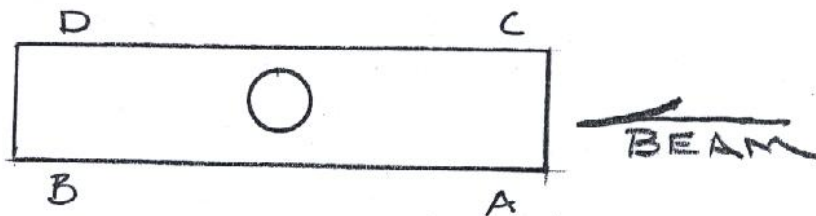
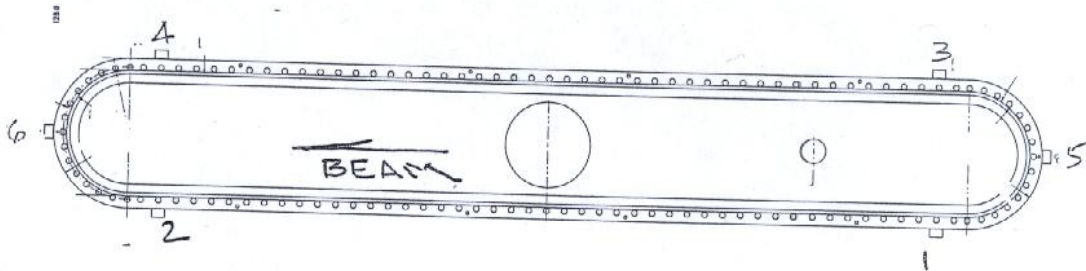


SSRL
BL14-1 MIRROR

2/09



MIRROR FLANGE

	X	Y	Z
1	5.731 /	-9.254 /	-22.025 /
2	5.743 /	-9.236 /	+21.965 /
3	-5.791 /	-9.287 /	-22.013 /
4	-5.781 /	-9.300 /	+21.959 /
5	+1.003 /	-9.254 /	-29.494 /
6	-1.010 /	-9.328 /	+29.462 /

TILT PLATE

	X	Y	Z
A	4.105 /	-16.864 /	-11.232 /
B	4.214 /	-16.839 /	+14.004 /
C	-4.147 /	-16.876 /	-11.191 /
D	-4.032 /	-16.852 /	+14.042 /

* SEE PRINTOUT FOR FIELD NUMBERS

Job Description:

Report Units: inches, milliradians

Job File: C:\Documents and Settings\levirt\My Documents\My Documents\SSRL 2009\BL14-1

Job Date: Wednesday, February 04, 2009 01:39:12 PM

Report Frame: PART

BL141M1MM	-6.299	-2.588	787.402
BL141M1M1	-0.392	-11.842	765.424
BL141M1M2	-0.732	-11.824	809.412
BL141M1M3	-11.914	-11.875	765.343
BL141M1M4	-12.255	-11.888	809.314
BL141M1M5	-6.060	-11.842	757.909
BL141M1M6	-6.545	-11.916	816.863
BL141M1MA	-2.104	-19.452	776.203
BL141M1MB	-2.197	-19.427	801.439
BL141M1MC	-10.356	-19.464	776.178
BL141M1MD	-10.443	-19.440	801.411

X Y Z

YAWED -8 MRAD

TRANSLATED

Y = -2.588"
X = -6.299"
Z = +787.402"

SSRL
BL14-1 MIRROR
MIRROR PLATE
TILT PLATE

Z-309
M.R., L.G.

Ⓚ

8.407 Bot. SAGITTAL CYLINDER
17.160

17.160
+ 8.753 HI ✓

A) 4.390

21.227

25.617 ✓

8.753

-16.864 ✓

B) 4.365

21.227

25.592 ✓

8.753

-16.839 ✓

C) 4.402

21.227

25.629 ✓

8.753

-16.876 ✓

D) 4.378

21.227

25.605 ✓

8.753

-16.852 ✓

Ⓚ +22.765 LOS

A) 17.660

1. —

18.660 ✓

22.765

+4.105 ✓

B) 10.551

8. —

18.551 ✓

22.765

+4.214 ✓

C) 8.752 (A-C)

.500

8.252 ✓

4.105

-4.147 ✓

D) 8.746 (B-D)

.500

8.246 ✓

4.214

-4.032 ✓

SSRL

14-1 M1 MIRROR

2-4-09

MIRROR PLATE (TILT PLATE)

M12, L67

(2)

O/S END OF MIR B, D.

23.622 1/2 MIR

8.292

+ 31.914 COS

U/S END OF MIR A, C

23.622

10.032

- 33.654 COS

A) 21.422

B) 16.910

C) 21.463 D) 16.872

1. —
22.422

- 33.654

-11.232

1. —
17.910

31.914

+14.004

1. —
22.463

- 33.654

-11.191

1. —
17.872

31.914

+14.042

SSRL
BL14-1 MIRROR
MIRROR FLANGE

2-3-09
M.R., L.G.

