CHAPTER 1 Trailer Startup and Shutdown

1.1 Precondition Checklist

CAUTION

Operating with the Battery Disconnect Switch (Figure 1) in the OFF position will result in a Hard Shutdown of all systems (Trailer and Simulator).

Figure 1 Generator Battery Disconnect Switch

Hazardous voltage: Back feed to the utility system can cause property damage, severe injury, or death. To prevent an inadvertent interconnection, turn both the ECU Power Select and the Trainer Unique Power Select LOG switches (Figure 2) located on the Power Select Panel to the OFF position before pressing the AUTO button.

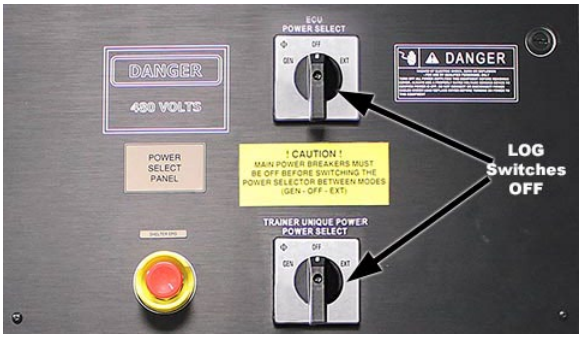
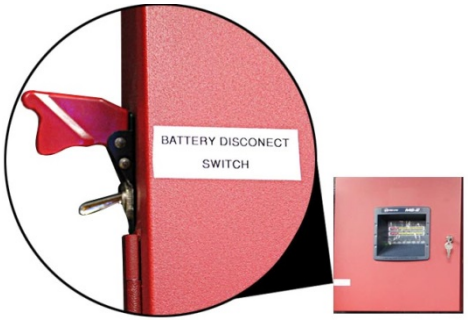
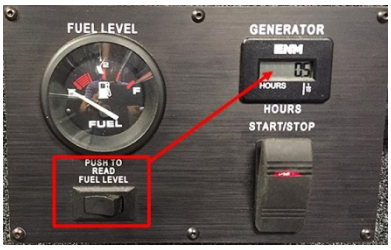


Figure 2 LOG Power Switch in OFF Position

Table 1 provides a checklist of the trailer to ensure safe operation when connecting to a power source. The operator must do a precondition check before connecting to power. A flashlight is needed to check the trailer's interior spaces.

Table 1 Precondition Checklist

✓		Step	Action
	1.	Check Generator Battery Disconnect Switchto ensure the switch is set in the "ON" position	**a.** At the front of the trailer, open the left generator door. i. Flip the door latch out. ii. Turn the door latch to the left. **b.** Verify the 12V DC Battery Switch to the ON position **c.** If OFF turn ON
	2.	Check Motion seats	Confirm main CP breaker is off.
			
	3.	Check panels below cockpit	**a.** Verify no tools have been left behind. **b.** Check for FOD (foreign object) **c.** Close the panel doors.
	4.	Cockpit is clear of objects	**a.** Check motion seats. **b.** Check Cyclic for freedom of movement. **c.** Check Pedals for freedom of movement **d.** Check Collective for freedom of movement.
	5.	Check the main principal breaker panel labeled PDP-2 Utility Power (120/208 VOLTS) switches are in the OFF position	**a.** Open the left PDP-2 Utility Power breaker box. **b.** Verify the main principal breaker: i. Is in the ON position. ii. If OFF switch ON. **c.** Verify that the 3 UPS circuit breakers are in the OFF position. **d.** If ON turn OFF **e.** Close and secure the breaker box door.
	6.	Check the main principal breaker panel labeled PDP-1 ECU Power (480 VOLTS) switches are in the OFF position	**a.** Open the right breaker box door. **b.** Verify the main principal breaker: i. Is in the ON position. ii. If OFF switch ON. **c.** Verify the HVAC breakers top two breakers (slots 1, 3, 5 and 2, 4, 6) are ON. **d.** Close and secure the breaker box door.
	7.	The ECU Power Select LOG switch on the Power Select Panel is in the OFF position	

	8.	The Trainer Unique Power Select LOG switch on the Power Select Panel is in the OFF position	
	9.	Turn the Battery Disconnect Switch to the OFF position **NOTE** The Fire Alarm system main control will sound until the Battery Disconnect Switch is turned on.	 **e.** Lift the Battery Disconnect safety cover. **f.** The switch should be down.
	10.	Check the Generator Fuel Level	**NOTE** This function will NOT work if the Battery Disconnect Switch is in the OFF position. On the Remote Generator Panel, below the Fuel Level gauge. A full generator tank provides 14 hours of continuous system operation. ▪ Press the rocker switch to read the fuel level. ▪ Levels are displayed by hours. 

