GTA 05-10-053

Improvised Explosive Device Effects Simulator, Increment 1 Training System

PURPOSE: This graphic training aid (GTA) serves as an expedient element for the setup, configuration, and operation of the improvised explosive device effects simulator (IEDES) training system in support of improvised explosive device (IED) defeat and full spectrum operations at all echelons.

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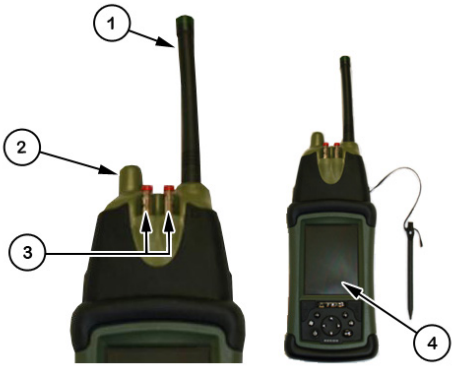
Module Control Unit Controls and Indicators

The module control unit (MCU) functions as a remote-triggering unit that is capable of wirelessly controlling a maximum of six electronic common interface devices (ECIDs), simultaneously or independently, on four government-approved frequencies for the continental United States (CONUS) and on four different frequencies outside the continental United States (OCONUS). (See figure 1.)



Key	*Control/Indicator*	*Function*
1	Antenna	Allows communication with the ECID. The CONUS antenna is identified with a green band; the OCONUS antenna is identified with a red band.
2	GPS antenna	Receives signals from GPS satellites.
3	Direct-wire terminal	Detonates by direct-wire communication.
4	Display screen	Displays on a touch-sensitive, PDA LCD screen.

Figure 1. MCU

Key	*Control/Indicator*	*Function*
5	Keypad	Allows the user to use the keys on the MCU instead of the touch screen.
6	Arrow buttons	Allows the user to navigate on the MCU screen and scroll topographic maps.
7	Power button	Powers the MCU on and off.
8	Enter button	Allows the user to make selections on the screen instead of using the touch screen.
9	Battery module	Serves as the MCU power supply.
10	Battery charger connection	Charges the internal battery by attaching to a 110-VAC battery charger.
11	USB connection	Enables log files to be downloaded to a computer for AAR and allows software updates to be uploaded.
12	Serial port connection	Is not used.
13	IR emitter diode	Is reserved for future use.
14	Stylus with lanyard	Allows the user to make selections on the PDA touch screen.

Figure 1. MCU (continued)

Module Control Unit Operation Procedures

Note. The operator must refer to operator user manual (OUM) 5-6920-703-10 before using this GTA pocket guide. This guide is a quick reference for the IEDES training system. Before beginning steps 1 through 14, ensure that the devices are properly connected and configured according to the operator's manual. If the following steps do not yield the indicated response, try again. If the attempt still fails, refer to the troubleshooting chart in the operator's manual.

- ***Step 1.*** Power on the MCU.

Notes.

1. The MCU was designed for the IEDES training system simulation components and equipment only.

2. The MCU will automatically run a built-in test (BIT). A failed BIT will be indicated on the screen with a red box next to the MCU detail or by message.

3. The HOME screen provides the user with the MCU name, battery power level, military grid reference system (MGRS) position and date, and currently configured frequency.

- ***Step 2.*** Click on the MCU detail hyperlink. Select the EDIT button to open the MCU EDIT screen. Rename the MCU if desired, and select the frequency to match the ECID. Select SAVE.

- ***Step 3.*** Click on the DEVICES tab. Select the SCAN button. Select the SCAN DEVICES button. After the scan is complete, select the CLOSE button to return to the DEVICES screen.

Notes.

1. Devices found will be displayed as *A* for armed or *D* for disarmed and will include the device type, device name, distance to the device, direction to the device, and device owner information.

2. A user can assume ownership of six (maximum) unowned ECIDs.

- ***Step 4.*** Select the desired ECID to display the ECID DETAILS screen. Take ownership by selecting the TAKE button.

Note. The button will change from TAKE to RELEASE.

- ***Step 5.*** Select the EDIT button. Using the touch screen keyboard, edit the ECID name. Select the SAVE button to save the new name.

- ***Step 6.*** Verify that the attached devices display as expected on the ECID DETAILS screen.

- ***Step 7.*** Select the DEVICES tab. Select the small arrow on the right end of the drop-down display. (See table 1 for a list of MCU tabs.)

Note. Step 7 only filters existing information; it does not perform a scan function.

Table 1. MCU tabs

All devices	All devices, regardless of ownership or status.
My devices	Devices owned by an MCU.
No owner	Devices not owned by an MCU.
Armed	All armed devices, regardless of ownership.
Disarmed	All disarmed devices, regardless of ownership.

- ***Step 8.*** Select the DETONATE tab for wireless initiation setup.

Note. The DETONATE screen will display the ECIDs that possess connected devices.

- ***Step 9.*** Select the CONFIG button for each ECID, and then select the scale of detonation desired for each signature device. Exit the DETONATION CONFIG screen by selecting *X* to return to the DETONATION screen.

Note. The user can also select to trigger any number of direct outputs.

- ***Step 10.*** Initiate the device by selecting the name of the ECID. On the MCU keypad, press and hold down SOFTKEY 1. (A yellow DETONATE? button will appear.) Select the DETONATE? button. (The caption will change to *SENDING…* while the detonation configuration is being transmitted to the devices. After the configuration is complete, the *SENDING…* caption will disappear and a red FIRE button will appear.) (See figure 2 for an MCU soft key illustration.)

Note. SOFTKEY 1 times out after 15 seconds of inactivity.

- ***Step 11.*** Select the FIRE button to detonate the device.

Figure 2. MCU soft keys

WARNING

When direct-wiring the MCU to an ECID or a nonpyrotechnic controller (NPC), do not arm the ECID or NPC until after the wires have been attached to the MCU terminals. Always place the provided wire nuts on the initiator end of the wires to prevent shorting during setup. Failure to comply may cause immediate personal injury or equipment damage.

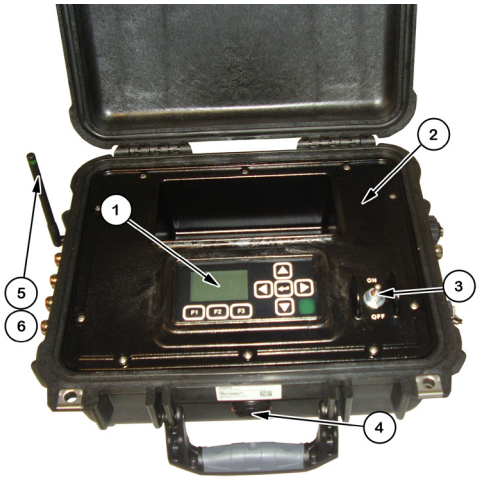
Module Control Unit Reboot Procedures

The user may be prompted to reboot or restart the MCU, or the software may stop responding. To reboot, hold down the POWER key. The screen will go dark; and in about 2 seconds, the following message will appear: *CONTINUE TO HOLD POWER BUTTON TO RESET IN 5 SECONDS.* The message will be accompanied by a 5-second countdown. If the user continues to hold down the button until the countdown reaches 0 seconds, the device will reboot, and the button can be released.

