

## Procedure for Attaching the Fins and Hanging the PNI Mirrors

Brian Lantz, Gabriela Gonzalez

### 1) Clean all parts

- fins

Standard cleaning procedure (see below)

- magnets

remove magnetic dust by sticking against double sided tape, both ends and sides.

Standard cleaning procedure

only 1 per beaker

- take off rods

Standard cleaning procedure

- guide rods

Standard cleaning procedure

- suspensions

clean out holes with brush

clean and bake. assemble loosely with silvered bolts, see detailed procedure

- suspension wire

we use 0.002" steel wire which we got from California Fine Wire

wrap wire around glass beaker, only as tightly as is necessary to keep wire in place.

hold with paper clips or something similar.

clean with Standard cleaning procedure, and

bake.

**DO NOT USE WATER PART OF CLEANING OR WIRE WILL RUST!**

- standoffs

lap ends with 1000 grit emory paper

remove wax with soap and hot water

1) Repeat 3 times: Put standoffs in wateralconox solution. Boil water, dip into ultra sound, reboil, reultrasound. Drain off water.

2) Rinse with clear water

3) Boil again, just to be picky.

4) 10 min. ultrasonic with Trichlor

5) rinse in etch degreaser

6) set 10sec in acid dichromate etch solution (200 ml water, 4 grams mix)

7) rinse in clear water to remove etch

8) Standard cleaning procedure

### 2a) Put mirror into jig (see figure 1)

magnet side up

arrow defining thin part of wedge to the side and slightly up, to avoid guide rod.

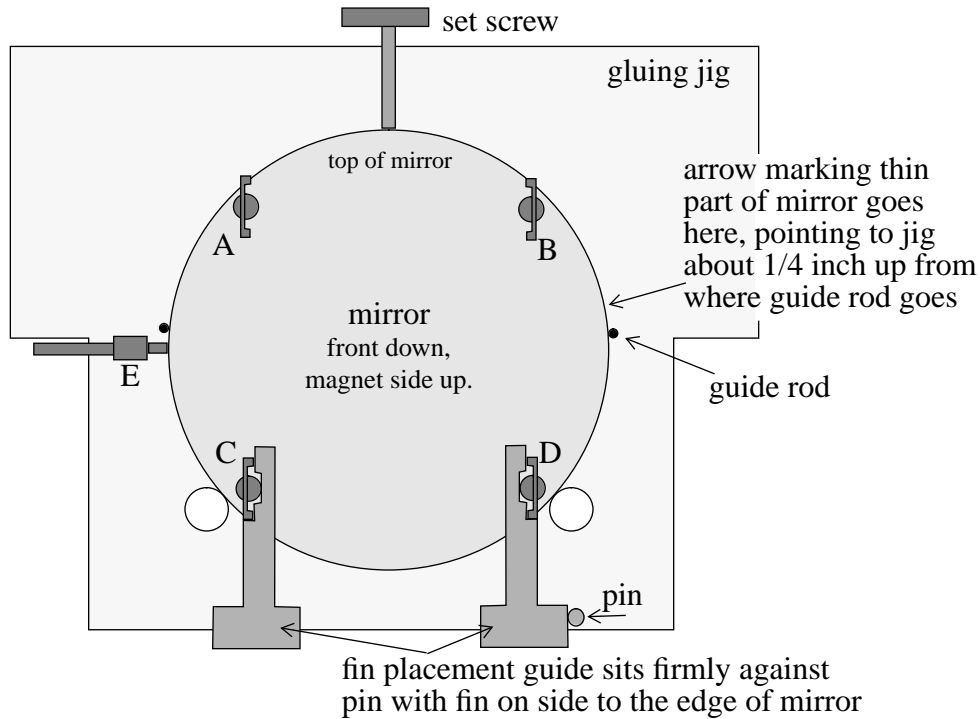


Figure 1: Positioning of mirror in gluing jig

## 2b) Mark mirror

thick part of wedge sideways.

need to decide how to make mark to define path of suspension wire

arrow must not interfere with suspension wire hardware or side OSEM

## 3a) Magnet/ standoff gluing

*mag/stand glue jig, vac-seal, big wire glue tool, test magnet*

Insert all 5 standoffs into the jig. Put one small drop of vac-seal on end of each standoff.

