INSTRUCTOR’S GUIDE
MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES) XXI COMBAT VEHICLE SYSTEM (CVS)

Kit for
BRADLEY FIGHTING VEHICLES

OPERATOR TRAINING COURSE

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CHAPTER 1 INTRODUCTION

1.1 GENERAL INFORMATION

Slides 1 and 2 - Introduction

The MILES XXI COMBAT VEHICLE SYSTEM (CVS) operator's training course is designed to give you the necessary information and skills required to identify, mount and use the MILES XXI equipment.

- The MILES XXI CVS equipment consists of Vehicle kits for the M2/M3A2 and M2/M3A3 Bradley Fighting Vehicles. To perform identification, installation and removal, you should understand how the MILES XXI system operates as well as have a general understanding on how the vehicles operate.

Slide 3 - Learning Objectives

- Learn what MILES XXI CVS equipment is and how it works.
- Identify equipment required to perform installation on the vehicles.
- Perform equipment inspection/check-out to ensure operability.
- Learn and perform the installation and removal of MILES equipment.
- At the end of this course you will be able to install and operate the MILES XXI CVS kit for the Bradley Series vehicle.

Slide 4 - 6 - Safety, Weapons and LASER Warning

Do not look directly at the LASER emitter at close range (less than 10 meters). Increasing the distance between the eye and the LASER reduces the risk of injury.

Do not look directly at the LASER beam or the LASER emitter through optics such as daylight sights, binoculars, telescopes, or periscopes at ranges of less than 75 meters.

SAFETY AND LASER WARNING

Safety

Conduct safety briefing for classroom instruction, handling weapons, blank ammunition and vehicle safety.

GENERAL WARNINGS AND CAUTIONS

During installation and removal certain potentially hazardous conditions exist. When performing the following procedures, the general warnings listed below should be observed when applicable.
SAFETY SUMMARY

This section provides a summary of all safety information contained in the operator's manual. Prior to starting a TASK, the warning(s) included in the text for that TASK must be reviewed and understood.

WARNING

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in injury to, or death of, personnel or long term health hazards.

CAUTION

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

NOTE

Highlights an essential operating or maintenance procedure, condition, or statement.

WARNING

You can be killed, burned, or injured by MILES XXI training devices even though they are simulators. Observe the same safety precautions you use for real weapons.

You can be killed or injured by sudden turret movement. Ensure turret power is OFF, or when traversing, check to ensure the area is clear around the turret.

Never load MILES XXI-equipped weapons with live or the wrong type of ammunition.

Fastener tape primer is highly flammable. Do not spray near heat, sparks, or open flame. Use only in well-ventilated areas.

A falling hatch could seriously injure you. Keep head lower than closed hatch position when opening or closing hatch. Keep hands clear of hatch rim when closing. Make sure latch pin mechanism is fully engaged when hatch is in any position.
The turret and guns may move suddenly and strike or crush personnel and equipment when palm grips are engaged. Make sure all personnel and equipment are clear of turret and weapons before power is applied to the turret.

Looking at the sun through any vehicle sight can cause blindness. Do not look at the sun through vehicle sights.

Fast motion of the turret or gun during boresighting could cause injury. Make sure the turret is in MANUAL mode. Move turret and gun very slowly during boresighting.

(Vehicle specific) hands can be crushed if gun rotor moves. Turn TURRET POWER OFF or set the GUN ELEVATION to MANUAL mode before reaching into gun rotor area.

When going to "live fire" ensure all miles equipment is removed from the vehicle.

Lithium batteries contain a strong reactive metal, which easily converts to high-pressure gas under excess heat. Lithium gas is extremely flammable and escaping gas may explode in the presence of atmospheric water vapor. In addition, lithium gas is extremely toxic and can cause severe injury to skin or death if inhaled.

When handling lithium batteries, observe the following safety precautions:

- Handle lithium batteries carefully. Look for signs or sounds of escaping gas. Immediately vacate the area if escaping gas is discovered.
- Do not apply heat directly to a lithium battery. When soldering or unsoldering batteries, always use a heat sink to isolate heat from the battery.

Don't dispose of lithium batteries in a fire, or in any manner that will expose the batteries to excessive heat.

Slide 7 - Schedule
- Classroom Instruction, 2 hours.
- Hands on Training, 6 hours.

