Signal Channel Connectors:
(Right-hand side of dark box, closest to electronics rack). Channel 0 is at the front of the box and Channel 7 is at the back of the box.

```
0  1  2  3  4  5  6  7
o  o  o  o  o  o  o  o  BNC
o  o  o  o  o  o  o  o  HV
```

R0=top CsI crystal
R1=lower preshower tile
R2=bottom CsI crystal
R6=upper preshower tile

High Voltage Connectors:
(Left-hand side of dark box, Closest to vertical dark box). Channel 0 is at the front of the box and Channel 7 is at the back of the box.

```
7  6  5  4  3  2  1  0
o  o  o  o  o  o  o  o  BNC
o  o  o  o  o  o  o  o  HV
```

L0=top CsI crystal
L1=lower preshower tile
L2=bottom CsI crystal
R2=upper preshower tile (note this connector is on the RHS of the box)

Inside Box:

Bottom layer
-Cesium Iodide Crystal (labeled Horiba) is placed up against PMT 20673
      -Front of box to back edge of crystal = 16inches
      -Right side of box to right edge of crystal = 18 inches
      -Right side of box to left edge of crystal = 24 inches
-Piece of felt is then draped over configuration

Middle layer
-Make sure that pre-shower tile is centered on top of crystal (based off of measurements above)
-Optical grease (use gloves) is applied to clear part of PMT 24561 and can also be used to help facilitate connection between PMT 24561 and pre-shower tile cable

-Make sure that black piece that extends from fibers hits the middle of the PMT
-Drape piece of felt over connection between optical fibers and the PMT
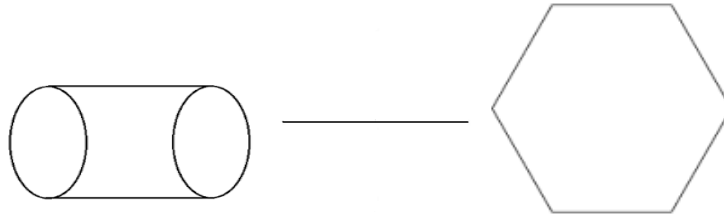
Top Layer
-Similar to bottom layer, except PMT 26799 was used. The PMT was replaced with PMT 23963 on 12/02/16 and the voltage divider was repaired.
-Felt covers entire configuration

High Voltage Crate:
-Turn key
-Push top left button under the LCD window
-Push "Display" three times to get to the menu to display the individual channels
          -Can then cycle through the 64 channels
- "ISET" displays the current threshold
-To change value of voltage, press "Modify"
          -Then press "Change"
          -After voltage has been changed, hit "Acknowledge" to accept value

-Must flip 'HV enable' switch up for voltage to ramp up
          -Once this is done, status should say "up"
          -MAKE SURE 'HV enable' switch is down and HV read back values are zero before
           opening the wooden box

High Voltage Channel Map and settings:
- Channels 0 and 2 connected but not used
- Channel 1 upper preshower tile, **HV = -1900 V**
- Channel 3 top CsI crystal for trigger, **HV = -1755 V**
- Channel 4 lower preshower tile, **HV = -2050 V**
- Channel 5 bottom CsI crystal for trigger, **HV = -1600 V**

Oscilloscope:
-This measures the PMT signal
-You can toggle back and forth between channel 1 and 2
-Vertical axis is voltage, horizontal axis is time
        -Scale can be changed by rotating the knobs
        -Events can be seen on the screen in real time

-In order to take data, signal cables must be connected to the QDC and TDC modules in the VME crate

Splitter

_____
O62 (top channel)
o
o (connected to QDC)
o (connected to QDC)
o
O72 (bottom channel)

_____
-12 ns from delay module is added to discriminator
-A and B must be pushed in on **coincidence unit** if triggering on 2 signals
-Push in more if triggering on more signals
-QDC integrates the analog signal (has pin-like connectors)
        -analog ribbon cable is plugged into ADC module
                -cable 17 = channel 0 QDC
                -cable 16 = channel 1 QDC
                -cable 15 = channel 2 QDC
-TDC measures the time between two pulses (has LEMO connectors)
-outbar inverts the signal

VME Crate
-far left module allows for transfer of information to computer
-In order to synchronize events, the Trigger Interface Module is used
-Panel L1A accepts input trigger and issues a signal
-BSY panel: "true" = busy
                "Not true" = not busy

Trigger
-a trigger can be formed from two logic pulses
-output from trigger is put into channel 0 of TDC
-channel 1 is connected to top crystal
-channel 3 is connected to bottom crystal

Cable Map:

Description	Delay Cable	QDC Ribbon	QDC Channel	TDC Channel
Trigger	N/A	N/A	N/A	0
Top CsI crystal	17	16	1	1
Bottom preshower tile	18	15	2	N/A
Bottom CsI crystal	19	14	3	3
Top preshower tile	20	13	4	N/A
Bad cable	21	N/A	N/A	N/A
Not used	22	12	5	N/A
Not used	23	11	6	N/A

Cables

-Can check the delay time labeled on each cable

Middle NIM Crate:

-In order to double check power supply, use multimeter

       -black probe goes into top hole, red probe goes into left holes to test voltage

*Connecting the pulse generator to data acquisition is helpful for determining the location of pedestal