1.2 Energize the Trailer

The power source is dependent on the availability of Shore Power and determines the process of connecting to power. If no Shore Power is available because the site location is a remote training site without a power station, the generator must be used. The Battery Switch must be in the "ON" position prior to applying Shore Power or starting the generator.

Trailer operation with either power source requires the Generator Battery Disconnect Switch to remain in the "ON" / "Connected" position. The simulator is configured for the generator to automatic start, which will attempt to engage the starter, in the event there is a loss of shore power. This configuration requires the Generator Battery Disconnect Switch to be set in the

"ON" position any time the Simulator is in use. The Battery Switch, identified in Figure 3, is located on the bottom right of the generator in the generator compartment. If for any reason, the generator starter is engaged and the battery is disconnected, power to all Trailer and Simulator systems will be disconnected and UPSs disabled.

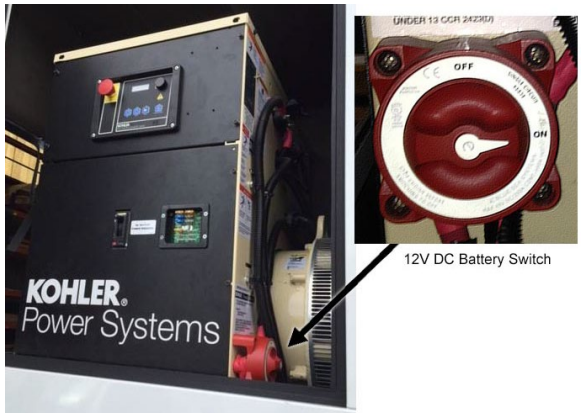


Figure 3 Generator Battery Disconnect Switch Location

The following conditions will require changes to the generator settings:

- The Generator Battery Disconnect Switch should be in the "OFF" / "Disconnected" position when the unit is to be stored or transported by air.
- If operation of the system is required inside of a hanger or where generator operation is not desired, the generator should be placed into Manual Start Mode and the Alarm Silenced from the Generator Control Panel. Refer to COTS TD 01-6910-725-20 Kohler Power System Decision Maker 3000 2014.

The following sections will prepare the trailer for initial condition to bring power to the trailer in the form of:

- Shore Power (Section 1.2.1)
- Generator Power (Section 1.2.2)

1.2.1 Shore Power

The Shore Power is supplied by two services: 60 amps and 100 amps both at 60Hz 480VAC - 3phase. The trailer comes with two trailer-to-shore cables which are 100ft 5 Conductor 4awg Type W cable. No additional tools are required when connecting and disconnecting the male/female Crouse Hinds Arktite Area10416 connectors to both the trailer and the facility shore power. An electrical grounding conductor is supplied with one end has a ring terminal which connects to the trailer grounding stud. The other end of the ground cable has a clamp to connect to the shore power grounding pin. The following are steps to connect shore power and power up the trailer.

1. Connect the grounding conductor from the trailer grounding stud (Figure 4) to the grounding pin at the power receptacle.

Figure 4 External Ground Connection on Trailer

a. Trailer connection.
   i. Unscrew the nut on the grounding pin by hand or use channel locks.
   ii. Slip the ring terminal over the pin.
   iii. Replace the nut onto the pin.
   iv. Tighten by hand or use channel locks to tighten.

b. Connect the ground cable clamp to the shore power grounding source.

2. Connect shore cables.

   a. To facility power (Figure 5) connection by following the instructions at the facility.

Figure 5 Facility Power Hook Up Sample

   b. To trailer power connection (Figure 6). No tools are required.
      i. Lift cap off the trailer connections at the junction box.
      ii. Insert cable.
      iii. Turn to secure.

Figure 6 Trainer Power and Ground Cable Connections

3. Turn on facility power breaker by following the instructions at the facility.
4. In the equipment room, on the Power Select Panel, select External Power (EXT):
    a. Turn the ECU Power Select LOG to EXT (Figure 6).

Figure 7 ECU Power Select to External

    b. Turn the Trainer Unique Power Selector LOG to EXT (Figure 7).

Figure 8 Trainer Unique Power Selection

5. Switch both main principal breakers to the ON position.
    a. Open the PDP-2 Utility Power (120/208 Volts) Breaker Panel.
        i. Flip the breaker handle up to the ON position as shown in Figure 9

Figure 9 PDP-2 Utility Power Main Breaker in ON position

1). Verify all breaker slots numbered 1-27are in the ON position (Figure 10).

2). If not in the ON position put in the ON position.

