Core Optics Wedges

Mike Zucker

Core Optic Wedges

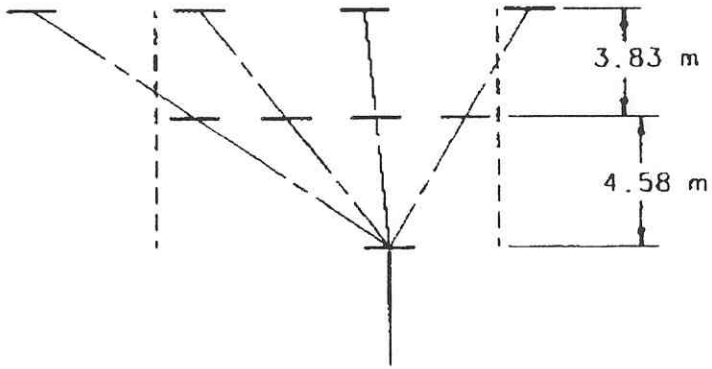
MEZ 5/19/95

- Why Wedge?
  - ›› Scattered Light & Phase Noise
  - ›› Sensor Pickoff Function (replaces dedicated optic)
- Geometrical Constraints
  - ›› Separate beams by *n* radii at "next optic"
  - ›› Dumps or deflectors within chambers
  - ›› Competition for tube aperture
    - — auxiliary optical lever beams
    - — stacks, suspension towers, fixed optics
- Auxiliary optical levers: interaction
- Physics considerations
  - ›› The Beamsplitter
  - ›› Principal Axes & Equilibria

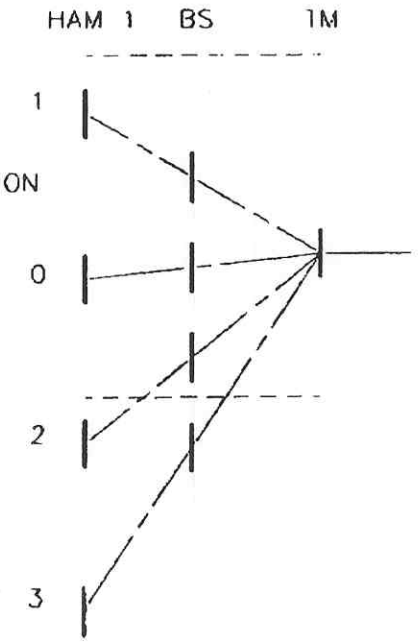
STRAY BEAMS FROM TEST MASS BACK 1.2 Degree Wedge

