BOOK70R

Notes:
"2% - Bk #2 H/X = 195, 294 + 404 58-59" on front
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Blank pages: page opposite page 1, 4, 170, 171, 290, 294-300, inside back cover sheets

-following pages each have 1 graph taped to it (all were re-taped): 16, 22, 115, 120, 124, 128, 142, 148, 177
-pages 45/46, 231/232, and 259/260 have a paper clip at top of each page
-page 61 has 1 (8.5x11) sheet taped
-page 63 has 1 (8.5x11) sheet taped
-1 small sheet of paper between pages 72/73
-1 keypunch computer card between pages 94/95
-page 107 has 1 (8.5x11) sheet, 1 half sheet, and 1 keypunch computer card taped to it
-page 199 has 2 small pieces of paper taped
-page 205 has 5 small pieces of paper stapled
-page 257 has 1 small piece of paper taped
-page 266 has 1 half sheet taped

Scanned by:
Sheila Finch
RSICC /Oak Ridge National Lab.
August 24, 1999

E-10

2%
Book # 2

Standard Blank Book

No. 38

Journals Double $ and Cts. no Units

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$\frac{H}{X} = \sim 350$

$\frac{H}{X} = 404$

Temp Coeff. - P.# 107

$\frac{H}{X} = 195^-$

Assembly	Page
28" X 28" - Comp. Refl.	178
33" Dia Cylinded - Bore	181
30" X 30" - Bore	185
28" X 28" - Bore	218
32" X 34" - Bore	249
30" X 30" - Bore	274

3 4

FAST FISSION FACTOR

28 X 28 X 37.5	230 - 241
32 X 32 X 21 1/2	264 - 270
32 X 34	271 - 273

7/8/58

McCarty
Connally
Lynn

INSTRUMENT CHECK

Time 9:45 AM Source X

Channel

	A	B	C	D	E
Range	10/1000	apr	10"	10/1000	900 V
Source Dist.	1"	0"	15"	1"	15"
% F.S. Trip	90	21	100	70	100

Counters

C.A. 220 ~~9.75~~ 90.25 Expr. 26 MI-1 Run 1

Sheet ..... Date 7-8 1958 Time 9:55 AM ~~PM~~

Purpose 26" Parallelipiped

Fuel 26" high

Bare

LOADING CHANGE

Description alternating blocks (4" cubes)

676 in² x .9454 x 26 = 16.616

- 74

16.542 kg

Mass before change ..... gmU gmU-235

Mass of Change ..... gmU gmU-235

Total Mass ..... gmU gmU-235

Sub-critical

alternating blocks - that is one $\frac{H}{X} = 200$ then one $\frac{H}{X} = 300$ block

6

c 27% $\frac{90.25}{9.75}$ Expr. 28 M1 1 Run 1

Sh Date 7-8 1958 Time 11:85 AM

Para 28" Parallelipiped

Fuel 28" high

Bare

Description alternating blocks (4" cubes)

784 in^2 x 9454 x 28 = 20.950

- 82

20.668

Mass of U-235

Mass of U-235

Total gmU gmU-235

Super-critical Tables point .18

CA 27 $\frac{90.25}{9.75}$ Exp. 28m1 Run 2

Sheet 7-8 of 8 Time 11:28 AM ~~PM~~

Purpose 28" Parallelipiped
Fuel 26" High

Bare
~~LOADING CHANGE~~

Description alternating blocks
$784 in^2 \times .945 \times 26 = 19.268$
-82
19.186

Mass before change	gmU	gmU-235
Mass of Change	gmU	gmU-235
Total Mass	gmU	gmU-235

Sub-critical

8

C.A. 270 $\frac{90.25}{9.75}$ Expr. 28 M 1 3

Sheet ____ Date 7-8-58 2:25 PM

Purpose 28" Paralleleppiped
Fuel 27" High

Bare

LOADING CHANGE

Description alternating blocks

$784 in^2 \times .945 \times 27 = 20.000$

82

19,918

fine change gmU

Change gmU 5

gmU 235

CRITICAL POSITIONS

C.A. 270 $\frac{90.25}{9.75}$ Expr. 28 M 1 Run 3

Table Pos. .01

A - .045 A 78 $\frac{100}{100}$

C - 14.485 B .0033

6.0 3X10 -10

D 5 - X $\frac{100}{100}$

E .1 900

Crit. 2:40 AM PM Duration ____ min.

Rod C @ .155 197.7 Sec. ~~of min.~~

Levelec no. C 14.485

19.918
92
19,826

5.65

1st
5.6
6.2
2
—
26
Criti
21
19

C.A. 290 $\frac{90.25}{9.75}$ Expr. 28 m_1 1 Run 4

Sheet ____ Date 7-8- 1958 Time 3:15 AM PM

Purpose 28" Parallelepiped

Fuel 27" High Plus 1 Reflector

Bare

LOADING CHANGE

Description Alternating blocks

784 in^2 X 9454 X 27 = 20.000

$-8c$

19.918

+ 92

20.010

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

~~Total Mass~~ ____ gmU ____ gmU-235

1 reflector 6.2 ¢

$\frac{5.6}{6.2} \times .125" = .114"$

27.000

− .114

26.886

Critical at 28 x 28 x 26.9

21090 in^3

19940 Kg

CRITICAL POSITIONS

C.A. 290 $\frac{90.25}{9.75}$ Expr 28 m_1 1 Run 4

.015

Channel

A- .035 A 34 100/200

C- 19.01 B .0028

C 54 3X10 =10

D 50 100/100

E 2 900

Time Crit. 3:25 PM Duration 8 min

Rod C @ 17.88 on 175.9 sec period = 6.2 ¢

Leveled Rd. C @ 19.01 Sensitivity ____ ¢/in

6.2
J.L

10

7/9/58

McCarty
Connally
Lynn

INSTRUMENT CHECK

Time 12:45 PM

Range	$\frac{10}{1000}$	opr	10^{-11}	$\frac{10}{1000}$	900V
Source Dist.	1"	0"	14"	1.5"	15"
% F.S. Trip	90	OK	100+	70	100+

