

# OPERATING MANUAL: MODEL FBU<sub>235</sub>-D<sub>14</sub> NUCLEAR ANTI- MATERIAL DEVICE

## SPECTRE ATOMIC ENERGY DIVISION OVERVIEW

Following a long standing history of providing the best in fission based weaponry, the SPECTRE Atomic Energy Group is pleased you have acquired our latest pure-fission model, the FBU<sub>235</sub>. (Fission-Bomb, Uranium 235 based). This model is Implosion based, with a liquid U<sub>235</sub> material being surrounded by high density explosive charges. This method, while considered older in design, has proven quite stable for field use, and relatively inexpensive due to the use of (relatively) easily available materials.

You can be assured of the best-in-breed status of our devices. Only the most effective materials and design methods are used, hand-picked from the vast intelligence and research stockpiles we maintain, gathered from other well-known SPECTRE intelligence divisions across the globe.

The following manual is intended for qualified personnel only. Operation and deployment of SPECTRE AED devices require investment in the appropriate personnel (whether home-grown, converted, or blackmailed to perform the required work) for maximum impact. Your effort in finding the most qualified individuals to prepare and detonate these devices will be well rewarded by providing the most destruction possible from a given device size.

What follows is the operation and maintenance guide for this particular model: The FBU<sub>235</sub>-D<sub>14</sub>, Operation Solstice model.

*PLEASE NOTE: THE FOLLOWING IMAGES HAVE BEEN CUSTOMIZED FOR CUSTOMER D<sub>14</sub>, YOUR SPECIFIC DEVICE MAY HAVE DIFFERENT COLORING AND MARKINGS, BASED ON THE CONTRACT SPECIFICATIONS.*

NOTICE – This \*Manual\* is part of a simulation designed for use by airsoft fields for entertainment and training purposes. No item described in this document is dangerous or life-threatening and all organizations are fictitious. All trademarked names and logos and titles are owned by their respective copyright owners and all use is claimed as “fair use” for parody purposes.



# SPECTRE

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## NORMAL OPERATION PROCEDURES

### MODES OF OPERATION

The unit supports four modes of operation:

1. PIN Code Countdown Timer to Detonation
2. Guided U235 Charge and Countdown
3. Repeating Countdown
4. Simple Countdown

Mode 2 requires the use of a U235 canister. Modes can be altered or the device reset using the programming menu as detailed below.

*NOTE THAT IF THE PROGRAM MENU IS NOT SELECTED ON POWER-UP, THE LAST OPERATING MODE IS RE-STARTED.*

*STRONG RF EMISSIONS NEAR THE DEVICE HAVE BEEN PROVEN TO CAUSE UNDESIRE OPERATION, INCLUDING HANGING THE CONTROLLER, ERRONEOUS KEYPAD ENTRY, ETC. IT IS RECOMMENDED THAT RF TRANSMITTERS ARE NOT OPERATED WITHIN SEVERAL FEET OF THE DEVICE.*

### INITIAL CONFIGURATION/RECONFIGURATION

Initial configuration or resetting the system is performed by accessing the hidden PROGRAMMING menu. Please read this section entirely before proceeding.

Follow these steps to initialize the device:

1. Obtain one of the two system access keys.



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2. Note the position of the key stops – in this view, “0” is turned off, and “1” is turned on.



3. Wait until the display shows “D14 Airsoft Bomb” and the firmware version. Immediately press and hold the red button to enter the programming menu.
4. Note that the system battery level will be displayed during power up. If the battery voltage is less than ~11.2 volts DC, an alarm will sound. It is possible to operate with a low battery but not recommended, as it may reduce battery life. NEVER run the system if battery is less than 10 volts.
5. If done correctly, the device will display “Program Mode”, “Press 1-7 for settings, # = OK”, “\* = exit.”. Allow the display to scroll thru the instructions before entering a number.

At this point, you are in the main programming menu. Press the number 1 thru 7 to select what option you wish to change, and # to confirm your selection. You can press any of the numbers and the menu will indicate what that option does.

Pressing \* from this menu will exit program mode and start the selected game immediately. The # key is used as “enter” or “accept” in this menu.