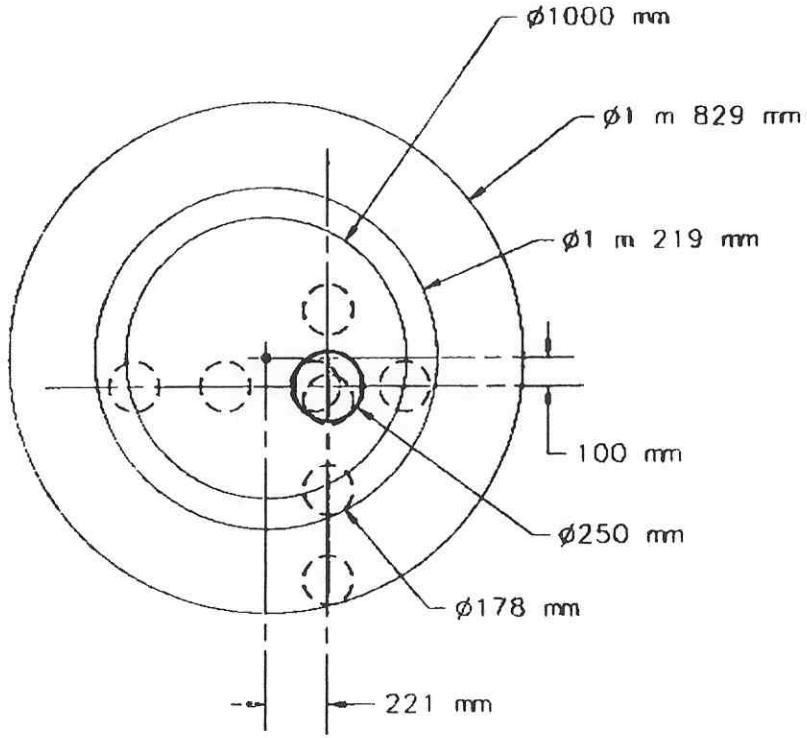
MEZ 5/22/95

HORIZONTAL SPLAY OPTION

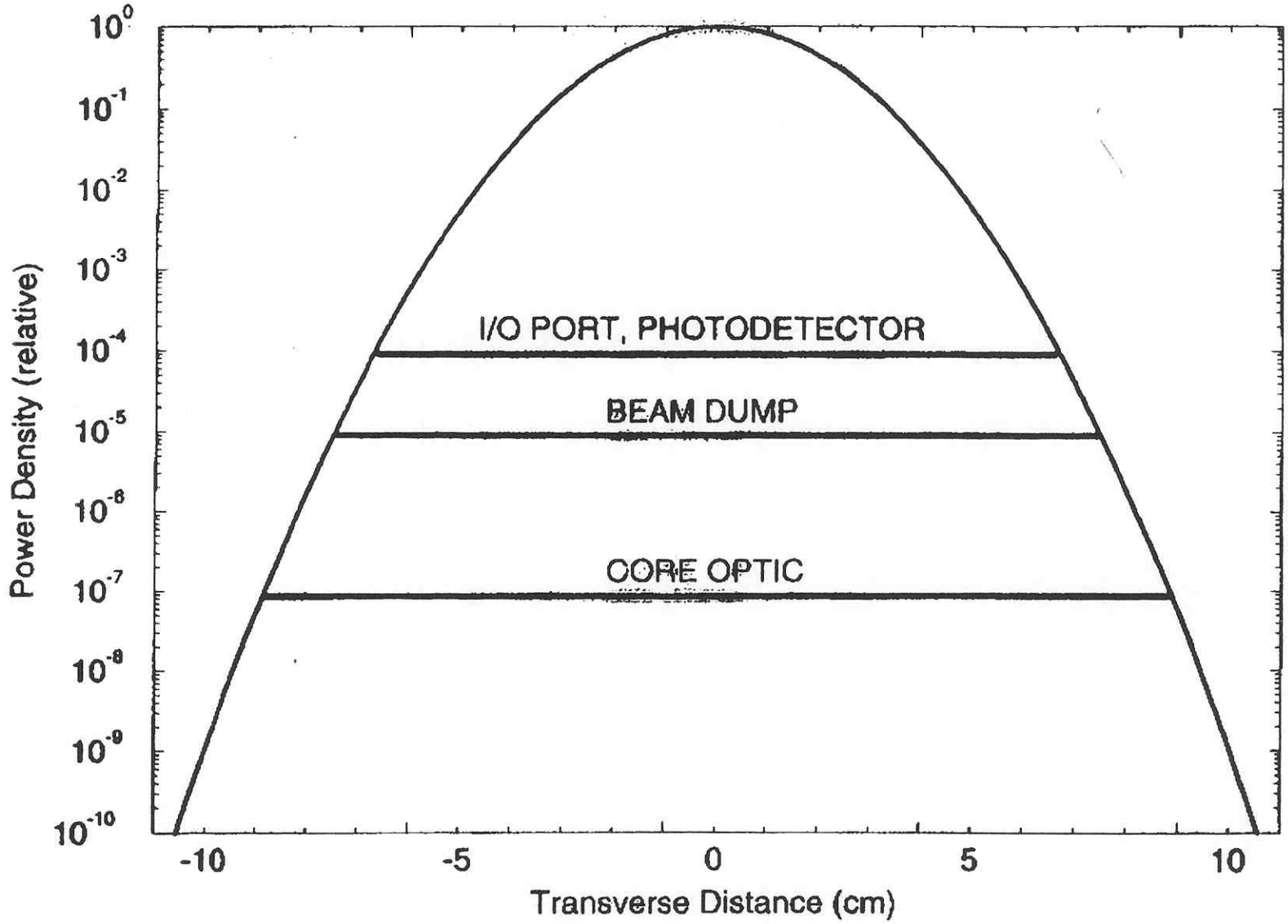


VERTICAL SPLAY OPTION

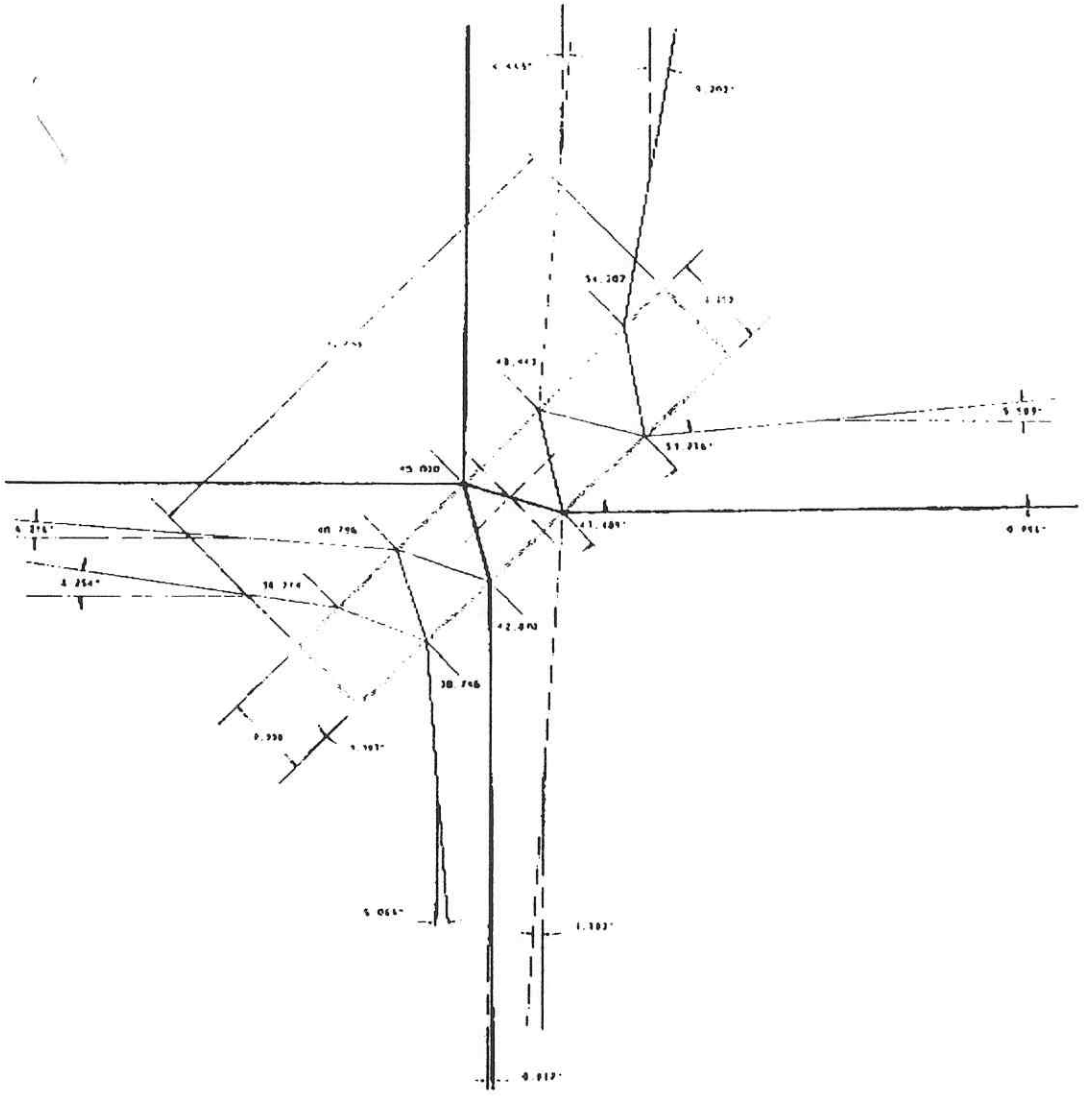


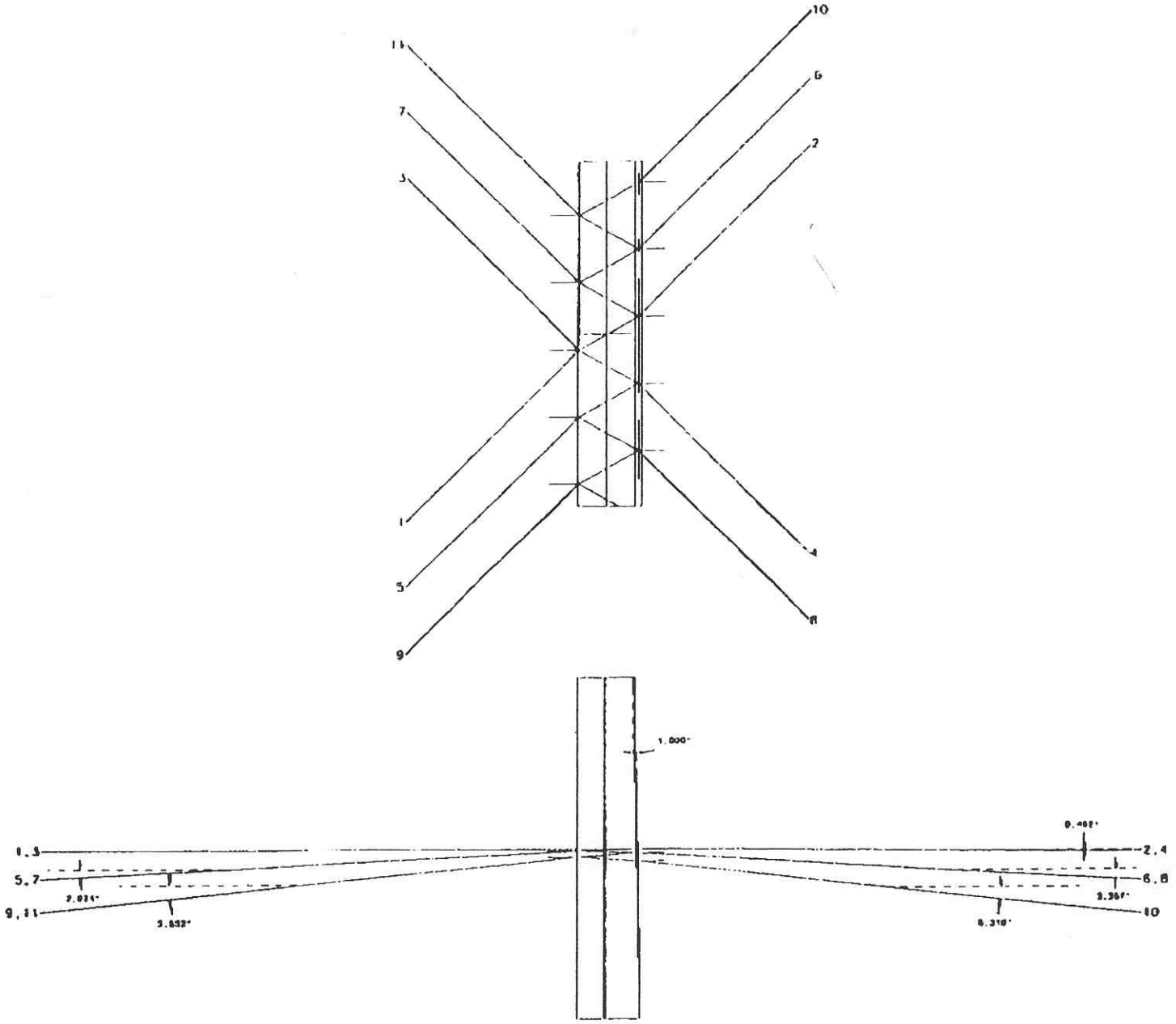


Beam and Component Diameters



BEAMSPLITTER
PRIMARY AND SECONDARY BEAM RAY TRACE

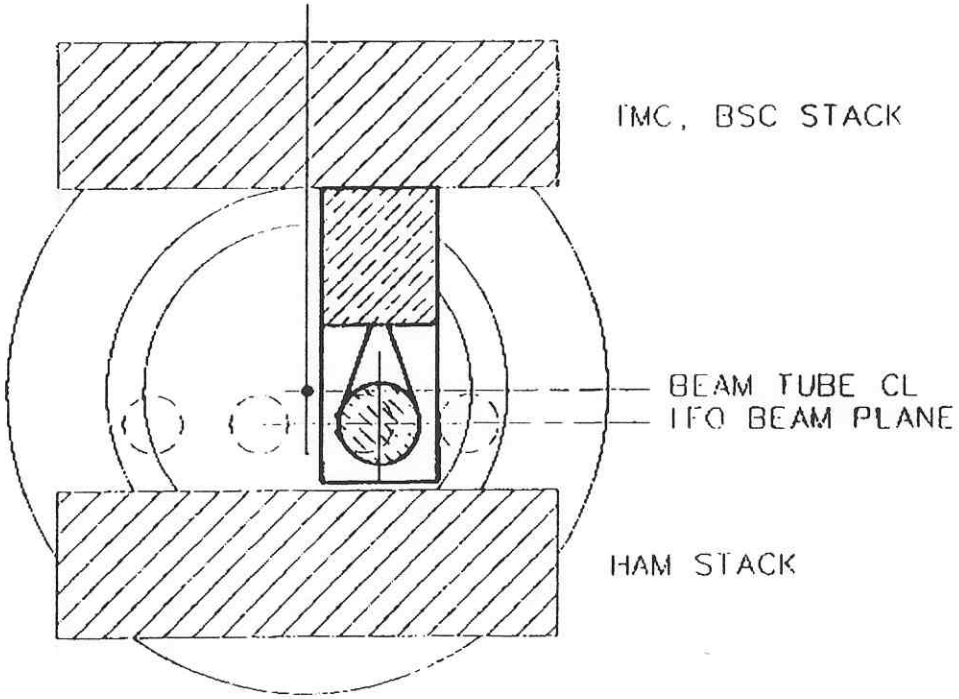