Electronic Common Interface Device

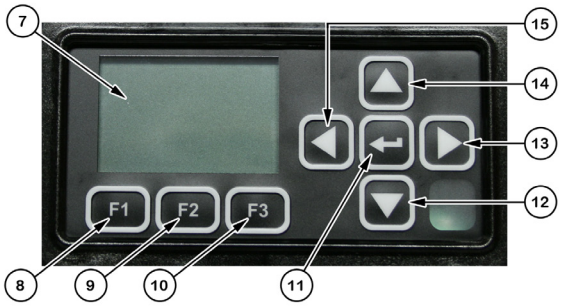
The ECID communicates wirelessly with the MCU on a government-approved, radio frequency band; and the communication range is up to 1,000 meters line of sight (LOS). Communication can be initiated by direct wire up to 500 meters. The ECID provides event data to the MCU.

Each ECID possesses a unique code that identifies it to the MCU and distinguishes it from other ECIDs. (See figure 3.)



Key	*Control/Indicator*	*Function*
1	Subassembly LCD	Serves as the user interface with the ECID.
2	GPS antenna	Receives GPS locations from GPS satellites.
3	POWER switch	Powers the system on and off.
4	Battery vent	Serves as the pressure and vapor vent for the internal 12-VDC battery.
5	Antenna (green)	Is used for CONUS operations.
6	Antenna (red)	Is used for OCONUS operations.

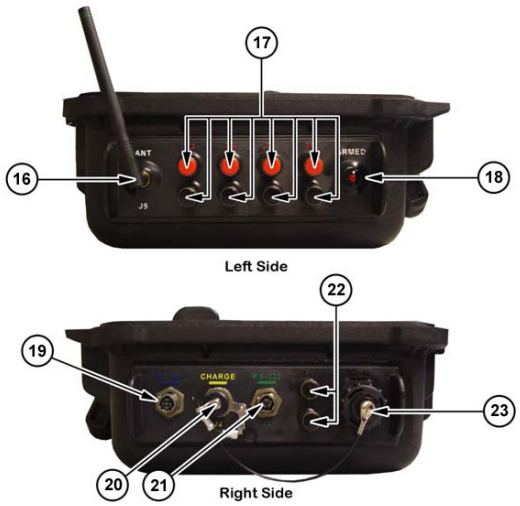
Figure 3. ECID



Key	*Control/Indicator*	*Function*
7	LCD display	Displays the setup, target, frequency, GPS, and armed status information.
8	F1 key	Returns to a higher menu level.
9	F2 key	Functions the same as the F1 key.
10	F3 key	Functions the same as the enter key.
11	ENTER key	Allows the user to select the desired setup selection.
12	DOWN ARROW key	Scrolls down through the menu; decreases value.
13	RIGHT ARROW key	Selects the next rightward value.
14	UP ARROW key	Scrolls up through the menu; increases value.
15	LEFT ARROW key	Returns to a higher menu level.

Note. When pressed simultaneously, the UP and DOWN arrow keys will launch the arming sequence if the ECID is in the OPERATE menu. It will disarm the ECID if it is currently armed.

Figure 3. ECID (continued)



Key	*Control/Indicator*	*Function*
16	Antenna connection	Connects to the antenna.
17	Output post	Connects individual signature devices.
18	Armed indicator	Flashes when the ECID is armed.
19	RS-485 connection	Enables communication between the ECID and the PSSD, NPC, or MEU.
20	Charge connection	Connects to the 110-VAC battery charger.
21	RS-232 connection	Serves as the communications link between the CIS and a DCIU player unit.
22	Input post	Connects the MCU to the ECID via direct-wire communication. Power should not be applied; closing the circuit activates the input.
23	RJ-45 Ethernet connection	Provides a connection for the FASIT expansion.

Figure 3. ECID (continued)

WARNING

The ECID should always be the last armed component. Personnel who emplace the devices should carry the MCU in the powered-off position. Power-on the MCU as the last device. Failure to comply may cause immediate personal injury or equipment damage.

Electronic Common Interface Device and Module Control Unit Operation Procedures

The following steps should be followed for ECID and MCU operation procedures:

- ***Step 1.*** Power on the ECID.

Note. The ECID will perform a BIT before displaying the message authentication code (MAC) address and software edition information, including the release date. After completing the BIT, the ECID will display a BIT PASS or BIT FAIL message.

- ***Step 2.*** Verify that the battery is fully charged.

Notes.

1. The battery icon is displayed on the top left of the screen.

2. ECIDs from the same kit that operate within the same lane should be set to the same frequency.

3. Steps 1 and 2 are the minimum steps required to configure the ECID for wireless operation.

- ***Step 3.*** Navigate to the MAIN SETUP screen. Press the ENTER key to navigate to the SETUP RESTORE DEFAULTS screen. Press ENTER. Use the UP or DOWN ARROW key to select YES, and press ENTER. (See figure 4.)

Figure 4. Main setup screen

Electronic Common Interface Device and Module Control Unit Wireless Operation Procedures

The following steps should be followed for ECID and MCU wireless operation procedures:

- ***Step 1.*** Press the F1 key to navigate to the MAIN menu, and use the UP or DOWN ARROW key to navigate to the MAIN SET FREQUENCY screen. Press ENTER. Use the UP or DOWN ARROW key to select the desired frequency. Press ENTER to save. (See figure 5.)

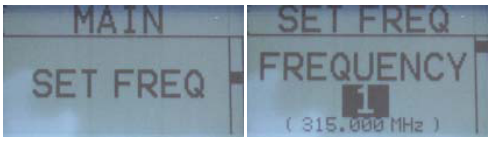


Figure 5. Main set frequency screen

- ***Step 2.*** Use the UP or DOWN ARROW key to navigate to the MAIN OPERATE screen.

Note. Ownership of the ECID must be taken before the ECID is used.

- ***Step 3.*** Ensure that all employed devices are connected and armed.
- ***Step 4.*** Navigate to the MAIN OPERATE screen, and press the ENTER key to display the arming screen. Press the UP and DOWN ARROW keys simultaneously to arm the ECID. Close the cover, and step away.

Electronic Common Interface Device and Module Control Unit Direct-Wire Operation Procedures

WARNING

When direct-wiring the MCU to an ECID or NPC, do not arm the ECID or NPC until after the wires have been attached to the MCU terminals. Always place the provided wire nuts on the initiator end of the wires to prevent shorting during setup. Failure to comply may cause immediate personal injury or equipment damage.

