of the comprehensive training capabilities of the CDT, each MRAP cab comes equipped with five interchangeable dashboards allowing the driver to learn and interface with the five MRAP vehicle variants, RG33L, MaxxPro, Caiman, RG31MkV, and M-ATV. The interchangeable dashboards are designed and built with the real vehicle controls to include the gauge clusters, switch panels and indicator lights. Each dashboard is made to interface with the standard MRAP cab by removing the bulkhead Mil-Spec connectors (four or five, depending on the variant), air lines (two or three depending on the variant) and thumb screws (four or five depending on the variant) securing the dashboard to the cab. Each dashboard can then be lifted out through the passenger door and then replaced with another dashboard.

The base Tank cab is modeled after the M1Abrams variant. The Tank cab is comprised of the tactical vehicle driver's seat, the hatch lifting mechanism, steering-throttle bar (T-Bar), Driver Vision Enhancer (DVE), and the Combat Vehicle Crewman (CVC) helmet. As part of the comprehensive training capabilities of the CDT, each Tank cab comes equipped with the instrument panels needed to allow the driver to learn and interface with the two Tank vehicle variants, M1A1 AIM-ED-SA, and M1A2 SEP V2. The M1A1 AIM-ED-SA variant utilizes three panels: the Instrument panel, Master panel, and Alert panel. The M1A2 SEP V2 utilizes a single Improved Driver's Integrated Display (iDID) panel. The panels are designed and built with the real vehicle controls to include the gauge clusters, switches and

indicator lights (excluding the row of 12 LEDs on the M1A1 Instrument panel). Each instrument panel is made to interface with the standard Tank cab by removing the connectors (one or two, depending on the panel), and captive screws (two or four, depending on the panel) securing the panel to the cab. Additionally, each Tank cab comes equipped with the Mine Clearing Kit, allowing the driver to learn and interface with the M1Abrams Mine Roller and Mine Clearing Blade (also referred to as the Plow).

**NOTE**

The DVE, steering system, brakes, cameras, headset and volume control are cab specific and therefore are covered in the associated volumes.

# 2 OPERATOR INSTRUCTIONS UNDER USUAL CONDITIONS

## 2.1 Description and Use of Operator Controls and Indicators

## 2.2 Remote Instructor Station

For MRAP and Stryker sites, the Remote Instructor station includes a student card scanner and a Q-Term handheld Remote Instructor keypad (Figure 20) located adjacent to the STS. For sites equipped with the Tank variant, the Q-Term keypad is not included.

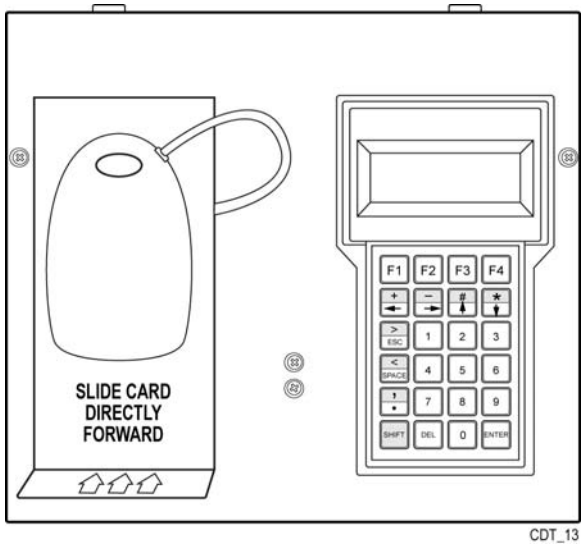



**Figure 17. Remote Instructor Station**

### 2.2.1 Q-Term Handheld Keypad

The Q-Term handheld Remote Instructor keypad is collocated with the student card scanner adjacent to the STS. The instructor can perform scenario-related functions with the keypad. By using the keypad while standing behind the STS, the instructor may view the driver's actions without the driver's knowledge and without disturbing the driver, yet be close enough to allow individual instruction of the driver.

The remote keypad, as depicted in Figure 18, has a display window at the top that provides the instructor with available options. At the bottom of the window are four command selection areas. Selection of any of these options is made by pushing their respective [F1], [F2], [F3], or [F4] button, as depicted in Figure 19. Depending on the option selected, the desired action may be taken or another page of options may appear.

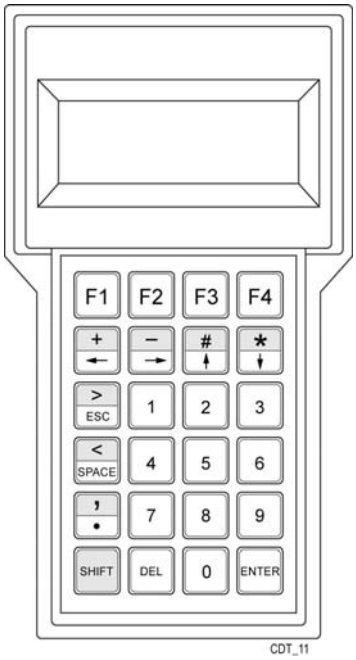



**Figure 18. Remote Instructor Keypad**

For certain pages, there may be a [>] button on the right side of the page or the [<] button on the left. Pressing either of these buttons will reveal additional choices available for that page.

For certain options (such as rain or time of day), the instructor can vary the level of the options by pressing the [+] button to increase the effect (add more rain) or the [-] button to decrease the effect.

The current level is shown in the upper right corner as a % with 100% being the maximum effect possible and 0% having the effect turned off.

Before the simulation is started, the message APP NOT RUNNING appears in the display window.

Once the simulator is kicked off from the IOS, the MAIN MENU appears.

There are four choices available from the MAIN MENU. Selecting any option from the MAIN MENU will result in display of a new page of options:

a. CONTROL (selected by pressing [F1])
b. ENV (selected by pressing [F2])
c. FAILURES (selected by pressing [F3])
d. MANEUVERS (selected by pressing [F4])

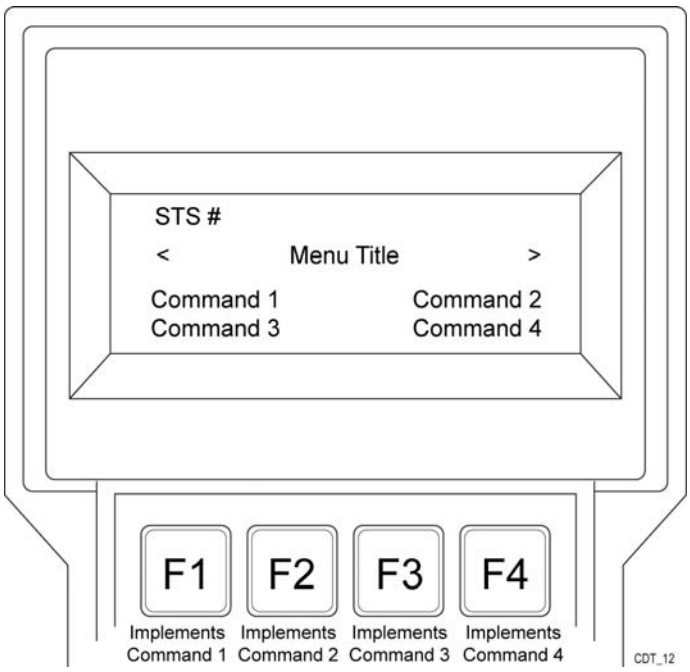



**Figure 19. Correlation of Keypad Text and Buttons**

#### 2.2.1.1 Keypad Control

**CONTROL SCREEN:** From the CONTROL screen, the keypad allows control operation of the simulator.
The buttons on the keypad are described below.

**[PAUSE]:** When pressed, this button freezes the exercise in its current condition. Accumulation of recorded or processed exercise time will halt until the exercise is resumed. The button is not functional while an exercise is being replayed.

**[MARK]:** When pressed, this button stores the current geographic location for later revisit to that particular location.

**[MAIN]:** Return to MAIN MENU.

**[STOP]:** Stops the simulation and sends the IOS to the scoring pages.

**[JB 30]:** A few seconds after this button is pressed, the exercise will be relocated (i.e., jumped back) to a position 30 seconds back in time.

**[CJB]:** Collision Jump Back. This allows a jump back of 30 seconds in driving

time from a collision.

**[JUMP FORWARD]:** A few seconds after this button is pressed, the exercise will be relocated (i.e., jumped forward) to the next mark dropped forward in time.

**[JUMP BACK]:** When pressed, this button freezes and relocates the exercise to the geographic location stored when [MARK] was pressed. This exercise may be restarted from this position by pressing the [RESUME] button. The simulator has the capability to store multiple MARK points. Pushing [JUMP BACK] takes the driver back to the previous MARK; subsequent JUMP BACKs take the driver back to previously dropped MARKs.

The control page, via the JB 30, JUMP BACK, JUMP FORWARD, and CJB commands, service the instructor's need to relocate the student to a previously driven portion of the scenario. As the student drives through the scenario, the instructor can drop MARKs wherever appropriate. At any subsequent point in the scenario, the instructor can navigate forward and backward through these saved MARKs using the [JUMP BACK]/[JUMP FORWARD] buttons. If no MARKs have been dropped, neither button appears. Once some MARKs have been dropped, the [JUMP BACK] button is enabled. The JUMP FORWARD is enabled once the instructor starts jumping back; i.e., there are MARKs forward in time to jump to. If the instructor jumps back to the first dropped mark, the [JUMP BACK] button is disabled, as there is nowhere to jump back to.

The [JB 30] and [CJB] buttons are enabled by the system; No MARKs are dropped by the instructor to enable them. [JB 30] is a running mark that trails along 30 seconds prior to wherever the student is when normally driving the scenario. The instructor is thus able to jump the student back 30 seconds at any time. The [CJB] button is enabled only when the student crashes or rolls over the vehicle, and jumps the student back to 30 seconds before the unfortunate mishap.

From the JB 30, CJB, JUMP BACK, and JUMP FORWARD states, two new options appear:

**[REPLAY]:** Replays the exercise from the current position.

**[REDRIVE]:** Restarts (re-drives) the simulation from the current position.

Regardless of which button is pressed, the instructor must press [RESUME] to restart the scenario at the selected point in time. Additionally, after a PAUSE or at the end of a REPLAY, the instructor must select [RESUME] to allow driving to start again.

[**RESUME**]: When pressed, this button restarts the exercise. This button can be used after pressing [PAUSE] causing the simulation to resume normal operation from that spot.

When [REPLAY] and [RESUME] are pressed, the simulation replays approximately the previous 30 seconds of the exercise as originally driven. During replay, the driver's station is not

active. When the replay has finished, the exercise may continue from that point forward by pressing the [RESUME] button if the exercise did not end in a collision.

When [RESUME] is pressed, the driver will enter the exercise at the same position and with the same conditions as when the exercise was stopped. Before restarting the exercise, ensure that the student is in the correct gear and throttle position and that the steering wheel is properly aligned.

When [TRAFFIC STOP] is pressed, there must be a car within approximately six seconds in front traveling in the same direction.

When [MERGE SQUEEZE] is pressed, the driver should be near the exit ramp of the interchange where the merge squeeze situation is expected to occur.

#### 2.2.1.2 Headset

The Remote Instructor station includes a headset that plugs in immediately to the left of the handheld keypad. The headset allows communication between the instructor and student in the cab.

### 2.2.2 Card Scanner

Once students are entered into the records database, they can log in by swiping their ID card through the card scanner (Figure 20) or by the instructor manually entering their 9-digit number or driver ID into the Driver Login screen at the IOS. The student must log in. An error message will appear on the IOS main screen if a student ID is entered that is not in the records database.

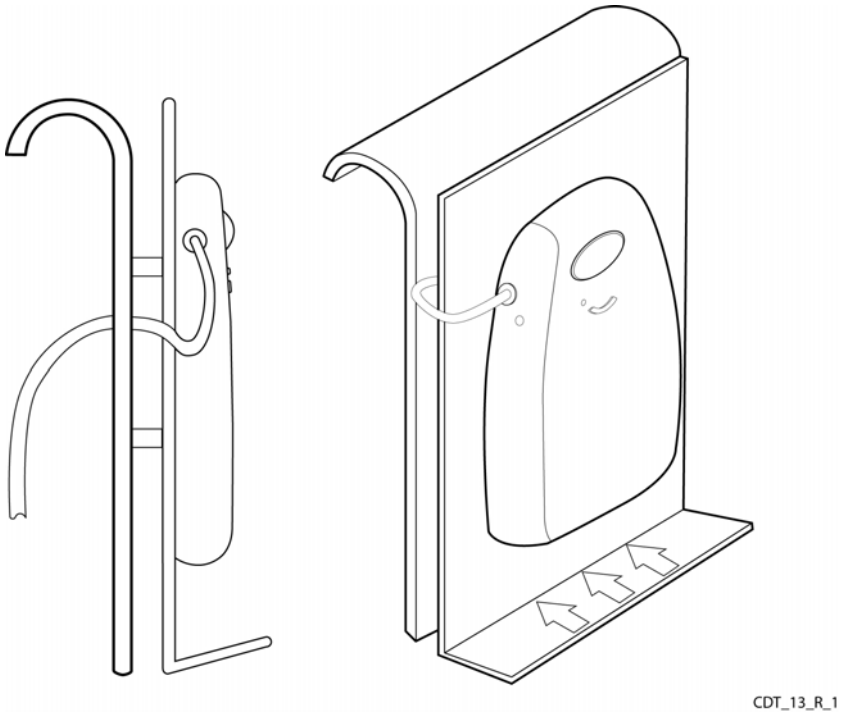



**Figure 20. Student Card Scanner**

### 2.2.3 Communication Panel

The Communications Panel (Figure 21) consists of two components, a sound mixer and a headphone amplifier. Its purpose is to control the volume of the IOS headphone. The mixer controls the input through the headphone microphone. The amplifier controls the volume of sound in the IOS headphone. Note that these controls are preset to optimum levels and that adjusting should be avoided unless absolutely required.

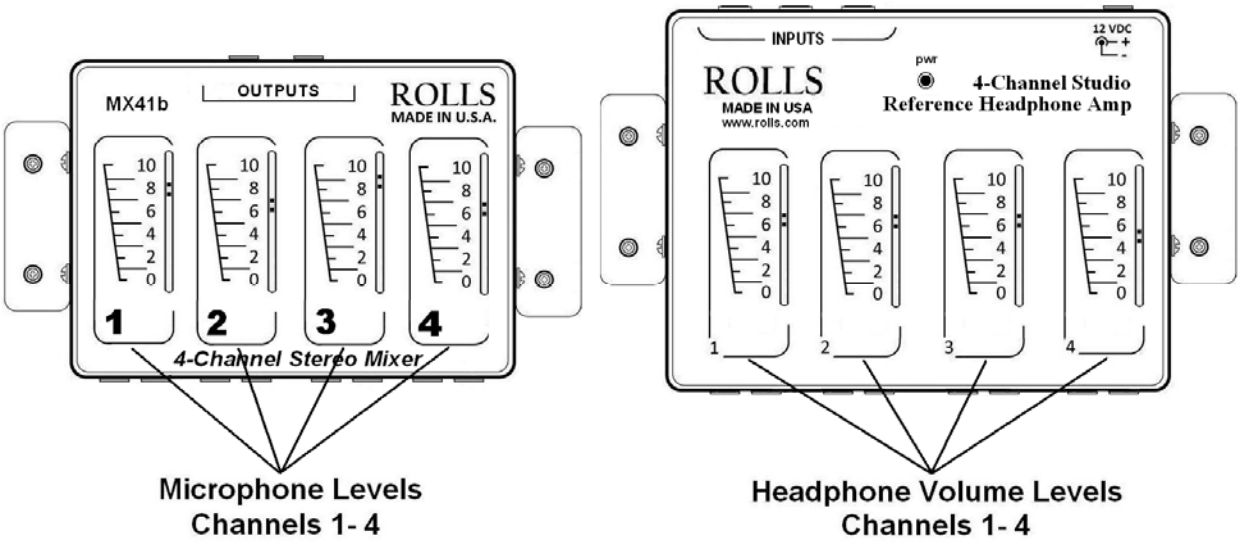



**Figure 21. Communication Panel Controls**

### 2.2.4 Keyboard and Mouse

The CDT IOS is equipped with a standard keyboard and mouse to enable the instructor to provide inputs into the CDT system. The primary use of the keyboard is to enter instructor name, student name, password, if applicable, and to reboot (restart) the computer. Figure 22 and Table 9 provide descriptive information regarding the controls and indicators of the keyboard. The mouse provides control of the screen cursor (arrow). As the mouse is moved, the cursor on the screen will also move. Move the mouse to place the cursor in a specific area on the screen. Press down on the left button on the mouse to select an activity.

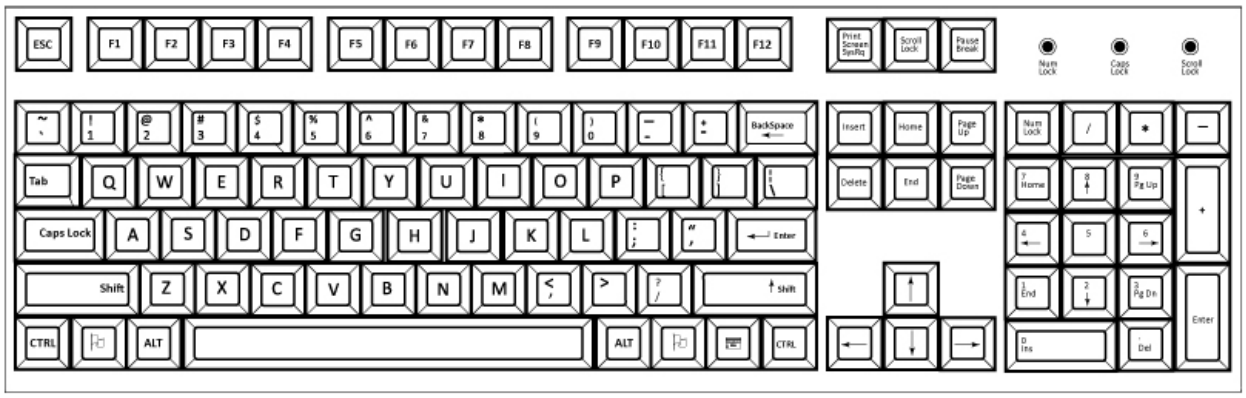


**Figure 22. Keyboard**

**Table 9. Keyboard Controls and Indicators**

| Control or Indicator | Description |
|---|---|
| Esc | Usually assigned to an application-specific function; often used to exit. |
| Print Screen | Prints the screen of the application in use. |
| Scroll Lock | Prevents the screen from scrolling. |
| Pause | Temporarily suspends screen scrolling or some break operations. |
| Num Lock | Activates the numeric keypad. |
| Num Lock Indicator | Lights green when Num Lock activates. |
| Caps Lock Indicator | Lights green when Caps Lock activates. |
| Scroll Lock Indicator | Lights green when Scroll Lock activates. |
| Delete | Deletes characters. |
| Alt | Used with another key for application-specific functions. |
| Ctrl | Used with another key for application-specific functions. |

### 2.2.5 Stealth View (Repeater Function)

The IOS supports four modes of operation for the repeater which is controlled from the Run screen (Figure 23):

- **Attached mode**: The image eye point is tethered to the student vehicle at a fixed position relative to the vehicle as it drives. Position is adjusted via the joystick. (Default)
- **Stealth**: The image eye point is free to roam anywhere throughout the visual data base. Eye point elevation azimuth and look angle are positioned via the joystick.
- **Drive mode**: The instructor takes control of the vehicle and the image eye point is that of the vehicle driver. The view changes as the instructor drives the vehicle with the joystick.
    - **Vehicle Limitation Override**: This option is available only in Drive mode. If selected, the instructor can navigate the ownship around the terrain outside the current scenario limitations.
- **Out the Window**: Shows the center screen from the driver's cab.

The instructor may toggle the mode of the repeater during the Execution/Redrive state.

- The repeater controls are only active if the STS is the current pod associated with the repeater.
- If the repeater is not attached, the instructor may click the [ENABLE STEALTH] button to attach/configure the repeater to the STS.


**Figure 23. Run Screen**

### 2.2.6 Joystick

The CDT is equipped with a joystick that enables the instructor to take control of the vehicle being driven. There are three modes that the instructor can use:

1. Stealth Mode: Instructor can roam anywhere throughout the visual world
2. Attached Mode: Follows the student vehicle as it drives
3. Drive Mode: Takes control of the vehicle

**NOTE**

The joystick also controls the Stealth/Repeater.

#### 2.2.6.1 Attached Mode

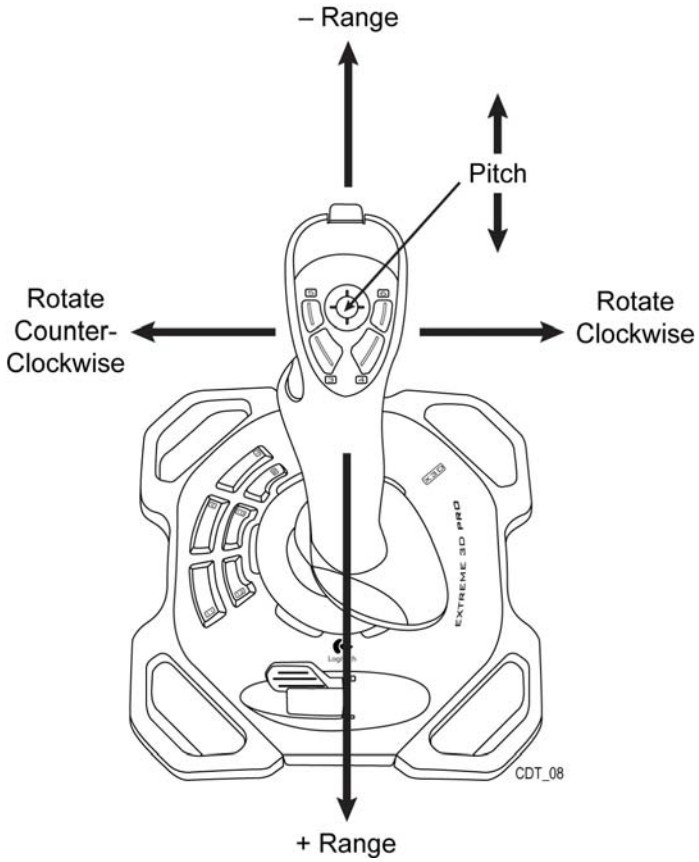



**Figure 24. Attached Mode Joystick Control**

**Joystick operation in Attached Mode:**

| | |
|---|---|
| **- Range** (move forward) | Push joystick forward. |
| **+ Range** (move backward) | Pull joystick backward. |
| **Rotate Clockwise** | Tilt joystick to the right. |
| **Rotate Counter-Clockwise** | Tilt joystick to the left. |
| **Pitch down** | Push [POV] button, located on the top of the joystick, forward to pitch view down. |
| **Pitch up** | Push [POV] button, located on the top of the joystick, rearward to pitch view up. |

### 2.2.6.2 Stealth Mode

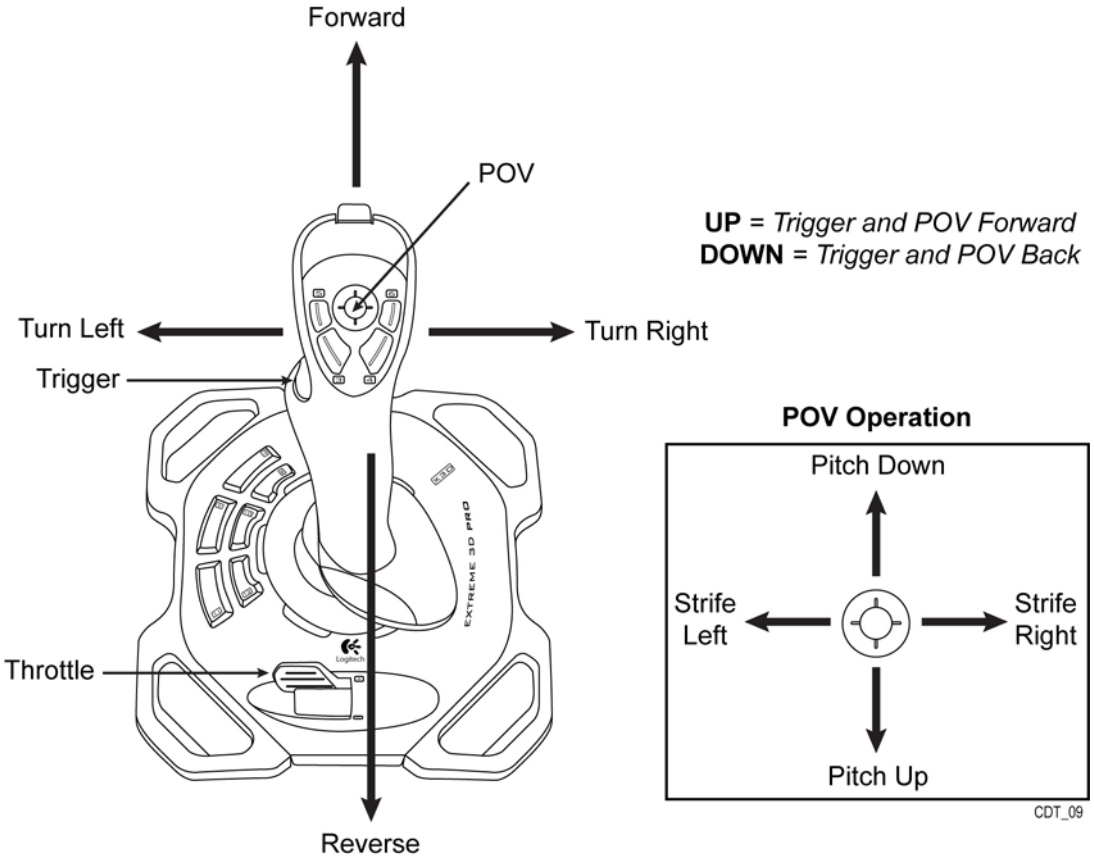



**Figure 25. Stealth Mode Joystick Control**

**Joystick operation in Stealth Mode:**

| | |
|---|---|
| **Forward** | Push joystick forward. |
| **Reverse** | Pull joystick backward. |
| **Pan Right** | Tilt joystick to the right. |
| **Pan Left** | Tilt joystick to the left. |
| **Up** | Depress trigger and push [POV] button, located on the top of the joystick, forward to move up. |
| **Down** | Depress trigger and push [POV] button, located on the top of the joystick, backward to move down. |
| **POV Pitch Down** | Push [POV] Button forward. |
| **POV Pitch Up** | Push [POV] button to the rear. |
| **Throttle Increase** | Move throttle lever up/forward (towards + symbol) to increase movement speed. |
| **Throttle Decrease** | Move throttle lever down/rearward (towards - symbol) to decrease movement speed. |

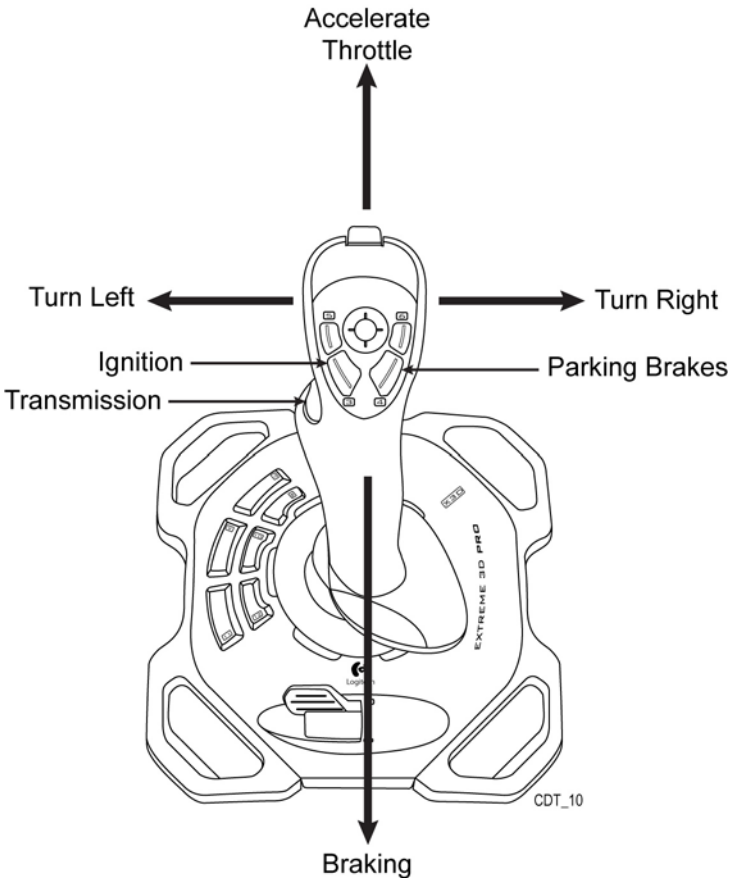



**Figure 26. Drive Mode Joystick Control**

**Joystick operation in Drive Mode:**

| | |
|---|---|
| **Forward** | Push joystick forward. |
| **Turn Right** | Tilt joystick to the right. |
| **Turn Left** | Tilt joystick to the left. |
| **Ignition** | Depress the silver button, located to the left of the [POV] button, to start ownship. |
| **Transmission** | Depress the silver button located to the left side of the joystick, to activate the ownship's transmission. Re-press the button to change the transmission to the desired setting. |
| **Parking Brakes** | Depress the silver button located to on the left side of the joystick base, to release the ownship's parking brake. Re-press the button to re-set the ownship's parking brake. |

### 2.2.7 Juice Goose® Remote Control Monitor and Power Sequencer

The Juice Goose Remote Control Monitor (RC5) provides a versatile and powerful means of remotely activating AC power in a sequenced array for application to both sensitive and high amperage equipment.

The RC5 features a latching three position switch (some systems use a key switch) that controls the sequence up, pause and sequence down operations of a Juice Goose Series product to which it is connected. Indicator lights report the switch position and the sequencing operation completion. When the switch is in the center (PAUSE) position, an indicator light reports the status of the signal line connection throughout the system.

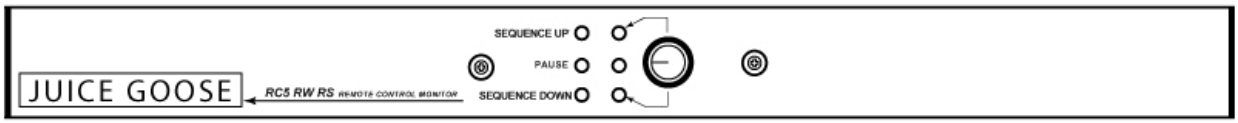



**Figure 27. Remote Control Monitor (RC5)**

The Power Sequencer (CQ) features a three-position switch on the front of the chassis. This switch is active only if there is no control cable on the Sequence Signal Input connector. When active, this switch allows the unit to sequence up or sequence down and to control the sequencing of any unit connected to the Sequence Signal Output connector. A Manual Override switch allows the Sequencer to be manually operated, overriding the control circuit in the unlikely event of a fault or failure. Lights on the front of the chassis allow monitoring of the unit operation. The PROCESSOR light will blink to indicate the control processor on the unit is functioning. The pod lights are illuminated as a result of contact closure by the relays, indicating that actual relay closure has occurred.

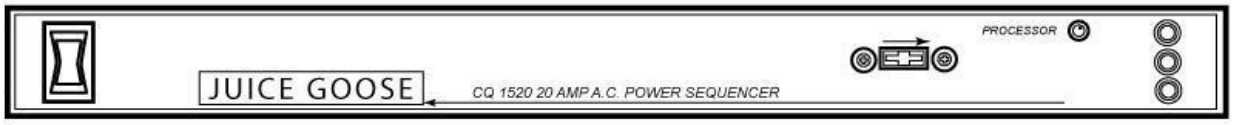



**Figure 28. Power Sequencer (CQ)**

This product features light-emitting diodes (LEDs) on the front of the chassis for real-time monitoring of the processor and sequencing functions. A green flashing LED indicates the continuing operation of the processor that controls and drives the sequencer. Individual red LEDs are tied to the output of each of the relays. Each LED lights when its relay latches. The LED can only be on when the relay is latched.

### 2.2.8 Audio Mixer Panel

The Audio Mixer Panel is located at the IOS and allows up to three headsets to be simultaneously connected to the communications system. The mixer panels are composed of headphone outputs, microphone inputs and adjustable gain control knobs for each headphone and each microphone.

### 2.2.9 UPS

The IOS rack contains a single Uninterruptable Power Supply (UPS), with two other UPSs located in the STS rack.

### 2.2.10 Speakers and Intercom

Because the speaker installation varies depending on the cab variant, refer to the individual volumes for information on each variant's speaker configuration and use.

The intercom system has adjustable volume controls at the student and instructor headset plug-in locations.

### 2.2.11 E-STOP (Motion Only)

Push the red [EMERGENCY STOP] (E-STOP) button (Figure 29) to force the motion base from the IOS to immediately lock to the lower resting position.

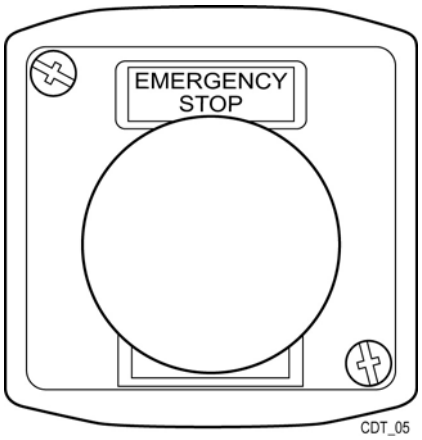



**Figure 29. IOS E-STOP**

**NOTE**

During the operation of the simulation, if the seatbelt is undone, driver's door is opened or the [EMERGENCY STOP] button is pressed, the motion base will immediately settle and lock to the lower resting position. The Instructor Operator Station (IOS) will receive warnings for such actions.

### 2.2.12 Emergency Power Off (EPO) – MTF Only

The [EMERGENCY POWER OFF] (EPO) button located at the Instructor Operator Station (IOS) in the MTF activates the shunt relay system to shut off all power to the system. The emergency lighting illuminates upon activation. The smoke detector and motion base remain powered on with battery backup. The EPO button is located on the wall adjoining the STS and IOS, directly under the window.

### 2.2.13 Security Measures for Electronic Data

The Student Records Database, housed in the local server or Common Data Server (CDS), contains student social security numbers and should be handled in a secure manner. Backups of

this data can be made to a CD-ROM or another location on the IOS computer. Refer to the Class Management section for information on archiving classes and student records.

### 2.2.14 Site and Shelter Requirements

Refer to the SMM 17-6920-913-24&P for CDT site and shelter requirements.

### 2.2.15 Assembly and Preparation for Use

To reduce maintenance and the possibility of damage to equipment as well as to ensure the safety of training personnel, an initial daily operational walk-around should be conducted prior to powering up the training system. The inspection should include the following:

1. IOS power cables should be securely plugged into the power receptacles.
2. Inspect the IOS station for any physical damage to components and cables.
3. Ensure that all STS power cables are securely plugged into the power receptacles.
4. Inspect the STS for any physical damage or unsecured panels or components; the inspection should include the Video Display Units, Motion Base, exterior of the cab and the interior the cab.
5. Verify that the cab mounting bolt flags are not extended with warning signs showing.
6. Ensure the area surrounding the STS is clear of any obstructions or personnel.

**WARNING**

Ensure the area surrounding the STS is kept clear of personnel whenever the STS is in operation. The motion base is a very powerful system that can cause serious injury or death if safety precautions are not observed.

## 2.3 CDT Operation

The following flowchart depicts the basic flow of CDT operation. Refer to section 4 for PMCS procedures.

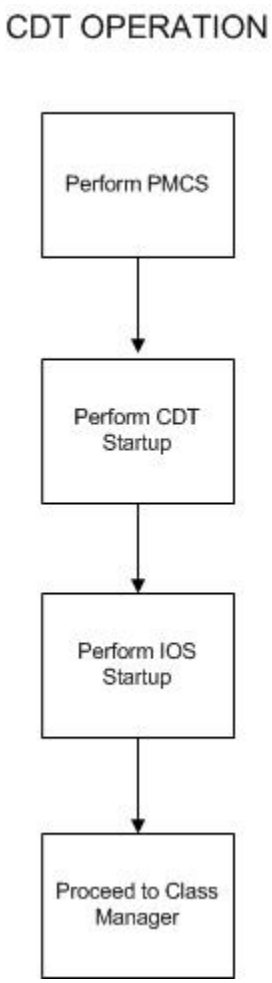



**Figure 30. CDT Operation Flowchart**

## 2.3.1 CDT Startup

After performing PMCS procedures, the next step in starting up the CDT involves a "power-up" procedure. This procedure is used to start the simulator if the program and all of the hardware had been previously shut down for some time. The recovery procedure is used **only** if the software has locked up while the simulator is in use and it will not respond to the IOS. There are different power-up procedures depending on site configuration: MTF with Generator, MTF with Shore Power, and Fixed Site systems.

**NOTE**

Once the simulator is powered up, it is recommended to leave it on. This will enable immediate access to the simulator, without having to wait for the power-up and initialization sequence process. However, if the simulator will not be used for an extended period of time (two days), or if continuous "clean" electrical power is uncertain, we recommend turning it off.

### 2.3.1.1 Power Up – MTF with Generator

1. Perform PMCS (see PMCS MAINTENANCE INSTRUCTIONS in this volume).

2. Verify Pollack switch is on:
    a. Open Pollack switch door.
    b. Door is located on the trailer exterior, road side, forward of front wheel.
    c. Verify the switch is on.
3. Check the generator battery and fuel level:
    a. Press Fuel Level pushbutton on generator starting panel.
    b. Pushbutton is located inside Main entry door, under fuel gauge.
    c. Verify fuel is at least ½ tank full.
        i. Order fuel if level is less than ½ full.
    d. If Fuel needle does not move:
        i. Verify Pollack switch is on.
        ii. Verify batteries are charged.
        iii. Verify fuel tank is not completely empty.
4. Start the generator:
    a. Press and release "START" on the Generator panel inside the main IOS door
    b. Generator should start within one (1) minute.
5. Turn LOG switch to "Generator."
    a. LOG switch is located in the Doghouse under the Main Breaker Panel (large black switch).
6. Turn the breakers ON:
    a. Turn on the Main 150AMP breaker.
    b. Verify all branch circuit breakers are on.
    c. Turn on four (4) HVAC breakers.
7. Turn on all Emergency lights. Utilize switch on bottom of light (switch away from wall is "ON"):
    a. One (1) in "doghouse"
    b. Two (2) in Simulator Bay
    c. One (1) in IOS area
8. Ensure all surge protectors and UPS and in the IOS rack are set to the ON position.
9. Turn on the three UPSs:
    a. Two on STS rack
    b. One on IOS rack
10. Turn on the Juice Goose RC5-RM (located in the IOS rack):
    a. Verify that nothing is on top of the IOS rack that may block the vent fan.
    b. Turn the key to the "Sequence Up" position.
11. Verify Juice Goose and Power LED's are on:
    a. Verify there are three (3) red LEDs lit on the IOS rack.
    b. Verify there are nine (9) red LEDs lit on the STS rack.
    c. Verify there are five (5) red LEDs on the floor boxes under the right VDU.
12. Ensure the IOS computer is on (green LED light should be lit).
13. Ensure the CCTV monitor is on.

14. Ensure that the IOS printer is powered up (for fixed sites the attached printer is located on the top of the rack).
15. Ensure all surge protectors, equalizer, amplifier, STS server, audio, and all image generators (IGs) in the STS rack are on.
16. Ensure the STS in the cab is on (green power light should be on).
17. Allow a minimum of five (5) to eight (8) minutes for the system to fully initialize.

#### 2.3.1.2 Power Up – MTF with Shore Power

1. Perform PMCS (see PMCS MAINTENANCE INSTRUCTIONS in this volume).
2. Verify Pollack switch is on:
    a. Open Pollack switch door.
    b. Door is located on the trailer exterior, road side, forward of front wheel.
    c. Verify the switch is on.
3. Turn LOG switch to "Line." LOG switch is located in the Doghouse under the Main Breaker Panel (large black switch).
4. Turn the breakers ON:
    a. Turn on the Main 150AMP breaker.
    b. Verify all branch circuit breakers are on.
    c. Turn on four (4) HVAC breakers.
5. Turn on all Emergency lights. Utilize switch on bottom of light (switch away from wall is "ON"):
    a. One (1) in "doghouse"
    b. Two (2) in Simulator Bay
    c. One (1) in IOS area
6. Ensure all surge protectors and UPS and in the IOS rack are set to the ON position.
7. Turn on the three UPSs:
    a. Two on STS rack
    b. One on IOS rack
8. Turn on the Juice Goose RC5-RM (located in the IOS rack):
    a. Verify that nothing is on top of the ISO rack that may block the vent fan.
    b. Turn the key to the "Sequence Up" position.
9. Verify Juice Goose and Power LED's are on:
    a. Verify there are three (3) red LEDs lit on the IOS rack.
    b. Verify there are nine (9) red LEDs lit on the STS rack.
    c. Verify there are five (5) red LEDs on the floor boxes under the right VDU.
10. Ensure the IOS computer is on (green LED light should be lit).
11. Ensure the CCTV monitor is on.
12. Ensure that the IOS printer is powered up (for fixed sites the attached printer is located on the top of the rack).
13. Ensure all surge protectors, equalizer, amplifier, STS server, audio, and all image generators (IGs) in the STS rack are on.

14. Ensure the STS in the cab is on (green power light should be on).
15. Allow a minimum of five (5) to eight (8) minutes for the system to fully initialize.

#### 2.3.1.3 Power Up – Fixed Site

1. Perform PMCS (see PMCS MAINTENANCE INSTRUCTIONS in this volume).
2. Ensure all surge protectors, UPS and IOS System in the IOS rack are set to the on position.
3. Turn on the Juice Goose RC5-RM (located in the IOS rack):
    a. If your system has a vent fan, verify that nothing is on top of the IOS rack that may block the fan.
    b. Turn the key to the "Sequence Up" position.
4. Verify Juice Goose and Power LED's are on:
    a. Verify there are three (3) red LEDs lit on the IOS rack.
    b. Verify there are nine (9) red LEDs lit on the STS rack.
5. Ensure the IOS computer is on (green LED light should be lit).
6. Ensure the CCTV monitor is on.
7. Ensure that the IOS printer is powered up (for fixed sites the attached printer is located on the top of the rack).
8. Ensure all surge protectors, equalizer, amplifier, STS server, audio, and all image generators (IGs) in the STS rack are on.
9. Ensure the STS computer is on (green power light should be on). For the Stryker and MRAP the STS computer is onboard the cab. The STS computer for the Tank cab is located in the STS rack.
10. Allow a minimum of five (5) to eight (8) minutes for the system to fully initialize.

### 2.3.2 IOS Startup

After powering up the CDT, the next step is to start up the IOS. Use the following procedure to start up the IOS:

1. Ensure the Audio computer is fully booted, and the DVR application is running (CCTV monitor has an image).
2. Log into the IOS system by using the appropriate CDT/IA password.
3. Once the system has fully booted up, ensure the IGs boot properly. Look for a blue sky in the foreground driver view monitors. If these monitors still appear black refer to LCCS for troubleshooting.

## 2.4 Class Manager

This section provides instructions for managing functions available to the Class Manager administrator. The administrator can perform the following functions:

- Display records
- Enroll students and instructors into classes
- Create and delete instructors
- Manage Programs of Instructions (POI) and Scenarios
- Back up and update student, instructor and class record files
- Create and delete student records
- Create and delete classes, POIs and POI scenario lists
- Archive deleted student and class records to external media

**NOTE**

Delete buttons are not available on any of the screens. To delete an item use the [DELETE] key on the keyboard.

### 2.4.1 Scenario Generation System

The Scenario Generation System (SGS) is the tool used to develop and revise scenarios that are executed on the CDT. Refer to the Scenario Generation System User Guide for instructions on using the SGS.

### 2.4.2 Accessing Class Manager

Accessing Class Manager requires a special username and password. A password is a security tool used to identify authorized users of a system and define their privileges. Limited access to passwords prevents unauthorized personnel from entering the system. The following user levels are available:

- `instructor: This user level masks the student social security number`
- `admin: This level allows the student social security number to be visible`

User names and passwords for each user level are assigned by the system maintainer.

After double-clicking the “Class Manager” icon on the desktop, the Class Manager screen is displayed (Figure 31). This screen is also referred to as the *Main Menu*.


**Figure 31. Class Manager - Main Menu Login Screen**

### 2.4.3 Logging On to Class Manager

1. Enter the **Username** and **Password** information and then click the [LOGIN] button.
2. After clicking the [LOGIN] button, the management buttons are available.


**Figure 32. Class Manager - Main Menu Instructor Logged In**

Options available include:

- Student Management
- Instructor Management
- Class Management

- Scenario Management
- Exit Class Manager

### 2.4.4 Instructor Management

Click the [INSTRUCTOR MANAGEMENT] button (Figure 32) on the *Main Menu* screen. Use the *Instructor Management* screen (Figure 33) to add, edit, delete, archive or retrieve archived instructors from the database. Instructors are listed alphabetically by last name.

#### 2.4.4.1 Add Instructor

1. (Required) Enter a 9-digit Instructor ID, First Name and Last Name (Figure 33).
2. Optional information that may be entered includes **Rank**, **PIN**, **Middle Name**, **Suffix**, **Security Level** and **Notes**. Notes allows for the addition of supplementing comments for specific instructors.
3. The **Enrollment Date** defaults to the current date but may be changed by clicking on the drop-down arrow.
4. The **Active** checkbox is not functional and may be implemented in the future.
5. When all the information has been entered click the [ADD INSTRUCTOR] button. The instructor is added to the alphabetical list.
6. If additional instructors are to be added, click the [CLEAR FIELDS] button and repeat steps 1-5.
7. When all instructors have been added click the [SAVE CHANGES] button.

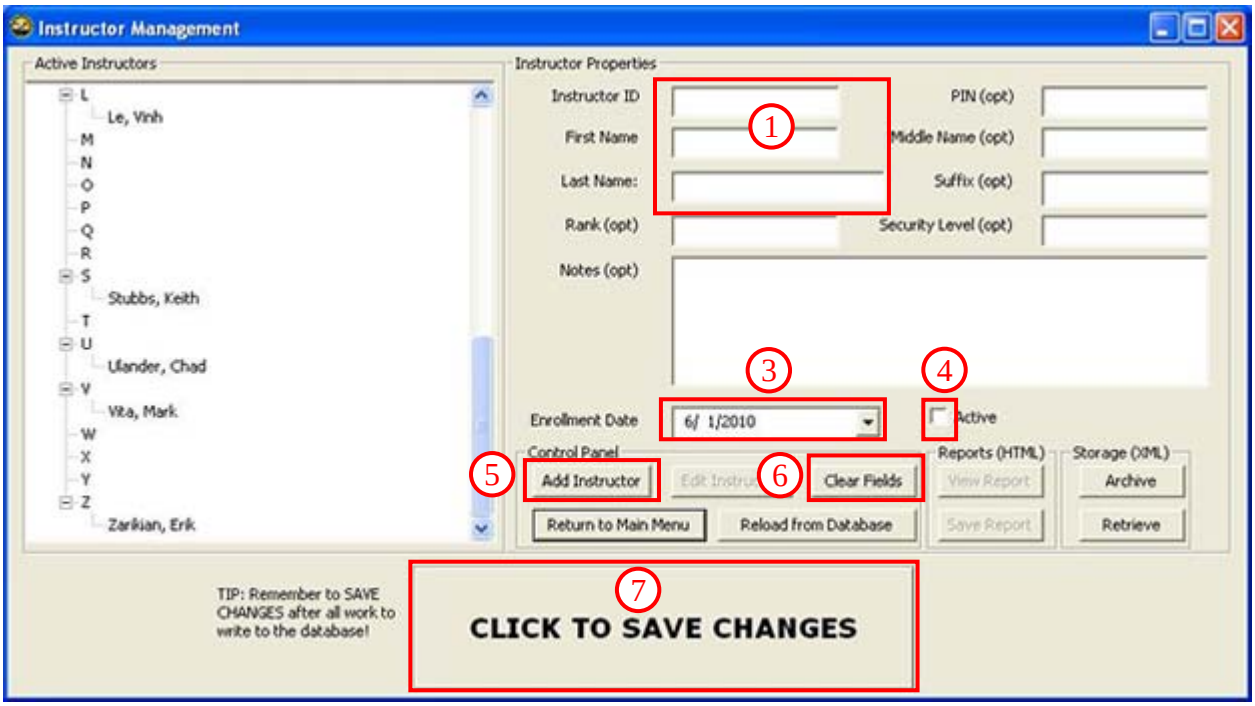



**Figure 33. Instructor Management - Add Instructor**

8. A prompt is displayed detailing the addition/changes. Click the [SAVE] button to confirm (Figure 34).

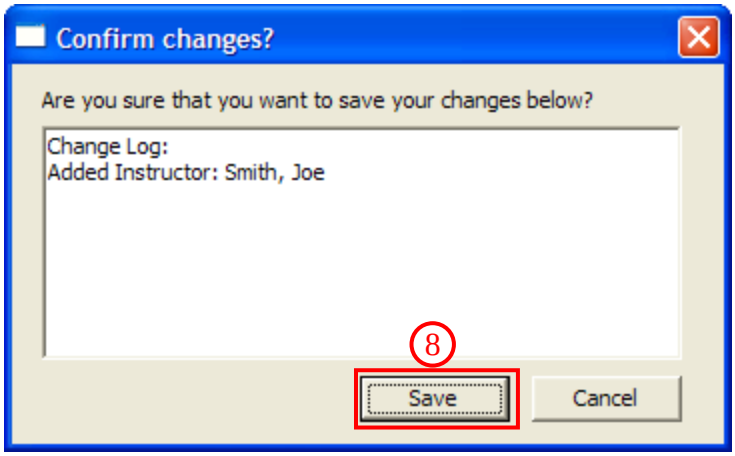



**Figure 34. Instructor - Confirm Additions Changes Dialog**

**NOTE**

Adding an instructor in Class Manager does not add the same instructor to the system for logging in to the initial IA screen.

#### 2.4.4.2 Edit Instructor

1. Select an instructor from the Active Instructors list (Figure 35).
2. Make the desired changes.
3. Click the [EDIT INSTRUCTOR] button (fields will clear but the changes are temporarily stored).
4. Click the [CLICK TO SAVE CHANGES] button.

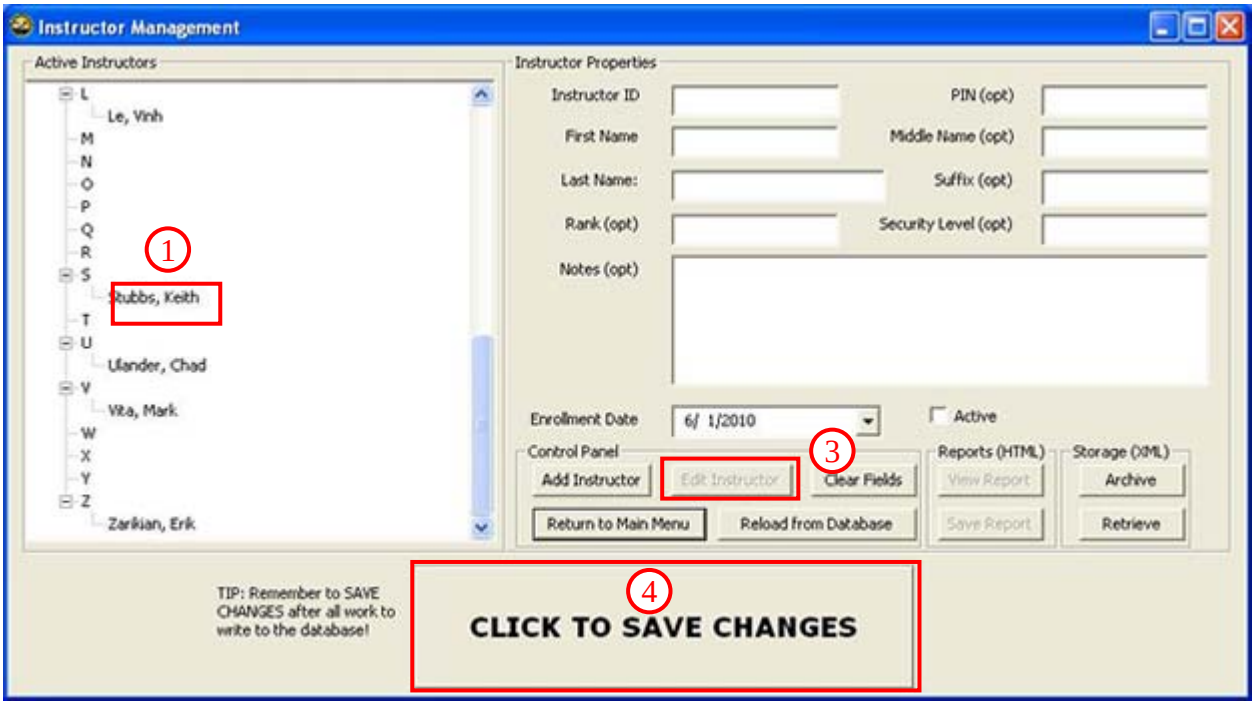



**Figure 35. Instructor Management - Edit Instructor**

5. A prompt is displayed detailing the addition/changes (Figure 36). Click the [SAVE] button to confirm.

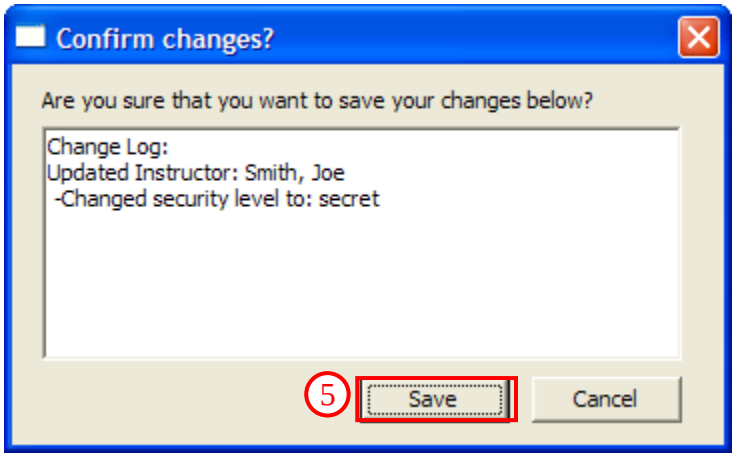



**Figure 36. Confirm Changes Dialog - Instructor**

### 2.4.4.3 View Report

The report summarizes the class information for a particular instructor such as dates, scenarios, students, passed, score, mileage, fuel used, time and vehicle. Some statistical information is also calculated.

1. Select an instructor from the Active Instructors list (Figure 37).
2. Click the [VIEW REPORT] button (results in Figure 38).