All of these settings are used across all game modes (if applicable). Settings that do not apply (such as the PIN value, which is not used during simple countdown mode) are ignored in that game mode.

The settings you can adjust are:



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1. Set Default Game Mode – select 1-4 to have the corresponding game start at power up. (see Modes of operation above) start . Enter 5# to have the device display the game mode numbers and names.
2. Countdown Strobe – Turn on or off the strobe flash when the unit is counting down. This does not affect strobe operation during detonation, as the strobe and horns will always operate if the device is detonated.
3. Countdown Beep – Disable/enable a beep each second the display counts down. If you wish the bomb to be more concealed, it is recommended you disable the beep during countdown.
4. Alert Duration – when detonated, how many seconds will the strobes and air horns operate? Enter a value from 1 to 240 seconds.
5. Countdown Time – What time does the countdown start at? This is number of minutes, and can range from 1 minute to 60 minutes.
6. PIN – the pin code is a 1-6 digit number from 1 to 999999. NOTE that if EOD mode is enabled, choosing a PIN less than 400 (from 1-400) may give invalid hints.
7. EOD Mode – Explosive Ordinance Disposal Expert option – if this mode is enabled, during the PIN countdown entering an invalid PIN will not result in detonation (after 4 invalid PINs), but rather, state if the PIN is too high or too low. Additionally, hitting the \* button will give a range of numbers, randomly selected, that are 0-200 numbers above and 0-200 numbers below the actual PIN. If this mode is NOT enabled, entering the wrong PIN more than 4 times detonates the bomb.

## MODE 1 - PIN CODE COUNTDOWN TIMER TO DETONATION

Mode 1 allows the typical scenario – Enter a PIN to start the countdown (the PIN is set in the programming menu by an admin), enter a PIN to pause the countdown. If you want to restart the countdown where you left off, enter the PIN again. The countdown can NOT be aborted, only paused.

Basic operation:

Enter the program menu before the game starts and set your Pin and other options, like EOD mode. Exit the program mode and enter the game mode immediately (\* key) or power the unit off and power it on in the field, letting it enter game mode automatically.

1. Power the unit on allowing the startup sequence to complete. (watch the battery display to verify the system is charged.)



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2. Once the system displays "Enter PIN:" it will wait until the correct PIN is entered before the countdown will start. Depending on your game, the admin can enter the Pin at the start of the game or you can allow players to start the countdown.
3. System will count down once the correct PIN is entered.
4. To pause the countdown enter the correct PIN and #.
5. If an incorrect PIN is entered and EOD mode is ON: If the entered PIN is higher than the actual PIN, "PIN too high" will be displayed (and vice versa for a low PIN). If \* is entered a hint is displayed.
6. If an incorrect PIN is entered and EOD mode is OFF: Incorrect PIN is displayed. After the 4<sup>th</sup> incorrect PIN, the device detonates.
7. If you allow the countdown to proceed to completion, the device will detonate. (Air horns will sound in training models.) The display will also indicate detonation by showing DETONATED on the display.

*NOTE – IF THIS WAS A REAL MODEL, STEP 6 WILL LIKELY NOT BE SHOWN BEFORE DETONATION HAS OCCURRED. WHILE THIS WOULD SEEM TO BE A DESIGN FLAW, IT IS INTENTIONAL AND NOT TERMS FOR WARRANTY CLAIMS. SPECTRE SHOULD NOT NEED TO STATE THE OBVIOUS – BUT - IF YOU ATTEMPT TO VIEW THE "TIME EXPIRED" SCREEN ON A LIVE DEVICE, YOU WILL NOT NEED TO WORRY ABOUT CONTACTING US FOR SUPPORT – OR ANYONE ELSE – EVER AGAIN.*

### MODE 2 – GUIDED U235 CHARGE AND COUNTDOWN

Mode 2 requires the canister for operation. Players will need the canister to arm and start the countdown, as well as disarm the device.