Ⓚ +8.717 14-1 BL (-2.588 FROM SPCL)

$$\begin{array}{r} 1) \ 16.971 \\ \underline{1.} \\ 17.971 \\ 8.717 \\ \hline -9.254 \end{array}$$

$$\begin{array}{r} 2) \ 16.953 \\ \underline{1.} \\ 17.953 \\ 8.717 \\ \hline -9.236 \end{array}$$

$$\begin{array}{r} 3) \ 17.004 \\ \underline{1.} \\ 18.004 \\ 8.717 \\ \hline -9.287 \end{array}$$

$$\begin{array}{r} 4) \ 17.017 \\ \underline{1.} \\ 18.017 \\ 8.717 \\ \hline -9.300 \end{array}$$

$$\begin{array}{r} 5) \ 16.971 \\ \underline{1.} \\ 17.971 \\ 8.717 \\ \hline -9.254 \end{array}$$

$$\begin{array}{r} 6) \ 17.045 \\ \underline{1.} \\ 18.045 \\ 8.717 \\ \hline -9.328 \end{array}$$

Ⓚ +22.733 LOS
16.034

$$\begin{array}{r} 1) \ 16.002 \\ \underline{1.} \\ 17.002 \\ 22.733 \\ \hline +5.731 \end{array}$$

$$\begin{array}{r} 2) \ 15.990 \\ \underline{1.} \\ 16.990 \\ 22.733 \\ \hline +5.743 \end{array}$$

$$\begin{array}{r} 3) \ 12.022 \quad (1-3) \\ \underline{.500} \\ 11.522 \\ 5.731 \\ \hline -5.791 \end{array}$$

$$\begin{array}{r} 4) \ 12.024 \quad (2-4) \\ \underline{.500} \\ 11.524 \\ 5.743 \\ \hline -5.781 \end{array}$$

$$\begin{array}{r} 5) \ 21.730 \\ \underline{1.} \\ 22.730 \\ 22.733 \\ \hline +1.003 \end{array}$$

$$\begin{array}{r} 6) \ 21.743 \\ \underline{1.} \\ 22.743 \\ 22.733 \\ \hline -1.010 \end{array}$$

SSRL
14-1 M / MI MIRROR
MIRROR FLANGE

2-4-09
M.R., L.G.

55.983

MIR 1200MM = 47.244"

(Z)

$$\begin{array}{r} \text{o/s END OF FL. 2, 4, 6} \\ 3.905 \quad (28.009) \\ 27.992 \frac{1}{2} \text{ FL.} \\ \hline + 31.897 \checkmark \end{array}$$

$$\begin{array}{r} \text{P/S END MIR} \\ 23.622 \frac{1}{2} \text{ MIR} \\ 8.292 \\ \hline 31.914 \checkmark \text{os} \end{array}$$

$$\begin{array}{r} \text{u/s END OF FL. 1, 3, 5} \\ 5.680 \quad (27.974) \\ 27.992 \\ \hline - 33.672 \checkmark \end{array}$$

$$\begin{array}{r} \text{u/s END OF MIR} \\ 23.622 \frac{1}{2} \text{ MIR} \\ 10.032 \\ \hline 33.654 \checkmark \end{array}$$

$$\begin{array}{r} 1) 10.647 \\ 1. \text{---} \\ \hline 11.647 \checkmark \\ - 33.672 \\ \hline \boxed{-22.025} \checkmark \end{array}$$

$$\begin{array}{r} 2) 8.932 \\ 1. \text{---} \\ \hline 9.932 \checkmark \\ 31.897 \\ \hline \boxed{+21.965} \checkmark \end{array}$$

$$\begin{array}{r} 3) 10.659 \\ 1. \text{---} \\ \hline 11.659 \checkmark \\ - 33.672 \\ \hline \boxed{-22.013} \checkmark \end{array}$$

$$\begin{array}{r} 4) 8.938 \\ 1. \text{---} \\ \hline 9.938 \checkmark \\ 31.897 \\ \hline \boxed{+21.959} \checkmark \end{array}$$

$$\begin{array}{r} 5) 3.178 \\ 1. \text{---} \\ \hline 4.178 \checkmark \\ - 33.672 \\ \hline \boxed{-29.494} \checkmark \end{array}$$

$$\begin{array}{r} 6) 1.435 \\ 1. \text{---} \\ \hline 2.435 \checkmark \\ 31.897 \\ \hline \boxed{+29.462} \checkmark \end{array}$$