1.1.1 Purpose of Equipment

Slide 8 - Purpose, Limitation, Outgoing Fire and Receiving Fire
- The MILES XXI equipment accurately simulates the effects of direct fire weapons, as they would affect the vehicle and crew during an exercise.
- Vehicle Control Unit (VCU) determines result of incoming fire on the vehicle.
- The MILES XXI equipped weapons have the same range, effect, and operational capabilities as the real vehicle weapons.
- They are effective against all MILES XXI equipped aircraft, vehicles and personnel.
- A dirty transmitter lens, however, may reduce the effective range of the weapons equipped with LASER transmitters.
- Outgoing Direct Fire from the vehicle main gun and secondary weapons is simulated by "firing" coded LASER beams from LASER transmitters mounted on the front of the turret. Each weapon has a different MILES XXI code.
- Receiving coded LASER beams “fired” from LASER transmitters simulates direct fire. When incoming fire is received, the VCU will determine whether your vehicle sustains a KILL (CATASTROPHIC, FIREPOWER, MOBILITY, or COMMO), NEAR MISS HIT-No damage.
  - Catastrophic Kill - simulates the crew is killed and total destruction of the vehicle.
  - Firepower Kill - simulates damage to the Main Gun.
  - Mobility Kill - simulates power train, track, wheel or other damage that would keep the vehicle from driving.
  - Communication Kill - simulates loss of radio communications.
  - A combination of a Mobility and Firepower Kill will be assessed as a Catastrophic Kill.
  - Hit No Damage - simulates your vehicle being engaged, but the vehicle received no damage as a result of the engagement.
  - Near Miss - indicates direct fire was close, but did not hit the vehicle.
- Each of these events will be displayed in the VDA window and voice messages over the vehicle intercom. The Combat Vehicle Kill Indicator (CVKI) on your vehicle Control Unit (VCU) will flash:
  1. Catastrophic Kill –continuously.
  2. Mobility, Fire Power, or Commo Kill - 4 times.
  3. Hit-No Damage and Near Miss - 2 times.
CHAPTER 2 EQUIPMENT DESCRIPTION

2.1 VEHICLE KIT OVERVIEW

2.1.1 Bradley Vehicle Kits - Common Components

Slide 9 - Introduction to MILES XXI CVS

- The MILES XXI CVS is made up of:
  - Component Assemblies
  - Vehicle Detection System VDS
    - Detector Belts
  - Cabling
    - Power cables
    - System BUS cables
  - LASER Transmitters
  - Weapon Effects Simulators

Slide 10 - Items Required for MILES XXI

- Controller Device (CD)

The CD is a fully compliant, portable, hand-held unit used for the configuration and control of Multiple Integrated LASER Engagement System (MILES) XXI systems in the field. The CD interfaces with individual operators, crews, and controllers to input data and select system parameters to the MILES XXI systems and to receive system data from the MILES XXI system. The CD provides an external data input/output (I/O) interface through an industry standard interface protocol to meet the specific timing requirements. The data transfer interface allows for the download of event data from the MILES XXI systems, the upload of Player Identification (PID), weapon characteristics, and vulnerability data and the download of events data to a Personal Computer (PC). The CD includes a Liquid Crystal Display (LCD) that is capable of being read in the open field in a normal day condition, in all observer-sun angles. A backlight is included for low light viewing. The message window turns on when activated. All messages are in English, or use icons to represent the various messages. The eight pushbuttons and the trigger are designed to allow activation even while wearing gloves. The device also serves as the data collection tool for the downloading of stored events for subsequent use in the After Action Review (AAR) system. Communication interfaces to the CD include Infrared (IR), Radio Frequency (RF), and direct wire (RS-232) connection. The user interface of the CD is accomplished with an eight-button keypad and the 4 line by 20 character LCD. Operation of the eight-button keypad is quickly learned and easily remembered. Keypad functions allow the user to access the various modes and setup specific functions performed by the CD, including the selection of the IR MILES codes. The trigger is used to turn on the CD, enter the LCD displayed menus, and transmit data.

The CD uses a field replaceable 9-volt battery mounted in the handle of the device. Fixed aim sights, aligned at the factory, are provided for use of the MILES transmitter functions. The CD makes use of modular construction and is environmentally sealed to provide a reliable, rugged unit for outdoor applications and adverse environmental conditions.