Counters

C.A. $27_0 \frac{90.25}{9.75}$ Expr. $28M_2-1$ Run # 1

Sheet ____ Date 7-9-58 Time 1:08 PM

Purpose 28" Parallelepiped

Fuel 27" High Plus 1 octant

Bare

$27\frac{1}{8}$"

LOADING CHANGE

Description

$784in^2 \times .9454 \times 27 = 20,000$

this assembly built by stacking blocks, 2 blocks of a kind in one dimension.

		−82	
Mass before change	gmU	19.918	gmU-235
		+92	
Mass of Change	gmU	20.010	gmU-235
Total Mass	gmU		gmU-235

CRITICAL POSITIONS

C. $2_{90} \frac{90.25}{9.75}$ Expr. $28M_2-1$ Run 1

Top Plate .101 T B

Channel

A	.03	40	100
C	~~16.3~~ 16.11		206
B		.0032	
C		6.2 3×10^{-10}	160
D		57	100
E		.2	980

1:28 P.M.

Rod C @ 14.48 on 508 sec period = 2.84

Levelac Rd. C @ 16.11 Sensitivity 1.42 %

3.10
1.47
8.12

The above run was made during a run by the South-wing of above normal operating power (Factor of 10).

CRITICAL POSITIONS

290 9025 9.75 for 28M2-1 Run #2

Channel

A -.03

C - 16.31

B Same

D as Run 1

E

Time Crit. 2:10 AM PM Duration ____ min.

Rod C. withdrawn to 16.11 on Slight Per.

Rod C @ 14.48 on 476 sec period = 2.53¢

Leveled Rd. C @ 16.31 Sensitivity ____ ¢/in.

Reactor level with Rod C = 16.31

After Southwing shut down Rod C adjusted to 16.11 adjustment was Probably made to quickly.

12

7/10/58

McCarty
Connolly
Lynn

INSTRUMENT CHECK

Time 9:45 AM

Source

	A	B	C	D	E
	10/1000	off	10''	10/1000	900 V.
	1''	0''	15''	1''	14''
% F.S. Trip Counters	90	ok	100+	70	100+

C.A. 270 90.25/9.75 Expr. 28 M3 - 1 Run 1

Date 7 - 10 1958 Time 9:55 AM

Purpose 28'' Parallelepiped
Fuel 27'' High - Plus 1 Octant

Bare

LOADING CHANGE

Description
784 in² X .9454 X 27 = 20,000
- 82
19,918
+ 92
20.010

This assembly was built by stocking 2 blocks of a kind in three dimension.

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU ____ gmU-235

C.A. 270 90.75/9.75 Run 3

.01

Rod	Channel	
A - 0	A .81	100/100
C - ~~13.54~~ 13.65	B .0033	
	C 7.8 3X10^-10	
	D 57	100/100
	E .2	900

10:13 AM 7 min.

Rod C @ 1.55 on 25 sec period = 4.45

Leveled Rd C @ 13.65 Sensitivity

7/11/58

McCarty
Connolly
Lynn

INSTRUMENT CHECK

8:50 AM Source Y

Channel	A	B	C	D	E
	10/1000 opr		10"	10/100	Scale
Source	1"	0"	16"	1"	15"
% F.S. Trip	90		100+	70	100+

Counters

C.A. 270 90.25/9.75 Expr. ~~24M-1~~ Run 1

Sheet ____ Date 7-11 1958 Time 9:05 AM PM

Purpose 24 ~~10~~" Parallelepiped
Fuel 24" High

Completely Reflected

LOADING CHANGE

Description Stack of alternate blocks
576 X .9454 = 544.55 g/1" Layer

544.55 g/1" X 24 = 13,069 -70 g for rods.

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 12,999 gmU-235

CRITICAL POSITIONS

C.A. ____ Expr. ____ Run ____

Table Pos. .01 T. P. ____

	Channel	
A - 20.22	A 46	100/200
C - 19.225	B .0034	-10
	C 8.8 3X10	100
	D 64	100
	E 1.0	750

Rod C @ 16.00 on 92.2 sec period = 10.3 ¢

Leveled Rd. ____ @ ____ Sensitivity ____ ¢/in.

C.A. 2% 90.25 / 9.75 Expr. 24M-1 Run 2

Sheet _____ Date 7-11 1958 Time _____

Purpose 24" Parallelepiped

Final 24" Slat Table 23.5"
23" on mod Table

Completely Reflected

LOADING CHANGE

Description Removed 1" plexiglas from ½"

136 g/quad. 544.55 X 23.5 / 24 = 12,796
-70
12,726

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 12,726 gmU-235

CRITICAL POSITIONS

2% 90.25 / 9.75 Expr 24M-1 Run 2

.01 T.