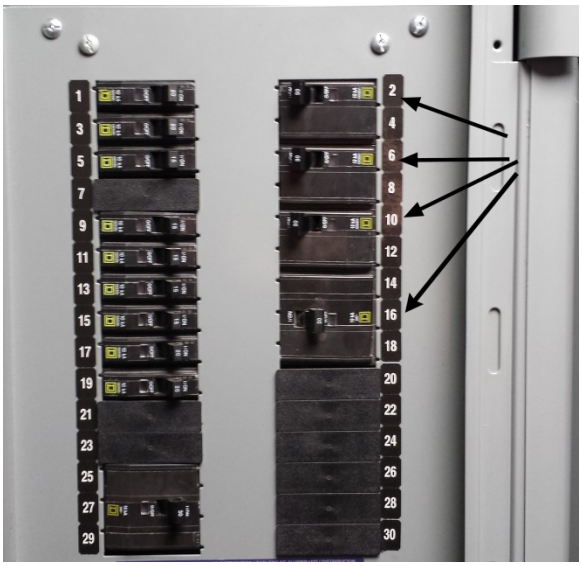


Figure 10 Breaker Panel

        ii. Close the panel door.

    b. The Fire Alarm Control Panel will sound a beep when the Utility panel is turned on. Turn the Battery Disconnect Switch to the ON position on the Fire Alarm Control Panel (Figure 11).

Figure 11 Fire Alarm Control Panel

i. Lift the Battery Disconnect safety cover.

ii. Toggle the switch up to turn on battery.

c. Open the PDP-1 ECU Power (480 Volts) Breaker Panel.

i. Flip the breaker handle (Figure 12) up to the ON position.

Figure 12 PDP-1 ECU Power Main Breaker in OFF Position

1). Verify both breaker slots numbered 1, 3, 5 and 2, 4, 6 are in the ON position (Figure 13).

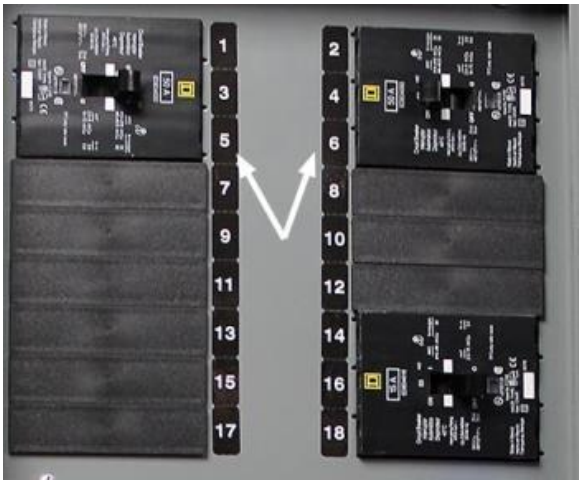


Figure 13 ECU Breaker Slots

2). If not in the "ON" position put in the ON position.

ii. Close the panel door.

6. Turn on internal lights to finish the process.

7. Verify all emergency lights are switched ON throughout the Trailer. A red light will indicate the light is ON as shown in Figure 14.

Figure 14 Emergency Light Switch

8. Continue to Section 1.1.1.2 Environmental Control System (ECS) Setup for connecting and running the ECS.

1.2.2 Prepare Generator

To prepare the trailer for generator power, set the Generator to "Ready Mode." Ready Mode is to prepare the trailer for Remote Start from the Equipment Room. The generator is located on the front of the trailer behind two access panel doors. The MT may need a ladder for this procedure. Figure 15 identifies the generator components used in this process.

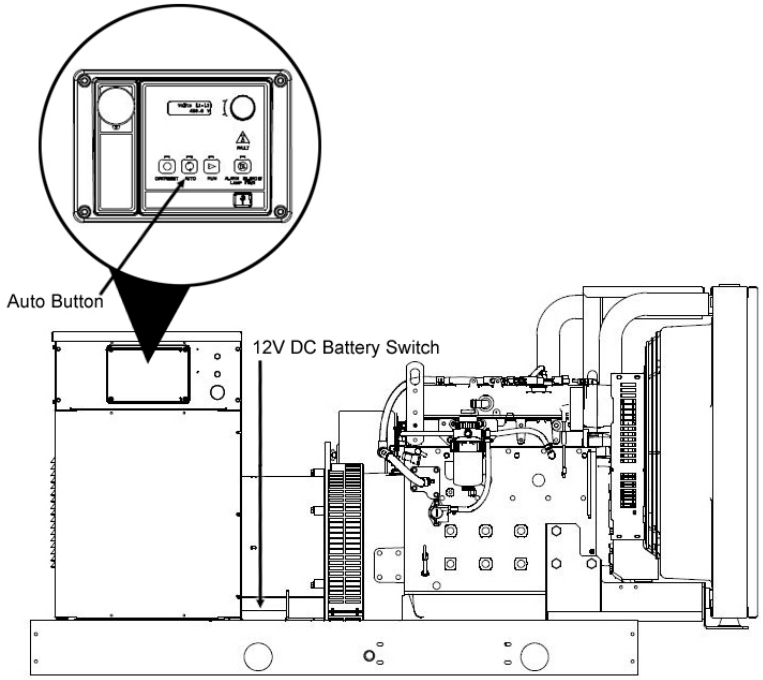


Figure 15 Generator Auto Button and Battery Switch

1. At the front of the trailer, open the left generator door.
    a. Flip the door latch out.
    b. Turn the door latch to the left.
2. Press the “Auto” button located at the front of the generator.
3. Close and latch the generator door:
    a. Turn the door latch to the right.
    b. Fold the door latch in to lock.
4. The Generator is now in Ready Mode and can be remotely started from inside the Equipment Room.