1. Basic operation:
2. Enter the program menu before the game starts and set your Pin and other options, like EOD mode. Exit the program mode and enter the game mode immediately (\* key) or power the unit off and power it on in the field, letting it enter game mode automatically.
3. Power the unit on allowing the startup sequence to complete. (watch the battery display to verify the system is charged.)
4. System will display "Detach Can and press red button". This means the system is detecting the canister correctly and ready to start.
5. Remove the Can and press the red button.



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6. System will display "Ready to charge! Attach Canister."
7. Give the canister to the players or however you want to use the canister (hide it?).
8. Players must bring canister to device and attach it. The system will automatically begin "priming" the pump system.
9. Unit will display "Ready to charge. Hold Red button" once priming is completed. Press the red button and hold it.
10. If you don't hold the red button the charging halts.. continue holding till the charging is complete.
11. Unit will charge, then indicate "Charged! Detach Canister.". Remove the canister to start the countdown.
12. To halt the countdown, attach the canister. Hold the red button while the system is discharged.
13. Once the discharge is completed, the unit says "Discharged! Detach Canister."

Once the system is discharged, or detonates, the game is over.

### MODE 3 – REPEATING COUNTDOWN

Mode 3 is a countdown based game where the device never completely stops counting down – until it detonates. However, the countdown can be "reset" by pressing the red button. Players will need to return to the device or maintain control of it to win the game.

Basic operation:

1. Enter the program menu before the game starts and set your Pin and other options, like EOD mode. Exit the program mode and enter the game mode immediately (\* key) or power the unit off and power it on in the field, letting it enter game mode automatically.
2. Power the unit on allowing the startup sequence to complete. (watch the battery display to verify the system is charged.)
3. System will wait at "Press red btn to start" and wait for the admin to start the game.
4. System will begin countdown. Countdown will continue until the system detonates, or the countdown is reset by pressing the red button again.

There is no way to disarm this game mode. The system should be turned off with the key to halt the countdown.



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## MODE 4 – SIMPLE COUNTDOWN

Mode 3 is a countdown based game where the device never completely stops counting down – until it detonates. However, the countdown can be “reset” by pressing the red button. Players will need to return to the device or maintain control of it to win the game.

Basic operation:

1. Enter the program menu before the game starts and set your Pin and other options, like EOD mode. Exit the program mode and enter the game mode immediately (\* key) or power the unit off and power it on in the field, letting it enter game mode automatically.
2. Power the unit on allowing the startup sequence to complete. (watch the battery display to verify the system is charged.)
3. System will display “Press red btn to start”, allowing the admin to start the game (or a player).
4. System will start counting down and detonate when time limit is reached UNLESS the red button is pressed. When the red button is pressed, “Countdown paused, red btn restarts” will be displayed.
5. Press the red button to restart the countdown where it left off.

There is no way to disarm this game mode, it can only be paused with the red button. The system should be turned off with the key to halt the countdown.





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## SYSTEM MAINTENANCE

### OVERVIEW

System maintenance includes items such as pre-operation checks, battery charging and replacement, and fuse replacement. The system is generally built to handle normal use but any time the device is dropped, kicked or knocked over, an inspection of the internal connections and components should be performed. The device has been upgraded with an Arduino Pro Mini MCU, and now uses relays to control alert devices (horns and strobe).

Aside from the device programming menu, the system may be reprogrammed using the normal Arduino IDE and programming methods to operate in different ways. That process is beyond the scope of this document however.

### TROUBLESHOOTING STRANGE BEHAVIOR

Note that if the programming menu is not selected on power-up, the last operating mode is re-started.

Strong RF emissions near the device have been proven to cause undesired operation, including hanging the controller, erroneous keypad entry, etc. It is recommended that RF transmitters are NOT operated within several feet of the device.

If the device display becomes garbled or appears to hang, power the system down with the access key, then power it back on. The last program will be restarted.

If the strobes or air horn devices sound continuously, the relay devices or controller may have failed or a wire may be shorted. Turn off the controller with the key switch, and remove the right access panel and pull out the internal board to access the main system fuse, or disconnect the battery.

In the event of continuous air horn operation, use hearing protection. Do not attempt to disable the compressor or horns directly, rather, remove power from the compressor by disabling main power or removing the fuse, or unplugging the compressor power leads.

