

## A3 line tune/beam line information

G. M. Bunce

June 1985

Collider Accelerator Department  
**Brookhaven National Laboratory**

**U.S. Department of Energy**

USDOE Office of Science (SC)

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Alternating Gradient Synchrotron Department  
BROOKHAVEN NATIONAL LABORATORY  
Associated Universities, Inc.  
Upton, New York 11973

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**A3 Line Tune/Beam Line Information**

Gerry M. Bunce

June 3, 1985

A Transport display of the A3 beam envelope for the E749 magnet settings is enclosed, along with magnet listings and curves and collimator information. Note that the actual spot achieved at A3 is approximately 1 to 2 mm half width vs the Transport result of 2 mm(H) x 4 mm (V).

Tunes:

- A3-A Tune of E749, 2/4/84,  $\Delta p/p = \pm .2\%$
- A3-B Q6/7 and Q8/9 polarities are reversed to give a smaller horizontal divergence to match the aperture of the beam dump in the  $K_L$  collimator.  $\Delta p/p = \pm .2\%$
- A3-C Same as B, but  $\Delta p/p = \pm 2\%$ , to show effects of momentum shifts.
- A3-D  $\Delta p/p = \pm .2\%$ , Q7/8 = 0. (Q9 then runs at a high gradient-- not ideal.)



Date: 2/4/84

• File 16

A3 "Tunes"

A3-A

<u>Magnet</u>	<u>I*</u>	<u>BL</u>	<u>Dibbuk* Counts</u>	<u>Remarks</u>
Q12	2428 B	$-3.03 \frac{\text{kg}}{\text{in}} \times 52''$		
Q34	1973 A	$2.50 \frac{\text{kg}}{\text{in}} \times 52''$ (Q3)		
P01	0			
D1	1897 A	$17.90 \text{ kg} \times 78''$		
D2	1700 A	$18.37 \text{ kg} \times 76''$		
Q5	565 A	$.723 \frac{\text{kg}}{\text{in}} \times 36''$		
D3	1550 A	$25.8 \text{ kg} \times 74''$	2480	
D4	1771 A	"	2835	
D5	1453 A	"	2325	
D6	1130 A <sup>ε</sup>	$20.1 \text{ kg} \times 74''$	2150	
Q6	2125 B	$-2.69 \frac{\text{kg}}{\text{in}} \times 52''$		
Q7/8	900 B/A	$\mp 3.70 \frac{\text{kg}}{\text{in}} \times 37.5''$	1800	
Q9	1800 A	$7.98 \frac{\text{kg}}{\text{in}} \times 38''$		

△ calculated for use in transport.

Comments on tune: from expt. 749 logbook.

Transport spot at A3: 2 mm x 4.5 mm  
 H                      V  
 (1/2 Full width)

\* The current is the Dibbuk count value, except as indicated in the last column.



5/8/85

G. Bunce

A3 Magnet List

	Type*	gap	B/I or BL/I <sup>†</sup>	L <sub>Effective</sub> <sup>†, ††</sup>
Q1	8Q48		.0649 $\frac{\text{kg} \times \text{inches}}{\text{amp}}$	(52")
Q2	8Q48		.0649	(52")
Q3	8Q32		.001275 $\frac{\text{kg}}{\text{amp}}$	35.8"
Q4	8Q48		.0660 $\frac{\text{kg} \times \text{inches}}{\text{amp}}$	(52")
P1	8P24			
D1	18D72	6"	.718 $\frac{\text{kg} \times \text{inches}}{\text{amp}}$	(78")
D2	18D72	4"	~18.37 kg/1700 amps	(76")
Q5	8Q32		.00128 $\frac{\text{kg}}{\text{amp}}$	36.0"
D3	18D72	2"	~25.8 kg/1550 amps	(74")
D4	18D72	2"	~25.8 kg/1771	(74")
D5	18D72	2"	~25.8 kg/1453	(74")
D6	10D72	2"	~20.1 kg/1130	(74")
Q6	8Q48		.0658 $\frac{\text{kg} \times \text{inches}}{\text{amp}}$	(52")
Q7	5Q36		.0041 $\frac{\text{kg}}{\text{amp}}$	37.5"
Q8	5Q36		.0041	37.5"
Q9	N3Q36		.1685 $\frac{\text{kg} \times \text{inches}}{\text{amp}}$	(38")
D7	18D72	2"	17.7 kg/1245 amps	(2000 Disks)
D8	18D72	4"		
D9	18D72	6 <sup>to</sup> 5"	7.9 kg/938 amps	

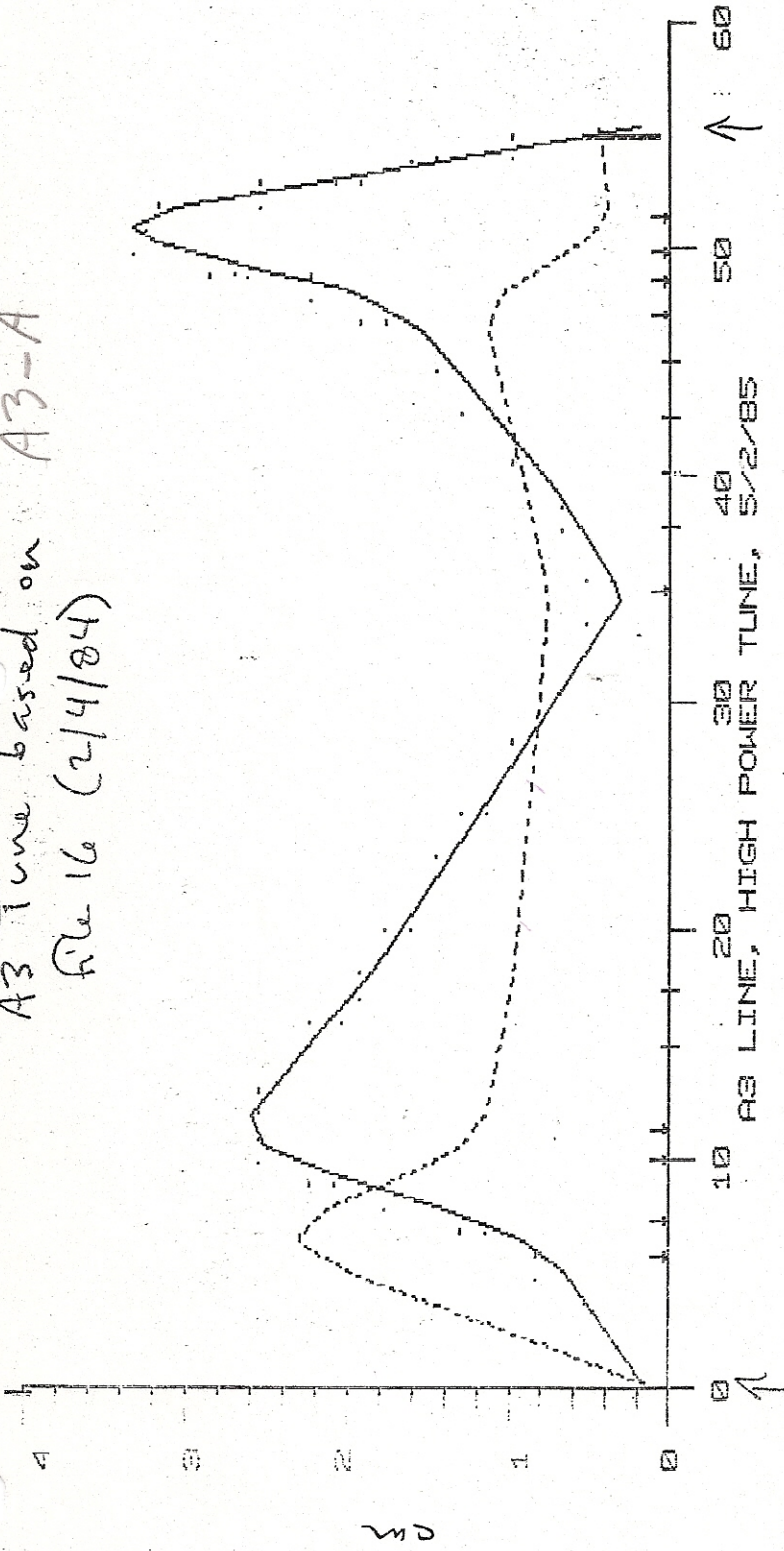
†† Parentheses indicate nominal lengths for Transport purposes.

† Field at 1" radius for quadrupoles. Transfer functions are given in the operating region of the tune of 2/4/84.