The following steps should be followed for ECID and MCU direct-wire operation procedures:

- ***Step 1.*** Navigate to the DIR WIRE CONFIG screen, and press ENTER.
- ***Step 2.*** Use the UP or DOWN ARROW key to select ENABLED, and press ENTER to enable the input terminals.
- ***Step 3.*** Press the UP or DOWN ARROW key to display the 12-volt outputs.
- ***Step 4.*** Press ENTER to change the on and off status. Use the LEFT and RIGHT ARROW keys to move between the four direct-wire outputs. Use the UP and DOWN ARROW keys to toggle between ON and OFF.
- ***Step 5.*** Press ENTER to save.
- ***Step 6.*** Press the DOWN ARROW key to display the configuration for the first device on the RS-485 output.

Note. The screen will display the abbreviated device followed by the serial number. The caption *NONE* will display below to show that no scale of detonation is currently selected.

- ***Step 7.*** Press the ENTER key, and use the UP or DOWN ARROW key to select the desired detonation scale. Press ENTER to save.
- ***Step 8.*** Repeat steps 5 and 6 to configure the remaining devices on the RS-485 output.

Note. After all attached devices have cycled through, the DIR WIRE CONFIG screen will display a summary of the configurations.

- ***Step 9.*** Press F1 to exit the configuration and return to the DIR WIRE CONFIG screen.
- ***Step 10.*** Attach one end of the wires to the T1 and T2 terminal posts on the ECID.
- ***Step 11.*** Deploy the wire from the emplacement point to the firing or initiation position.
- ***Step 12.*** Remove one wire nut, and attach it to the T1 terminal. Remove the second wire nut, and attach it to the T2 terminal.

- ***Step 13.*** Return to the ECID. Navigate to the MAIN OPERATE screen, and press the ENTER key to display the ARMING screen. Press the UP and DOWN ARROW keys (or the LEFT and RIGHT ARROW keys) simultaneously to arm the ECID. Close the cover, and step away.
- ***Step 14.*** Return to the firing point, and select the HARD WIRE check box. On the MCU keypad, press and hold down SOFTKEY 1. Select the DETONATE? button. Tap the FIRE button to detonate.

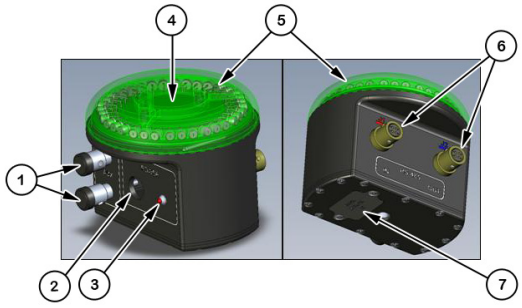
Note. The caption will change to *SENDING…* while the detonation configuration is being transmitted to the devices.

WARNING

Do not allow wires to touch after the ECID is armed. Failure to comply may cause immediate personal injury or equipment damage.

Multi-Integrated Laser Engagement System Emitter Unit Controls and Indicators

Figure 6 lists the controls, indicators, and functions of the multi-integrated laser engagement system (MILES) emitter unit (MEU).



Key	*Control/Indicator*	*Function*
1	T1 and T2 auxiliary	Initiates direct input. Power should not be applied to the connections. Closing the circuit initiates the input.

Figure 6. MILES emitter unit

2	ON/OFF power switch	Serves as the MEU ON/OFF power switch.
3	LED indicator	Displays the on/off power status.
4	IR detector	Allows the user to set up a PID.
5	Laser diode emitters	Provides a 360° field of fire.
6	RS-485 (J1 and J2) communications connection	Connects to the RS-485 connection port and allows multiple devices to be daisy-chained together using the J1 input and the J2 output.
7	Battery cover	Serves as the location for the 9-volt alkaline battery.

Figure 6. MILES emitter unit (continued)

Multi-Integrated Laser Engagement System Emitter Unit Operation Procedures With the Electronic Common Interface Device

The MEU is a self-contained device that operates on a 9-volt alkaline battery which can be connected in-line with the NPC or pyrotechnic scalable signature device (PSSD) or set up with a push-pull booby trap or pressure device. The following steps provide operation procedures for MEUs with ECIDs:

- ***Step 1.*** Install the battery. Loosen screws, remove the battery cover, and install a 9-volt battery. Reinstall the cover.

Note. The MEU can be connected at any point in the RS-485 connection chain.

- ***Step 2.*** Apply power by pressing and holding the ON/OFF power switch until the red light-emitting diode (LED) indicator flashes.

Note. The MEU will automatically run a BIT. If the BIT passes, the indicator will flash every 5 seconds after the initial power is turned on. If the BIT fails, the LED indicator will flash a failure code.

- ***Step 3.*** Obtain a universal controller device (UCD). Squeeze the trigger to apply power.

Note. After the UCD completes the BIT, the UCD will automatically start in the MAIN ADMIN TX screen.

- ***Step 4.*** Navigate to the MILES TX screen, and press ENTER. Set the *W*-value to 35 and the *P*-value to the desired player identification (PID). If an odd PID for opposing forces (OPFOR) is selected, press ENTER and change the AMMO TYPE to *O*. If an even PID for blue forces (BLUEFOR) is selected, change the AMMO TYPE to *K*. (See figure 7.)

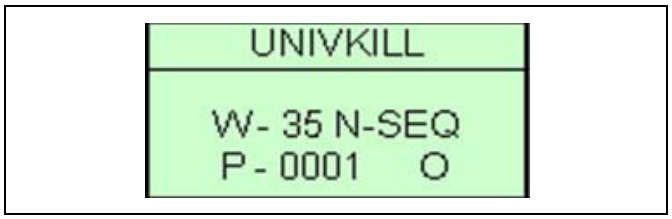


Figure 7. MILES TX screen

- ***Step 5.*** Aim the UCD at the top of the MEU, and squeeze the trigger to transfer the PID to the MEU.

Note. The MEU will respond with two quick flashes, acknowledging the PID transfer.

- ***Step 6.*** Set the UCD to DECODE, and trigger the MEU by shorting the T1 and T2 terminals. Verify that the PID and MILES codes match the values set. (See table 2.)

Table 2. PID codes

Scale	*MILES Message Count*				
	1	*2*	*3*	*4*	*5*
Small	21	27	N/A	N/A	N/A
Medium	01	10	21	27	N/A
Large	01	10	05	21	27
Extra large	01	27	N/A	N/A	N/A
Mixed large	01	10	05	21	27
Mixed, extra large	01	27	N/A	N/A	N/A

- ***Step 7.*** Tag the device for maintenance, and return the MEU to the issue point to obtain another MEU if the MEU experiences a BIT failure. (See table 3 for MEU flash indicators.)

Note. If the POWER switch is held down for more than 5 seconds, the MEU will transition into maintenance mode. The LED indicator will blink at 1-second intervals while the switch is held down. When the switch is released, the LED indicator will go out. If this happens, power off the MEU, restart it or wait 1 minute for the MEU to automatically power off, and then power it back on.