Chart

A - .025 = .88 = 100/100

C - 18.525 = .0033 = 6.73 X 10^-10 = 10.0/100

D 59. = 100

E 1.0 = 750

21.3% Excess

Time Crit. 10:28 AM PM Duration 6 min

Rod C - 14.00 - 67.33 Res. Period = 13.1

Leveler C 18.52 Sensitivity 2.9 ¢/in

Ro
0+
13.4
14.0
2
1c

CA 2 70 $\frac{90.25}{9.75}$ Expr. 24M-1 Run 3

Sheet Do 7-11-1958 Time 10:48 AM PM

Purpose 24" Parallelepiped

Fuel ~~24"~~ on Stat Tally 23" except for 1 quadrant @ 24"

Completely Reflected

23.25"

LOADING CHANGE

Description Removed 1" layer from 1 quadrant

544.55 x 23.25 = 12,660

70 for rods

12590

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 12,590 gmU-235

CRITICAL POSITIONS

~~2~~ 9 6 $\frac{90.25}{9.75}$ Expr. 24M-1 Run 3

.015

Channel

A .015 43 100/200

C 13.40 .0032

6.3 3X10⁻¹⁰ 100/100

.57 .8 750

Time Crit. 12:13 AM PM Duration 8 min.

12,590

- 52

12,548 g

11

0

Rod C

0 to 13.4 = 6.5¢

13.4 to 14.0 = 1.7

14.0 to 18.52 = 13.1

21.3¢

- 6.5

15.8¢/quadrant

23.15"

High = 0¢

Rod C @ .155 on 165 sec period = 6.5¢ Exam

Leveled Rd. C @ 13.40 Sensitivity ____ ¢/in.

16

C.A. 27 90.25 / 9.75 Expr. 26M-1 1

Sheet _____ Date 7-11-58 Time 2:35 AM PM

Purpose 26" Diameter Cylinder

24" High (532 in² Base)

Completely Reflected

LOADING CHANGE

Description Stack of alternate blocks

532 in² X .9454 = 502.95 g/1" layer

502.95 X 24 = 12,070, -70 for rods

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 12,000 gmU-235

CRITICAL POSITIONS

C.A. 27 90.25 / 9.75 Exp. 26M-1 Run 1

Rod P _____ 101 T _____

Channel

A 80 10.0 / 100

B .0032

C 6.0 3X10⁻¹⁰ / 100

D 55 / 100

E 1.0 750

Tim Crit. 2:46 AM PM Duration 6 min.

Rod C @ 13.00 on 80.36 sec period = 11.45

Leveled Rod C @ 17.20 Sensitivity 2.71 in.