\* Notation:  $iL_j \Rightarrow$   
 $i$  = inside diameter of quads; unshimmed gap width for dipoles.  
 $j$  = length of poles.



A3 Tune based on A3-A  
file 16 (2/4/84)



A3 tyt

meters

RUN PLTR A tyt

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:



A3-A

A3 Tune

(22.4/84)

DRIFT	5	5	0.000000	0.000000	0.000000	0.000000	0.000000
QUAD*	5	1	920000	-3	000000	2	540000
DRIFT	3	0	280000	0	000000	0	000000
QUAD*	5	1	320000	-3	000000	2	540000
DRIFT	3	0	520000	0	000000	0	000000
QUAD*	5	1	910000	2	500000	2	540000
DRIFT	3	0	280000	0	000000	0	000000
QUAD*	5	1	320000	2	500000	2	540000
DRIFT	3	0	970000	0	000000	0	000000
ROTAT	2	1	980000	0	000000	0	000000
BEND*	4	1	980000	17	900000	0	000000
ROTAT	2	1	033000	0	000000	0	000000
DRIFT	3	0	510000	0	000000	0	000000
ROTAT	2	1	033000	0	000000	0	000000
BEND*	4	1	980000	18	370000	0	000000
ROTAT	2	1	033000	0	000000	0	000000
DRIFT	3	16	130000	0	000000	0	000000
QUAD*	5	0	910000	0	723000	2	540000
ROTAT	2	1	370000	0	000000	0	000000
BEND*	4	1	412000	0	000000	0	000000
ROTAT	2	1	880000	25	800000	0	000000
DRIFT	3	1	412000	0	000000	0	000000
ROTAT	2	1	560000	0	000000	0	000000
BEND*	4	1	412000	0	000000	0	000000
ROTAT	2	1	880000	25	800000	2	523000
DRIFT	3	1	412000	0	000000	0	000000
ROTAT	2	1	560000	0	000000	0	000000
BEND*	4	1	412000	0	000000	0	000000
ROTAT	2	1	880000	25	800000	2	523000
BEND*	4	1	412000	0	000000	0	000000
ROTAT	2	1	412000	0	000000	0	000000

RUN PLTR

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:



A3-A  
 A3 Tur  
 (2/4/84)

DRIFF	3.		0.	000000	0.	000000	0.	000000
ROTAT	2.		0.	000000	0.	000000	0.	000000
BEND*	4.	"A3D6	20.	100000	0.	000000	2.	277000
ROTAT	2.		0.	000000	0.	000000	0.	000000
DRIFF	3.		0.	000000	0.	000000	0.	000000
QUAD*	5.	"A3Q6	-2.	690000	0.	540000	-6.	585000
DRIFF	3.		0.	000000	0.	000000	0.	000000
QUAD*	5.	"A3Q7	-3.	700000	0.	540000	-6.	691000
DRIFF	3.		0.	000000	0.	000000	0.	000000
QUAD*	5.	"A3Q8	13.	700000	0.	540000	7.	009000
DRIFF	3.		0.	000000	0.	000000	0.	000000
QUAD*	5.	"A3Q9	7.	982000	0.	540000	3.	286000
DRIFF	3.		0.	000000	0.	000000	0.	000000
FIT	10.		1.	000100	0.	010000	0.	198000
FIT	10.		3.	000300	0.	010000	0.	448000
	0.		0.	000000	0.	000000	0.	000000

RUN PLTR

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:



AP/p = .2%  
A3-B

DRIFT	9:	5.000000	0.000000	0.000000	0.000000	0.000000
QUAD*	5:	1.320000	-3.030000	0.000000	2.540000	-5.822000
DRIFT	3:	0.280000	0.000000	0.000000	0.000000	0.000000
QUAD*	5:	1.320000	-3.030000	0.000000	2.540000	-5.822000
DRIFT	3:	1.520000	0.000000	0.000000	0.000000	0.000000
QUAD*	5:	0.910000	2.500000	0.000000	2.540000	10.767000
DRIFT	3:	1.320000	0.000000	0.000000	2.540000	7.541000
QUAD*	5:	1.970000	0.000000	0.000000	0.000000	0.000000
DRIFT	3:	1.033000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.980000	17.900000	0.000000	0.000000	2.136000
BEND*	4:	1.033000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.033000	0.000000	0.000000	0.000000	0.000000
DRIFT	3:	0.510000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.930000	18.370000	0.000000	0.000000	2.136000
BEND*	4:	1.033000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.033000	0.000000	0.000000	0.000000	0.000000
DRIFT	3:	16.130000	0.000000	0.000000	0.000000	0.000000
QUAD*	5:	0.910000	0.723000	0.000000	2.540000	36.853000
DRIFT	3:	1.370000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.412000	0.000000	0.000000	0.000000	0.000000
BEND*	4:	1.880000	25.800000	0.000000	0.000000	2.923000
ROTAT	2:	1.412000	0.000000	0.000000	0.000000	0.000000
DRIFT	3:	1.412000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.412000	0.000000	0.000000	0.000000	0.000000
BEND*	4:	1.880000	25.800000	0.000000	0.000000	2.923000
ROTAT	2:	1.412000	0.000000	0.000000	0.000000	0.000000
DRIFT	3:	1.412000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.412000	0.000000	0.000000	0.000000	0.000000
BEND*	4:	1.880000	25.800000	0.000000	0.000000	2.923000
ROTAT	2:	1.412000	0.000000	0.000000	0.000000	0.000000

RUN PLTR

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:



A3-B

$\Delta p/p = 1.2\%$

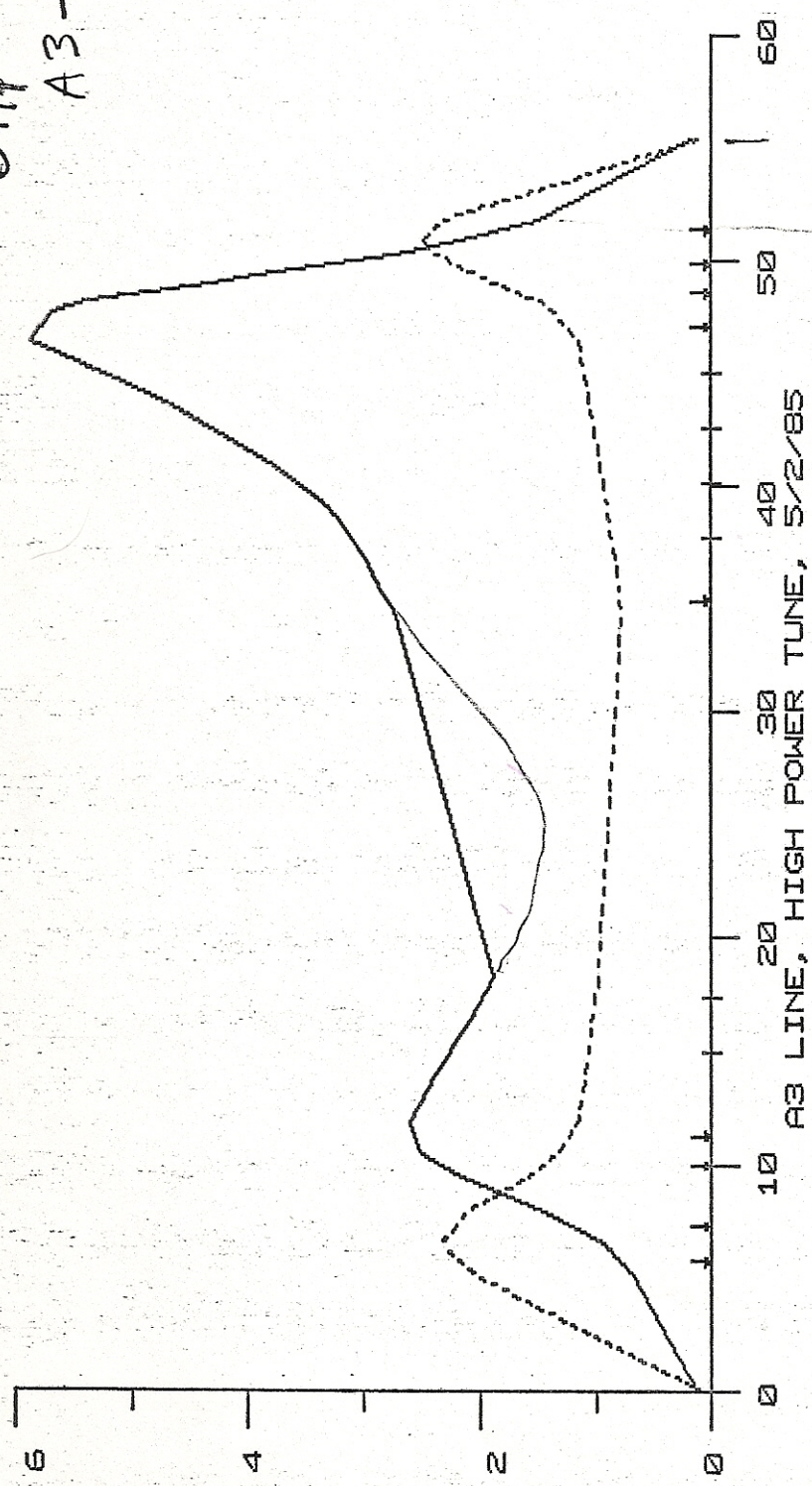
DRIFT	3:		0.510000	0.000000	0.000000	0.000000
ROTAT	2:		1.100000	0.000000	0.000000	0.000000
BEND*	4:	"A3D6	1.980000	20.100000	0.000000	2.277000
ROTAT	2:		1.100000	0.000000	0.000000	0.000000
DRIFT	3:		0.510000	0.000000	0.000000	0.000000
QUAD*	5:	"A3Q6	1.320000	3.788000	2.540000	5.055500
DRIFT	3:		0.390000	0.000000	0.000000	0.000000
QUAD*	5:	"A3Q7	0.953000	3.700000	2.540000	7.000900
DRIFT	3:		0.270000	0.000000	0.000000	0.000000
QUAD*	5:	"A3Q8	0.953000	-3.700000	2.540000	-6.691000
DRIFT	3:		0.570000	0.000000	0.000000	0.000000
QUAD*	5:	"A3Q9	0.970000	-8.267000	2.540000	-2.855500
DRIFT	3:		3.640000	0.000000	0.000000	0.000000
FIT	10:		1.00010	0.100000	0.010000	0.16860
FIT	10:		3.00030	0.100000	0.010000	0.09980
	0:		0.000000	0.000000	0.000000	0.000000