### OPENING THE CASE

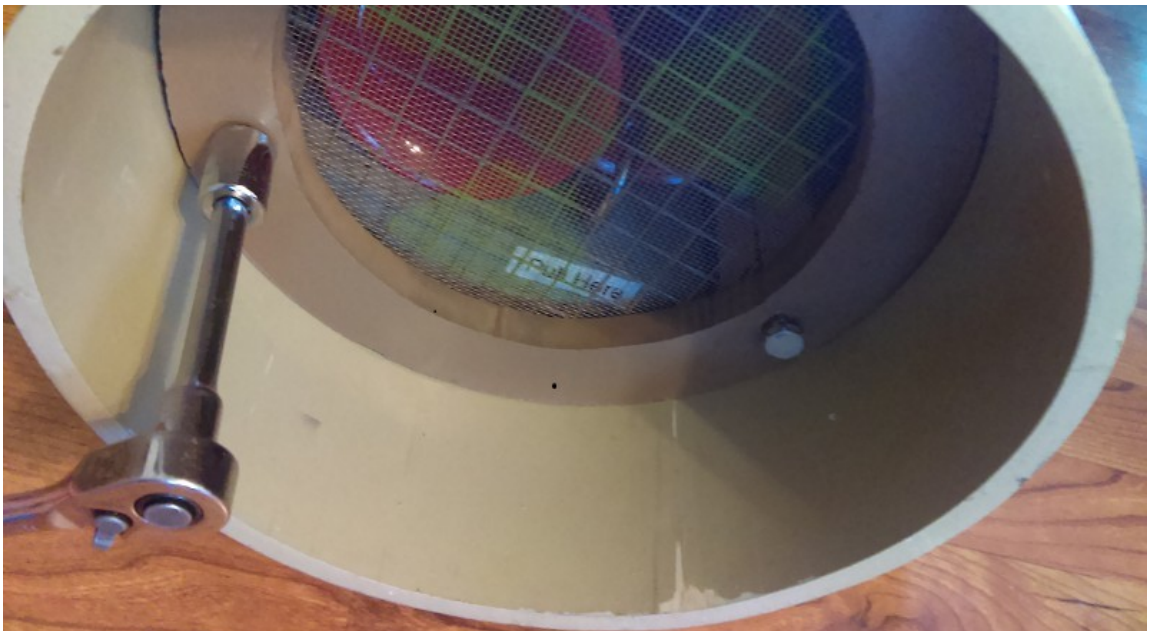
The case should be opened using the round screen panel on the right side of the main tube body (when facing the keypad). 2 10mm bolts can be unscrewed half-way and the cover removed. Once that is accomplished, the internal component board can be pulled out to the right for service.

Steps to access the internal components are as follows.



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1. Using a 10mm socket, unscrew the 2 bolts on the right side of the main tube body. If you only unscrew them half-way you should be able to use them to pull the cover out.





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2. Remove the cover, exposing the internal carrier board and side panel connector. Unplug the connector if needed.



3. Slowly pull the carrier board (it may be tight based on humidity and age of device) to the right using the finger pull (as indicated).



WATCH OUT for the main wire harness in loom catching on components when you slide the carried board out or other components catching on bolts. There should be enough free wire to