- TOW Mode Switch Box (M2A2 and Below)
- Super Elevation Suppression Box (M2A2 and Below)
Slide 11 - MILES XXI CVS Components

- Vehicle Control Unit
- VCU Mounting Bracket
- Vehicle Display Assembly (VDA)
- Vehicle Control Interface (VCI)
- Main Gun Laser Transmitter (MGLT)
- Vehicle Detection System (VDS)

Slide 12 - Vehicle Control Unit (VCU)

- Used on all Bradley vehicles.
- Contains the master computer for the MILES XXI system. The VCU interprets the effects of direct fire simulation on the vehicle. Audio and visual responses to the effect of direct fire are generated by the VCU and made available to the crew through the vehicle intercom system and the Combat Vehicle Kill Indicator (CVKI).
- The VCU operates on vehicle power and also contains a 14.4-volt Lithium-Ion rechargeable battery for back-up power. The unit interfaces with the rest of the MILES XXI system through the use of system BUS cables that route to the various components.
- CVKI flashes to indicate effect on vehicle of incoming fire
- CVKI is permanently fixed atop the VCU housing and provides the visual responses in the form of flashes to the effects of the incoming direct fire as follows:
  - Two flashes for a NEAR MISS and a HIT but not a KILL.
  - Four flashes for a MOBILITY KILL and COMMUNICATIONS KILL.
  - Continuous flashes for a CATASTROPHIC KILL.
  - The audio messages through the intercom system report: KILL, MOBILITY KILL, COMMUNICATIONS KILL, HIT, or NEAR MISS.
- Contains rechargeable battery for backup power, which is charged while vehicle is running.
- RF Antenna
- GPS Antenna
- Fuse

NOTE

The battery requires an initial charge upon receipt of the equipment.

Slide 13 - VCU Mounting Bracket

- Mounts the VCU to the right side of the turret.

Slide 14 - Vehicle Display Assembly (VDA)

- It is a small, lightweight assembly located inside the vehicle to provide the interface between the soldier and MILES XXI.
The VDA provides a 2-row 16-character backlit display, two menu/submenu scroll pushbuttons and one menu/submenu select push-button.

The first menu to appear after the MILES XXI system is powered up and BIT is complete will be the main menu.

Using the UP/DOWN scroll buttons allows the operator to scroll through the main menus and sub-menus.

Use the SELECT push-button to enter each of the main menus and in some cases, sub-menus.


Displays up to 500 recorded events (increments of 99).

Used to view:

- Current vehicle configuration
- Vehicle status
- Weapon system status
- Munitions status
- Previous events
- Built in test (bit) status
- Software version.

After being engaged by direct fire, an assessment message will be displayed on the VDA. The event message will be displayed until a new event is received, or until any button is pressed to clear it, returning to the previous display. The VDA backlite will go out after 7.5 secs, therefore it will take two button presses to activate the display menus, the first press of a button will activate the backlite.

The VDA will also enable the audio alarm when no intercom is used. Controller personnel perform selecting the vehicle type and ammunition load.

**Slide 15 - VDA Mounting**

- The VDA is mounted on the VDA mounting bracket assembly to the TOW motor cage.

**Slide 16 - VDA Messages**

<table>
<thead>
<tr>
<th>HHMMSS</th>
<th>=</th>
<th>Hour/Minutes/Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>XXXXXX</td>
<td>=</td>
<td>IS ALIVE!</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IS DEAD!</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FPK (Firepower Kill)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MOBK (Mobility Kill)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COMK (Commo Kill)</td>
</tr>
<tr>
<td>YYYYY</td>
<td>=</td>
<td>PID (Player Identification)</td>
</tr>
</tbody>
</table>
### Slide 17 - VDA Menus