Table 3. MEU flash indicators

Flashes	*Meaning*
Has no flashes for more than 5 seconds.	The MEU is off.
Flashes 5 times per second while the power button is held.	The MEU is ready to start.
Flashes 1 time per second.	The MEU is in maintenance mode.
Is lit steady for 15 seconds.	The MEU has started.
Flashes 1 time every 5 seconds.	The MEU is operational.
Flashes 4 quick flashes after the power is turned on.	The BIT failed (return to maintenance for repair).
Flashes 4 times per second while the power button is held.	The MEU is ready to power off.
Flashes 10 times in 1 second.	The MEU is powering off.
Flashes 2 quick flashes immediately following programming with UCD.	The PID or MILES effect transmission is accepted.
Flashes 2 quick flashes every 5 seconds.	The battery is low.

Multi-Integrated Laser Engagement System Emitter Unit Stand-Alone Device Operation Procedures

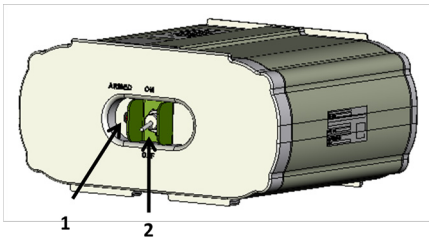
The MEU can be used with a stand-alone device, such as the push-pull booby trap. However, these devices are not part of the IEDES kit and must be supplied by the individual operational unit. The following steps should be followed for MEU stand-alone device operation procedures:

- ***Step 1.*** Install the battery. Loosen screws, remove the battery cover, and install a 9-volt battery. Reinstall the cover.
- ***Step 2.*** Attach wires from the pressure switch assembly stand-alone device to the T1 and T2 terminal posts.

- ***Step 3.*** Power-on the unit.
- ***Step 4.*** Set the PID.

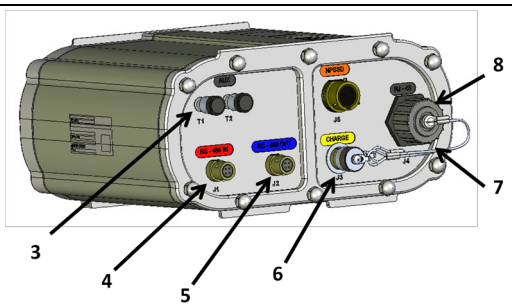
Nonpyrotechnic Controller/Nonpyrotechnic Scalable Signature Device

The IEDES NPC is the interface device between the ECID and the nonpyrotechnic scalable signature device (NPSSD). It electrically connects the ECID RS-485 connection port with other signature devices and MEUs. It has an RS-485 input and an RS-485 output connector, allowing attached devices to be daisy-chained together. (See figure 8.)



Key	*Control/Indicator*	*Function*
1	Armed indicator	Illuminates when the device is armed and flashes to provide additional status information.
2	Power switch	Powers the NPC on and off.

Figure 8. NPC

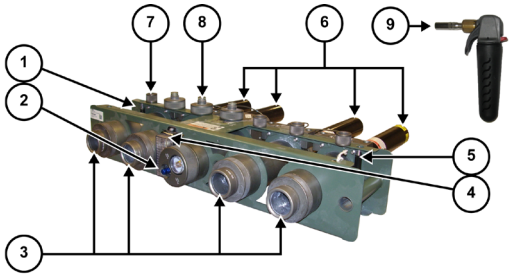


Key	Control/Indicator	Function
3	Terminal posts	Serves as hardwire trigger inputs.
4	RS-485 J1 connector	Serves as the input connector for communications from the ECID.
5	RS-485 J2 connector	Serves as the output connector for communications to the MEU.
6	J3 charger connector	Serves as the connection point to charge the internal 12-volt battery.
7	J4 RJ-45 Ethernet connector	Provides an Ethernet communication interface for future use.
8	J5 NPSSD connector	Provides a connection point for the cable to connect to the NPSSD.

Figure 8. NPC (continued)

The NPC controls the NPSSD. The NPSSD is capable of firing individual or multiple tubes, simultaneously, to produce the desired scale of effect, providing small, medium, and large simulated IED signatures. It is also capable of firing multiple iterations before reloading. (See figure 9, page 18.)

Nonpyrotechnic Scalable Signature Device



Key	*Control/Indicator*	*Function*
1	5-cell caddy	Supports the solenoid air trigger and the echo chamber devices with attached 9-ounce CO2 vapor bottles.
2	Solenoid air trigger	Uses pressurized CO2 and initiates trigger sequences.
3	Echo chamber	Causes the burst disk to inflate and explode, simulating the signature of an IED.
4	Strobe	Flashes and reflects off of the smoke simulation powder for a simulated signature. The strobe can also be commanded from the MCU to flash to identify the device from a distance.
5	Ground stakes	Allows the NPSSD to be directionally aimed and secured to the ground.
6	9-ounce CO2 vapor bottles	Contains compressed CO2 vapor.
7	Magnetized caps	Protects 9-ounce CO2 vapor bottle valves when they are not emplaced.
8	Plugs	Resets the firing pin in the echo chamber after each use.
9	Fill valve assembly	Allows the air solenoid to be filled with CO2 from a 12-gram CO2 trigger command cartridge.

Figure 9. NPSSD

Pyrotechnic Scalable Signature Device Indicators

The PSSD is a pyrotechnic device that is capable of firing multiple cartridges simultaneously and firing multiple iterations before reloading. Used in conjunction with an MEU, the PSSD will produce MILES kill effect codes. (See figure 10.)