RUN PLTR

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:



DAF = 2%  
A3-C



ENTER UP TO 55 CHARACTERS OF DESCRIPTION:

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:

$\frac{12 \text{ mm}^2}{\rho} = 4 \text{ mm}^2$   
 $\rho = 3 \text{ mm}^2$



AP/P = 2%  
A3-C

DRIFT	3:	5:	0.00000	0.00000	0.00000	0.00000
QUAD*	5:	1.32000	-3.03300	-5.82200	0.00000	0.00000
DRIFT	3:	0.28000	0.00000	0.00000	0.00000	0.00000
QUAD*	5:	1.32000	-3.03300	-5.82200	0.00000	0.00000
DRIFT	3:	1.52000	0.00000	10.76700	0.00000	0.00000
QUAD*	5:	0.91000	2.50000	7.54100	0.00000	0.00000
DRIFT	3:	1.32000	0.00000	0.00000	0.00000	0.00000
QUAD*	5:	1.97000	0.00000	0.00000	0.00000	0.00000
DRIFT	3:	1.03300	0.00000	0.00000	0.00000	0.00000
ROTAT	2:	1.98000	17.90000	2.13600	0.00000	0.00000
BEND*	4:	1.03300	0.00000	0.00000	0.00000	0.00000
ROTAT	2:	0.51000	0.00000	0.00000	0.00000	0.00000
DRIFT	3:	1.03300	0.00000	0.00000	0.00000	0.00000
ROTAT	2:	1.93000	18.37000	2.13600	0.00000	0.00000
BEND*	4:	1.03300	0.00000	0.00000	0.00000	0.00000
ROTAT	2:	1.03300	0.00000	0.00000	0.00000	0.00000
DRIFT	3:	16.13000	0.00000	0.00000	0.00000	0.00000
QUAD*	5:	0.91000	0.72300	36.85300	0.00000	0.00000
DRIFT	3:	1.37000	0.00000	0.00000	0.00000	0.00000
ROTAT	2:	1.41200	0.00000	0.00000	0.00000	0.00000
BEND*	4:	1.88000	25.80000	2.92300	0.00000	0.00000
ROTAT	2:	1.41200	0.00000	0.00000	0.00000	0.00000
DRIFT	3:	0.56000	0.00000	0.00000	0.00000	0.00000
ROTAT	2:	1.41200	0.00000	0.00000	0.00000	0.00000
BEND*	4:	1.88000	25.80000	2.92300	0.00000	0.00000
ROTAT	2:	1.41200	0.00000	0.00000	0.00000	0.00000
DRIFT	3:	0.56000	0.00000	0.00000	0.00000	0.00000
ROTAT	2:	1.41200	0.00000	0.00000	0.00000	0.00000
BEND*	4:	1.88000	25.80000	2.92300	0.00000	0.00000
ROTAT	2:	1.41200	0.00000	0.00000	0.00000	0.00000

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:



AP/ = 2.3  
A3-C

DRIFT	3:	0.510000	0.000000	0.000000	0.000000	0.000000
ROTAT	2:	1.100000	0.000000	0.000000	0.000000	0.000000
BEND*	4:	1.880000	20.100000	0.000000	0.000000	2.277000
ROTAT	2:	1.100000	0.000000	0.000000	0.000000	0.000000
DRIFT	3:	0.510000	0.000000	0.000000	0.000000	0.000000
QUAD*	5: 0 1	1.320000	3.827000	0.000000	2.540000	5.006000
DRIFT	3:	0.390000	0.000000	0.000000	0.000000	0.000000
QUAD*	5:	0.953000	3.700000	0.000000	2.540000	7.009000
DRIFT	3:	0.270000	0.000000	0.000000	0.000000	0.000000
QUAD*	5:	0.953000	-3.700000	0.000000	2.540000	-6.691000
DRIFT	3:	0.570000	0.000000	0.000000	0.000000	0.000000
QUAD*	5: 0 1	0.970000	-8.281000	0.000000	2.540000	-2.850000
DRIFT	3:	3.640000	0.000000	0.000000	0.000000	0.000000
FIT	10:	1.000010	0.100000	0.100000	0.010000	0.172000
FIT	10:	3.000030	0.100000	0.100000	0.010000	0.099990
FIT	0:	0.000000	0.000000	0.000000	0.000000	0.000000

ENTER UP TO 55 CHARACTERS OF DESCRIPTION:

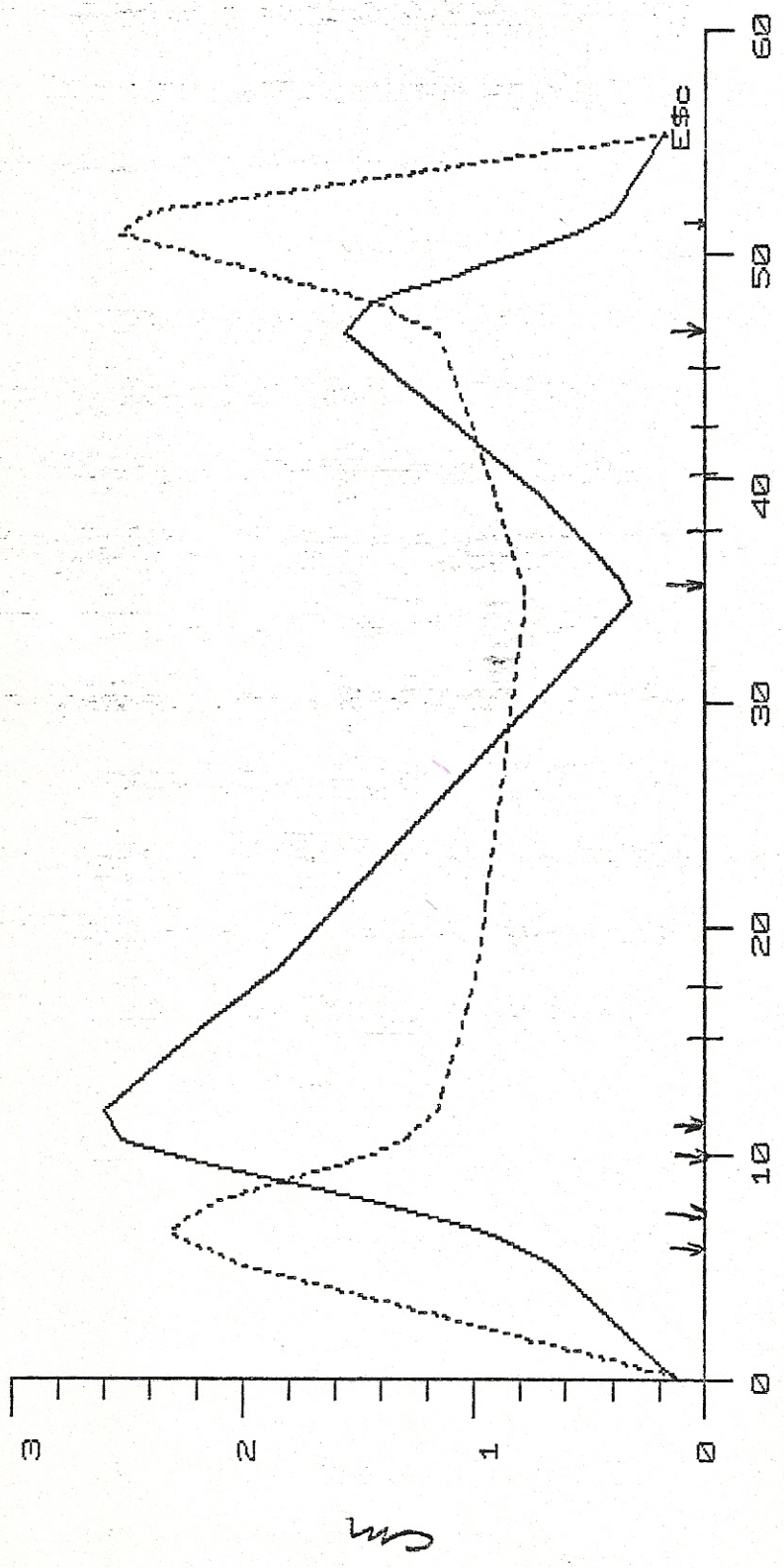
ENTER UP TO 55 CHARACTERS OF DESCRIPTION:



A3-D

4-Jun-85 09:11

Q7/8-0, Q6/9 REVERSED POLARITY.



A3 LINE - meters



A3-D

"A3 LINE, HIGH POWER TUNE, 5/2/85

"A1Q1	5.00000	0.00000	0.00000	0.00000	0.00000
DRIFT	1.32000	-3.03000	2.54000	0.00000	-5.82200
QUAD*	0.28000	0.00000	0.00000	0.00000	0.00000
DRIFT	1.32000	-3.03000	2.54000	0.00000	-5.82200
QUAD*	1.52000	0.00000	0.00000	0.00000	0.00000
DRIFT	0.91000	2.50000	2.54000	10.76700	0.00000
QUAD*	0.28000	0.00000	0.00000	0.00000	0.00000
DRIFT	1.32000	2.50000	2.54000	7.54100	0.00000
QUAD*	1.97000	0.00000	0.00000	0.00000	0.00000
DRIFT	1.98000	17.90000	0.00000	2.13600	0.00000
BEND*	1.03300	0.00000	0.00000	0.00000	0.00000
ROTAT	0.51000	0.00000	0.00000	0.00000	0.00000
DRIFT	1.03300	18.37000	0.00000	0.00000	0.00000
ROTAT	1.93000	0.00000	0.00000	2.13600	0.00000
BEND*	1.03300	0.00000	0.00000	0.00000	0.00000
ROTAT	16.13000	0.00000	0.00000	0.00000	0.00000
DRIFT	0.91000	0.72300	2.54000	36.85300	0.00000
QUAD*	1.37000	0.00000	0.00000	0.00000	0.00000
DRIFT	1.41200	0.00000	0.00000	0.00000	0.00000
ROTAT	1.88000	25.80000	0.00000	2.92300	0.00000
BEND*	1.41200	0.00000	0.00000	0.00000	0.00000
ROTAT	0.56000	0.00000	0.00000	0.00000	0.00000
DRIFT	1.41200	25.80000	0.00000	2.92300	0.00000
BEND*	1.88000	0.00000	0.00000	0.00000	0.00000
ROTAT	1.41200	0.00000	0.00000	0.00000	0.00000
DRIFT	0.56000	0.00000	0.00000	0.00000	0.00000
ROTAT	1.41200	0.00000	0.00000	0.00000	0.00000
BEND*	1.88000	25.80000	0.00000	2.92300	0.00000
ROTAT	1.41200	0.00000	0.00000	0.00000	0.00000
DRIFT	0.56000	0.00000	0.00000	0.00000	0.00000
ROTAT	1.41200	0.00000	0.00000	0.00000	0.00000
BEND*	1.88000	25.80000	0.00000	2.92300	0.00000
ROTAT	1.41200	0.00000	0.00000	0.00000	0.00000

Q7/8 = 0  
Ap/p ~ 2%



A3-D

0.00000  
 0.00000  
 2.27700  
 0.00000  
 0.00000  
 4.04800  
 0.00000  
 0.00000  
 0.00000  
 0.00000  
 0.00000  
 0.00000  
 -2.40200  
 0.00000  
 0.17500  
 0.09980  
 0.00000

0.00000  
 0.00000  
 0.00000  
 0.00000  
 2.54000  
 0.00000  
 2.54000  
 0.00000  
 2.54000  
 0.00000  
 2.54000  
 2.54000  
 0.00000  
 0.01000  
 0.01000  
 0.00000

0.00000  
 0.00000  
 20.10000  
 0.00000  
 0.00000  
 4.78900  
 0.00000  
 0.00000  
 0.00000  
 0.00000  
 0.00000  
 -9.73500  
 0.00000  
 0.10000  
 0.10000  
 0.00000

0.51000  
 1.10000  
 1.88000  
 1.10000  
 0.51000  
 1.32000  
 0.39000  
 0.95300  
 0.27000  
 0.95300  
 0.57000  
 0.97000  
 3.64000  
 1.00010  
 3.00030  
 0.00000

3. DRIFT  
 2. ROTAT  
 4. BEND\*  
 2. ROTAT  
 3. DRIFT  
 5. 0 1 QUAD\*  
 3. DRIFT  
 5. 0 1 QUAD\*  
 3. DRIFT  
 5. 0 1 QUAD\*  
 3. DRIFT  
 5. 0 1 QUAD\*  
 3. DRIFT  
 10. FIT  
 10. FIT  
 0.

"A3D6

"A3Q6

"A3Q7

"A3Q8

"A3Q9

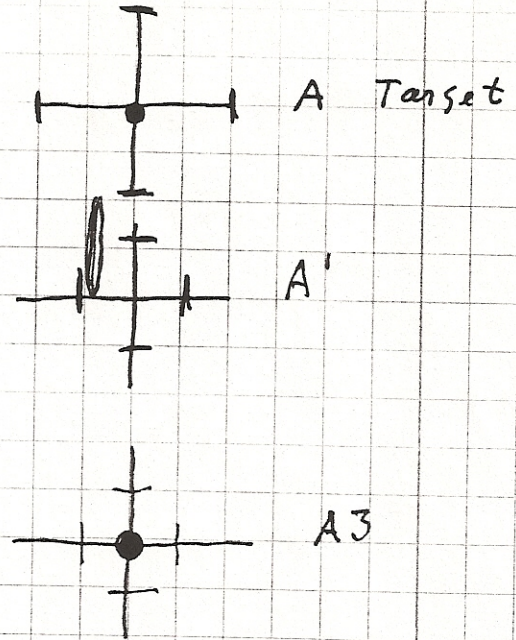
Q7/8 = 0

$\Delta p/p \approx .2\%$



FROM THE LOG BOOK MS

	Set	I
Q12	2428	2428
Q34	1973	1973
P01	0	0
D1	1897	1897
D2	1700	1700
Q5	565	565
D4	2834	1770
D5	2325	1453
Q6	2125	2125
Q78	1800	900
Q9	1800	1800
D10	3333	2498



D9      2750      See page 13 for Counting Characteristics  
1032

## Beam / pulse

13:15 Feb 4 RHA

A (SEC)	1600	
A3 (SEC)	1000	<u>K-short</u>
ECL	<del>50</del> 170	
T4-T5	30,000	
OR-D	650,000	
Events	150	

Software Bells and Beamtime seem  
co-terminus - ie software appears  
to be keeping up with no problem

Feb 4 13:35 Go to KL (RHA)