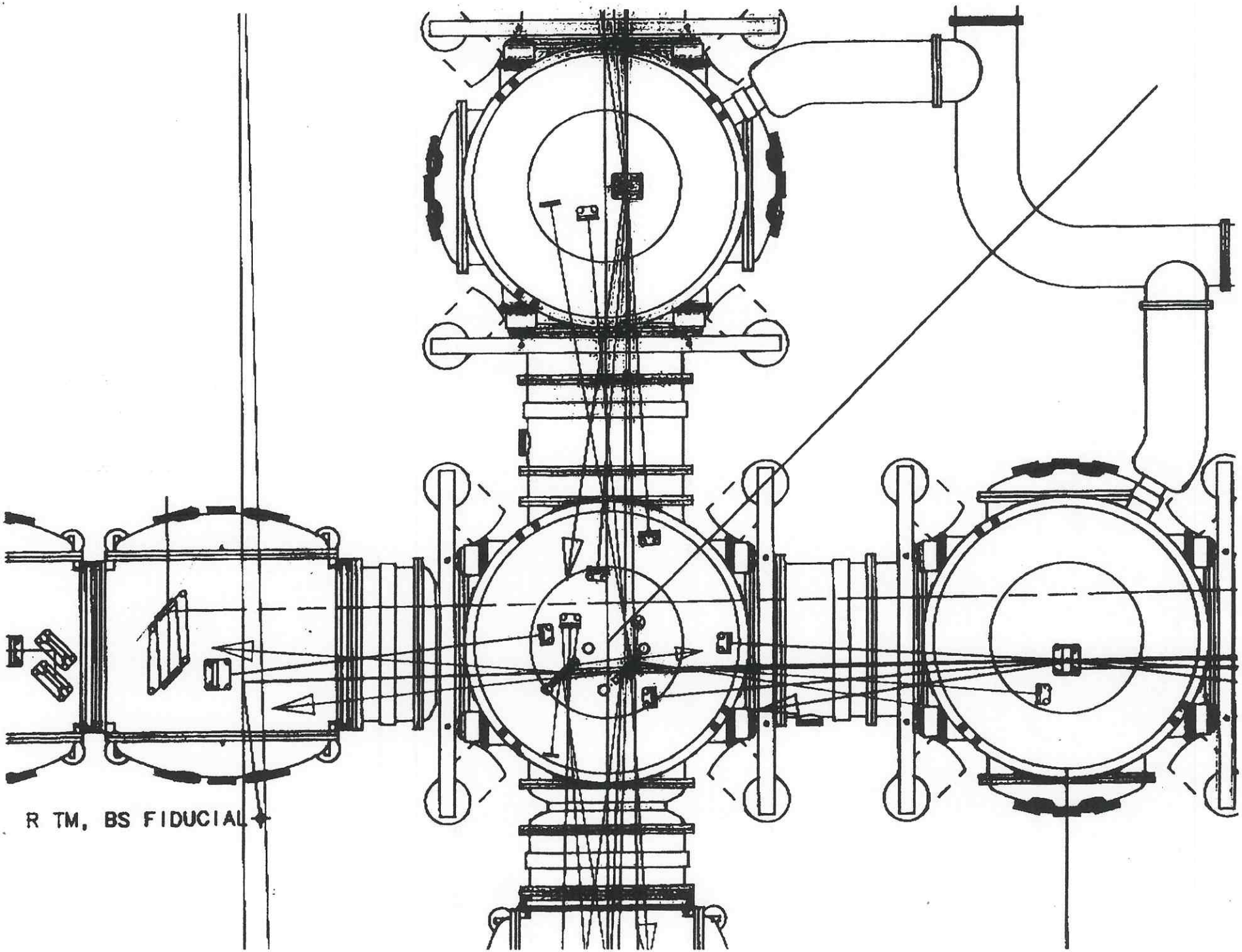

10
11
6
7
2
3
1
4
5
8
9
1.000"
1,3
2,4
5,7
6,8
9,11
10

GENERIC APERTURE OBSTRUCTIONS

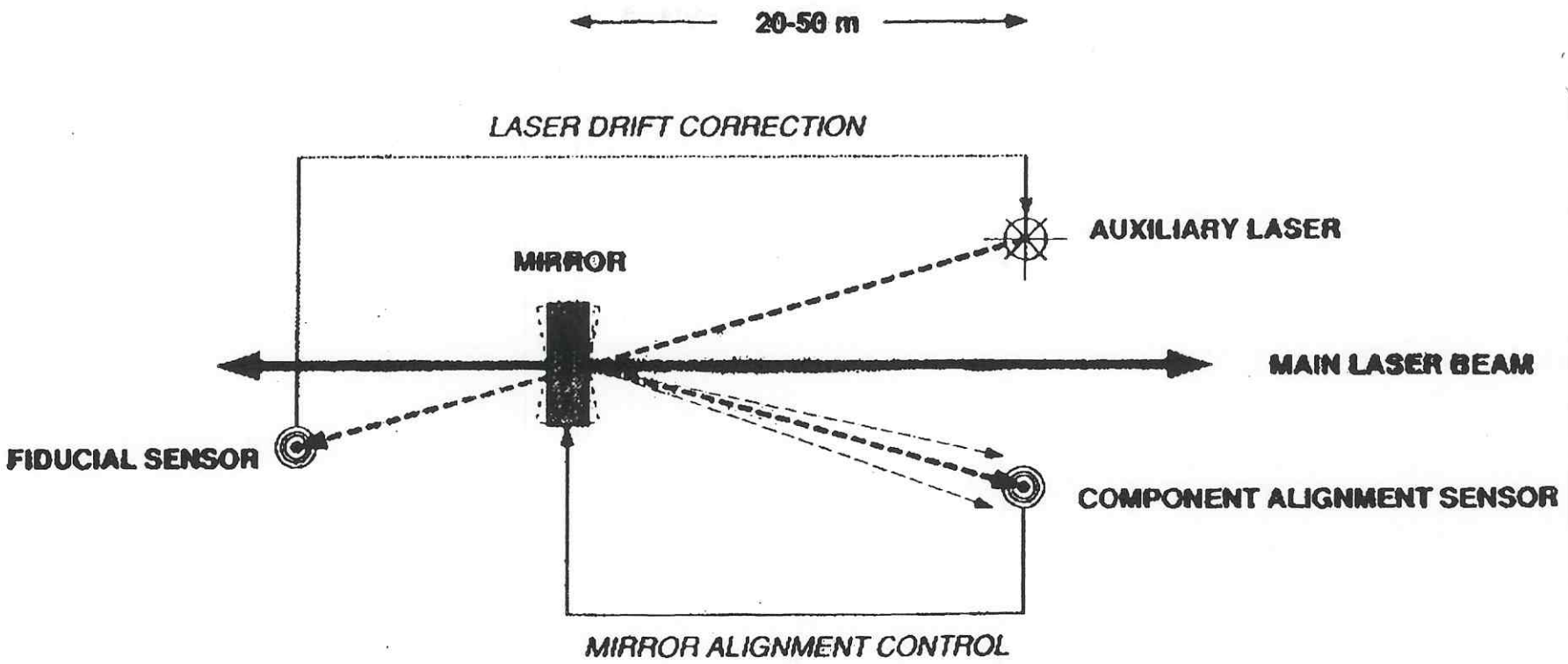
MEZ 5/22/95

HORIZONTAL SPLAY OPTION

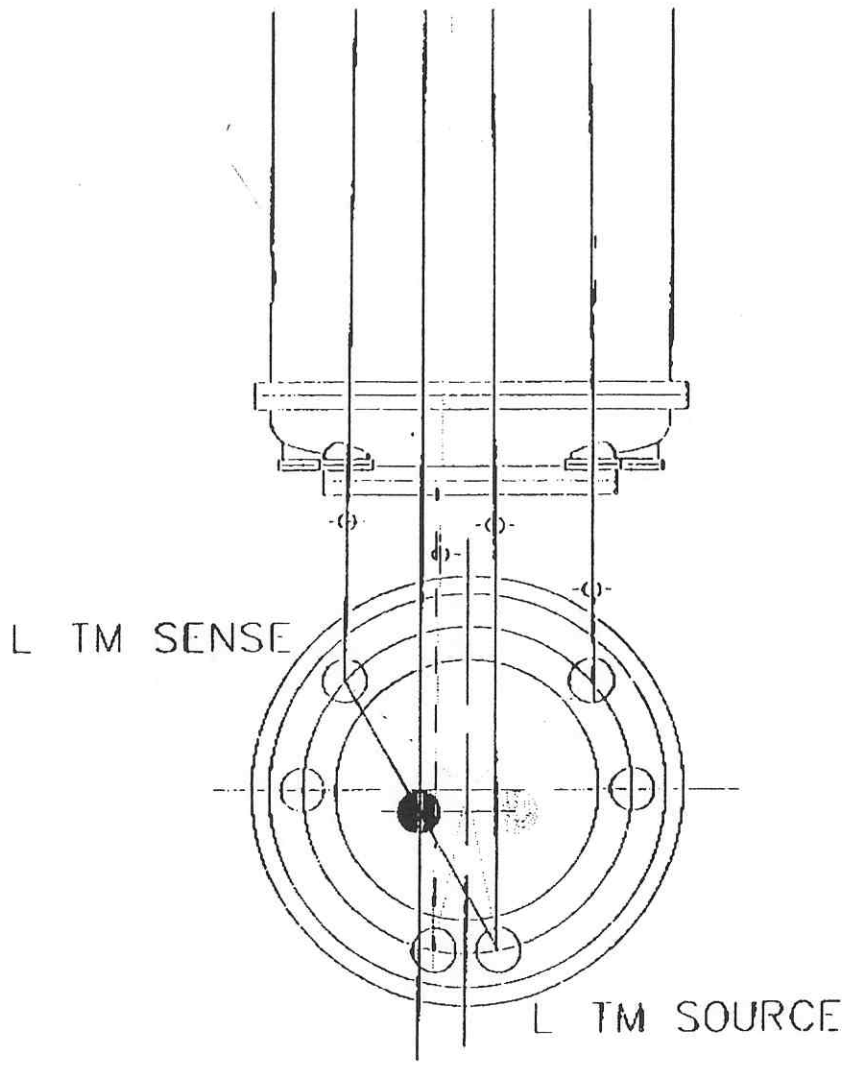



R TM, BS FIDUCIAL

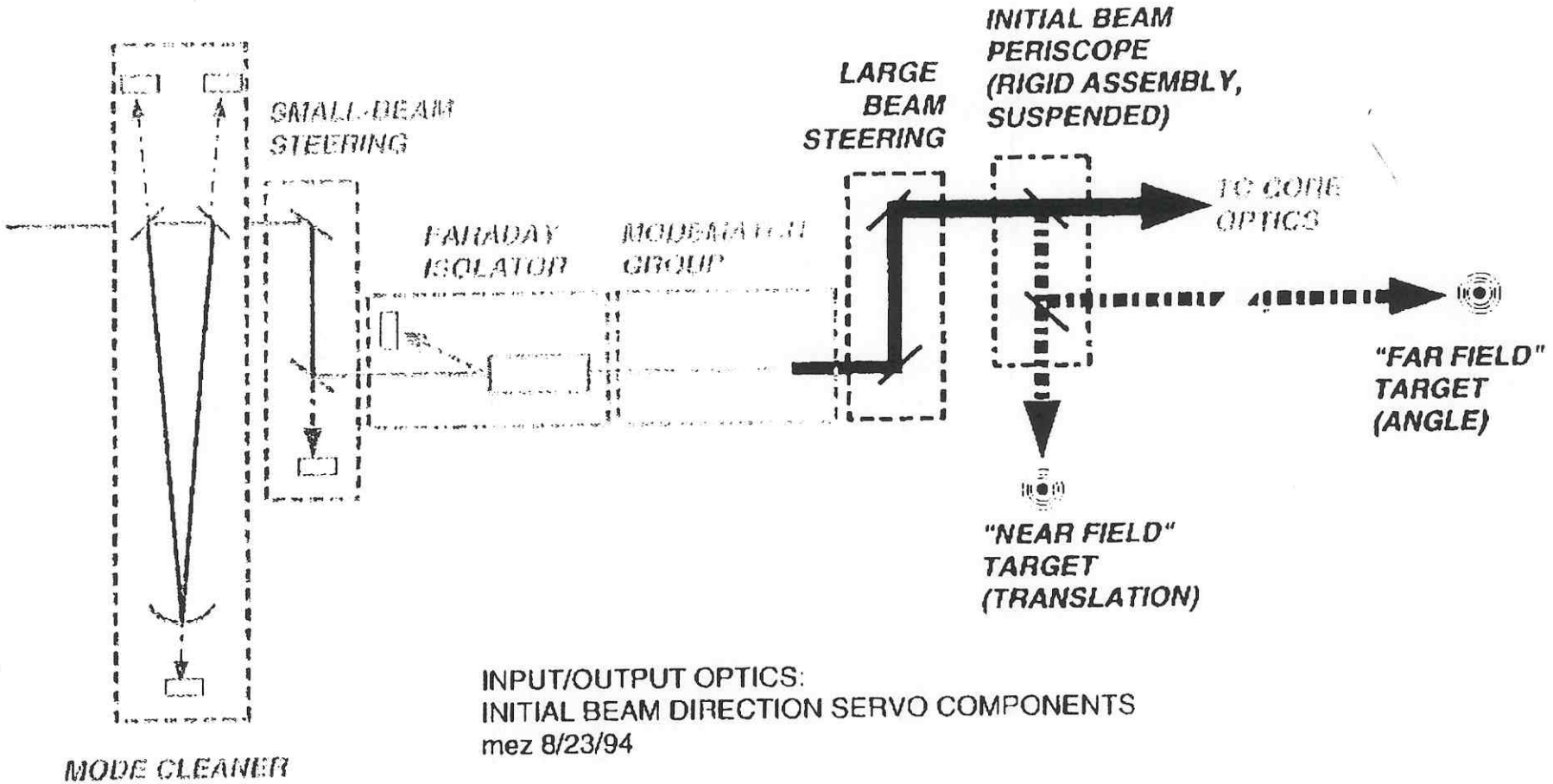
AUXILIARY LASER ALIGNMENT