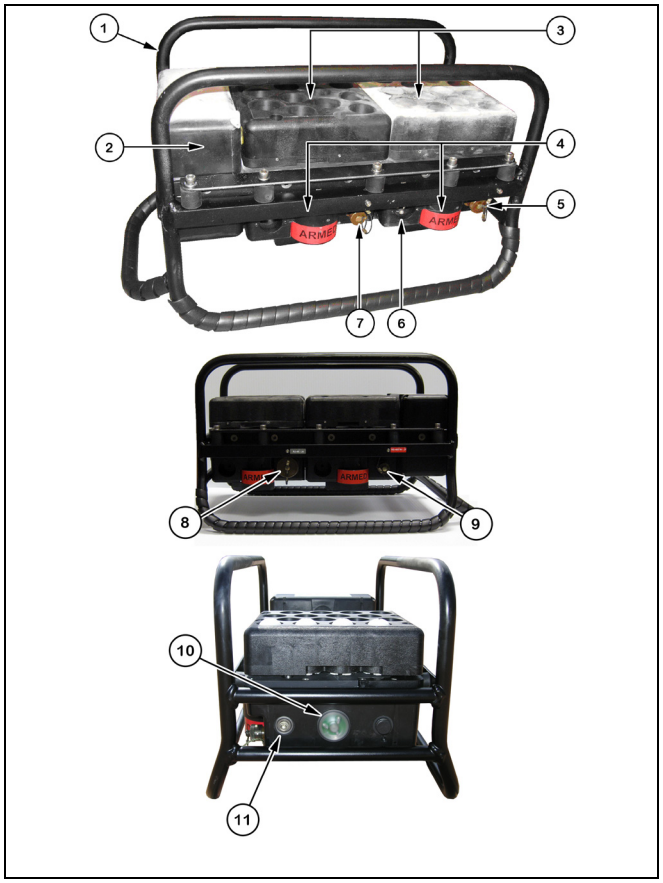


Figure 10. PSSD

Key	*Control/Indicator*	*Function*
1	PSSD caddy	Stabilizes the frame support.
2	Battery compartment	Contains 1 12-VDC, 7.5-amp SLA and provides power to ignite multiple cartridges.
3	Removable magazines	Contains up to 16 M30 cartridges or 6 M30 cartridges and 10 M31A1 cartridges.
4	SAFE/ARM wheels	Secures magazines to the housing unit. There are 2 SAFE/ARM wheels on each side of the device. Each wheel is color-coded with a green side for SAFE and a red side for ARM. To place the device in SAFE mode, turn all 4 wheels so that the green indicator faces outward. To place the device in ARMED mode, turn the wheels so that the red indicator faces outward.
5	Charger connection	Provides a connection for the battery charger.
6	POWER switch	Powers the PSSD on and off.
7	RS-485 output (J2)	Connects to additional signature devices as required or connects to the MEU.
8	Ethernet connection	Provides a communication connection for future use.
9	RS-485 input	Receives communication signals from the ECID for firing.
10	Armed LED indicator	Illuminates when the device is armed.
11	Status LED indicator	Alerts the user to problems and alerts the user when the device is ready for operation.

Figure 10. PSSD (continued)

Improvised Explosive Device Effects Simulator Extended Kit Setup Procedures

The IEDES kit may be configured with multiple firing devices. In this example, two PSSDs are emplaced utilizing one ECID, two NPCs, two NPSSDs, and one MEU. The following steps should be followed for IEDES extended kit setup procedures:

- ***Step 1.*** Locate the area of operation for emplacing the IEDES system.

WARNINGS

1. Hearing can be impaired when the PSSD is fired while utilizing the M30 and M31A1. All personnel within 46 meters of an armed PSSD must wear single hearing protection.

2. To prevent fragmentation hazards, personnel must remain at least 5 meters from an armed PSSD. Failure to comply may cause immediate personal injury or equipment damage.

- ***Step 2.*** Emplace the ECID. Remove four 15-meter RS-485 cables from the transit case.

Note. Each cable end is identified with a red or blue color code.

- ***Step 3.*** Connect one blue color-coded RS-485 cable to the blue color-coded J1 output RS-485 ECID connector.

WARNING

Do not apply power to the ECID at this time. Possible accidental initiation of the device may occur if power is applied. Failure to comply may cause immediate personal injury or equipment damage.

- ***Step 4.*** Acquire two PSSDs from Kit B and two NPSSDs from Kit A. Emplace the PSSDs and NPSSDs according to scenario requirements.
- ***Step 5.*** Connect the red color-coded connector to the J1 ECID cable.

- ***Step 6.*** Locate the blue color-coded J2 RS-485 connection on the first PSSD to be emplaced. Connect the RS-485 cable to the blue color-coded J2 connector, and route the other end of the RS-485 cable to the red color-coded J1 input connector on the second PSSD.
- ***Step 7.*** Locate the second PSSD to be emplaced. Connect the RS-485 blue color-coded connector to the J1 output. Route the cable to the first NPC, and connect the cable end to the red color-coded J1 connector.
- ***Step 8.*** Connect another RS-485 cable to the blue color-coded J2 NPC output, and connect it to the second red color-coded J1 NPC input.
- ***Step 9.*** Obtain two additional 15-meter RS-485 cables to connect each of the blue color-coded J5 NPC outputs to the red color-coded NPSSD inputs.
- ***Step 10.*** Retrieve a 3-meter RS-485 cable and the MEU from Transit Case 4, Kit A.

Note. The MEU should be placed near the signature device to provide accurate MILES kill zone effect codes.

- ***Step 11.*** Connect the red color-coded 3-meter RS-485 connector to the J1 on the MEU. Connect the other end to the blue color-coded J2 output connector on the second NPC. (See figure 11.)
- ***Step 12.*** Obtain one 9-volt alkaline battery to install in the MEU. Install the battery. Loosen screws, and remove the battery cover from the bottom of the MEU. Verify the polarity position for the battery installation, and then correctly install the battery. Replace and secure the battery cover.
- ***Step 13.*** Turn on the MEU by pressing and releasing the POWER switch.

Note. A red LED indicator will illuminate.

- ***Step 14.*** Assign a PID to the MEU.

Note. When the MEU is triggered, it will emit a series of MILES kill codes with the PID to intended targets. The maximum range for the MEU is 35 meters.

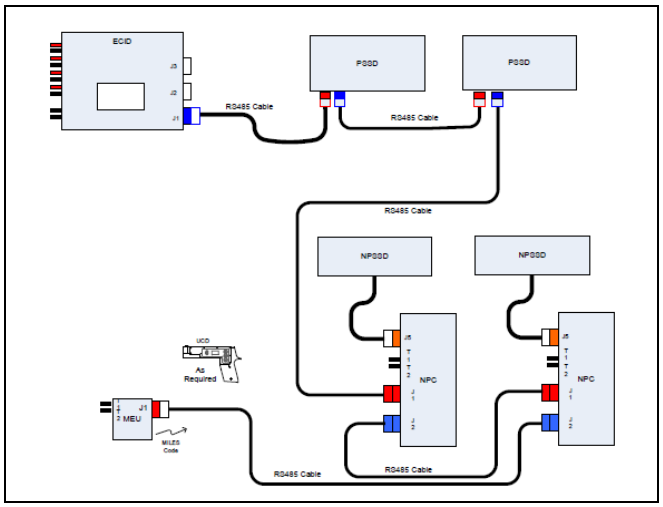


Figure 11. PSSD, NPSSD, and MEU extended kit setup

- ***Step 15.*** Ensure that the NPSSD air solenoid trigger pressure is between 40 to 100 pounds per square inch (psi).
- ***Step 16.*** Remove the burst disk retainers from the eight echo chambers. Locate the smoke simulation powder in the equipment supply transit case.
- ***Step 17.*** Fill each echo chamber half full of smoke simulation powder. Place two plastic cups or one rubber burst disk over each echo chamber opening. Reinstall the burst disk retainer. Hand-tighten the retainers until they are snug.
- ***Step 18.*** Obtain eight 9-ounce vapor carbon dioxide (CO2) bottles from Transit Case 1, Kit A. Ensure that the 9-ounce vapor bottles are full. Remove the dust caps from each bottle, and magnetically attach them to the NPSSD caddy. Hand-tighten each bottle to the echo chamber on the NPSSD.

Note. If the LED indicator flashes more than once per 5 seconds, a BIT failure has occurred. Remove and replace the NPC.

