

Opertating The Penn State Shot Box
2004.322

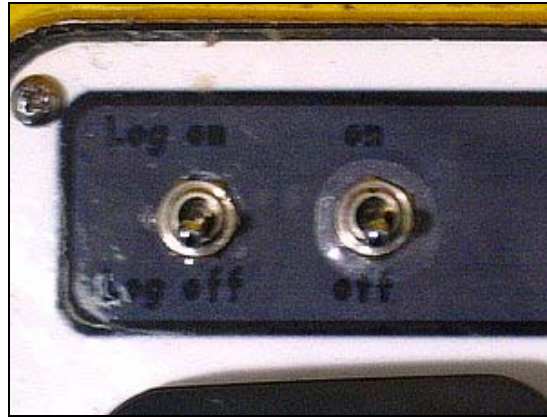
1. **Charge the shot box.** The box runs on internal, rechargeable batteries in the field. They may be charged using 120VAC or 12VDC power. Just connect the appropriate cable to the appropriate jack. *I think* that the box will use 12VDC power for operating if it is available as well as charge the battery, but that the 120VAC power will only charge the batteries when the box is not in use (power switch off).



2. **Set up the GPS antenna.** When you are ready to operate the shot box remove the GPS antenna from the Velcro on the shot box and place it where it will have an unobstructed view of the sky. If the whole shot box has an unobstructed view of the sky then the GPS antenna may be left attached to front of the shot box. There is about two meters of cable connected to the GPS antenna.



3. **Turn on the power** using the power switch in the upper left-hand corner of the front of the box.



4. **Let the GPS lock.** The LCD display will show the current time (that the box thinks it is), GPS solution status, the current GPS position, and the <MENU> selection item. The rules are the same for these GPS units as they are for any other. If the unit really does not know where it is the LAT and LON will be zeros, and it may take up to 20 minutes to get a lock and a good position. The same goes if the box was moved a long distance (100's of kilometers) since it was last powered up. If it has only been a few days since the box was last used it may take a couple of minutes. If it has only been a couple of hours since it was used it should take one minute or less to lock and produce an accurate position.

The GPS solution status is indicated in the upper right-hand corner of the display. "ND" indicates that the GPS has no position solution yet. "2D" indicates that the GPS has locked on to at least 3 GPS satellites. "3D" means that a complete solution has been achieved and the displayed time and position is correct. You should only shoot when "3D" status is indicated.



5. **Menu navigation.** Moving around the menus and setting values is achieved by using the SET, CANCEL, UP and DOWN buttons. Two arrows (-> and <-) indicate what will be selected from the menus when the SET button is pressed. In the picture below the <NEXT MENU> would be selected if the SET button were to be pressed. To move to the menu item COUNT DOWN you would press the UP button.



6. **Setting the interval.** The shot box will generate a trigger pulse at set time intervals. This interval can be set through the SET INTERVAL menu item and it **SHOULD BE DONE EVERY TIME YOU TURN THE SHOT BOX POWER ON.** From the main display with the time and position press the SET button. This will take you to the menu in the picture below.



Press the UP button twice to get to the SET INTERVAL menu item and then the SET button to select it.



EVERY TIME YOU GO TO THIS MENU ITEM THE INTERVAL WILL BE SET TO 5 SECONDS. What this means is that the box will produce a trigger pulse every 5 seconds starting on the minute (i.e. on the minute, 5 seconds after the minute, 10 seconds after the minute, etc.). When you tell the box to begin its countdown there will be no more than 5 seconds before the trigger pulse will be generated. There is no way to just check what the interval is set to. Once you come to this display it is too late. The interval has already been set to 5 seconds.



Use the UP and DOWN buttons to set the interval to what you want to use. A one minute interval is what would be consider "normal" (the picture below). This means that a trigger pulse will be generated every minute ON the minute. When you start the countdown you will have one minute or less before the trigger pulse gets generated. Once you have the interval you want to use selected press the SET button to set it and leave the display.



7. **Connect the detonator.** Connect the wires to the DETONATOR terminals.



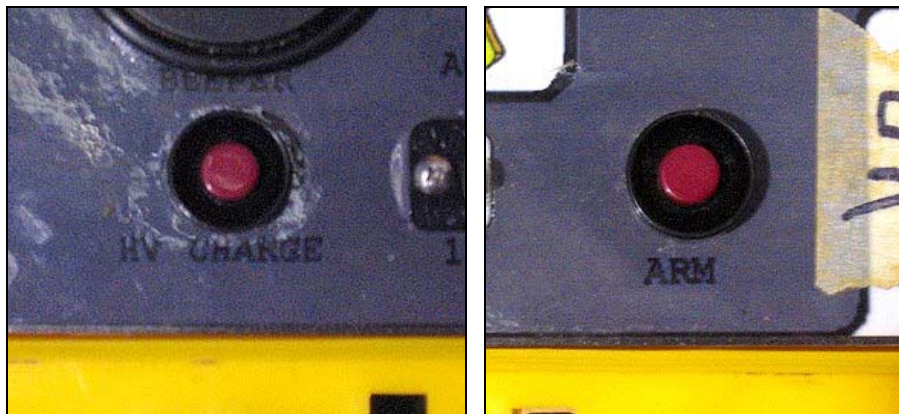
8. **Start the countdown.** When everything is ready go to the COUNT DOWN menu item and select it with the SET button.



This will bring up the countdown display. This display shows the current time, the GPS status, and the amount of time before the trigger pulse will be generated. If timing is important don't shoot if the GPS status indicator is no "3D". The picture below shows that there is 14 seconds to go before the trigger pulse will be generated.



9. **Fire in the hole.** I've been saying that a trigger pulse (at the TRIGGER PULSE connector) will be generated every minute (if you set the interval to one minute), but the detonation pulse will only be generated at the same time as the trigger pulse if the RV CHARGE and ARM buttons near the bottom of the front of the box are being held down when the trigger time arrives. About 15 seconds before the trigger time you should press and hold down the RV CHARGE button, then just before the detonation time you should press and hold down the ARM button. Standard two-handed operation.



10. **KABOOM.** At the correct time (on the minute in this example) the trigger and detonation pulses will be generated. The HV CHARGE and ARM buttons may be released. If you do not want a trigger pulse to be generated the next minute then press the CANCEL button to leave the countdown display.



NOTES:

- The internal battery voltage can be checked through the TEST MENU, BATTERY TEST item. It is a 12 volt battery, so a voltage below 12 volts is probably not good.