1.2.3 Generator Power

When shore power connections are not available, the UH-72A SFTS Trailer can be fully powered with the generator mounted to the front of the trailer. The generator can be started by using the (1) remote starter switch in the equipment room or (2) the local starter switch located on the control panel mounted on top of the generator. The following steps start the generator from inside the equipment room (recommended). Complete instructions for operation and maintenance of the Generator can be found in 61501 Fidelity Flight Trailer binders for COTS 208-600 V Kohler Power manual 7/13. The steps for turning on generator power to operate the trainer are as follows:

1. Turn ON generator using the remote starter switch (start/stop) located on the Remote Generator Control Panel (Figure 16).

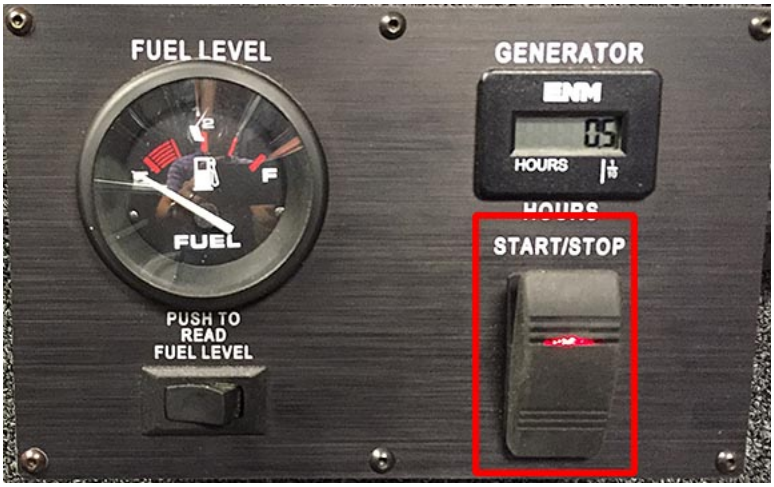


Figure 16 Remote Generator Control Panel

a. If an issue occurs where the generator will not start, the ground fault interrupter (GFI) receptacle in the generator controller box should be checked to determine if it has tripped.

b. The lid to the generator controller box will need to be removed to access the GFI receptacle.

2. On the Power Select Panel, select Generator Power (GEN).

a. Turn the ECU LOG to GEN.

Figure 17 ECU Log to Generator

b. Turn the Trainer Unique LOG to GEN Figure 17.

Figure 18 Trainer Unique Log to Generator

3. Turn the Trainer Unique Power Breaker to the GEN position (Figure 18).
4. Switch both main principal breakers to the ON position.
    a. Open the PDP-2 Utility Power (120/208 Volts) Breaker Panel.
        i. Flip the breaker handle up to the ON position (Figure 19).

Figure 19 PDP-2 Utility Power Main Breaker in ON position

1). Verify all breaker slots numbered 1-27 (Figure 20) are in the ON position.

2). If not in the “ON” position put in the ON position.

Figure 20 Breaker Panel

ii. Close the panel door.

b. The Fire Alarm Control Panel will sound a beep when the Utility panel is turned on. Turn the Battery Disconnect Switch to the ON position on the Fire Alarm Control Panel (Figure 21).

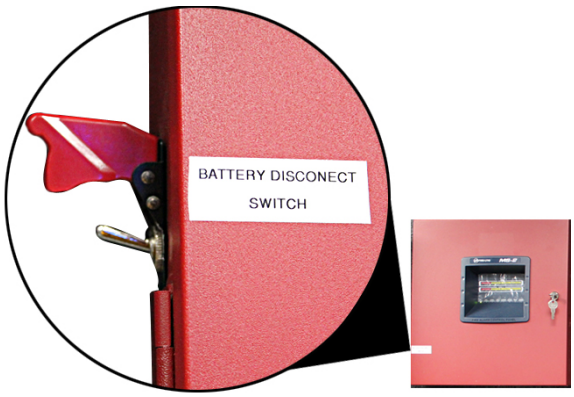


Figure 21 Fire Alarm Control Panel

i. Lift the Battery Disconnect safety cover.

ii. Toggle the switch up to turn ON battery.

c. Open the PDP-1 ECU Power (480 Volts) Breaker Panel.

i. Flip the breaker handle up to the ON position (Figure 22).