- ***Step 19.*** Move to the PSSD. Verify that the power is off, and turn the arming wheels to the SAFE position. Remove the magazines, and load the M30 and M31A1 cartridges. (See figure 12.)

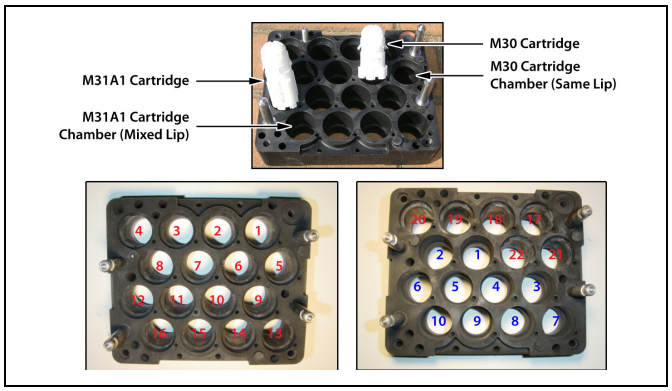


Figure 12. Magazine-loading illustration

WARNING

To prevent fragmentation hazards, personnel must remain at least 5 meters from armed PSSDs. Failure to comply may cause immediate personal injury or equipment damage.

- ***Step 20.*** Obtain the M30 and M31A1 cartridges from the ammunition supply point (ASP).
- ***Step 21.*** Load the M30 and M31A1 cartridges into the magazines in the designated positions according to the guidelines provided in table 4. Insert each cartridge into a magazine chamber, rounded end first with contacts facing upward.

Notes.

1. The red numbers indicate M30 cartridges, and the blue numbers indicate M31A1 cartridges.

2. When using the mixed magazine, note that the M30 chamber has a shallow lip to accommodate the lugs while the M31A1 chamber has a deep well that is smooth.

3. Each PSSD will detonate up to 32 shots. The user may select different combinations of M30 and M31A1 cartridges, depending on the magazine type.

Table 4. PSSD scalable effects

Scale	*M30 Cartridge*	*M31A1 Cartridge*	*Number of Shots (2xM30 magazine)*	*Number of Shots (1xM30 and 1xM30/M31 split magazine)*
Small	1	N/A	32	22
Medium	2	N/A	16	11
Large	4	N/A	8	N/A
Mixed large	3	1	N/A	7
Extra large	6	N/A	5	N/A
Mixed, extra large	4	2	N/A	5

- ***Step 22.*** Reinstall the magazines onto the PSSD. After the magazines are in place, ensure that the red, armed wheels are showing on the outside edge of the PSSD launcher. Move the POWER switch to the ON position.

Note. Device initiation will begin immediately. The LED and audio indicators will provide the launcher status.

- ***Step 23.*** Verify that the LED status indicator illuminates red and that it does not visually display a green or yellow illumination. (See table 5, page 26.) After applying power to the PSSD, return to the ECID to complete emplacement procedures and setup operations.

Table 5. PSSD status indicator

LED Indicator	*Data*	*Description*
Green indicator	On	No ammunition detected
	Flashes	OK
Yellow indicator	On	BIT failure
	Flashes	Low battery
Red indicator	On	Armed
	Flashes	1 flash per 5 seconds—armed 1 flash per 1 second—unsafe
Beeper Indicator	***Data***	***Description***
1 beep	N/A	Operational
2 beeps	N/A	No ammunition/wheels unlocked
4 beeps	N/A	BIT failure

- ***Step 24.*** Return to the NPC, and move the POWER switch to the ON position. Verify that the LED indicator illuminates. Return to the ECID to complete emplacement procedures and setup operations.

Note. After applying power, the NPC will begin an arming countdown that is signaled by one beep every second and by one long beep for the last 3 seconds. After the beeping stops, the NPC is armed.

- ***Step 25.*** Press the UP and DOWN ARROW keys simultaneously. Move to the designated location.

Note. The ECID will perform a 30-second arming countdown that is signaled by one beep every second and by one long beep for the last 3 seconds. After the beeping stops, the ECID is armed.

- ***Step 26.*** Power on the MCU. Click on the GET GPS button on the HOME screen.

Note. The MCU will be the last device to set up.

- ***Step 27.*** Command the MCU to communicate with each emplaced ECID.

Note. Each emplaced ECID will respond by showing that it is active and ready for operation.

Pyrotechnic Scalable Signature Device Safe Test Procedures

The following steps should be followed for PSSD safe test procedures:

- ***Step 1.*** Hold the ammunition magazine in front of the device, and align the locking pins of the magazine with the holes in the contact plate. Ensure that the groove on the top surface of the magazine is aligned with the direction of the battery case.

Note. It is only possible to mount ammunition magazines in one direction. The groove should be turned toward the battery. Both magazines must be installed on the PSSD before use.

- ***Step 2.*** Fit the ammunition magazine to the PSSD launcher, and press the ammunition magazine toward the device while simultaneously moving the SAFE/ARM locking mechanism clockwise until it reaches the STOP position.

Notes.

1. The red exterior wheel surface must show on the outside edge of the PSSD launcher.

2. The PSSD is designed to operate with one or both of the ammunition magazines. The device will only function if all four locking wheels are closed. Otherwise, a failure status will be detected.

- ***Step 3.*** Move the MAIN switch on the PSSD launcher to the ON position. The activation of the device will begin immediately.

Notes.

1. Within 30 seconds after the MAIN switch is activated, the launcher LED indicator should display a solid green light, signifying that no ammunition was detected.

2. If the launcher LED indicator does not display a solid green light within 30 seconds, the PSSD will not function. The PSSD failure status should be identified.

- ***Step 4.*** Move the MAIN switch on the PSSD launcher to the OFF position.

Suicide Vest Simulator Kit Setup Procedures

The following steps should be followed for suicide vest simulator kit setup procedures:

- ***Step 1.*** Locate the pipe bomb simulation tubes. (See figure 13.)

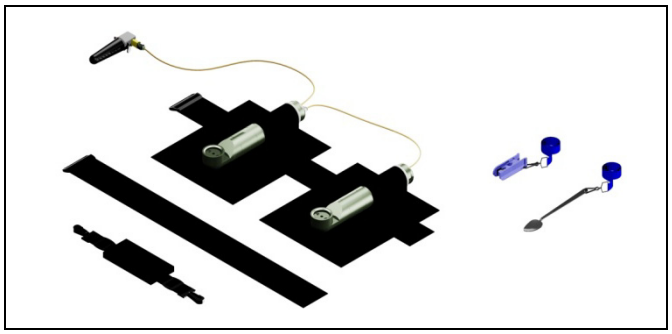


Figure 13. Suicide vest simulator kit

- ***Step 2.*** Hold a simulation tube in your left hand. Use your right hand to unscrew the end with the air valve cap, and insert one 12-gram CO2 cartridge into each tube.
- ***Step 3.*** Retighten the air valve cap back onto the simulation tube.
- ***Step 4.*** Unscrew the right angle head from the simulation tube. Fill the reservoir half full with smoke simulation powder. Install a rubber burst disk and retainer ring. Reinstall the right-angle head onto the simulation tube.
- ***Step 5.*** Install both pipe bomb simulators by sliding each one through the top of each vest pouch opening. Cut the airline tubes to length, and push the tubes into the air valves.
- ***Step 6.*** Attach the belt strap through each pouch. Clip the neck strap onto the vest, and adjust the strap to fit. Place the neck strap over your head, allowing the vest to hang from your chest area. Adjust the belt strap so that the suicide vest fits snugly against your upper torso.