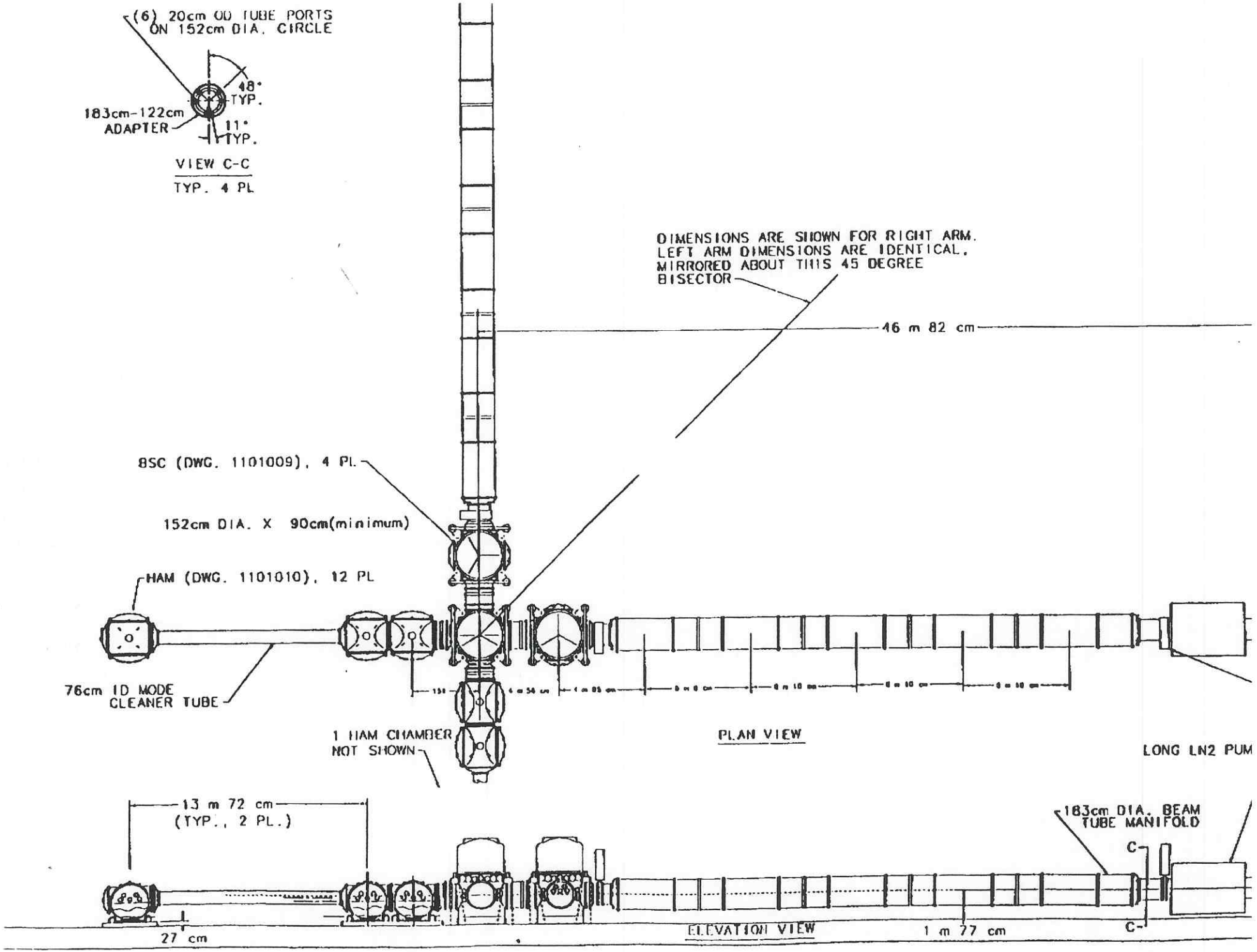
LIGO

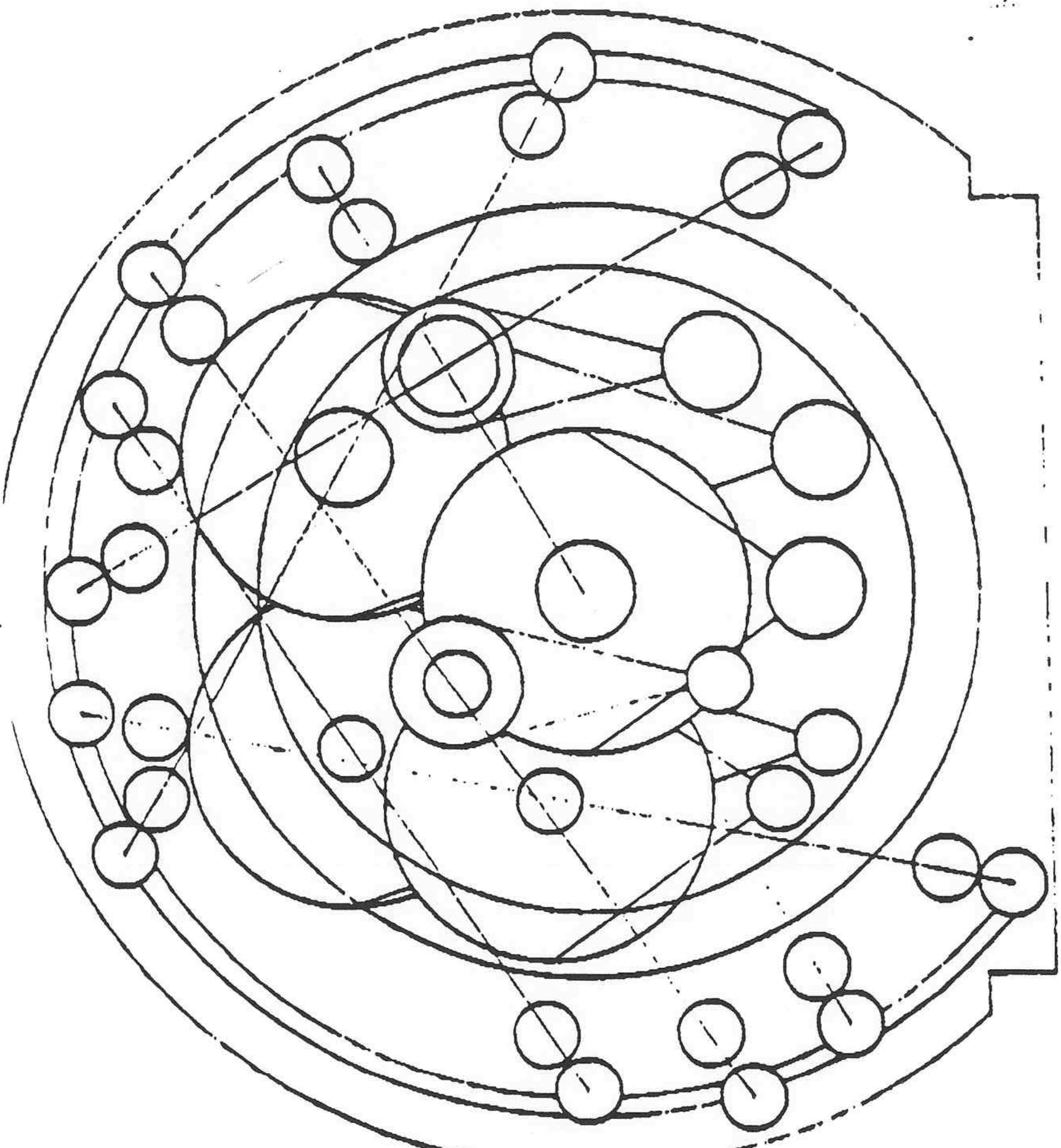

L TM SENSE
L TM SOURCE

AUXILIARY LASER ALIGNMENT SYSTEM: LAYOUT EXERCISE



INPUT/OUTPUT OPTICS:
INITIAL BEAM DIRECTION SERVO COMPONENTS
mez 8/23/94


(6) 20cm OD TUBE PORTS ON 152cm DIA. CIRCLE
48° TYP.
183cm-122cm ADAPTER
11° TYP.
VIEW C-C
TYP. 4 PL