Rod C

0 to 11.22 = 3.55 ¢

11.22 To 13.00 = 4.4 ¢

13.00 to 17.20 = 11.4 ¢

19.35 A - .06

C - 17.20

Excess

126 g/

1/4 X 126

11,8

11

Rod C

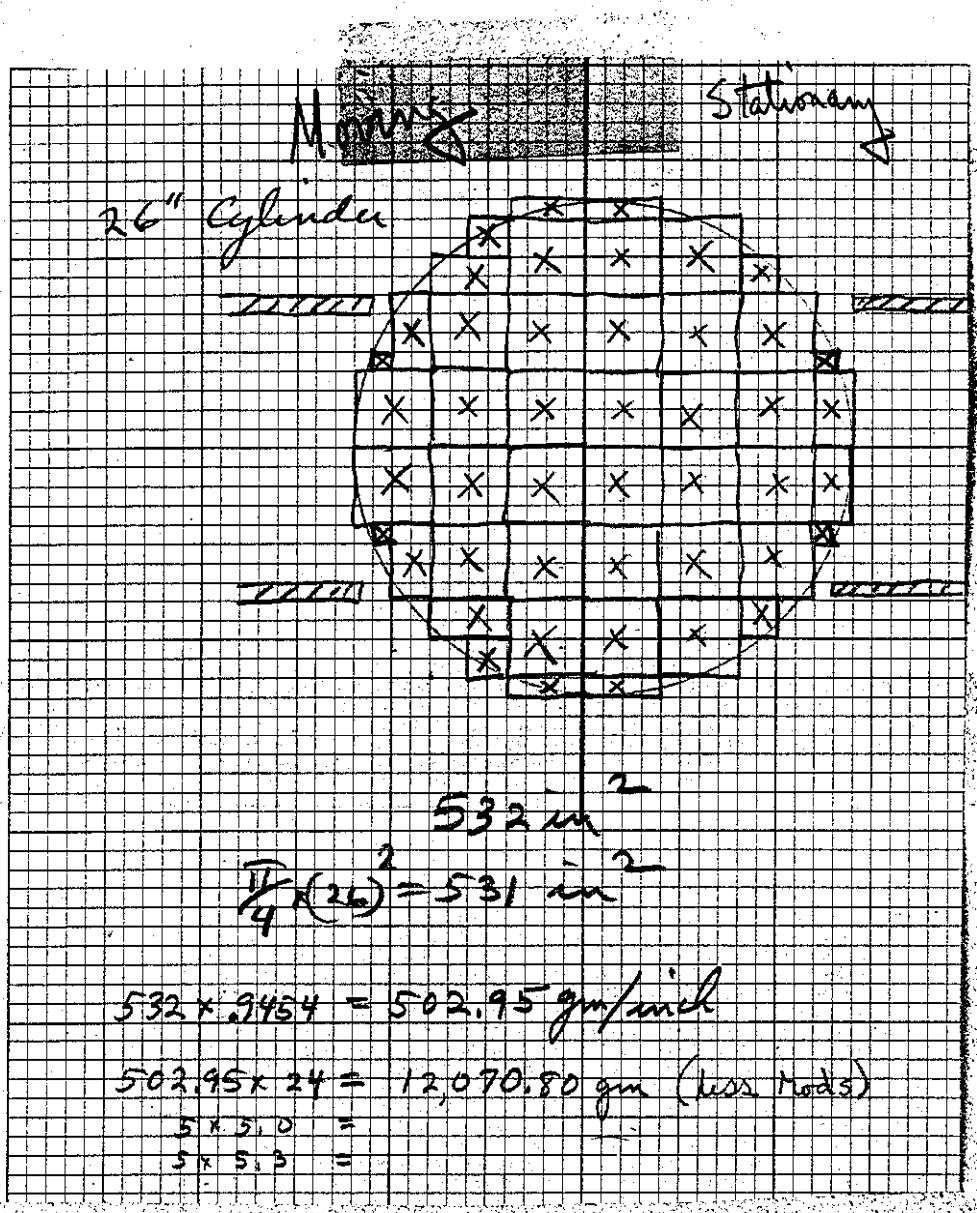
0 to

19.35

3.25

16.8

1



532 in²

$\frac{\pi}{4} \times (26)^2 = 531$ in²

532 × .9454 = 502.95 gm/inch

502.95 × 24 = 12,070.80 gm (less Mods)

5 × 5.0 =

5 × 5.3 =

17

C.A. 2% 90.25 / 9.75 Expr. 26M-1 Run 2

Sheet ____ Date 7-11-68 3:10 PM

Purpose 26" Dia. Cylinder
24" on 3 quadrants
23" on 1 quadrant

23.75"

LOADING CHANGE

Description Removed 1" layer from 1 quadrant

126 g/quadrant — 502.95 X 23.75 = 11,945
- 70

1/4 X 126 = 42

Mass before change	____ gmU	____	gmU-235
Mass of Change	____ gmU	____	gmU-235
Total Mass	____ gmU	11,875	gmU-235

11,875
- 42
11,833 g = 0 #

CRITICAL POSITIONS

C.A. 2% 90.25 / 9.75 Expr. 26M-1 Run 2

Table Pos. .015

Control Rod — Channel

A 0.055 — A 73 10/500

2 11.22 — .0015

3 — C 5.6 2.5 X 10^-10

4 — D 54 10/500

E .5 750

Tim Crit. ____ AM / PM Duration ____ min.

Rod C 0 to 11.22 = 3.55

19.35
3.55
15.8 # / quadrant

23.75
- .05
23.7" height

12,608 in^3

206 liters

Rod C @ .155 on 337 sec period = 3.55 ¢

Leveler Rod C @ 11.22 ____ ¢/in.

18

7/14/58

McCarty
Lynn
Connolly

INSTRUMENT CHECK

Time 2:24 PM

Source γ

	A	B	C	D	E
Range	10/1000	opr.	10^{-11}	10/1000	900V
Source Dist.	1"	~~0~~	15"	1½	15"
% F.S. Trip	85	OK	100+	75	100+

C.A. 2.70 ~~4.75~~ ~~8.48~~ 8.48 ~~15.2~~ 15.2 Expr. 20L-1 Run 1

Sheet ____ Date ____ 195__ Time 2:40 PM

Purpose 20" Parallelepiped

~~Bare~~ 20" High [18" Fuel + 4 layers ½" plexiglas]

Completely reflected

= 300 blocks

LOADING CHANGE

Description assembly built by Lattice Gmbh with ½" plexiglas to give # = 400.

A_4 = 75	207,450	4,149.00	
A_5 = 5	12.500	250.00	
A_2 = 40	55.280	1,105.60	
Mass B_X = 5	3.45K	69.05	gmU-235
Mass of			gmU-235
Total #	278,684	5,573.65	gmU-235

Sub-critical

C.A. ~~8-4-8~~ 15.2 Expr. 20L-1 Run 2

Sheet ____ Date 7-18-58 Time 3:20 PM

Purpose 20" Parallelepiped

~~Fueled~~ 22" high [20" Fuel + 4 layers ½" plexiglas]

Completely Reflected

LOADING CHANGE

Description added: 2" layer to top

	$A_2 4 = 11$	30,426	608.52
	$A_2 2 = 3$	4,146	82.92
Removed:	$B_2 4 = 5$	3,450	69.05

Mass before change 278,684 gmU 5,573.65 gmU-235

Mass of Change 31,122 gmU 622.39 gmU-235

Total Mass 309,806 gmU 6,196.04 gmU-235

Sub Critical

20

7/15/58

McCarty
Connolly
Lynn

INSTRUMENT CHECK

Time 8:40 AM/PM Sit r

	Channel A	B	C	D	E
Range	10/1000	OPR	10"	10/100	900 V.
Source Dist.	1"	0"	14"	1"	16"
% F.S. Trip Counters	95	OK	100+	75	100+

C.A. 2% ~~15.2~~ 84.8 Expr. 221-1 Run 1

Sheet ____ Date 7-15-1958 Time 8:50 AM ~~PM~~

Purpose 22" Paralleliped
20" High

Comp. Rifle

LOADING CHANGE

Description Added:

$A_2 = 20$	27,640	552.80	
$A_2 = 5$	3,455	69.10	
$C_2 4 = 10$	1,730	34.70	
Mass before change	309,806 gmU	6196.04	gmU-235
Mass of Change	32,825 gmU	656.60	gmU-235
~~Total Mass~~	342,631 gmU	6,852.64	gmU-235

Sub critical

C.A. 290 ~~75-2~~ 84.8 Expr. 22L-1 Run 2

Sheet ____ Date 7-15 1958 Time 9:45 ~~PM~~ AM

Purpose 22" Parallelepiped

22" High [20" Fuel + 4 ~~1~~ Layers of ½" plus ight)

Completely reflected

22" cube

10,648 in³

LOADING CHANGE

Description Added.