Note. After the CO2 cartridge is installed in the command trigger detonator and the base is resecured onto the trigger head, the trigger head will puncture the CO2 cartridge. The trigger head must remain in the SAFE position until the moment before initiation.

- ***Step 7.*** Install one 12-gram CO2 cartridge into the command trigger detonator by unscrewing the handle from the base. Insert the CO2 cartridge into the base, keeping the nipple pointing upward. Move the trigger head to the SAFE position by pushing up on the red tab.
- ***Step 8.*** Attach the base to the trigger head by screwing them together. Measure out additional air tubing, and cut the tubing to length if necessary. Attach one end to the command trigger detonator, and attach the other end to the first pipe bomb simulator.
- ***Step 9.*** Locate the shoulder-mounted, MILES emitter unit (SMMEU) battery holder. Install one 9-volt battery after removing two screws from the battery cover. Observe the correct polarity position before installing the battery. After installing the battery, resecure the cover by tightening the screws.
- ***Step 10.*** Notice that the SMMEU has a hook-and-pile tape strap. Wrap the strap around the harness on your left shoulder, and secure the strap. Place the battery and trigger component into the unused pouch next to the left simulator tube.

  Step 11. Connect the final length of tubing from the left simulator tube to the battery compartment of the SMMEU.

Push-Pull Booby Trap Setup Procedures

The following steps should be followed for push-pull booby trap setup procedures:

- ***Step 1.*** Locate the push-pull booby trap.

Note. If the safety pin and the hairpin trigger are not attached to the device, check the case from which the device came. Both pins are necessary for proper function. (See figure 14, page 30.)

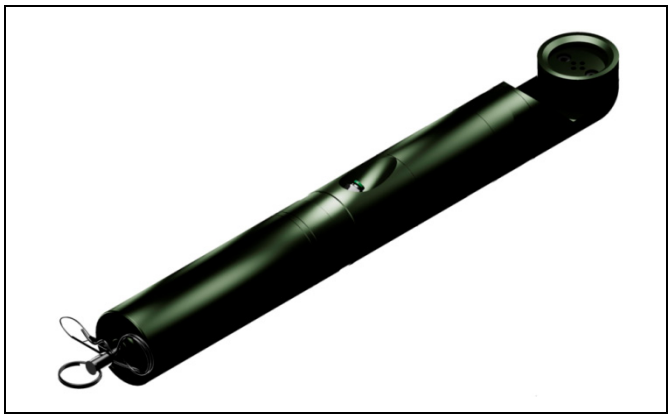


Figure 14. Push-pull booby trap

- ***Step 2.*** Verify that the plunger is pulled back and that the safety pin is installed. Insert the hairpin into the small hole on the opposite side of the safety pin. Hold the booby trap in one hand, and twist the middle of the device with your other hand to unscrew the two halves.
- ***Step 3.*** Place one 12-gram CO2 cartridge into the half that contains the triggering component. Ensure that the CO2 cartridge nipple faces outward. Carefully thread and tighten the halves back together until a snug fit is secured.
- ***Step 4.*** Unscrew the right-angle head to install the smoke simulation powder. Place 2 tablespoons of the powder into the reservoir. Reattach the right-angle head, and tighten it until a snug fit is secured.
- ***Step 5.*** Remove the burst disk retaining ring. Place one black rubber burst disk onto the right-angle head, covering the holes. Reinstall the retaining ring over the burst disk, and tighten it until a snug fit is secured.
- ***Step 6.*** Use the airline tube cutter provided with the kit to cut the tubing to the desired length. Insert one end of the tubing into the air valve in the middle of the device.

- ***Step 7.*** Route the other end of the tubing to the PRESSURE switch, and attach it. Route the two wires from the PRESSURE switch assembly to the T1 and T2 terminal posts, and connect each wire.
- ***Step 8.*** Obtain a 9-volt battery. Install the 9-volt battery in the MEU. After the battery is installed, press and release the push button on the MEU to apply power.
- ***Step 9.*** Use a UCD to assign a PID to the MEU.

WARNING

A fully assembled, active device should not be stored, carried, or transported. Failure to comply may cause immediate personal injury or equipment damage.

- ***Step 10.*** Emplace the push-pull booby trap. Tie the trip wire to the hairpin initiator, and tie the other end of the trip wire to a secured position. Remove the safety pin to arm the device.

Note. In this example, the initiator is a trip wire.

Step 11. Place the MEU on a flat surface so that the MEU will transmit the MILES codes when the push-pull booby trap is triggered.

Pressure Device Setup Procedures

The following steps should be followed for pressure device setup procedures:

- ***Step 1.*** Locate the pressure device.

Note. If the safety and retaining pins are not attached to the device, check the case from which the device came. Both pins are necessary for proper function. (See figure 15, page 32.)

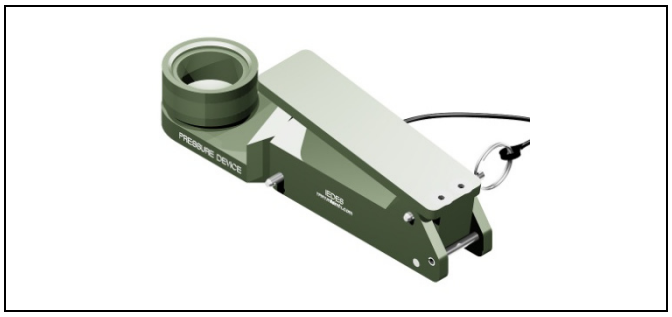


Figure 15. Pressure device

- ***Step 2.*** Verify that the safety pin is installed. Hold the pressure device in one hand, and remove the retaining pin from the device with your other hand.

Note. The safety pin is the pin inserted near the hinged portion of the pressure lever.

- ***Step 3.*** Notice that the safety and retaining pins are tethered together. Pull the squib from the base.
- ***Step 4.*** Place one 12-gram CO2 cartridge into the base. Ensure that the CO2 cartridge nipple faces outward.
- ***Step 5.*** Position the squib over the cartridge, and press the squib onto the base. Insert the retaining pin to secure the squib to the base.

WARNING

Do not remove the safety pin until the device is ready to be emplaced. Failure to comply may cause immediate personal injury or equipment damage.

- ***Step 6.*** Unscrew the burst disk retaining ring from the squib. Place 2 tablespoons of smoke simulation powder into the reservoir.
- ***Step 7.*** Place a black, rubber burst disk over the top of the reservoir. Reinstall the burst disk retaining ring back into position on the squib, and secure the ring.
- ***Step 8.*** Use the airline cutter provided with the kit to cut the green airline tubing to the desired length.