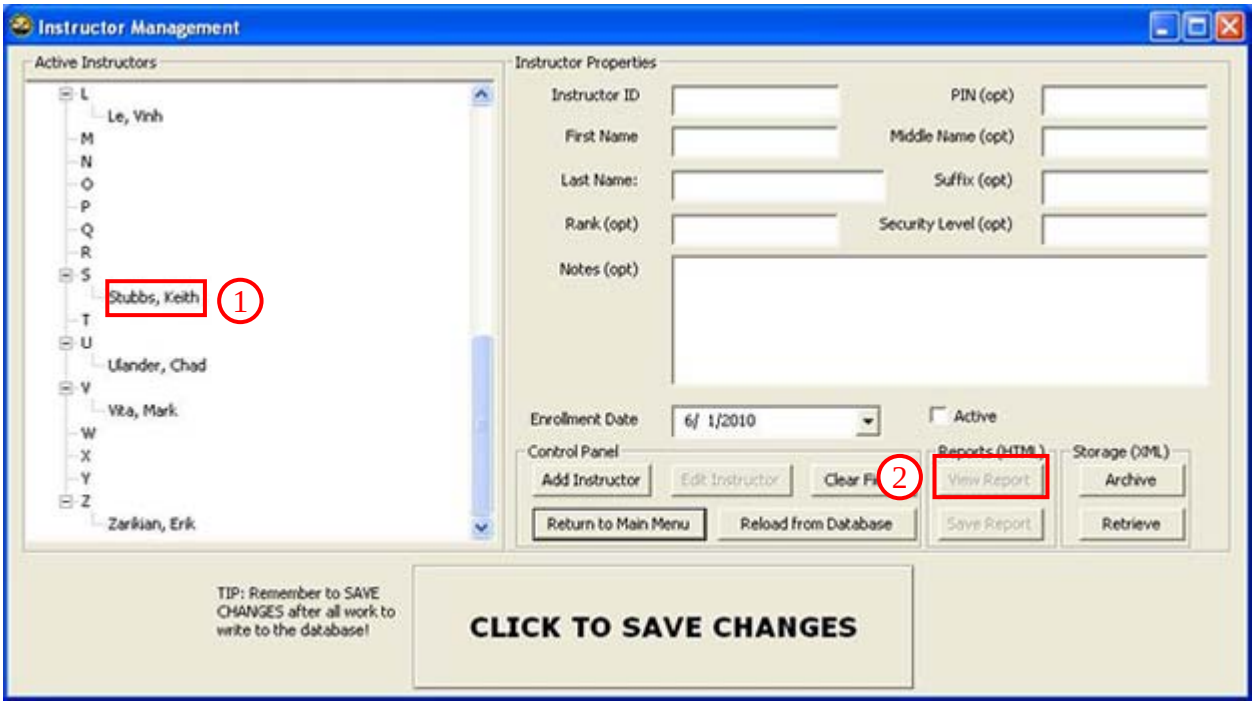



**Figure 37. Instructor Management, View Report**

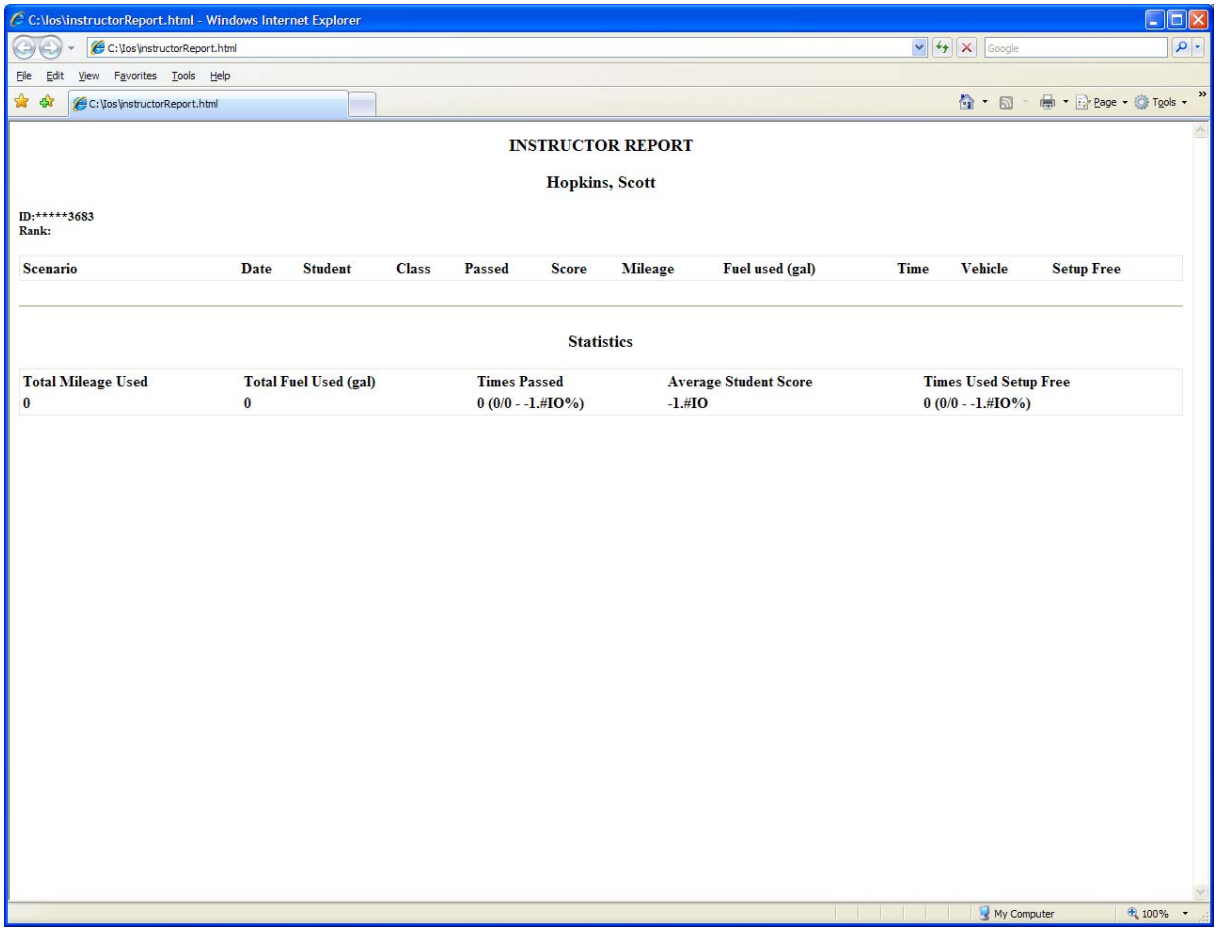



**Figure 38. Instructor Report**

### 2.4.4.4 Save Report

1. Select an instructor from the Active Instructors list.
2. Click the [SAVE REPORT] button.

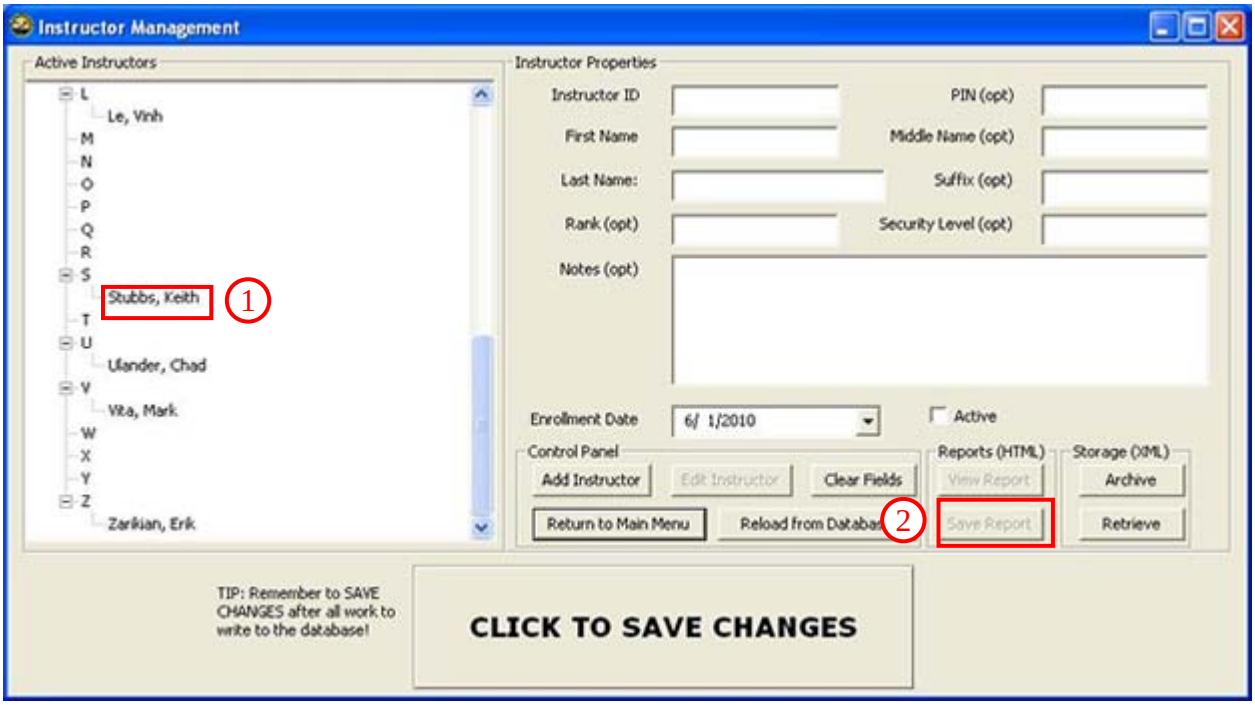



**Figure 39. Instructor Management, Save Report**

3. A *Save As* dialog is displayed (Figure 40)
4. Navigate to the desired save location, enter a File name and click the [SAVE] button.

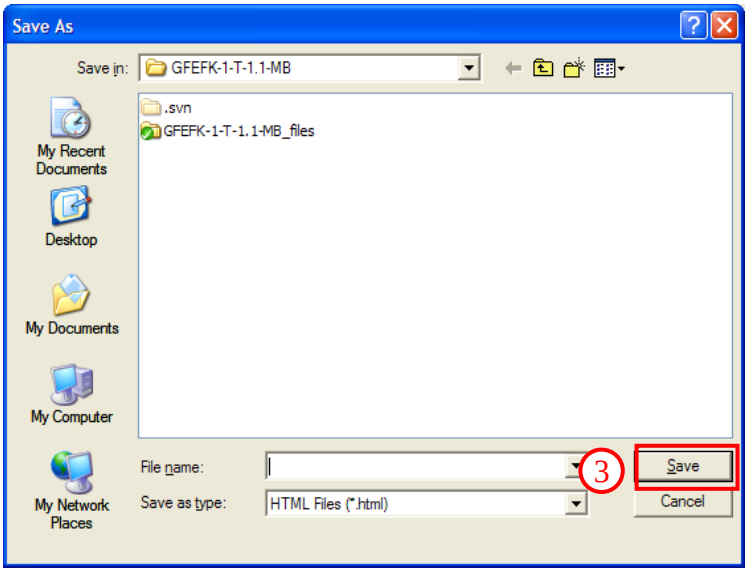



**Figure 40. Save Report - Save As Dialog**

#### 2.4.4.5 Archive

Archive moves the active portion of the database to an inactive area where it can be accessed at a later time, such as the PC hard drive or a CD-ROM. Archive saves all instructor information at a point in time. Archiving is useful for maintaining permanent records of instructor(s) on a daily, weekly, monthly, etc., basis. This allows the database to be purged of obsolete data but a record of the data remains preserved.

1. Click the [ARCHIVE] button (Figure 41).

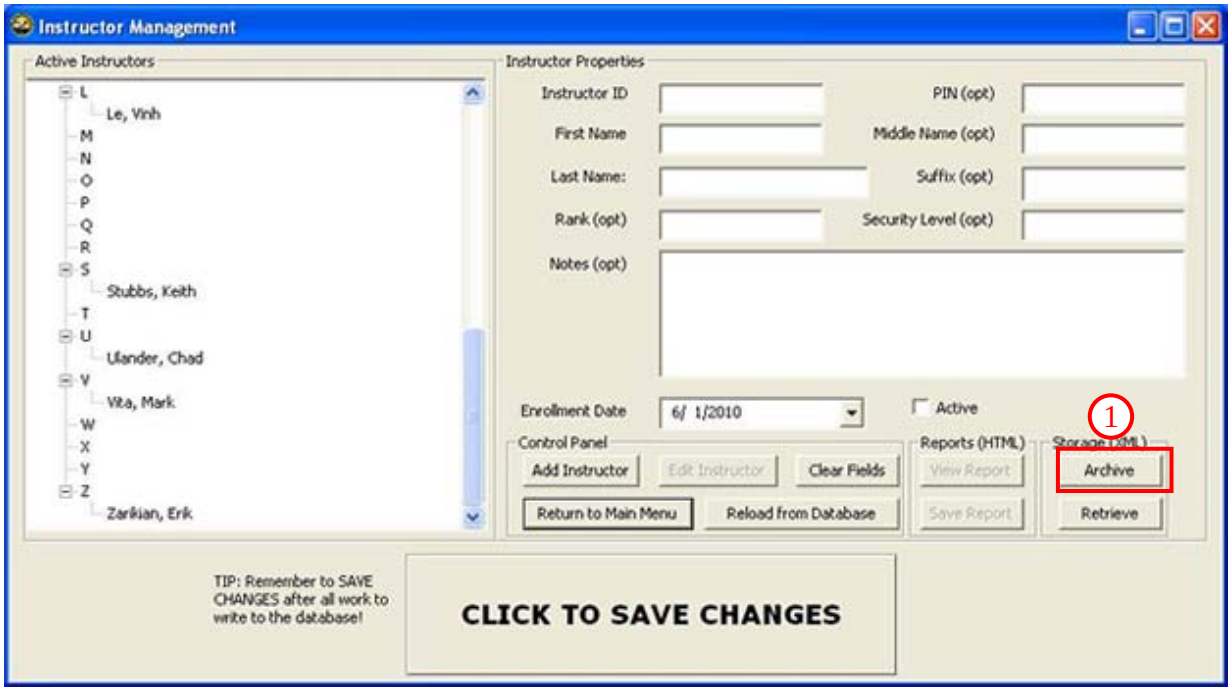



**Figure 41. Instructor Management - Archive Instructor**

2. A *Save As* dialog is displayed (Figure 42).
3. Navigate to the desired location, enter a **File name** and click the [SAVE] button.

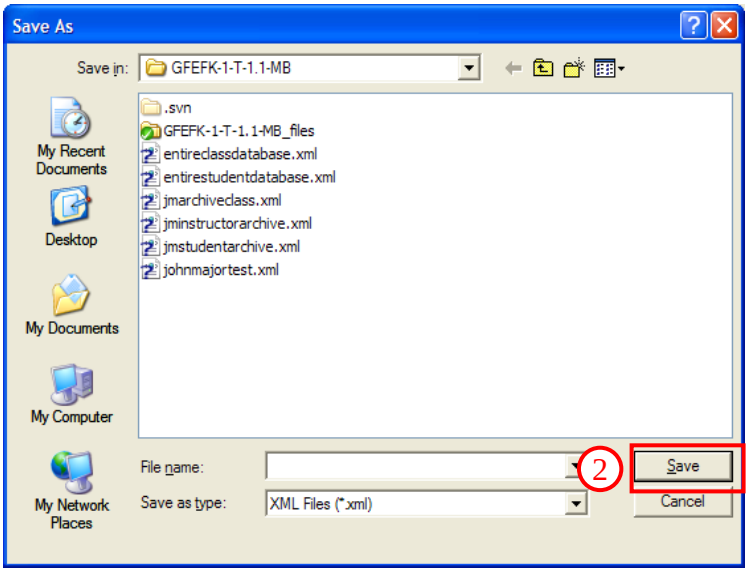



**Figure 42. Archive, Save As Dialog**

### 2.4.4.6 Retrieve

A retrieve loads archived data back into the database. This is useful for restoring accidental database deletions/corruptions or reviewing data from a previous point in time.

1. Click the [RETRIEVE] button (Figure 43).

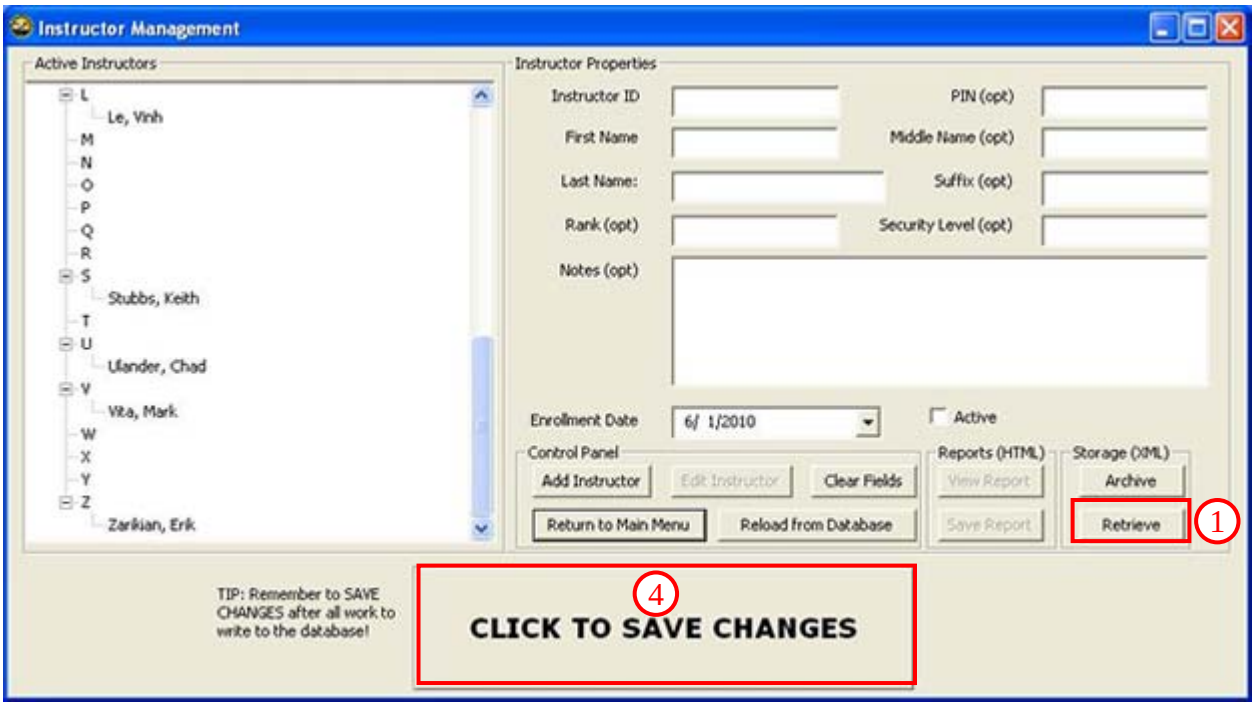



**Figure 43. Instructor Management - Retrieve**

2. An Open dialog is displayed (Figure 44).
3. Navigate to the desired location, select a File name and click the [OPEN] button.
4. Click on the [CLICK TO SAVE CHANGES] button.

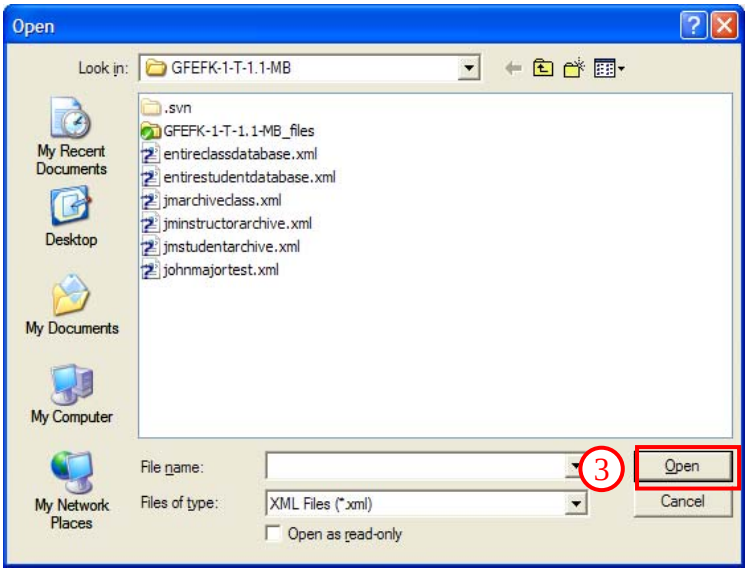



**Figure 44. Retrieve - Open Dialog**

### 2.4.4.7 Reload From Database

Reloads the student data from the database at the point of the last database save. Useful for discarding erroneous edits without risk of saving to the database.

1. Click the [RELOAD FROM DATABASE] button to reload all data from the database (Figure 45).

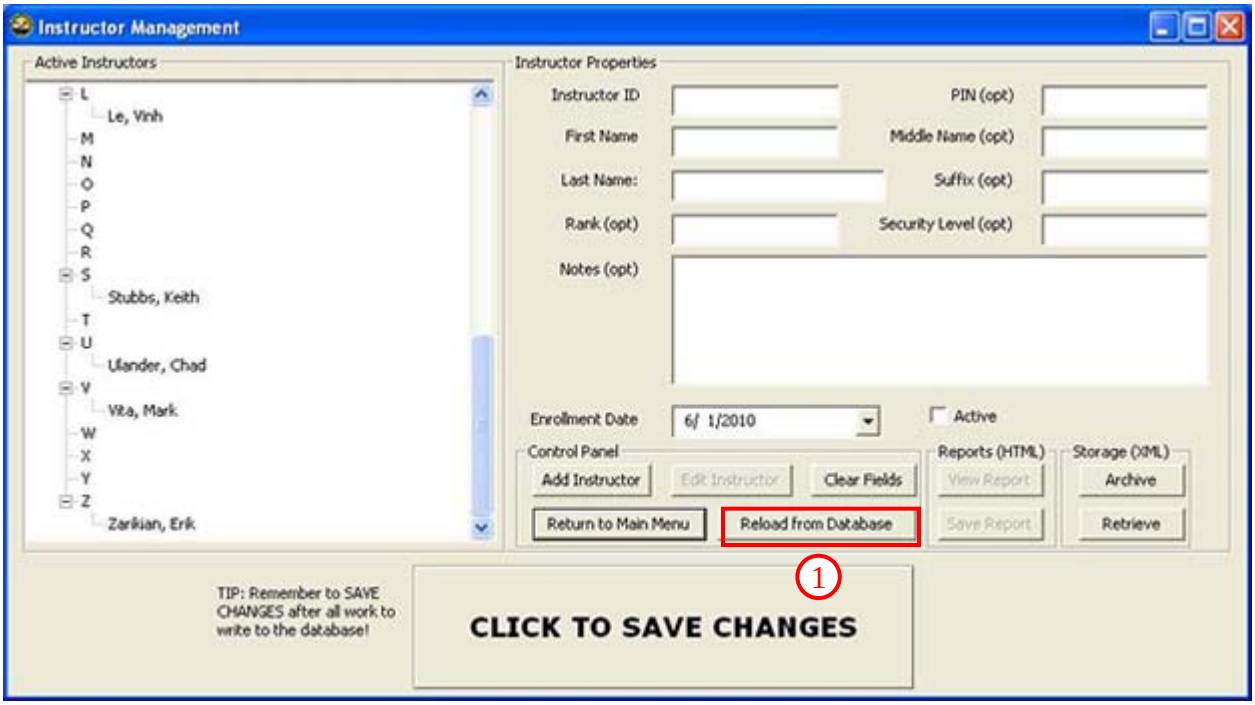



**Figure 45. Instructor Management - Reload From Database**

### 2.4.4.8 Clear Fields

1. Click the [CLEAR FIELDS] button (Figure 46).
2. All data in the *Class Properties* group fields are cleared.

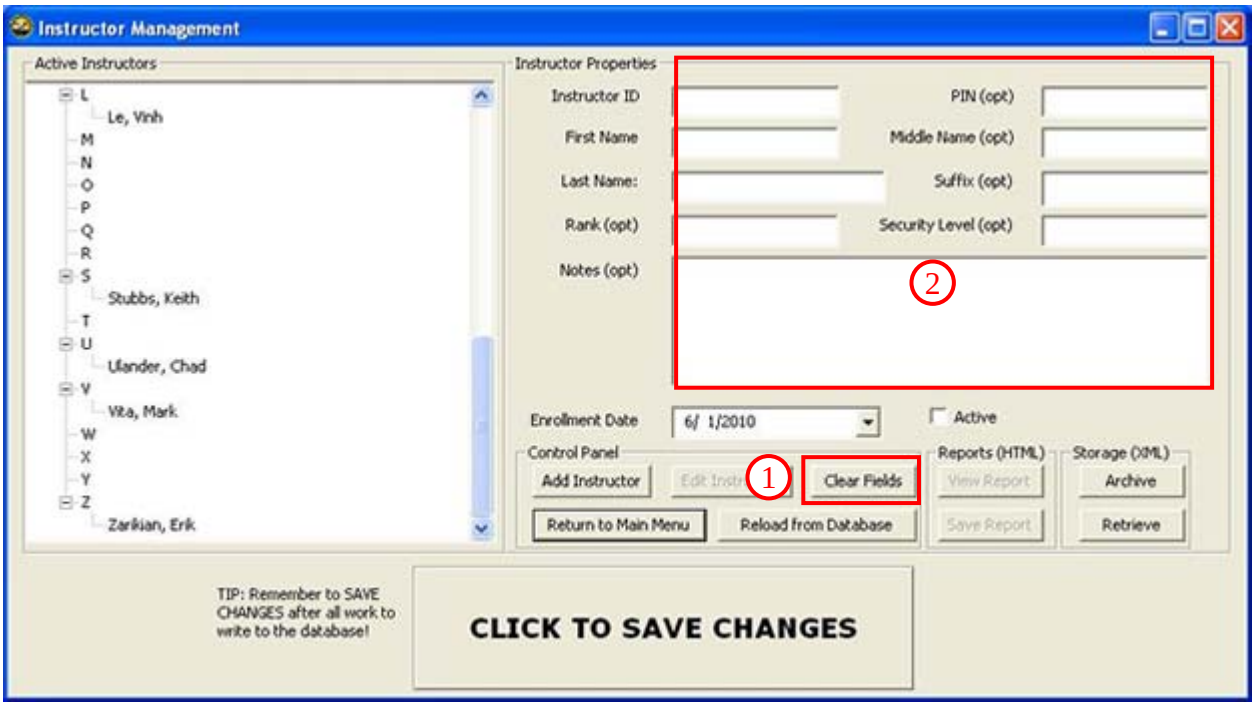



**Figure 46. Instructor Management - Clear Fields**

#### 2.4.4.9 Return to Main Menu

1. Click the [RETURN TO MAIN MENU] button to close the screen and return to the *Main Menu* (Figure 47).

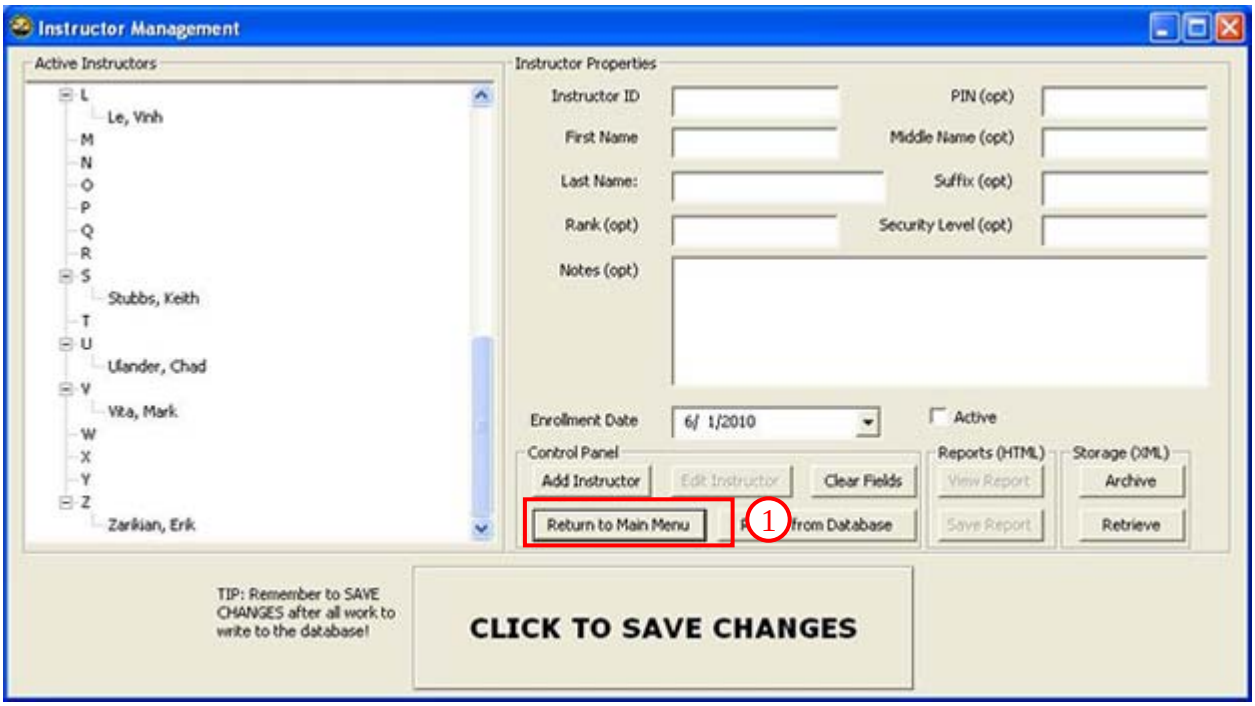



**Figure 47. Instructor Management - Return to Main Menu**

### 2.4.5 Student Management

Click the [STUDENT MANAGEMENT] button (Figure 48) on the Class Manager *Main Menu* screen. Use the *Student Management* screen (Figure 49) to add, edit, delete, archive or retrieve archived instructors from the database. Students are listed alphabetically by last name.


**Figure 48. Class Manager - Main Menu**

#### 2.4.5.1 Add Student

1. Enter the required 9-digit SSN, First Name and Last Name (Figure 49).
2. Optional information that may be entered includes **Rank**, **Pin**, **Middle Name**, **Suffix**, **Promotion** and **Notes**. Notes allows for the addition of supplementing comments for specific students.
3. The **Enrollment Date** defaults to the current date but may be changed by clicking on the drop-down arrow.
4. When all the information has been entered click the [ADD STUDENT] button. The student is added to the alphabetical list.
5. If additional students are to be added, click the [CLEAR FIELDS] button and repeat steps 1-4.
6. When all students have been added click the [CLICK TO SAVE CHANGES] button.

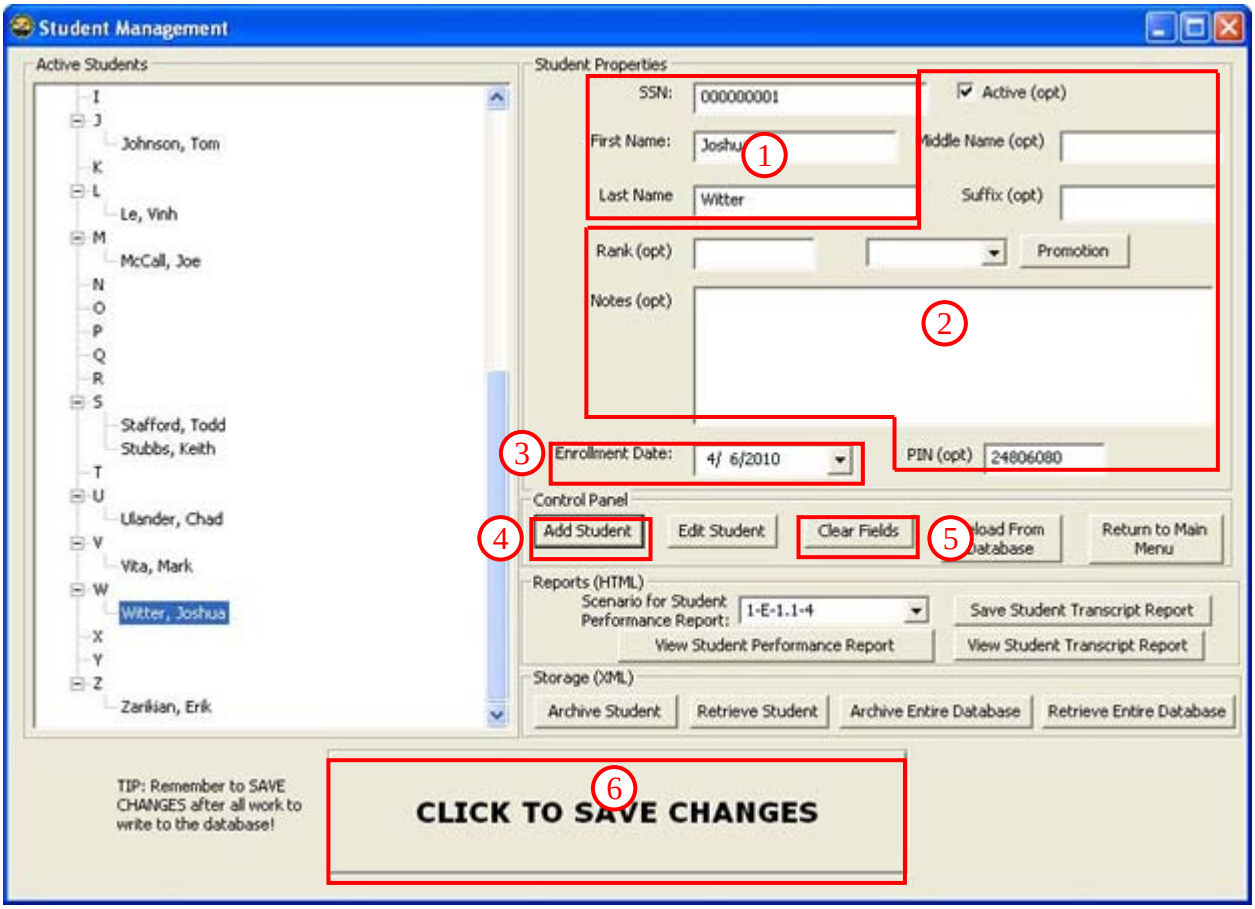



**Figure 49. Student Management - Add Student**

7. A prompt is displayed detailing the addition/changes (Figure 50).
8. Click the [SAVE] button to confirm.

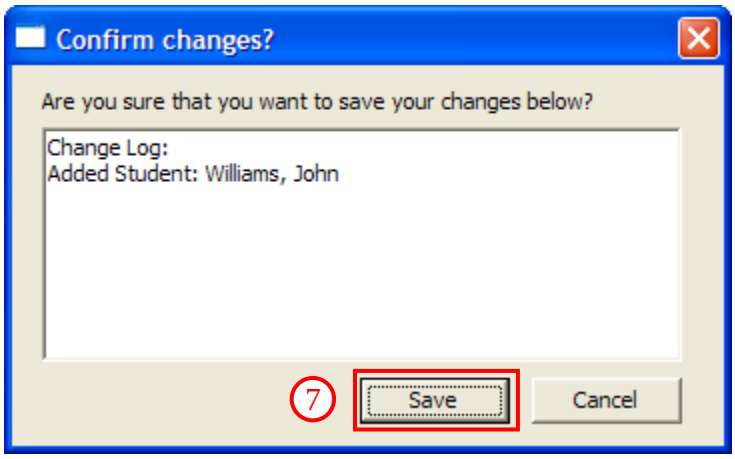



**Figure 50. Confirm Additions/Changes Dialog**

### 2.4.5.2 Edit Student

1. Select a student from the Active Students list (Figure 51).
2. Make the desired changes.
3. Click the [EDIT STUDENT] button (fields will clear but your edits will be temporarily stored).
4. Click the [CLICK TO SAVE CHANGES] button.

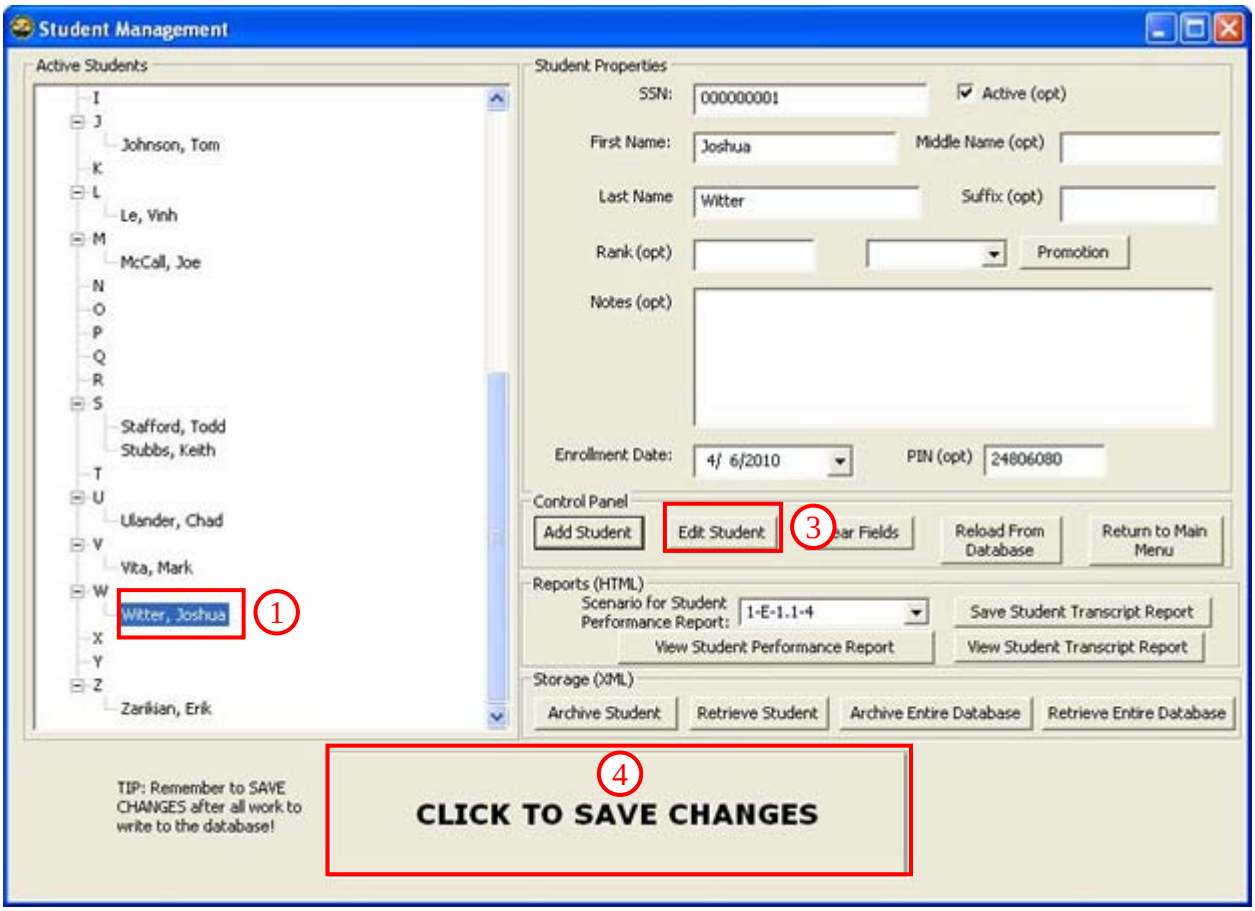



**Figure 51. Student Management - Edit**

5. A prompt is displayed detailing the addition/changes (Figure 52). Click the [SAVE] button to confirm.

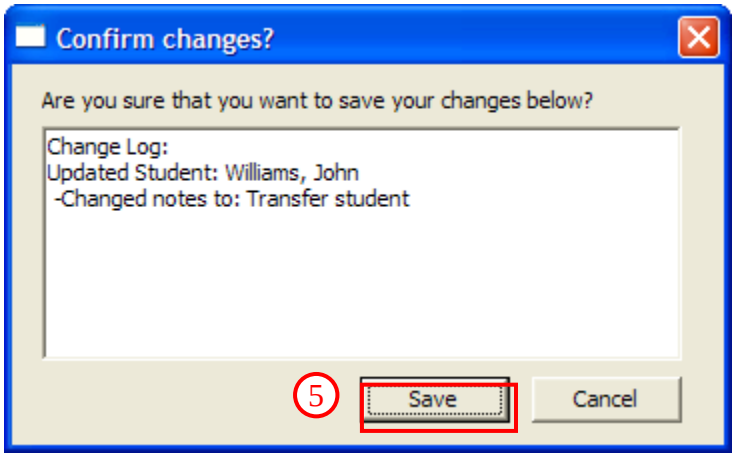



**Figure 52. Confirm Additions - Changes Dialog**

### 2.4.5.3 View Reports

#### 2.4.5.3.1 View Student Performance Report

This report summarizes the student performance for a specific scenario, such as class dates, scenarios, instructor, performance (pass, fail or incomplete), score, mileage, fuel used, time, and instructor comments.

1. Select a student from the Active Students list (Figure 53).
2. Select the scenario from the Scenario for Student Performance Support drop-down menu.
3. Click the [VIEW STUDENT PERFORMANCE REPORT] button (results in Figure 54).

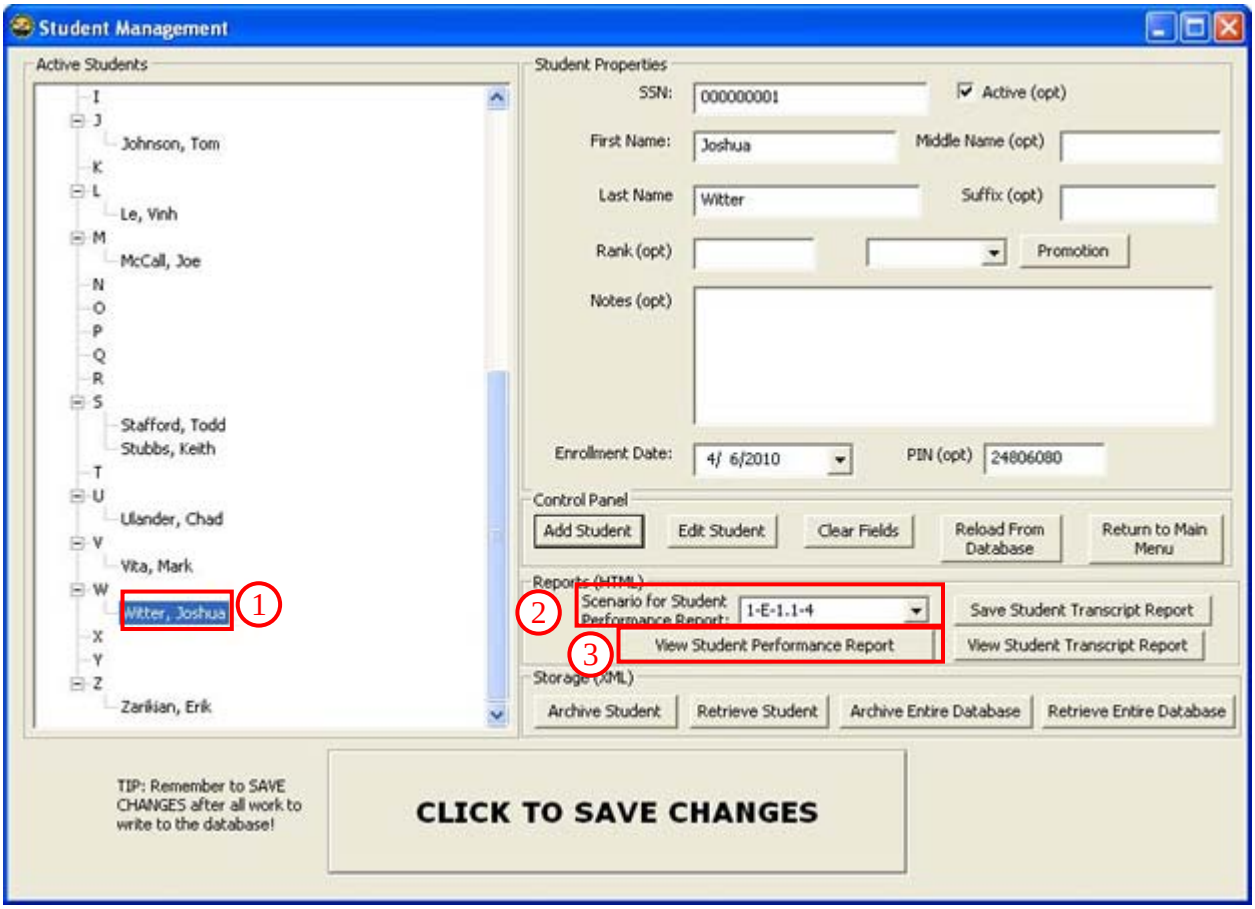
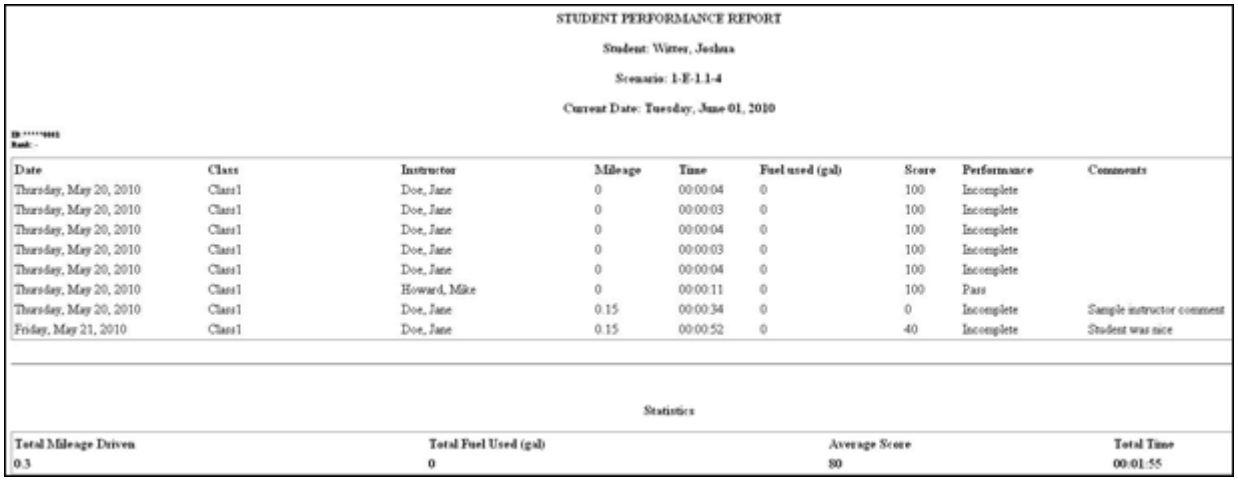



**Figure 53. Student Management - View Student Performance Report**



STUDENT PERFORMANCE REPORT

Student: Witter, Joshua

Scenario: 1-E-1.1-4

Current Date: Tuesday, June 01, 2010

| Date | Class | Instructor | Mileage | Time | Fuel used (gal) | Score | Performance | Comments |
|---|---|---|---|---|---|---|---|---|
| Thursday, May 20, 2010 | Class1 | Doe, Jane | 0 | 00:00:04 | 0 | 100 | Incomplete | |
| Thursday, May 20, 2010 | Class1 | Doe, Jane | 0 | 00:00:03 | 0 | 100 | Incomplete | |
| Thursday, May 20, 2010 | Class1 | Doe, Jane | 0 | 00:00:04 | 0 | 100 | Incomplete | |
| Thursday, May 20, 2010 | Class1 | Doe, Jane | 0 | 00:00:03 | 0 | 100 | Incomplete | |
| Thursday, May 20, 2010 | Class1 | Doe, Jane | 0 | 00:00:04 | 0 | 100 | Incomplete | |
| Thursday, May 20, 2010 | Class1 | Howard, Mike | 0 | 00:00:11 | 0 | 100 | Pass | |
| Thursday, May 20, 2010 | Class1 | Doe, Jane | 0.15 | 00:00:34 | 0 | 0 | Incomplete | Sample instructor comment |
| Friday, May 21, 2010 | Class1 | Doe, Jane | 0.15 | 00:00:52 | 0 | 40 | Incomplete | Student was nice |

Statistics

| Total Mileage Driven | Total Fuel Used (gal) | Average Score | Total Time |
|---|---|---|---|
| 0.3 | 0 | 80 | 00:01:55 |

**Figure 54. Student Performance Report**

#### 2.4.5.3.2 View Student Transcript Report

This report summarizes the student's overall performance on the CDT.

1. Select a student from the Active Students list (Figure 53).
2. Click the [VIEW STUDENT TRANSCRIPT REPORT] button (results in Figure 54).

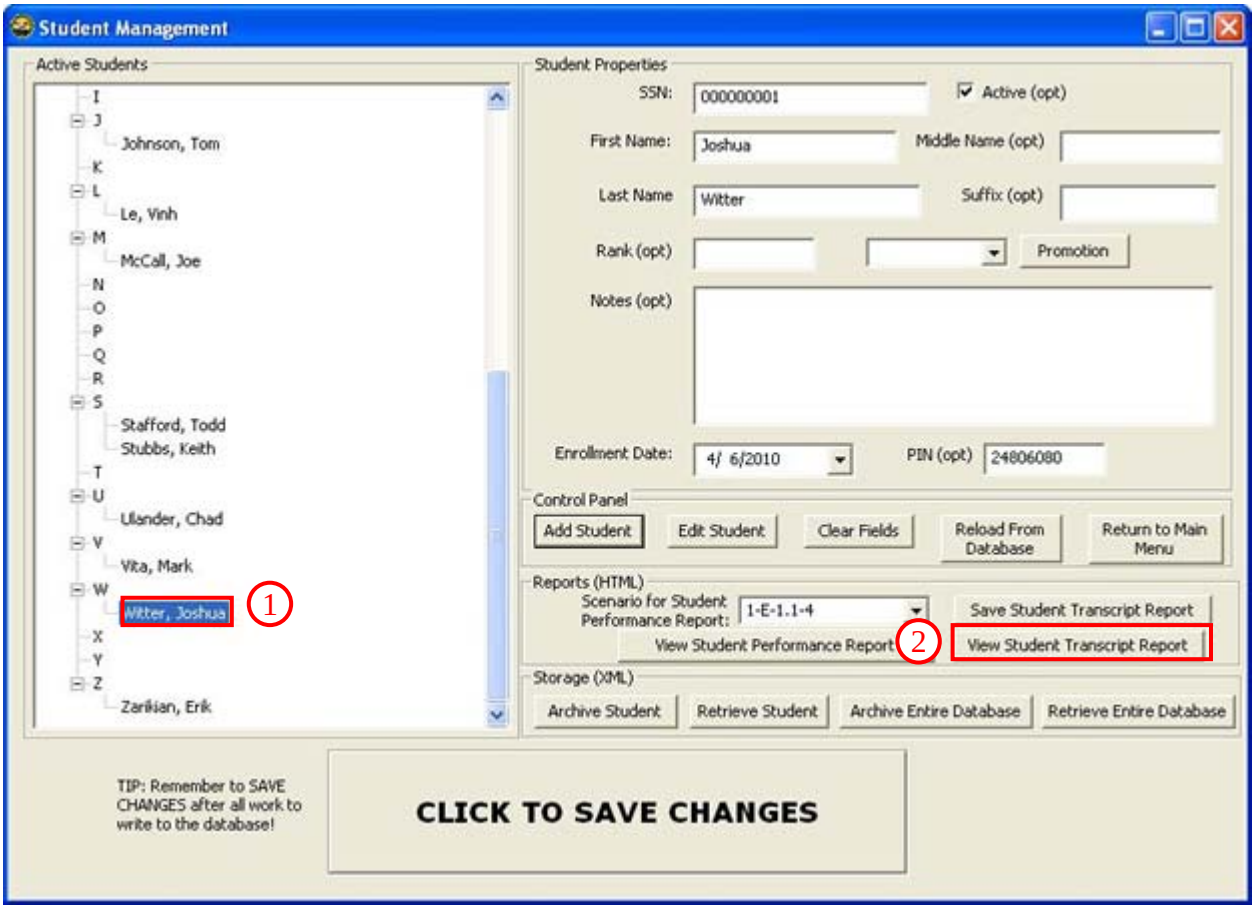
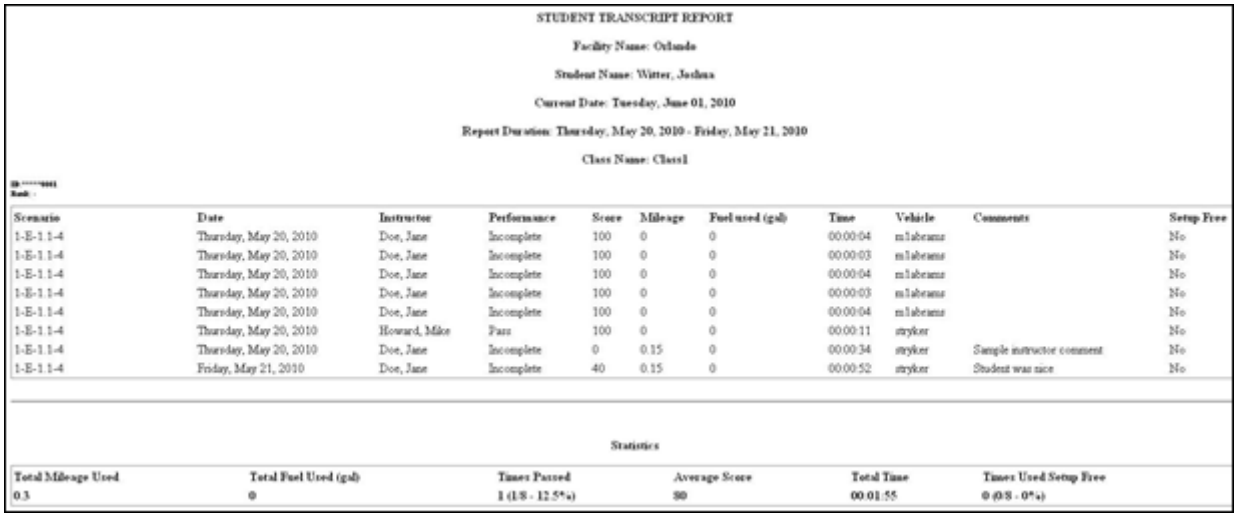



**Figure 55. Student Management - View Student Transcript Report**



STUDENT TRANSCRIPT REPORT

Facility Name: Orlando

Student Name: Witter, Joshua

Current Date: Tuesday, June 01, 2010

Report Duration: Thursday, May 20, 2010 - Friday, May 21, 2010

Class Name: Class1

| Scenario | Date | Instructor | Performance | Score | Mileage | Fuel used (gal) | Time | Vehicle | Comments | Setup Free |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-E-1.1-4 | Thursday, May 20, 2010 | Doe, Jane | Incomplete | 100 | 0 | 0 | 00:00:04 | m1abrams | | No |
| 1-E-1.1-4 | Thursday, May 20, 2010 | Doe, Jane | Incomplete | 100 | 0 | 0 | 00:00:03 | m1abrams | | No |
| 1-E-1.1-4 | Thursday, May 20, 2010 | Doe, Jane | Incomplete | 100 | 0 | 0 | 00:00:04 | m1abrams | | No |
| 1-E-1.1-4 | Thursday, May 20, 2010 | Doe, Jane | Incomplete | 100 | 0 | 0 | 00:00:03 | m1abrams | | No |
| 1-E-1.1-4 | Thursday, May 20, 2010 | Doe, Jane | Incomplete | 100 | 0 | 0 | 00:00:04 | m1abrams | | No |
| 1-E-1.1-4 | Thursday, May 20, 2010 | Howard, Mike | Pass | 100 | 0 | 0 | 00:00:11 | stryker | | No |
| 1-E-1.1-4 | Thursday, May 20, 2010 | Doe, Jane | Incomplete | 0 | 0.15 | 0 | 00:00:34 | stryker | Sample instructor comment | No |
| 1-E-1.1-4 | Friday, May 21, 2010 | Doe, Jane | Incomplete | 40 | 0.15 | 0 | 00:00:52 | stryker | Student was nice | No |

Statistics

| Total Mileage Used | Total Fuel Used (gal) | Times Passed | Average Score | Total Time | Times Used Setup Free |
|---|---|---|---|---|---|
| 0.3 | 0 | 1 (1/8 - 12.5%) | 80 | 00:01:55 | 0 (0/8 - 0%) |

**Figure 56. Student Performance Report**

#### 2.4.5.4 Save Student Transcript Report

1. Select a student from the *Active Students* list (Figure 57).
2. Click the [SAVE STUDENT TRANSCRIPT REPORT] button.

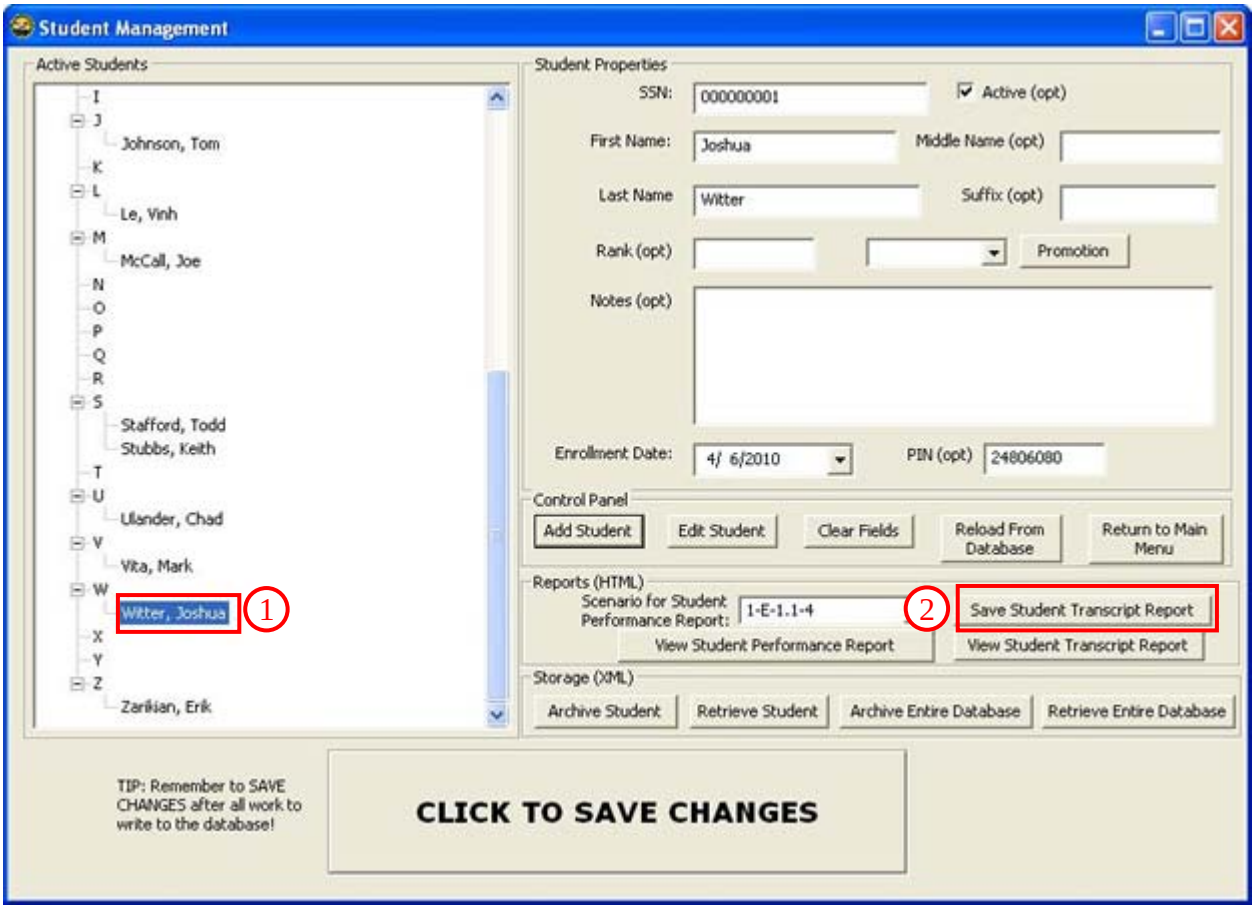



**Figure 57. Student Management - Save Student Transcript Report**

3. A Save As dialog is displayed (Figure 58). Navigate to the desired save location, enter a File name and click the [SAVE] button.

