DR Walz 1-11-02

Real Photon Collaboration Meeting

E-159, E-160, E-162

Photon Beam Overview

Goniometer

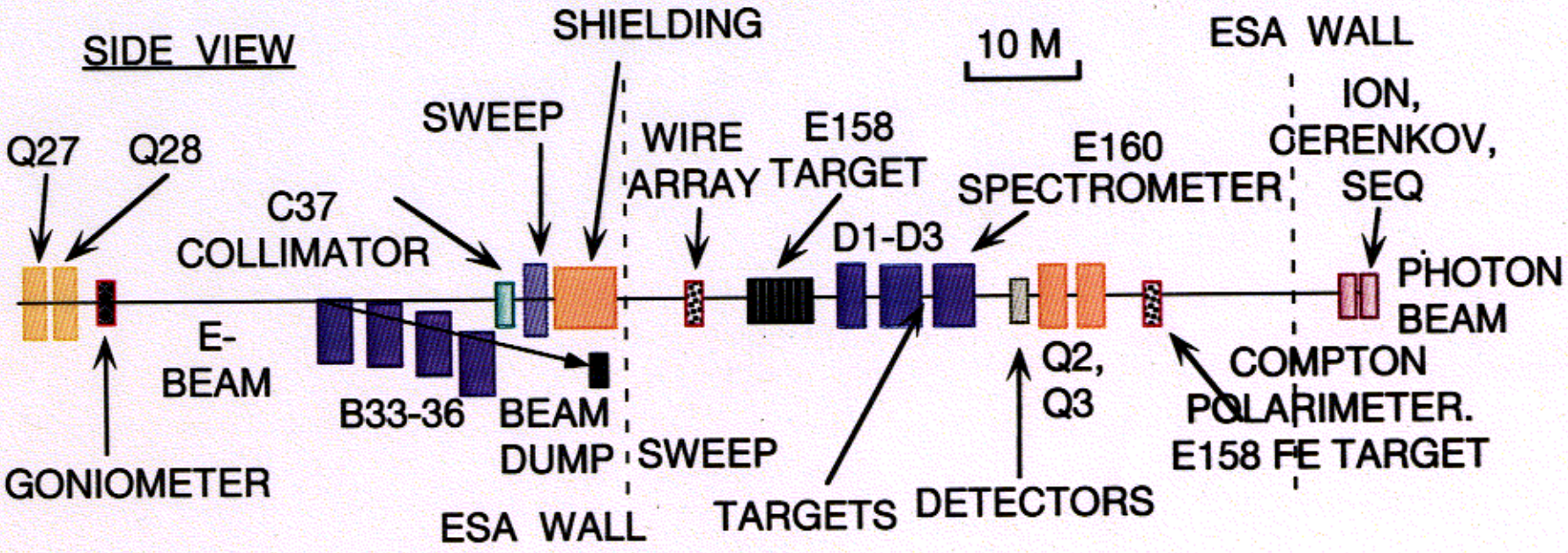
Photon Collimator C-37

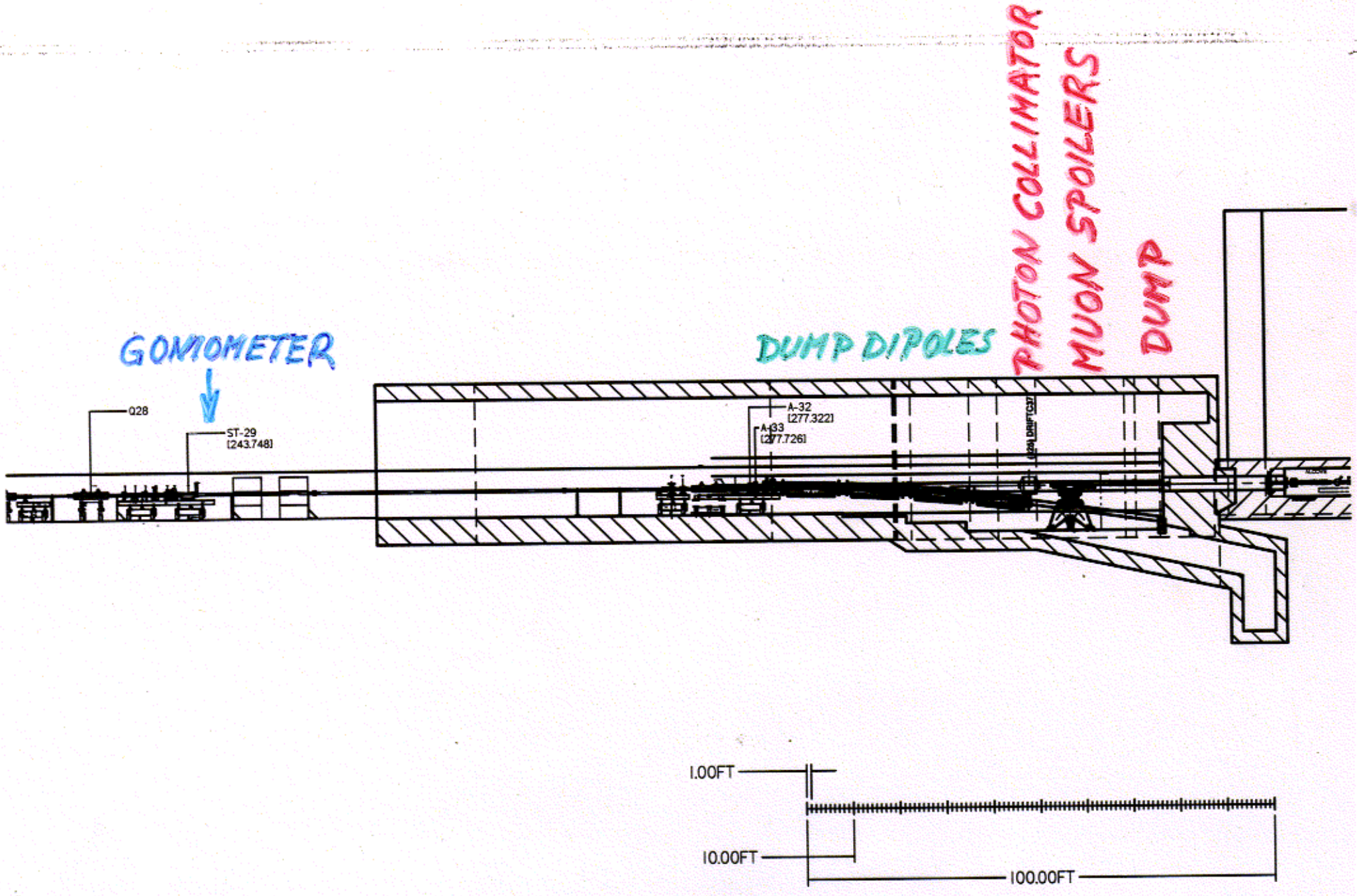
Muon Spoiler Magnets

Electron Beam Dump Line

Status and Schedule