<table>
<thead>
<tr>
<th>MAIN MENU</th>
<th>SUB-MENU</th>
<th>SUB/SUB-MENU</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPNTYPE MAIN GUN</td>
<td>SELECT WPNTYPE MAIN GUN</td>
<td></td>
<td>Selects weapon.</td>
</tr>
<tr>
<td>LDR M2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SELECT WPNTYPE COAX</td>
<td></td>
<td>Selects weapon.</td>
</tr>
<tr>
<td></td>
<td>SELECT WPNTYPE TOW</td>
<td></td>
<td>Selects weapon.</td>
</tr>
<tr>
<td></td>
<td>PRESS SELECT TO CANCEL</td>
<td></td>
<td>Returns to MAIN MENU.</td>
</tr>
<tr>
<td>RELOAD WEAPON TYPE</td>
<td>AMMO TYPE LOADED</td>
<td></td>
<td>Displays the ammo type and the remaining rounds loaded. Load time for the 25mm is 15 secs and 30 secs for TOW.</td>
</tr>
<tr>
<td>HE RNDS 0230</td>
<td>0000 SEL TO LOAD 0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELOAD TIME: 000 MAX LOAD: 0000</td>
<td></td>
<td>Displays reload time and MAX number of rounds that can be loaded.</td>
</tr>
<tr>
<td></td>
<td>AMMOS 1-4: 0000 0000 0000 0000</td>
<td></td>
<td>Number of rounds available for the different ammo types.</td>
</tr>
<tr>
<td></td>
<td>AMMOS 5-8: 0000 0000 0000 0000</td>
<td></td>
<td>Number of rounds available for the different ammo types.</td>
</tr>
<tr>
<td></td>
<td>PRESS SELECT TO CANCEL</td>
<td></td>
<td>Press SELECT to exit to the Main Menu without changing ammunition.</td>
</tr>
<tr>
<td>AMMO TYPE HE REM</td>
<td>SELECT HE REM RNDS 0000</td>
<td></td>
<td>Press SELECT to choose ammo type and use the down button to scroll through the list.</td>
</tr>
<tr>
<td>ROUNDS 1150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRESS SELECT TO EXIT</td>
<td></td>
<td>Press SELECT to exit to the Main Menu without selecting ammunition.</td>
</tr>
<tr>
<td>MAIN MENU</td>
<td>SUB-MENU</td>
<td>SUB/SUB-MENU</td>
<td>DEFINITION</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>PRESS SELECT FOR EVENT STATUS</td>
<td>TIME -HHMMSS</td>
<td></td>
<td>Shows current time, vehicle PID and status.</td>
</tr>
<tr>
<td></td>
<td>PID IS ALIVE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEXT MOST RECENT EVENT</td>
<td></td>
<td></td>
<td>Pressing UP scroll button moves forward in time. Pressing DOWN scroll button moves back in time. Press SELECT to exit to the Main Menu.</td>
</tr>
<tr>
<td>SELECT AUX MENU</td>
<td>SELECT BIT</td>
<td>PRESS SELECT FOR BIT</td>
<td>Use the UP/DOWN arrows to scroll through the sub-menus. Must return to EVENT MENU to view results. Scroll UP and or DOWN to press SELECT to Exit to PREVIOUS MENU.</td>
</tr>
<tr>
<td></td>
<td>BACKLITE IS HIGH</td>
<td>BACKLITE IS HIGH</td>
<td>Starts with current BACKLITE level. Press UP to increase and press DOWN to decrease. Press SELECT to Exit to PREVIOUS MENU.</td>
</tr>
<tr>
<td></td>
<td>SELECT TO CHANGE</td>
<td>INC=UP DEC=DOWN</td>
<td></td>
</tr>
<tr>
<td>SELECT VOLUME CONTROL</td>
<td>VOLUME: 20%</td>
<td>USE UP/DOWN SW</td>
<td>Displays current intercom RIA volume. Press UP/DOWN buttons to increase and decrease volume. Press SELECT to Exit to PREVIOUS MENU.</td>
</tr>
<tr>
<td>SELECT SOFTWARE VERSION</td>
<td>SELECT TO EXIT</td>
<td>SW VER XX.XX</td>
<td>Press SELECT to exit to AUX MENU. NOTE: Only displays VDA software version.</td>
</tr>
<tr>
<td>SELECT SYSTEM CONFIG</td>
<td>1234MLCV</td>
<td>++++</td>
<td>Refer to Figure 3-3. Press SELECT to exit to AUX MENU.</td>
</tr>
<tr>
<td>SELECT ADMIN FUNCTIONS</td>
<td>SELECT FOR BELT CONFIG</td>
<td></td>
<td>Scroll to SELECT which belt to configure (1-4). Shoot any belt with a RESET command using a CD, to initialize.</td>
</tr>
<tr>
<td>MAIN MENU</td>
<td>SUB-MENU</td>
<td>SUB/SUB-MENU</td>
<td>DEFINITION</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SELECT FOR VEHICLE CONFIG</td>
<td>Scroll to SELECT vehicle type. Shoot any belt with a RESET command using a CD, to configure.</td>
</tr>
<tr>
<td>SELECT MAIN MENU</td>
<td></td>
<td></td>
<td>Press SELECT to Exit to MAIN MENU.</td>
</tr>
</tbody>
</table>
Slide 18 - Player ID (PID)
- First Character identifies the ammo type.
- The next 4 digits are the unique number assigned to identify players and vehicles participating in an exercise.
- Even numbers represent BLUFOR and odd numbers represent OPFOR.
- Number can be changed from BLUFOR to OPFOR and “vice versa”.
- Player ID’s are assigned by the Controller Device (CD) and the VDA.