- ***Step 9.*** Attach one end of the tubing to the air valve that is located directly behind the squib head. Attach the other end to the pressure switch assembly. (See figure 16.)

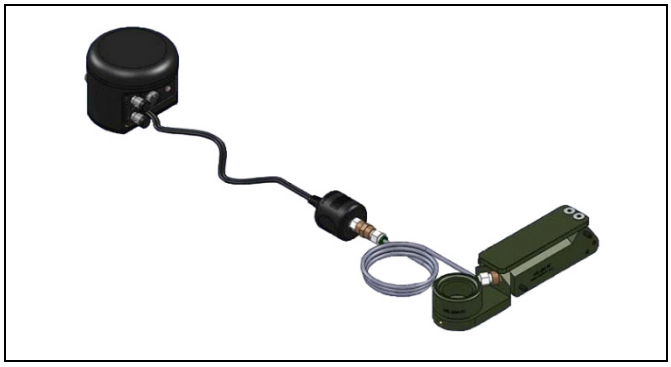


Figure 16. Pressure switch assembly connection

WARNING

A fully assembled, active device should not be stored, carried, or transported. Failure to comply may cause immediate personal injury or equipment damage.

- ***Step 10.*** Route the wires from the PRESSURE switch assembly to the T1 and T2 terminal posts on the MEU, and connect each wire.
- ***Step 11.*** Obtain a 9-volt battery. Install the 9-volt battery in the MEU. After the battery is installed, press and release the push button on the MEU to apply power.
- ***Step 12.*** Use a UCD to assign a PID to the MEU. Place the MEU on a flat surface so that the MEU will transmit the MILES codes when the pressure device is triggered.
- ***Step 13.*** Emplace the pressure device in the desired location. Remove the safety pin only.

WARNING

The pressure device is in an irreversible, armed condition after the pressure lever has been depressed. The device discharges upon release of the PRESSURE lever.

Nonpyrotechnic Scalable Signature Device Disarm Procedures

WARNING

Have and maintain control of the MCU before returning to the emplaced equipment. Failure to comply may cause immediate personal injury or equipment damage.

The following steps should be followed for NPSSD disarm procedures:

- ***Step 1.*** Locate the ECID, and disarm it by pressing the UP and DOWN ARROW keys simultaneously until *DISARMED* is displayed.
- ***Step 2.*** Locate the emplaced NPC, and press down on the POWER switch to turn off the NPC.

Nonpyrotechnic Scalable Signature Device Fill Station Procedures

WARNINGS

1. The NPSSD component of the IEDES training system uses CO2 in vapor form only. Never fill 9-ounce vapor CO2 bottles with liquid CO2.

2. The 320-ounce, 20-pound fill station tank (MIL-FST-V) should only be filled through an authorized local gas or welding contractor via the installation training aids service center (TASC).

3. When refilling the 9-ounce vapor CO2 bottles, the MIL-FST-V must be in the upright position only. Failure to comply may cause immediate personal injury or equipment damage.

The following steps should be followed for NPSSD fill station procedures:

- ***Step 1.*** Verify that the valve is fully closed on the large, 320-ounce CO2 tank; and locate the fill station valve. (See figure 17.)
- ***Step 2.*** Insert a fiber washer gasket into the fill station valve female fitting. Ensure that the dump/fill lever is in the upward position, and hand-tighten the female fitting onto the fill station tank male fitting.

Key	Control/Indicator	Function
1	Fill station	Fills 9-ounce CO2 bottles.
2	320-ounce CO2 tank	Holds the CO2 for 9-ounce CO2 bottles.
3	Adaptor	Converts standard connections to metric.
4	Wrench	Attaches the fill station to the 320-ounce CO2 tank.

Figure 17. NPSSD fill station

- ***Step 3.*** Use the provided fill station wrench to securely tighten the female fitting.
- ***Step 4.*** Remove the fill station valve safety pin. Turn the fill station valve knob counterclockwise to open the valve, and listen for possible air leaks.
- ***Step 5.*** Remove the magnetic valve cap, attach it to the end of the bottle, and thread the 9-ounce CO2 bottle to the fill station until a snug fit is secured.
- ***Step 6.*** Move the DUMP/FILL lever to the FILL position, and press and hold the lever to begin the transfer of CO2 to the 9-ounce vapor CO2 bottle. When the transfer is complete, a chirp or click noise will be heard. Release the lever.
- ***Step 7.*** Move the DUMP/FILL lever to the DUMP position, and press and hold the lever to release excess CO2 vapor from the fill station valve. The fill process is now complete.

Nonpyrotechnic Scalable Signature Device Air Solenoid Trigger Recharge Procedures

The following steps should be followed for NPSSD air solenoid trigger recharge procedures:

- ***Step 1.*** Remove the valve cap from the fill valve on the air solenoid.
- ***Step 2.*** Attach the trigger command fill valve assembly (TC-FVA) by threading it onto the fill valve.

CAUTION

Do not fill the air solenoid beyond 100 psi. Failure to comply may cause equipment damage.

- ***Step 3.*** Depress the red safety switch on the TC-FVA, and squeeze the trigger to charge the air solenoid. Monitor the pressure gauge, and fill the air solenoid to 100 psi.
- ***Step 4.*** Remove the TC-FVA from the air solenoid, and replace the valve cap.

Glossary

AAR	after-action report
ASP	ammunition supply point
ATTN	attention
BIT	built-in test
BLUEFOR	blue forces
CIS	common instrumentation system
CO2	carbon dioxide
CONUS	continental United States
DCIU	digital control and interface unit
DOD	Department of Defense
ECID	electronic common interface device
FASIT	future Army system of integrated target
GPS	ground positioning system
GTA	graphic training aid
IED	improvised explosive device
IEDES	improvised explosive device effects simulator
IR	infrared
LCD	liquid crystal display
LED	light-emitting diode
LOS	line of sight
MAC	message authentication code
MANSCEN	Maneuver Support Center
MCU	module control unit
MEU	multi-integrated laser engagement system emitter unit
MGRS	military grid reference system
MIL-FST-V	320-ounce carbon dioxide vapor fill station tank with high-flow valve
MILES	multi-integrated laser engagement system
MO	Missouri

N/A	not applicable
NPC	nonpyrotechnic controller
NPSSD	nonpyrotechnic scalable signature device
OCONUS	outside the continental United States
OPFOR	opposing forces
OUM	operator user manual
PDA	personal digital assistant
PID	player identification
psi	pounds per square inch
PSSD	pyrotechnic scalable signature device
SLA	sealed lead acid
SMMEU	shoulder-mounted multi-integrated laser engagement system emitter unit
TASC	training aids service center
TC-FVA	trigger command fill valve assembly
UCD	universal controller device
USB	universal serial port
VAC	voltage alternating current
VDC	voltage direct current