Figure 22 PDP-1 ECU Power Main Breaker in OFF Position

1). Verify all breaker slots numbered 1, 3, 5 and 2, 4, 6 are in the ON position.

2). If not in the "ON" position put in the ON position.

ii. Close the panel door.

5. Turn on internal lights to finish the process.

6. Verify all emergency lights (Figure 23) are switched ON throughout the Trailer. A red light will indicate the light is ON.

Figure 23 Emergency Light Switch

7. Continue to Section 1.1.1.2Environmental Control System (ECS) Setup for connecting and running the ECU.

1.2.3.1 Environmental Control System (ECS) Setup

Dependent of the current external temperatures, bringing the interior temperature of the SFTS trailer to an adequate operational temperature can take up to four hours. Once power is supplied to the trailer it is important to connect the humidifier hose and turn on the ECUs and humidifier to prepare the internal temperatures for training.

1.2.3.1.1 Connect Humidifier (if required)

Figure 24 Heated Hose

The humidifier requires a hose connection for operation. The trailer is equipped with a 50 Ft. ½" to ¾" Diam. Heated Hose (Figure 24) with power cord and is functional with or without power. It is recommended to plug in the hose when the air temperature is between 35°F - 48°F. The hose should be connected to the GFI receptacle in the Storage area closest to the hose in the colder climates. The hose is heated throughout the entire length for continuous heating. During setup, the MT will connect the hose from the facility water supply to the humidifier water connection labeled "Humidifier Supply" (Figure 25) located at the rear on the street side of the trailer. The following provides steps to connect the hose during setup.

Figure 25 Humidifier Water Inlet Connection

1. Locate and remove the humidifier hose in the Storage area B.
2. Connect hose to facility water supply.
3. Locate the Humidifier Supply on the street side of the trailer.
    a. Lift the cap.
    b. Connect water hose (Figure 26).

Figure 26 Trailer Hose Connection

4. Connect condensation plumbing; refer to SFTS-COTS-214 Carel Humidifier Submittal and Product Documentation for the installation.

5. When connected, turn on water supply.

1.1.1.1 Simulator Startup

The MT must turn on the machines in the Equipment Room. The three server racks houses multiple machines which include UPS Units and servers. In order to bring the system up properly, there is a specific order when powering on the equipment. Figure 27 is labeled alphanumerically and with arrows to identify the order of starting each machine. The following section provides the sequence to start the system.

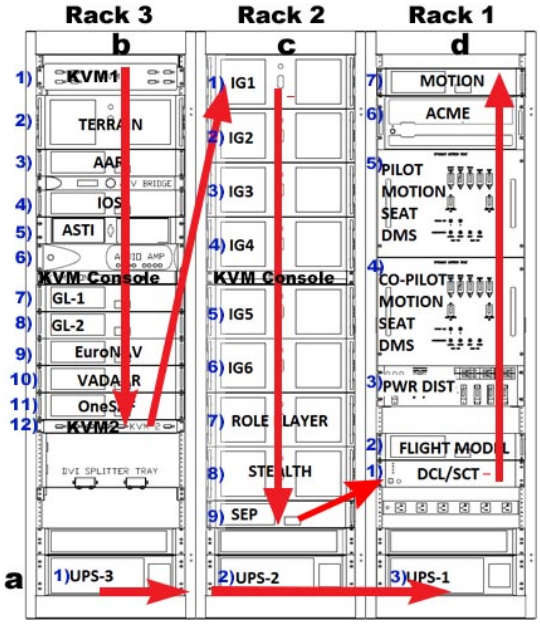


Figure 27 Computer Identification

6. Power on UPS.

   a. Begin with Figure 27 Item a. 1) UPS-3. The UPS unit will boot up the two network switches (Cisco and HP) which are mounted in the rear of Rack b.

      i. Press the red illuminated UPS Power Button (Figure 28 (a)).

Figure 28 UPS Battery Backup Unit

      ii. The UPS status information screen (Figure 28 (b)) will prompt "Turn on Immediately".

      iii. Push the "OK" button (Figure 28 (c)).

NOTE

Allow a five full minute boot time for the switches.

   b. Verify the network switches are fully booted. Move to the rear of the rack

      1). Cisco is located at the top of the rack (Figure 29). The "Syst" LED indicate:

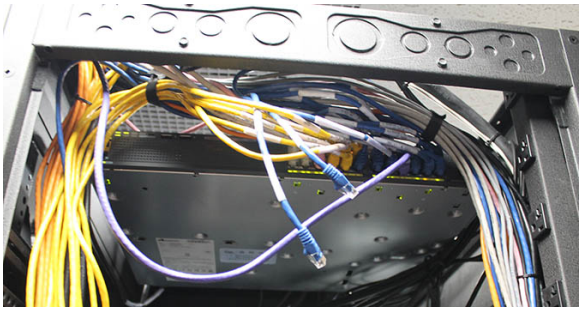


Figure 29 Cisco Network Switch

         i). Steady green indicates fully booted.

         ii). Blinking indicates still booting.

         iii). Amber indicates an error condition.