$A_z 2 = 23$	31,786	635.72
$B_z 4 = 2$	1380	27.62
$C_z 4 = 4$	692	13.84
$c2 = 3$	258	5.19

Mass before change 342,631 gmU 6,852.64 gmU-235

Mass of Change 34,116 gmU 682.41 gmU-235

Total Mass 376,747 gmU 7,545.05 gmU-235

~~Added~~

Sub Critical

$$\frac{10,648}{7,545} = .7086 \text{ g/in}^3$$

CA 270 $\frac{848}{15.2}$ Expr. 22L-1 Run 3

Sheet _____ Date 7-15-58 12.55 PM

Purpose 22" Parallelepiped

23⅛" High [Fuel = 21" + 4 layers of ½" plexiglas + 1 layer ⅛" plexiglas]

Completely reflected

LOADING CHANGE

Description Added

A 21 = 25	17,275	
C 4 = 10	1,738	
Mass before change	376,747 gmU	7,545.05 gmU-235
Mass of Change	19,005 gmU	380.20 gmU-235
Total Mass	395,752 gmU	7,925.25 gmU-235

CRITICAL POSITIONS

CA 270 $\frac{848}{15.2}$ Expr. 22L-1 Run 3

,015 T

Channel		
A 06	A 48	100/200
C 18.27	B .0033	
	C 6.5 3X10⁻¹⁰	100
	D 56	800
	E 10	750

Run Crit. 1:07 AM PM Duration 6 min.

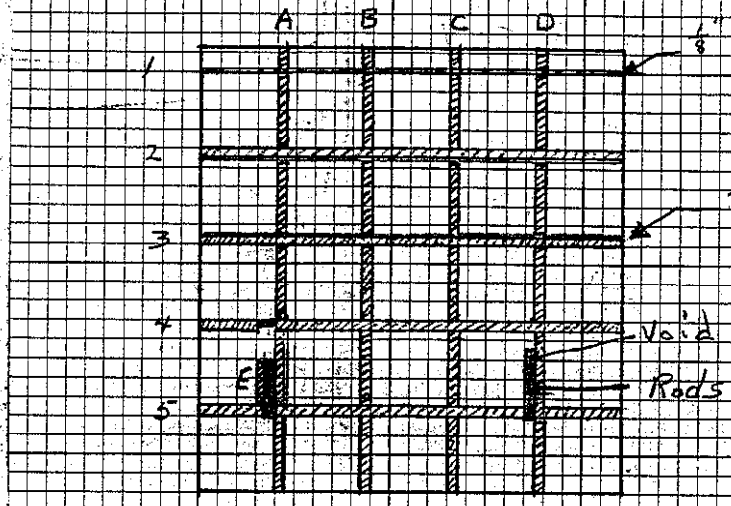
35.7 Excess

Rod C @ 16.00 or 75 sec period = 12.1

Levelec Rod C @ 18.27 Sensitivity 5.33

Rod
0
11.50
0
11.5
14.7
16.0

DIETZGEN GRAPH PAPER
10 PER INCH
EUGENE DIETZGEN CO.
MADE IN U.S.A.



1_4 – $\frac{1}{2}'' \times 22'' \times 11'' = 30.25\ in^3$

$2+3$ – $\frac{1}{2}'' \times 22'' \times 22'' = 484.0\ in^3$

4 – $\frac{1}{2}'' \times 22'' \times 21.5'' = 236.5\ in^3$

5 – $\frac{1}{2}'' \times 22'' \times 21'' = 231.0\ in^3$

A, B, C, D – $\frac{1}{2}'' \times 22'' \times 21'' = 924.0\ in^3$

E – $\frac{1}{2}'' \times 22'' \times 2.5'' = 27.5\ in^3$

1933. in^3 plexiglas

For Assembly 22.5" High

to give 0 Excess

C.A. 290 84.8/15.2 Expr. 22L-1 Run 4

Sheet ____ Date 7-15 1958 Time 1:25 PM

Purpose 22" Parallelepiped
23⅛" High Except for 1 quadrant.
[20.75" Fuel + 4 Layers ½" plexiglas + ¾ Layer 3 ⅛" plexiglas]
Completely Reflected

Rod C
0 to 12.795 = 9.0¢
11.50 to 12.795 = 2.5¢
0 to 11.50 = 6.5¢
11.50 to 14.78 = 11.6¢
14.78 to 16.00 = 5.5¢
16.00 to 18.27 = 12.1¢
35.7¢

LOADING CHANGE

Description			
Removed	$A_2 1 = 9$	6219	124.38
Added:	$C_2 1 = 1$	43.4	0.868
	$C_2 4 = 8$	1,388	27.76
Mass before change	395,752 gmU	7,925.25	gmU-235
Mass of Change	4788 gmU	95.76	gmU-235
Total Mass	390,964 gmU	7,829.49	gmU-235

7,829.49
- 95.76
7,733.73

CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. 22L-1 Run 4
.02

Rod		Channel	
A	-.06	A 80	100/100
C	-14.78	B .0032	
		C 6.0	2×10^{-10}
		D 55	100/100
		E .9	750 V

Time Crit. 1:38 PM Duration 7 min.