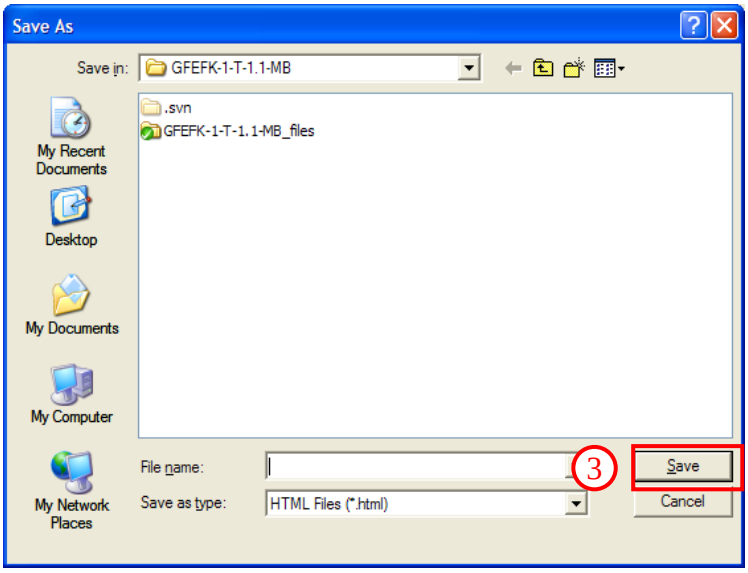



**Figure 58. Student Report - Save As Dialog**

#### 2.4.5.5 Archive Student

Archive moves a student from the active portion of the database to an inactive area where it can be accessed at a later time, such as the PC hard drive or a CD-ROM. Archive captures and saves student information at a given point in time. Archiving is useful for maintaining permanent records of students on a daily, weekly, monthly, etc., basis. This allows the database to be purged of obsolete data while preserving a record of the data.

1. Select a student from the Active Students list (Figure 59).
2. Click the [ARCHIVE STUDENT] button.

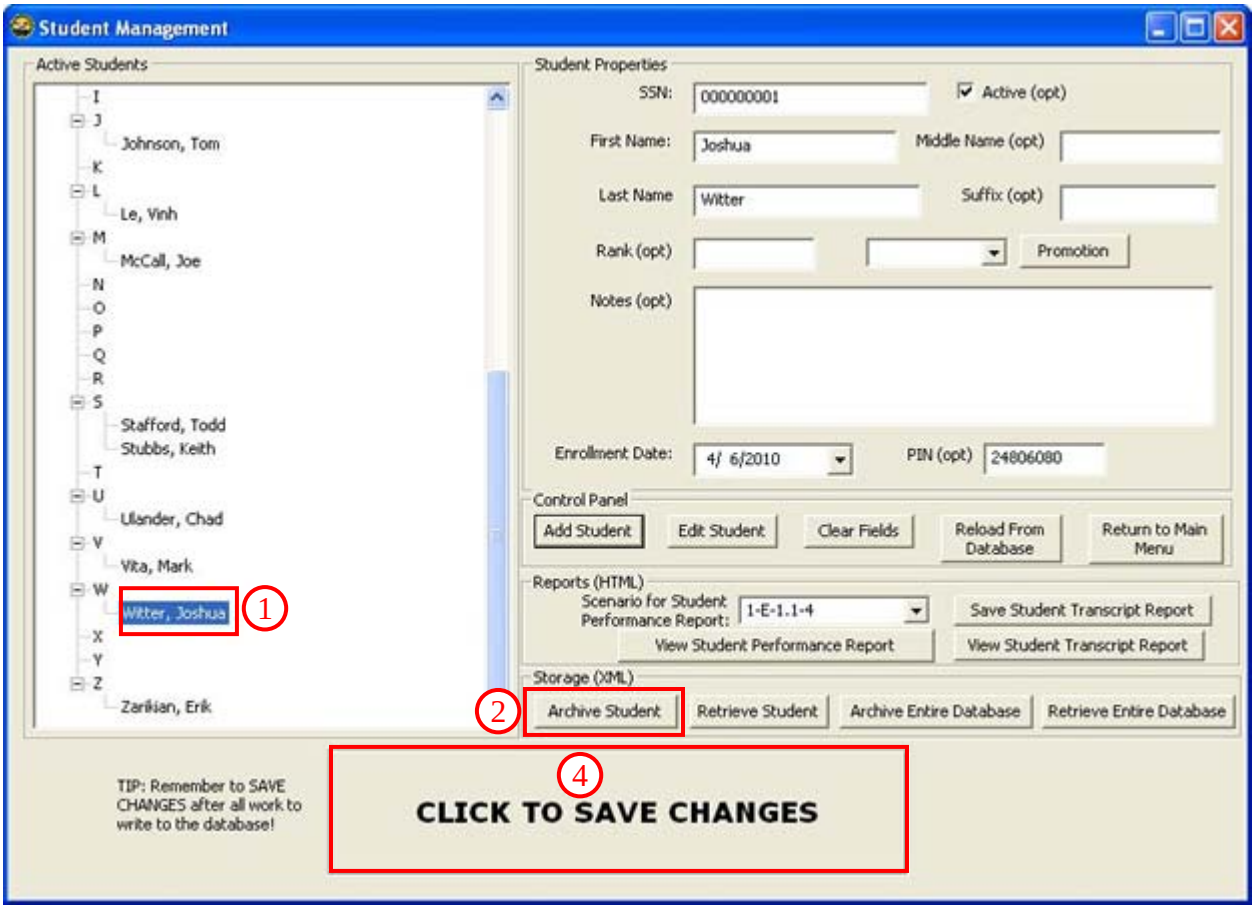



**Figure 59. Student Management - Archive Student**

3. A *Save As* dialog is displayed (Figure 60). Navigate to the desired location, enter a File name and click the [SAVE] button.
4. To permanently remove the student from the database, select the [CLICK to SAVE CHANGES] button (Figure 59).

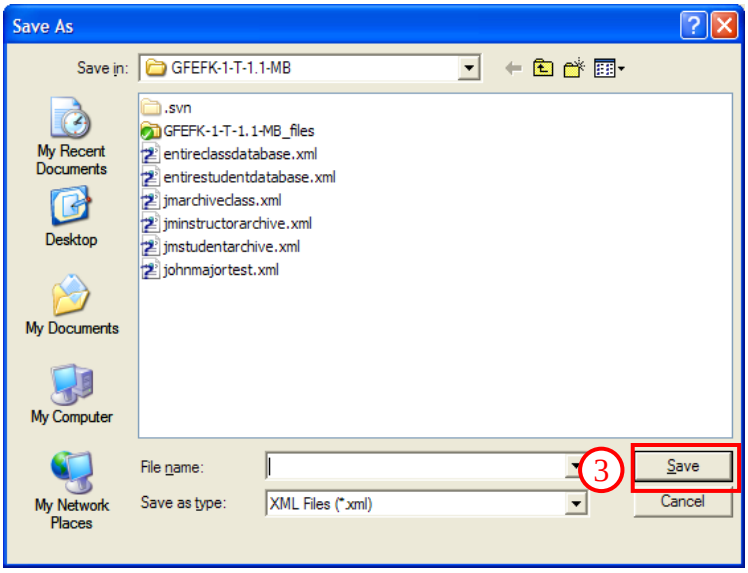



**Figure 60. Archive Student - Save As Dialog**

### 2.4.5.6 Archive Entire Database

Archive Entire Database is functionally similar to Archive Student described in section 2.4.5.5.

1. Click the [ARCHIVE ENTIRE DATABASE] button (Figure 61).

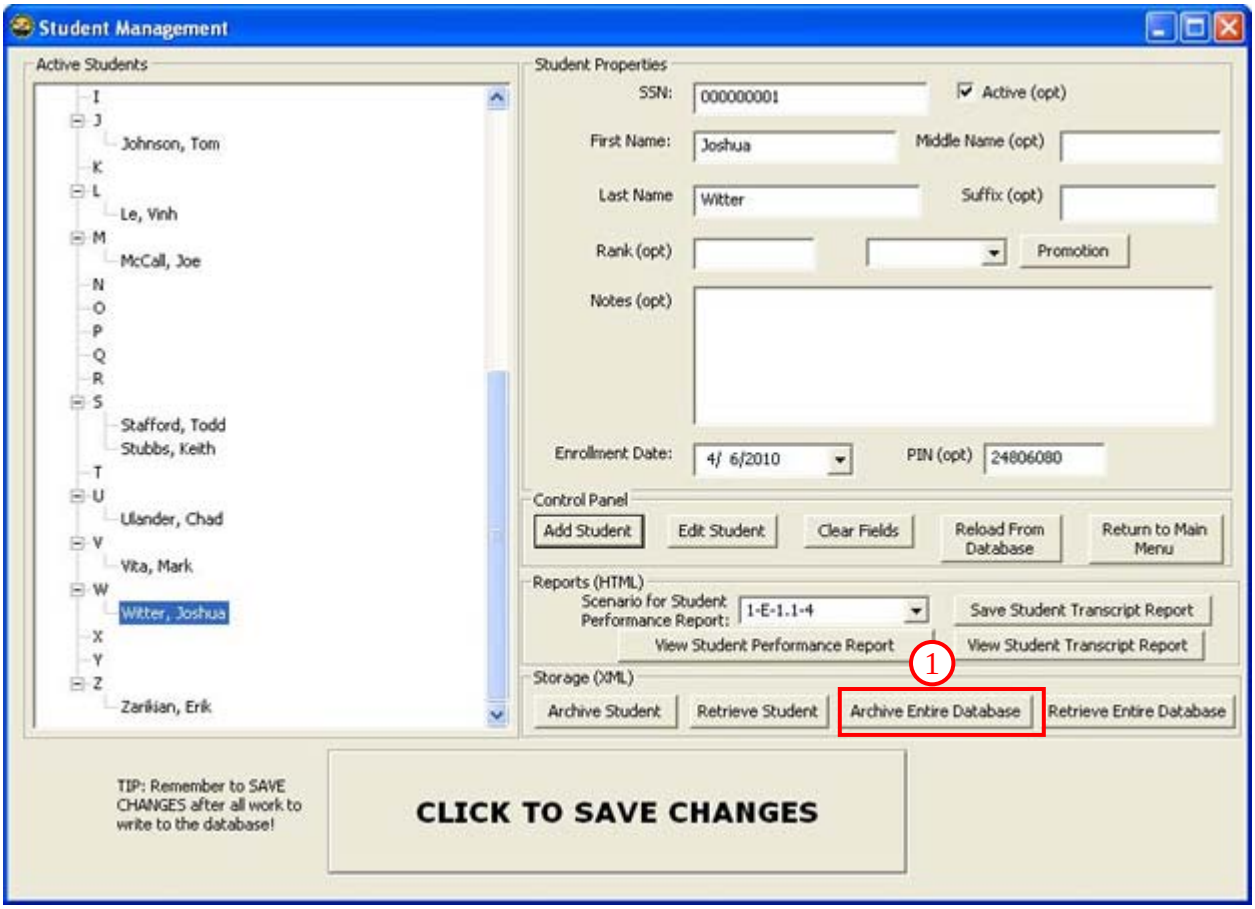



**Figure 61. Student Management - Archive Entire Database**

2. A Save As dialog is displayed (Figure 62). Navigate to the desired location, enter a File name and click the [SAVE] button.

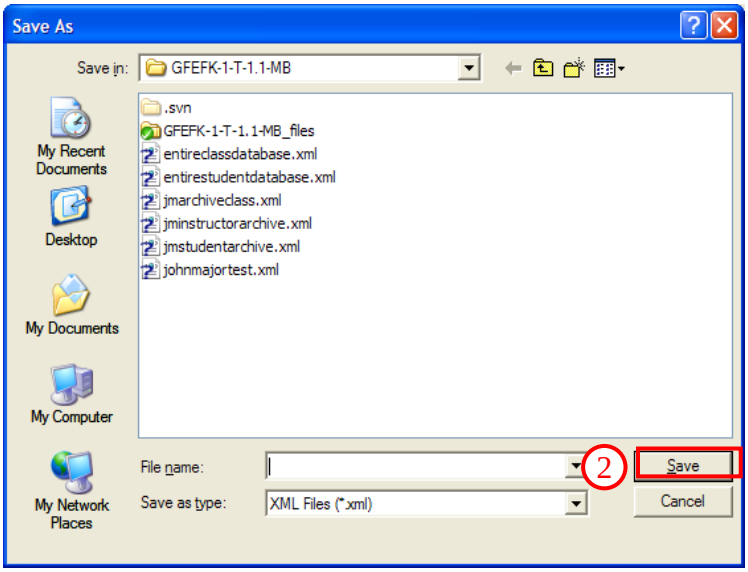



**Figure 62. Archive Entire Database - Save As Dialog**

### 2.4.5.7 Retrieve Student

A retrieve loads archived data back into the database. This is useful for restoring accidental database deletions/corruptions or reviewing data from a previous point in time.

1. Select a student from the *Active Students* group.
2. Click the [RETRIEVE STUDENT] button (Figure 63).

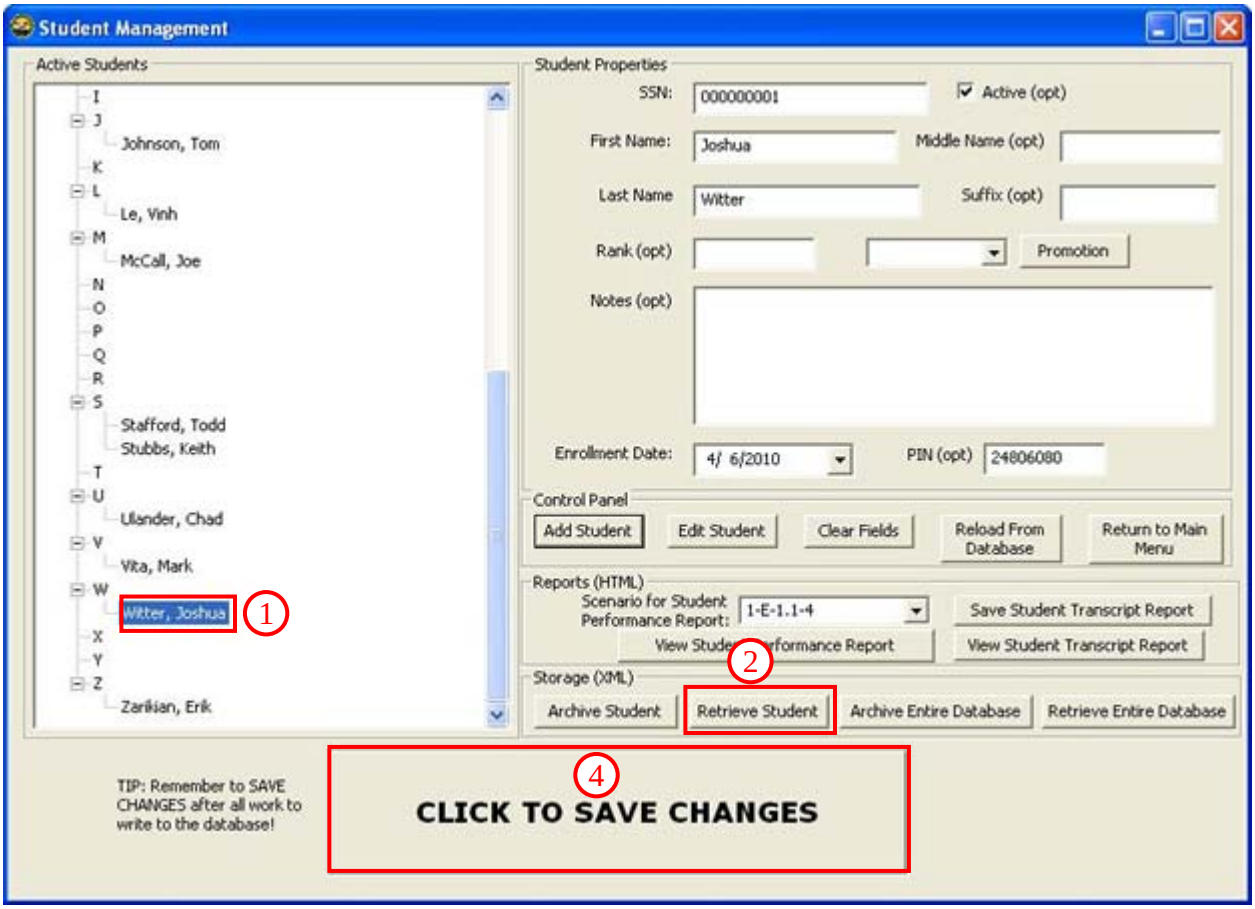



**Figure 63. Student Management - Retrieve Student**

3. An *Open* dialog is displayed (Figure 64). Navigate to the desired location, select a **File name** and click the [OPEN] button.

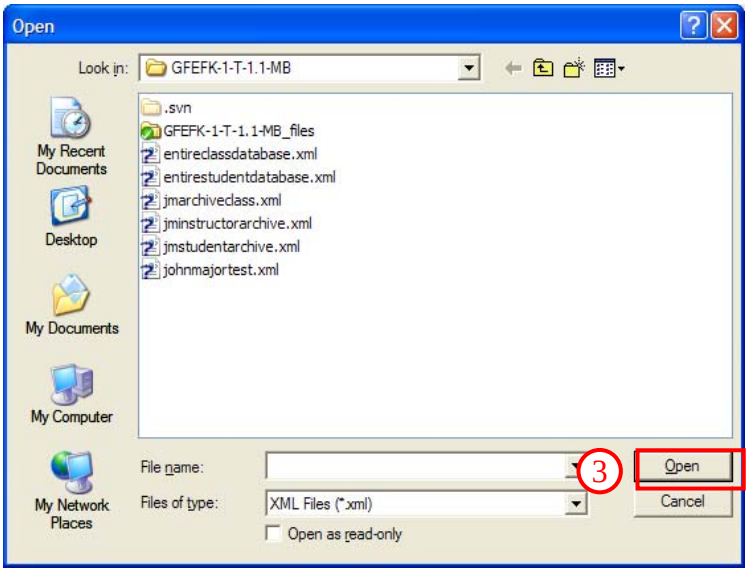



**Figure 64. Retrieve Student - Open Dialog**

4. Click the [CLICK TO SAVE CHANGES] button.

#### 2.4.5.8 Retrieve Entire Database

Retrieve Entire Database is functionally similar to Retrieve Student described in section 2.4.5.7.

1. Click the [RETRIEVE ENTIRE DATABASE] button (Figure 65).

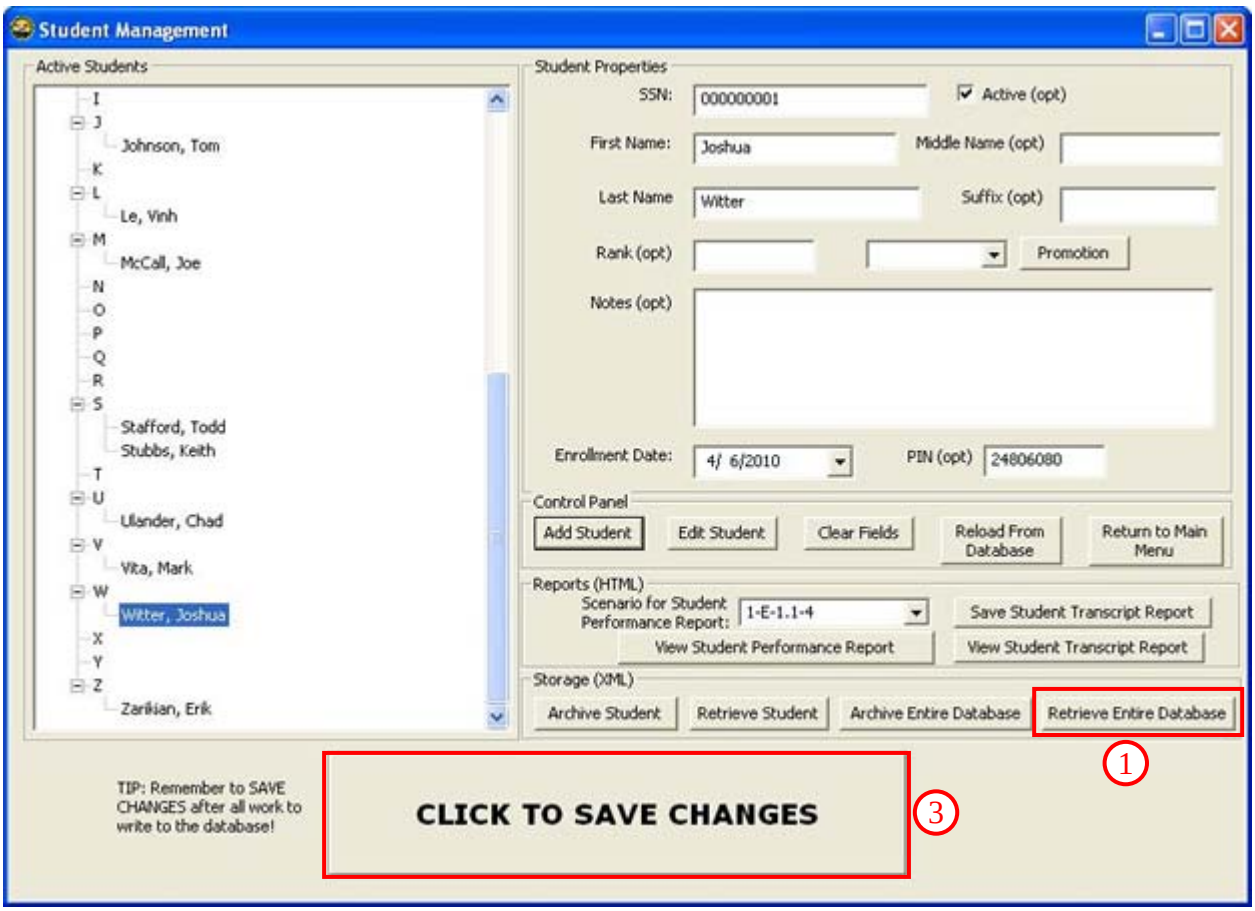



**Figure 65. Student Management - Retrieve Entire Database**

2. An Open dialog is displayed (Figure 66). Navigate to the location where the database was saved, select a File name and click the [OPEN] button.

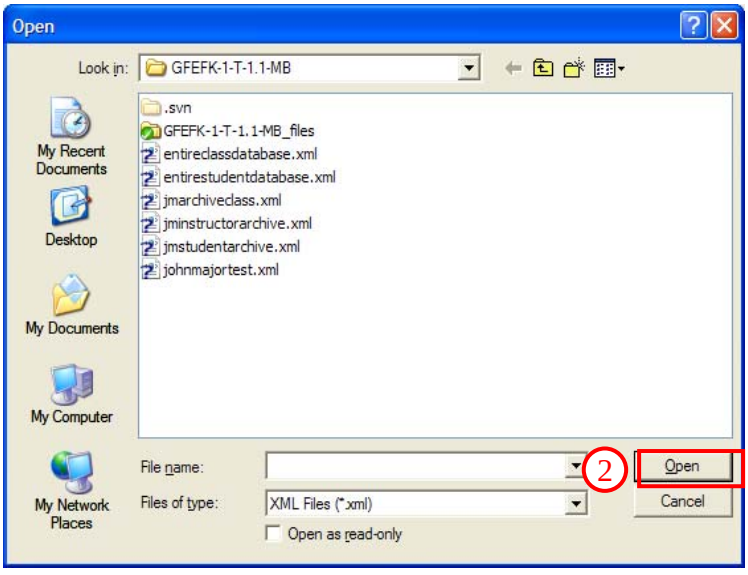



**Figure 66. Retrieve Entire Database - Open Dialog**

3. Click the [CLICK TO SAVE CHANGES] button.

### 2.4.5.9 Reload From Database

This option reloads the instructor data from the database at the point of the last database save. Useful for discarding erroneous edits without risk of saving to the database.

1. Click the [RELOAD FROM DATABASE] button to reload all data from the database (Figure 67).

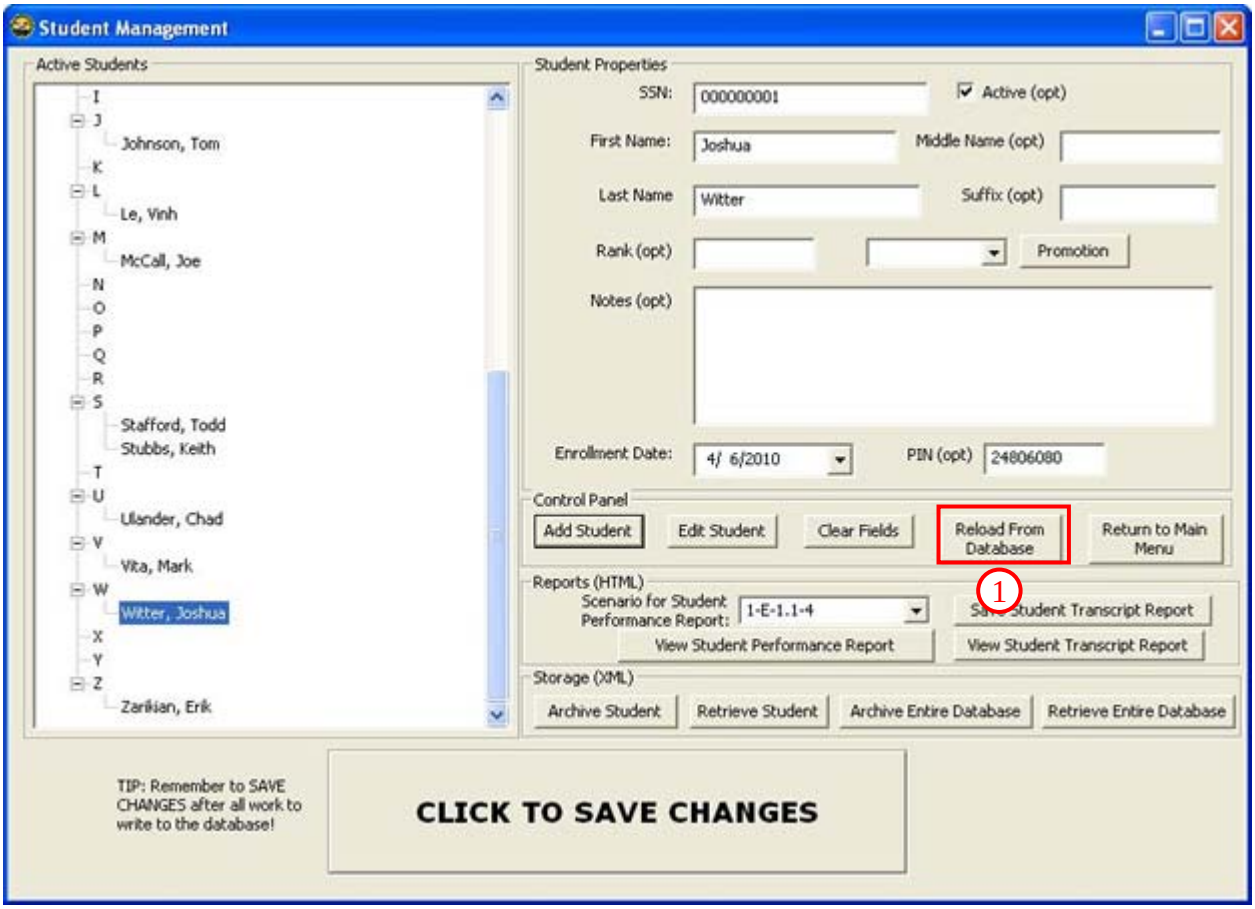



**Figure 67. Student Management - Reload From Database**

### 2.4.5.10 Clear Fields

1. Click the [CLEAR FIELDS] button (Figure 68).
2. All data in the *Student Properties* group fields are cleared (*Enrollment Date* defaults to current date).

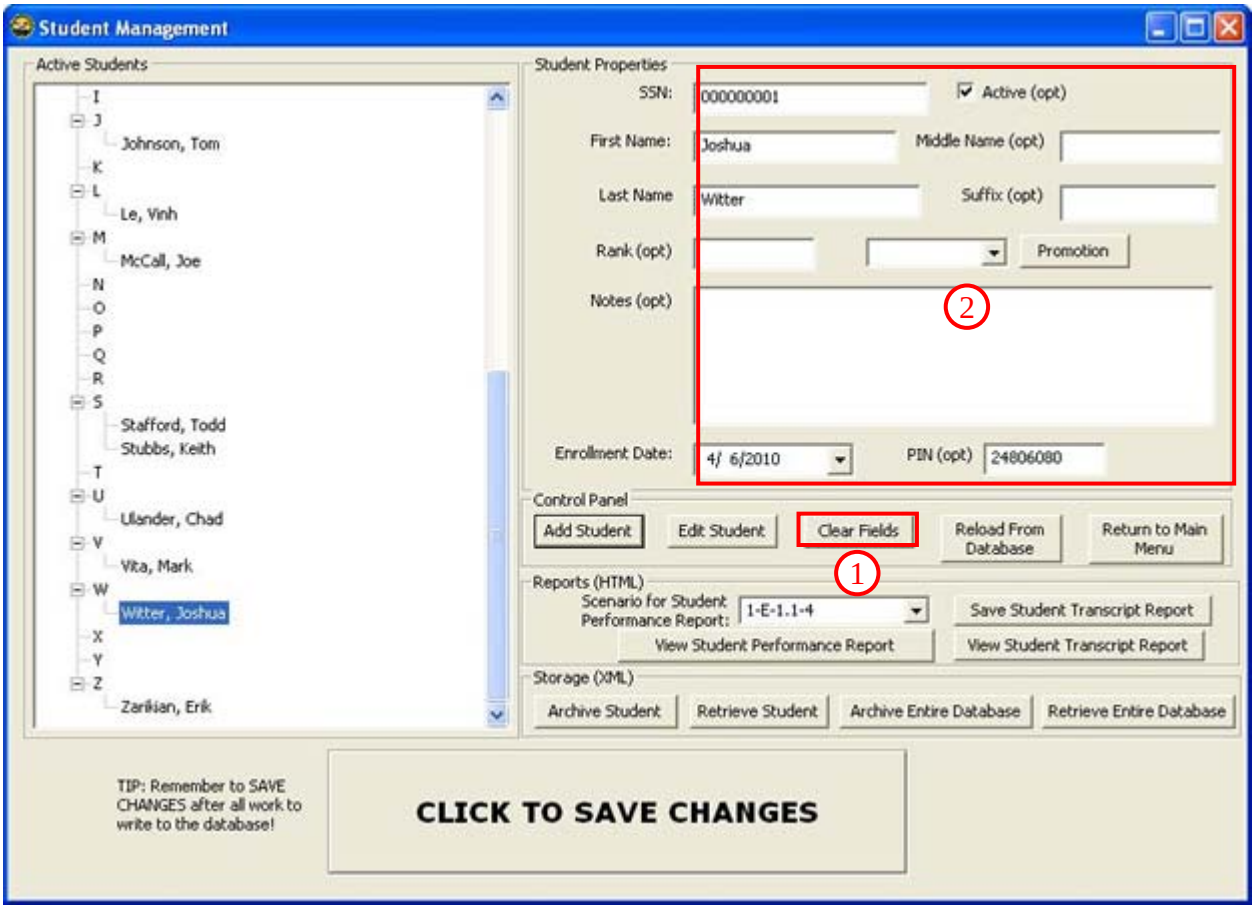



**Figure 68. Student Management - Clear Menu**

### 2.4.5.11 Return to Main Menu

1. Click the [RETURN TO MAIN MENU] button (Figure 69) to close the screen and return to the Main Menu.

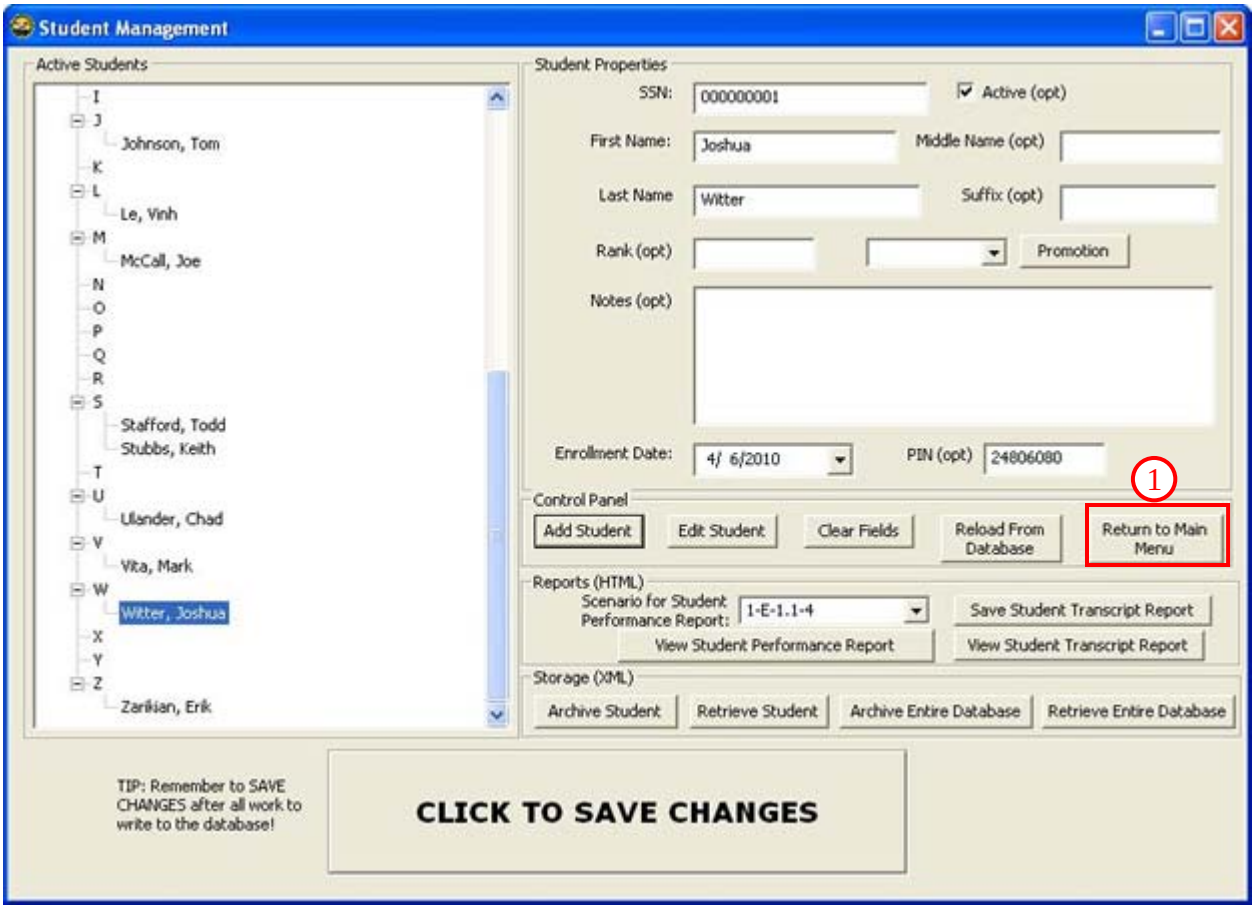



**Figure 69. Student Management - Return to Main Menu**

## 2.4.6 Scenario Management

1. Click the [SCENARIO MANAGEMENT] button (Figure 70) on the Class Manager *Main Menu* screen.
2. Use the Scenario Management screen (Figure 71) to set scenario configurations and limits.


**Figure 70. Class Manager - Main Menu**

#### 2.4.6.1 Managing Programs of Instruction (POIs)

The Scenario Management screen (Figure 71) shows all the available Programs of Instruction (POI). The levels may be expanded out to view all scenarios by clicking the [+] sign to the left of each category. Once a scenario is selected, the options to configure the limits, modifiers, configuration data, and options may be made by clicking the applicable buttons. Click the keyboard [DELETE] key to remove a scenario.

#### 2.4.6.2 Adding a POI

1. Enter the POI name in the field next to the [CREATE NEW POI] button (Figure 71).
2. Click the [CREATE NEW POI] button.
3. The new POI is displayed at the bottom of the *Active Scenario* list.

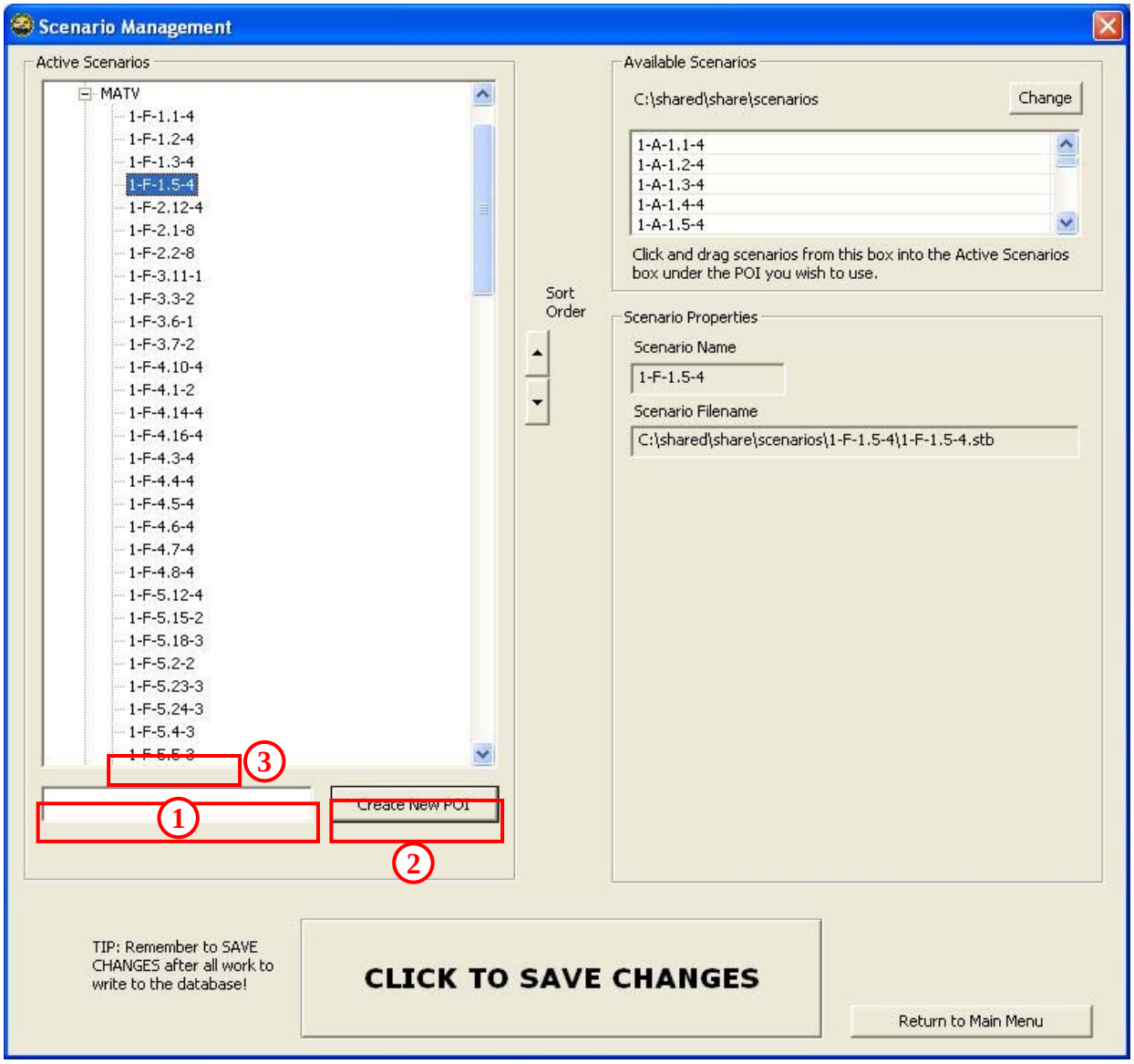



**Figure 71. Scenario Management - Adding a POI**

### 2.4.6.3 Adding Scenarios to a POI

1. From the Available Scenarios group (Figure 72), click and drag the desired scenarios to the main folder of the POI just created. [SHIFT] click and [CTRL] click allow selection of multiple scenarios. If the desired scenarios are not displayed, click the [CHANGE] button to navigate to the folder in which they reside.
2. When the POI is populated with at least one scenario, the POI will be reordered in the list alphabetically. Scenarios can be reordered as described 2.4.6.1.

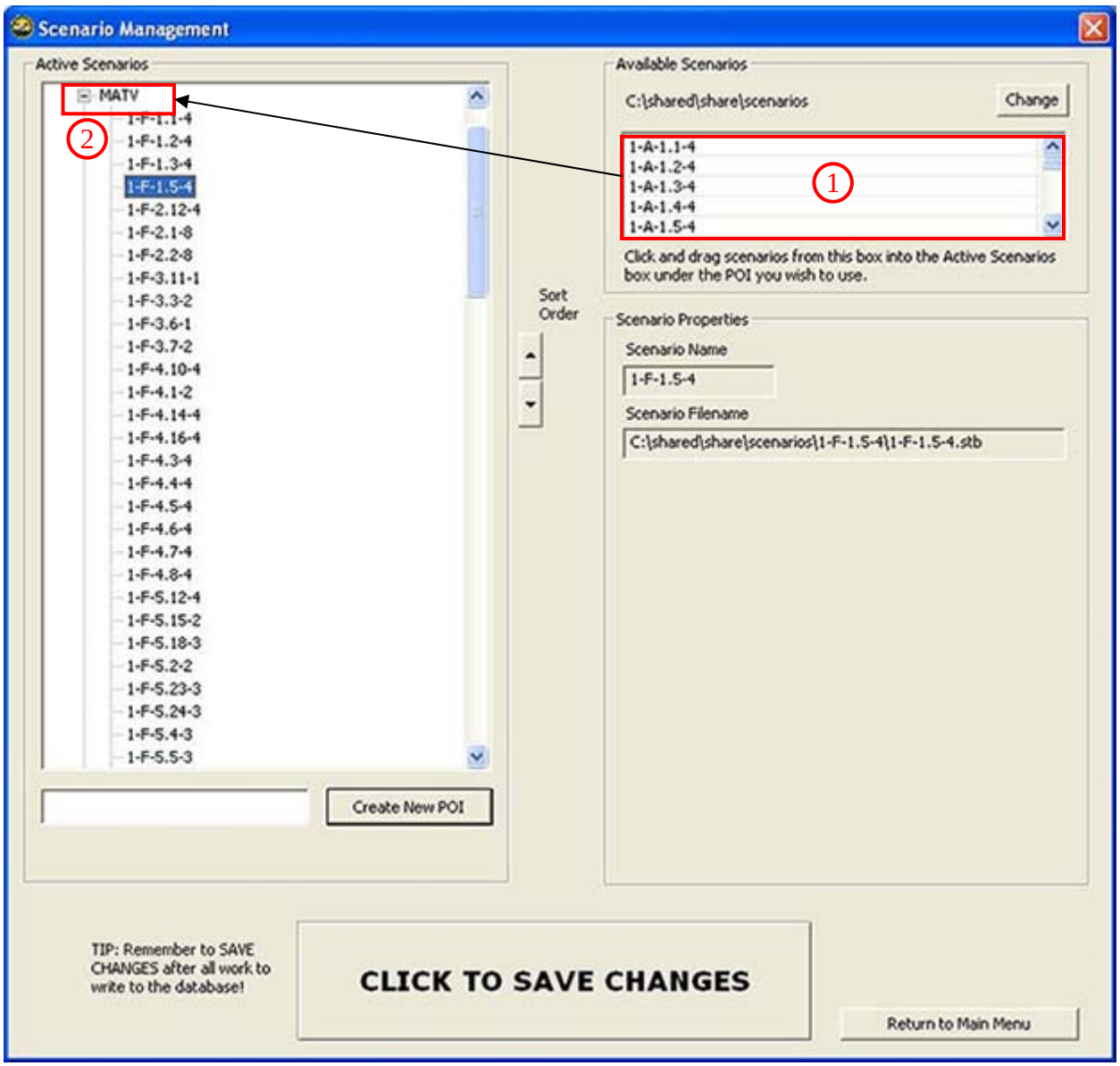



**Figure 72. Scenario Management - Adding Scenarios to POIs**

### 2.4.6.4 Deleting a POI

1. Select the POI to be deleted (Figure 73).
2. Press the [DELETE] key on the keyboard.
3. Click the [CLICK TO SAVE CHANGES] button.

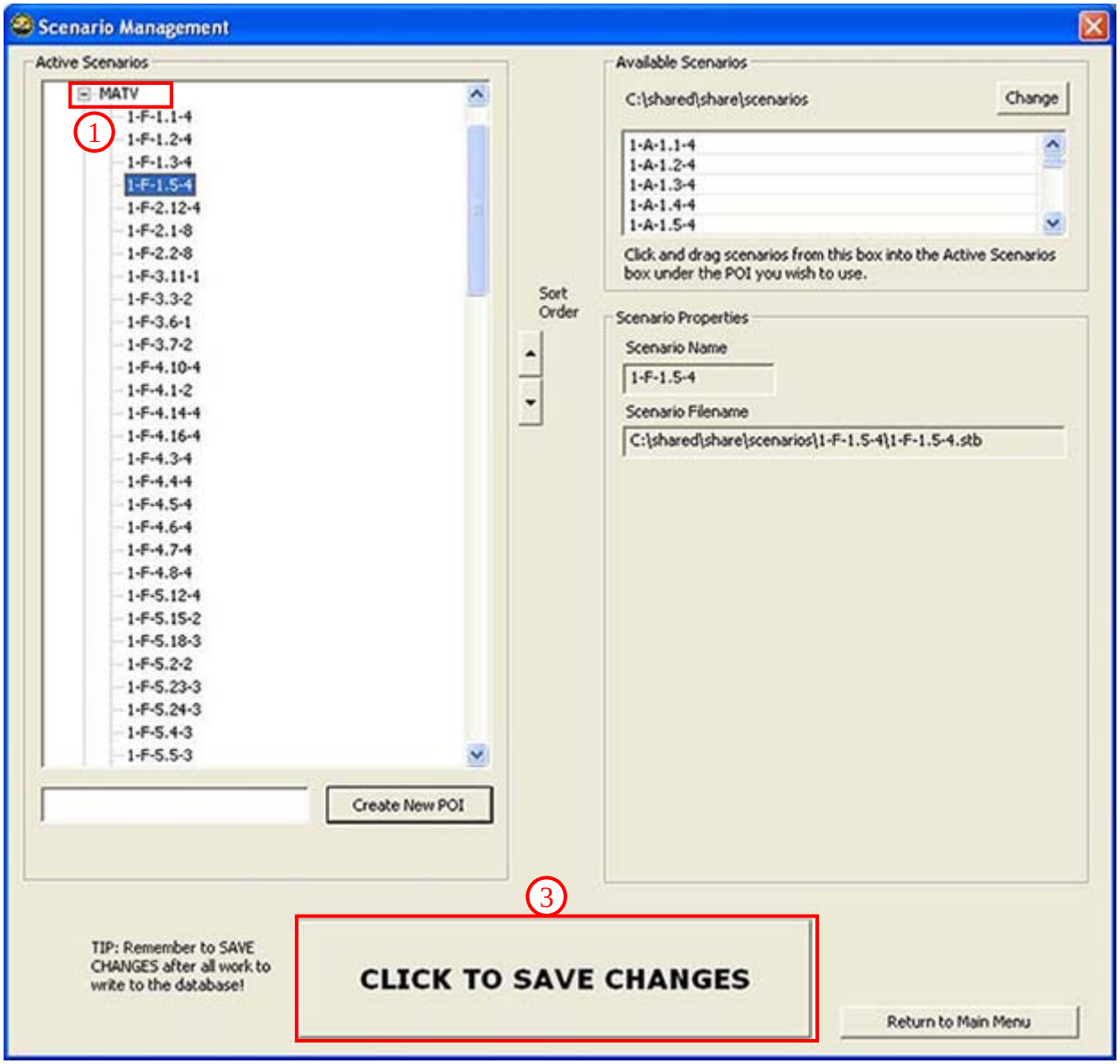



**Figure 73. Scenario Management - Deleting a POI**

4. A prompt is displayed detailing the addition/changes (Figure 74). Click the [SAVE] button to confirm the changes.

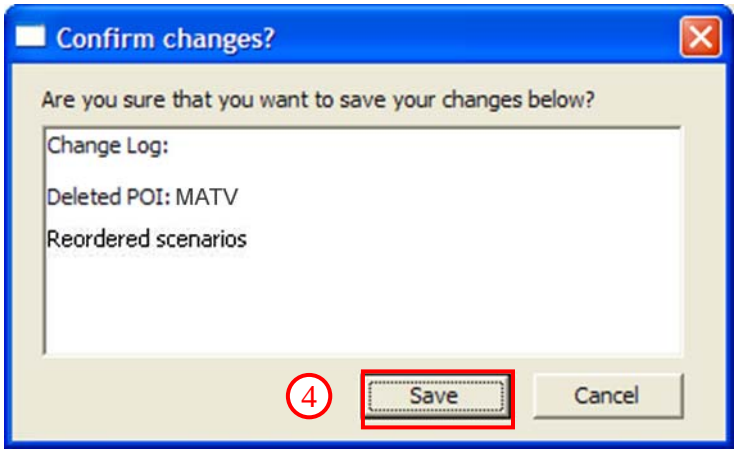



**Figure 74. Scenario Management - Confirm Delete Dialog**

#### 2.4.6.5 Sorting Scenarios

1. To change the order of a scenario within the POI list, select the scenario (Figure 75).
2. Click the up or down buttons to move the selected item within the list.
3. Click the [CLICK TO SAVE CHANGES] button.

| Button | Function |
|---|---|
|  | Moves a scenario up one line. |
|  | Moves a scenario down one line. |

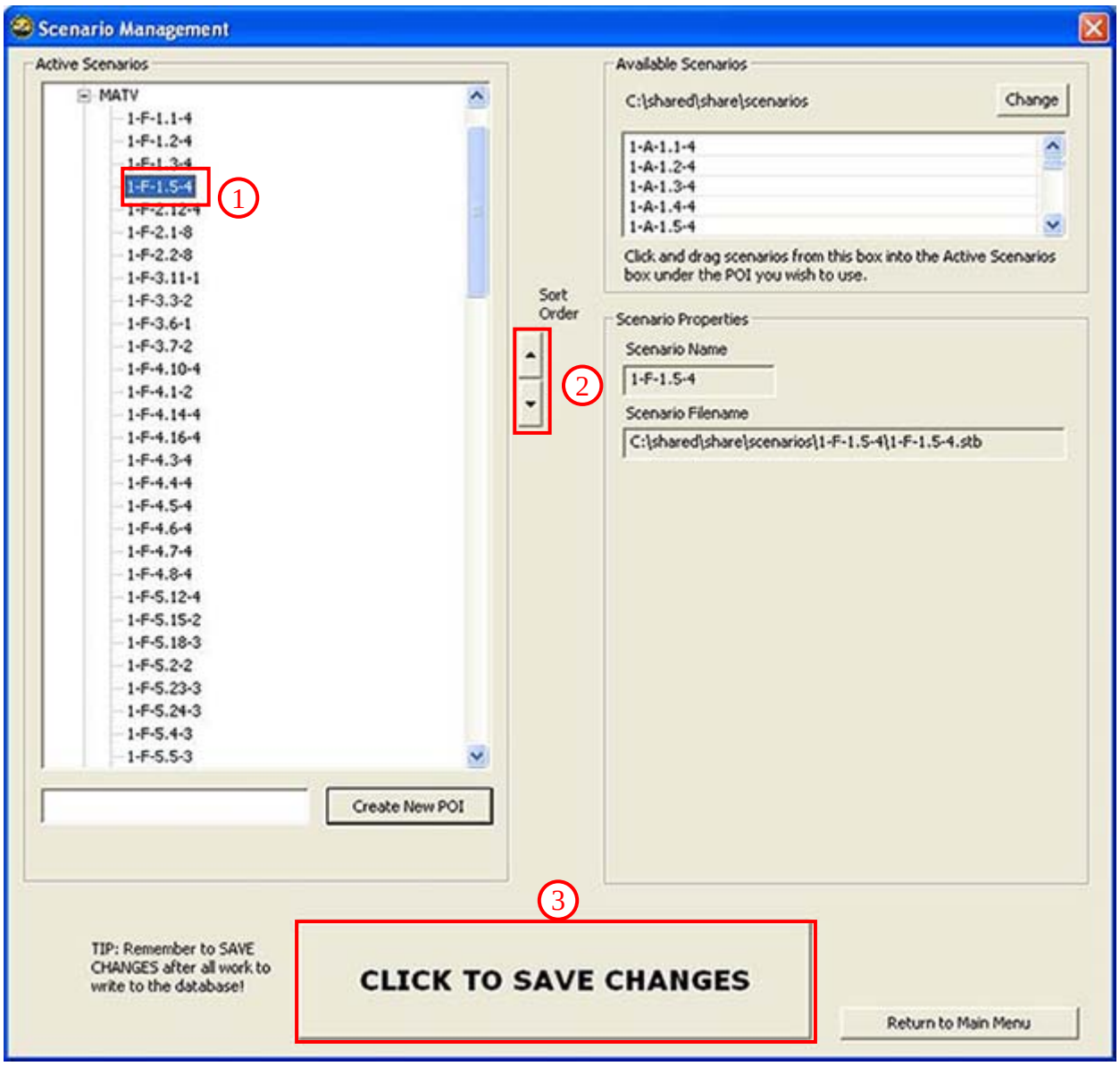



**Figure 75. Scenario Management - Sorting Scenarios**

4. A prompt is displayed detailing the addition/changes (Figure 76). Click the [SAVE] button to confirm the changes.

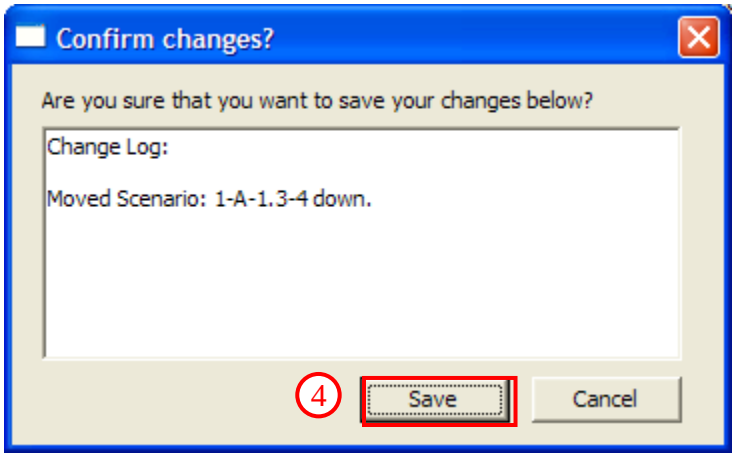



**Figure 76. Scenario Management - Sorting Scenarios**

#### 2.4.6.6 Deleting Scenarios

1. Select a scenario within the list (Figure 77).
2. Press the [DELETE] key on the keyboard.
3. Click the [CLICK TO SAVE CHANGES] button.
4. A prompt is displayed detailing the addition/changes (Figure 78). Click the [SAVE] button to confirm the changes.