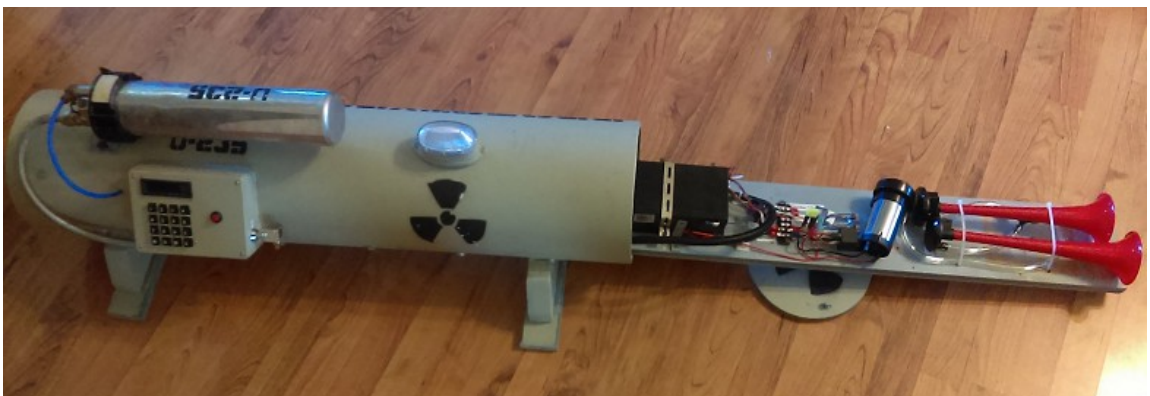


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move the carrier board out enough for servicing the items, with no additional slack.



4. Details on the internal components and a component list is available in the specifications section of this document.



*ALWAYS DISCONNECT ONE OR BOTH OF THE MAIN BATTERY CONNECTORS WHEN PERFORMING SERVICE.*



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*SEVERAL COMPONENTS ARE 'GROUND-SWITCHED'. WHICH MEANS THEY RECEIVE CONSTANT POWER FROM THE BATTERY + RAIL, AND GROUND IS SWITCHED BY THE RELAYS. THIS MEANS THE STROBE AND COMPRESSOR POWER WIRES WILL NORMALLY BE RESTING AT +12VDC.*

## BATTERY CHARGING

Connect a 12V SLA charging supply to the power jack on the right side screen of the device main tube body. Center Pin is ground. It is suggested that no more than 1 amp charging is used. This port is fused at 3A. Charging may take several hours due to battery capacity (it is a larger 8A-Hr SLA). Battery is considered charged when the voltage reaches 14.4 VDC. Battery voltage less than 10.5V is not recommended and can damage the SLA battery. A smart lead-acid controller will extend the life of the battery, as will keeping it charged and not allowing it to become completely dead.

AS LONG AS VOLTAGE NEVER EXCEEDS 17 VOLTS, a solar panel can be plugged into the charger port while the unit is in the field to extend the operating time.

Any white crusty residue on the "top" of the battery, or swelling of the battery indicates internal failure and requires the battery to be disposed of immediately. A Sulphur or rotten-egg smell also indicates overcharging and possible battery damage.

## BATTERY REPLACEMENT

As this unit uses a Sealed Lead Acid Battery (SLA), please replace the battery with a suitable sized replacement. SLA batteries can be mounted in any position. The existing cell is a 7 or 8 Amp-Hour 12V battery. Power is marked as Red for +12V, and black for Ground.

Unscrew the bracket holding the battery down and one or more of the side screws to free the battery. When tightening the new battery down, ensure there is a very small amount of "wiggle-room" so the plastic battery case is not being crimped. Overtightening can crack the new battery case.

This is a standard battery design, and any battery with similar specifications can be used – whether it was sold for UPS, deer-feeder, telecom, or general use.

As the battery uses lead, proper disposal should be performed. Do not discard the battery in normal trash. Dispose of or recycle according to local ordinances.

## FUSE REPLACEMENT

Fuses should not typically blow unless an internal short develops in the device or a component. Before replacing a fuse, investigate the component that blew the fuse and verify it is not malfunctioning. If the main 30A fuse blows, disconnect all other fuses (and keep track of which wires go with which fuse) and reconnect components one fuse at a time to isolate the cause.



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Component	Fuse Size	Purpose
Main Battery	30A	Main power for all systems.
Controller	3A	Power for the microcontroller and display.
Strobes	3A	Power for the 2 strobe lights.
Air Horn	20A	Power for the Air Horn compressor (high current!)
Air Horn Relay	3A	Power for the Air Horn relay (low current).