Rod C 11.50 on 78.2 sec period = 11.6¢
Leveled Rd. C @ 14.78 Sensitivity 3.53

Rod C 11.55 on 107 sec period = 9.0¢
Leveled Rd. C @ 12.795 Sensitivity 17.00
Rod A +1

Rod C
0 to 11.50 = 6.5¢
11.50 to 14.78 = 11.6
18.1¢
Excess

7.829
- .096
7.733 Kg

H/X = 38 — 22.56" High ← 0 Excess → 7.733 Kg

24

7/17/58

INSTRUMENT CHECK

Time 9:30 — Signature r

	A	B	C	D	E
Range	10/1000	OPR	10"	10/1000	900V
Source D	1"	0	13"	1½"	16"
% F.S. Trip	90	OK	100	70	100+

counters

C.A. 270 ~~84.8/15.2~~ Expt. 26.5-1 Run 1

Sheet ____ Date 7-17-58 Time 9:40 AM ~~PM~~

Purpose Parallelepiped

Base 26" X 26.5"

26½" High 24" fuel + 5 layers of ½ inch Plexiglas

Base

LOADING CHANGE

Description				
	$A_24 = 204$	564,264	11,285.28	
	$A_245 = 6$	15,000	300.00	
	$A_2 2 = 41$	56,662	1,133.24	
	$A_21 = 6$	4,146	82.92	
	$C_24 = 16$	2,777	55.52	
	$C_22 = 1$	86	1.73	
Mass before				gmU-235
Mass of Ch		gmU		gmU-235
Total Mass	642,935	gmU	12,858.69	gmU-235

Super-Critical

C.A. 270 $\frac{84.8}{15.2}$ Expr 26.5-1 Run 2

Sheet 7-17-8 Time 10:05 AM PM

Purpose Parallelepiped 26½"

Base 26" X 24.5

22" Fuel + 5 Layers of ½" Plexiglas

Bare

22"
2½
24.5" High

LOADING CHANGE

Description Removed:

18 $A_2 4$ = 49,788 99.576

3 $A_2 2$ = 4,146 82.92

Mass before change 142,935 gmU 12,858.69 gmU-235

Mass of Change 53,934 gmU 1,078.68 gmU-235

Total Mass 589,601 gmU 11,780.01 gmU-235

½ inch plexiglas

CRITICAL POSITIONS

270 $\frac{84.8}{15.2}$ Expr 26.5-1 Run 2

.01

		Channel
A-.055	A 75	100/100
C-10.01	B .0034	
	C 7.5 3X10	-10/100
	D 54	100
	E .4	900

Term Crit. 10:22 AM PM Duration 6 min

7-31-58

INSTRUMENT CHECK

Time _____ AM PM Source _____

	Channel A	B	C	D	E
Range	10/1000			10/1000	900
Source Dist.	1"		16"	2"	15"
% F.S. Trip	90		100	70	180+

C.A. 27b 92.8 Expr. 28-5 Run 1

Sheet _____ Date 7-31 1958 Time 3:03 AM PM

Purpose 28" Diameter Cylinder
28" on Stat. table - 28" on movable

Fully Reflected

LOADING CHANGE

Description

6.16 in² X 102.6 X 27.5 = 17,380.44
-107.40
17,273.04

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass 17,273.04 gmU-235

Foil irradiation - 1 dysprosium + 1 Al U.
a 1 inch square hole was left - in center of movable table for shaft of rotating foil holder. a 4"X4"X1" void at interface for holder also.
The above plus voids for rods accounts for the 107.40 gms.

CRITICAL POSITIONS

Expr. 28-5 Run 1

.01

	Channel	
A - 15.12	A 65	100/500
C - 20.685	B .01	
	C 2.5 2.5% 10	-10
	D 42	100/500
	E 3.0	690

Tim Crit. 3:17 AM PM Duration 20 min.

28

8-4-58

Lynn
Connolly
McCarty

INSTRUMENT CHECK

Time 1:00 ~~AM~~ PM Source Y

	A	B	C	D	E
Range	$\frac{10}{1000}$	opr	10^{-11}	$\frac{10}{1000}$	900 V.
Source Dist.	1"	0	16"	$1\frac{1}{2}$"	16"
% F.S. Trip	90	61	100	70	100+
Counters					

Same loading as on P-26 - Hyposium Aluminum foil irradiation - 13 foils in holder numbered side toward table center

C.A. 29.0 $\frac{92}{8}$ Expr. 28-5 Run 2

Sheet ____ Date 8-4 1958 Time 1:05 ~~AM~~ PM

Purpose 28" Diameter cylinder
28" on Stat. Table
27" on Mov. Table

Fully Reflected

CRITICAL POSITIONS

C.A. 29.0 $\frac{92}{8}$ Expr. 28-5 Run 2

Table P .01 T

		Channel
A - 19.555	A 67	$\frac{100}{500}$
C - .155	B .0105	
	C 5.2	2.5×10^{-10} $\frac{100}{500}$
	D 43.5	$\frac{500}{690}$
	E 3.0	

Tim Crit 1:21 $\frac{40}{60}$ AM PM Duration 20 min.