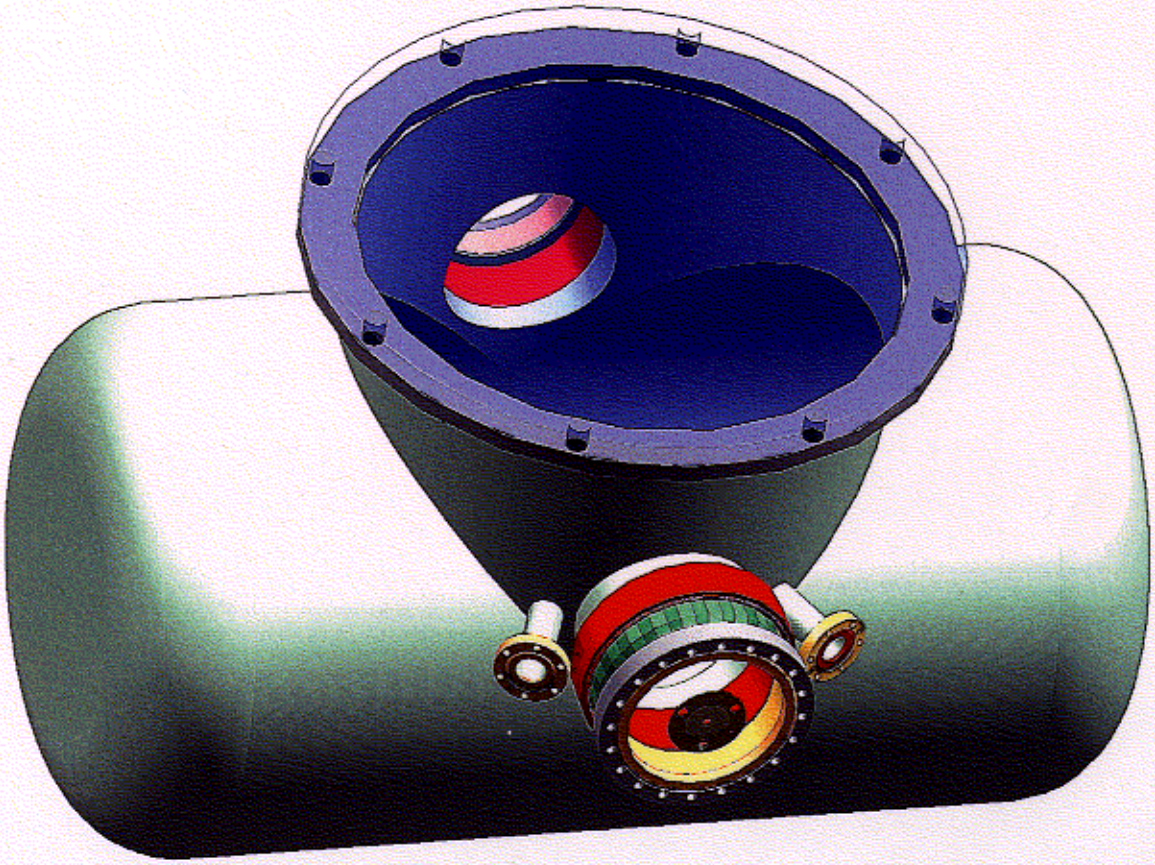
COHERENT BREMSSTRAHLUNG PHOTON BEAM LINE FOR E160



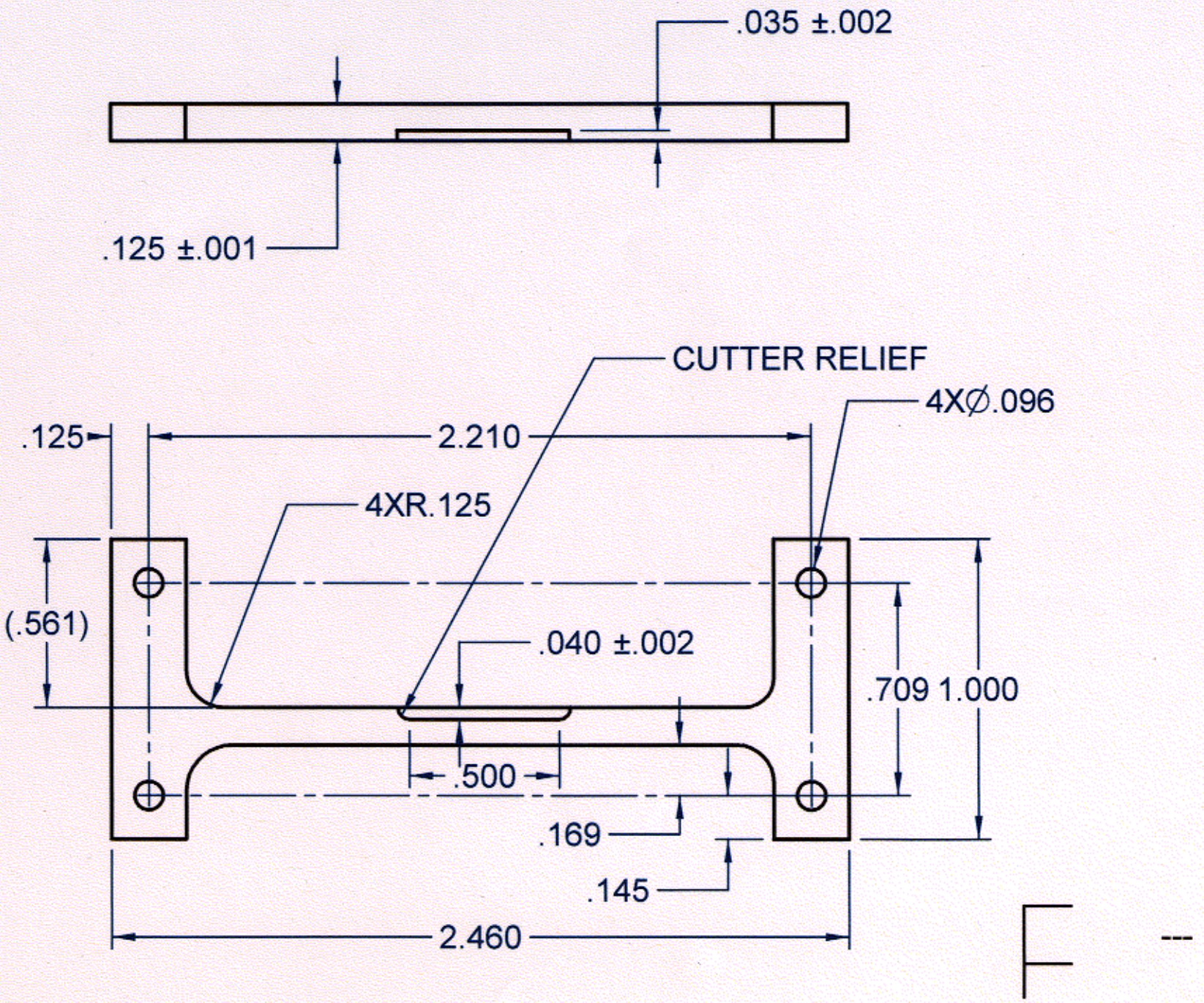

GONIOMETER
DUMP DIPOLES
PHOTON COLLIMATOR
MUON SPOILERS
DUMP
Q28
ST-29
[243.748]
A-32
[277.322]
A-33
[277.726]
1.00FT
10.00FT
100.00FT