Slide 19 - Vehicle Detection System (Belts)
- Common to all vehicles.
- Equipped with IR photo detectors.
- VDS consists of at least one detector belt for each side of the turret. The front side belt is unique in that its size is different than the other three belts.

The Vehicle Detection System is comprised of independent detector belts. Each detector belt is equipped with IR photo detectors mounted on webbed fabric with Velcro for easy attachment to the vehicle. The detector belts are interconnected via system BUS cabling.

Slide 20 - LASER Transmitters
- Main Gun LASER Transmitter (MGLT) used to simulate the firing of:
  - TOW
  - 25mm
  - COAX

Slide 21 - Requirements before Aligning MGLT
- Ensure Bradley is parked on level ground.
- MILES XXI is properly installed and configured.
- Proper boresighting and zeroing procedures are completed.

Slide 22 - MGLT
- Simulates various types of main gun, TOW and M240 COAX firing.
- Aligns the transmitter with the 25mm to replicate direct fire.
- The Main Gun LASER Transmitter is a single LASER tube assembly used to simulate various types of main guns and coaxial machine guns. The MGLT projects an eye safe coded LASER beam onto a target out to the effective range of each weapon with its ammunition being simulated.
- The MGLT is comprised of an environmentally sealed compartment containing the LASER tube and associated electronics. The MGLT also contains a 12X telescope and X-Y adjustment mechanism used to align the transmitter with the vehicle main gun.
- Alignment procedures are conducted IAW the operators manual.

Slide 23 - MGLT
- The MGLT mounts on top of the gun barrel.

Slide 24 - Bradley Components
- Vehicle Control Interface (VCI)
- Shorting Plug
- Floor Plate (M2A2 and Below)
- Cable Protector Bracket

**Slide 25 - VCI**

- Electrically interfaces with the Bradley series vehicles to provide Main Gun, Coax Machine Gun, and TOW Missile firing control logic and audio cues (A3 specific) for the MILES XXI CVS.

**Slide 26 - VCI Audio Functions**

- Audio indicators are voice messages heard through the vehicle intercom. These messages describe direct or indirect fire that affects the status of the vehicle.
- Allow crewmembers to hear current vehicle status.
- Injects voice cues into the vehicle intercom system.

**Slide 27 - VCI Audio (cont.)**

- Voice Messages:
  - Near Miss
  - Hit
  - Resurrect
  - Commo KILL
  - Firepower KILL
  - Mobility KILL
  - Vehicle KILL
  - Reset
  - Audio Check
- Bradley A3 sounds:
  - 25mm Firing
  - TOW missile launch

**Slide 28 - Kill Types**

- Kill
- Firepower Kill
- Mobility Kill
  - Combination of a FPK and a MOBK will assess a Catastrophic Kill.
  - During a MOBK, if after 20 seconds the vehicle moves more than 100 meters, the system will initiate a Cheat Kill, however a Catastrophic Kill will be displayed on the VDA and the Cheat Kill can be viewed in the event log.
- Communications Kill
- Cheat Kill

**Slides 29 and 30 - VCI Mounted Bradley A2 and A3**

**Slide 31 - Shorting Plug**

- The Shorting Plug connects to the power cable that runs into the 25mm.
- Disconnect cable and attach Shorting Plug to the cable.

**Slide 32 - Floor Plate (A2)**

- The Floor Plate is used in lieu of the factory Floor plate to accommodate the connection of the power and fire control hookups.