8-6-58

INSTRUMENT CHECK

Time 8:30 AM PM Source V

	A	B	C	D	E
	10/1000	opr	10"	10/1000	900V-
Source Dist.	1"	OK	V	15"	16"
% F.S. Trip	90	V	100+	75	100+
Counters					

C.A. 29.92/8 Expr 28-5 Run 3

Sheet Date 8-6 1958 Time 9:08 AM PM

Purpose 28" Dia. Cylinder
28" on Stat Table
27" on Mov. Table
Fully Reflected

Same Loading as on Page-26
13 Dysprosium Aluminum Foils
5 Gold Foils
2 Dysprosium Oxide Foils
Numbers Toward Table center

CRITICAL POSITIONS

C.A. 29.92/8 Expr 28-5 Run 3

Rod .01 T P

	Channel	
A - 15.10	A 32	1000/500
C - 20.685	.05	
	6.0	5X10⁻⁹
	D 51.5	1000/200
	E 3.2	690

Time Crit. 9:25 18/60 AM PM Duration 20 min.

Easy chamber moved Back; Possibly 4 Ft.

30

8-12-58

Callihan
Connolly
McCarty

INSTRUMENT [illegible]

Time 10:50 AM

	A	B	C	D	E
Range	10/1000	Op.	10^{-11}	10/1000	700 V
Source Dist.	1"	0	15	1"	16"
% F.S. Trip	85 ✓	100+	70	100+	

Counters.

C.A. 270 92/8 Expr. 28-5 Run 4

Sheet _____ Date 8-12-1958 Time 12:15 AM/PM

Purpose 28" Dia. Cylinder
28" on Stat. table
27" on mov table.
Fully Reflected

Same loading as on Page 26.

13 Gypsum pads in holder numbered ~~one~~ side toward table center

CRITICAL POSITIONS

C.A. 270 92/8 Expr. 28-5 Run 4

Table Pos. .01

A - 15.295	.55	1008/200
C - 20683	B .055	
	= 561	$\times 10^{-9}$
	D 69	1000/100
on Per A = about 13.40	E 62	750

Tim Crit. 12:47 20/60 AM/PM Duration 20 min.

8-18-58

Lynn
Connolly
McCarty
Mihalczo

INSTRUMENT CHECK

Time 1:40 ~~AM~~ PM Source Y

Channel	A	B	C	D	E
Range	19/1000	off	10"	12/1000	900 V
Source Dist.	1"	OK	13"	2"	15"
% F.S. Trip	90	OK	100	70	100+

C.A. 29U 9z/8 Expr. 28-5 Run 5

Sheet Date 8-18 1958 Time 2:05 ~~AM~~ PM

Purpose 28" dia. cylinder
28" on Stat. Table
27" on mov. table
Fully Reflected

U^{238} & U^{235} fission Counters located ~ at Center of assembly. U^{238} - 0", 3/4", 3/16"
U^{235} - 0", -3/4", 3/16

Fission counter
Depleted - Enriched

②	227x16	6429x256
	20 Min - Power = .01	
③	249x16	6887x256
	20 min Power = .011	

d Table Center

Calculate ∈

①	79x16	1714x256
	5 min	P = 01

CRITICAL POSITIONS

29U 9z/8 Expr. 28-5 Run 5

Tables .01

A = 15.415
C = 12.73

Channel		
A	60	100/500
B	.01	
C	5.0 x 10^{-9}	
D	37.5	100/500
E	3.0	840 V.

Time Crit. 2:26 AM PM Duration 40 min.

32

8-19-58

Lynn
Connolly
McCarty

INSTRUMENT CHECK

Source r

Time 1:00 ~~AM~~ PM

Channel	A	B	C	D	E
	10/1000 dpr	~~5~~"		10/1000	900 V
Source Pos.	1"	15"	2"	14"	
% F.S. Trip	90	100+	70	100+	

Fission counters
9 3/8" back from center
20 min count
P = .025

Depleted x16	Enriched x256	
374	8550	20
636	13141	30

C.A. 290 92/8 Expr. 28-5 Run 6

Sheet ____ Date 8-19 1958 Time 1:08 ~~AM~~ PM

Purpose 28" Dia cylinder
28" on Stat. Table
27" on Mov. Table
Fully Reflected

Same loading as on page 26
$n_{238} + n_{235}$ fission counters

CRITICAL POSITIONS

C.A. 290 92/8 Expr. 28-5 Run 6

.01

Counter

A - 15.61 . 36 1000/200

C - 13.00 .024

7.0 2.5×10^{-9}

D 41 1000/100

E 1.5 690

Tim Crit. 1:28 ~~AM~~ PM Duration 41 min.

Fissio
12½"
10 min c

Depleted x16	E x
106	4
120-6	3
118.12	3.6
64-12	1
	20
118-2	37

C.A. $270\frac{92}{8}$ Expr. 28-5 Run 7

Sheet _____ Date 8-19 1958 Time 220 PM

Purpose 28" Dia. Cylinder
28" on Stat. Table
27" on mov. Table
Fully Reflected

Same loading as on Page 26
U_{238} & U_{235} fission counters

Fission Counters
$12\frac{1}{2}$" back from center
10 min. count

Depleted X16	Enriched X256
106	4101-1
120-6	3968-96
118.12	3624-207
64-1/2	1836-98
	20 min.
118-2	3701-71

CRITICAL POSITIONS

$270\frac{92}{8}$ Expr 28-5 Run 7

.01

	Channel	
A - 15.60	A 22	100/1000
C - 13.005	C .008	
	C 3.7	10^{-7}
	D 27	100/500
	E .7	750V.

Time Crit. 2:40 AM PM Duration 68 min.