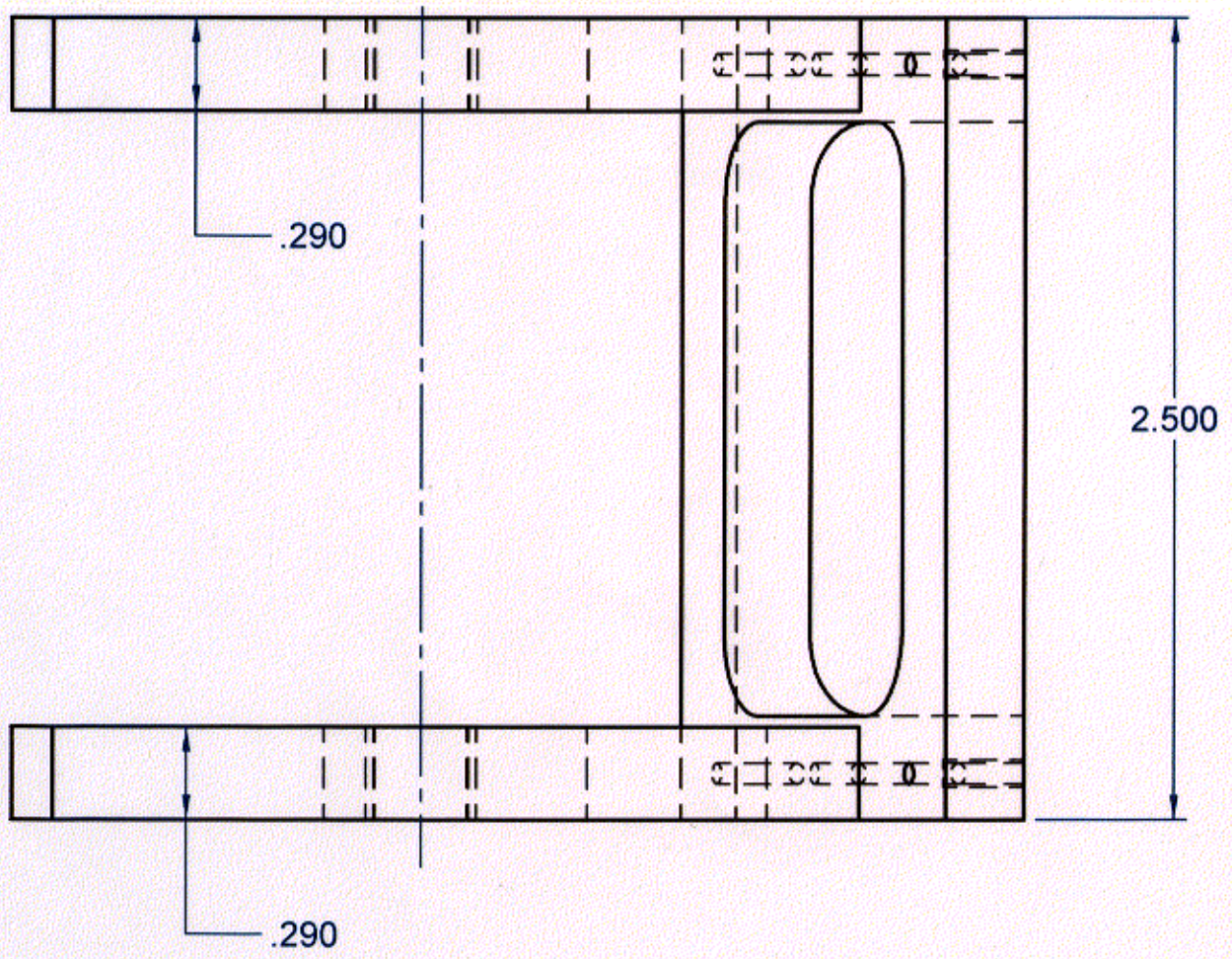
Goniometer

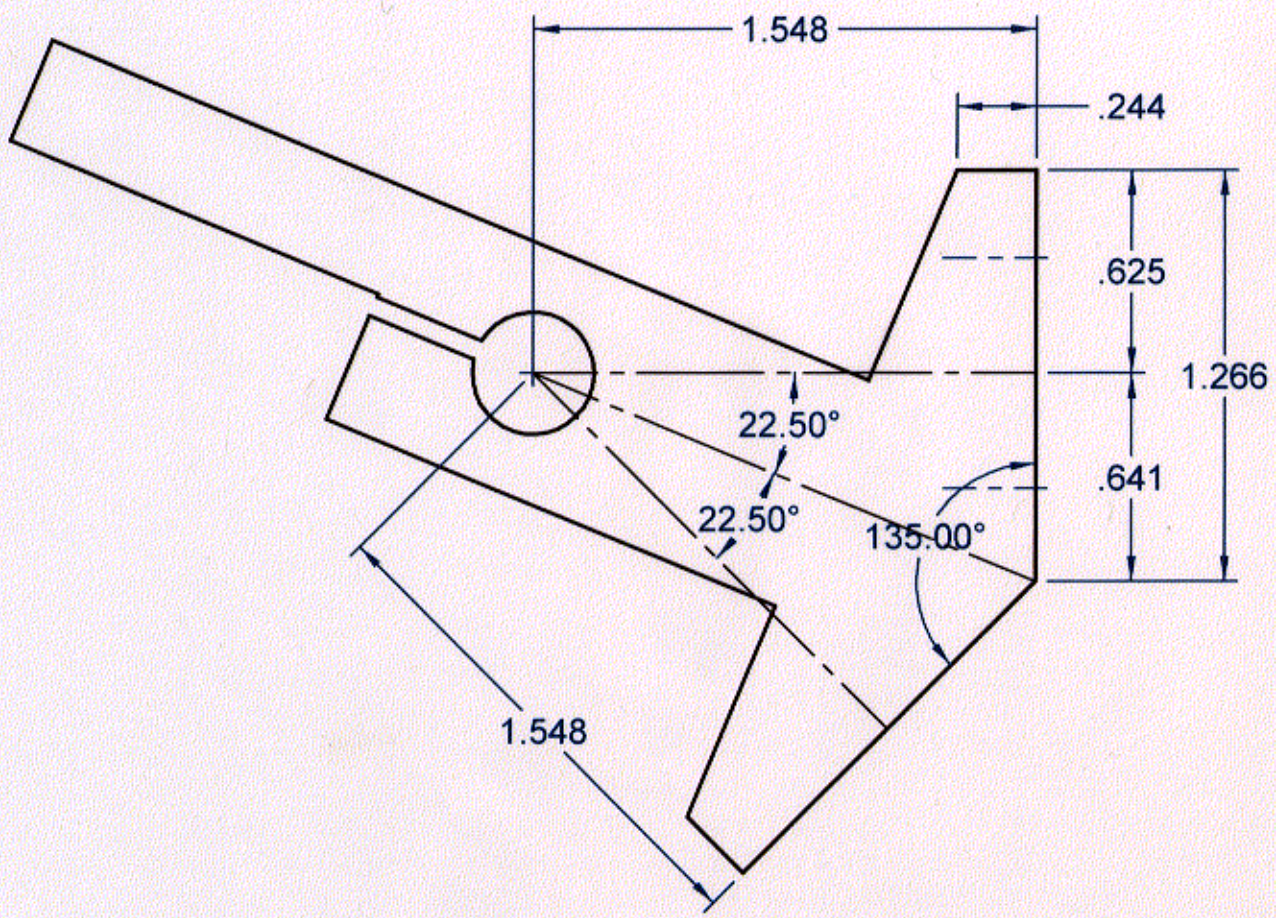
- Housing design modification to bring UV light to the diamond targets and view the targets complete
- Fabrication to commence in 1 to 2 weeks
- Vacuum flange design modification to change from Indium quick disconnect coupling to conflat flanges complete
  - Fabrication to commence in 1 to 2 weeks
- Target holder design modification to increase distance from e^- beam centerline to Be-bar complete
  - Parts to be fabricated soon
- New collimating SEM design well underway, to be completed in January
  - Fabrication to follow
- Motor and cable checkout in progress