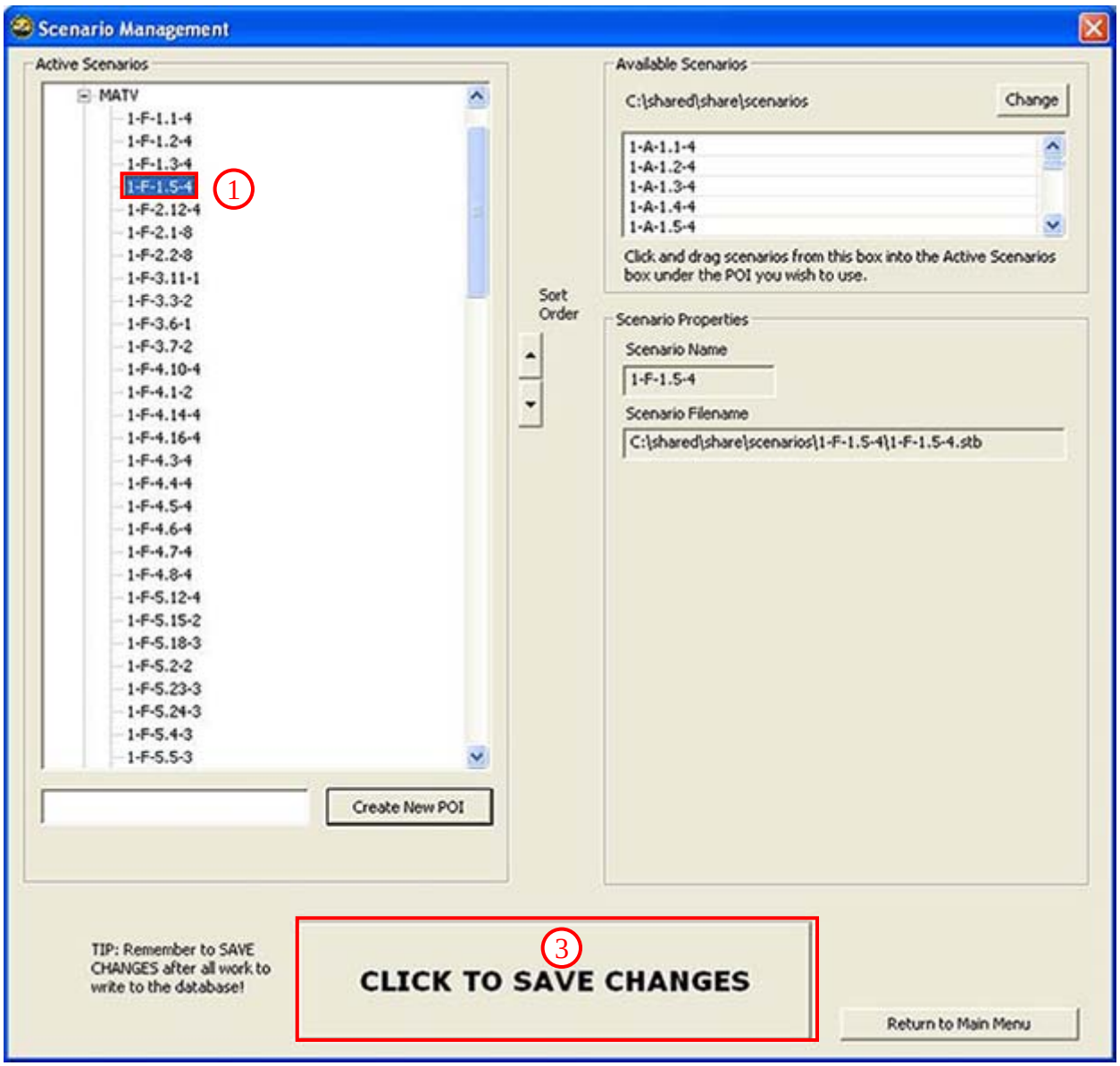



**Figure 77. Scenario Management - Delete Scenario**

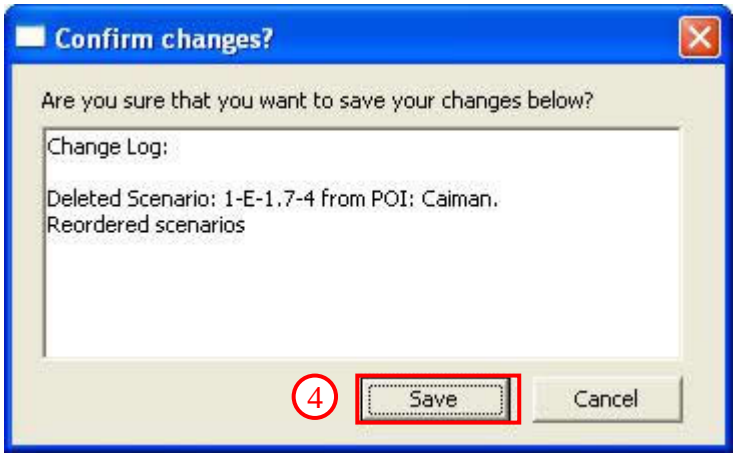



**Figure 78. Scenario Management - Confirm Deletion**

## 2.4.7 Class Management

Click the [CLASS MANAGEMENT] button (Figure 79) on the Class Manager *Main Menu* screen. Use the *Class Management* screen (Figure 80) to create, edit, delete, archive and retrieve from archive. Classes are listed alphabetically by name.


**Figure 79. Class Manager - Main Menu**

### 2.4.7.1 Add Class

1. Enter a name for the class in the **Name** field located in the *Class Properties* group and the **Location** (both are required). **Description** is optional. The defaults for the **Start Date** and **End Date** are the current date but may be changed by clicking on the drop-down arrow. The date can also be typed manually in the date fields.
2. Click the [ADD CLASS] button. The class now appears in the alphabetized list of *Active Classes*.

3. From the *Available Students* and *Available Instructors* group, click and drag the desired individuals to the class just created. [SHIFT] click and [CTRL] click allow selection of multiple individuals. Individuals may be deleted by selecting the name and pressing the [DELETE] key on the keyboard.
4. When all the information has been added click the [CLICK TO SAVE CHANGES] button.

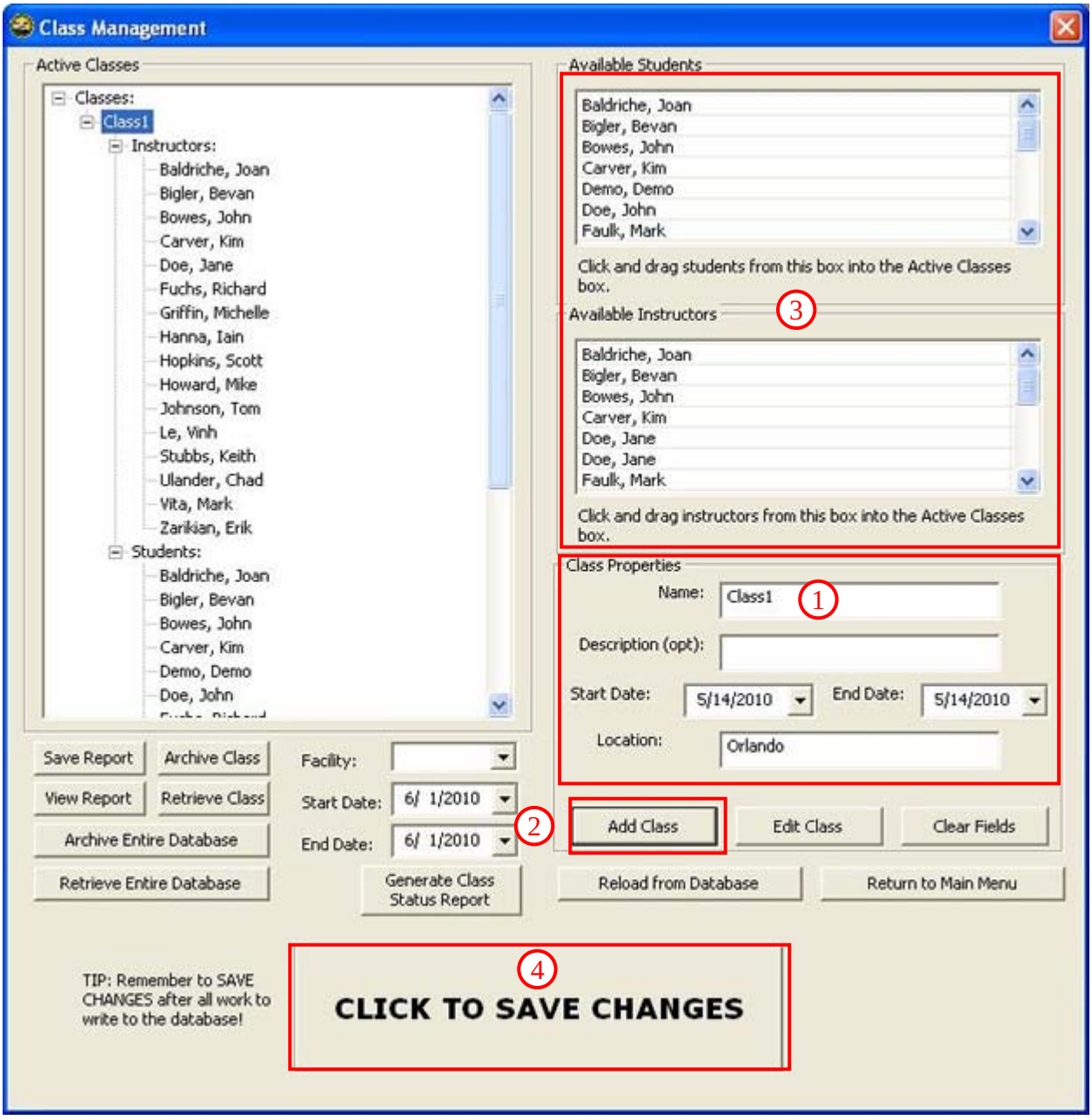



**Figure 80. Class Management - Add Class**

5. A prompt is displayed detailing the addition/changes (Figure 81). Click the [SAVE] button to confirm.

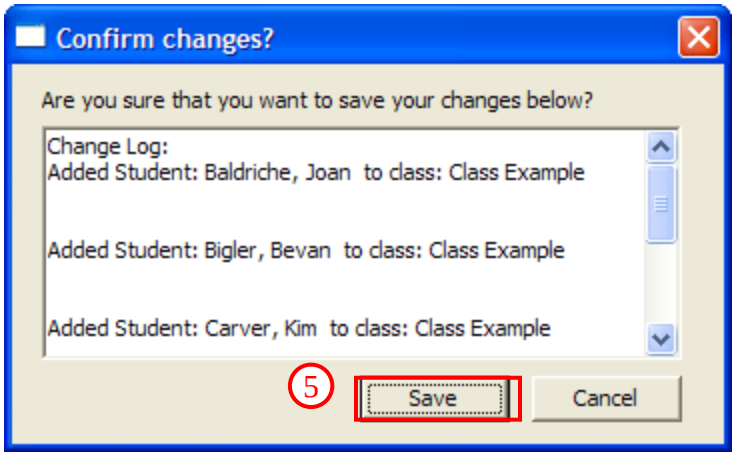



**Figure 81. Classes - Confirm Changes Dialog**

#### 2.4.7.2 Edit Class

1. Select a class, instructor or student from the Active Classes list (Figure 82).
2. Make the desired changes.

**NOTE**

Dragging and dropping instructors and students into a class will deselect the name of the class. To edit the fields in the Class Properties group (**Name**, **Description**, etc.) the class will have to be reselected.

3. To delete a class, instructor or student, select the item to be deleted and then press the [DELETE] key on the keyboard.
4. Click the [EDIT CLASS] button in Class Properties.
5. Click the [CLICK TO SAVE CHANGES] button.

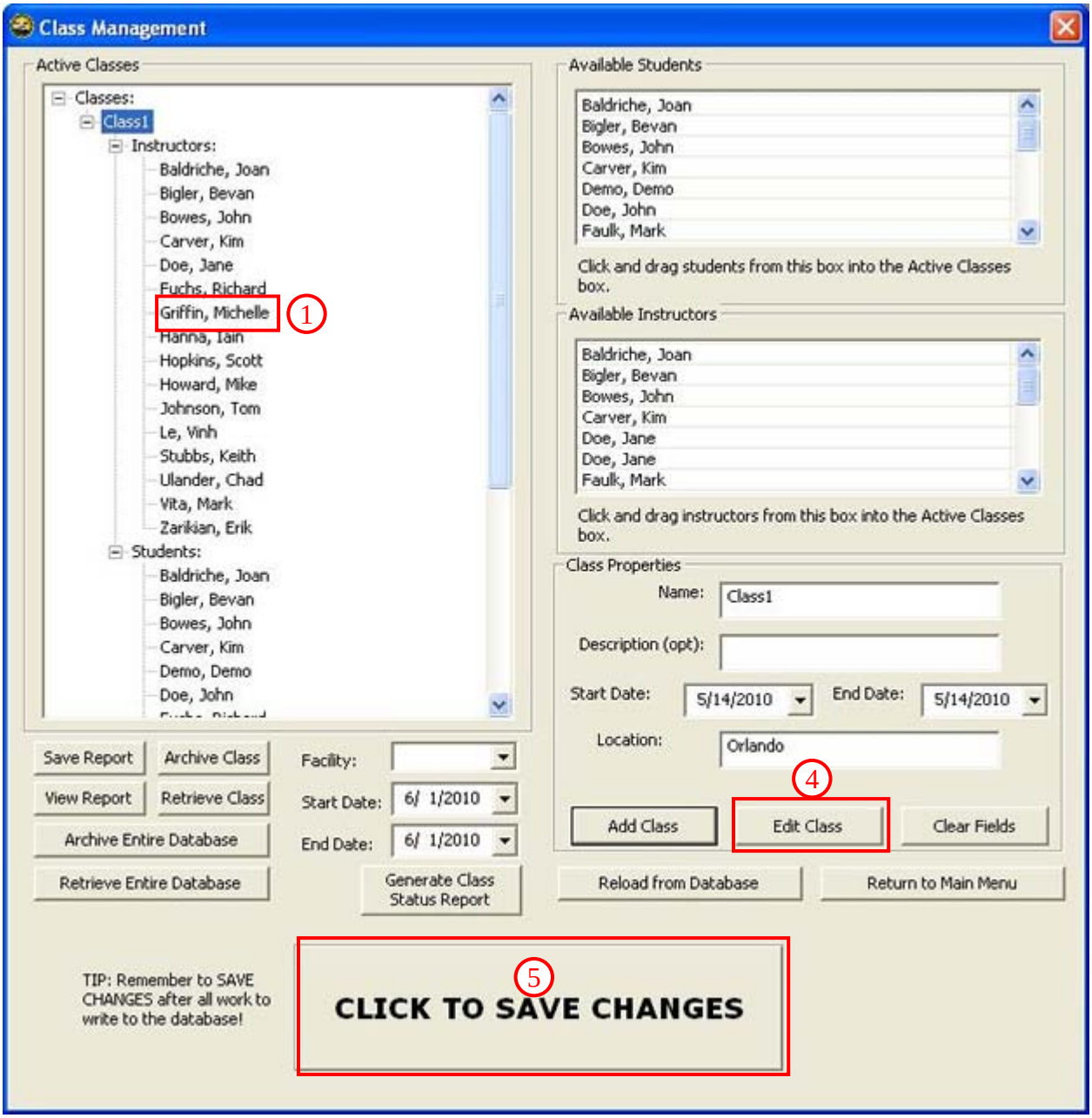



**Figure 82. Class Management - Edit Class**

6. A prompt is displayed detailing the addition/changes (Figure 83). Click the [SAVE] button to confirm.

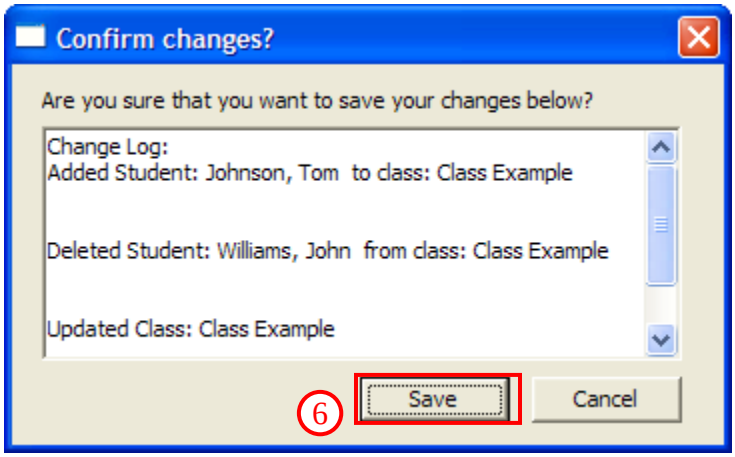



**Figure 83. Class - Confirm Changes Dialog**

#### 2.4.7.3 View Report

The report summarizes the class information such as dates, scenarios, students, passed, score, mileage, fuel used, time and vehicle. Some statistical information is also calculated. See Figure 85.

1. Select a class from the *Active Classes* list (Figure 84).
2. Click the [VIEW REPORT] button.

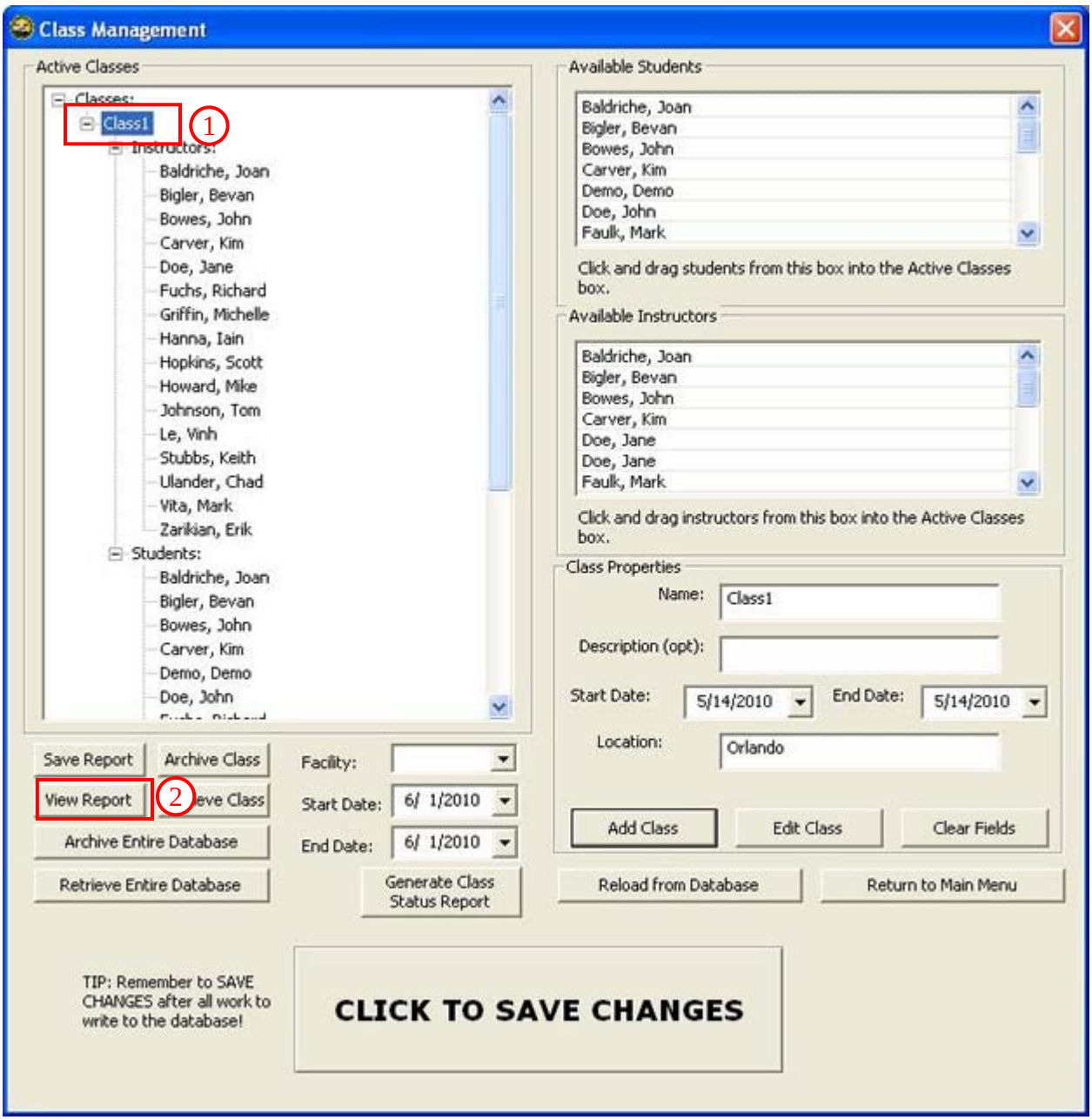



**Figure 84. Class Management - View Report**

STUDENT CLASS REPORT

Facility Name: Orlando

Current Date: Tuesday, June 01, 2010

Class Name: Class1

Class Duration: Friday, May 14, 2010 - Friday, May 14, 2010

Instructors: Baldriche, Joan; Bowes, John; Bigler, Bevan; Carver, Kim; Doe, Jane; Fuchs, Richard; Griffin, Michelle; Hanna, Iain; Hopkins, Scott; Howard, Mike; Johnson, Tom; Le, Vinh; Stubbs, Keith; Ulander, Chad; Vita, Mark; Zarikian, Erik;

| Student | Attempts (Free / Programmed) | Times Passed | Average Score | Total Mileage (Free / Programmed) | Fuel used (gal) | Total Time (Free / Programmed) | Total Network Time (Free / Programmed) |
|---|---|---|---|---|---|---|---|
| Baldriche, Joan | Student was absent from class or training log missing | | | | | | |
| Bigler, Bevan | Student was absent from class or training log missing | | | | | | |
| Bowes, John | Student was absent from class or training log missing | | | | | | |
| Carver, Kim | Student was absent from class or training log missing | | | | | | |
| Demo, Demo | Student was absent from class or training log missing | | | | | | |
| Doe, John | Student was absent from class or training log missing | | | | | | |
| Fuchs, Richard | Student was absent from class or training log missing | | | | | | |
| Griffin, Michelle | Student was absent from class or training log missing | | | | | | |
| Hanna, Iain | Student was absent from class or training log missing | | | | | | |
| Hopkins, Scott | Student was absent from class or training log missing | | | | | | |
| Howard, Mike | Student was absent from class or training log missing | | | | | | |
| Johnson, Tom | Student was absent from class or training log missing | | | | | | |
| Le, Vinh | Student was absent from class or training log missing | | | | | | |
| McCall, Joe | Student was absent from class or training log missing | | | | | | |
| Stafford, Todd | Student was absent from class or training log missing | | | | | | |
| Stubbs, Keith | Student was absent from class or training log missing | | | | | | |
| Ulander, Chad | Student was absent from class or training log missing | | | | | | |
| Vita, Mark | Student was absent from class or training log missing | | | | | | |
| Witter, Joshua | 8 (0 / 8) | 1 | 80 | 0.3 (0 / 0.3) | 0 | 00:01:55 (00:00:00 / 00:01:55) | 00:00:00 (00:00:00 / 00:00:00) |
| Zarikian, Erik | Student was absent from class or training log missing | | | | | | |

Statistics

| Total Attempts (Free / Programmed) | Total Mileage (Free / Programmed) | Total Time (Free / Programmed) | Total Networked Time (Free / Programmed) | Total Fuel Used (gal) | Times Passed (%) | Average Class Score |
|---|---|---|---|---|---|---|
| 8 (0 / 8) | 0.3 (0 / 0.3) | 00:01:55 (00:00:00 / 00:01:55) | 00:00:00 (00:00:00 / 00:00:00) | 0 | 1 (1/8 - 12.5%) | 80 |

**Figure 85. Student Class Report**

#### 2.4.7.4 Save Report

1. Select a class from the *Active Classes* list (Figure 86).
2. Click the [SAVE REPORT] button.

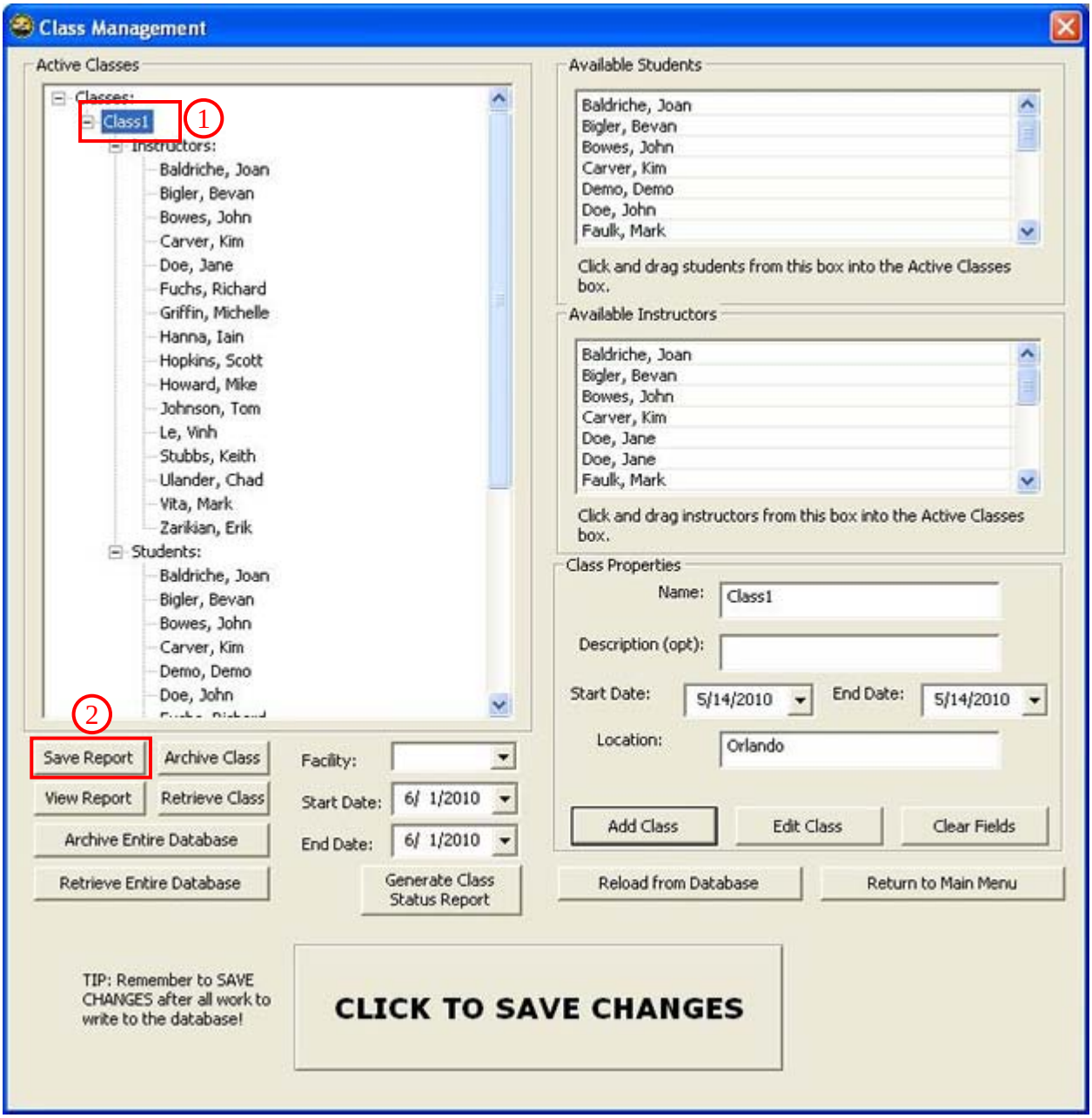



**Figure 86. Class Management - Save Report**

3. A Save As dialog is displayed (Figure 87). Navigate to the desired save location, enter a File name and click the [SAVE] button.

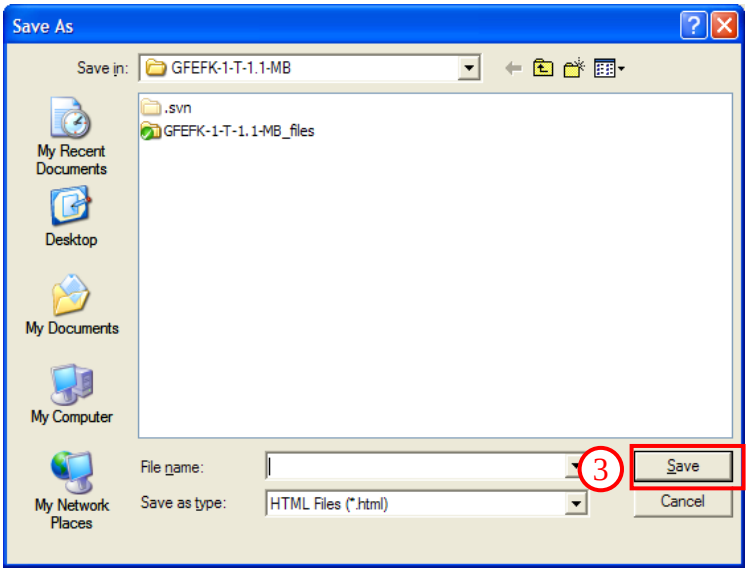



**Figure 87. Save Report - Save As Dialog**

### 2.4.7.5 Archive Class

Archive moves a class from the active portion of the database to an inactive area where it can be accessed at a later time, such as the PC hard drive or a CD-ROM. Archive captures/saves class(es) information at a point in time. Archiving is useful for maintaining permanent records of a class(es) on a daily, weekly, monthly, etc., basis. This allows the database to be purged of obsolete data but a record of the data remains preserved.

1. Select a class from the *Active Classes* list (Figure 88).
2. Click the [ARCHIVE CLASS] button.

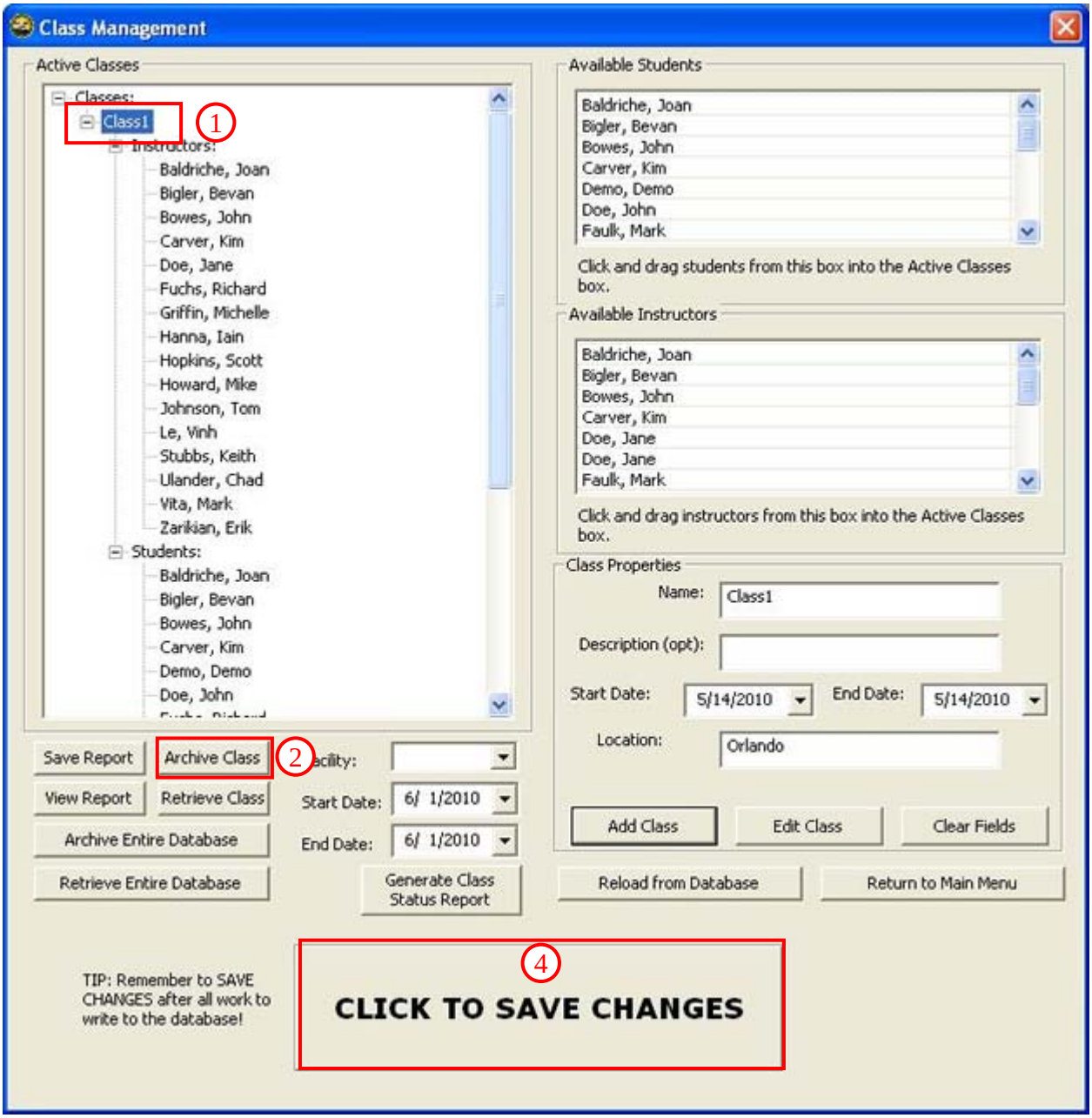



**Figure 88. Class Management - Archive Class**

3. A Save As dialog box is displayed (Figure 89). Navigate to the desired save location, enter a File name and click the [SAVE] button.
4. Click on the [CLICK TO SAVE CHANGES] button (Figure 88).

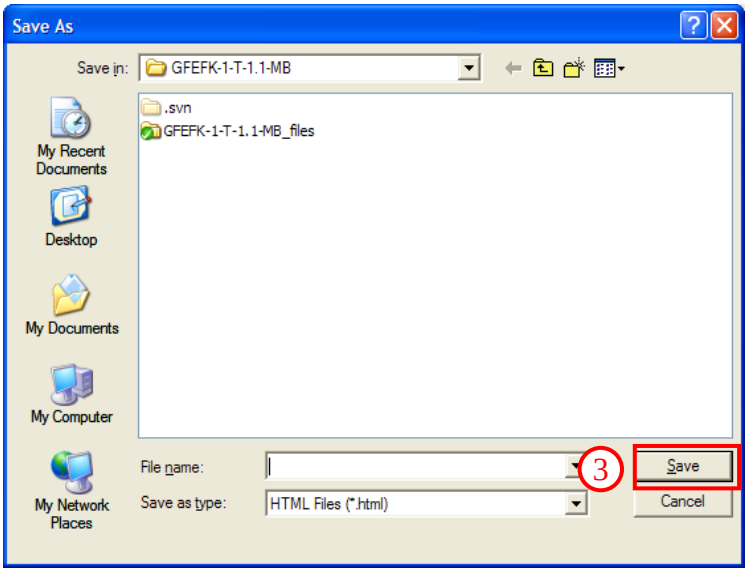



**Figure 89. Archive Class - Save As Dialog**

### 2.4.7.6 Archive Entire Database

Archive moves the active portion of the database to an inactive area where it can be accessed at a later time, such as the PC hard drive or a CD-ROM.

1. Click the [ARCHIVE ENTIRE DATABASE] button (Figure 90).

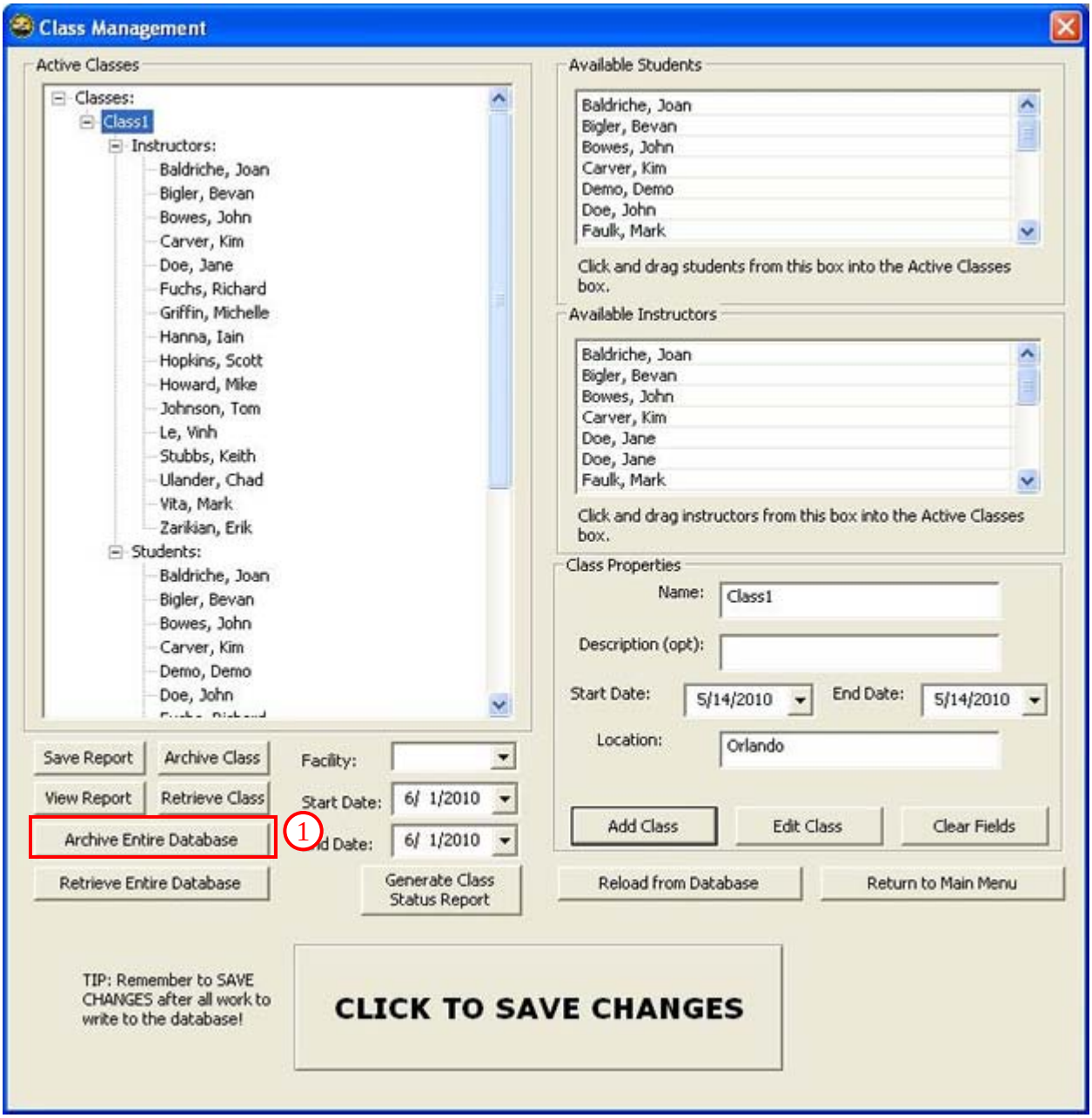



**Figure 90. Class Management - Archive Entire Database**

2. A *Save As* dialog is displayed (Figure 91). Navigate to the desired location, enter a File name and click the [SAVE] button.

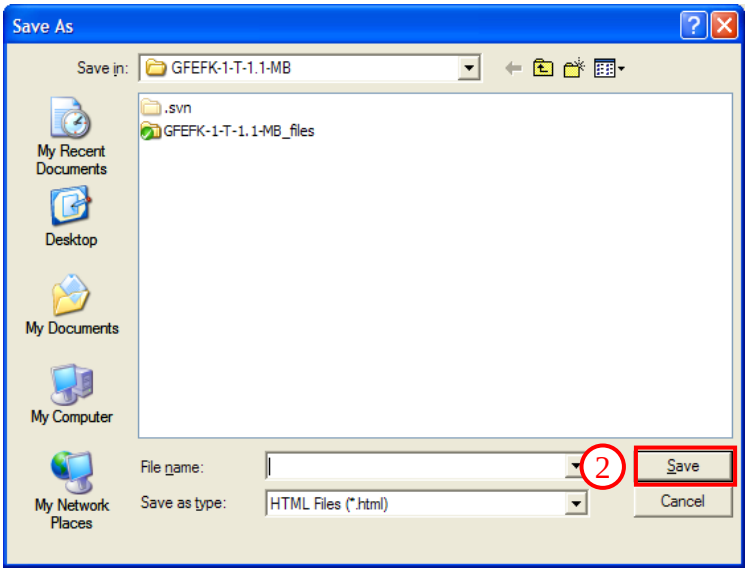



**Figure 91. Archive Entire Database - Save As Dialog**

### 2.4.7.7 Retrieve Class

The Retrieve Class option loads archived data back into the database. This is useful for restoring accidental database deletions/corruptions or reviewing data from a previous point in time.

1. Click the [RETRIEVE CLASS] button (Figure 92).

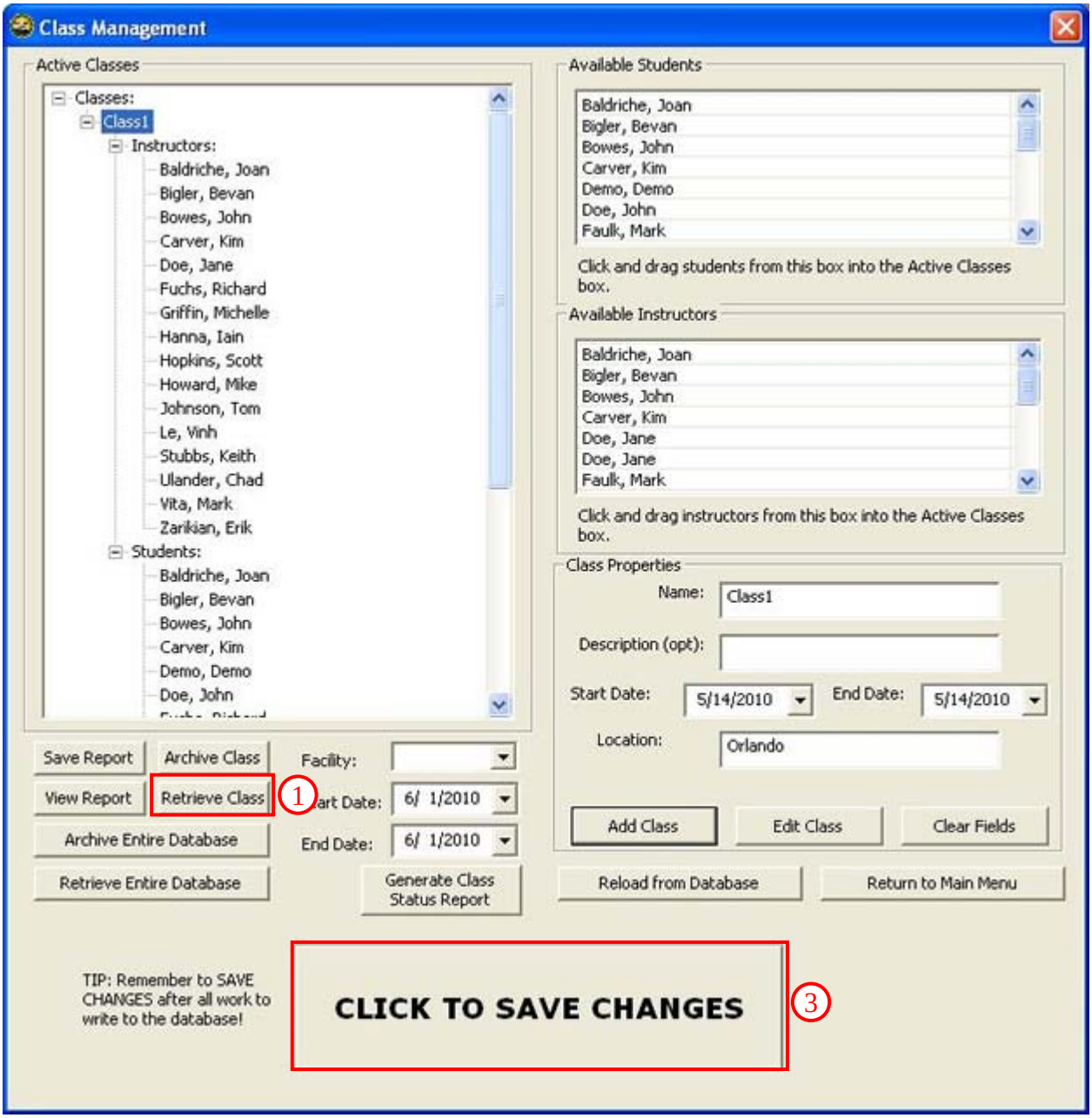



**Figure 92. Class Management - Retrieve Class**

2. An Open dialog box is displayed (Figure 93). Navigate to the desired location, select a File name and click the [OPEN] button.

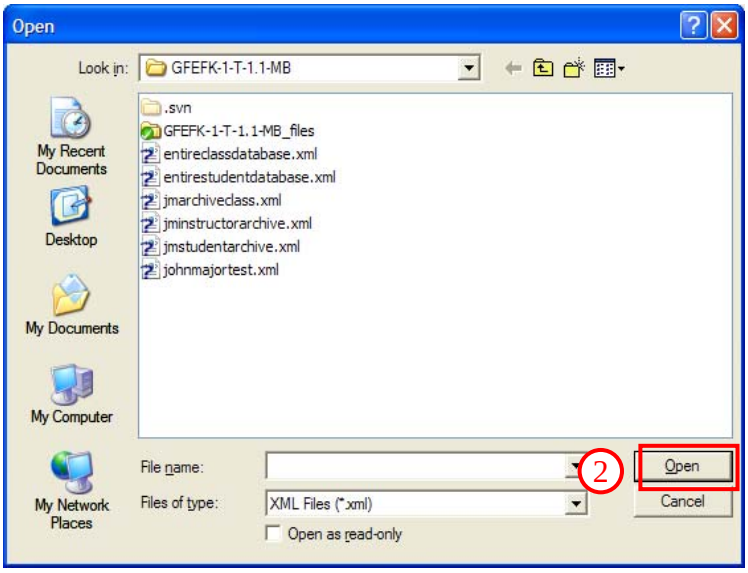



**Figure 93. Retrieve Class - Open Dialog**

3. Click the [CLICK TO SAVE CHANGES] button.

#### 2.4.7.8 Retrieve Entire Database

1. Click the [RETRIEVE ENTIRE DATABASE] button (Figure 94).

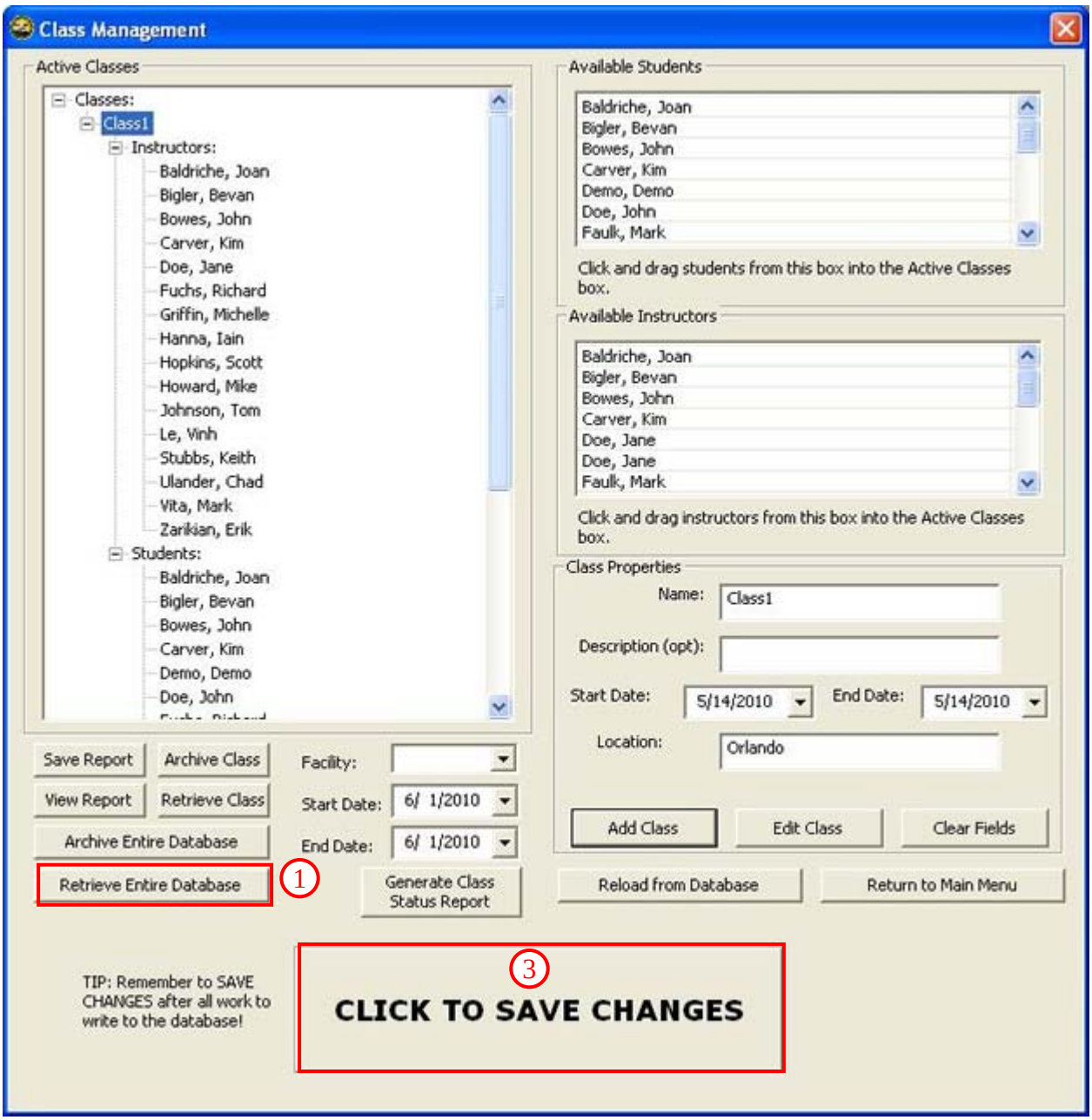



**Figure 94. Class Management - Retrieve Entire Database**

2. An Open dialog box is displayed (Figure 95). Navigate to the desired location, select a File name and click the [OPEN] button.