The drop should not cover more than half the area of the end of the rod. Slide magnets into holes as per orientation marked on jig.

Put jig in oven overnight at 40C

Remove magnets with metal piece so as to not break glue joint. (ie don't let the magnet you are pulling out of the jig jump sideways and stick onto the next magnet in the glue jig or the standoff will break off)

## 3b) Guide rod/mirror gluing

*mirror jig, metal band, vac-seal, small wire glue tool*

Start at same time as magnet/ standoff.

hold guide rod onto mirror with restraining wire, a "metal rubber band".

piece of clean steel wire with loops twisted into ends. reaches around mirror, loops held together with a small clean spring

Attach with two small dabs of vac-seal, on top side of rod

see figure 2 for jig alignment

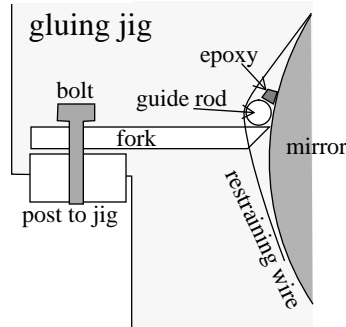


Figure 2: alignment of jig for attaching guide rods

#### 4) Fin/ magnet gluing

*fin jig, vac-seal, big wire glue tool, ball driver*

put fins and magnets into jig. 4 dabs of vac-seal. overnight at 40C.

#### 5) Fin assembly/ mirror gluing

*super mirror cleaning, vac-seal, tweezers, small allen, oven, big wire glue tool*

A,D, and E should have same orientation BTL 10/95

drag wipe mirror to remove all dust from magnet side and side magnet area.

small dab of vac-seal on standoff, spot of glue to cover about half of end area

do not tighten guides in place too much, must be smoothly removed.

put spring clips onto guides.

put fin assembly into spring clip, flat side of fin towards clip.

gently push fin assembly down onto mirror.

tiny bit of glue should show all around standoff.

hold fin in place and reset spring clip,

(there must be no residual tension pulling fin away from mirror)

overnight at 40C

#### 6) Take off fin guides.

*ball driver*

carefully release and remove spring clips completely

loosen guide and remove

#### 7) Hang Mirror

*temp holder, support block, wire tools, ball driver, small allen,*

Need special back piece

remove OSEM plates

remove top EQ Stop from OSEM plate

attach temp mirror holder

put tower horizontal, top on support block, bask (OSEM) side up.

set mirror on teflon screws in lower EQ Stops and temp mirror holder

install suspension wire (more on this elsewhere)

replace OSEM plates

replace top EQ Stop

tighten EQ Stop screws to hold mirror securely.  
erect tower  
remove temp mirror holder

#### 8) Balance mirror

*piezo tapper, ball driver small allen, optical lever, wire tools*

check wind on laminar flow bench  
check optical level on laminar flow bench.  
Be able to track prebake to postbake balance changes

loosen EQ Stops some  
align wire to mark on mirror  
rotate mirror to straighten wire  
balance the mirror.

#### 9) Glue take off rods

*small wire glue tool, vac-seal*

glue one end of each take off rod. (opposite ends) mirror free swinging, use small tool  
opposite ends to ensure re-adjustability for first few minutes.  
let hang 1 hour so glue starts to hold  
glue other ends of rods  
let hang for 3 days at room temp. Do Not Fold, Spindle, or Mutilate while epoxy sets.

#### 10) Remove mirror, put into holder

ball driver, temp holder, super mirror cleaning stuff, special fit mirror drag wipers  
reverse procedure for erecting.  
drag wipe both sides to avoid baking on dust

#### 11) Bake mirror

cool bake 100C, examine epoxy joints for discoloration.

#### 12) Reinstall Mirror in Suspension Tower

rehang mirror (see above)  
leave EQ Stops tight.  
tighten all bolts to 100 lb/inches  
loosen EQ Stops  
center suspension wire on mark, make sure mirror balances.  
tighten EQ Stops  
put into experiment

Standard cleaning procedure:

10 min ultrasonic in each of  
alconox  
Deionized water (exception - do not use water for steel wire)  
methanol  
acetone