**Slide 33 - Cable Protector Bracket**

- Protects the training port cables from being stepped on.

**Slide 34 - Weapon Effects**

- Bradley ATWESS Firing Fixture (BAFF)
- FLASH Weapon Effects Signature Simulator (FLASHWESS)
- Direct/Indirect Fire CUE

**Slide 35 - BAFF**

- BAFF – is a weapon effects simulator system, which is part of the CVS for the Bradley Fighting Vehicle.
- Two ATWESS devices within the BAFF are used to simulate the firing from one or both actual TOW tubes.
- Firing chambers in each ATWESS accommodate a standard M22 Pyrotechnic charge.
- The BAFF is attached to the Bradley by means of four rubber shock mounts directly linked to the VCU through three direct lines contained in the interface cable.

**Slide 36 - FLASHWESS**

- The FLASHWESS mounts on the main gun and flashes to simulate 25mm firing.

**Slide 37 - DIFCUE**

- The DIFCUE is an electro-mechanical device that is installed on a vehicle and simulates both direct fire vehicle kill and incoming artillery during force-on-force training exercises.
- The DIFCUE can be loaded with up to 60 pyrotechnic cartridges and simulates flash, smoke and noise of a direct fire kill and incoming artillery fire.

**Slide 38 - DIFCUE Trigger Cable Assembly**

- Connects the VCU to the DIFCUE.
- DIFCUE not included in CVS kit. Used in the Combat Training Centers (CTC).

**Slide 39 - Cabling Components**

- System BUS Cables
- System Cables
- Terminators
- Vehicle Power Interface Cables
- M240 Coax Microphone Trigger Assembly

**Slide 40 - System BUS Cables**

- Common to all vehicles.
The System BUS cabling carries data and power between the VCU and other components of the MILES XXI system.

The cables are a simple, 4-wire cable with identical connectors at both ends, with only the length of the cable assemblies varying.

The System BUS cabling interconnects all modular assemblies in a daisy chain fashion.

System BUS cables are interchangeable, however placement is crucial due to the cable lengths.

Slide 41 - System Cables

Each kit contains specially designed common cable assemblies for the following components:

- BAFF Trigger Cable
- FLASHWESS Cable Assembly
- VCU Adapter Assembly Cable
- MGLT Adapter Cable
- Coax Microphone Cable

Slide 42 - VCU Signal Cable

Cable 2031348-1 interfaces to the RS 232, DIFCUE, ATWESS, MGSS and FLASHWESS.

Slide 43 - Vehicle Power/Interface Cable

Connections and routing are unique to each vehicle.

Slide 44 - Power and Fire Control Connection Bradley

Interconnects the VCU to the vehicle’s utility power system BUS DTP J1. The fire control connection connects to DTP J4.

Slide 45 - Training Pass Port Connection Bradley A3

Interconnects the VDA to the 2W87 J2 connector, located behind the radio rack.

Slide 46 - Coax MIC Cable

Transforms blank ammunition being fired to an electronic signal to the MGLT.

The coax MIC clips to the barrel of the M240 BFA.

Slide 47 - Terminators

Terminators are used to provide network impedance matching for the System BUS Cable Assembly.

Two terminators are used in MILES XXI kit.

One connects to the last detector belt in the series.

The other is connected to the RIA.

Slide 48 - Transit Case

Transports and stores MILES XXI equipment.

Slide 49 - Questions on the Bradley Vehicle Kit
CHAPTER 3 CONFIGURATION OF THE SYSTEM

3.1 POWER UP/POWER DOWN THE SYSTEM

3.1.1 Review of Controller Device (CD)

Slide 50 - Controller Device Description
- CD is a portable, handheld unit.
- Used for configuration and control of MILES XXI equipment in the field.
- Interfaces with:
  - Operators
  - MILES XXI devices
- Inputs and receives data.
- Selects system parameters.
- Collects data for the AAR.