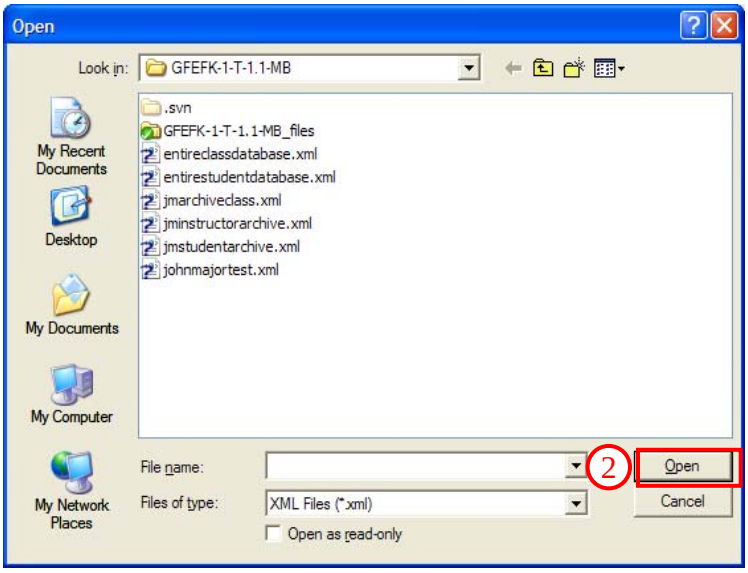



**Figure 95. Retrieve Entire Database - Open Dialog**

3. Click the [CLICK TO SAVE CHANGES] button.

#### 2.4.7.9 Reload From Database

Reloads the class data from the database at the point of the last database save. Useful for discarding erroneous edits without risk of saving to the database.

1. Click the [RELOAD FROM DATABASE] button (Figure 96) to reload all data from the database.

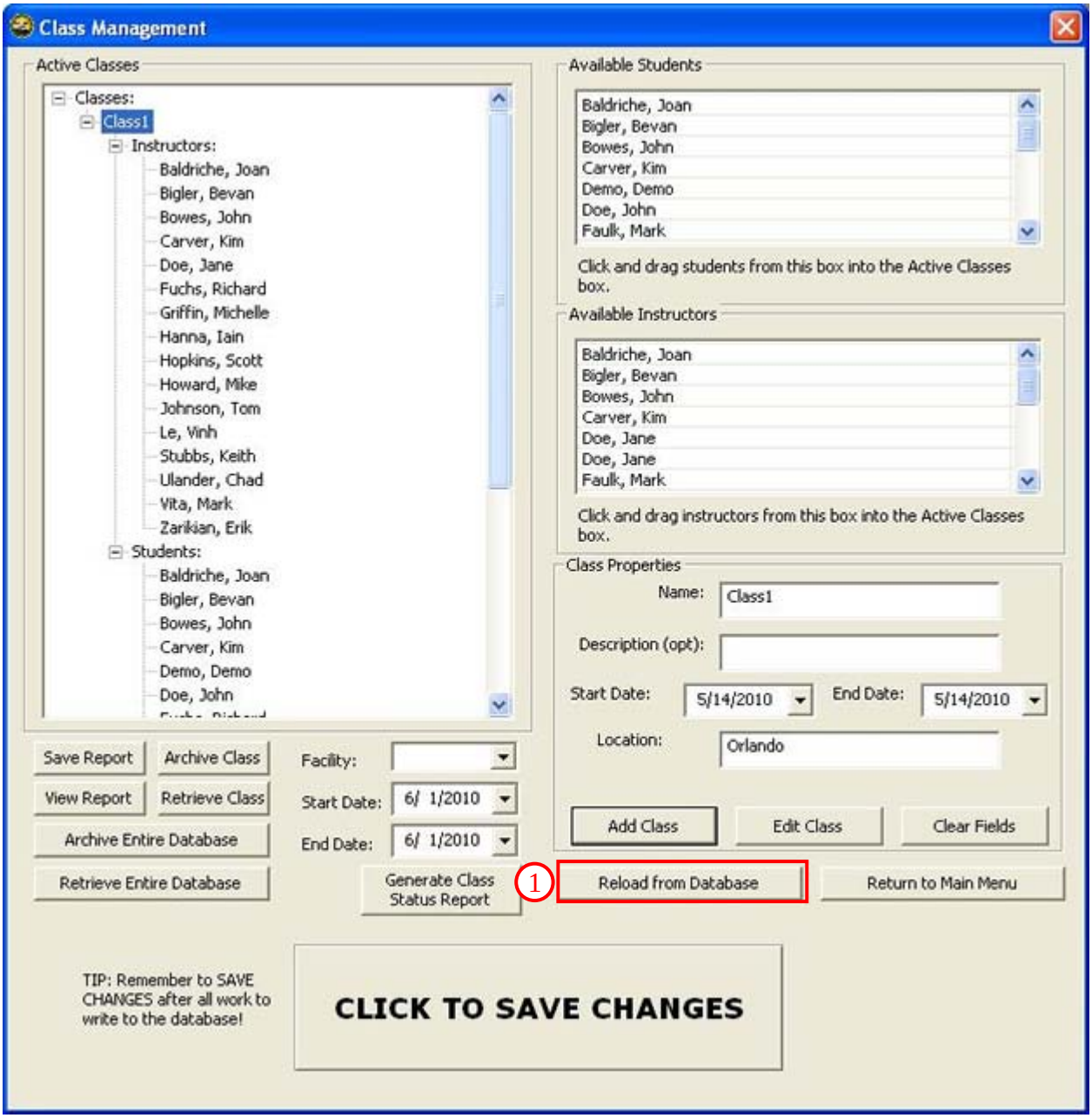



**Figure 96. Class Management - Reload From Database**

### 2.4.7.10 Generate Class Status Report

The report summarizes the class information for a specific facility for a specified time period. Information such as dates, number of scripted and nonscripted scenarios, number of students, passed, total mileage, total fuel used, total number of training sessions and total time is listed. Some statistical information is also calculated. The report contains the same information as listed in Figure 85.

1. Select the desired facility.

2. Click the drop-down arrow on the **Start Date** and select the desired begin date for the report. The date can also be typed manually in the date field (Figure 97).
3. Click the drop-down arrow on the **End Date** and select the desired end date for the report. The date can also be entered manually in the date field.
4. Click the [GENERATE CLASS STATUS REPORT] button, the report is then displayed (Figure 98). The report can be saved by using the *File/Save As* menu option in the Windows Explorer screen.

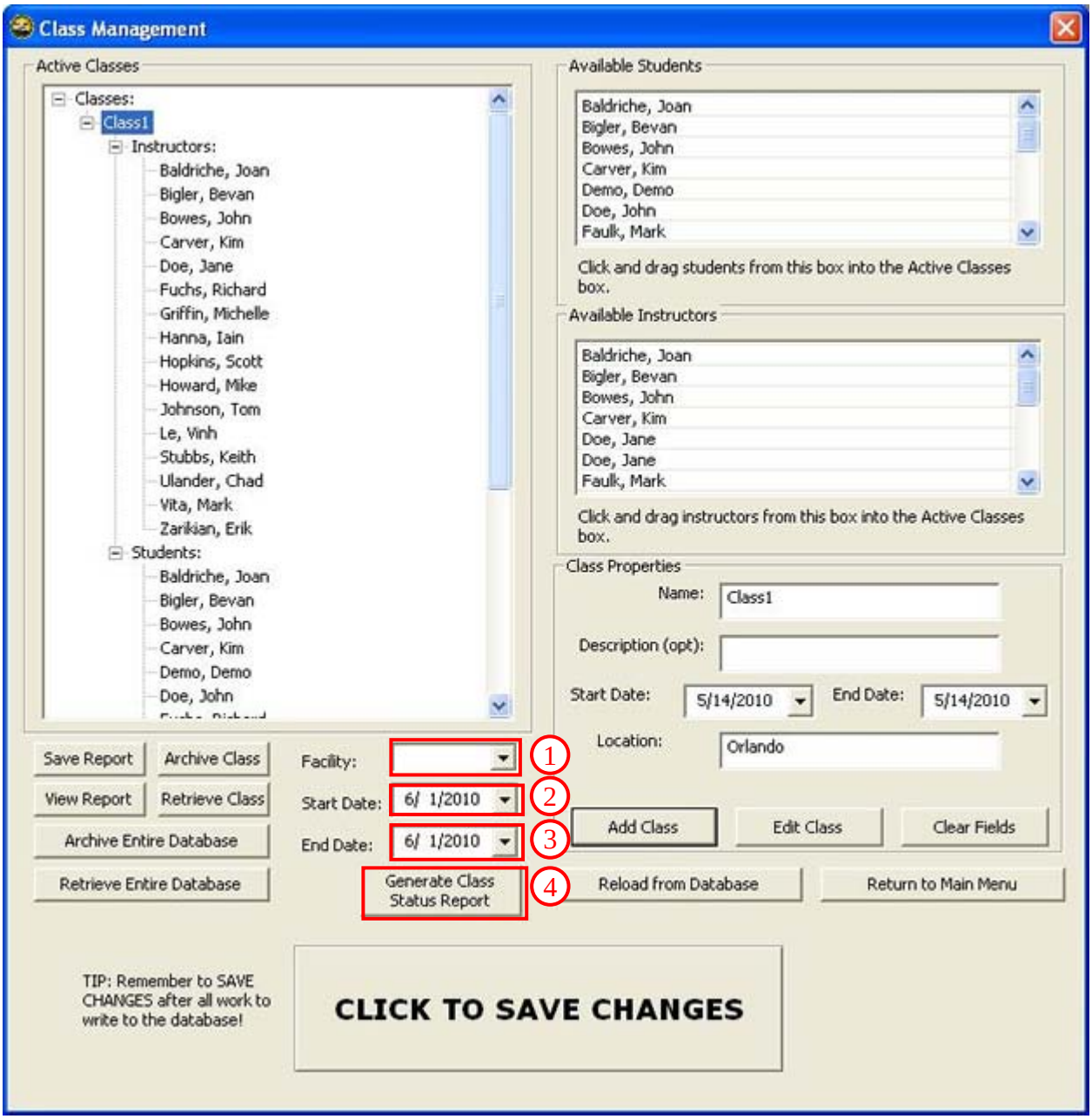
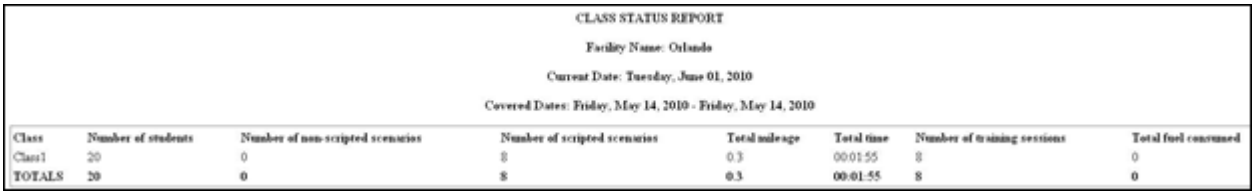



**Figure 97. Class Management - Generate Report**



CLASS STATUS REPORT

Facility Name: Orlando

Current Date: Tuesday, June 01, 2010

Covered Dates: Friday, May 14, 2010 - Friday, May 14, 2010

| Class | Number of students | Number of non-scripted scenarios | Number of scripted scenarios | Total mileage | Total time | Number of training sessions | Total fuel consumed |
|---|---|---|---|---|---|---|---|
| Class1 | 20 | 0 | 8 | 0.3 | 00:01:55 | 8 | 0 |
| TOTALS | 20 | 0 | 8 | 0.3 | 00:01:55 | 8 | 0 |

**Figure 98. Class Management – Class Status Report**

### 2.4.7.11 Clear Fields

1. Click the [CLEAR FIELDS] button (Figure 99).
2. All data in the *Instructor Properties* group fields are cleared.

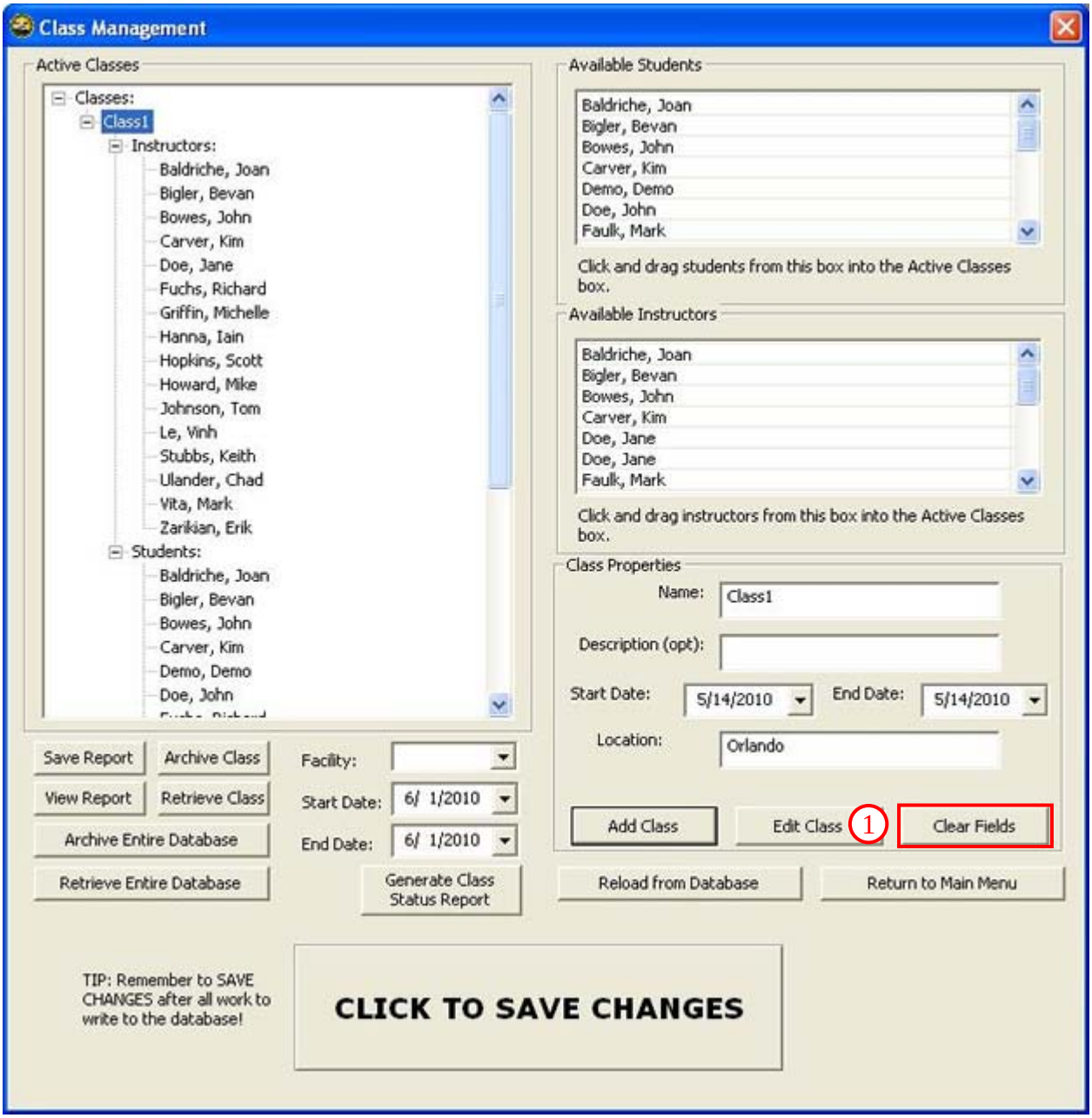



**Figure 99. Class Management - Clear Fields**

### 2.4.7.12 Return to Main Menu

1. Click the [RETURN TO MAIN MENU] button (Figure 100) to close the screen and return to the Main Menu.

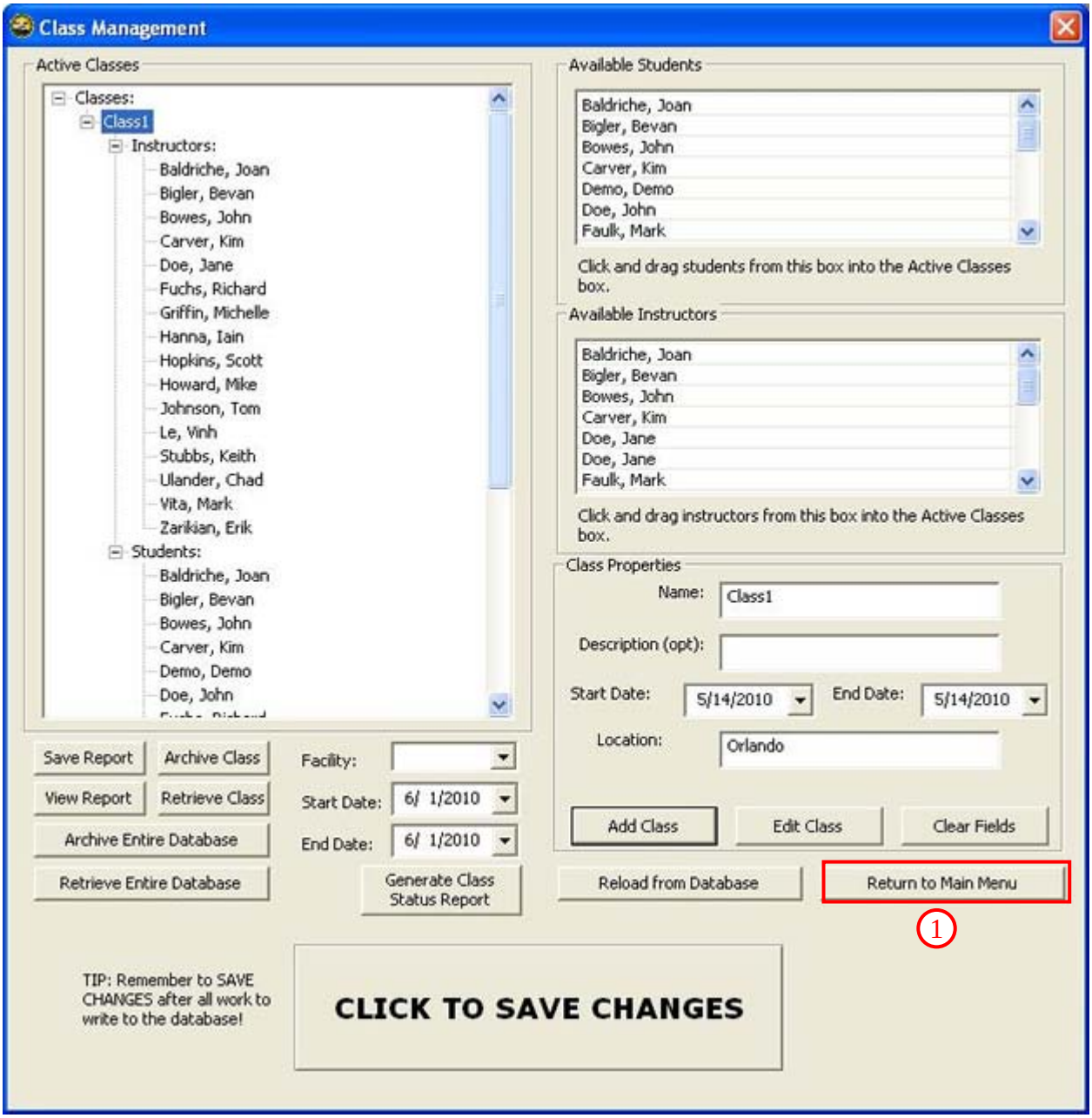



**Figure 100. Class Management - Return to Main Menu**

## 2.5 IOS Application

The Instructor/Operation Station (IOS) application functions are described in the following sections, beginning with projector setup.

## 2.5.1 Power Up Projectors

**NOTE**

The following procedures assume the Operator/Instructor has access to the original installation disks. If the disks are not available, download the software from the various manufacturer websites and follow their instructions.

### 2.5.1.1 Epson

For fixed site systems, the projectors can be controlled from the IOS PC depending on the CDT system (Lot 1 - EPSON Projector Control Software (EMP); Lot 2 - bitLogix NetControl Advanced 1.9; MRAP MTF - ProjectorNet). The projector control panel can be accessed by either clicking on the green icon in the Windows taskbar in the lower right corner (Figure 101) by the time or by selecting the Windows [START] button in the lower left corner of the desktop, select Programs menu, then the Epson EMP menu, and finally the EMP icon. The main Projector Control Panel will appear (Figure 102). To start the projectors select the CDT icon in the EMP application window, then select the red power icon on the EMP application toolbar. To shutdown the projectors select the CDT icon in the EMP application window, and then select the gray and black power icon in the EMP application toolbar. Additional information can be found in the Epson Projector Users Guide and Epson Projector Control Panel Users Guide.


**Figure 101. Projector Windows Taskbar Icon**

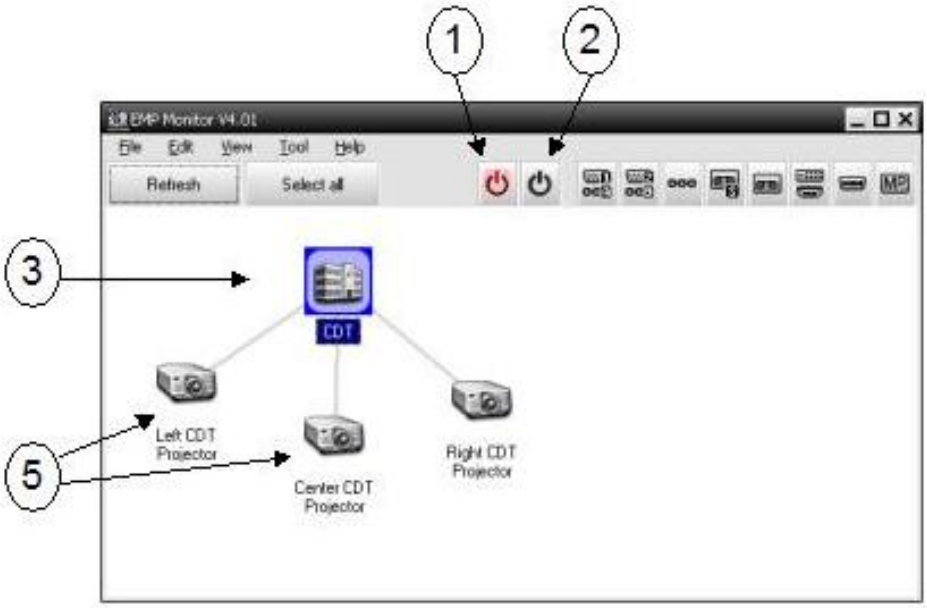



**Figure 102. Projector Control Panel**

**Table 10. Projector Control Panel**

| Item | Description |
|---|---|
| 1 | [ON] button |
| 2 | [OFF] button |
| 3 | Projector group (Select to be able to turn on all projectors together) |
| 5 | Projectors |

#### 2.5.1.2 InFocus and Proxima

Use the following procedure for the systems with InFocus software.

1. Double-click the ProjectNet icon on the IOS desktop.
2. Click the [DEVICE CONTROL] button on the toolbar.
3. From the Control Manager window, click the [POWER ON] button on the upper right corner of the window. Active monitors are indicated with a green light. Inactive monitors show a red light.
4. Click CLOSE to close the Control Manager window.
5. Close the InFocus ProjectorNet program by clicking the Windows red X.
6. When prompted to save changes, select NO.

**NOTE**

If all of the projectors are red (not active), click the Root System icon on the left pane. Next, press F11 to test the connections. A warning screen appears if any projectors are not reachable over the network. If any projectors are not available, contact LCCS for maintenance.

## 2.5.2 IOS Application Startup

To launch the IOS application, double click the IOS icon on the IOS screen.

## 2.5.3 Simulation Assets Readiness and Allocation (SARA) Screen

After clicking on the IOS icon, wait until the Simulation Assets Readiness and Allocation (SARA) screen appears (Figure 103). The SARA screen verifies that key system components are properly initialized and ready for operation. There are two modes: Stand-Alone and Networking. The default mode is Stand-Alone. To access the Networking mode, click the [NETWORKING MODE] button.

### 2.5.3.1 Stand-Alone Mode

In Stand-Alone mode (default) the only available STS and repeater are those that are currently attached to the IOS and displayed in the SARA dialog box (Figure 103). To access the Networking mode, click the [NETWORKING MODE] button.

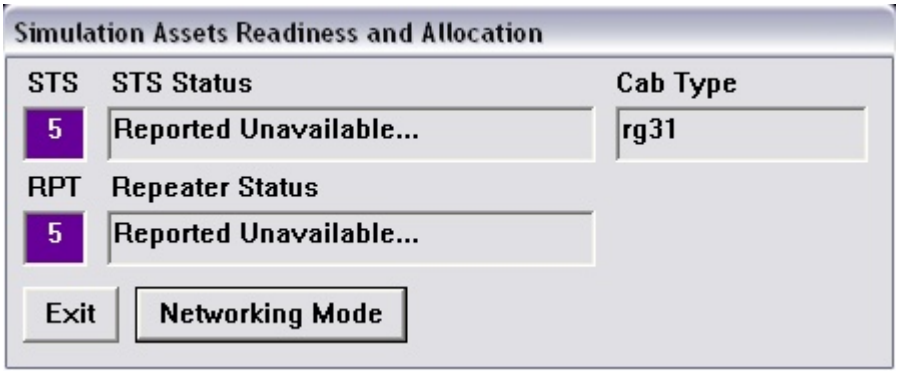



**Figure 103. SARA Screen – Stand-Alone Mode**

### 2.5.3.2 Networking Mode

In Networking mode, all networked STSs and repeaters are available for use, unless in use by another IOS. There is one IOS per each STS. Networking mode allows multiple and simultaneous exercises. “Platoon Networks” can be established where individual STSs are grouped to form a single exercise. In this case, a single “Master IOS” can control as many as eight STSs, as shown in Figure 104.

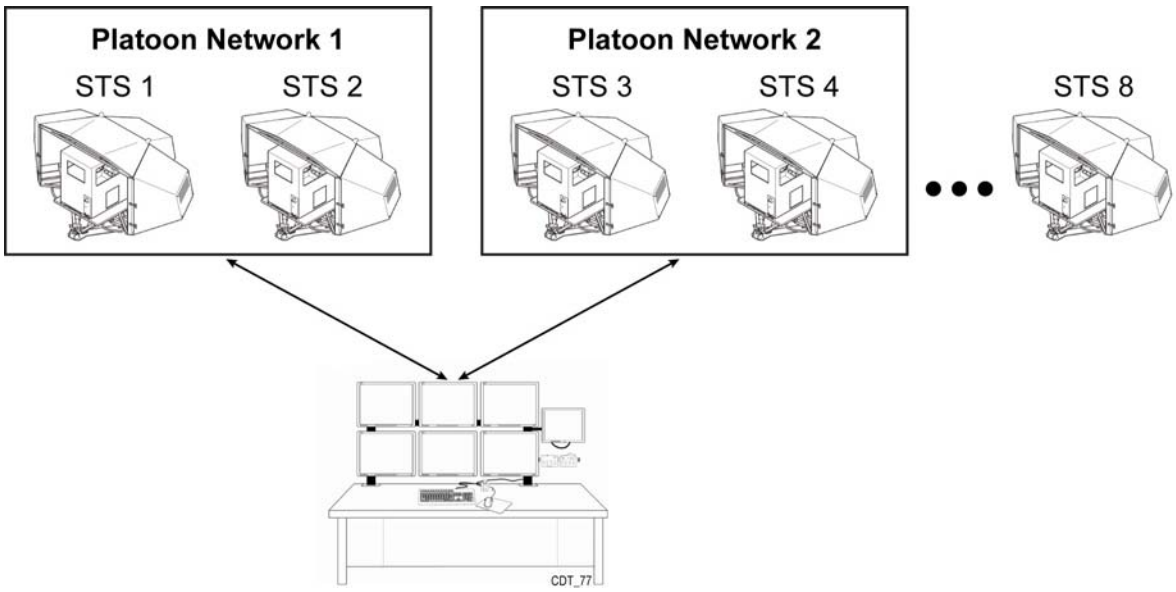



**Figure 104. Networking Mode**

The following information appears on the SARA screen (Figure 105) after entering the Networking Mode:

**STS Area**

**STS Num Column**: The STS Num column contains a number surrounded by a unique color that represents each individual STS that is under the control of the IOS (Figure 105).

**STS Status Column**: The STS Status column is represented by a text box, and displays the status of the connection to an individual STS.

There are three possible outcomes from a SARA:

1. **Initialization Successful** - A standard SARA sequence will show the simulator(s) CONNECTED and then INITIALIZED (Figure 105), and the Cab Type column will display the variant and its configuration. Upon successful initialization, the [LOAD SCENARIO] button becomes active. Click on the [LOAD SCENARIO] button to go to the next step.
2. **Initialization Failure** – An error message for the status appears. All possible SARA messages are shown in Table 11.
3. **Cab Configuration Failure** – An error message for the cab configuration or variant appears.

After all simulators have connected to the IOS and show INITIALIZED in their status window, press the [LOAD SCENARIO] button (Figure 105).

**STS Cab Type Column**: The STS Cab Type column represents the cab configuration of the individual STS.

**STS Network Column**: The STS Network column contains [CONNECT/DISCONNECT] buttons required to connect to or disconnect from each STS.

## Repeater Area

The Repeater area corresponds to the repeater monitor at the IOS, therefore it is represented differently compared to the STSs. The repeater selected in this area displays the current exercise/scenario on the Stealth view monitor.

**REPEATER Num Column**: The REPEATER Num column contains a number surrounded by a unique color that represents each STS stealth view/repeater that is under the control of the IOS (Figure 105).

**REPEATER Status Column**: The REPEATER Status column is represented by a text box, and displays the status of the connection to an individual STS stealth view/repeater.

**REPEATER Network Column**: The REPEATER Network column contains [CONNECT/DISCONNECT] buttons required to connect to or disconnect from each STS stealth view/repeater.

Note that the STSs automatically display their availability. An exercise has at least one STS and will run one scenario. A single scenario will run for up to eight STSs. The scenario must support the total number of selected STSs. If the scenario supports it, all vehicles can see and interact with each other. To manually refresh the screen, select the [DISCOVER STSs] button.

### 2.5.3.3 Running a Scenario in Networking Mode

1. When running a scenario in Networking mode, select from 1-8 STSs and 0-8 repeaters (a minimum of one STS; no repeaters are required).
2. Once the STSs and repeaters have been selected, and their status is INITIALIZED, a [LOAD SCENARIO] button appears at the bottom of the SARA dialog box. Click the [LOAD SCENARIO] button to begin the exercise (Figure 105).


**Figure 105. SARA Screen – Networking Mode**

### 2.5.4 IOS Error/Status Messages

When an error or status message occurs, one of the following descriptions will be identified with quotation marks.

**Table 11. IOS Error/Status Messages**

| | |
|---|---|
| **Connecting...** | The IOS has initiated communication between the IOS and the STS. |
| **Connected** | The STS checked itself and determined that all STS nodes are ready. |
| **Resetting App...** | This message appears when there is a state mismatch between the IOS and STS. The STS computer is reset to match states. The user would see this message if the IOS crashed and was restarted. |
| **Not Connected** | (Fatal error, recheck possible) The application isn't running on the STS or the IOS can't communicate with the STS.<br>"This error indicates the IOS computer cannot communicate with the top level STS computer. Please check the following: The pod net hub, the patch cables from the hub to the IOS and the STS power." |
| **VC Connect Error** | (Fatal error, recheck possible) Not all STS nodes are ready to run the simulator.<br>"The top level STS computer cannot communicate with the sub level computers. Check power, hub, and cables." |
| **Unknown client** | (Fatal error, recheck possible) An unknown client has control of the STS application.<br>"This STS is under the control of another IOS like program." |
| **NETMAN failed** | (Fatal error, recheck possible) The network manager couldn't load all of the necessary environmental variables. The user should see this message only if the STS is improperly configured.<br>"NETMAN couldn't load all of the necessary environmental variables, restart NETMAN." |
| **Generic Error** | (Fatal error, recheck NOT possible) A generic error occurred. |
| **Server X failed** | (Fatal error, recheck possible) Where X can be EXEC, CABI, CABO, NETMAN, COLL, EDE, DATMAN, VEH, VIS, MOTION, SOUND, REPLAY or Replay Server.<br>Indicates that the given server returned an error. "One of the servers failed. Contact LCCS support personnel." |
| **Initialized** | The STS completed initialization. |
| **Init Failed, generic error** | (Fatal error, recheck possible) A generic error occurred while the STS was initializing.<br>"The IOS was initially able to communicate with the STS but for some reason the connection was lost. Contact LCCS support personnel." |

### 2.5.5 IOS Fatal Exception Error

If the following error message appears on the IOS, follow the instructions in the message to ensure that the problem is properly documented and sent to the system administrator. The recommended action is to select the [YES] button, thereby closing the current IOS session.


**Figure 106. IOS Fatal Exception Error**

### 2.5.6 IOS E-STOP Warning Messages

The following E-STOP-related warning messages may appear at the Instructor Operator Station (IOS):

This warning message appears if the E-STOP button has been pressed, causing the motion base to halt. Follow the directions in the message.


**Figure 107. Motion Base Warning Message**

This warning message appears if the E-STOP button has been pressed and the steering smartnode has been halted. This message can also occur if an unexpected status is returned by the smartnode. Follow the directions in the message.

**NOTE**

The E-STOP at the IOS will not shut down the smartnode.


**Figure 108. Smartnode Warning Message**

This message will appear at the IOS if the seatbelt or the cab door is not correctly fastened, or if a fixed-site fire detector has been tripped. Follow the directions in the message.


**Figure 109. Seatbelt/Interlock/Fire Detector Warning Message**

### 2.5.7 Instructor Login Procedures

1. Type the instructor's identification number in "Instructor ID#" field shown in (Figure 110) and press [ENTER] on the keyboard or click on the [LOGIN] button on the screen.
2. The Driver Setup screen (Figure 113) will appear with the driver's name shown in parentheses. The instructor may now conduct training exercises.


**Figure 110. Instructor Login Screen**

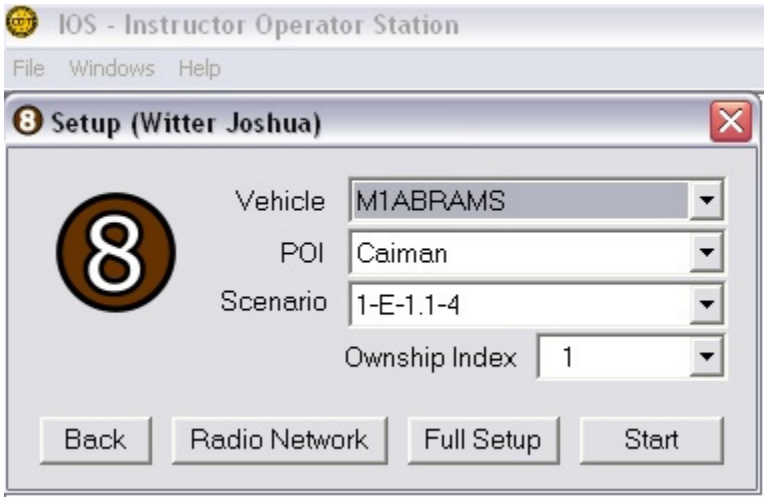



**Figure 111. Driver Setup Screen**

**NOTE**

If you are not established in the Class Manager system as an instructor, notify the System Administrator.

### 2.5.8 Student Login

A Student Login for STS Screen (Figure 113) will appear for each STS controlled by the IOS. The actual STS number is displayed on the screen. Students can log in by swiping their ID card

through the card scanner (Figure 16) located adjacent to each STS trainer or by the instructor manually entering their 9-digit number or driver ID into the Student Login screen at the IOS.

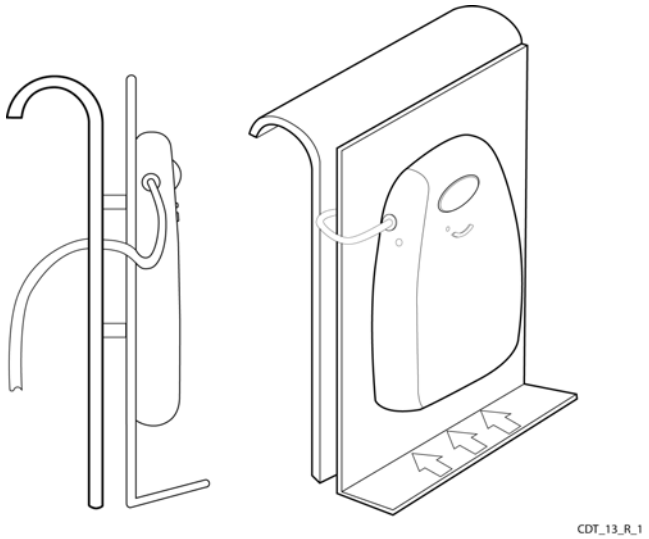



**Figure 112. Student Card Scanner**

The student must login. An error message will appear if a student ID is entered that is not in the records database.

**NOTE**

If the student is not established in the Class Manager system, notify the System Administrator.


**Figure 113. Student Login Screen**

## 2.5.9 Student Training Station (STS)

### 2.5.9.1 Entering the STS

When students enter the STS cab, the Instructor/Operator should ensure the following:

1. The STS is NOT in operation, the red warning light is NOT on, and the motion system is not raised.
2. The surrounding area is clean and clear of obstacles.

3. The platform leading up to the cab driver's door is properly positioned for safe entry.
4. The student is positioned correctly in the driver's seat and, when applicable, the seatbelt fastened.
5. The driver's headset is properly positioned and functional.
6. The driver's door is closed and latched properly.
7. For MTFs only, the door to the Doghouse is closed.
8. For MTFs only, the door to the IOS room is closed.

#### 2.5.9.2 Exiting the STS

When students exit the Student Training Station (STS) cab, the Instructor/Operator should ensure the following:

1. The STS is NOT in operation, the red warning light is NOT on, and the motion system is not raised.
2. The surrounding area is clean and clear of obstacles.
3. The platform leading up to the cab driver's door is properly positioned for safe exit.
4. The driver's headset is properly stowed.
5. The driver's door is closed after exiting.

### 2.5.10 IOS Windows Environment

Successful entry of the Student ID (Figure 113) will yield the Setup screen and place you in the IOS Windows environment.

#### 2.5.10.1 IOS File Menu

The following options are available from the IOS File Menu (Figure 114):

- Logout Instructor – logs out the instructor.
- End Exercise – select the desired exercise to end (Figure 115).
- Exit – closes the program.


**Figure 114. IOS File Menu**

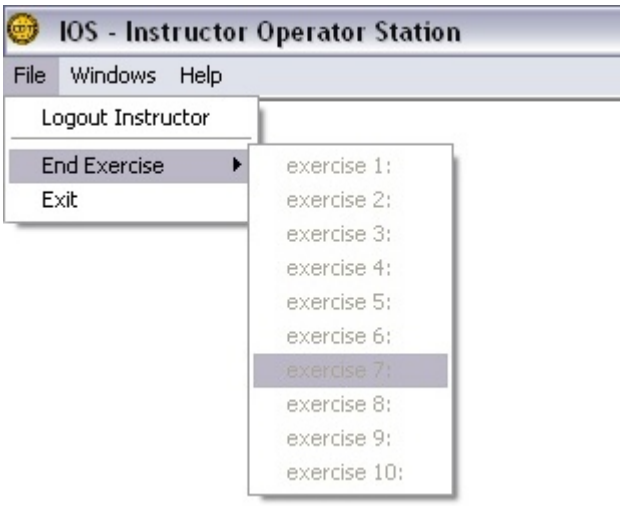



**Figure 115. IOS File Menu – End Exercise**

#### 2.5.10.2 IOS Windows Menu

The IOS Windows menu (Figure 116) lists each STS and its associated IOS screens, such as Gauges or Failures. Each active window is shown with a check mark. Inactive screens and STSs are grayed out. Select the Show All option to show all IOS windows for the selected STS. Select the Hide All option to hide all selected windows for the current STS. Select the SARA Dialog option to access the SARA dialog box.

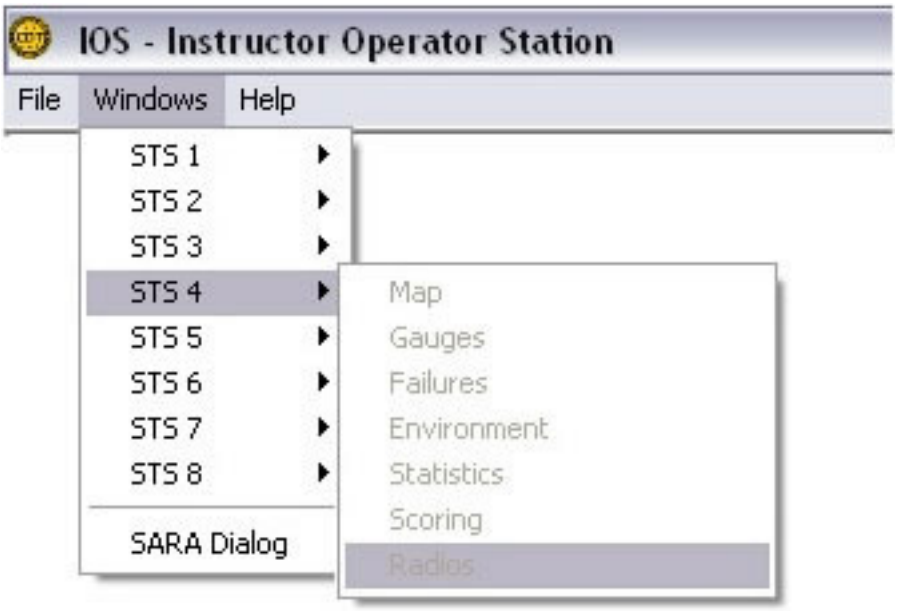



**Figure 116. IOS Windows Menu**

#### 2.5.10.1 IOS Help Menu

The IOS Help menu (Figure 117) contains the following options:

- About IOS – (Figure 118) displays the current IOS configuration and contact information.
- Stats for the IOS – (Figure 119) displays the current mileage and time statistical information for any previously connected STSs. Real-time information for a current exercise can also be captured by opening this screen during an exercise.


**Figure 117. IOS Help Menu**


**Figure 118. About IOS Screen**


**Figure 119. Statistics for this IOS Screen**

### 2.5.11 Setup Screen

A Setup screen (Figure 120) will appear for each STS/student associated with the exercise. Select one of the options listed on this screen:

**Back** – to return to Logout screen.

**Radio Network**- to configure radio communications between the IOS and STS(s).

**Full Setup** – to access the Extended Setup screen.

**Start** – to start the scenario.

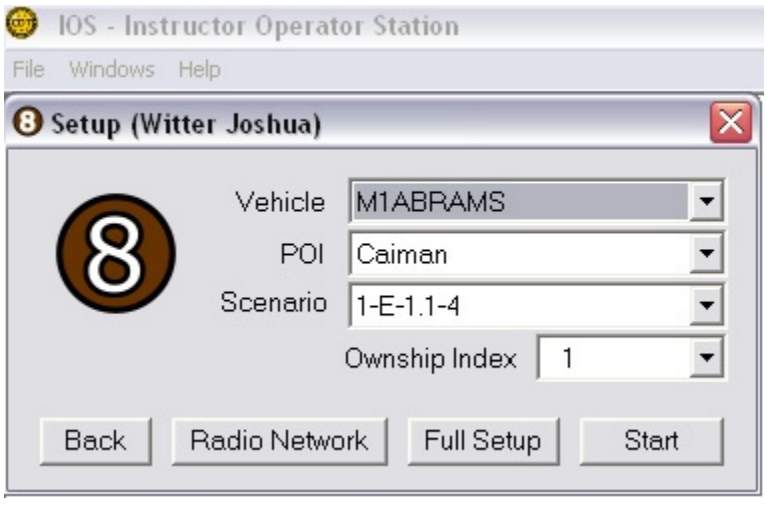



**Figure 120. Setup Screen**

Typically [START] would be selected now to begin training the student. This will run the scenario using the preselected settings.

The scripted scenarios run in their default settings (as originally designed) when selecting [START], ensuring that all of the students drive the scenario under the exact same conditions. Student scoring occurs both during the running of scripted scenarios and during free play. Scenario scoring results are permanently recorded to the student's record in the database.

From the Setup screen, a vehicle type and/or a pre-defined scenario may be selected by scrolling down the list of available vehicles and highlighting the desired vehicle. Make sure to select the Plan of Instruction (POI) associated with the vehicle type. For example, the RG33L vehicle should be matched with the RG33L POI.

The Ownship Index is used to select the ownship of a selected scenario. This maps the driver to the ownship. For stand-alone scenarios, the Ownship Index defaults to 1. For networked scenarios the range is 1-8. Networked scenarios should always start with an Ownship Index value of 1. As additional students are added the Ownship Index increases incrementally (i.e., 2-8).

To accept and run the recommended scenario, press the [START] button.

## 2.5.12 Radio Network

### 2.5.12.1 Radio Network Screen

Select the [RADIO NETWORK] button on the Setup screen (Figure 120) to access the Radio Network screen (Figure 121) and begin configuration of new radio networks by grouping STSs into "Platoon" networks.

1. Type in the desired network name and then click the [CREATE NEW NETWORK] button.
2. Drag and drop one or more STSs from the existing Default Network into the newly created network. A group of two or more STSs is considered a Platoon network.
3. If desired, click the [HIDE] button to hide the Radio Network screen.

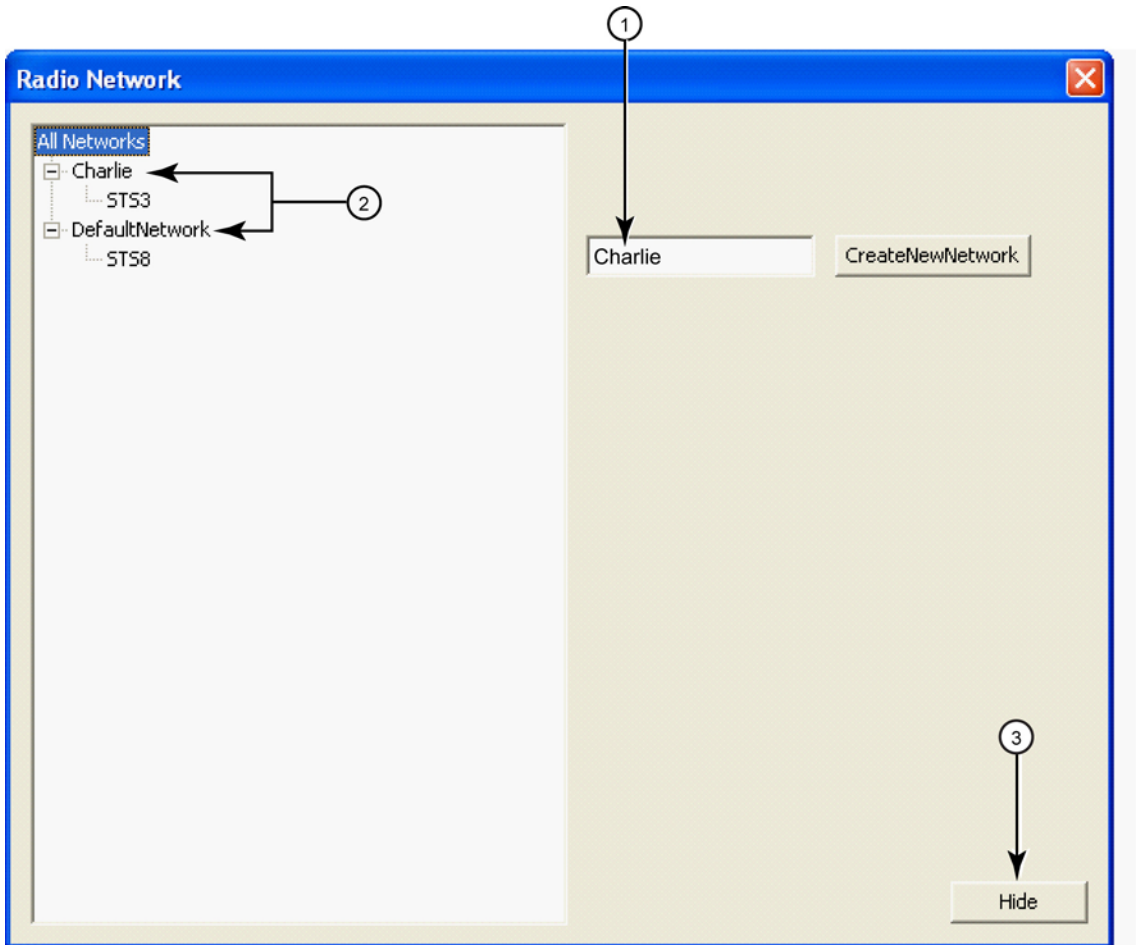



**Figure 121. Radio Network Screen**

### 2.5.12.2 Radio Dialog Screen

Once the radio network is established, the next step is to configure the radio access from the Radio Dialog screen.

1. To access the Radio Dialog screen, select the desired STS and associated Radio option from the IOS Windows drop-down menu (Figure 122).
2. On the Radio Dialog screen, click one or more checkboxes in the STS Name column to activate the radio for the desired STS(s) (Figure 123).
3. To activate all STS radios, click the ALL checkbox.
4. To activate radios for a specific platoon network click the checkbox associated with each network in the Network Index column.

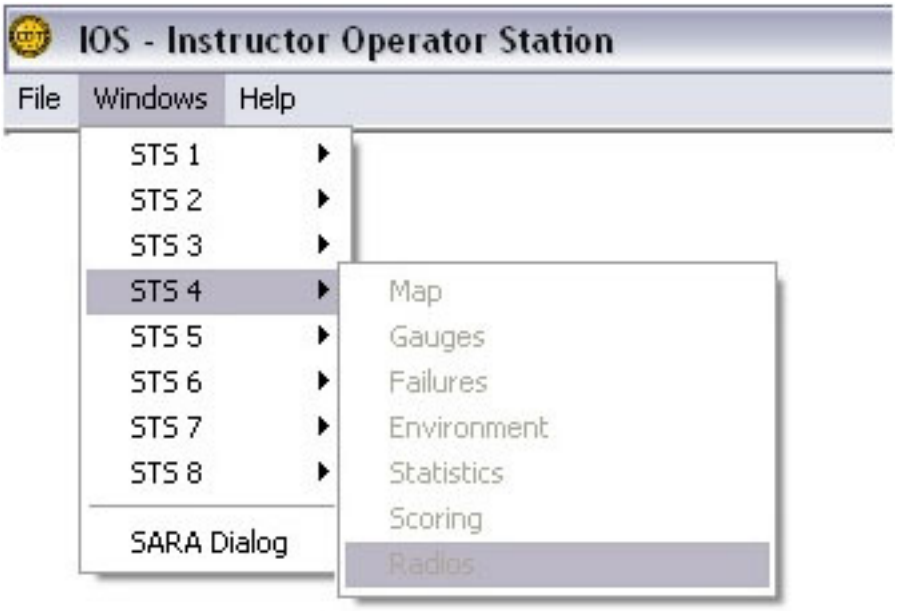



**Figure 122. Accessing the Radio Dialog Screen**

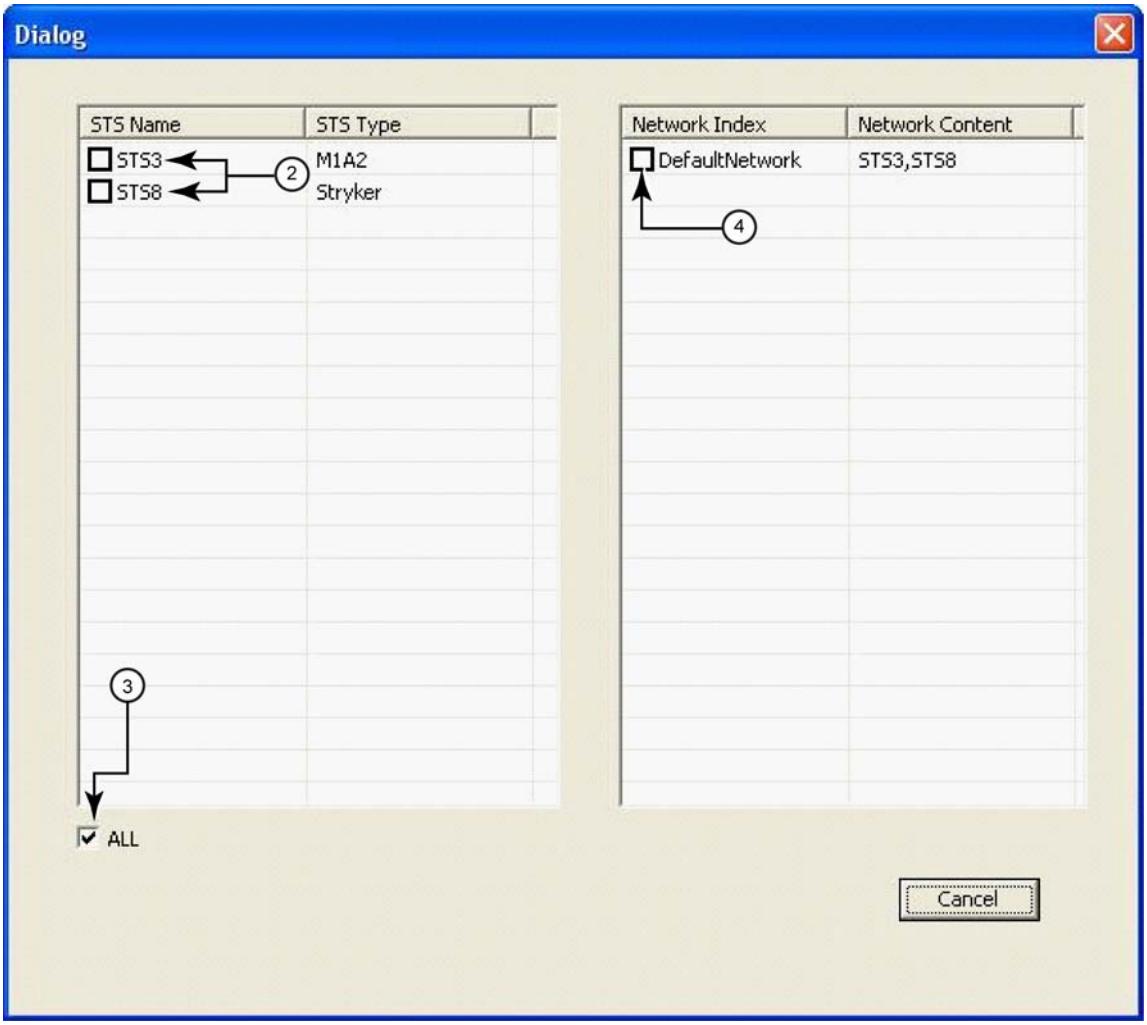



**Figure 123. Radio Dialog Screen**

## 2.5.13 Extended Setup Screen

To modify a scenario, press the [FULL SETUP] button. This action will display the Extended Setup Screen as shown in Figure 124. For a formal training scenario, only certain parameters may be changed. Parameters specific to the particular scenario are not allowed to be changed and are grayed out. Setup options for the Extended Setup screen (Figure 124) are described below.

Options available for setup are discussed based on the order they are organized: from left to right, and from top to bottom on the screen.