Feb 4 13:55 Set D10 — 3313 Set point 2484 Amps

14:30 DIBBUK FILE #16 HAS CURRENT  
SETTING



11:25 K<sup>o</sup> P.O. - SWITCH TO K<sup>o</sup>s.

```

FEB-04 14:48:53      0.00 DEV/C
MAGN SETPT TOL PDL STATUS CURRENT
0407 2431. 2408. 8.000 B ON 247.0 207
0408 1978. 1978. 8.000 A ON 197.0 207
0409 04000 100.0 4.000 B STEY DEFER 17300 207
0410 1908. 1897. 4.000 A ON DEFER 1908. 207
0411 1999. 1700. 4.000 A ON 1999. 207
0412 567.0 565.0 8.000 A ON 567.0 207
0413 2479. 2480. 4.000 A ON 247.0 207
0414 2874. 2875. 4.000 A ON 287.0 210
0415 2725. 2725. 4.000 A ON 272.0 214
0416 2149. 2150. 8.000 A ON 214.0 215
0417 2125. 2125. 8.000 B ON 212.0 212
0418 1801. 1800. 8.000 B ON 180.0 220
0419 1795. 1800. 8.000 A ON DEFER 1795. 210
0420 3325. 3329. 20.00 B ON 332.0 22
0421 2752. 2750. 12.00 A ON 275.0 22
0422 3312. 3313. 4.000 A ON 331.0 22

```

SAVED ON FILE 16

FEB 4 - 14:48

REL  
MS  
RKA



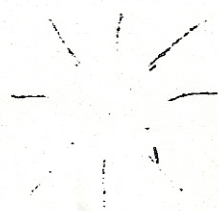
# Collimators on Dobbuk

Exp: 735  
(A3 Line)

	Max. Opening	Max Close	Collimation (looking downstream)	Current Max. opening (mm)	Tuning Address
K1	3245	2090	A1C1: Horizontal	189.77	050
K2	3180	2056	A1C2 Vert. top	84.90	051
K3	3175	2059	A1C2 Vert. Bottom	84.52	052
K4	3130	2066	A1C3 Vert. top <del>240</del>	81.00	072
K5	3085	2067	A1C3 Vert. bottom <del>240</del>	-77.85	073
K6	3250	2070	A1C3 Horiz. Right	-90.22	074
K7	<del>3250</del> 3300	2070	A1C3 Horiz. Left	93.82	075
<del>K8</del>	<del>3070</del>	<del>2067</del>	<del>A1C4 Vert. Top</del>	<del>76.57</del>	<del>062</del>
<del>K9</del>	<del>3080</del>	<del>2068</del>	<del>A1C4 Vert. Bottom</del>	<del>-77.47</del>	<del>063</del>
<del>K10</del>	<del>3285</del>	<del>2068</del>	<del>A1C4 Horiz. Right</del>	<del>-92.85</del>	<del>064</del>
<del>K11</del>	<del>3155</del>	<del>2069</del>	<del>A1C4 Horiz. Left</del>	<del>83.82</del>	<del>065</del>

(There is no A1C4 in the A3 beam line.)

K1 is two pieces (left and right) controlled together.  
The maximum opening at A1C1 is thus 180 mm, or twice the Dobbuk reading.





BEAM A-3

EXP. NO. 780

DATE 11-5-84

REF. D'W'G. NOS. DIA-1188-C-5A1

BY PKZ ORIG. \_\_\_\_\_

BEAM COMPONENTS

COORDINATES

SYMBOL	TYPE	BEARING	ANGLE	DISTANCE	NORTH	EAST
"A" STATION		16.9345°	16°56'04"		13165.997	12966.042
Absorber	series of holes			114."		
AIC1	COLL.	Hor.	197" drift 5.00m	167."		
AIQ1	M210	l=52" off	1.32m .28m	223."	-2.779 kg/inch	
AIQ2	M220	l=52" off	1.32m	286."	"	
AIC2	COLL.	Vent. top bottom	l=60" 1.52m	341."		
AIQ3	8Q32-3	l_eff=36" l=11"	.91m .28m	390."	2.045 kg/inch	
AIQ4	M221	l_eff=52"	1.32m	445."	"	
AIP1	8P24	l=77.5"	1.97m	499."		
AID1	M717	-2.0651°	-2°03'54"	587A.57"	17.90 kg	
	18072 gap=6"	14.8694°	l_eff=78" 1.98m	l=20" .51m		
AID2	M708	-2.0651°	-2°03'54"	97."		
	18072 gap=4"	12.8043°	l_eff=76" 1.93m		18.37 kg	
AIC3	COLL.	Vent, Hor.	l=635" 16.17m	638."		Pick up primary beam to clean up
AIQ5	8Q32-9		l_eff=36" .91m	692."	off	
	(See a sweep here)		l=54" 1.37m			
A3D3	M702	-2.8233°	-2°49'24"	801.014"	25.80 kg	
	18072 2" gap	9.981°	l_eff=74" 1.98m	l=22" .56m		
A3D4	M802	-2.8232°	-2°49'23"	96."	25.80 kg	
	18072 2" gap	7.1578°	l_eff=74" 1.98m	l=22" .56m		
A3D5	M730	-2.8233°	-2°49'24"	96"	25.80 kg	
	18072 2" gap	4.3345°	l_eff=74" 1.98m	l=20" .51m		
A3D6	K.O.A.	-2.2°	-2°12'	94"	20.10 kg	
	10072	2.1345°	l_eff=74" 1.98m	l=20" .51m		
A3Q6	M206		l_eff=52" 1.32m	82.987"	-4.105 kg/in	
	8Q48		l=13.8" .35m			
A3Q7	M5Q36-1		l_eff=44" 1.12m	743.237"	off	
			l=71.05" 1.80m			

SWICS  
Flag  
SEC

not raised  
for string

Flag

u  
10072  
10072  
10072







BEAM SET-UP SHEETS

HIGH POWER TUNES

BY SCHWANER DATE 4/23/85 SHEET 1 OF 2  
 EXPERIMENT NAME MORSE/SCHMIDT No. 780 LIAISON T. BLAIR  
 BEAM CONDITION POSITIVE MOMENTUM 28.5 Ge/c  
 REQUESTED BY \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 COMPLETED-WATCH SUP \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

FILE # 916  
 FEB 4, 1984

DESIG.	MAG.	P.S.	R.V.	POL.	POS.	INIT.	T.S.	POS.	INIT.	TAP	INIT.	MAG. I	INIT.
A1Q1	210	407	69	B					2430	2		2430	✓
A1Q2	220	417 <sup>M</sup>	/	B						2		"	✓
A1Q3	8Q32 -3	401 <sup>M</sup>	67	A						4		1975	✓
A1Q4	221	425	/	A						4		"	✓
A1P1	8P24 -1	10-3	BI	B						-		138	off
A1D1	717	402	62	A						2		1882	1897
A1D2	708	436	BI	A						3		1640	1700
A1Q5	8Q32 -9	412	80	A						4		565	✓
A1D3	702	324	BI	A					2480	3		1550	✓
A1D4	802	322	BI	A					2835	1		1770	✓
A3D5	730	318	36	A						3		1500	1453
A3D6	CATH OF ARGON	5125 -1	NA	A						2150	1	269	1130
A3Q6	206	421	AS4	B			81			4		2600	2125
A3Q7	5Q36 -1	252	45	B			41			1800	1	1100	900
A3Q8	5Q36 -2			A						↓		1100	900
A3Q9	N3Q36 -10	420	68	A			90			4		2200	1800
A3D7	715	307	NA	B			88			3		1200	
A3D8	712	405	AS2	B			63			2		1867	
A3D9	727	923	BI	A			38			1		1000	
A3D10	72D18 -3	268 450-5	BI	A			44			1		2500	
A3D10T	18C72 Coils	468	BI	A						3		1500	

SENSITROLS SET BY \_\_\_\_\_ DATE \_\_\_\_\_



# EXPERIMENTAL BEAM COMPUTER SETUP

BEAM LINE A3 STATUS PRIME SHEET 2 OF 2  
 EXPERIMENT NAME MORSE/SCHMIDT NO. 780 MOMENTUM 28.5 GeV/c+  
 COMPUTER B PORT NO. 3 TERMINAL NO. 6 TUNE BOX 7

REQUESTED BY \_\_\_\_\_ DATE \_\_\_\_\_ LIAISON \_\_\_\_\_  
 COMPLETED BY \_\_\_\_\_ DATE \_\_\_\_\_ FILE LOCATION \_\_\_\_\_