DIMENSIONS ARE SHOWN FOR RIGHT ARM. LEFT ARM DIMENSIONS ARE IDENTICAL, MIRRORED ABOUT THIS 45 DEGREE BISECTOR
46 m 82 cm
BSC (DWG. 1101009), 4 PL.
152cm DIA. X 90cm(minimum)
HAM (DWG. 1101010), 12 PL
76cm ID MODE CLEANER TUBE
1 HAM CHAMBER NOT SHOWN
PLAN VIEW
LONG LN2 PUM
13 m 72 cm
(TYP., 2 PL.)
183cm DIA. BEAM TUBE MANIFOLD
C
C
27 cm
ELEVATION VIEW
1 m 77 cm



LIGO MARCH 1990 MONTHLY REVIEW

RD-C

Science Integration Meeting

1.0 Authors ... Titles

Lisa Sievers...*Length Control Modeling*

Nergis Mavalvala...*Interferometer Design Considerations*

Albert Lazzarini...*LIGO Science Requirements Document*

Rai Weiss...*Beam Tube Baffling*

Albert Lazzarini/Larry Jones...*Mounting approach*

Stan Whitcomb...*Some Thoughts on Scattered Light in the Corner Station*

Johm Worden...*Vacuum Equipment Interfaces*

Fred Asiri...*Facility Interface with Detector, Vacuum Equipment and Beam Tube*

Hiro Yamamoto...*HR Coating, AR coating and Dual-Wavelength-ready coating*

Dave Shoemaker...*Argon and Nd:YAG Lasers: Comparative information*

Gabriela Gonzalez...*Performance tests of the Barry Isolators*

Peter Fritschel...*Barry Controls Isolators, Are they useful for LIGO?*

Kent Blackburn...*Support to 40 Meter: Data Analysis and Visualization with AVS*

Alex Abramovici...*Where should the Pockels Cell be?*

Seiji Kawamura...*Suspension Design for LIGO and the 40m Interferometer*

Mike Zucker...[(*missing Vertical or Horizontal Test Mass Wedges*)]