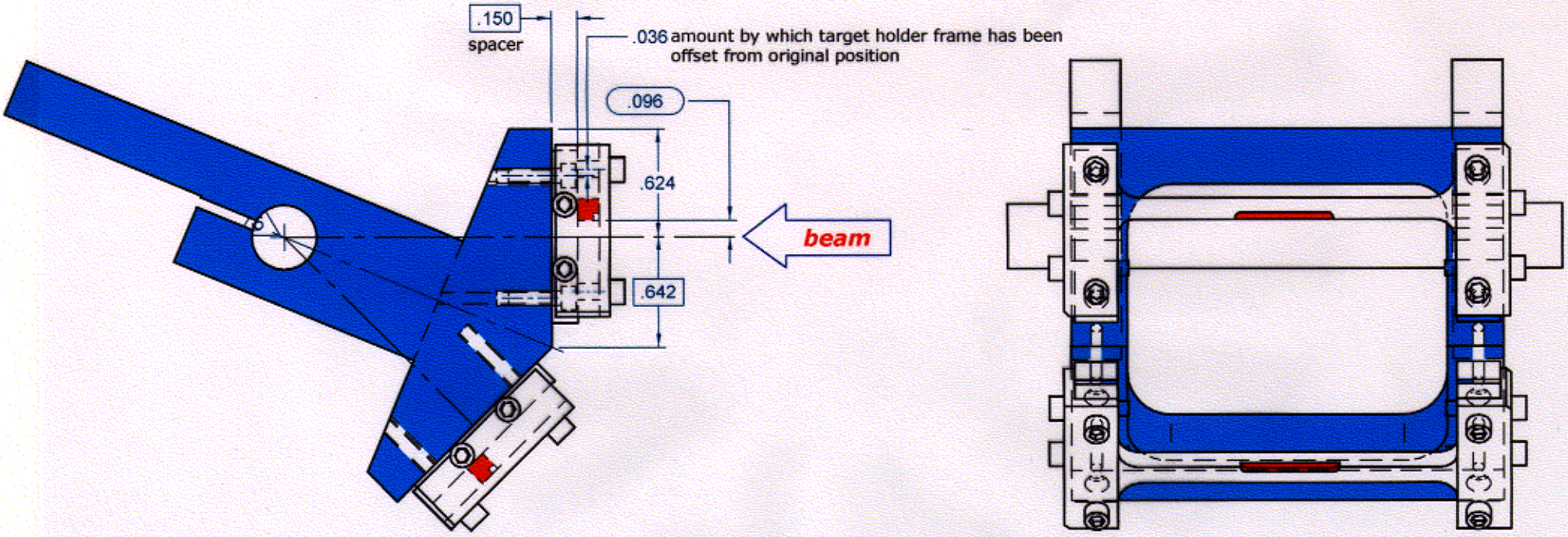


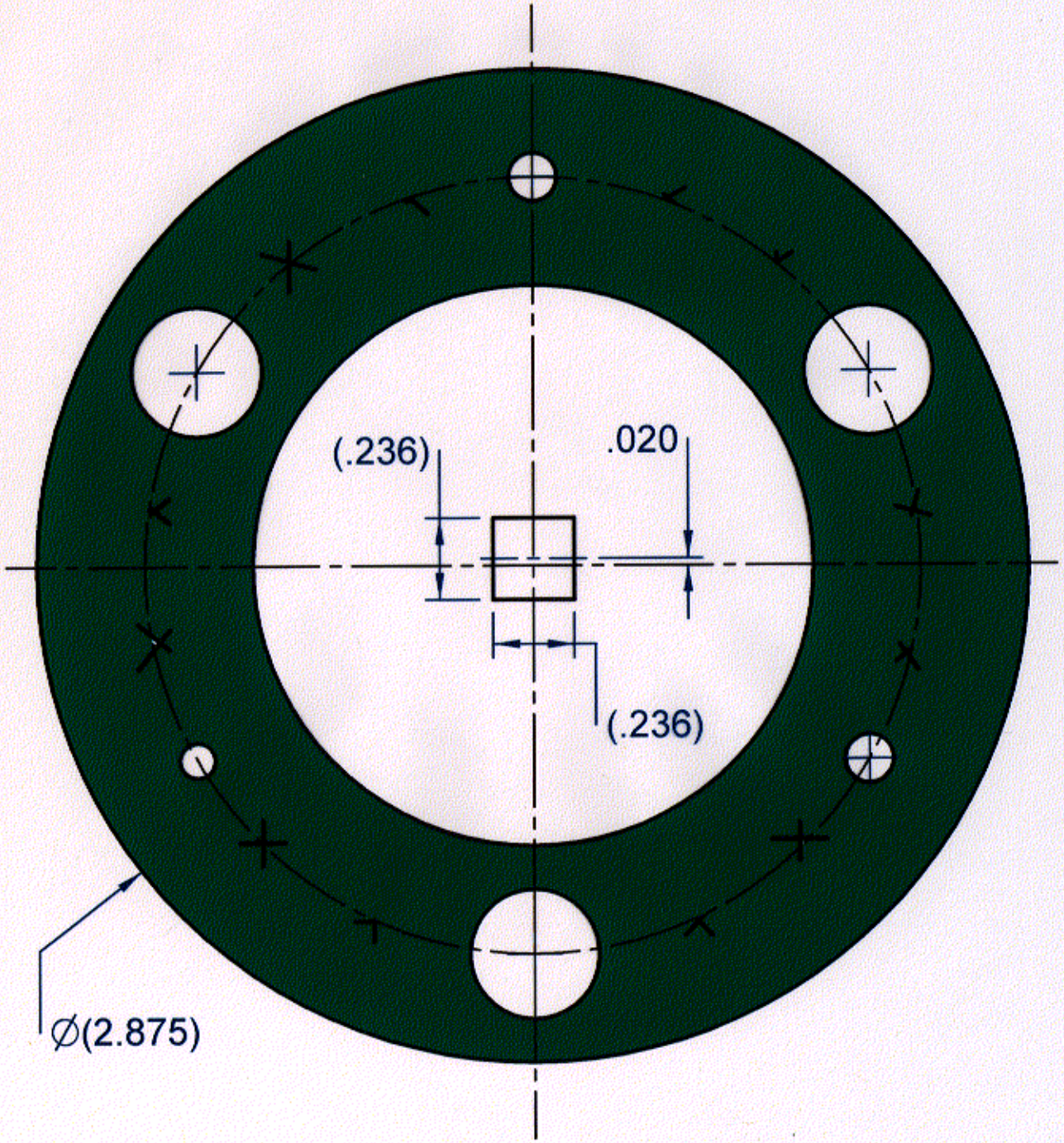
MODIFIED GONIOMETER HOUSING

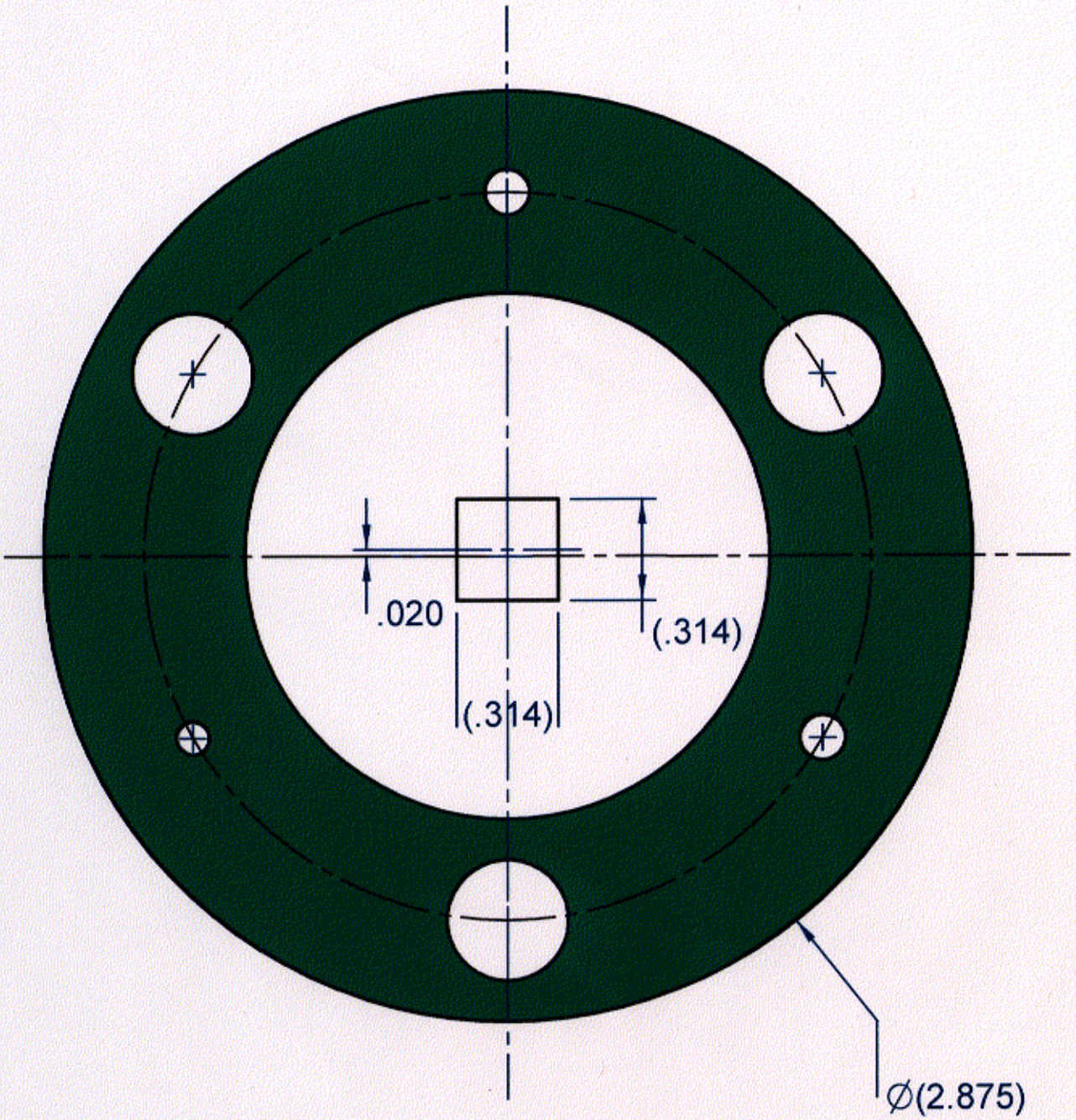

.035 ±.002
.125 ±.001
CUTTER RELIEF
4XØ.096
.125
2.210
4XR.125
(.561)
.040 ±.002
.709 1.000
.500
.169
.145
2.460