IN CTS

ID	POWER SUPPLY	SET POINT	TOL	POL	STATUS	MAGN LIMIT	ADD
Q12	417	2430	4.0	B	ON	2564	201
Q34	401	1975		A	ON	1996	202
P01	10-3	2208.		B	ON	4000	203
D01	402	1882		A	SECURITY INT'LK ON	2409	204
D02	436	1640		A	SECURITY INT'LK ON	2409	205
Q05	412	565		A	ON	3000	206
D03	324	2480.		A	SECURITY INT'LK ON	2496	207
D04	322	2832.		A	ON	2848	210
D05	318	2400.		A	ON	2416	214
D06	S125-1	2152.		A	ON	2232	215
Q06	421	2600		B	ON	3200	212
Q78	252	2200?		B/A	ON	2400	220
Q09	420	2200		A	ON	2400	213
D07	307	1920.		B	ON	2000	221
D08	405	1867		B	ON	1900	217
D09	923	2666.		A	ON	2693	222
D10	450-5	3333		A	ON	3346	223
D10T	468	1500		A	ON	1800	224

COMMENTS: HIGH POWER TUNE  
 SECURITY INT'LK. P.S. 402, 436, 324  
 HIGH RISK ELEMENTS A3D6, A3D10, A3D10T

WATCH SUPERVISOR \_\_\_\_\_



7/27/1982  
10:05  
1982  
H. Brown

Flag  
A105  
A104  
A103  
A102  
A101  
A100

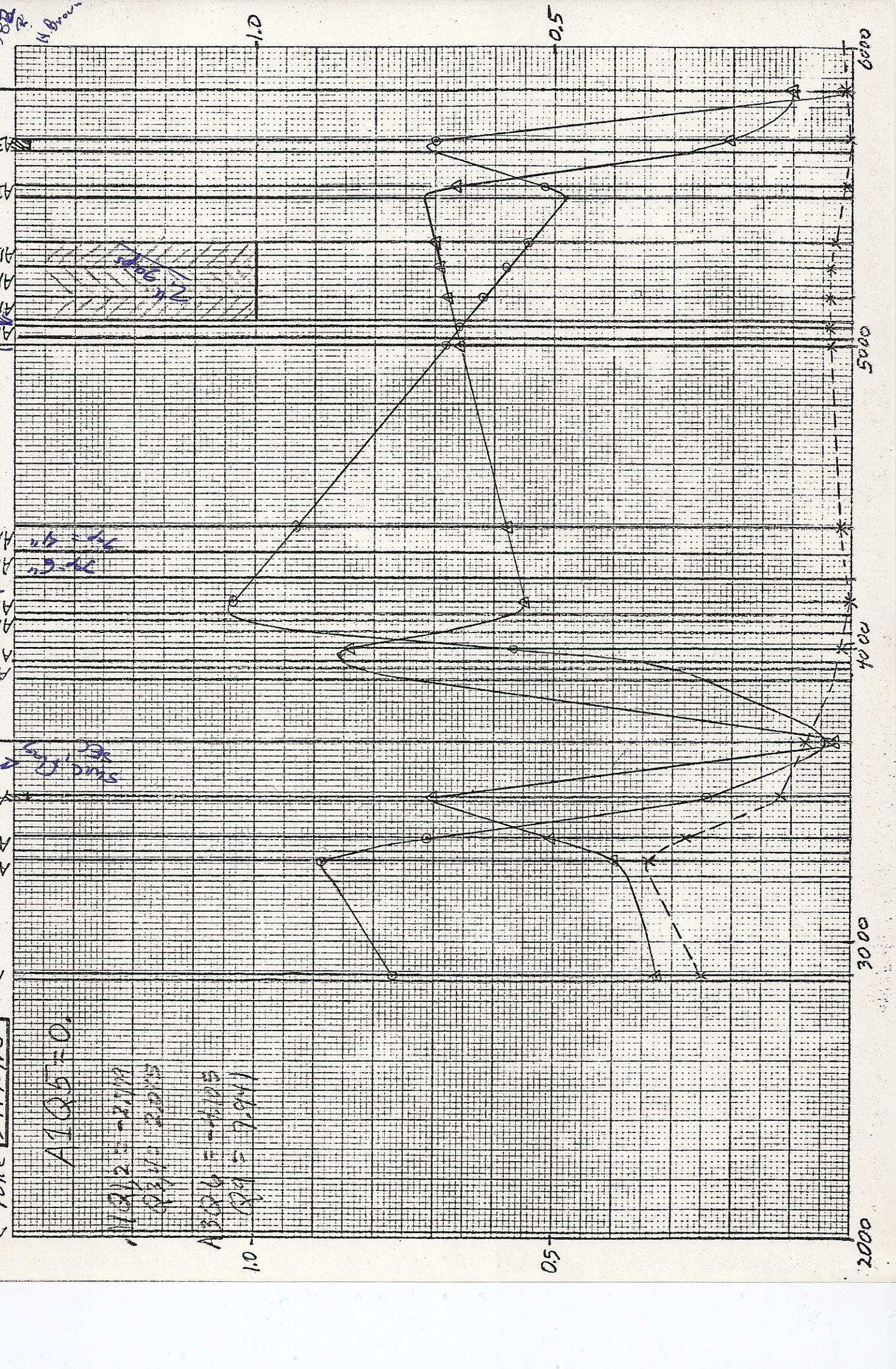
10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105



A-A3  
Tune STRONG

A105 = 0

A102 = 2.111  
A104 = 2.015

A106 = 4.125  
A109 = 7.941

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105

10 X 10 TO THE HALF INCH  
A-A3  
A101  
A102  
A103  
A104  
A105



Parby

AIQ1-4, Q6

Multiply by kamps to get gradient

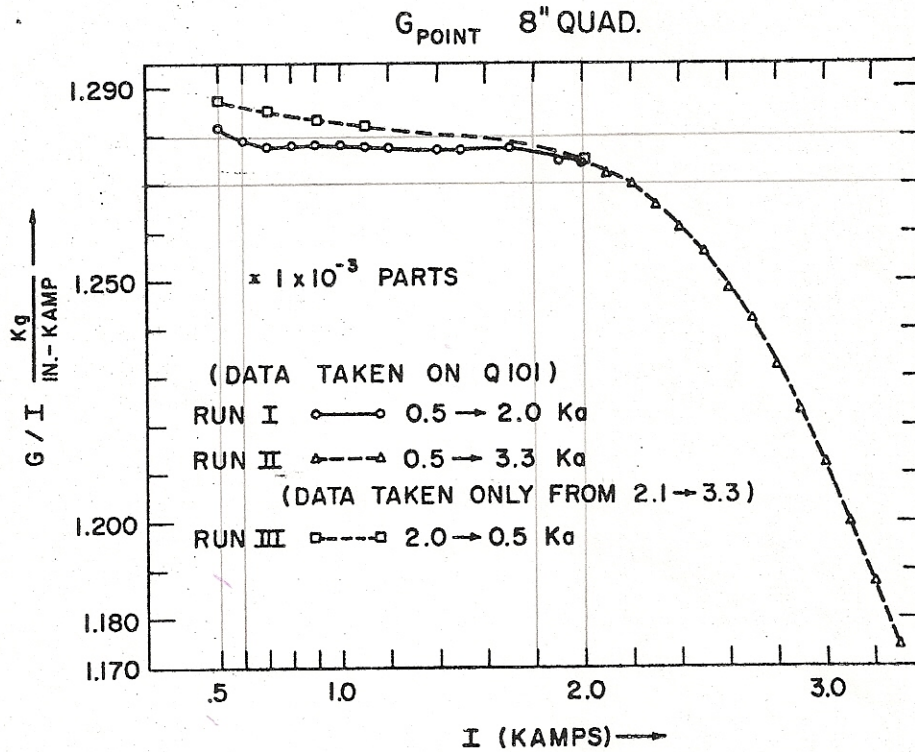


Fig. 6. Gradient, G point, vs I for 8 inch quadrupoles.