      2). HP is located at the top of the rack (Figure 30). The "PWR" LED:

Figure 30 HP Network Switch

a). Steady green indicates fully booted.

b). Blinking indicates still booting.

c). Steady red or flashing yellow indicates an error condition.

ii. Both network switches must display steady green BEFORE moving onto UPS2 which powers the VME.

c. Repeat Steps 1.a.i. and ii turn on:

i. UPS 2.

ii. UPS1.

7. Reset both KVM switches, items 1) and 12) in Figure 27, mounted in server rack b closest to the door. This step ensures all components will start properly.

a. Turn off KVM1 located at the top of rack b.

i. To avoid the wiring in the rear, reach behind from the front of the KVMs.

ii. Toggle the switch shown in (Figure 31 to the off position.

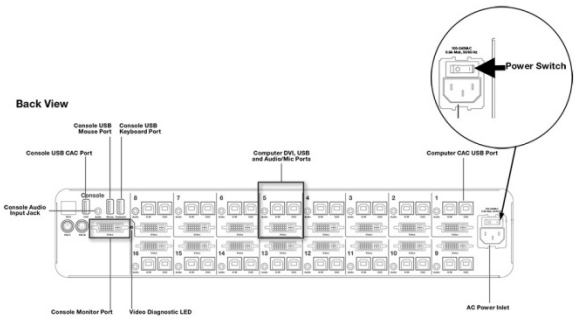


Figure 31 KVM Back View Power Switch

b. Repeat Steps 2ai & 2aii on KVM2 which is located under the OneSAF machine in rack b.

c. Wait 10 seconds.

d. Power on KVMs.

i. Power on KVM1.

ii. Wait 10 seconds.

iii. Power on KVM2.

8. Turn on the machines using the power buttons located on the front of each machine.

a. Start at the top of Rack b with item 2) Terrain Server moving downward turn on each machine ending with item 11) OneSAF.

- Terrain Server

- AAR
- IOS
- ASTI
- GL-1
- GL-2
- EuroNav
- VADAAR
- OneSAF.

b. Move to the top of Rack c begin with item 1) IG-01moving downward turn on each machine ending with item 9) SEP.

- IG-01
- IG-02
- IG-03
- IG-04
- IG-05
- IG-06
- Role Player
- Stealth
- SEP

c. Move to the bottom of Rack 1 (Item d)

NOTE

- Powering up equipment in Rack 1 must be done in the specified order listed. Start at the bottom with Figure 27 Item d. 1) DCL/SCT and move up.
- Failure to power on the motion equipment in the proper order will result in an error "CP0000 CPU1 internal error (IERR) Contact support". Should this message appear Inform MT. The MT should refer to the Troubleshooting section of the System Maintenance Manual, SMM 01-6910-725-24&P to correct the error.

i. Start with Figure 27 Item d. 1) DCL/SCT press the power button.

ii. Move up to Item d. 2) Flight Model

iii. Move up to Item d. 3) flip the Main Circuit Breaker (CB) switch (Figure 32) on the PWR DIST to the ON position. This action will power on both Pilot and Co-pilot Motion Seat Dynamic Motion Seats (DMS) above the PWR DIST.

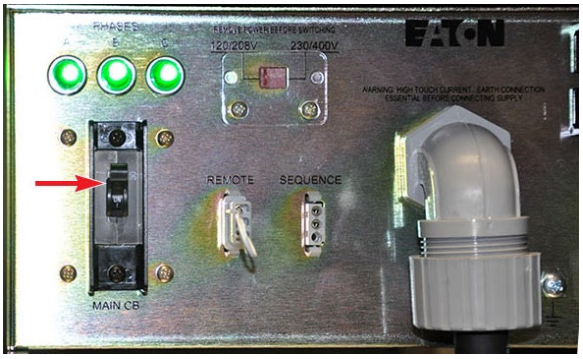


Figure 32 PWR DIST Main CB Switch

iv. Verify both Pilot and Co-pilot DMS Main Power switchesItems d. 4) and Item d. 5) are in the ON position:

1). If the Pilot and Co-pilot Motion Seat DMS switches are ON, continue to Step 3.v.

2). If the Pilot and Co-pilot Motion Seat DMS switches are OFF:

a). Turn on Items d. 4) Co-pilot Motion Seat DMS Main Power switch (Figure 33).

b). Turn on Item d. 5) Pilot Motion Seat DMS Main Power switch.