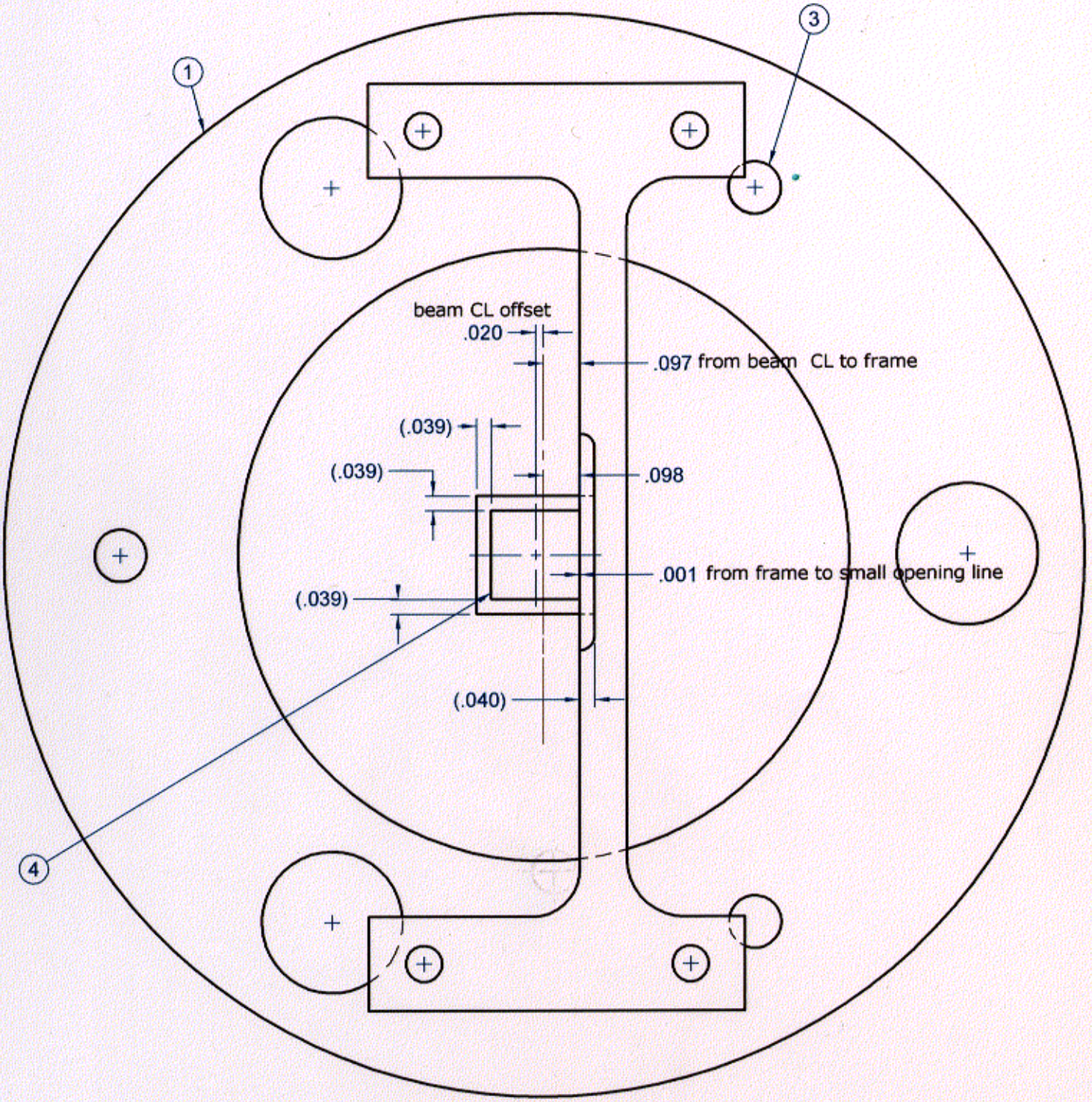

.290
2.500
.290

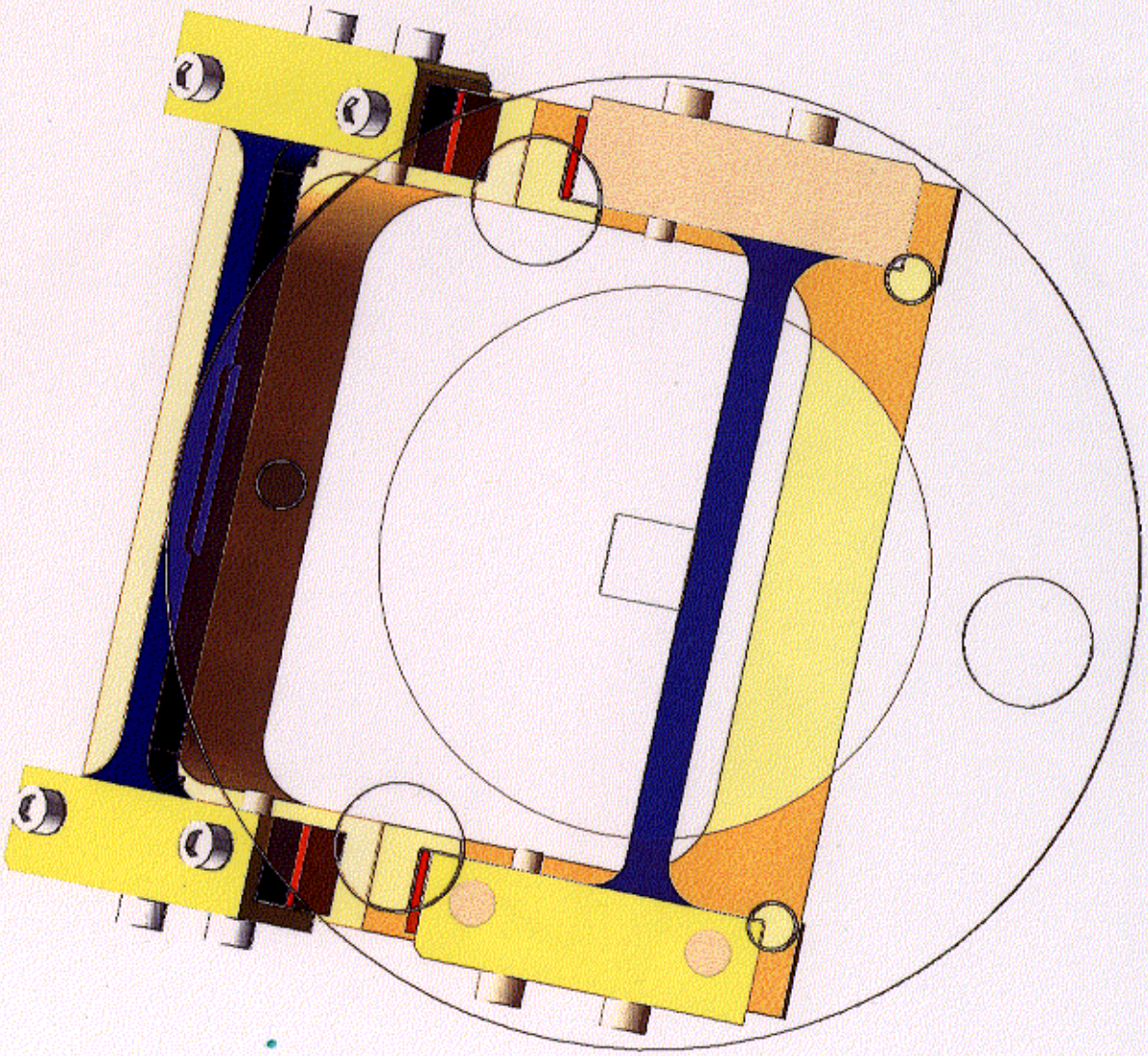

1.548
.244
.625
1.266
.641
22.50°
22.50°
135.00°
1.548


.150
spacer
.036 amount by which target holder frame has been offset from original position
.096
.624
.642
beam


(.236)
.020
(.236)
∅(2.875)