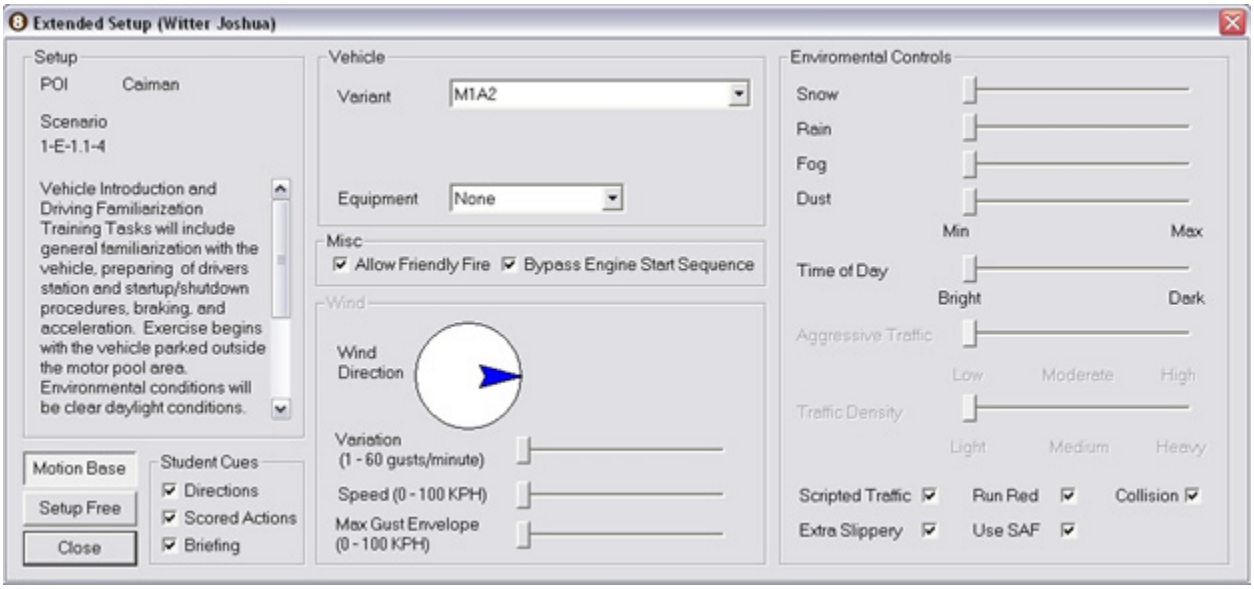



**Figure 124. Extended Setup Screen**

**NOTE**

The **Allow Friendly Fire** option is inoperable but available for future enhancement.

#### 2.5.13.1 Setup Free

To allow modification of any parameter, press the [SETUP FREE] button in the left quadrant of this setup screen. Once the [SETUP FREE] option has been selected, the student scoring information for the scenario will not be saved in the records database.

#### 2.5.13.2 Motion Base

To disable the motion base during a scenario, click the [MOTION BASE] button in the left quadrant of the Setup screen.

#### 2.5.13.3 Student Cues: Directions, Scored Actions and Briefing

The simulator features a digital instructor to support student training. To access the digital instructor, select the Directions checkbox. The digital instructor provides directions to guide the student through the scenario and provides feedback when the student exceeds user-selected thresholds. The digital instructor can be deselected by un-checking the Directions checkbox.

Scored Actions can be deselected by un-checking the Scored Actions checkbox while in Setup Free mode. The student will not receive demerits and no final score will be displayed at the end of an exercise if this checkbox is un-checked. It is recommended that the Scored Actions function should not be deselected prior to driving any of the scenarios.

The Briefing option enables/disables the instructor briefing.

#### 2.5.13.4 Vehicle Options

The instructor can select the vehicle variant. In each case, scroll down to the desired selection and click on it to highlight it. If the instructor closes the Full Setup Screen, reselects a

different vehicle, then re-opens the Full Setup Screen, the Vehicle Options are reset to the default values of the new vehicle type.

#### 2.5.13.5 Wind

Options on defining the wind include direction, number of wind gusts per minute (Variation slider control), nominal wind speed in kilometers per hour (Speed slider control), and maximum wind gusts in kilometers per hour (Max Gust Envelope slider control).

To change the wind direction, place the cursor on the arrow inside the Wind Direction circle and drag it toward the desired position. North is up.

#### 2.5.13.6 Environmental Controls

The top four sliders in the Environmental Controls area control atmospheric effects displayed on the scene: SNOW, RAIN, FOG, DUST, and TIME OF DAY. For each effect, place the cursor on the slider control, press the left mouse button and drag the slider control to the desired position. The visual effect will be displayed on the simulator screens. If an atmospheric slider control is grayed out, one of the other environmental controls is in use. Slider controls must be moved to the left before another environmental effect may be selected. Also, an atmospheric slider control can be locked in the configuration. If they are grayed out, it means that only the Administrator may make changes to those effects.

**NOTE**

Each of these features is mutually exclusive. For instance, the Fog slider must be moved to the minimum value before Rain or Dust can be enabled.

#### 2.5.13.7 Aggressive Traffic

The Aggressive Traffic slider control defines the overall behavior of the vehicles and pedestrians in the immediate vicinity of the vehicle.

**Low:** At this level, the traffic obeys the law all of the time, accelerates moderately, and maintains a large following distance. Also, the following distance increases as the speed limit increases.

**Moderate**: At this level, 70% of the traffic obeys the law and 30% of it is aggressive (pushes the limits of the law).

**High**: At this level, all of the traffic randomly exhibits bad behavior, such as tailgating, merging aggressively, accelerating quickly, failing to yield, and failing to stop completely at intersections. These vehicles will never force a collision with the driver, but may cause the driver to brake suddenly to avoid an accident.

#### 2.5.13.8 Traffic Density

**NOTE**

The Scripted Traffic option must be deselected (unchecked) to use the Traffic Density slider control.

The Traffic Density slider controls the number of vehicles that can operate in the vehicle's immediate vicinity. Up to 40 vehicles can operate there, and they may include cars, motorcycles, and trucks. This does not mean that a specified number of vehicles will constantly be in the driver's view, but it provides an upper limit to the number of vehicles that may appear in driver's view concurrently.

**Light**: At this level, the driver may see up to 10 autonomous vehicles at any one time.

**Medium**: At this level, the driver may see up to 20 vehicles. Pedestrians appear at this level.

**Heavy**: At this level, the driver may see up to 40 vehicles at any time. Pedestrians may appear at this level.

#### 2.5.13.9 Collision / Other Options

Checking and scoring of collisions that occur during a training session can be disabled by un-checking this selection in the lower right corner of the screen.

**NOTE**

If collisions are disabled, the ownship will pass through traffic vehicles and all fixed objects without any effect.

Selecting the Scripted Traffic option disables the Aggressive Traffic and Traffic Density sliders, forcing the scenario to follow the scripted traffic parameters.

The follow environmental control options are **not** functional for Stryker or MRAP variants:

- Use SAF
- Run Red
- Extra Slippery

To leave the Full Setup Screen, click on the [CLOSE] button in the lower left corner of the screen. The Regular Setup Screen will now be displayed. The Full Setup Screen will also be closed if the instructor starts the scenario with the [START] button on the Setup Screen.

#### 2.5.13.10 Start Scenario

To initiate the scenario, select the [START] button on the Setup Screen (Figure 125).

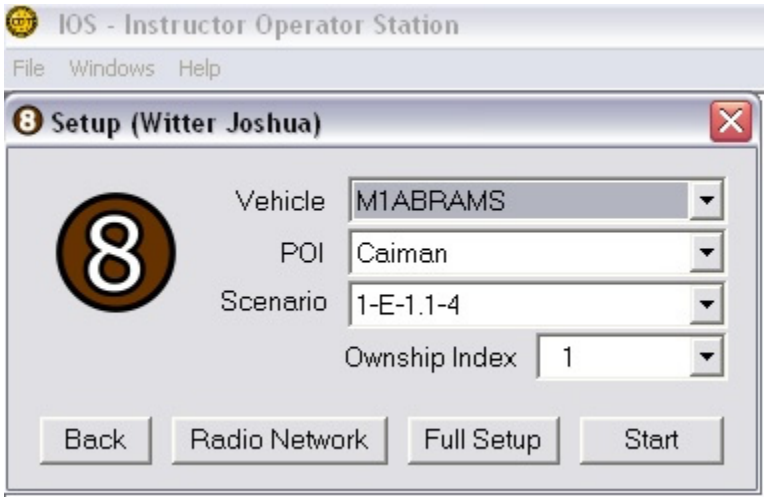



**Figure 125. Starting a Scenario**

### 2.5.14 Monitoring Procedures

While the simulator is running a scenario, there are many aspects of the training that can be monitored and controlled, including the following:

- VCR-like controls to freeze, restart, replay, or re-drive the simulator
- Display of a map of the driving area including all vehicle locations
- Repeater display of selected cab instrument panel gauges
- Options for controlling the atmospheric and traffic environments
- Monitoring of driver scoring parameters
- Ability to insert mechanical failures and/or initiate traffic events
- Statistical driving data

When the scenario begins, the information shown on the Run screen changes as shown in Figure 126. The instructor can stop the simulator by clicking on the [STOP] button in the lower left, pause/un-pause the simulator by pressing the [ || ] button, and go to the full monitoring capability by clicking the [MAIN WINDOW] button.

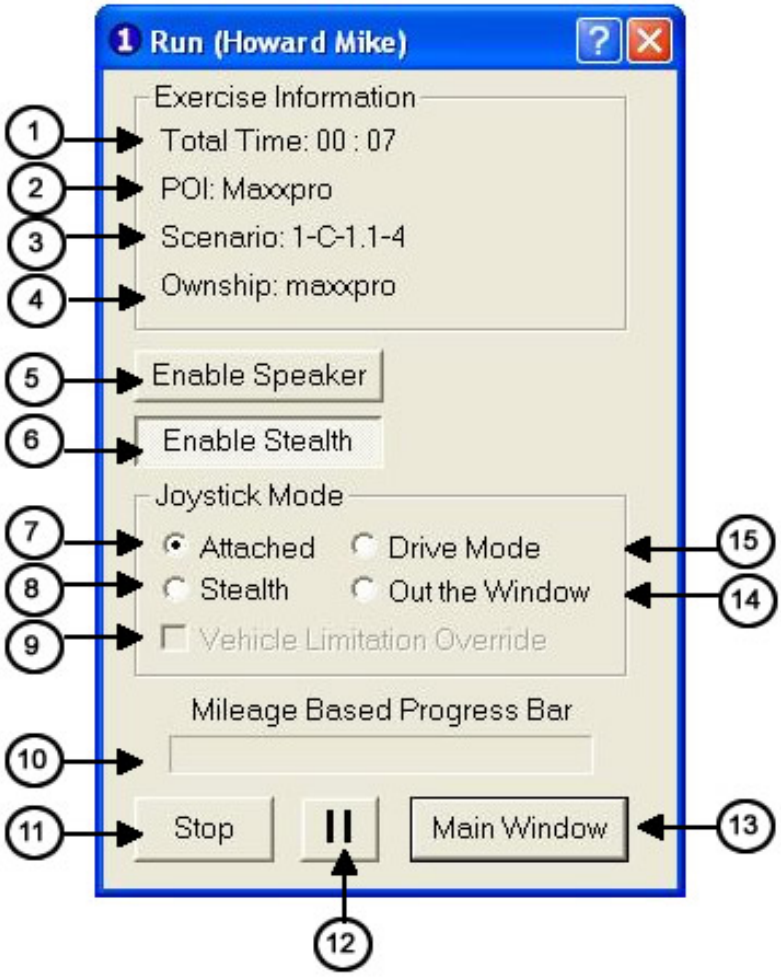



**Figure 126. Primary Run Screen**

**Table 12. Primary STS Control Screen**

| Item | Control or Indicator | Description |
|---|---|---|
| 1 | Timer | Indicates the actual scenario run time. |
| 2 | POI | Indicates the current Program of Instruction. |
| 3 | Scenario | Indicates the current scenario. |
| 4 | Ownship | Indicates the type of vehicle in the scenario. |
| 5 | Enable Speaker | When selected, allows all audio, including external sounds, to be heard through the speakers. |
| 6 | Enable Stealth | Enables the stealth view to display on the Stealth monitor. |
| 7 | Attached | Attached Joystick Mode always follows the ownship. |
| 8 | Stealth | Stealth Joystick Mode allows the instructor to move anywhere in the visual database. |

| | | |
|---|---|---|
| 9 | Vehicle Limitation Override | (Active only when Drive Mode is selected.) If selected, the instructor can navigate the ownship around the terrain outside the current scenario limitations |
| 10 | Mileage Based Progress Bar | Indicates the percentage complete for the scenario. |
| 11 | Stop | Stop the training scenario. |
| 12 | Pause | Pause/Un-pause the training scenario. |
| 13 | Main Window | Full scenario monitoring capability. |
| 14 | Out the Window | Shows the center screen from the driver's cab. |
| 15 | Drive | Drive Joystick Mode allows the instructor to take control of the ownship. |

When a student goes off course, a red Off Course icon appears as shown below in Figure 127. When the green DONE icon appears, the student has completed the scenario.


**Figure 127. Primary Run Screen – Off Course**

The image in Figure 128 appears after clicking the [MAIN WINDOW] button. The Main window appears on the left, and allows the instructor to monitor the functions described above. To open one of the monitoring windows, select the Windows drop-down menu, then select the STS number, and then select the window function.

The window on the right contains the controls and monitoring devices used when conducting a scenario, such as the gauges and failure indicators.


**Figure 128. Map Screen and Main Window Screen (Dual Monitor Configuration)**

To view all possible windows (Figure 129), the following steps are required:

1. **Environmental Controls Window**: Click on the Windows pull-down menu from the main taskbar and select ‘STS’ followed by ‘Environment.’
2. **Statistics Window**: Click on the Windows pull-down menu from the main taskbar and select ‘STS’ followed by ‘Statistics.’
3. **Scores Window**: Click on the Windows pull-down menu from the main taskbar and select ‘STS’ followed by ‘Scoring.’

**NOTE**

For Stryker systems with single monitor configurations, all open screens can be accessed via tabs located at the top of the screen. When a tab is selected, the associated screen appears, overlaying (but not completely covering) the existing screen(s).

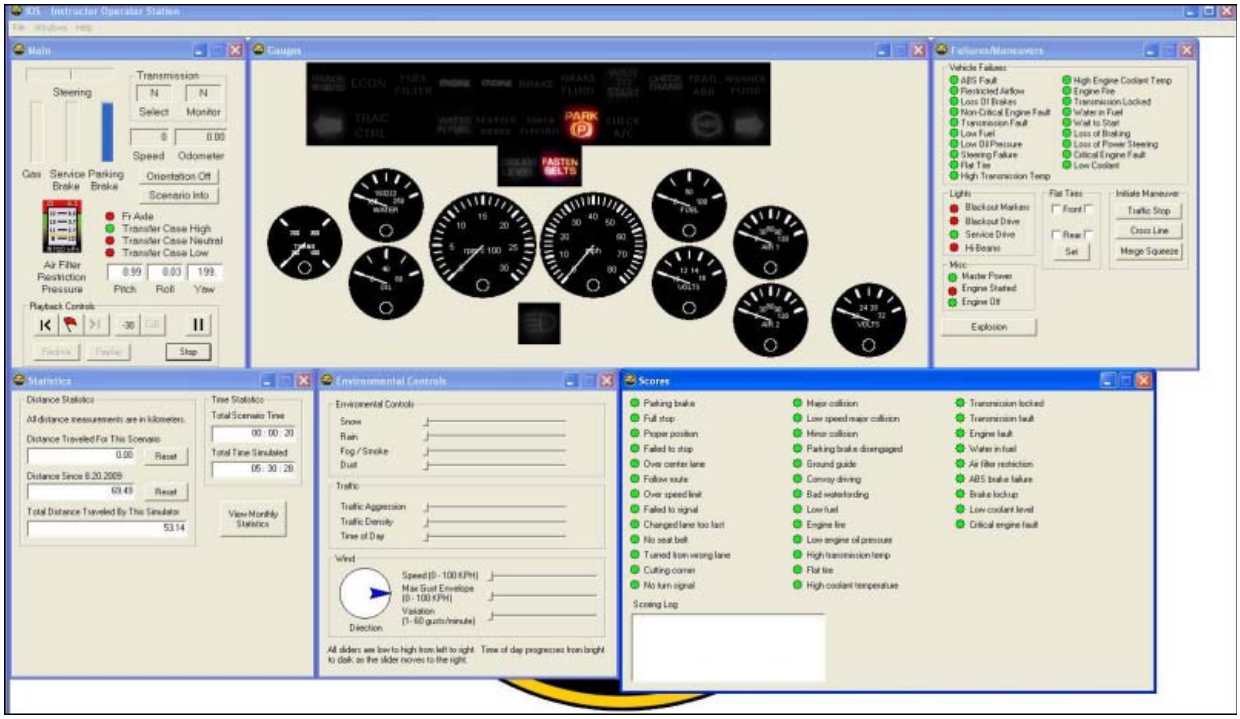



**Figure 129. Opening all IOS Screens**

The sections below describe the particular steps to monitor each simulator function.

## 2.5.15 Main Window

The Main window consists of four main areas: Standard dashboard information, orientation, scenario information and playback controls (Figure 130).

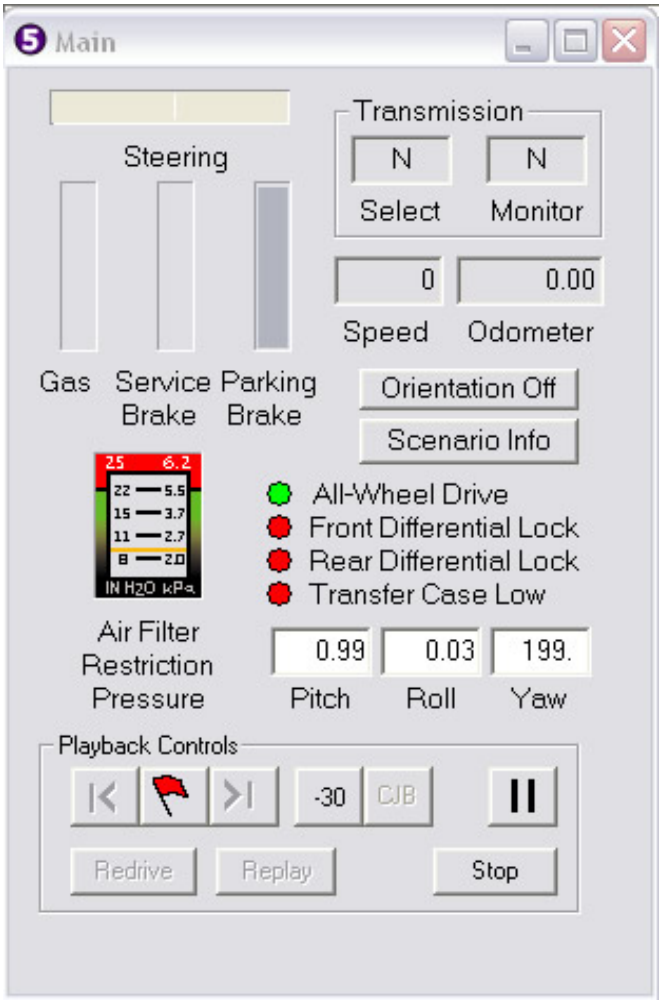



**Figure 130. DVR Controls on Main Screen**

### 2.5.15.1 Standard Dashboard Information

The standard dashboard information includes steering, gas, service brake, parking brake, transmission, speedometer, odometer, air filter restriction pressure, and variant-specific indicators (Figure 130).

### 2.5.15.2 Orientation

The yaw, pitch, and roll are displayed directly above the playback controls. The information can be hidden by clicking on the [ORIENTATION OFF] button (Figure 130). This information is for display purposes only and therefore cannot be administered. The effects of yaw, pitch and roll on the CDT are shown below (Figure 131).

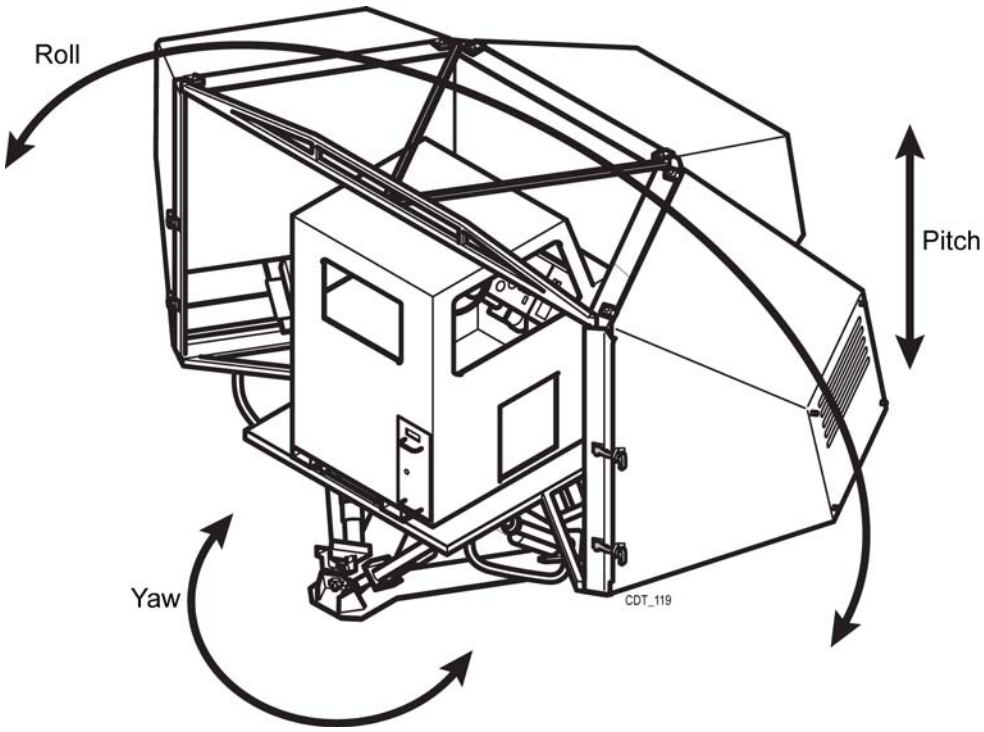



**Figure 131. Effects of Yaw, Pitch and Roll**

### 2.5.15.3 Scenario Information

Click on the [SCENARIO INFO] button to view details about the current scenario (Figure 130).

### 2.5.15.4 Playback (VCR) Controls

The Playback (VCR) Controls are located in the bottom of the main screen (Figure 130).

Playback (VCR) controls are available on each Simulation Monitor screen. The functions of the VCR are identical to those VCR controls available on the keypad described in Section 2.5.15.4 of this document. The VCR controls are shown below:

**[PAUSE]**

When pressed, this button freezes the exercise in its current condition. Accumulation of recorded or processed exercise time will halt until the exercise is restarted. The button is not functional while an exercise is being replayed. When this button is depressed (the button is "in"), it functions as the [RESUME] button.

**[MARK]**

When pressed, this button (red flag icon) stores the current geographic location for later revisit to that particular location.

**[JUMP BACK]**

When pressed, this button freezes and relocates the exercise to the geographic location stored when the most recent [MARK] was pressed. The simulator has the capability to store multiple MARK points. Successive pushes on [JUMP BACK] takes the driver back to previous MARKs. If this button is ghosted, there are no further MARKs available backwards in time. This exercise may be restarted from this position by pressing [REPLAY] or [REDRIVE] and then [RESUME].

**[JUMP FORWARD]**

When pressed, this button relocates the exercise to the geographic location stored forward from the current location. The simulator has the capability to store multiple MARK points. Pushing [JUMP FORWARD] takes the driver back to the previous MARK, subsequent JUMP FORWARD(s) takes the driver forward another MARK. This button is only active if multiple marks are stored and the instructor has used the [JUMP BACK] button enough (two or more times) to 'position' the scenario somewhere in the middle of the list of marks. If this button is ghosted, there are no further MARKs available ahead in time. This exercise may be restarted from this position by pressing [REPLAY] or [REDRIVE] and then [RESUME].


**[JUMP BACK] 30 Seconds**
After this button is pressed, the exercise will be relocated (jumped back) to a position 30 seconds back in time.


**[CJB]**

Jumps back 30 seconds in driving time from a collision.


**[STOP]**

Stops the simulation and send the IOS to the scoring pages.

When selecting JUMP BACK, JUMP FORWARD, -30, or CJB state, two new options appear:

**NOTE**

When any form of jumpback is utilized, the IOS application does not reset any malfunctions that may have occurred within that jumpback timeframe; meaning the malfunctions appear as disengaged to the instructor from the IOS screen. In order for the instructor to disengage a malfunction from the IOS (if needed), they will need to first engage the malfunction (toggle to red), and then disengage it (toggles to green).


**[REPLAY]**

Replays the exercise currently driven.


**[REDRIVE]**

Restarts (re-drives) the simulation, from the currently displayed STS position.

**NOTE**

When a collision occurs, the simulator clock continues to measure time. No change in the driver's location will be observed if more than 30 seconds have elapsed before selecting the [–30] button. Select the [CJB] button to have the student jump back 30 seconds before the collision.

After selecting [REPLAY] or [REDRIVE], after a [PAUSE], or at the end of a REPLAY, the instructor must select [RESUME] to driving to start again.

**[RESUME]**
When pressed, this button restarts the exercise. This button can be used after pressing [PAUSE] causing the simulation to resume normal operation from that spot. It should be noted that the [RESUME] button is the same [ II ] button that is used for [PAUSE]. The function of the button toggles between [PAUSE] and [RESUME].

- During REPLAY, the driver's station is not active. After the REPLAY is completed, the exercise may be continued forward by pressing [RESUME] (if the exercise did not end in a collision).
- For REPLAY: when [RESUME] is pressed, the driver will enter the exercise at the same position and with the same conditions as when the exercise was stopped. Before restarting the exercise, ensure that the driver is in the correct gear and throttle position and that the steering wheel is properly aligned.
- For REDRIVE: when [RESUME] is pressed, the driver will enter the exercise at the same position and with the same conditions as when the MARK was dropped. Before restarting the exercise, ensure that the student is in the correct gear and throttle position and that the steering wheel is properly aligned.

### 2.5.16 Map Screen

The Map screen displays the scenario driving area. As shown in Figure 132, there are controls to move the center of the map by clicking the appropriate arrows ([↑] UP, [↓] DOWN, [←] LEFT, [←] RIGHT) at the center right of the screen. The user can also zoom down or up by clicking on the appropriate button at the upper right corner of the screen. The ZOOM function does not change the center of the picture, but rather zooms in or out with the same center.

The ownship may be selected to be always displayed by clicking on the [LOCK ON OWNSHIP] checkbox located at the right side of the screen. The four arrows at the top right of the screen will not function as long as this box is checked. They will be grayed out when the box is checked.

Uncheck the lock on ownship checkbox to activate the arrows. This allows the instructor to "explore" the route that the student will be driving. Recheck the checkbox to immediately center the ownship in the map screen.

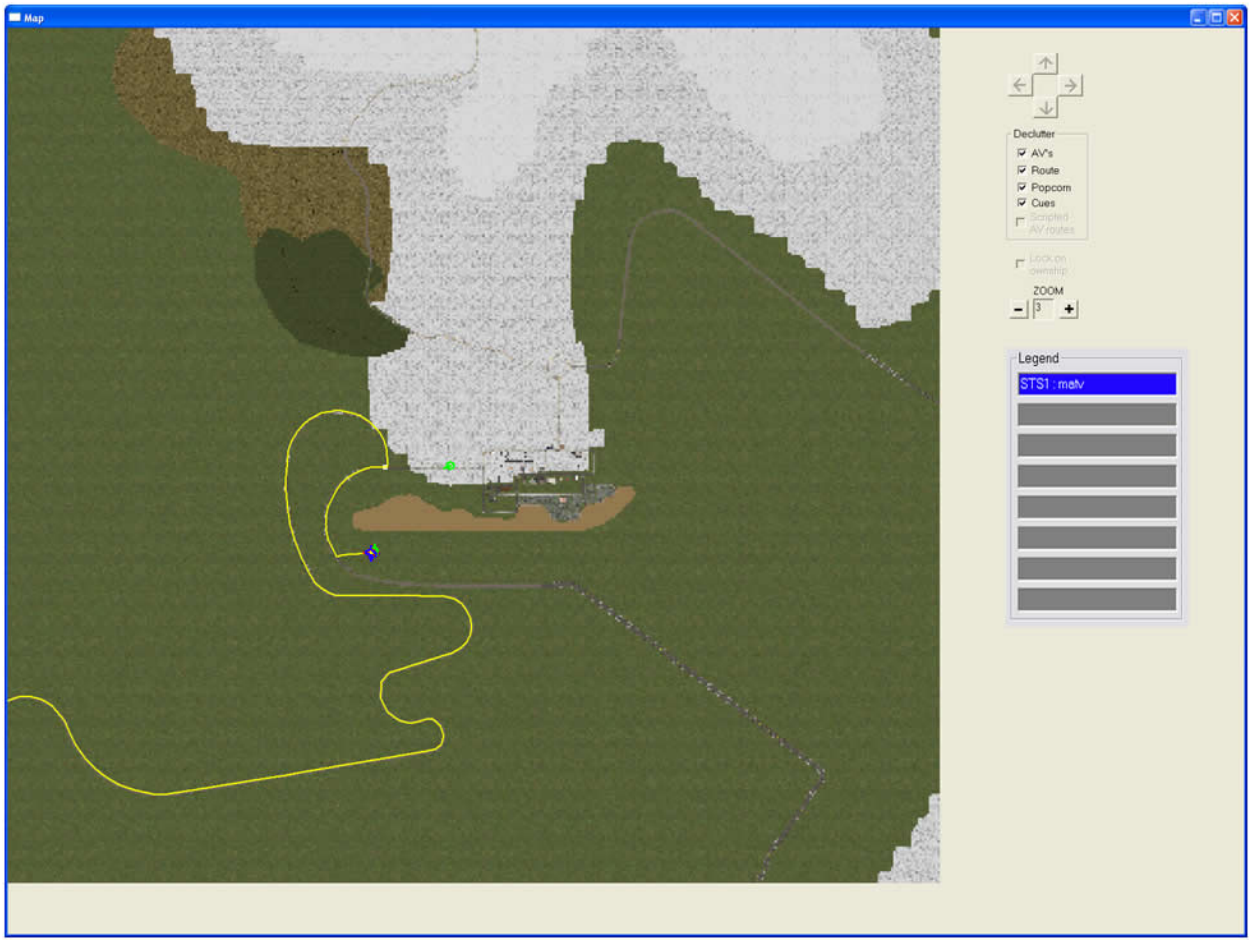



**Figure 132. Map Screen**

On the map, there are several simulation elements displayed:

- Color-coded circle – the ownship location. Each ownship has a separate unique color; in the example above the blue circle indicates the location of STS1. See Figure 105 to view all of the colors associated with the STSs.
- Green circles – other traffic locations
- Yellow dots – the path the ownship has driven
- Yellow line – the scripted/planned route (if applicable) for the ownship
- Red crosses – student cue locations, (path waypoints or route changes)
- White lines – roadways

On the right side of the screen there are options available to selectively declutter the map display, including autonomous vehicles (AVs), the route, the yellow historical route dots, and driving/route cues. Select or deselect the associated checkboxes to view/declutter the map display.

## 2.5.17 Gauge Screen

The gauge screen replicates the gauges and indicators of the currently selected ownship's vehicle instrumentation. The following are typical dashboard instrumentation gauges and displays:

- Gear selected
- Tachometer
- Speedometer
- Left and right turn signals
- Water temperature gauge
- Oil pressure gauge
- Jake brake setting

Figure 133 shows a typical gauge screen. The actual gauge screen displayed will vary as a function of the vehicle and cab type. Multiple in-cab gauges appear on the gauge screen, to replicate each of the variants. Refer to the appropriate volume for the gauge screen associated with each variant. Typical gauges displayed when this screen is active include:

- Throttle position (gas)
- Brake position
- Gear selected
- Vehicle type
- Steering wheel position

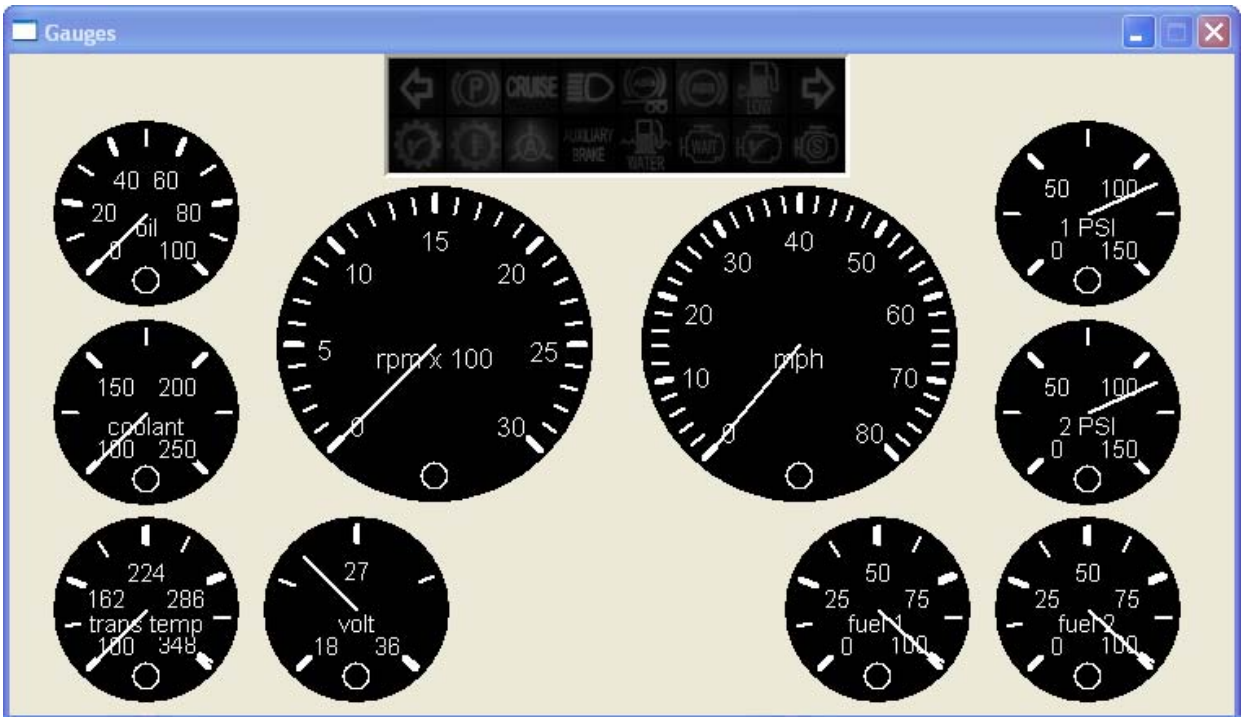



**Figure 133. Typical Gauge Screen**

## 2.5.18 Scores

The Scores Monitoring Screen (Figure 134) provides a means of monitoring the driving behavior of the student. The performance parameters are reported on this page in real time. Whenever a scoring threshold is exceeded, the appropriate indicator light flashes red for two to three seconds and the Scoring Log dialog box becomes highlighted in orange. The student's violation is also recorded and displayed in the Scoring Log dialog box with the exact time of the violation and the number of points deducted. The Cumulative Student Score displays the total score for the scenario, which equates to the highest score possible (100) minus the deduction points. In the example below, there are five deductions of one point each, leading to a cumulative student score of 95 (100 - 5). These parameters provide a visual indicator for the instructor to recognize situations where a student has not performed within desired parameters. Not all scoring items are active for each scenario and the scoring items differ per CDT variant.

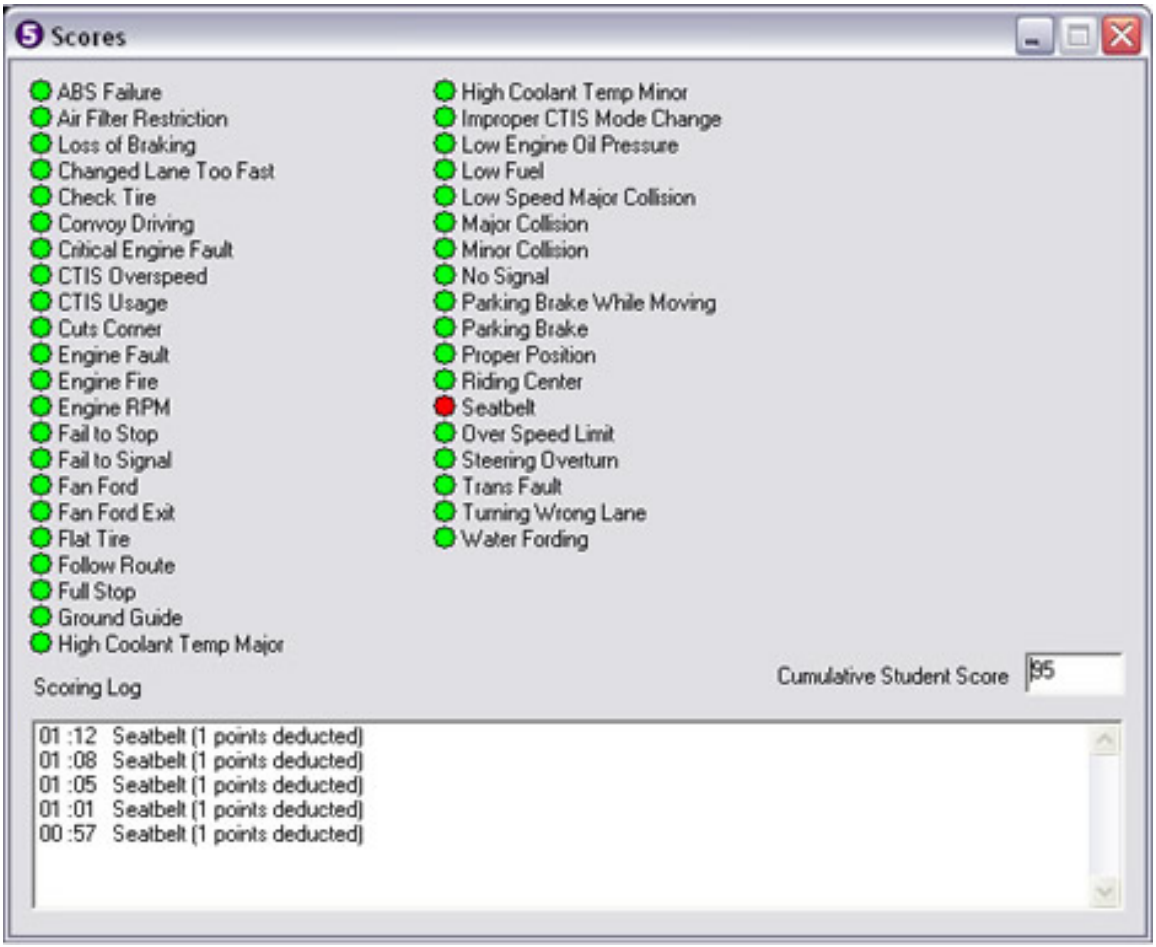



**Figure 134. Scores Monitoring Screen**

## 2.5.19 Failures/Maneuvers Controls

**NOTE**

The Failures/Maneuvers screen controls can only be used in Setup Free mode.

Mechanical failures and traffic conditions may be selected from the Failures/Maneuvers screen shown in Figure 135.

The instructor can select simultaneous failures to occur if desired while in Setup Free mode. Failures are initiated when the instructor clicks the button or when scripted. The instructor can also clear failures at any time after they have been initiated during both scripted and free play scenarios.

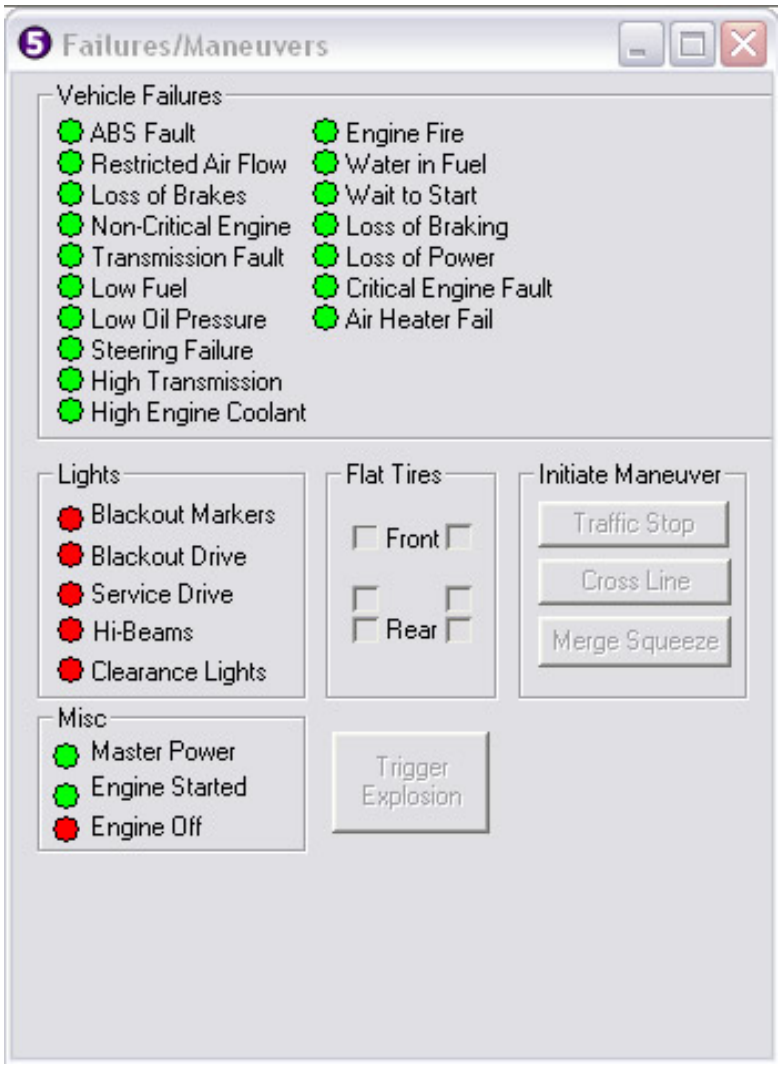



**Figure 135. Typical Failures/Maneuvers Screen**

Below is a list of typical vehicle failures and their effect. Refer to the Volume II, Stryker Variant, for specific failures associated with Stryker. Refer to Volume III, MRAP Variants, for the specific failures associated with each MRAP variant.

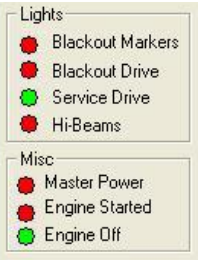
**Table 13. Typical Failures and Effects**

| FAILURE | EFFECT |
|---|---|
| ABS Fault | ABS Fault light goes on and ABS functionality is lost. |
| Critical Engine Fault | Critical Engine Fault light goes on. |
| Engine Fire | Engine Fire light goes on. |
| Flat Tire | Flat Tire light goes on and vehicle pulls towards direction of the flat tire. |
| High Engine Coolant Temp | High Coolant Temp light goes on. |
| High Transmission Temp | High Transmission Oil Light goes on. |
| Loss of Brakes | Loses Brake Air Pressure, brakes lockup. |
| Loss of Braking | Service brakes do not work. |
| Low Fuel | Fuel Level declines rapidly (5-10 min). |
| Low Oil Pressure | Low Engine Oil Pressure light goes on. |
| Loss of Power Steering | Loss of Power Steering light goes on and power steering is lost, making the vehicle difficult to steer. |
| Non-Critical Engine Fault | Non-critical engine light goes on. |
| Restricted Airflow | Air Filter light goes on. Power is lost. |
| Steering Failure | Failure light goes on and steering wheel locks up; vehicle continues to go straight. |
| Transmission Fault | Check Transmission light goes on. |
| Wait to Start | Wait to Start light goes on, student must wait until the light goes out before continuing with the scenario. |
| Water in Fuel | Water in Fuel light goes on; effect is simulation dependent (such as loss of power or sputtering). |

**NOTE**

When planning to initiate a failure, it is good practice to drop a mark just prior to clicking the [FAILURE] button. This provides the instructor the option of restarting the simulation from the time just before the failure occurred. If the engine dies as a result of a failure, there is no recourse for the instructor except to clear the fault and restart the scenario from the beginning.

The Failures/Maneuvers screen controls (see below) can only be used in Setup Free mode and are set in a similar manner to allow the instructor to initiate controlled traffic maneuvers on selected traffic entities.




**Lights and Misc**:

The Lights and Misc portion of this screen shows what the driver is doing. A green light indicates a function is enabled and red indicates a function is disabled. The lights and miscellaneous indicators vary depending on the CDT variant.


**Tire Blowout**:

The Tire Blowout (Flat Tires) function is located below the vehicle failures. Select the tire(s) that you want to blowout (this can only be initiated if in Setup Free mode). The CDT will react as if it has experienced a blowout of a single tire or multiple tires (up to two at a time). The maximum number of tire blowouts for Stryker variants is eight (8). For MRAP variants, the maximum number of tire blowouts is two (2).


**Initiate Maneuver**:

The Initiate Maneuver section shows ‘Traffic Stop’ – which stops all traffic except for the ownship vehicle; ‘Cross Line’ – which stops the autonomous traffic from crossing into the ownship vehicle’s path; and ‘Merge Squeeze’ – which generates autonomous traffic when the ownship is about to enter the highway from an on-ramp in a way that forces the ownship to move into the other lane. With the Merge Squeeze failure, a second vehicle will often approach the ownship from the rear and “park” in the driver’s blind spot at the right rear of the vehicle.


**Explosion**:

When [EXPLOSION] is pressed, the driver will see, hear, and feel the effects of an explosion near the front of the vehicle.

## 2.5.20 Statistics

Driving statistics are displayed in the Statistics Window (Figure 136). Distance and time information are collected per session, as well as total usage. Click the [RESET MONTHLY STATS] button to reset. Fuel consumption varies depending on the CDT variant. The total fuel consumed equates to the current cumulative amount of fuel used by the CDT. Total simulated miles equates to the current cumulative miles logged by the CDT.

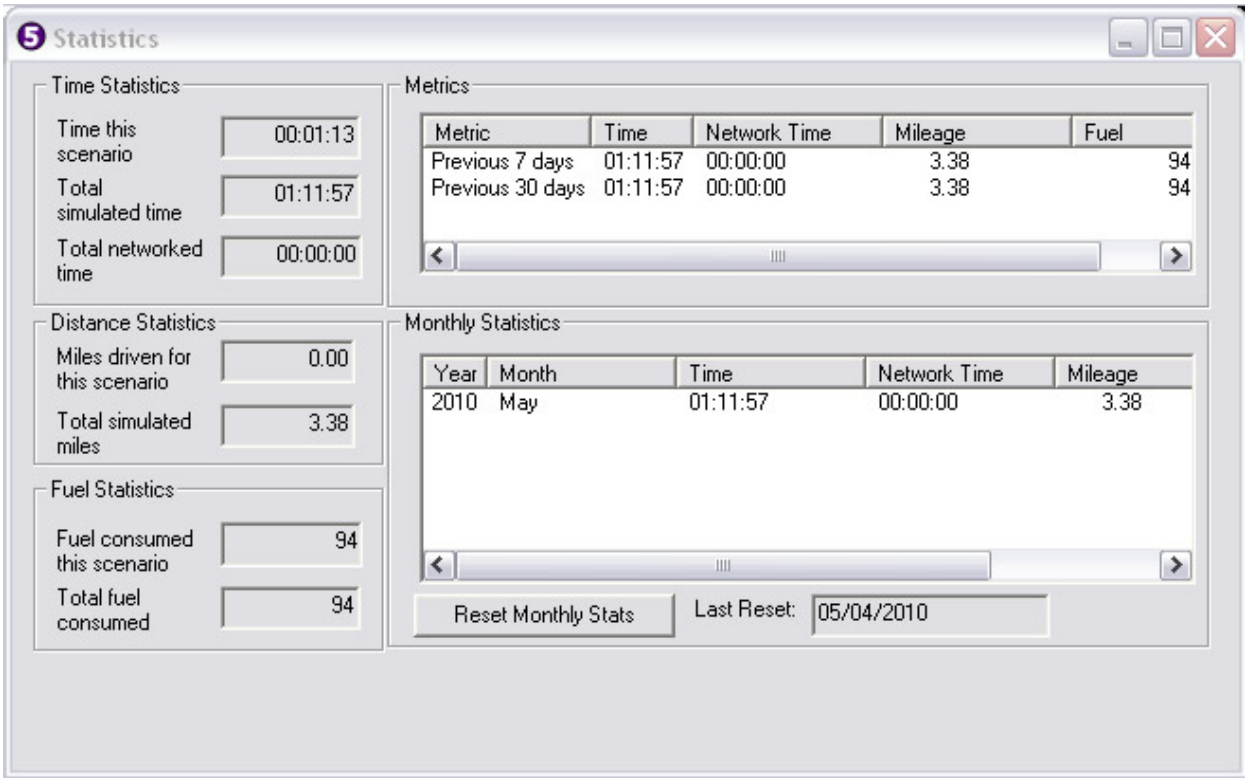



**Figure 136. Statistics Window**

### 2.5.21 Scoring the Exercise

After the simulation has been terminated at the IOS or from the keypad, the first of several scoring screens appears in the Scoring Summary Screen as shown in Figure 137 below.

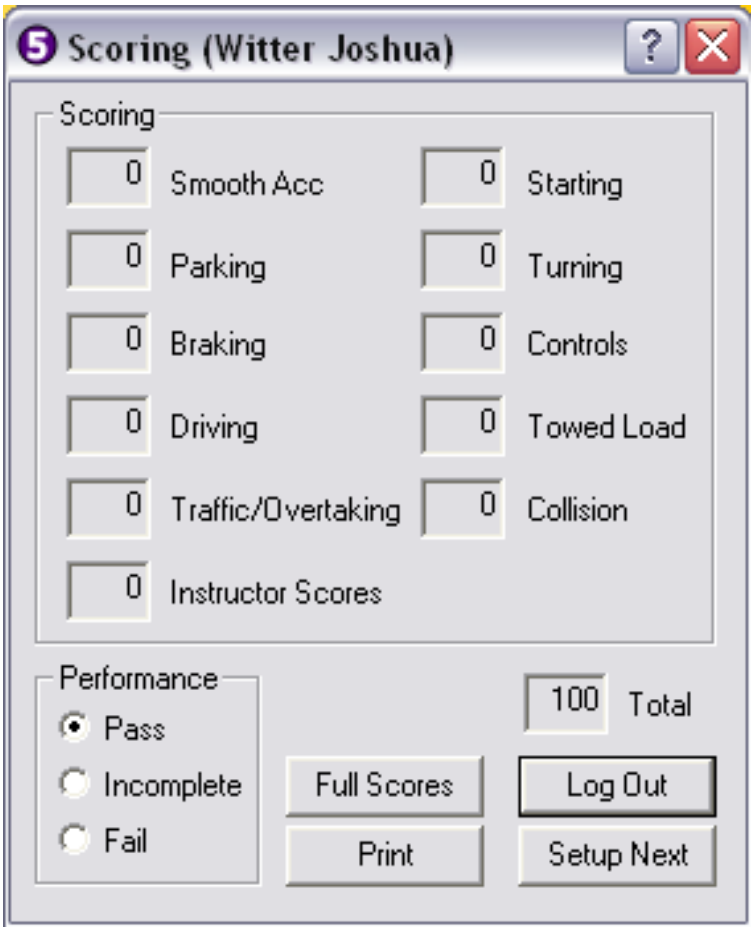



**Figure 137. Scoring Summary Screen**

Scoring is based on a demerit system. For each scenario, the student starts with 100 points and loses points for driving outside of certain parameters. On this page, the cumulative demerits for eleven categories are shown as well as the scenario total (100 minus all demerits scored).

Primary student scoring is divided into the categories as shown above. To observe any of the scoring categories in more detail, click on the [FULL SCORES] button. This will bring up the Full Score screen shown in Figure 138.

There are several options available in addition to reviewing the score. On the left side of the Scoring Summary screen, there are buttons for PASS, INCOMPLETE, and FAIL. The system recommends PASS for any score of 80 or over and FAIL for any score 79 or under. However, the instructor can override the system recommendation and select an alternative outcome. For example, the instructor can select the [PASS] radio button, followed by the [SETUP NEXT] button to manually pass a student who received a failing score or did not complete the scenario.

If the driver did not complete the scenario, an INCOMPLETE recommendation is made. Again, the instructor can override this.

The instructor can print the scoring summary page by clicking on the [PRINT] button on the Scoring Summary Screen.

Selecting the [SETUP NEXT] button will return the instructor to the Regular Setup Screen.

The final option is to LOGOUT. Selecting this button will return the system to the Student Login page.

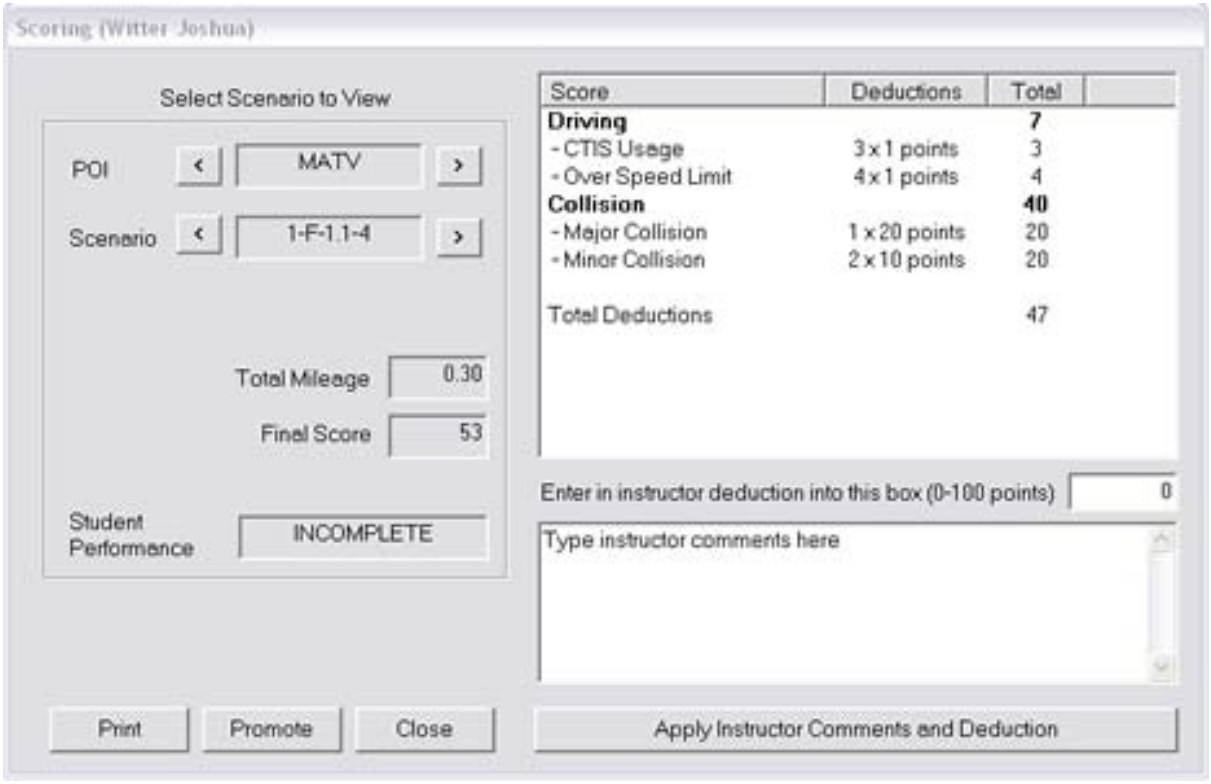



**Figure 138. Full Score Screen**

From the Full Score screen, the instructor can also review the final scores and total mileage from previous scenarios by selecting the desired POI and scenario in the upper left corner. When selected, the final scenario score and total mileage is presented as well as the student performance (Pass, fail, or incomplete) and any deductions incurred during the exercise. The instructor may also enter an additional deduction which is then reflected in the Final Score box once the [APPLY INSTRUCTOR COMMENTS AND DEDUCTION] button is selected. When making a deduction, the instructor should also enter supporting comments stating the reason for the deduction. The instructor comment area is located directly above the [APPLY INSTRUCTOR COMMENTS AND DEDUCTION] button.

