

Counter assemble (DRAFT)

Note: when working with electrical tape; pull tape off roll then let it “relax” by hanging it vertically and let it rest for 3-5 minutes.

Note: Always handle scintillator plate with the enclosed cotton gloves. Avoid any oil or fingerprints on the plastic.

Critical: The PMTs are expensive electronic devices. The windows are easily damaged by excessive pressure. DO NOT force the PMT against the scintillator “cookie”.

User provided parts: electrical tape, teflon plumbers tape, scotch tape, applicator stick, data computer

Tools: scissors, straight edge, straight-edge razor blades

Stage I: Wrap scintillator plate-->Creating a “light-tight” wrap around the scintillator

1) Aluminum Foil Wrap

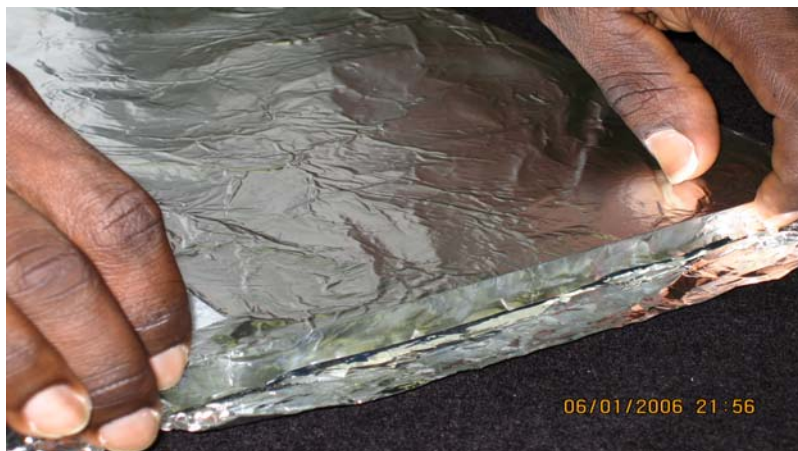
Cut aluminum foil: 18” X 26”. (approx 3” oversize of plate)

Place the scintillator plate atop one half of aluminum foil with the shiny side in (toward the scintillator).

Fold the foil over one of the long edges.

Fold foil around a other long edge, book style with this edge as the “binder”.

Fold foil around the other plate edges using “gift-wrap” folds.



Tape the foil into place with “scotch” tape.

Some creativity is allowed. The point is to completely cover the scintillator.
Smooth the foil assuring no holes or tears.
Add additional “repair” pieces to cover any noticeable tears or holes.
Trim foil to cover just behind the counter cookie.



Using 1/2” teflon plumbers tape, wrap the edges of the “cookie” cylinder. Do not cover the face of the “cookie”.



2) Tyvek, black wrap
Cut Tyvek material: 9” X 23 1/2” (1/2” undersize plate) (Note: plan the layout before

cutting the provided Tyvek)
Place scintillator atop one half of the Tyvek material, black side out.
Fold Tyvek around the short edge.
Tape Tyvek edge with electrical tape.



Flip plate and tape other edge pulling Tyvek snug and tight.

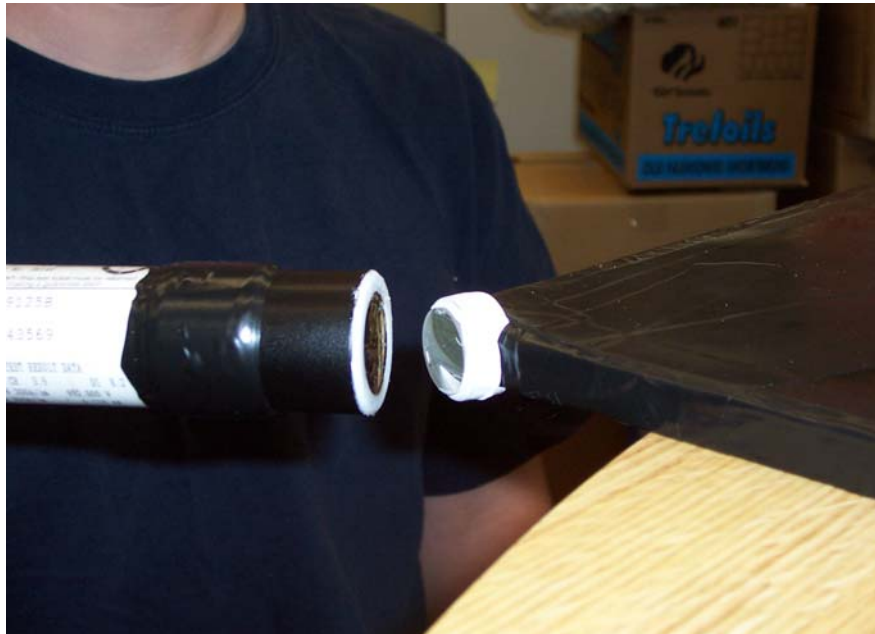


Completely cover remaining exposed plate using 1" and 3" electrical tape. Note: all light holes must be covered to avoid ANY light leaks. Reinforce each corner with extra electrical tape using "gift-wrap" folds. Again, be creative, but avoid bulk.
Tape Tyvek tight just behind the cookie.
Apply a strip of 3" electrical tape running diagonally from the cookie at 18°.

Stage II: Mate PMT to the scintillator-->assuring that scintillator light reaches the PMT
Apply a small amount of Optical Couplant to the face of the PMT; approx.: 1 g (a little dab'll do ya.).



Carefully present the PMT to the scintillator “cookie” face; extra hands will help.



Gently press the PMT until the Couplant spreads over the two faces.
Using the 3” electrical tape, wrap the joint to hold the faces in position.



DO NOT force the two faces together; gentle is good.

Stage III: Mount the PVC tube around the PMT-->providing structural support
Check for burrs and rough edges on the PVC tube; sand/scrape as needed.
Carefully slide the PMT/scintillator assemble into the PVC support tube slit end first;
guide the wires into the PVC and avoid capturing or pinching the wires.



The PMT must slide gently into the PVC. If there is any resistance-->STOP. Determine what is binding and address the friction. Check that the PMT/cookie junction is not too thick. Continue guiding the PMT into the PVC until approx 1-2" from the end of the slot; again do not force the fit.



The PVC slit will extend beyond the far side of the scintillator.
The “cookie” is mounted to the corner of the scintillator at 18° . Measure this angle on the
PVC tube to assure the PMT and “cookie” have a flush fit.
Using 3” electrical tape wrap the outside of the PVC at the PMT/”cookie” face; this to
block any light leaks.
Using 3” electrical tape, apply along the PVC slit to the scintillator surface.



Wrap the PVC at the slit end that extends beyond the scintillator; this to assure capturing the
scintillator assembly and applying clamping pressure. At this point
the assembly should be a rigid structure ready for connecting to power and the DAQ.