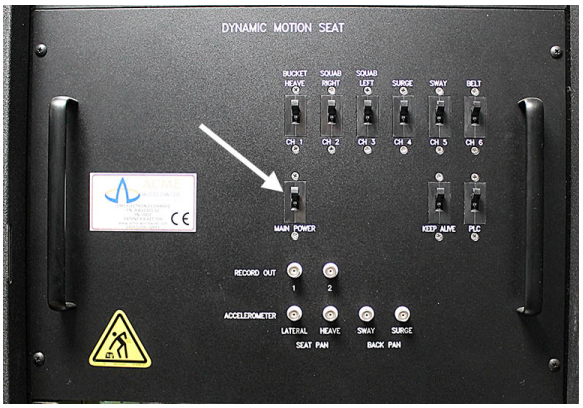


Figure 33 DMS Main Power Switch

v. Check the ACME machine:

1). After switching the ON the DMSthe ACME machine light will be blue.

2). Wait 5 seconds for ACME light to turn green.

3). If the light remains blue, manually press the power button to turn it on if it doesn't turn green,

vi. Move up to the top of Rack d.7) Motion computer

1). The Motion computer should automatically power on.

2). Press the Motion computer power button if not green.

9. Proceed to the IOS/AAR room.
   a. Check the IOS/AAR monitors are ON.
   b. Power on ALL monitors if the monitors were not automatically turned on.
10. Login at the IOS.
   a. Use the mouse to navigate to IOS screen.
   b. Login. Type:
      i. User Name (UN)
      ii. Password (PW)
      iii. Press ENTER.

1.1.1.2 System Powerdown

1. Open RemrunGUI.
   c. Double click the RemRun icon on the IOS Main desktop.
   d. If already running, pull up the RemRun main window from the taskbar.
2. Shutdown the RemRun applications.
   a. Press the STOP button (Figure 34) to shut down all applications.

Figure 34 Select Stop

   b. Wait a few moments.
   c. The machine squares will switch to gray when shutdown is complete (Figure 35),

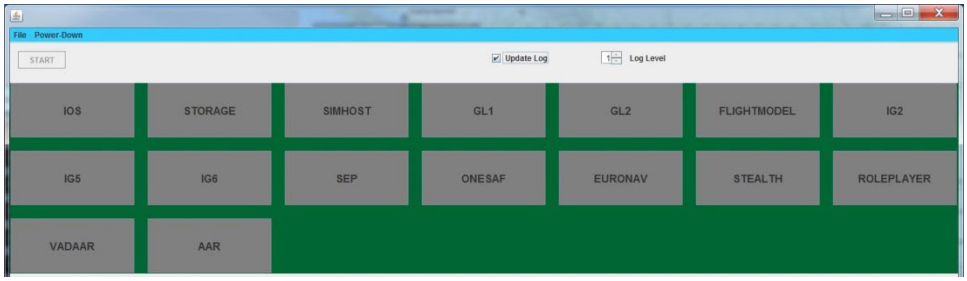


Figure 35 Shutdown Complete

3. Navigate to the Top Toolbar; select Powerdown option (Figure 36).

Figure 36 Remrun GUI Power Down

a. Select Power Down from the drop-down.

b. A Powerdown dialog box (Figure 37) will open, asking "Really power down all simulator servers?"

Figure 37 Powerdown Dialog Box

c. Select Powerdown to continue.

d. The system will begin to Powerdown.

   i. All the machines will begin to shut down.

   ii. This can take several minutes for all machines to power down.

e. The MT will confirm all machines controlled by RemRun have been shut down in the Equipment Room. Table 2 provides a checklist of machines that power off with RemRun:

Table 2 RemRun Powerdown Servers

RemRun Server Checklist		
	1.	Terrain
	2.	AAR
	3.	IOS
	4.	GL1
	5.	GL2
	6.	EuroNav
	7.	VADAAR
	8.	OneSAF
	9.	IG machines 1-6,
	10.	Roleplayer
	11.	Stealth
	12.	SEP
	13.	Flight Model
	14.	Motion

f. The MT should shutdown:

i. The ASTI computer by momentarily pressing the power button highlighted in red in Figure 38 on the front of the server.

Figure 38 ASTi Box, Power Rocker Switch Circled in Red

ii. The DCL computer by momentarily pressing the power button on the front of the servers.

1.1.1.3 Manual Shutdown

When shutting down the subsystems most machines will be shut down remotely form the IOS using the RemRun. A few machines require extra steps from the MT to shut down from the Equipment Room. In the event a machine was not shutdown, the machine will need to be manually shutdown. Table 3 lists the machines that shutdown remotely and machines which require manual shutdown. The following section describes the Remote Shut down and Powerdown of the subsystems.