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## AUXILLARY INFORMATION/SPECIFICATIONS

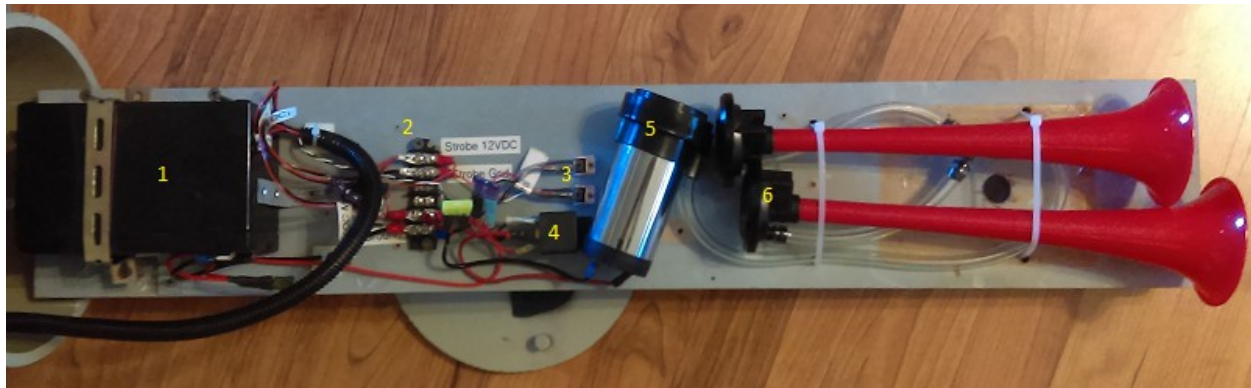
### INTERNAL COMPONENT LIST

The following components are used in this device.

Item #	Component
1	Main Battery. SLA 12VDC 7 or 8 AHr battery. (UB1280 or similar) 30A Main fuse on battery.
2	Main connection block. Most component fuses are located here.
3	Strobe Relay (photo is slightly out of date). Clamping Diode installed across coil, if you replace this device use a suitable clamping diode to shunt spikes and connect with correct polarity. Relay is 30A, 30VDC rated. 12V coil.
4	Air Horn Relay. Clamping Diode installed across coil, if you replace this device use a suitable clamping diode to shunt spikes and connect with correct polarity. Relay is 30A, 30VDC rated. 12V coil.
5	Air horn compressor. Loud on its own, bolted to the carrier board. Uses a 20A fuse. No maintenance possible on this part.
6	Air Horns. Dual low frequency horns, zip-tied for convenient removal/replacement.
7	Strobes. Left side and top. Standard 12V auto/alarm white strobes. 3A fuse for both.
8	"U235" canister. (old water filter). Mounting head contains a NC push-button switch that the controllers uses to sense whether the canister is properly connected or not.
9	Keypad/Controller box. An Arduino Pro Mini controller with custom program, keypad and LCD parallel interface. A small slave relay board is also attached. Runs on 12VDC with a 3 A fuse (board drops voltage to 5V for internal use).
10	LCD display – serial connected to PIC board, blue.
11	"Red Button" – main button used to arm/disarm/enter reset mode. Hold this button when powering system up to reset the device.
12	Key Switch. Switches power to Microcontroller only – however this will generally turn off all components. If you do not hold the red button when powering up the device with this key, the last-run program is restarted.

Internal Components:





External Components:



Miscellaneous Specs:

Weight: 18.5 Kg or 40 lbs.

Width: 1 M or 40 in.



While the keyboard keys are labeled differently, and the loads are switched using relays versus normal transistors, the following diagram is fairly close in showing basic system diagram. What is missing is the additional switch inputs (the red button and canister switch) from a PIC input pin to ground.





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## QUICK REFERENCE SHEET

Print copies of the following sheet for in-field reference.

Device Reset: Hold red button after turning device on with key switch. Wait for programming menu to be displayed.

1. Set Default Game Mode – select 1-4 to have the corresponding game start at power up. (see Modes of operation above) start . Enter 5# to have the device display the game mode numbers and names.
2. Countdown Strobe
3. Countdown Beep
4. Alert Duration
5. Countdown Time
6. PIN
7. EOD Mode

## DISCLAIMER

SPECTRE is not liable for non-detonation, transportation, operation, or maintenance of any Atomic Division device outside of the strict terms of your contract. If a warranty claim is made and the resulting cause is deemed to be end user failure, standard SPECTRE protocol will be followed. Remember, at SPECTRE, we hold our facilities, personnel and customers to the highest standard.

“Failure is not an option.”