Darby

A101-4, Q6

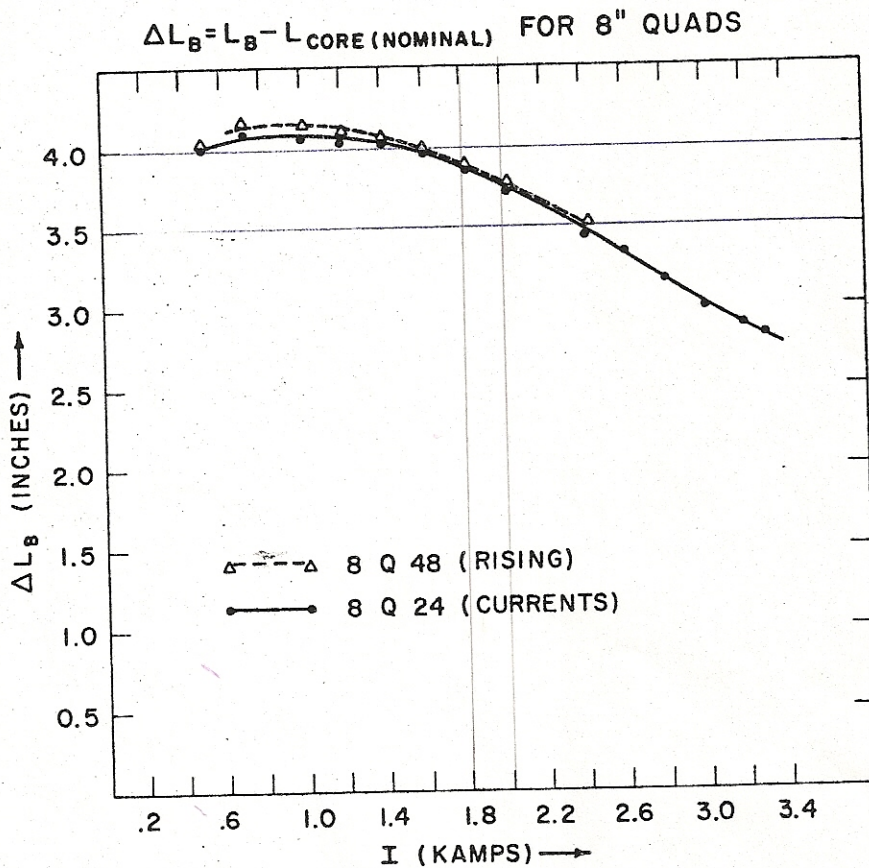
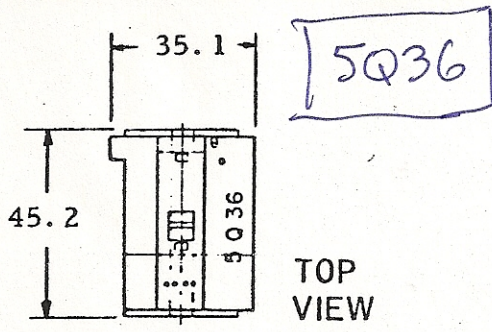
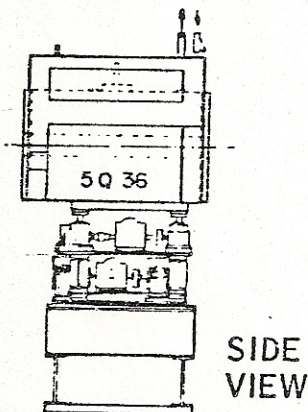
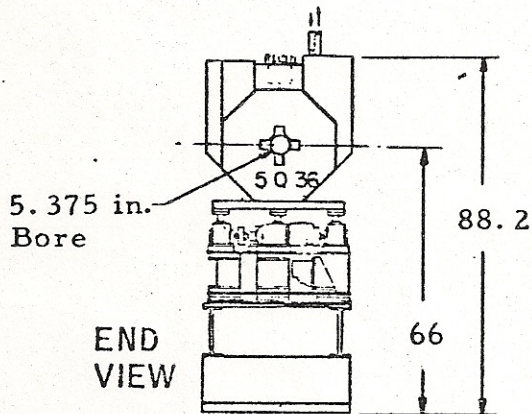
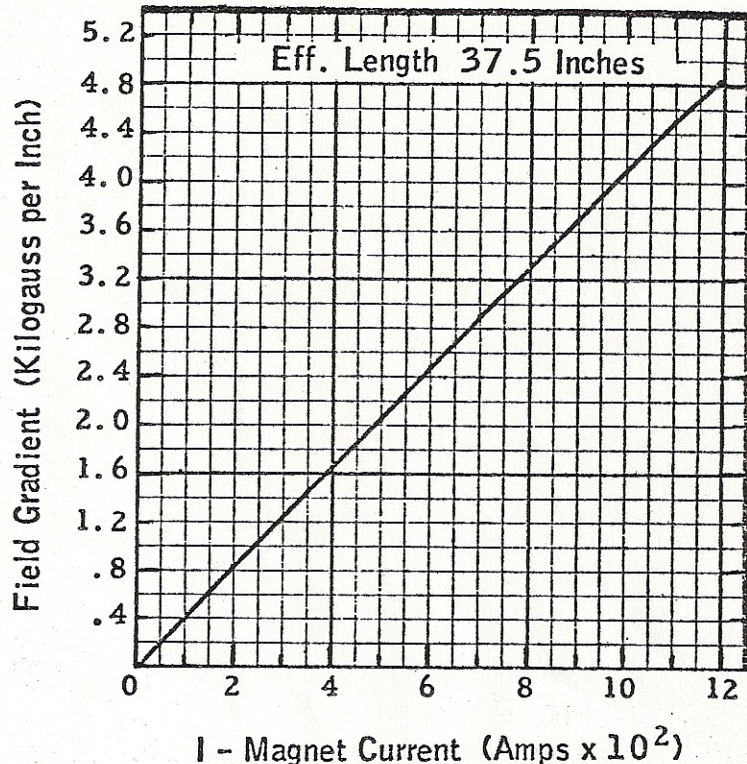


Fig. 7. Magnet length,  $L_B$ , vs  $I$  for 8 inch quadrupoles. ( $L_B = \Delta L_B + L_{core}$ ).





A307, Q8



Total Weight: 3.5 Tons

Measured Data:

- Voltage 122 Volts dc
- Current 1200 Amps dc
- Power 146 kW
- Field Strength 13.0 kG

Cooling Water  
(System Pressure Drop 200 psi)

- No. of Circuits 24
- Pressure Drop 75 psi
- Flow 14 gpm
- Temp. Rise 72°F

Current (Amps)	Terminal Voltage (Volts)	Gauss/Inch
200	19	831
300	28	1244
400	38	1658
500	48	2075
600	58	2488
700	68	2907
800	78	3317
900	90	3724
1000	101	4116
1100	112	4489
1200	122	4832
Errors	± 2%	+1 to +3%