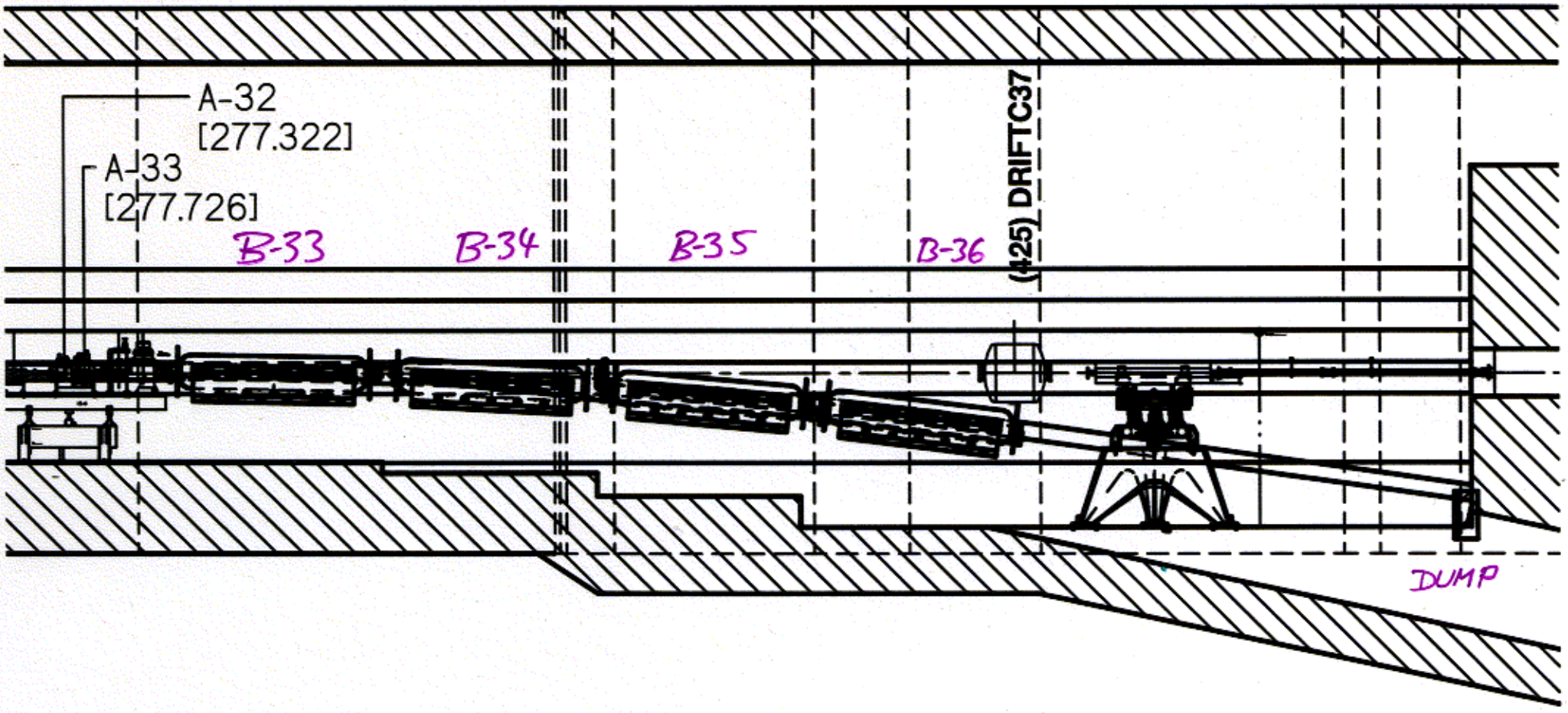

.020
(.314)
(.314)
Ø(2.875)


1
3
4
beam CL offset
.020
.097 from beam CL to frame
(.039)
(.039)
.098
.001 from frame to small opening line
(.039)
(.040)



Photon Collimator C-37

- Collimator installed in Beam Switchyard
  - Has remote adjustment capability, but needs stepper motors
- Photon beam pin cushion monitor can be installed to front (x) jaws but downbeam (y) jaws are not readily accessible
  - If this concept is used, would have to mount y-monitor to x-jaws at one fixed gap
- Other possibility is to either find E-78 4 Quadrant pin cushion monitor or build a new one to existing design


A-32
[277.322]
A-33
[277.726]
B-33
B-34
B-35
B-36
(425) DRIFTC37
DUMP

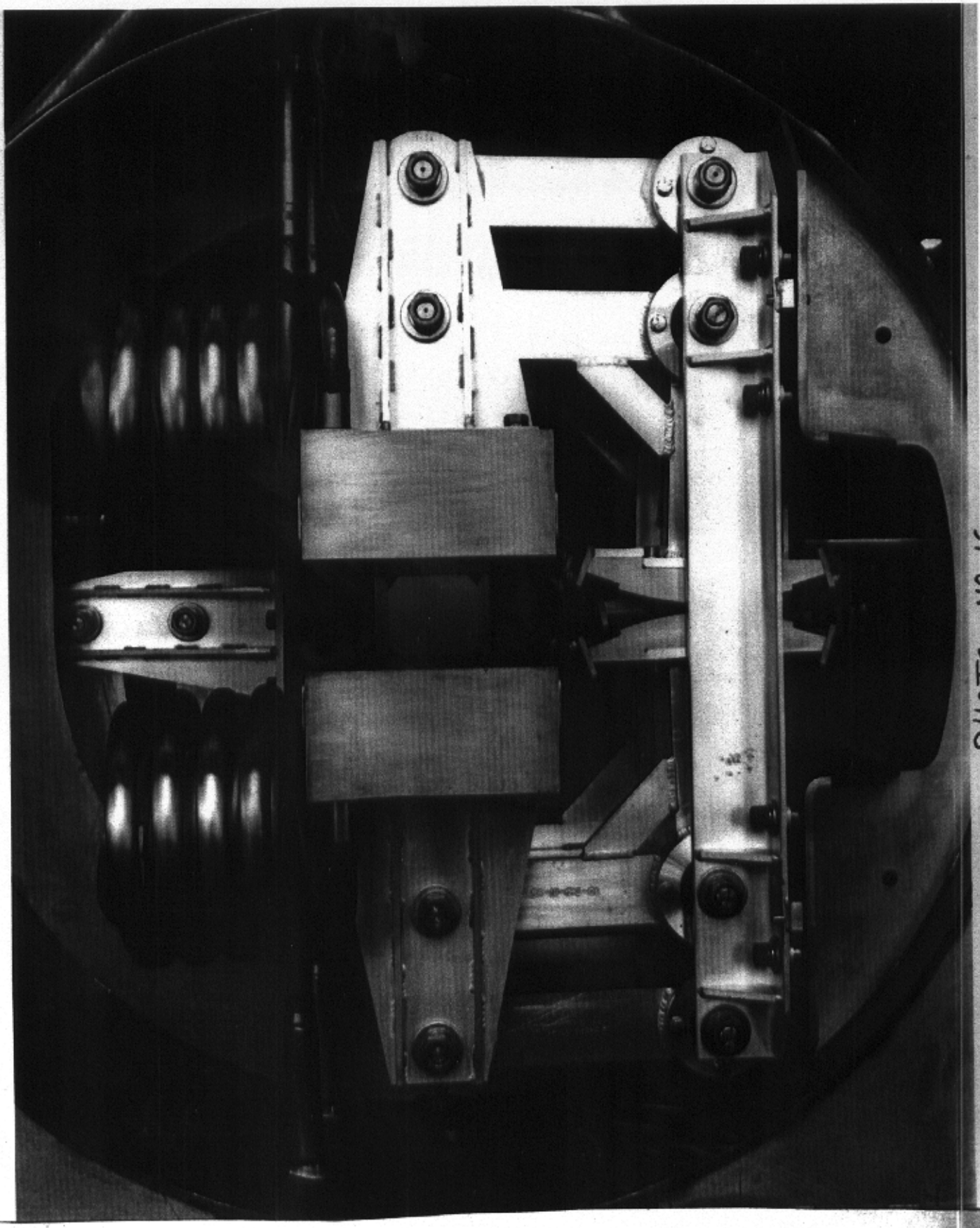


Photo No. 16 (M-1866-3)

Close-up view of internal pantograph module assemblies of the Hi-Z Collimator. Downstream head is welded in place. Jaws are open to about the mid-position in both the upbeam and the downbeam assemblies. This view is a good picture of the collimating affect of this device.