**NOTE**

Do not enter any special characters (example, “can’t”, should be entered as “cannot”) in the Instructor Comments section, as this will cause the following IOS error.

"ERROR: syntax error at or near "t"; Error while executing the query."

In the event this error does occur, simple remove the special character in the Instructor Comments field, and the error should clear itself.

To print a formatted Scoring Summary page, click on the [PRINT] button in the lower left corner of the screen. To return to the Scoring Summary Screen, click on the [CLOSE] button in the lower left corner of the screen. The [PROMOTE] button is not operational. For instructions on how to manually pass (promote) a student see the earlier description of the Scoring screen (Figure 137) and the use of the [PASS] button.

### 2.5.22 Logout

Selecting the student performance level (Pass, Incomplete, or Fail) and then selecting [LOG OUT] from the Scoring screen will logout the current student and bring up the Driver Login screen. This will allow the instructor to login another student.

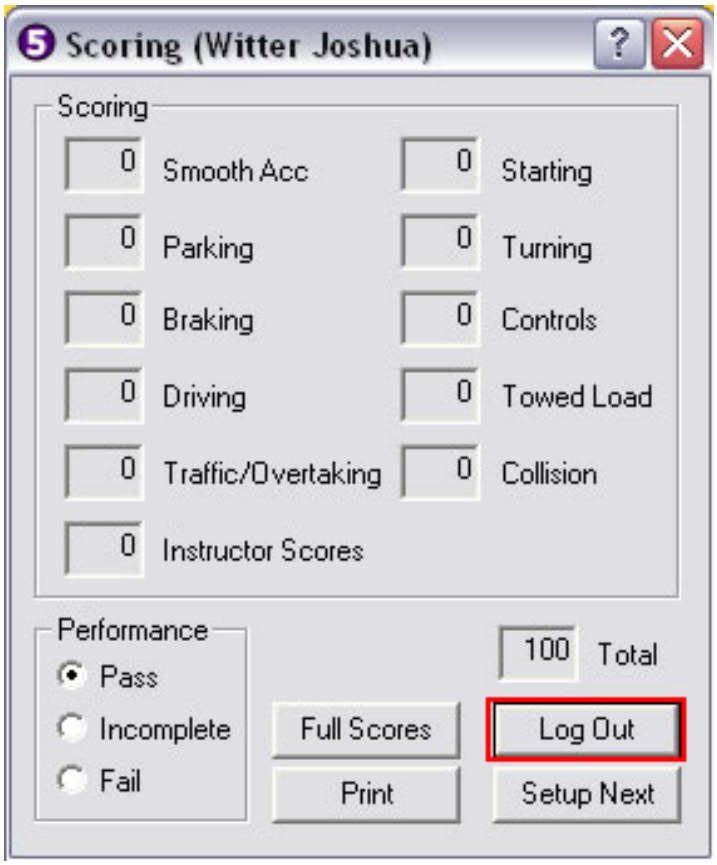



**Figure 139. Logging Out from the Scoring Screen**

## 2.6 After Action Review (AAR) Station

**NOTE**

Not all CDT systems include an AAR station.

The After Action Review Station (AAR) is located near the IOS. It consists of a table, color monitor, computer, speakers, keyboard, and mouse. The purpose of the AAR Station is to allow an off-line review of training results after the instructor has halted the training scenario.

The AAR application supports playback (instant replay) of all or part of the scenario. The instructor is able to pause, rewind, and fast forward the exercise from the AAR GUI page. The playback of a training scenario provides the visual, aural and instrumentation cues of the original execution through recorded video and sound.

AAR capabilities are only available after an exercise has been completed and are not part of the run-time IOS system. As such, the AAR function may be utilized during (in parallel with) training sessions.

The After Action Review (AAR) Digital Video Recorder (DVR) solution is divided into several subsystems.

1. Controls
2. Recording
3. Automated Controls
4. Archiving and Capacity

## 2.6.1 Controls

Controls are provided for After Action Review at the AAR Station. The AAR Station provides access to AAR without interference to ongoing training conducted through the IOS PC anytime during the training process as well as after training has been completed. The controls provide playback of all or any part of the scenario. The instructor is able to pause, rewind, and fast forward (2x, 4x and 8x) the playback of the scenario. The playback of all training scenarios shows the recorded visual, aural and instrumentation of the original execution.

## 2.6.2 Recording

Recording is performed by the DVR. Each training scenario is saved as a digital video/audio file and labeled by timestamp. The channels recorded would be variations of the video feeds listed along with the Cab audio feed.

### 2.6.2.1 Bullet Cameras

1. Student View – This Bullet camera is focused on the student and provides the Instructor with visual feedback of the student.
2. Control Panel View - This Bullet camera is focused over the student's shoulder and provides the Instructor with visual feedback on the student's interaction with the vehicle controls.

### 2.6.2.2 Center Image Generator Channel Loop Output

The Center IG Channel output provides the instructor with the same forward view the student is presented with. This gives the instructor reference to the simulated environment that the Student is interacting with.

### 2.6.2.3 Left Image Generator Channel Loop Output

This Left IG Channel output provides the Instructor with the same left hand view the student is presented with. This gives the Instructor reference to the driver's current simulated environment.

#### 2.6.2.4 Right Image Generator Channel Loop Output

This Right IG Channel output provides the instructor with the same right hand view the student is presented with. This gives the Instructor reference to the driver's current simulated environment.

#### 2.6.2.5 DVE Image Generator Channel Loop Output

The DVE IG Channel output provides the instructor with the same DVE view the student is presented with. This gives the instructor reference to the simulated environment that the student is interacting with.

Automated Controls are provided by the Simulation management applications. The applications queue the DVR to begin recording when a training scenario is initiated and signals the DVR to stop recording when the scenario is stopped.

Archiving of AAR recording footage can be accomplished via CDR disks. These disks can be played on standard PC workstations and DVD players. The DVR video file capacity is handled with a Round-Robin video file expiration system. The system begins writing over the oldest video files first once the DVR's maximum capacity has been reached.

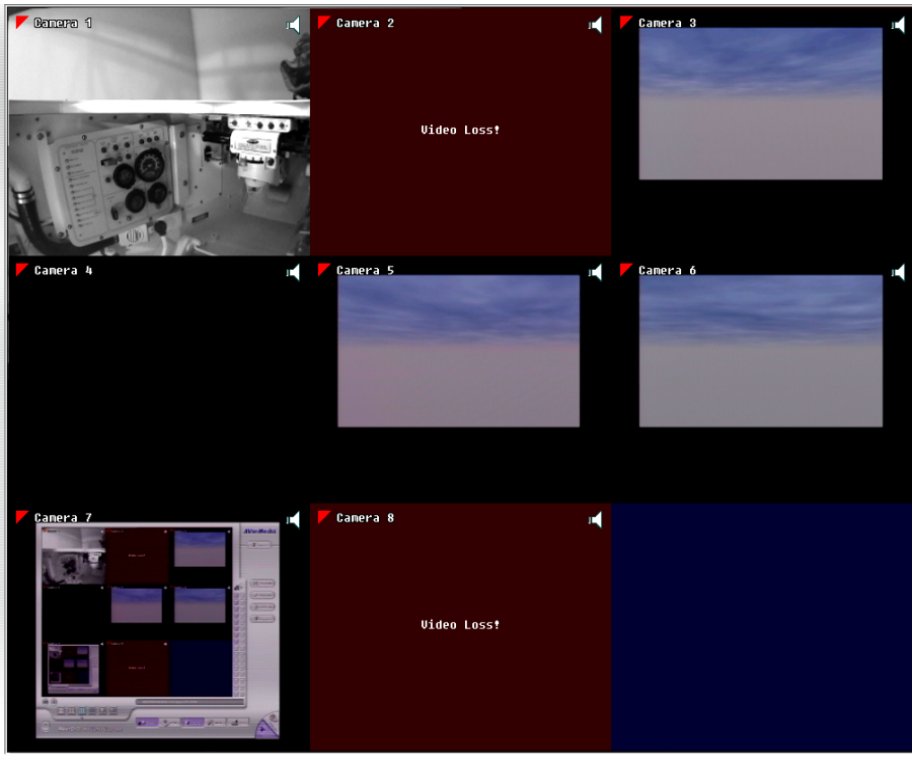



**Figure 140. AAR – Camera Views**

- Camera 1 – Inside Cab Dashboard/Panel View
- Camera 2 – Inside Cab Student View
- Camera 3 – Repeater Monitor View (IG Output Channel)
- Camera 4 – Repeater Monitor View (IG Output Channel)
- Camera 5 – Repeater Monitor View (IG Output Channel)
- Camera 6 – DVE View

- Camera 7 – DVR View
- Camera 8 – Not Active

### 2.6.3 Operation

1. Press and hold Ctrl+Alt+Del if the screen saver is activated.
2. User will get the “DoD Warning Banner” Read and click [OK].
3. In the Authorization window (Figure 141), enter the IA user name and password and click [OK]. See local site maintainer for username and password.


**Figure 141. Authorization Window**

4. To run the AAR application, double-click the CM3000 icon on the AAR station desktop (Figure 142).


**Figure 142. AAR Station Desktop – CM3000 Icon**

5. After the DVR Software has finished opening ensure that the [NETWORK] button is highlighted/active (Figure 143).

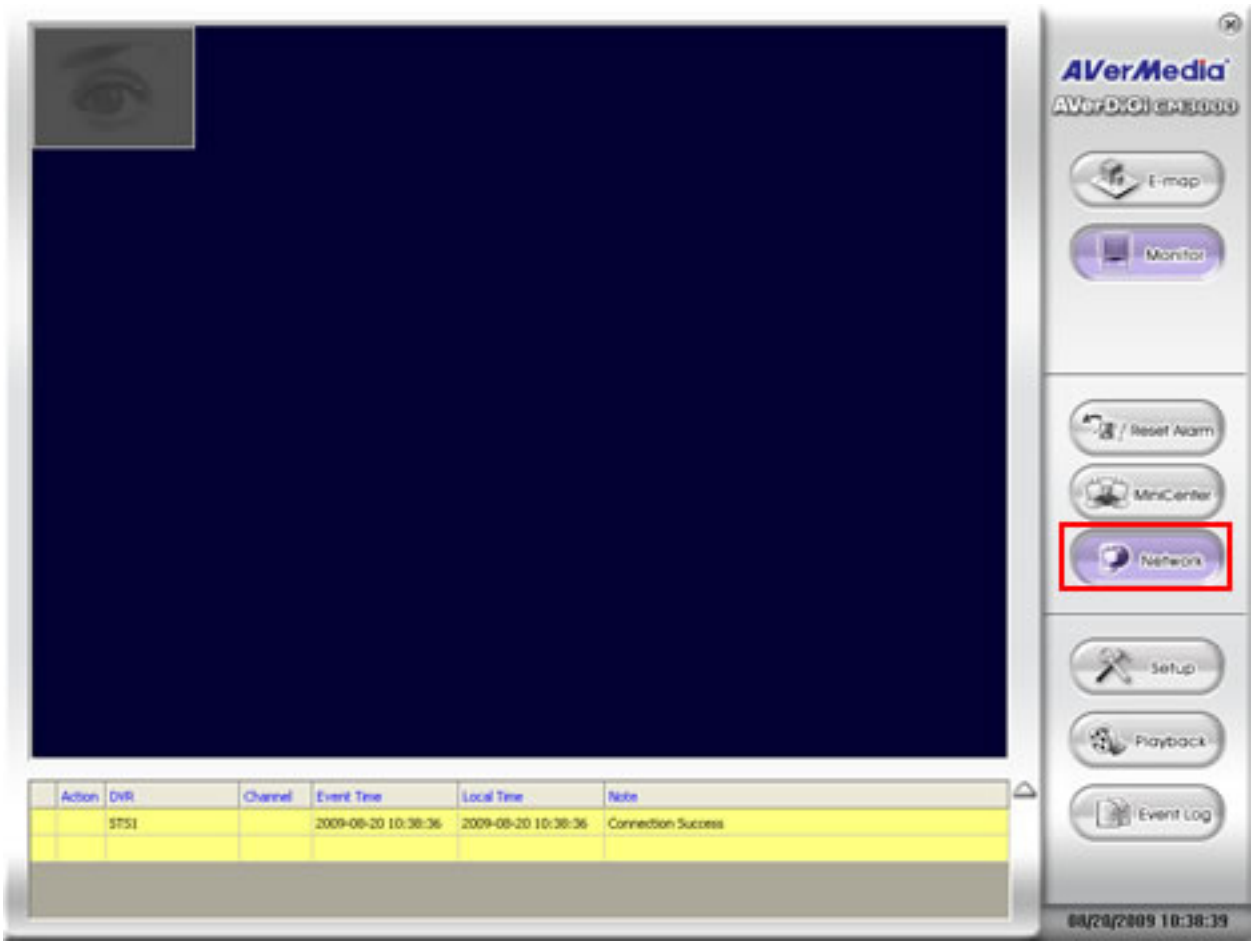



**Figure 143. AAR - Network Button**

6. Next click the [PLAYBACK] button on the bottom right of the screen (Figure 144).

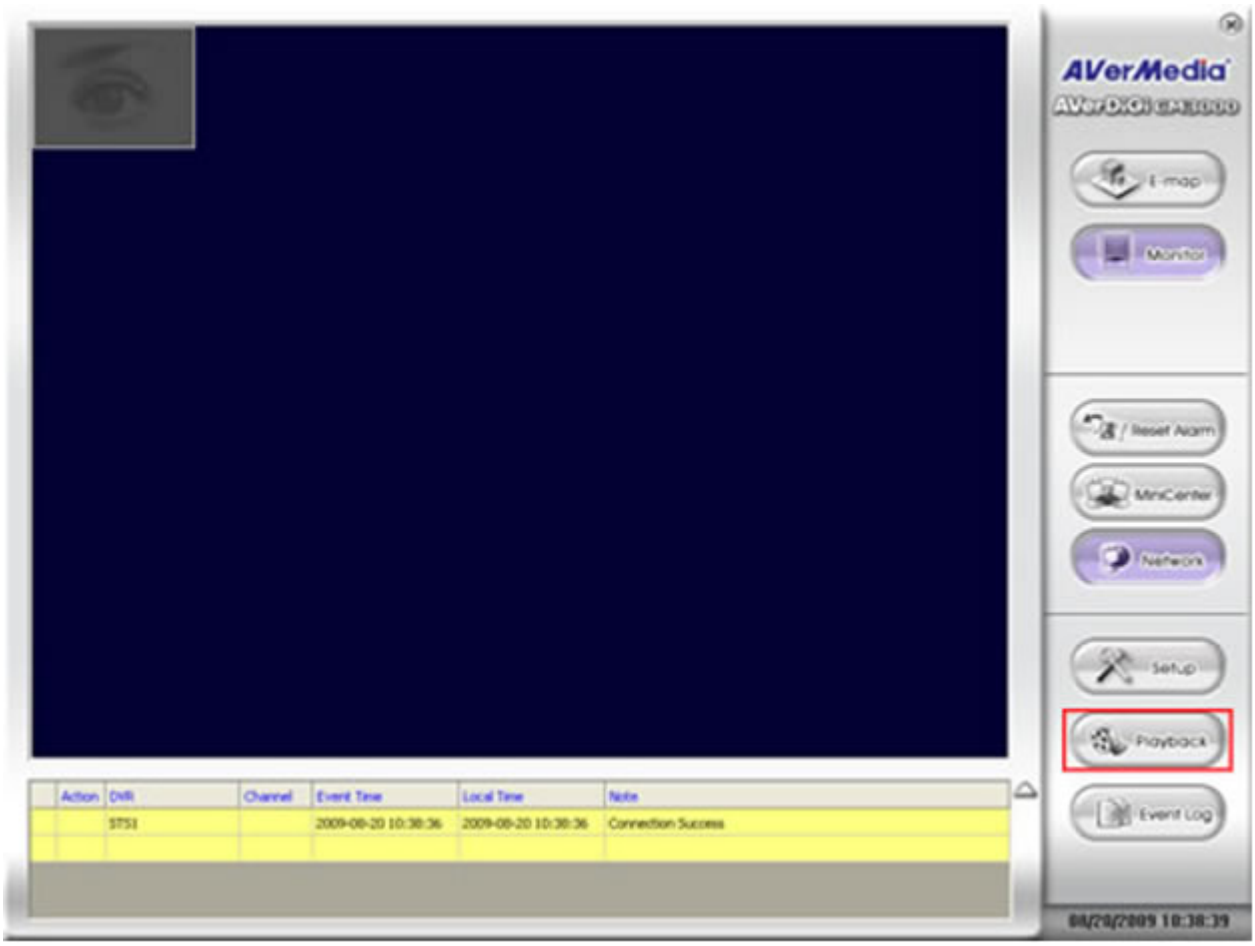



**Figure 144. AAR - DVR Software**

7. Select the STS101 database and then click [OK] (Figure 146).

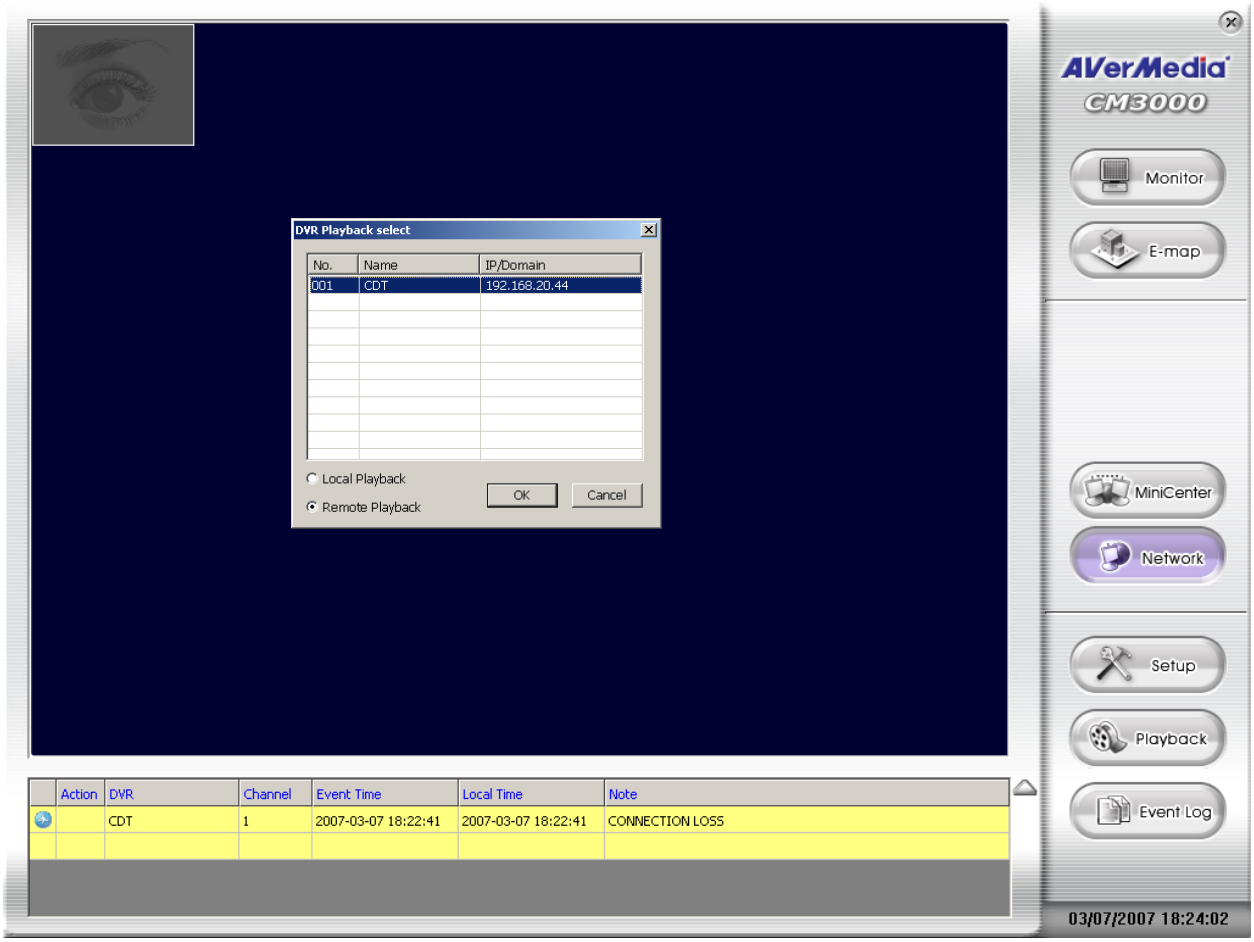



**Figure 145. AAR – STS Database Selection**

8. Select Remote Download and Playback, click the [OK] button.

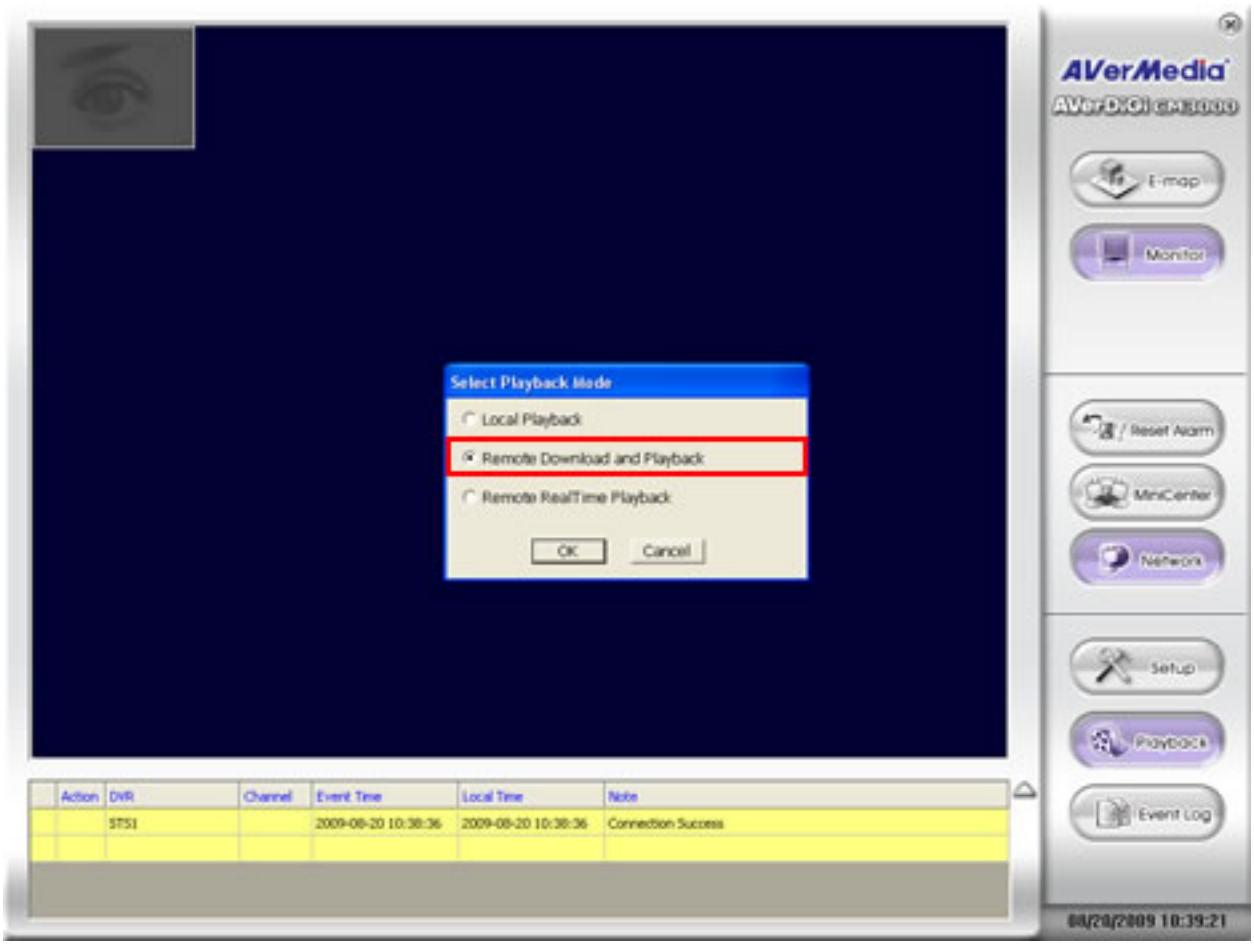



**Figure 146. AAR - Remote Download and Playback**

9. Select the Date and Time of the training you want to review (Figure 147).

    - Blue squares indicate saved data.
    - Red squares indicate boxes highlighted by the user.
    - Time of day is shown in the row across the top of the matrix.

Camera view is indicated in the column to the left of the matrix. A summary of the various camera views is shown in Figure 140. Note that camera 7 (not shown) is a self-fed audio feed and therefore not used to monitor the driver.

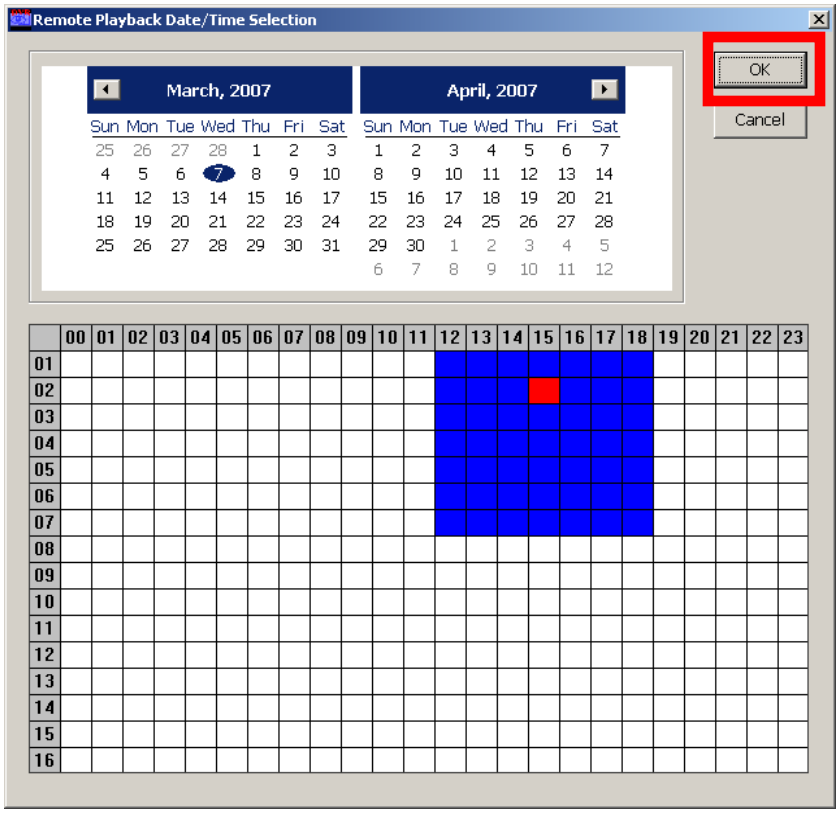



**Figure 147. AAR - Recording Date and Time Selection**

10. To watch an exercise that has been previously driven you must select a time and date on the calendar and click OK. The time selected will highlight in red.
11. The Time Selection window appears (Figure 148) with thumbnail views for selecting the starting point and ending points of the video recording.
12. Click the desired thumbnail view for the starting point. A red outline should appear around that thumbnail. Multiple sequences may be selected.
13. Double-click inside the highlighted thumbnail to activate playback. If multiple sequences are desired, double-click the last thumbnail.


**Figure 148. AAR - Time Selection Window**

14. A new window appears: the Playback window (Figure 149). Wait until the green progress bar is full before trying to control the video.


**Figure 149. AAR - Select Slider Control or PLAY Button**

15. Click the [PLAY] button, and use the controls or drag the slide control bar until you see the activity that you want to review/record.
16. Use the controls at the bottom to move forward, rewind or to find the specific area of interest.

### 2.6.4 Export a Video Segment

1. Find the beginning of the area of interest and click the [SET SEGMENT] button (Figure 150).
2. Find the end of the area of interest by using the slide bar or play buttons.
3. Click [SET SEGMENT] again to set the stopping point.


**Figure 150. AAR - Set Segment**

4. Click the [EXPORT] button (Figure 151) to save the clip specified. A dropdown window will appear.
5. Highlight [OUTPUT VIDEO CLIP].


**Figure 151. AAR – Export**

6. The SAVE AS window (Figure 152) appears to specify where to export the clip.
7. Select the AVI file type.

**NOTE**

If MPG is selected as the file type to export, no audio will be captured.

8. Enter a name for the file and click the [SAVE] button.

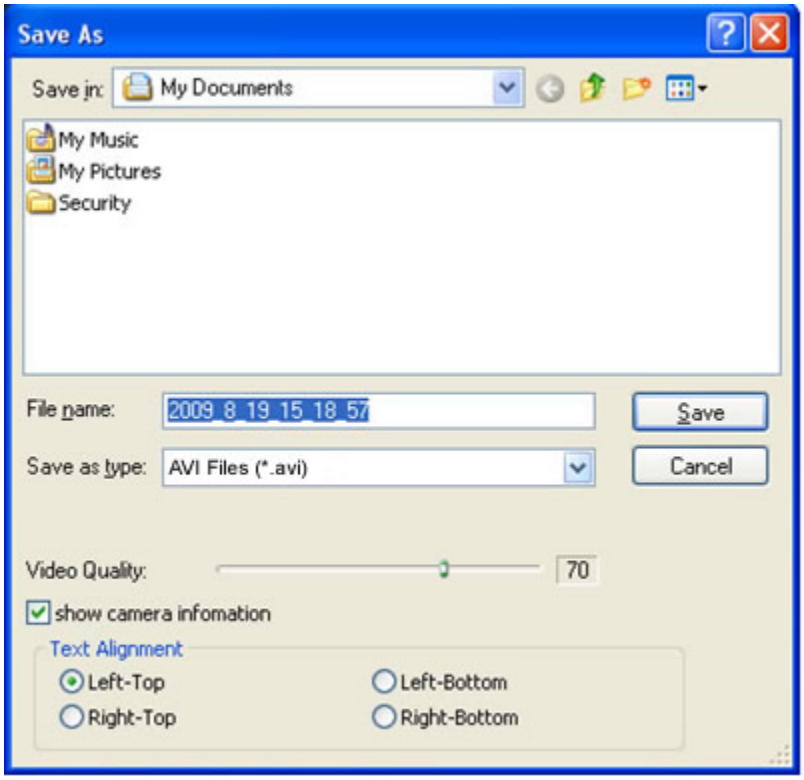



**Figure 152. AAR - Save File**

9. The screen below will appear while the DVR file is being saved as an AVI file (Figure 153).

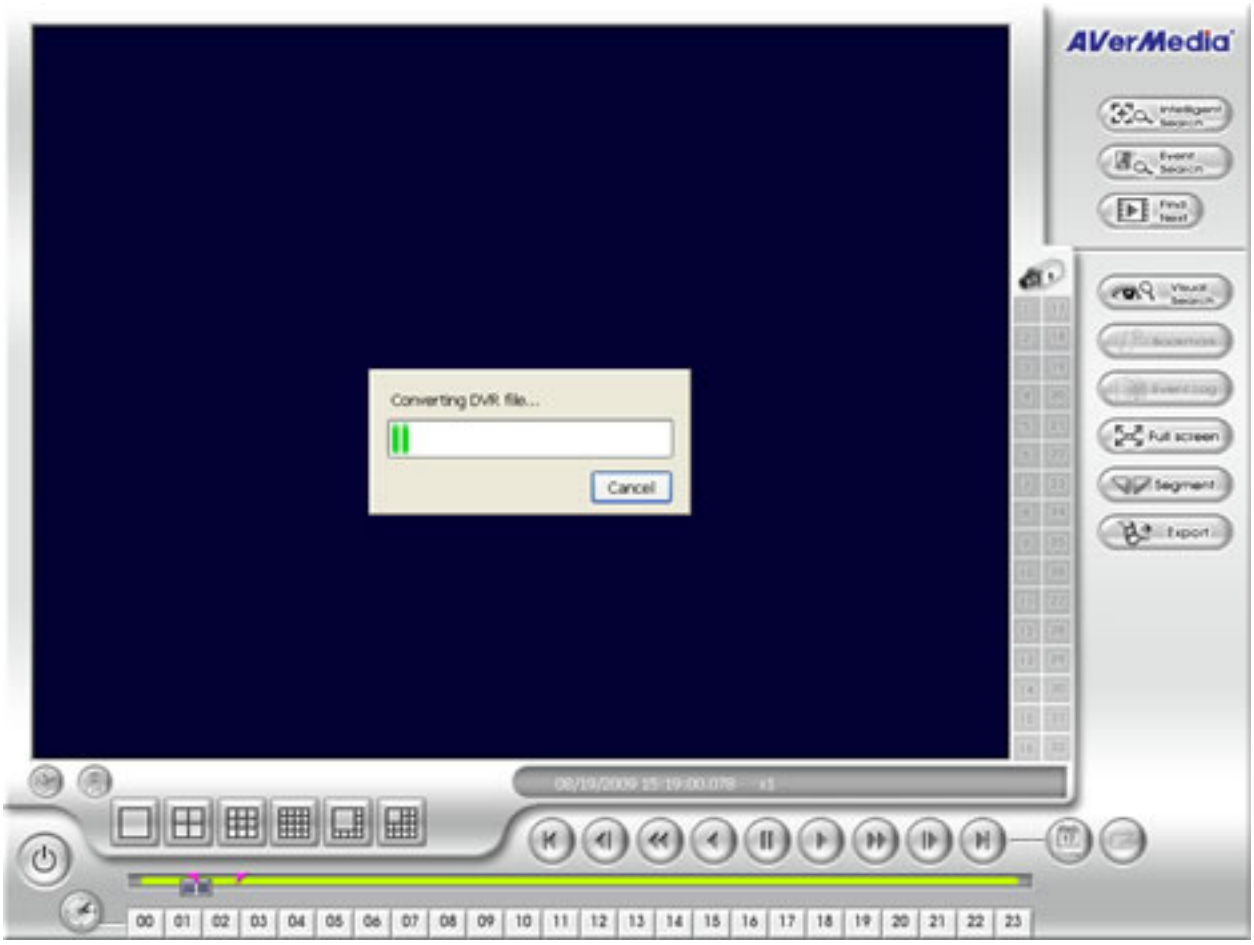



**Figure 153. File Conversion Screen**

10. Click [OK] once the “File exporting complete!!!” message appears (Figure 154).


**Figure 154. AAR - File Export Complete Message**

### 2.6.5 Exiting the AAR Application

1. At the replay section, click the [POWER] button in the lower left of the screen (Figure 155).


**Figure 155. AAR – Power Button**

2. Close the Time Selection (thumbnails) window by clicking the [X] in the upper right corner.


**Figure 156. AAR – Close Time Selection Screen (Thumbnails)**

3. Close the Calendar/Matrix window (Figure 157) by clicking the [X] in the upper right corner.

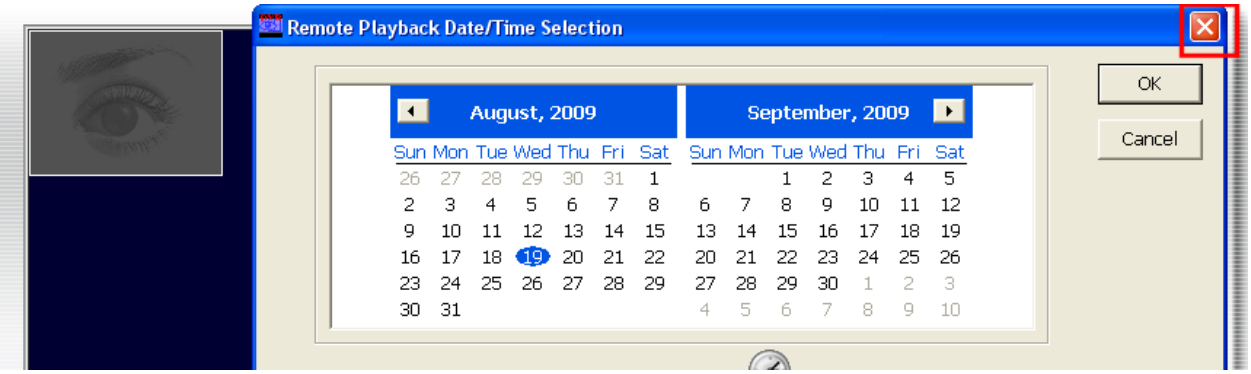



**Figure 157. AAR – Close Remote Playback Date/Time Selection Window**

4. Close out of the main application by clicking the [X] in the upper right corner (Figure 158).


**Figure 158. AAR – Close Main Window**

5. Logout out of the session by clicking [EXIT] (Figure 159).

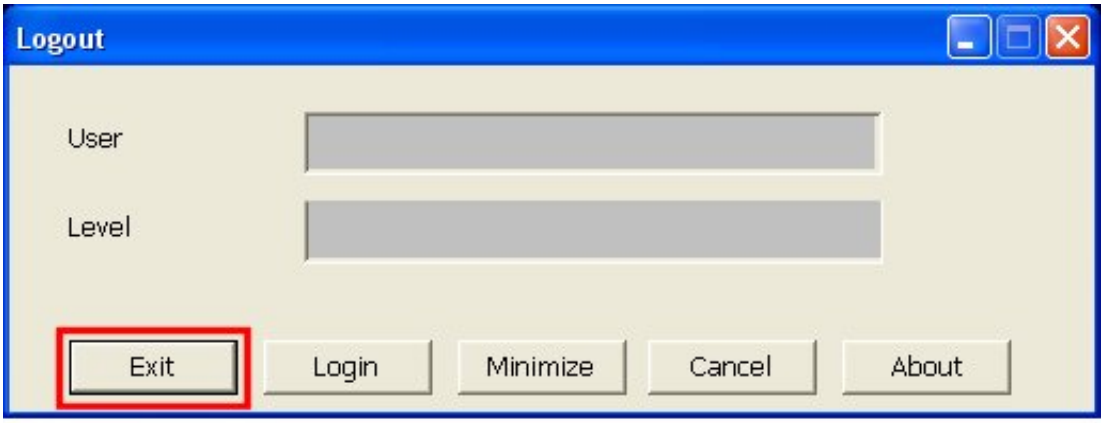



**Figure 159. AAR – Logout Window**

6. Logout of the Authorization window - password is required (Figure 160).


**Figure 160. AAR – Authorization Window**

7. Screen will show the "Please wait…." message as the application closes.
8. The Windows desktop will appear.

### 2.6.6 Record a CD of a Driving Exercise

1. Place a CD-R or CD-RW into the AAR PC CD Drive.
2. Double-click on the My Computer program icon on the Windows desktop.
3. Double-click on C: and navigate to the file(s) to be copied (Figure 161).

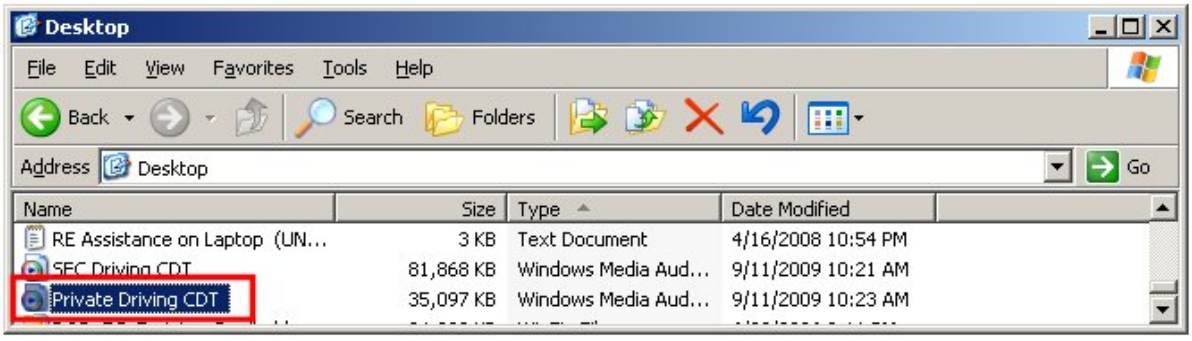



**Figure 161. AAR – Copying Driving Exercise to CD**

4. Double-click again on the My Computer program icon to open a second window.
5. Select and drag and drop the file(s) to be copied from the first open window to the CD drive on the second window.
6. A "Copying…" window will appear and show the status.
7. Double-click the CD drive (Figure 162) to view the copied files.

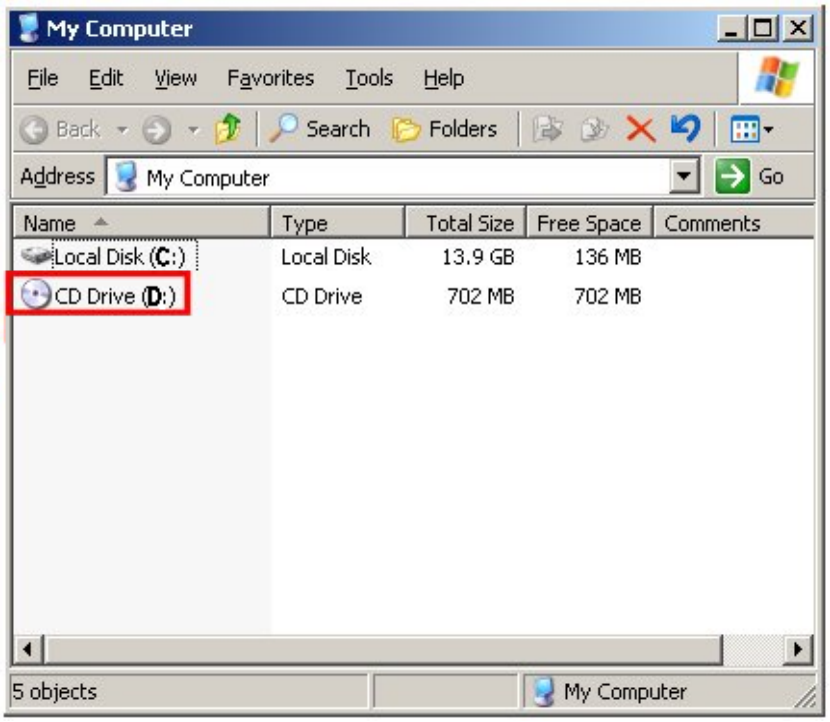



**Figure 162. AAR – CD Drive in My Computer**

8. Highlight and right-click the file(s) to be burned to the CD (Figure 163). A dropdown menu appears.

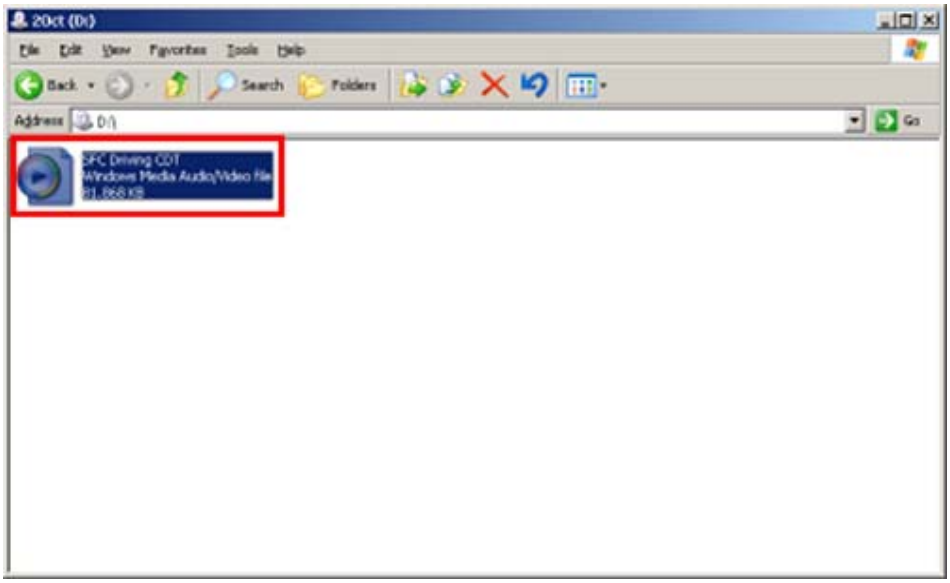


**Figure 163. AAR – Selecting File to Burn to CD**

9. Select the Burn to CD option from the dropdown menu.

### 2.6.7 Record a DVD of a Driving Exercise

1. Double-click on the NeroStartSmart icon on the AAR desktop to launch the DVD burning software.
2. From the Nero Start Smart window, click on the Nero icon at the bottom left, and select [NERO VISION] from the Nero Application List (Figure 164).

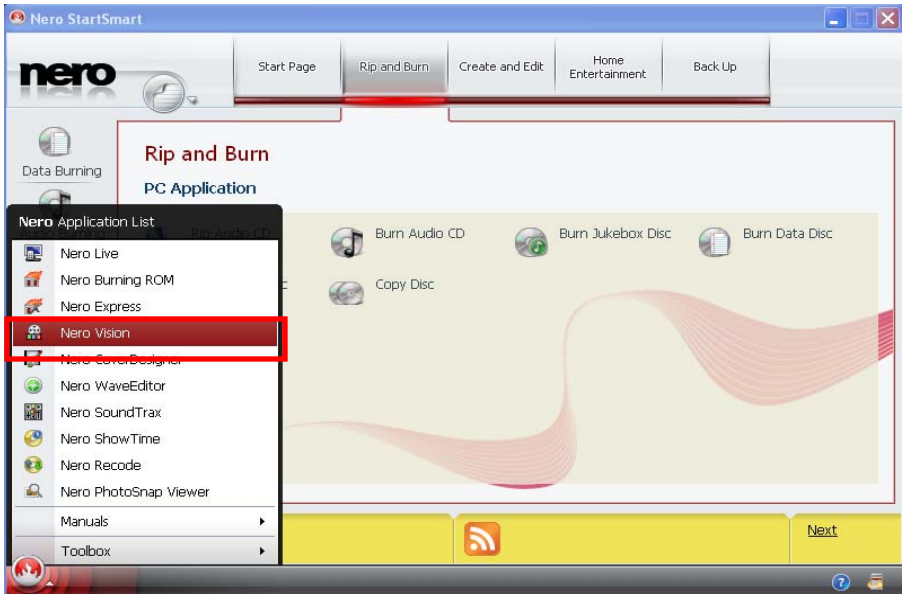



**Figure 164. AAR – Select Nero Vision**

3. From the Nero Vision window, click on the menu icon on the bottom left, and select [MAKE A DVD – DVD VIDEO] (Figure 165).

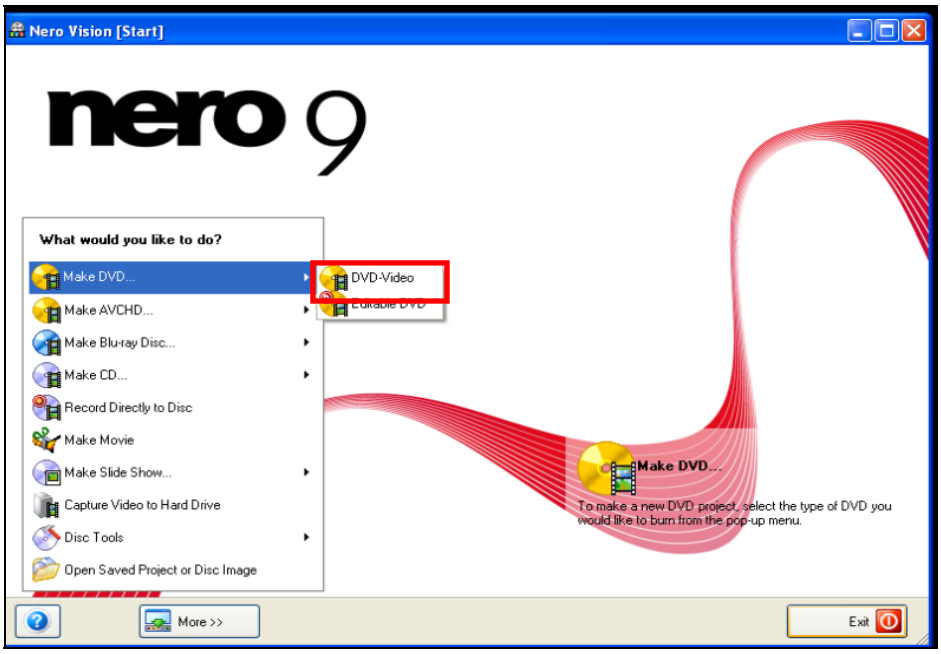



**Figure 165. AAR – Select Make a DVD, DVD-Video**

4. Click on [IMPORT], and select [IMPORT FILES] (Figure 166).

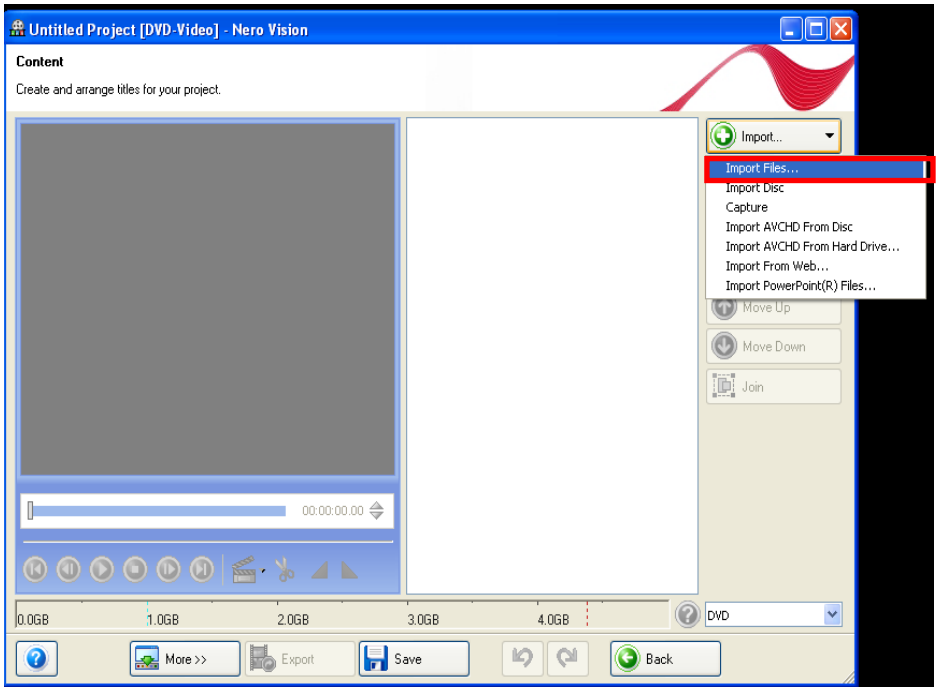



**Figure 166. AAR – Select Import Files**

5. An OPEN dialog box will appear. Search to the location of the file you want to import, select the desired file, and click [OPEN] (Figure 167).

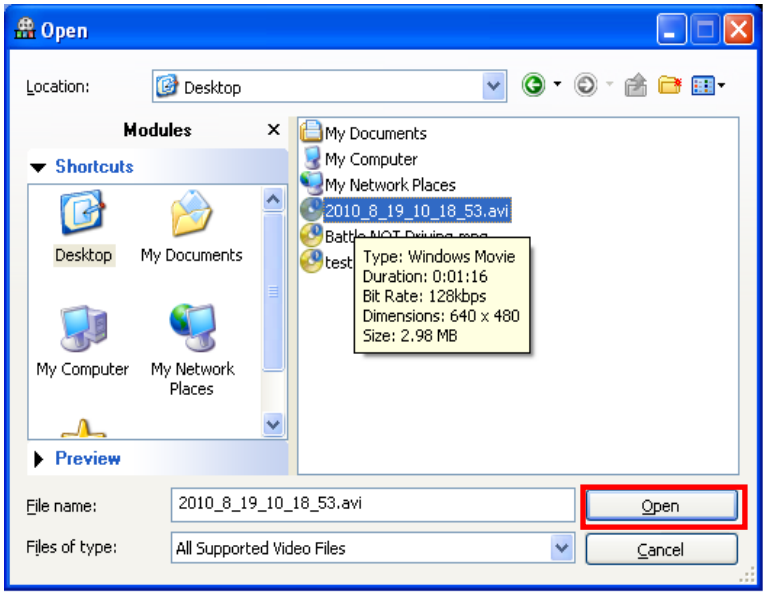



**Figure 167. AAR – Select File to Import**

6. An Edit Menu window will appear, which allows you to edit as desired (Figure 168).

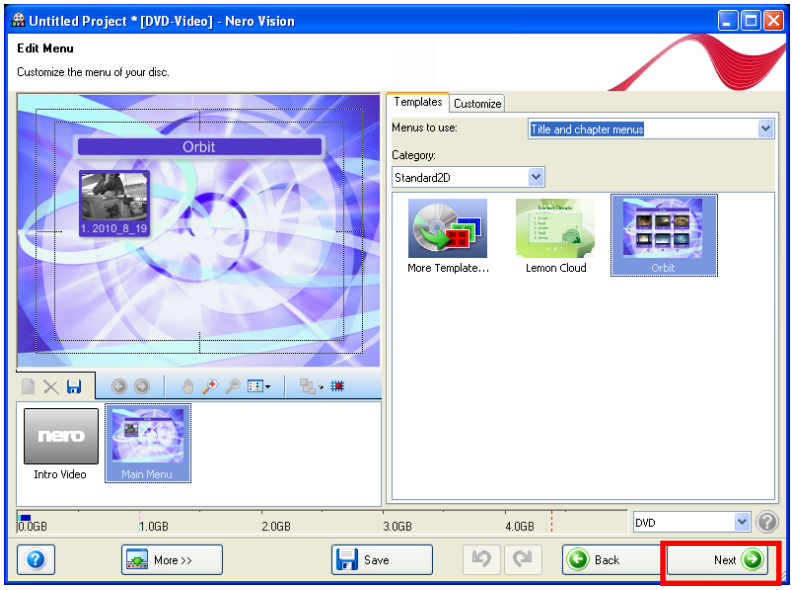



**Figure 168. AAR – Edit Menu**

7. Click [NEXT], and the Preview Menu window will appear (Figure 169).

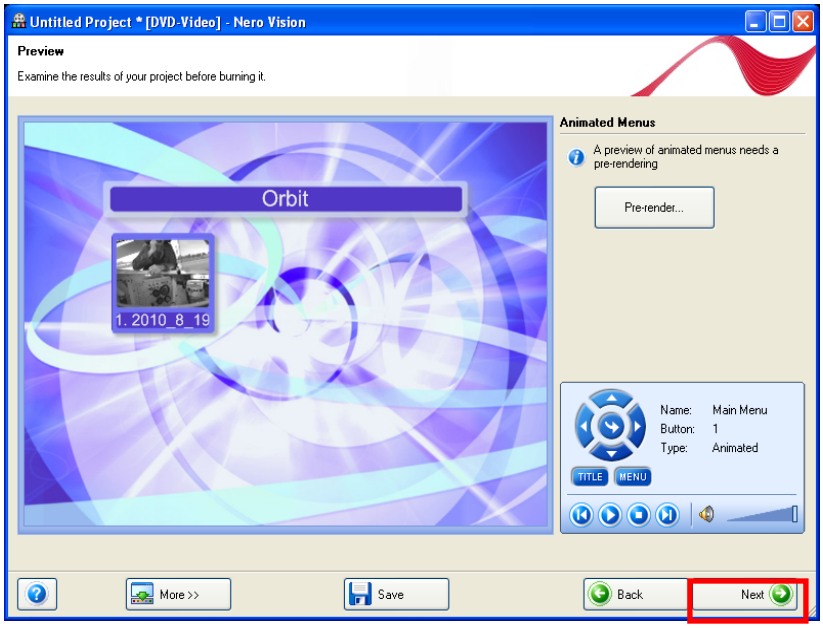



**Figure 169. AAR – Preview Menu**

8. Preview as needed, and click [NEXT]. The Burn Options window appears.
9. Ensure you have a DVD-R or DVD-RW in your burn drive.
10. From the Burn Options window, click [BURN] (Figure 170).