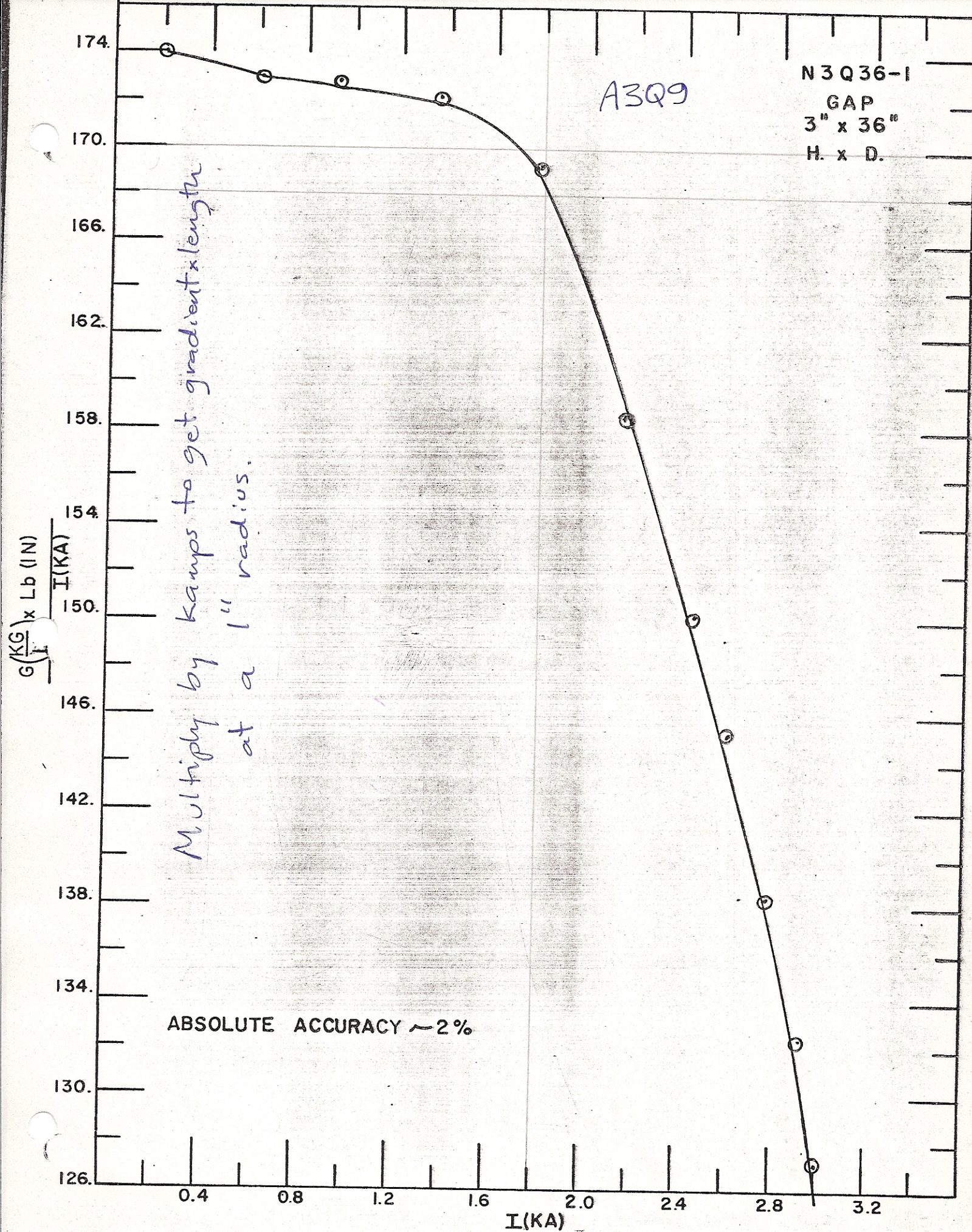
N3Q36-1

GAP  
3" x 36"  
H. x D.

A3Q9

*Multiply by kamps to get gradient x length  
at a 1" radius.*

ABSOLUTE ACCURACY ~ 2%





18D72 (6" gap)

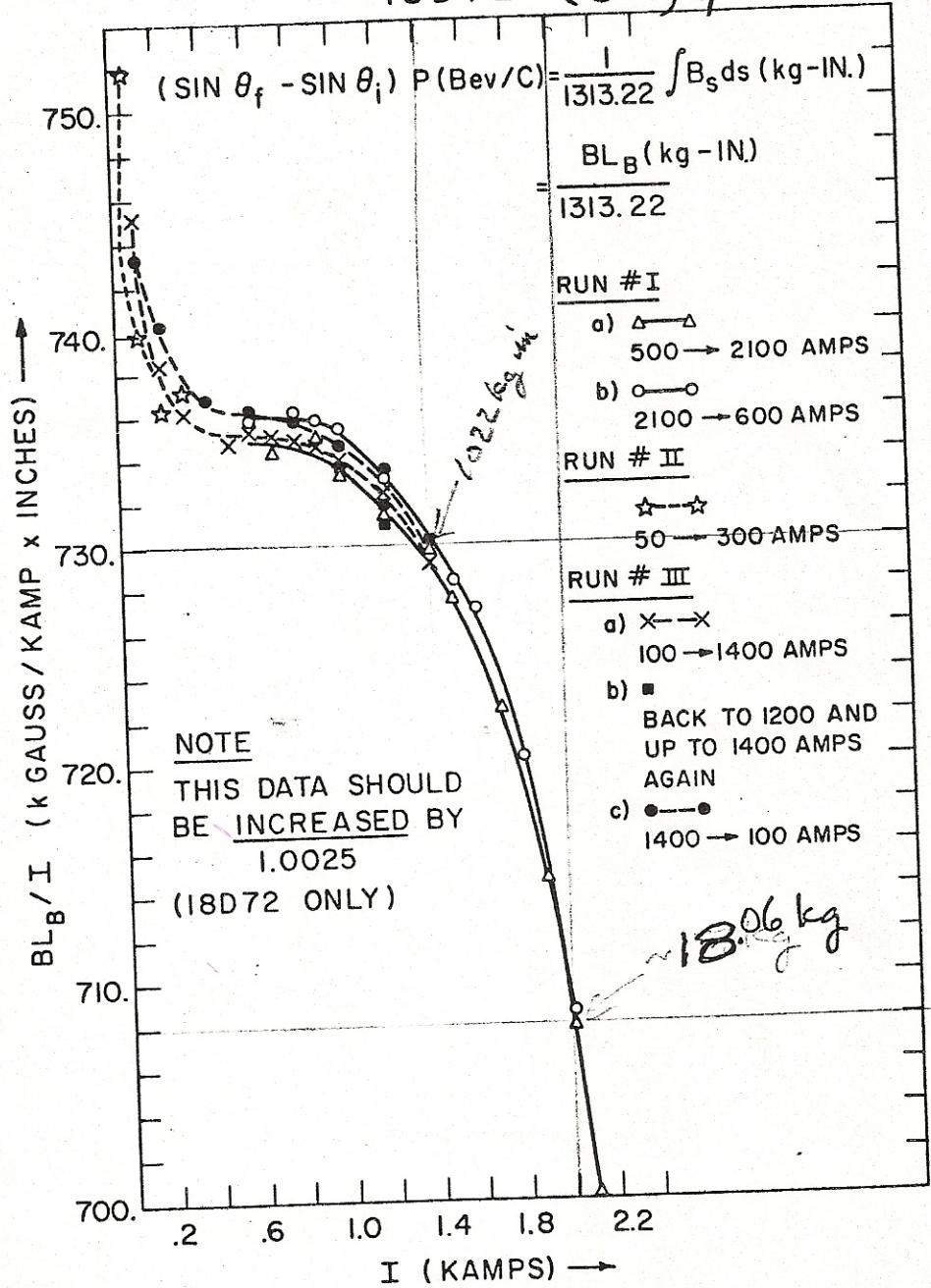


Fig. 2.  $\int B_s ds$  vs I for 18D72 magnets.

1 k amp  $\Rightarrow$  735  $\frac{\text{kg}}{\text{kamp}}$  x inches

$L_{eff} = 79.6$

$B = 735 / 79.6 = 9.23 \text{ kg}$



Darby

AID1

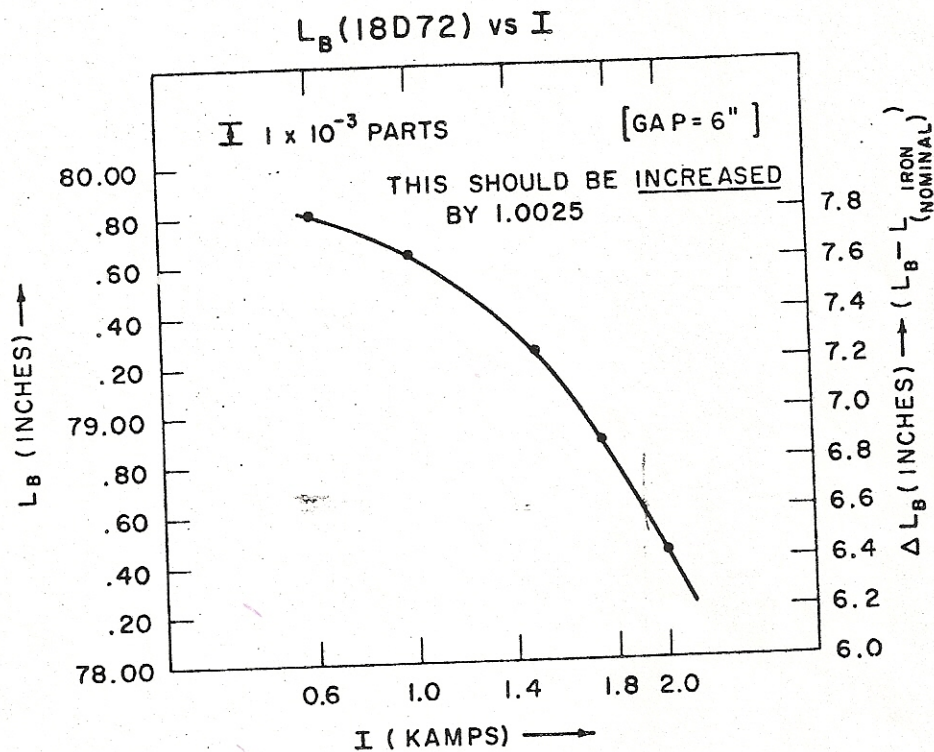


Fig. 3. Magnet length,  $L_B$ , vs  $I$  for 18D72 magnets.

(6" gap)