DRWALZ 5-18-01

Possible Photon Collimator for E-159, E-160, E-161

Device: High-Z Collimator C-0

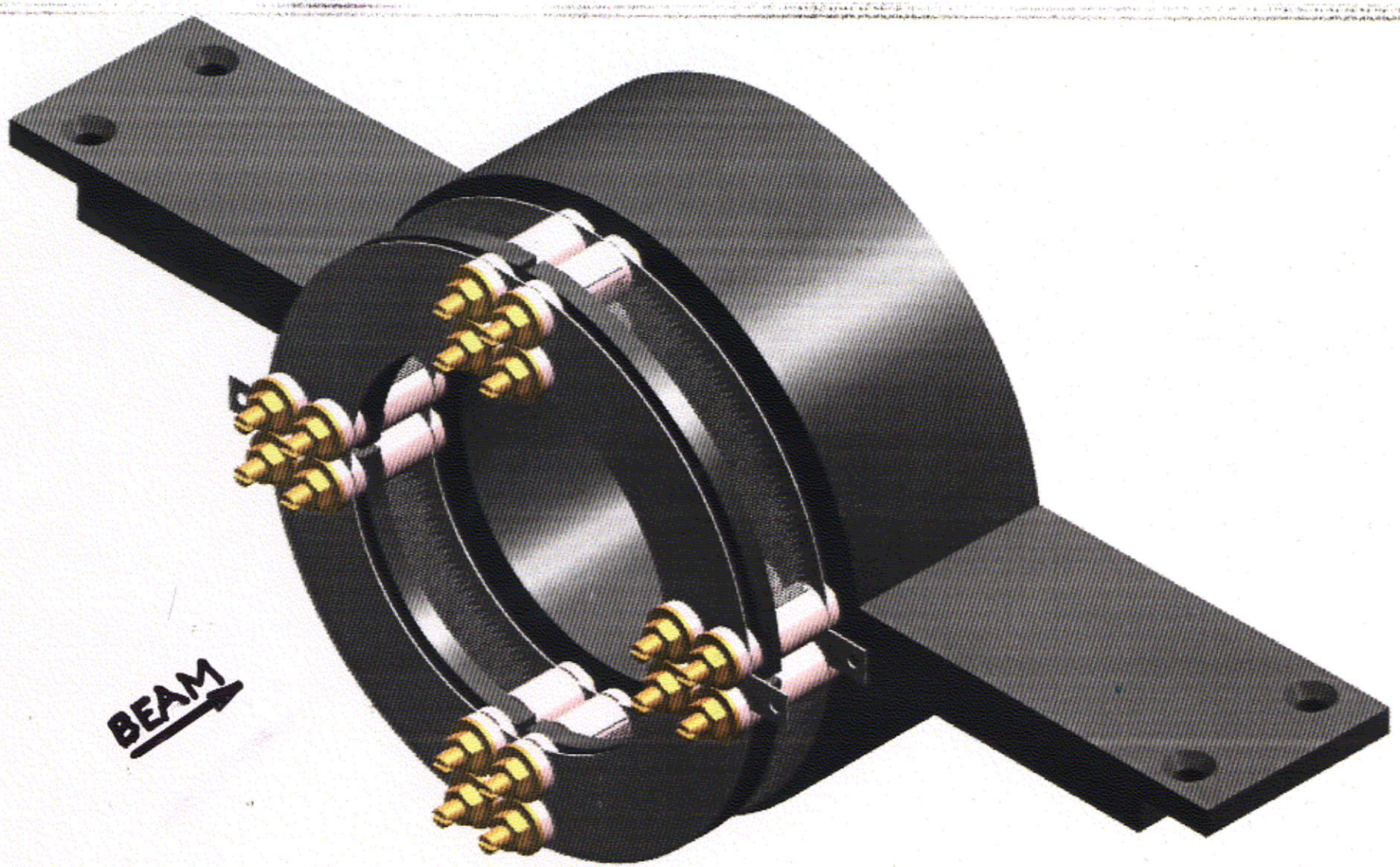
Built in 1965 for BSY

Length: $32 X_0$, Copper

Power Absorption Capacity: 40kW for $\sigma > 3$mm
20kW for $\sigma < 3$mm

Aperture: Adjustable to 15cm total

Water Flow Rate: 10gpm



E-158 PINCUSHION PHOTON BEAM MONITOR

BEAM

Muon Spoiler Magnet(s)

- Magnet(s) to be installed downbeam of Photon Collimator C-37
- Desired $\int Bdl \sim 5$ T-m
- Have identified two dipoles to do the job
  - A 10D90 (was B-42) with 2.92 inch gap

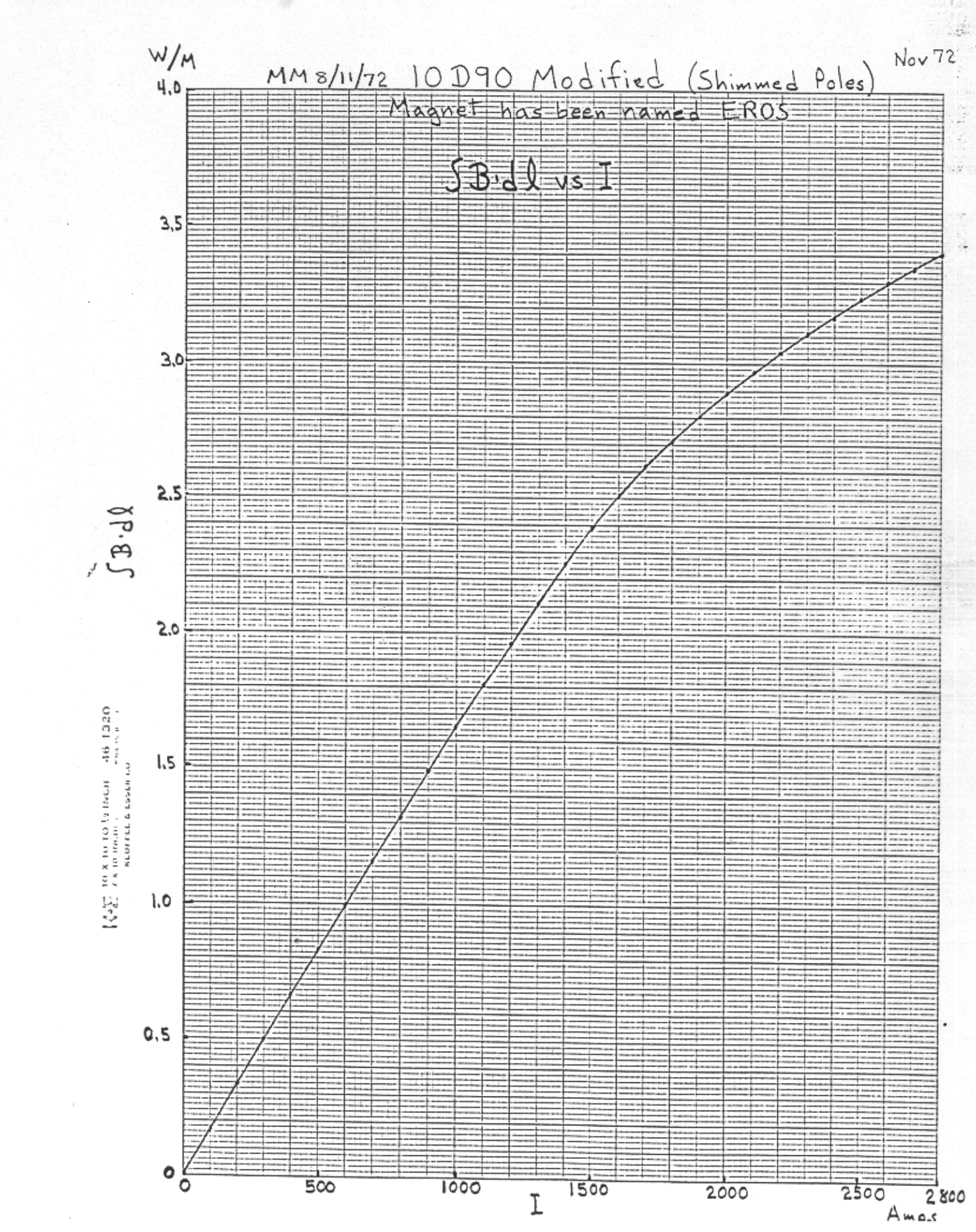
    $\int Bdl \sim 2.8$ T-m at $I_{ex} = 2000A$