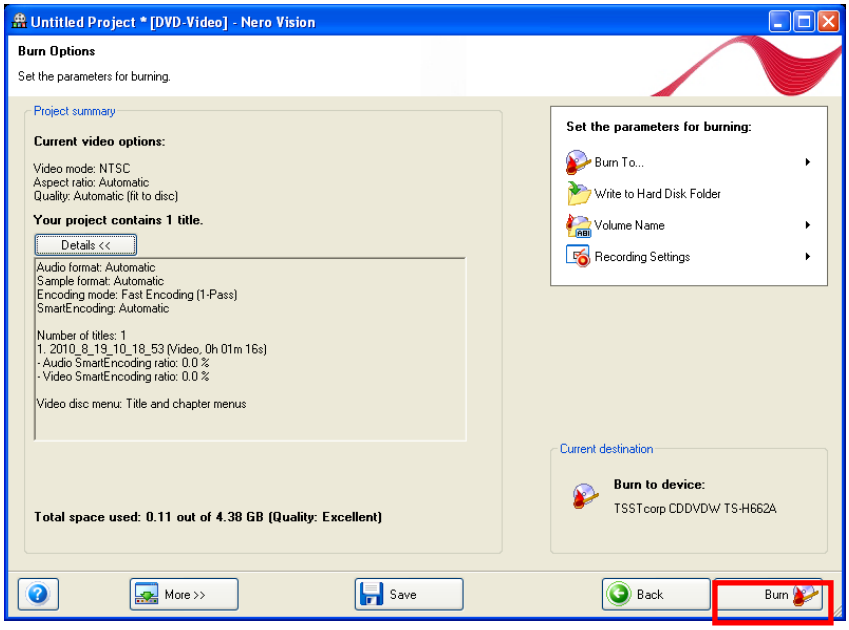



**Figure 170. AAR – Burn Options**

11. Once the burn has completed successfully, a window will pop up, and confirm the burn success (Figure 171). Click [YES] to save the log file (for instances when additional DVDs must be burned with the same information) or [NO] to discard the log file.

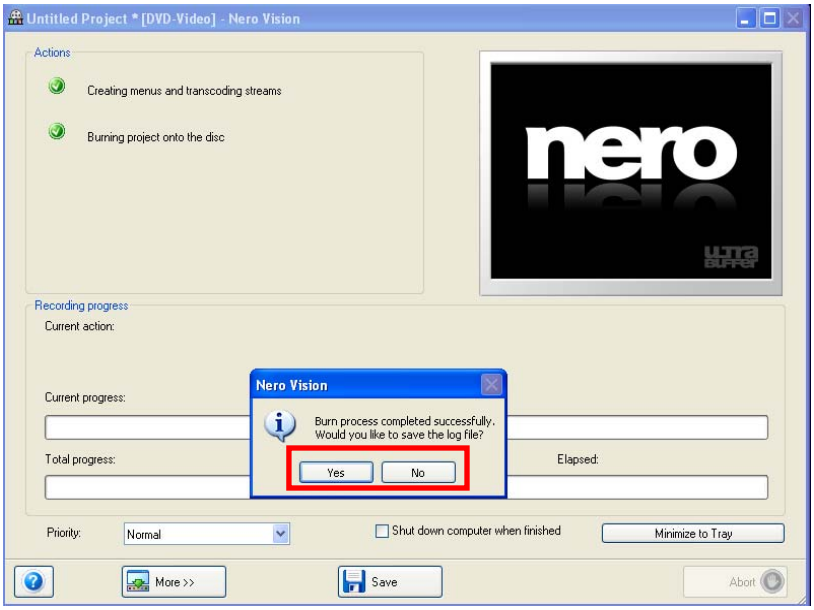



**Figure 171. AAR – Burn Complete**

## 2.7 Shutdown Procedures

### 2.7.1 Stopping the Scenario

1. To stop the scenario, click the [STOP] button at the lower left side of any of the Monitoring Screens or on the square button at the lower left of the Primary STS Run screen shown in Figure 172.


**Figure 172. Primary STS Run Screen - Stop**

2. Select the appropriate student performance (pass, incomplete, fail) on the Scoring window, and then click the [LOGOUT] button (Figure 173) to logout or the [SETUP NEXT] button to return to the POI/Scenario selection screen.

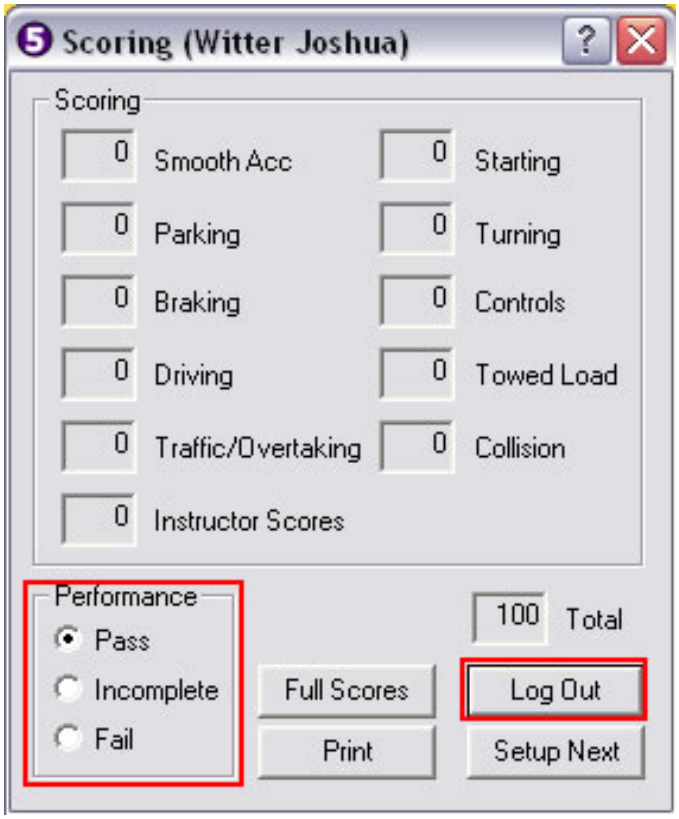



**Figure 173. Scoring Window - Logout**

3. The instructor has the ability to pass a student even if the student does not receive a passing score of 80 points or more. You will receive the "Change not recommended" message on the right if you select pass (Figure 174). The instructor also has the ability to fail the student even if the system shows that they received a score of 80 points or more.

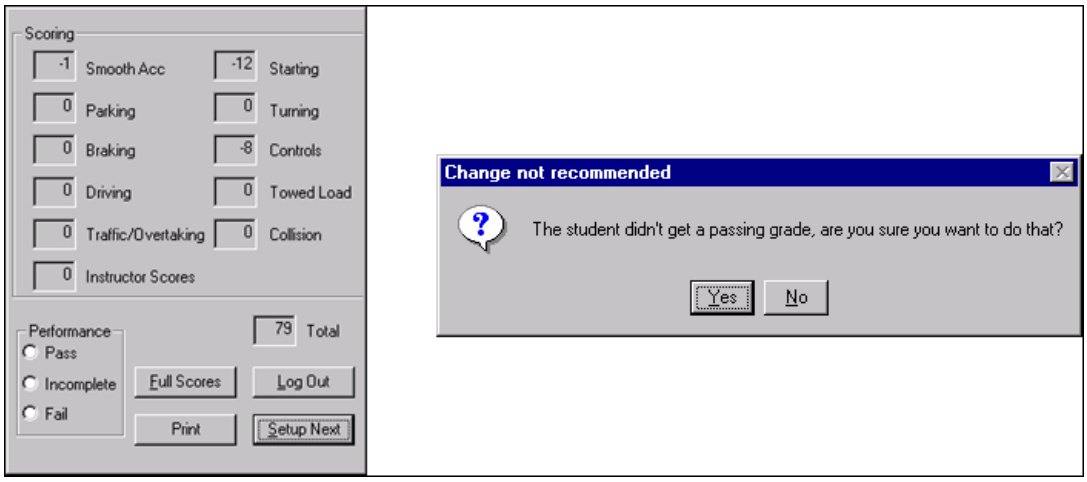



**Figure 174. Scoring Window – Passing a Student**

4. After clicking the [FULL SCORES] button in the Scoring window, the Scores screen will appear on the right (Figure 175). This screen allows the instructor to see exactly where the student lost points during the exercise.

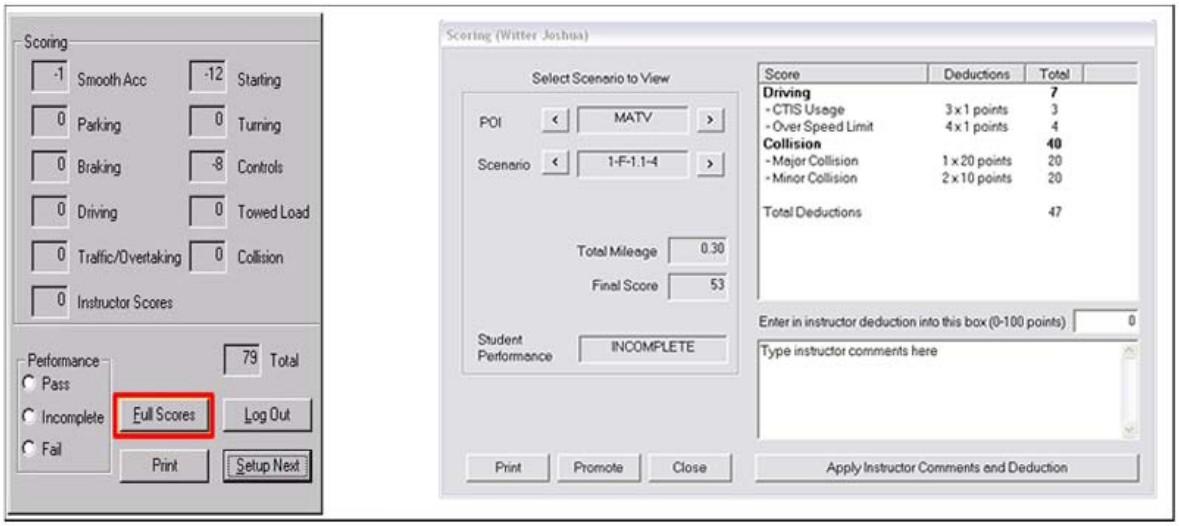



**Figure 175. Scoring Window – Full Scores**

5. After clicking the [PRINT] button in the Scoring window, the student's scorecard appears (Figure 176). The student scorecard includes the following scores: Smooth Acceleration, Parking, Braking, Driving, Traffic/Overtaking, Starting, Turning, Use of Controls, W/Towed Load, and Collision. Any additional deductions added by the instructor appear at the bottom of the report, along with the reasons for the deductions.

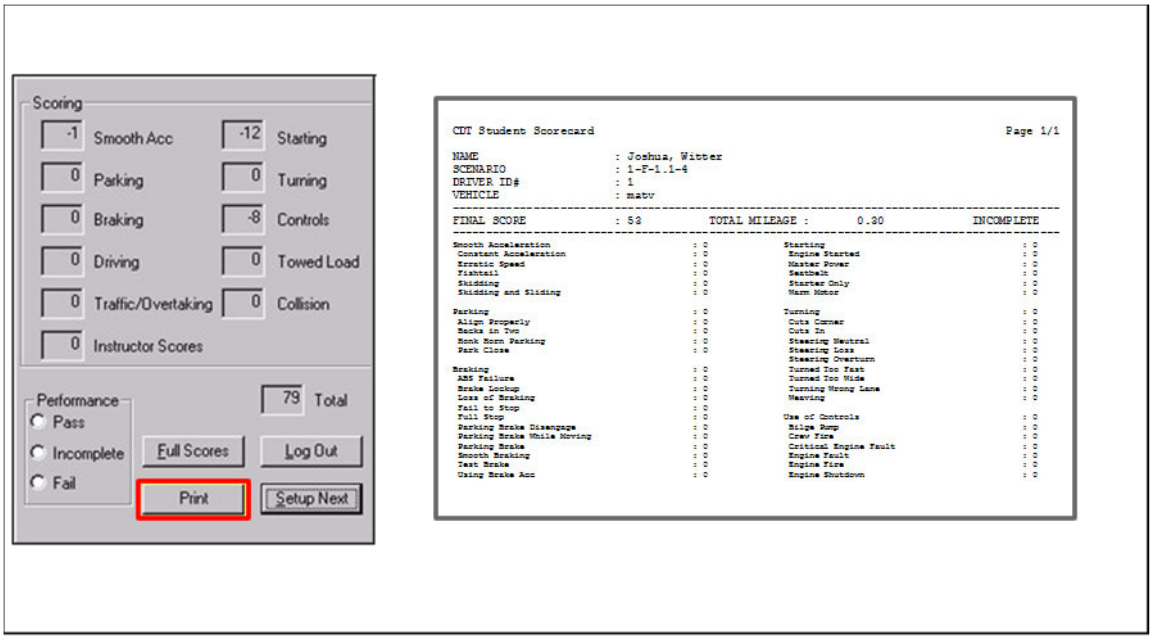



**Figure 176. Printing CDT Student Scorecard**

## 2.7.2 Power Down Simulator

Use this procedure to turn off all of the simulator's hardware.

**NOTE**

It is recommended to leave the simulator system powered up at all times unless (1) the simulator is not planned for use for at least 72 hours, (2) continuous "clean" electrical power is uncertain, or (3) service/maintenance requires a shut down.

**NOTE**

If a scenario is not running, proceed to Step 2.

1. Click the [LOGOUT] button.
2. On the top menu bar, Select "FILE>LOGOUT INSTRUCTOR".
3. Click the [EXIT] button.

## 2.7.3 Power Down Projectors

### 2.7.3.1 Epson Software

1. Select the CDT icon in the EPSON Projector Control Software (EMP) application window.
2. Select the gray and black power icon in the EMP application toolbar. Additional information can be found in the Epson Projector Users Guide and Epson Projector Control Panel Users Guide.

### 2.7.3.2 InFocus and Proxima

1. Double-click the ProjectorNet icon on the IOS desktop.
2. Click the [DEVICE CONTROL] button on the toolbar.

3. From the Control Manager window, click the [POWER OFF] button on the upper right corner of the window.
4. Click the [CLOSE] button to close the Control Manager window.
5. Close the InFocus ProjectorNet program by clicking the Windows red X.
6. When prompted to save changes, click the [NO] button.

### 2.7.4 Power Down Remaining Components

1. Double-click the **Shutdown Trainer** icon located in the **C:\IOS\Utilities\Maintenance** folder. This icon is a shortcut to a command (.cmd) file that automatically shuts down the following components:

    - Audio PC
    - IG rack
    - Stealth PC
    - Repeater PC
      STS PC

2. Turn off IOS PC.

    a. On the IOS PC, click the [START] button.

    b. Click “SHUTDOWN”.

    c. Click “OK”.

    d. With the exception of the PELCO display, wait for all other displays at the IOS to turn black (no image).

3. Turn off AAR PC.

    e. On the AAR PC, click the [START] button.

    f. Click “SHUTDOWN”.

    g. Click “OK”.

    h. wait for the display at the AAR to turn black (no image).

4. Turn the IOS rack “Juice Goose” power sequencer off.

    a. Turn the knob/key on top of IOS rack to “Sequence Down”.

    b. All Juice Goose LED’s will turn off on IOS rack, STS rack, and floor boxes under motion base.

**NOTE**

The following **additional** steps apply only to MTF systems.

5. Turn off all lights and ensure all access panels and doors are secure.
6. Turn off each UPS.

    a. Power off one (1) on IOS rack.

    b. Power off two (2) on STS rack.

7. Turn off all emergency lights. Use switch on bottom of light (switch towards wall is “off”).
    a. One (1) in IOS Area.
    b. Two (2) in Simulator Bay (STS area).
    c. One (1) in Doghouse.
8. Turn off four (4) AC breakers located in the main power panel in the Doghouse.
9. Turn off main 150AMP breaker located in the main power panel in the Doghouse.
10. Turn off generator.
    a. Check fuel level. If level is less that ½ tank, order fuel.
    b. Press and release the generator’s STOP button.
    c. The generator will enter its cool down period, and will shut off after 7-10 minutes.
11. If removing power from the MTF trainer, turn off the battery-enabled toggle switch on the MOOG motion base. Otherwise, go to the next step.
12. Turn off all lights and ensure all access panels and doors are secure.

## 2.8 Decals and Instruction Plates

The decal and instruction plate locations are shown in Figure 177.

**Common:**

1. Moog: The Moog has decals warning of the danger of being nearby during operation.
2. Stairs: Weight limitation and instructional/caution decals are included with stairs. The weight limitation is 800 lbs. The decals are affixed to the front ledge of the lowest step.

**MTF Only:**

3. VDU Setup Procedure: A decal with the VDU setup procedure is located on the underflooring of the large bumpout panel.
4. Circuit Breaker: The MTF circuit breaker panel contains a decal describing the function of each breaker.
5. Leveling: An instructional decal is located near the leveling bubble on the MTF.
6. IOS Door: The IOS door has a warning decal stating “Do not enter during operation.”
7. Doghouse Exterior Door: This door has a warning decal stating “Do not enter while generator is running.”

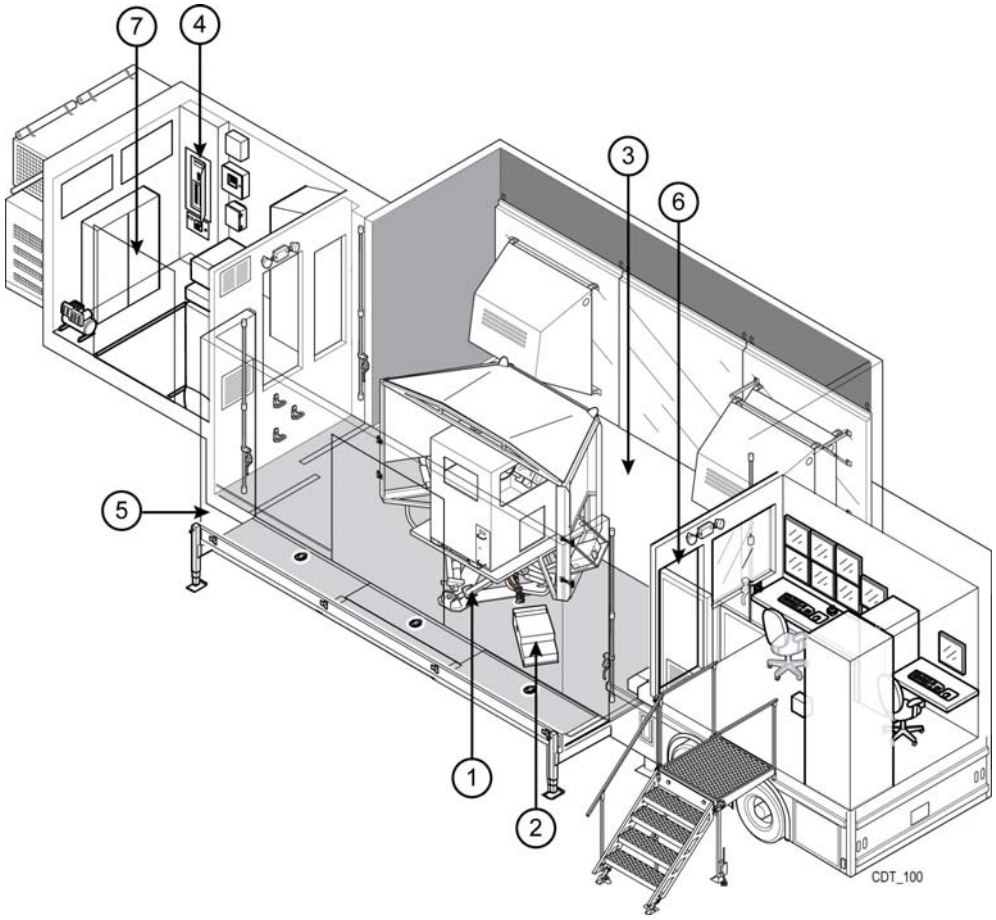



**Figure 177. Decals and Instruction Plates**

## 2.9 Preparation for Movement

Refer to the SMM 17-6920-913-24&P for instructions on CDT preparation for movement.

## 2.10 Emergency Procedures

### 2.10.1 E-STOP (Motion Only)

There are two buttons labeled “EMERGENCY STOP” (also known as “E-STOP”) included with the CDT MRAP and Stryker systems; one in the Instructor Operator Station (IOS) and one in the cab (Figure 29). For the Tank variant cabs, this same button is simply labeled “STOP.” Pushing the E-STOP button immediately parks the motion base and effectively halts the simulation.

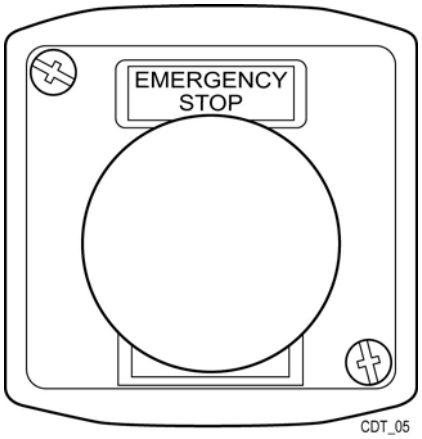



**Figure 178. E-STOP**

**NOTE**

During the operation of the simulation, if the seatbelt is undone, the driver's door is opened, or the Emergency Stop (E-STOP) is pressed, the motion base will immediately settle and lock to the parked position. The Instructor Operator Station (IOS) will receive warnings for such actions (see section 2.5.6).

### 2.10.2 Emergency Power Off (EPO) – MTF Only

The EMERGENCY POWER OFF (EPO) button located at the Instructor Operator Station (IOS) in the MTF activates the shunt relay system to shut off all power to the system. The emergency lighting illuminates upon activation. Upon activation, the smoke detector and motion base are still-powered with battery backup. The EPO button is located on the wall adjoining the STS and IOS, directly under the window.

# 3 TROUBLESHOOTING PROCEDURES

## 3.1 Troubleshooting Index

The index below references the procedures in the PMCS table located in Chapter 4, PMCS Maintenance Instructions.

# 4 PMCS MAINTENANCE INSTRUCTIONS

## 4.1 PMCS Introduction

Any maintenance reserved for trained LCCS personnel is covered in SMM 17-6920-913-24&P.

## 4.2 PMCS Table

**Table 14. PMCS Table**

| Item No. | Component Name | INTERVAL | | | | | Procedure |
|---|---|---|---|---|---|---|---|
| | | Before | During | After | Weekly | Monthly | |
| **Mobile Training Facility (MTF) - Exterior** | | | | | | | |
| 1 | MTF Leveling | • | | | | | Verify leveling of the trailer by checking bubble levels. Contact LCCS if the trailer is not level. |
| 2 | Tires | • | | | | | Check for flat tires. Contact LCCS to repair or replace any flat tires. |
| 3 | Jack Stands | • | | | | | Ensure the jack stands are in place under the trailer. Contact LCCS if the jack stands are not in place. |
| 4 | Canopy | | | | • | | Check the canopy conditions. Contact LCCS if the canopy requires service. |
| 5 | Entry Area | • | | | | | Check whether the entry area's ladder and locking devices are in the correct position and secured. Adjust the ladder and locking devices if necessary. |
| 6 | Data Labels /Plates | | | | • | | Check whether all labels and data plates are in place. Contact LCCS if any labels or data plates are missing. |
| **Mobile Training Facility (MTF) - Interior** | | | | | | | |
| 7 | Trailer Floor | • | | | | | Check the cleanliness of the trailer floor. If necessary, sweep the floor with the broom located in the Doghouse. |
| 8 | Hydraulic Leaks | • | | | | | Check for hydraulic leaks. Contact LCCS if any leaks are found. |
| 9 | Water Leaks | • | | | | | Check for water leaks from the ceiling. Contact LCCS if any leaks are found. |
| 10 | Grounding Cables | • | | | | | Make sure grounding cables are connected. Contact LCCS if any cables are not connected. |

| Item No. | Component Name | INTERVAL | | | | | Procedure |
|---|---|---|---|---|---|---|---|
| | | Before | During | After | Weekly | Monthly | |
| 11 | Generator Fuel Level | • | | | | | Check fuel level for the generator. Ensure enough fuel is present to complete the class. |
| 12 | Fire Extinguisher | • | | | | | Check whether the fire extinguisher is full. Contact LCCS if the fire extinguisher is not full. |
| 13 | Air Conditioning | • | | | | | Check that the air conditioning is on during warm weather, or the heat is on during cold weather. Turn on the air conditioner/heater if necessary. |
| 14 | Interior Lighting | • | | | | | Check the lighting inside the trailer. Contact LCCS to repair any lighting. |
| 15 | Doghouse Door | • | | | | | Check whether the Doghouse door is closed. If the door is open, close it before operating the STS to avoid carbon monoxide fumes entering the area. |
| 16 | Data Labels /Plates | | | | • | | Check whether all labels and data plates are in place. Contact LCCS if any labels or data plates are missing. |
| **Instructor/Operator Station (IOS)** | | | | | | | |
| 17 | IOS Table | • | | | | | Check the cleanliness of the IOS table. If necessary, clean the IOS station table of any dust or grime using distilled water and a clean towel. |
| 18 | Monitor Cleaning | • | | | | | Check that the monitors are clean and connected properly. If monitors require cleaning, use approved cleaning fluid and a clean towel. Connect monitors if necessary. Contact LCCS for any monitor connection problems. |
| 19 | Headset Connection | • | | | | | Check headsets for loose connections. Contact LCCS if any headset repairs are required. |
| 20 | Remote Control | • | | | | | Check the remote control for correction operation. Contact LCCS for any remote control repairs. |
| 21 | E-STOP Button | • | | | | | Check whether E-STOP buttons are obstructed. Remove any obstructions. |
| 22 | Keyboard Cleaning | • | | | | | Check keyboards for cleanliness. If necessary, clean the keyboards with |

| Item No. | Component Name | INTERVAL | | | | | Procedure |
|---|---|---|---|---|---|---|---|
| | | Before | During | After | Weekly | Monthly | |
| | | | | | | | a clean towel dampened with distilled water. |
| 23 | Joystick Operation | • | | | | | Check whether the joystick operates correctly. Contact LCCS for any required joystick repairs. |
| 24 | Cable Connections | • | | | | | Check for loose cable connections. Contact LCCS if cables are not connected properly |
| 25 | Printer | • | | | | | Check whether the printer has adequate supplies of ink and paper. Obtain additional printer paper if necessary. Contact LCCS if new printer cartridge is required. |
| 26 | IOS Fatal Exception Error | | • | | | | Follow the instructions displayed in the error message. |
| 27 | IOS Not Responding | | • | | | | 1. Simultaneously hold down the [CTRL], [ALT], and [DELETE] keys on the IOS keyboard. This will yield a window that has Logoff as an available button in the lower center of the screen. Click on [LOGOFF], which will yield the NT Logon page. If the mouse is not active, press the TAB key until the LOGOFF option is highlighted then press the [ENTER] key, which will yield the NT Logon page.<br>2. If the IOS responds to the login inputs, continue on as normal.<br>3. If the IOS does not respond, call LCCS maintenance personnel. |
| **Student Training Station (STS)** | | | | | | | |
| 28 | Cab Floor Cleaning | • | | | | | Check the cleanliness of the cab floor. Special attention should be paid to keeping the floor area of the cab clean, especially near the pedals and around the seat skirt area to prevent binding of the seat adjustment. If necessary, sweep the floor with the broom located in the Doghouse. |
| 29 | STS/Cab Cleaning | • | | | | | Check the cleanliness of the STS/cab. If necessary, clean any dust or grime using distilled water |

| Item No. | Component Name | INTERVAL | | | | | Procedure |
|---|---|---|---|---|---|---|---|
| | | Before | During | After | Weekly | Monthly | |
| | | | | | | | and a clean towel. |
| 30 | Cable Connections | • | | | | | Check cables for loose connections, cuts and fraying. Contact LCCS for any cable repairs. |
| 31 | Step-Up Platform | • | | | | | Check whether the step-up platform is in proper location for entering the cab. If necessary, adjust the location of the platform so students can safely enter the cab. |
| 32 | Frames | • | | | | | Check the flying frame and K frame for loose bolts and missing hardware. Contact LCCS for any required missing parts and repairs/installations. |
| 33 | Cab Door | • | | | | | Check whether the cab door closes properly. Contact LCCS if the door does not close properly. |
| 34 | Seatbelt | • | | | | | Check seatbelt operation. Contact LCCS if the seatbelt does not function properly. |
| 35 | Cab Fans | • | | | | | Check whether the cab fans are operating correctly. Contact LCCS if any of the fans is not working properly. |
| 36 | Data Labels /Plates | | | | • | | Check whether all labels and data plates are in place. Contact LCCS if any labels or data plates are missing. |
| 37 | Projector – Blue Screen | | • | | | | Press the RGB button on the projector's remote control. Contact LCCS if blue screen remains. |
| 38 | Projector - Inoperable | | • | | | | Unplug projector for three minutes and then plug it back in. If projector remains inoperable contact LCCS. |
| 39 | Projector – Red Screen | | • | | | | If all of the projectors are red (not active), click the Root System icon on the left pane. Next, press F11 to test the connections. A warning screen appears if any projectors are not reachable over the network. If any of the projectors remain inactive contact LCCS for maintenance. |
| 40 | Projector – Screen Freeze | | • | | | | 1. From the IOS, stop the scenario.<br>2. If the screen goes white with the other screens, the system is |

| Item No. | Component Name | INTERVAL | | | | | Procedure |
|---|---|---|---|---|---|---|---|
| | | Before | During | After | Weekly | Monthly | |
| | | | | | | | ready to accept the next training session.<br>3. If the screen remains frozen with the old image, exit from the IOS application through the Instructor Login page.<br>4. Call LCCS maintenance personnel. |
| 41 | Projector – All Screens Freeze | | • | | | | 1. From the IOS, stop the simulator and exit from the IOS application through the Instructor Login page.<br>2. If the IOS does not respond to login inputs, follow the Shut Down procedures in "Power Down the Simulator" section.<br>3. Restart the simulators by following the Startup procedure in the "Power Up Procedures" section.<br>4. Notify LCCS maintenance personnel. |
| 42 | Projector – Flashing Screen | | • | | | | The projector bulb is failing. Contact LCCS personnel. |

# 5 SUPPORTING INFORMATION

## 5.1 References

- SMM 17-6920-913-24&P, CDT System Maintenance Manual.

## 5.2 Components of End Items (COEI)

There are three separate COEI lists for the CDT system: one for the MTF, one for the MRAP variants, and one for the Tank variants. The MRAP variants COEI is located in Volume III - MRAP variants. The Tank COEI is located in Volume IV – Tank variants. The COEI for the MTF is shown below. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts.

### 5.2.1 COEI for the MTF

The items listed in Table 15 are installed in the MTF system at the time of contractor delivery.

### 5.2.2 COEI Column Explanation

The following provides an explanation of the columns found in the COEI table:

**Item Number:** Indicates the reference number of the item.

**Item Description:** Indicates the minimum description to identify and locate the item.

**Unit of Measure (U/M):** Indicates how the item is issued, such as individually (EA, to represent "each"), in pairs, (PR represents "pair"), etc.

**Quantity Required (Qty. Req.):** Indicates the quantity of the item authorized to be used with or on the vehicle.

**Table 15. COEI – MTF Only**

| Item Number | Item Description | U/M | Qty. Rqr. |
|---|---|---|---|
| 1 | AAR Keyboard | EA | 1 |
| 2 | AAR Mouse | EA | 1 |
| 3 | AAR Speaker | EA | 2 |
| 4 | Bosh Hammer Drill | EA | 1 |
| 5 | Bosh Hammer Drill Bit (HS1924) | EA | 1 |
| 6 | Bungee Cord | EA | 2 |
| 7 | Cab Access Stairs | EA | 1 |
| 8 | Consumables: | | |
| 8a | Ground Rods (2 required per installation) | EA | 2 |
| 8b | Lighting mast (8 required per installation) | EA | 8 |
| 9 | Door key set (see COTS Manual – Volume II) | EA | 1 |
| 10 | Entry way platform: | | |

| Item Number | Item Description | U/M | Qty. Rqr. |
|---|---|---|---|
| 10a | Stairs | EA | 1 |
| 10b | Platform | EA | 1 |
| 10c | Stair handrails | EA | 2 |
| 10d | Platform handrails | EA | 2 |
| 11 | Extension Cord 25' | EA | 1 |
| 12 | Facility Power Connectors: | | |
| 12a | Black | EA | 1 |
| 12b | Red | EA | 1 |
| 12c | Blue | EA | 1 |
| 12d | White | EA | 1 |
| 12e | Green | EA | 1 |
| 13 | Fire Extinguishers: | | |
| 13a | 3 lb | EA | 2 |
| 13b | 5 lb | EA | 1 |
| 14 | Garden Hose | EA | 2 |
| 15 | Grease Gun | EA | 1 |
| 16 | Grounding cable (generator) | EA | 1 |
| 17 | Grounding Cable (lighting) | EA | 1 |
| 18 | Grounding Clamp | EA | 2 |
| 19 | Headsets: | | |
| 19a | IOS Station | EA | 2 |
| 19b | Cab & Cable | EA | 1 |
| 20 | IOS chairs | EA | 2 |
| 21 | IOS Keyboard | EA | 1 |
| 22 | IOS Mouse | EA | 1 |
| 23 | IOS Printer | EA | 1 |
| 24 | IOS Ratchet Straps | EA | 1 |
| 25 | Joystick | EA | 1 |
| 26 | Ladder - 6 ft. | EA | 1 |
| 27 | Landing gear plates | EA | 8 |
| 28 | License plate | EA | 1 |
| 29 | Maintenance Laptop | EA | 1 |
| 30 | MOOG Ratchet Straps | EA | 3 |
| 31 | MOOG Spare Parts (box) | EA | 1 |
| 32 | MRAP Driver Simulator Operator's Manual | EA | 1 |
| 33 | COTS Manual – Volume I | EA | 1 |
| 33 | COTS Manual – Volume II | EA | 1 |
| 34 | COTS Manual – Volume III | EA | 1 |
| 35 | MTF Scale-up / Scale-down instruction set | EA | 1 |

| Item Number | Item Description | U/M | Qty. Rqr. |
|---|---|---|---|
| 36 | MTF toolkit (see toolkit content list inside toolkit bag) | EA | 1 |
| 37 | Outrigger jack | EA | 4 |
| 38 | Outrigger jack footplate and pin | EA | 4 |
| 39 | Outrigger jack hand crank | EA | 2 |
| 40 | Pad Locks | EA | 4 |
| 41 | Power Cable - 100 ft.: | | |
| 41a | Black | EA | 1 |
| 41b | Red | EA | 1 |
| 41c | Blue | EA | 1 |
| 41d | White | EA | 1 |
| 41e | Green | EA | 1 |
| 42 | Projector Lens Cap | EA | 3 |
| 43 | Pull-out canopy - Long side | EA | 1 |
| 44 | Pull-out canopy - short side | EA | 1 |
| 45 | Remote Control - Projectors | EA | 3 |
| 46 | Remote Control - Pelco system | EA | 1 |
| 47 | Remote Control - Correscan (TVOne) | EA | 1 |
| 48 | Spares kit (MRAP/MFT see current list) | EA | 1 |
| 49 | STS inside entry stairs | EA | 1 |
| 50 | STS outside entry stairs: | | 1 |
| 50a | Stairs | EA | 1 |
| 50b | Handrails | EA | 1 |
| 51 | Tie Down Ring / Doghouse | EA | 6 |
| 52 | Tongue jacks | EA | 2 |
| 53 | Can Smoke | EA | 1 |
| 54 | Glad Hands | EA | 2 |
| 55 | Ratchet Straps (GFE): | EA | |
| 55a | Straps Being Used | EA | 4 |
| 55b | Strap Spares | EA | 2 |
| 56 | Ratchet Strap Protective Sleeves (GFE) | | |
| 56a | Protective Sleeves Being Used (GFE) | EA | 8 |
| 56b | Protective Sleeve Spares (GFE) | EA | 4 |
| 57 | Diesel Fuel Transfer Pump | EA | 1 |

### 5.2.3 Basic Issue Items (BII)

Basic Issue Items (BII) are the spares delivered to support maintenance and repair of the CDT system. Although shipped separately, BII must accompany the CDT during operation and whenever it is transferred between property accounts. This manual is your authority to

request/requisition replacement BII, based on TOE/MTOE authorization of the end item. There are two separate BII lists for the CDT system: one for the common components that accompany each CDT variant and one for the components specific to each variant. Variant-specific BII is located in the appropriate volumes. The BII for the common components is shown below.

### 5.2.4 BII for the Common Components

Given that the CDT is a family of simulators, the following terms have been provided to further define the systems referenced throughout this manual.

- **Lots 1 & 2** – refers to the fourteen fixed-site systems delivered under the Stryker contract.
- **MTF** (Mobile Training Facility) – refers to the thirteen mobile trailer site systems delivered under the MRAP contract.
- **CES** (Common Equipment Set) – refers to the two fixed systems delivered under the MRAP contract.
- **TV** – refers to the eighteen fixed systems delivered under the Tank contract.

The items shown in Table 16 through 19 identify which BII are provided with the CDT system at the time of contractor delivery.

### 5.2.5 BII Column Explanation

The following provides an explanation of the columns found in the BII table:

**Item Number:** Indicates the reference number of the item.

**Part Number:** Indicates the part number of the item.

**Item Description:** Indicates the minimum description to identify and locate the item.

**Source:** Indicates the manufacturing source of the spared item.

**Unit of Measure (U/M):** Indicates how the item is issued, such as individually (EA, to represent “each”), in pairs, (PR represents “pair”), etc.

**Quantity Recommended:** Indicates the quantity of the item authorized to be used with/on the vehicle.

**System**: Indicates the system and contract the item was delivered under.

**Table 16. BII – Lots 1 & 2**

| Item Number | Part Number | Item Description | Source | U/M | Qty. Recommended |
|---|---|---|---|---|---|
| 1 | ST3120813AS | Image Generator (RT) Hard Drive Barracuda 7200.9 SATA 160GB HDD carrier PN: SK33502-70C | Seagate/Chenbro | EA | 1 |
| 2 | ST3120813AS | Image Generator (Stealth) Hard Drive Barracuda 7200.9 SATA 160GB HDD carrier PN: SK33502-70C | Seagate/Chenbro | EA | 1 |
| 3 | ST9120823AS | STS 0 Hard Drive 160GB SATA7200.2 8MB and DE50 Carrier SATA II PN: 6417-5000-0500 | Seagate/CRU | EA | 1 |
| 4 | ST9120823AS | AAR/IOS Hard Drive 160GB SATA7200.2 8MB Cache hard drive and DE50 Carrier SATA II PN: 6417-5000-0500 | Seagate/CRU | EA | 1 |
| 5 | EPX-50-CDT-Desktop | E&S EPX-50 CDT Desktop | Evans and Sutherland | EA | 1 |
| 6 | OEMB945R05 | IOS System PC | Dedicated Computing | EA | 2 |
| 7 | OEMB945R05 | STS Node PC | Dedicated Computing | EA | 2 |
| 8 | OEMB945R05 | Audio Node PC | Dedicated Computing | EA | 2 |
| 9 | NV7000 | DVR Card | Avermedia | EA | 1 |
| 10 | VP201B | 20" LCD Monitor | Viewsonic | EA | 1 |
| 11 | 284812 | Mouse 3button | Logitech | EA | 1 |
| 12 | 414535 | 104key keyboard (Black) | Logitech | EA | 1 |
| 13 | Epson 9300i | Epson 9300i UXGA projector | Epson | EA | 1 |
| 14 | V13H010L26 | Epson 9300i Bulb | Epson | EA | 3 |
| 15 | SN-STEERING-M | Smart node steering solution | Gforce/FAAC | EA | 1 |
| 16 | C52998-001 | Spares Kit for Moog | Moog | EA | 1 |

**Table 17. BII – MTF**

| Item Number | Part Number | Item Description | Source | U/M | Qty. Recommended |
|---|---|---|---|---|---|
| 1 | RTC0000001 | Image Generator Computer (EPX-50 RT/GP) | Rockwell Collins | EA | 1 |
| 2 | ST3250310NS | Image Generator (RT) Hard Drive Barracuda ES.2 SATA 3.0 250GB and 5-IN-3 SATA HDD carrier PN: SK33502-70C | Seagate/Chenbro | EA | 1 |
| 3 | ST3250310NS | Image Generator (Stealth) Hard Drive Barracuda ES.2 SATA 3.0 250GB and 5-IN-3 SATA HDD carrier PN: SK33502-70C | Seagate/Chenbro | EA | 1 |
| 4 | ST9160310AS | STS 1 Hard Drive 160GB SATA5400.5 8MB and DE50 Carrier SATA II PN: 6417-5000-0500 | Seagate/CRU | EA | 1 |
| 5 | ST9160314AS | STS 0 Hard Drive 160GB SATA5400.6 8MB and DE50 Carrier SATA II PN: 6417-5000-0500 | Seagate/CRU | EA | 1 |
| 6 | ST9160310AS | AAR/IOS Hard Drive 160GB SATA5400.5 8MB Cache hard drive and DE50 Carrier SATA II PN: 6417-5000-0500 | Seagate/CRU | EA | 1 |
| 7 | ST9160310AS | AAR Hard Drive 160GB SATA5400.5 8MB and DE50 Carrier SATA II PN: 6417-5000-0500 | Seagate/CRU | EA | 1 |
| 8 | ST9160314AS | Sound Hard Drive 160GB SATA5400.6 8MB and DE50 Carrier SATA II PN: 6417-5000-0500 | Seagate/CRU | EA | 1 |
| 9 | 512-P3-N963-TR | NVIDIA Gforce 9600 GSO or 8800GT | NVIDIA | EA | 1 |
| 10 | SBO570 | Creative Labs Audigy Soundblaster | CL Audigy | EA | 1 |
| 11 | NIC-PWLA8391GT | Intel Pro/1000GB FH LeadFree PCI NIC | Intel | EA | 1 |
| 12 | NV6240 Express-8CH-302AABXK | CS 8CH PCIE Video Capture Card VGA Avermedia | AverMedia | EA | 1 |
| 13 | VP2130b | 21.3" Viewsonic Black Flat Panel LCD Monitor | Viewsonic | EA | 1 |
| 14 | 5108 | InFocus 5108 Short Trow Lens-038 High | InFocus | EA | 1 |

| Item Number | Part Number | Item Description | Source | U/M | Qty. Recommended |
|---|---|---|---|---|---|
| | | Resolution Projector and Lens | | | |
| 15 | SP-LAMP-046 | InFocus Lamp | InFocus | EA | 3 |
| 16 | KT800P2M10PK | Keyboard | Key Tronic | EA | 1 |
| 17 | 37-20-086-20 | Southco One piece flexible handle latch | Southco | EA | 4 |
| 18 | OEM-A3430-02 | AAR/IOS System (W2K) DC#966589000 | Dedicated Computing | EA | 1 |
| 19 | 3810 CSTAT | 3/8"x10" Safety Tip Air Terminal (Lightning Rod) | Harger | EA | 4 |
| 20 | DP40 SP2 | ECU Air Filter 22.5 x 22.5 x 2 | Airguard | EA | 1 |
| 21 | 253107 | Generator Air Filter | KOHLER | EA | 1 |
| 22 | GM63894 | Generator Fuel Filter | John Deere | EA | 1 |
| 23 | GM34935 | Generator Oil Filter | KOHLER | EA | 1 |
| 24 | SL3330 | Sta-Lube Lithium Grease (All-Purpose) | CRC | EA | 1 |
| 25 | 7500K34 | Ground rod | McMaster-Carr | EA | 4 |

**Table 18. BII – CES**

| Item Number | Part Number | Item Description | Source | U/M | Qty. Recommended |
|---|---|---|---|---|---|
| 1 | EPX-5-CDT RT/GP | EPX-5 RT/GP Spare | Rockwell Collins | EA | 1 |
| 2 | EPX-50 RT | EPX-50 RT Spare | Rockwell Collins | EA | 1 |
| 3 | EPX-50 GP | EPX-50 GP Spare | Rockwell Collins | EA | 1 |
| 4 | OEM-A3430-02 | Audio PC | Dedicated Computing | EA | 1 |
| 5 | OEM-A3430-02 | STS Linux PC | Dedicated Computing | EA | 2 |
| 6 | Logitech - 931641-0403 CDWG P/N - 973382 | Mouse 3 Button | CDWG | EA | 2 |

| Item Number | Part Number | Item Description | Source | U/M | Qty. Recommended |
|---|---|---|---|---|---|
| 7 | Logitech P/N - 967740-0403<br>CDWG P/N - 1048754 | 104 Keyboard (Black) | CDWG | EA | 2 |
| 8 | OEM P/N - LCD2190UXp-BK<br>CDWG P/N - 993067 | NEC 21" Color LCD Monitor | CDWG | EA | 7 |
| 9 | IN5108 | Multimedia Projector | InFocus | EA | 3 |
| 10 | SP-LAMP-046 | InFocus Lamp | InFocus | EA | 3 |
| 11 | Chenbro P/N - 83H555335-016<br>CDWG P/N - 1622073 | Chenbro Hard drive hot-plug Tray - IGs | CDWG | EA | 2 |
| 12 | Promise Tech P/N - F29SS1620000002<br>CDWG P/N - 1409584 | SP.SuperSwap1600.Drive Carrier-Charcoal.BOX - Dedicated Computers | CDWG | EA | 4 |
| 13 | Seagate P/N - ST3250310NS<br>CDWG P/N - 1323014 | Seagate Barracuda ES.2 ST3250310NS 250GB 7200 RPM 32MB Cache SATA 3.0Gb/s 3.5" Internal Hard Drive - IGs | CDWG | EA | 2 |
| 14 | Seagate P/N - ST3250310NS<br>CDWG P/N - 1323014 | Seagate Barracuda ES.2 ST3250310NS 250GB 7200 RPM 32MB Cache SATA 3.0Gb/s 3.5" Internal Hard Drive - Dedicated Computers | CDWG | EA | 4 |
| 15 | Lens-038 | Short Throw Lens | InFocus | EA | 3 |
| 16 | Logitech P/N - 963290-0403<br>CDWG P/N - 543453 | Joystick - Wingman-EX-Pro3D | CDWG | EA | 1 |
| 17 | OEM P/N - RA-300<br>Dedicated P/N - RA-300 | STS Amplifier | Dedicated Computing | EA | 1 |
| 18 | Intel P/N - PWLA8492MT<br>Newegg P/N - N82E16833106209 | Lan Card - INTEL PRO/1000 MT DUAL GBE<br>REV C Gigabit Ethernet Card | Newegg | EA | |

| Item Number | Part Number | Item Description | Source | U/M | Qty. Recommended |
|---|---|---|---|---|---|
| 19 | Creative Labs P/N - 70SB073A00000<br>CDWG P/N - 1162540 | Creative Labs X-FI XTREME GMR | CDWG | EA | 1 |
| 20 | OEM P/N - NV6240EX8<br>CDWG P/N - 1278332 | Avermedia NV6240 Express 8CH Card | CDWG | EA | 1 |
| 21 | MSI P/N - N8400GS-TD512<br>Newegg P/N - N82E16814127366 | NVIDIA GFORCE 8400GSPCIE, 512MB | Newegg | EA | 1 |

**Table 19. BII – TV**

| Item Number | Part Number | Description | Source | U/M | Qty. Recommended | |
|---|---|---|---|---|---|---|
| | | | | | Ft. Benning | Ft. Leonard Wood |
| TVSpare01 | EPX-5-CDT RT/GP | EPX-5 RT/GP Spare | Rockwell Collins | EA | 1 | 1 |
| TVSpare02 | EPX-50 RT | EPX-50 RT Spare | Rockwell Collins | EA | 1 | 1 |
| TVSpare03 | EPX-50 GP | EPX-50 GP Spares | Rockwell Collins | EA | 1 | 1 |
| TVSpare04 | 205230 | Audio PC | SAIC | EA | 1 | 1 |
| TVSpare05 | 205229 | STS Linux PC | SAIC | EA | 1 | 1 |
| TVSpare06 | Logitech - 931641-0403<br>CDWG P/N - 973382 | Mouse 3 Button | CDWG | EA | 2 | 1 |
| TVSpare07 | Logitech P/N - 967740-0403<br>CDWG P/N - 1048754 | 104 Keyboard (Black) | CDWG | EA | 2 | 1 |
| TVSpare08 | NEC P/N - LCD2190UXp-BK<br>HP P/N - EF227A8#ABA<br>CDWG P/N - 993067<br>CDWG P/N - 935815 | Monitor - Min Requirements: 20.1" LCD, Analog/Digital, Resolution 1600 x 1200, Contrast Ratio 800:1, Brightness 300 cd/m2 | CDWG | EA | 1 | 1 |

| Item Number | Part Number | Description | Source | U/M | Qty. Recommended | |
|---|---|---|---|---|---|---|
| | | | | | Ft. Benning | Ft. Leonard Wood |
| TVSpare09 | 205252 | CDT STS Station Projector with Short Throw Lens | SAIC | EA | 1 | 1 |
| TVSpare09a | IN5108 | Multimedia Projector | Tierney Brothers | EA | 1 | 1 |
| TVSpare09b | LENS-038 | Short Throw Lens | Tierney Brothers | EA | 1 | 1 |
| TVSpare10 | Logitech P/N - 963290-0403 CDWG P/N - 543453 | Joystick - Wingman-EX-Pro3D | CDWG | EA | 1 | 1 |
| TVSpare11 | Clark Synthesis P/N - TST-329 Parts Express P/N - 300-862 | Tactile Sound Transducer | Parts Express | EA | 1 | 1 |
| TVSpare12 | Alesis - RA-300 Dedicated P/N - RA-300 | Amplifier | Dedicated Computing | EA | 1 | 1 |
| TVSpare13 | Creative Labs P/N - 70SB073A00000 Dedicated Computing - SND-SBAUDIGYSE CDWG P/N - 1162540 | Sound Blaster Audigy 2 ZS Card (Install in Audio PC) | Dedicated Computing Newegg | EA | 1 | 1 |
| TVSpare14 | MSI P/N - N8400GS-TD512 Dedicated Computing - SND-CSXFIXTRGMR Newegg P/N - N82E16814127366 | Video Card - 128MB PCI EXP | Dedicated Computing Newegg | EA | 1 | 1 |
| TVSpare15 | Intel P/N - PWLA8492MTDedicated Computing - NIC-PWLA8492MT-CNewegg P/N - N82E16833106209 | Lan Card - INTEL PRO/1000 MT DUAL GBE REV C Gigabit Ethernet Card | Dedicated ComputingNewegg | EA | 1 | 1 |
| TVSpare16 | Chenbro P/N - 83H555335-016 | Chenbro Hard drive hot-plug Tray - lgs | Chenbro | EA | 4 | 4 |
| TVSpare17 | Promise Tech P/N - F29SS1620000002 | SP.SuperSwap1600.Drive Carrier-Charcoal.BOX - Dedicated Computers | Promise Technologies | EA | 4 | 4 |

| Item Number | Part Number | Description | Source | U/M | Qty. Recommended | |
|---|---|---|---|---|---|---|
| | | | | | Ft. Benning | Ft. Leonard Wood |
| TVSpare18 | Seagate P/N - ST3250310NS CDWG P/N - 1323014 | Seagate Barracuda ES.2 ST3250310NS 250GB 7200 RPM 32MB Cache SATA 3.0Gb/s 3.5" Internal Hard Drive - Igs | CDWG | EA | 4 | 4 |
| TVSpare19 | Seagate P/N - ST3250310NS CDWG P/N - 1323014 | Seagate Barracuda ES.2 ST3250310NS 250GB 7200 RPM 32MB Cache SATA 3.0Gb/s 3.5" Internal Hard Drive - Dedicated Computers | CDWG | EA | 4 | 4 |
| TVSpare20 | SP-LAMP-046 | InFocus Lamp | Tierney Brothers | EA | 6 | 2 |

### 5.2.6 Equipment Recommended but not Supplied

- Forklift
- Torque wrench

## 5.3 Expendable and Durable Items List

The following items are required to maintain the CDT:

- Distilled water
- Diesel fuel (MTF generator)
- Motor oil (MTF generator)
- Mild cleaning materials
- Automotive cleaning materials
- HVAC filters (reference the COTS List)

## 5.4 List of Publications

Table 17 lists the publications required to operator and maintain the CDT Common Components. The COTS manuals for the equipment list may be found in the COTS manual binders.

**Table 17. Publications Required to Maintain the CDT**

| Description | Number |
|---|---|
| Operators Manual | OUM 17-6920-913-10 |
| Maintenance Manual | SMM 17-6920-913-24&P |
| COTS (Stryker) Manual | TM 17-6920-913-24&P |
| COTS (MRAP) Manual | TD-17-6920-913-20-1 (Refer to Volume 3)<br>TD-17-6920-913-20-2<br>TD-17-6920-913-20-3 |
| Scenario Generation System User's Manual | N/A |

## 5.5 AKO CDT Website

To obtain the latest electronic versions of the CDT technical manuals, access to the Army Knowledge Online (AKO) home page is required. The AKO is the official U.S. Government Information System and is for information purposes only. The AKO URL address is shown below:

https://www.us.army.mil/suite/page/629741

**NOTE**

Users must have an AKO email account and must first join a user group from this page to be granted access. Users can then navigate to a specific CDT variant page or knowledge center.