Slide 51 - Controller Device Inspection
- Have students follow PMCS per TM 9-6920-3659-10, Ch 5.
- Check:
  - Housing
  - All 8 buttons
  - LCD
  - RS-232 connector
  - Battery: Present
  - Trigger Switch

Slide 52 - CD Usage
- CD is used by Observer/Controllers (OCs).
- CD is used to alter, monitor, or control a given training exercise.
- CD operates in four primary modes:
  - LASER IR Transmission Mode (0-500 meter range)
  - LASER IR Detection Mode (0-20 meter range)
  - RF Mode (must acquire domain)
  - Direct Link (RS-232 cable)

NOTE

The CD can be used to “Kill” and “Resurrect” all current MILES systems. The full capabilities of the CD are used solely to interact and configure MILES XXI systems.
3.1.2 Power up the System

Slide 53 - Power up the System

- Turn on the VCU power switch (CVKI will start blinking, indicating the vehicle is dead).
- Turn on vehicle Master power.
- Reset System from a Kill status (CVKI will stop blinking).
- Conduct a CD Acquire.
- Select System Config.

Slide 54 - Vehicle Config

- Check the VDA display to confirm the vehicle is configured correctly. The vehicle type will display as either “M2” for blank fire mode (normal), or “M2df” for dry fire mode (used for transmitter alignment only). The display will be the same for all Bradley variants.

WPNTYPE MAIN GUN
LDR           M2__

Slide 55 - Configure Vehicle Using the VDA

- Using the VDA:
  - Scroll through the menus in the VDA and locate the “SELECT AUX MENU” main menu.
  - Press “SELECT” and scroll to the “SELECT ADMIN FUNCTIONS” sub-menu and press “SELECT”.
  - Scroll to the “SELECT FOR VEHICLE CONFIG” sub-menu and press “SELECT”.
  - Scroll to select the appropriate vehicle from the display.
  - Press “SELECT” and a menu will appear that prompts you to shoot any detector belt with a CD using the RESET command, within 30 seconds.
  - An “INITIALIZED” voice cue will be heard through the vehicle intercom system, to confirm configuration.

Slide 56 - Configure Vehicle Using the CD

- Using the CD:
  - Select the CVS menu.
  - Select “CVS SET VEHICLE CONFIG”.
  - Choose the correct vehicle from the sub-menu.
  - Aim the CD at the VDS and pull the trigger.
  - Confirm selection by viewing the VDA display window.

Slide 57 - Detector Belt Factory Configuration

The detector belts are configured at the warehouse for placement on the vehicle.
Labels are placed on the electronics module by CLS personnel, to indicate vehicle placement.

- The number denotes direction on the vehicle and the actual direction is also indicated.
  1 = Front
  2 = Right (Side)
  3 = Rear
  4 = Left (Side)

- The additional spaces are used in lieu of reconfiguring the detector belts (indicating such), for an alternate mounting location.

If the detector belts have to be manually initialized, conduct the follow-on procedures.

**Slide 58 - Initialize System, Set Detector Belts Using the VDA**

- Using the VDA:
  - Scroll through the menus in the VDA and locate the “SELECT AUX MENU” main menu.
  - Press “SELECT” and scroll to the “SELECT ADMIN FUNCTIONS” sub-menu and press “SELECT”.
  - Scroll to the “SELECT FOR BELT CONFIG” sub-menu and press “SELECT”.
  - Scroll to select the appropriate detector belt to be initialized.
  - Press “SELECT” and a menu will appear that prompts you to shoot any detector belt, using any generation MILES CD, using the RESET command within 30 seconds.
  - The CVKI will flash the appropriate number of times, according to the detector belt initialized and the VDA will beep the same number of times.
  - Confirm initialization by checking the SYSTEM CONFIG display.

**Slide 59 - Initialize System, Set Detector Belts Using the CD**

- Using the CD:
  - Select CVS menu; then pull trigger on CD.
  - Select BELT1, vehicle front, and fire CD at the belt.
  - Select BELT2, fire CD and continue clockwise around the vehicle.
  - Do the remaining 2 belts.
- Once again fire at each belt using the appropriate belt command and ensure the VCU flashes accordingly for each belt, (BELT1 VCU flashes one time, BELT2 VCU flashes two times, etc.).

**NOTE**

If any detector belt does not configure, conduct detector belt troubleshooting as per Chapter 4 in the operator’s manual.