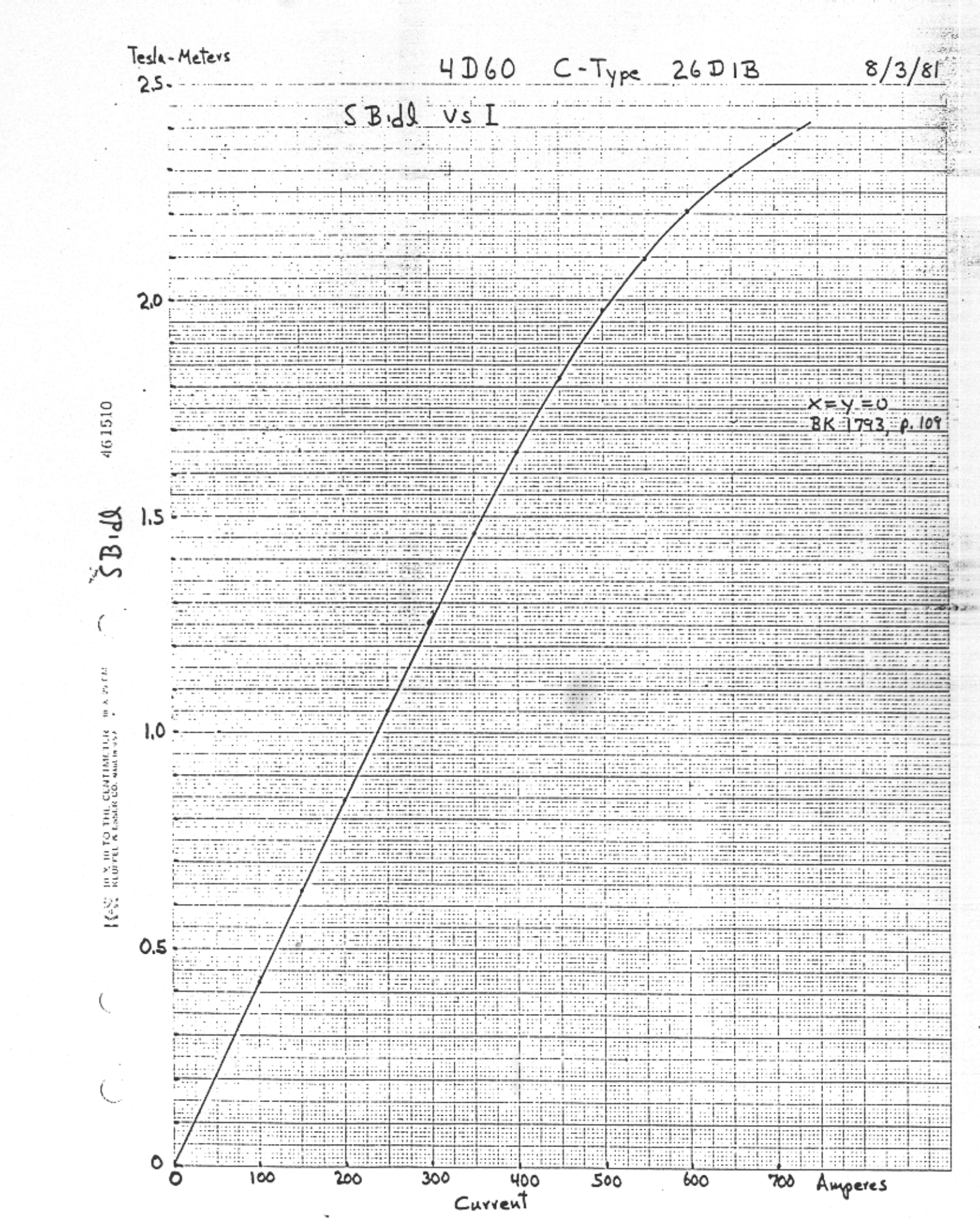
    $\int Bdl \sim 3.4$ T-m at $I_{ex} = 2800A$
  - A 4D60 (was 26D1) with 1.562 inch gap

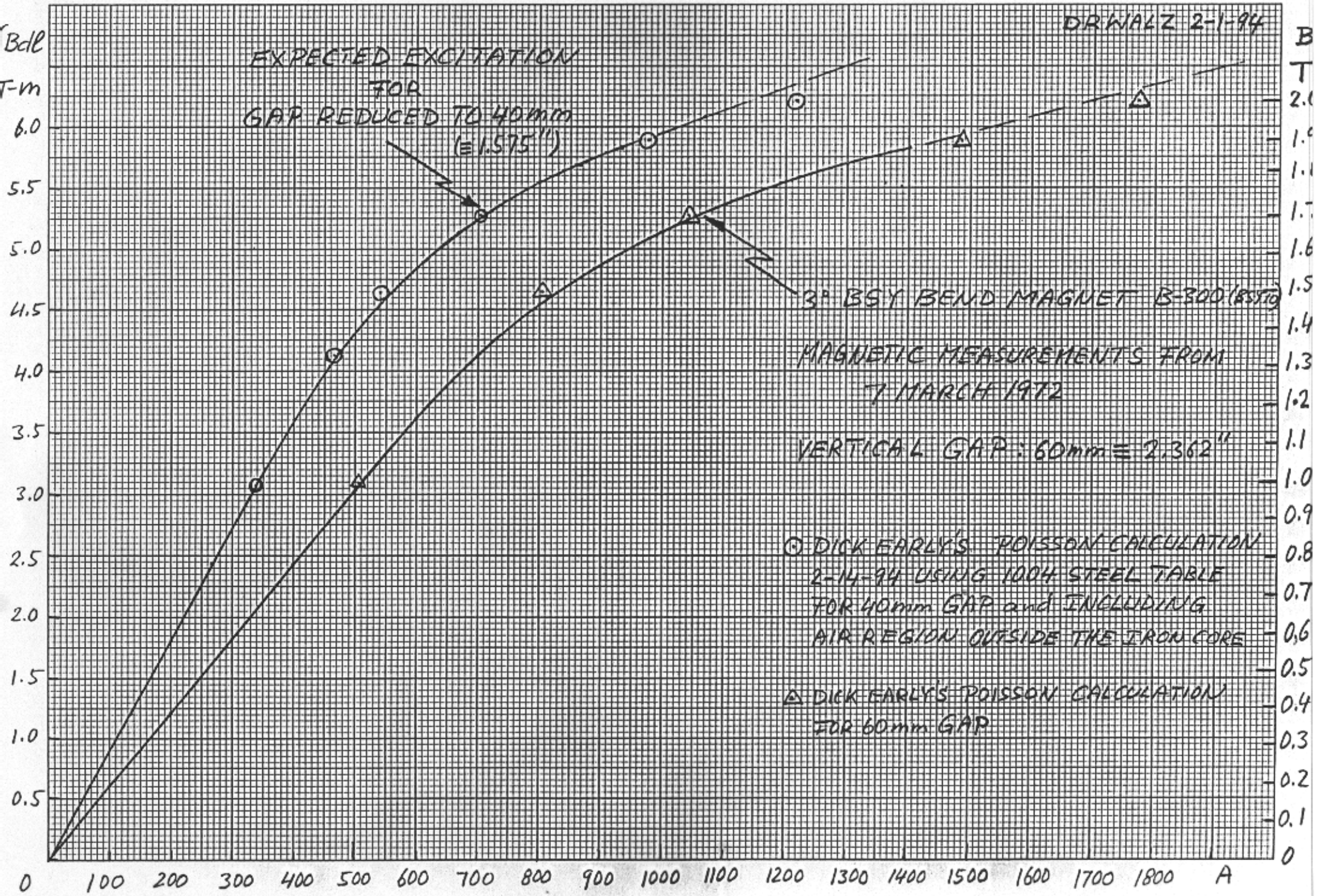
    $\int Bdl \sim 1.97$ T-m at $I_{ex} = 500A$

    $\int Bdl \sim 2.36$ T-m at $I_{ex} = 700A$

    Gap would need to be increased to 2 inch
- Longitudinal space tight


W/M
MM 8/11/72 10D90 Modified (Shimmed Poles)
Nov 72
Magnet has been named EROS
∫B·dl vs I
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
∫B·dl
0
500
1000
1500
2000
2500
2800
I
Amps


Tesla-Meters
4D60 C-Type 26D1B
8/3/81
SBdl vs I
2.5
2.0
1.5
1.0
0.5
0
SBdl
461510
X=Y=0
BK 1793, p. 109
0
100
200
300
400
500
600
700
Amperes
Current



Electron Beam Dump Line

- 4 Dipoles were removed from Beam Switchyard
  - All are in Heavy Assembly Building ready for disassembly
  - Coils to be checked for radiation damage and soundness
  - Work order for these tasks was written, needs signature
- New Magnet Conductor on order, due at SLAC in the next week
- Coil Winding Fixture being readied
- Will wind as many coils as are required, allowing for acceptable existing coils and spares
- If green light is given soon, magnets with 3 coils per pole can be ready for installation by the end of summer 2002

Electron Beam Dump Line (continued)

- Magnet Vacuum Chambers will need to be modified (at least 2 of 4) to accommodate reduced deflection angle
  - Design just getting underway
- Magnet supports will need to be modified
  - Design not yet started
- Need two toroidal current monitors in front of beam dump
  - May have two in storage (tape-wound cores) from old beamline (B.L. 27) or may have to build two using existing design
- Beam Dump exists (60 to 100 kW capacity)
  - Need support frame design and fabrication

Status and Schedule

- Current Status as outlined above
- Schedule at least for FY01/02 driven by availability of Manpower and Funding
  - One mechanical engineer and two designers working on electron dump line
  - One mechanical designer working on goniometer
  - One electrical/electronics technician working on goniometer
  - Shop manpower looks o.k for goniometer modifications
  - Shop manpower also o.k for magnet coil work and magnet disassembly/assembly
  - Funding???