Table 3 Subsystem Shutdown

List of machines	
Powered down with RemRun (the power light off)	**Remains powered after RemRun**
Terrain	ASTI
AAR	DCL
IOS	ACME
GL1	Pilot Motion Seat DMS
GL2	Co-Pilot Motion Seat DMS
EuroNav	-
VADAAR	-
OneSAF	-
IG machines 1-6,	-
Roleplayer	-
Stealth	-
SEP	-
Flight Model	-
Motion	-

1. Verify or Powerdown the remaining machines.
    a. Verify DCL is powered down.
    b. Turn off the Motion machine by pressing the power button
    c. Turn off the Main Power to the “Pilot Motion Seat DMS” (top).
    d. Turn off the Main Power to the “Co-Pilot Motion Seat DMS” (bottom).
    e. Turn the main CB switch of the PWR DIST panel to OFF (Figure 39).

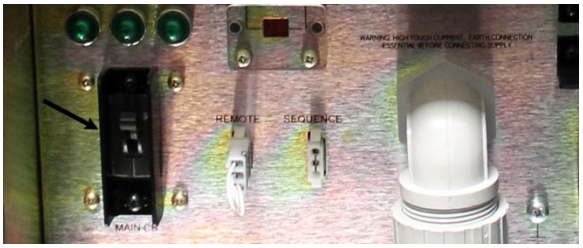


Figure 39 Power Distributor

2. At this point all of the machines should be off.
3. Turn off UPS-1 to 3.
    a. Begin with UPS-3, press the white illuminated UPS Power Button.
        i. The UPS status information screen will prompt "Turn off Immediately."
        ii. Push the "OK" button.
    b. Repeat Steps 5ai-aii for UPS-2, and then UPS-1.
4. Turn off the top/right 3 circuit breakers in the left PDP-2 Utility Power CB panel.
5. Return to the UPS 1-3 and repeat Step 3.
6. Use the HVAC control panels in the IOS room to shut down IOS and equipment room HVAC. Do one of the following:

a. If training is to continue the next day, continue to Section 1.1.1.4Trailer Powerdown.

b. If training is complete and the trailer is ready to relocate, continue to Section **Error! Reference source not found.Error! Reference source not found.**before powering down the trailer and disconnecting power.

1.1.1.4 Trailer Powerdown

1. The I/O must verify all emergency lights are switched OFF throughout the Trailer.
   a. Flip the switch
   b. The red indicator light of the emergency light will turn off.

NOTE

A flashlight is required to perform the following tasks as the equipment room will become very dark when the breaker panel has been shutoff.

2. Open the PDP-2 Utility Power (120/208 Volts) Breaker Panel.
   a. Flip the breaker handle down to the OFF position as shown in Figure 40.

Figure 40 Breaker Panel

   b. Close and secure the breaker box door.

3. The fire alarm control panel box will start to beep, turn OFF the Battery Disconnect switch (Figure 40).

Figure 41 Battery Disconnect Switch

4. Open the right breaker box labelled PDP-1 ECU Power (480 Volts) Breaker Panel door.
    a. Put the main principal breaker in the OFF position.
    b. Close and secure the breaker box door.
    c. Turn off both HVAC breakers box (slots 1, 3, 5 and 2, 4, 6). These are the top two breakers in the right breaker box.
5. Return to the UPS machines and power off again by following Step 3 from Section 1.1.1.3Manual Shutdown.
6. On the Power Select Panel (Figure 41) turn the LOG switches to OFF:
    a. ECU
    b. Trainer Unique Power

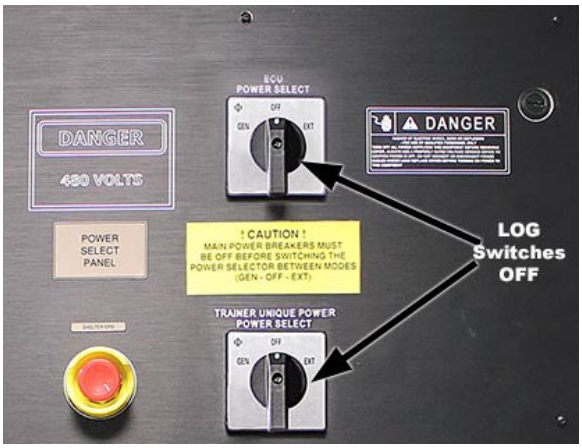


Figure 42 Power Select Panel LOG Switches OFF

7. Do one of the following:
    a. If training is to continue the next day ensure all external storage and entry doors are locked.
    b. If training is complete and ready to relocate continue to:

i. Section **Error! Reference source not found.Error! Reference source not found.**

ii. Section **Error! Reference source not found.Error! Reference source not found.**.