id-451-090-50, top frame assy

48. _____ install a clean tin seal to the lid over the pins per -090-53
49. _____ using the **lift plan** install the tank onto the flange (verify the baffle is installed).
50. _____ make up the tin vacuum seal by torquing bolt pairs alternately across the flange, alternating between upbeam and downbeam pairs, working from the tank center to the ends; torque to 11 ft-lbs
51. _____ install ion pump and make up the flange
52. _____ leak check the assembly
53. _____ assemble the 14-1 Y-stage mover 14-1, -090-77 and the 14-1 tilt stage 14-1, -090-76; check functionality of all parts: slides, optical switches, LVDT's, action jacks, motors, piezo actuator, etc; adjust the bracket, -077-83, so that the slot bears against the shoulder screw under action jack loading; tighten the four 1/4-20 X .75 SHCS; verify there is at least $Y = +/- .75$ stroke available in each LVDT
54. _____ assemble the y tilt mover 14-1, -090-75
55. _____ per -090-50, mount the tilt mover to the frame and tilt plate; assemble the optical switch and sensor flag assy, -072-66; the pivot shaft and flexor may be left disconnected from the pitch plate at this time
56. _____ wire and dress cables for all the motors, piezo actuator, switches, and LVDT's
57. _____ bake assembly at 120 C per -086-00; record room temperature, base pressure after bake; re-torque flange bolts at room temperature to 11 ft-lbs; vent to nitrogen with appropriate overpressurization valve.
14-1 M1 base pressure _____ Torr

id-451-090-50, 14-1 M1 installation**installation to BL 14**

58. _____ assemble all remaining components per mirror assembly id-451-090-50
59. _____ align the tank first, followed by mirrors; attach final alignment data to the BL 14-1 M1 traveler
- 14-1 M1 mirror tank
- X: -160.0 +/- 1.0 mm (from BL 14-2 centerline)
- Y: -65.73 +/- .13 mm (entrance & exit flanges)
- Z: 20,000.0 ± 5.0 mm (from source point, center of tank)
- Pitch: 0.0 +/- 1.0 mrad
- Yaw: -8.0 +/- 1.0 mrad
- Roll: 0.0 +/- 1.0 mrad

60. _____ remove the stanchions, transfer load to the tilt mover, and align the 14-1 mirror
 X: -160.0 +/- 1.0 mm (14-1 mirror center from BL 14 centerline)
 Y: -65.73 +/- .13 mm (to bottom of sagittal cylinder)
 Z: 20,000.0 ± 5.0 mm (from source point, centered on flange)
 Pitch: 0.0 +/- 0.20 mrad
 Yaw: -8.0 +/- 1.0 mrad
 Roll: 0.0 +/- 1.0 mrad

61. _____ set the BL 14-1 M1 Y, pitch, yaw limit switches:

61.a. _____ set the mirror to Y = -65.73 mm and pitch = -1.0 mrad; adjust the downbeam sensor flag of the -072-66 to trigger the optical switch; record the LVDT values.
 upbeam LVDT _____
 downbeam LVDT _____

61.b. _____ set the mirror at Y = -65.73 mm and pitch = 0.0 mrad, disable the optical switch and set the four vertical and two horizontal limit switches; refer to -090-75; record the LVDT positions (one turn of the trigger 4-40 trigger screw is .025, .0042/flat); attach a label with an ink line extending across the slide carriage and base near the switch; cut the label to make two colinear line segments; record the trigger position in inches and mm on the label; measure and record the offset between the carriage and base; affix a label with this value near the switch; make a sketch or take a photo of the measured offset and append to the traveler; set the hardstop .005-.010 beyond the switch trigger.

downbeam, upper (Ytrig = +.411 ± .005 @ 0 mrad) _____
 downbeam LVDT _____
 label attached to slide, trigger value recorded _____ (initial and date)
 carriage-base offset _____; label, photo/sketch _____ (initial and date)
 hardstop set (+.005/+.010 beyond trigger) _____

downbeam, lower (Ytrig = -.327 ± .005 @ 0 mrad) _____
 downbeam LVDT _____
 labels attached to slide, trigger value recorded _____ (initial and date)
 carriage-base offset _____; label, photo/sketch _____ (initial and date)
 hardstop set (-.005/-.010 beyond trigger) _____

upbeam, upper (Ytrig = +.327 ± .005 @ 0 mrad) _____
 upbeam LVDT _____
 label attached to slide, trigger value recorded _____ (initial and date)
 carriage-base offset _____; label, photo/sketch _____ (initial and date)
 hardstop set (+.005/+.010 beyond trigger) _____

upbeam, lower (Ytrig = -.409 ± .005; @ 0 mrad) _____
 label attached to slide, trigger value recorded _____ (initial and date)
 carriage-base offset _____; label, photo/sketch _____ (initial and date)