**Slide 60 - Select System Config Menu**

- Confirms component presence (+).
- Identifies missing components (-).
- BIT will confirm missing components.
  - 1 – identifies detector belt one
  - 2 – identifies detector belt two
  - 3 – identifies detector belt three
  - 4 – identifies detector belt four
  - M – identifies MGLT
  - L – identifies VDA
  - C – identifies PCU (VCU)
  - V – identifies VCI

- All items highlighted with a “+” denote the VCU has recognized those components connected within the system configuration. If a component or a detector belt that the vehicle uses is highlighted with an “-” this indicates that the component was present initially but cannot be found, conduct troubleshooting to determine where the fault lies. Additionally, the VDA should display the component that has not been recognized during BIT.

**Slide 61 – Set Vehicle PID Using the VDA**
- Using the VDA:
  - Select the “SELECT AUX MENU” main menu.
  - Scroll to the “SELECT ADMIN FUNCTIONS” sub-menu and press “SELECT”.
  - Scroll to the “SELECT TO CHOOSE VEHICLE PID” sub-menu and press “SELECT”.
  - Use the UP/DOWN push-buttons to enter the PID number and press the SELECT push-button after each number is entered.
  - Shoot any detector belt with a CD, using the RESET command.
  - The VDA will beep twice and the display will change accordingly.

**Slide 62 – Set Vehicle PID Using the CD**
- Using the CD:
  - Perform CD Acquire.
  - Select the “CD PID” menu.
  - Select “PID SELECT”.
  - Use the UP/DOWN push-buttons to select the correct number, press the SEL push-button after each number is selected.
  - After the last number is selected, the following menu will appear “PID SEND”.
  - Aim the CD at the VDS and pull the trigger.
  - Confirm PID selection by viewing the VDA display window.

**Slide 63 - M2A2 / M3A2 Alignment Procedures**
- Place vehicle on level platform, weapons boresighted, and a target at 1200 meters.
- Ensure MILES XXI has been properly installed and configured for M2/M3.
- Turn on vehicle Master Power, Turret Power and MILES XXI.
- Select alignment aiming point.
Place range knob on “zero” and leave in that position.
Lay TOW reticle on alignment aiming point.
Refer 25mm reticle to alignment aiming point.
Looking through the 12-power scope located inside the MGLT, unlock azimuth and elevation locking knobs. Using azimuth and elevation adjustment knobs move MGLT to vehicles aiming point. Lock down azimuth locking knob and then lock down elevation locking knob.
Conduct “G” pattern to confirm gun lay.
Fire at target with MAIN GUN, TOW and COAX to confirm Boresight.

**Slide 64 - M2A3 / M3A3 Alignment Procedures (Slide 1 of 2)**
- Place vehicle on level platform, and a target at 1200 meters.
- Ensure MILES XXI has been properly installed and configured for M2/M3.
- Turn on vehicle Master Power, Turret Power and VCU power.
- Select alignment aiming point.
- Lay gun manually on reticle aiming point.
- Looking through the 12-power scope located inside the MGLT, unlock azimuth and elevation locking knobs. Using azimuth and elevation adjustment knobs move MGLT to vehicles aiming point. Lock down azimuth locking knob and then lock down elevation locking knob.
- Select Boresight 25mm from the Commanders Tactical Display (CTD).
- Use the Gunner’s Hand Station (GHS) to move reticle to aim point. Once aligned select Calculate and save on the Commander’s Tactical Display (CTD).

**Slide 65 - M2A3 / M3A3 Alignment Procedures (Slide 2 of 2)**
- Select Boresight 7.62 on the CTD.
- Move GHS to align sight to aim point.
- Select Calculate and save on the CTD.
- Select Boresight TOW on the CTD.
- Move GHS to align sight to the aim point.
- Select Calculate and save on the CTD.
- Select all weapons and verify alignment of sights and MGLT.
- Fire at target with 25mm, TOW and COAX to confirm alignment.

**3.1.3 Power Down The System**

**Slide 66 - Power Down the System**
- Turn off VCU power and vehicle master power.
- Clear all weapons and simulators of blank ammunition and cartridges.

**NOTE**
Remove all MILES XXI equipment in reverse order of installation, prior to washing vehicles. Equipment should be dry and free of dirt and oil prior to storage in transit case.
3.1.4 Summary and Vehicle Installation

Slide 67 - Summary

- Placing into operation the CVS equipment.
- Installation and removal of the CVS equipment.

Slide 68 - Vehicle Installation

- Hands on training will take place for installing the equipment on each particular vehicle.

NOTE

Refer to the appropriate vehicle operator’s manual for installation procedures.