34

8/20/58

McCarty
Connolly
Mihalczo
Lynn

INSTRUMENT CHECK

Time 1115

	A	B	C	D	E
Range	1/100	10/1000 OK	10^{-11}	10/1000	900 V.
Source Dist.	1"	1"	0"	15"	2"	14"
% F.S. Trip ~~80~~		90	OK	100+	70	100+

C.A. 2% 92/8 Expr. 28-6 Run 1

Sheet _____ Date 8-20-1958 Time 1:25 ~~AM~~ PM

Purpose Assembly 28"X28"X 23 12/28", Comp. Refl.
Rotating foil holder on moveable Table.
just in to Reflector. U-al alloy foils.

LOADING CHANGE

Description

28X28 = 784 X 23.43 = 18,369 in^3

18,369 X 1.026 = 18,846 gm of 25

A4S
A4 Diff. 43 X 14 = 90.02 *

Mass of 25 − 90.02 + 18,846 = 18,756
Mass of 35 − 16.47
Total 18,740.47 gm 25
U-235

*

CRITICAL POSITIONS

CA 290 $\frac{92}{8}$ Expr 28- Run 1

999.945

Channel		
A 13-275	A 54	1000/100
C 17.595	B 01.95	
	C 6.5	2.5×10^{-9}
	D 65	100/500
	E .8	690

Time 1:48 $\frac{50}{60}$ AM/PM Duration 20 min.

CA 290 $\frac{92}{8}$ Expr 28-6 Run 2

Sheer 8-20 Time 2:25 AM/PM

Purpose Assembly 28"x28"x23.43

CRITICAL POSITIONS

my 25

CA 290 $\frac{92}{8}$ Expr 28- Run 2

991.91

Channel		
A 15.50	34	1000/200
C 15.48	B .028	
	C 7.0	2.5×10^{-9}
	D 43	1000/100
	E 1.0	690

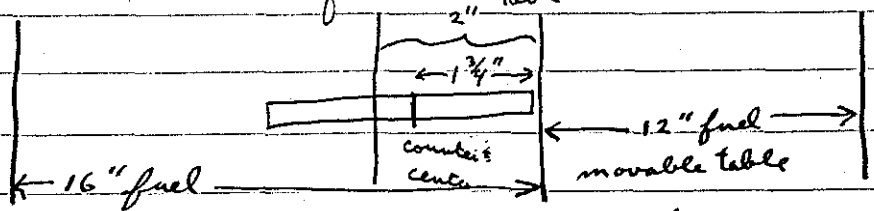
3:15 AM 50 min

fission counters #5-3 Counter #1
#8-2 Counter #2
#5-2 Counter #3

Amplifier Settings #1 Gain 8, rise time 0.8 μs, disc Pulse 35.0
#2 " " " " 10.0
#3 " " " " 10.0

Counters 2 & 3 are on same control rod drive.

Counter 1 fixed position under assembly next to fuel on movable table



Counter drive against in limit switch 26.745.

Counter Rod Position	Counter 1	Counter 2	Counter 3	time	Power
27.00	3360 x 256	781 x 16	6720 x 256	30 min	.025
	860,160	12,496	1,720,320		
		$C = \frac{12496}{1720320} = 7.26 \times 10^{-3}$			
29.00	2183	543 x 16	4277 x 256	20	.025
		$C = 7.4 \times 10^{-3}$			

Counter #3 sick - Scaler trouble.

DO NOT USE THIS DATA

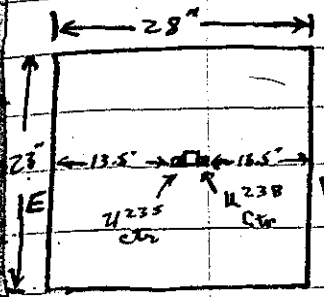
8-21-58
Connally
Lynn
McCarty
Michalczo

INSTRUMENT CHECK

Time 8:40 AM

Source Y

Channel	A	B	C	D	E
	10/1000	off	10"	10/1000	9.00 V.
Source Dist.	1"		16"	15"	13"
% F.S. Trip	85		100	70	100+



stat. Table

C.A. 290 92/8 Expr. 28-6 Run 3

Sheet Date 8-21 1958 Time 8:58 AM

Purpose Assembly 28"X28"X23.43

U^{238} Fission Counter - } Axial Traverse
U^{235} Fission Counter - } from Center out.

Power
.025
.025

CRITICAL POSITIONS

C.A. 290 92/8 Expr 28-6 Run 3

Future Pos. .01 T R

Control Rod	Channel	
A. 14.52	A X2	100 / 1000
C- 16.83	B .0186	
	C X1	2.5X10⁻⁹
	D .53	100 / 500
		11 / 750

Tim Crit. 9:25 AM Duration min.

down 4:17

Fission Counters #5-3 Scaler #1
#8-2 " #2
#5-2 " #3

Amplifier Settings #1 Gain 8, Fine Time 0.8 μs, Disc Pulse 20
#2 " " " " 10
#3 " " " " 10 * See Note below

Counters #8-2 + #5-2 are same Control drive.
#5-3 in fixed position under assembly at Core Reflector
Counter drive in Position = 26.745", See p. 36.

Counter drive Subsyn. reading	Counter #1	Counter #2	Counter #3	Time total	Power (B.)
27.00	4105	346	4410	10	.0170
at Center of Reactor 0"	* Changed pulse disc level on Counter #2 from 10 to 15. by G.R.R.				
	x256	x16	x256		
27.00"	4087	152	4362 2177	10	.017
	4072	156	4358.2257	10	.017
	8159	308 4928	8720		
29.00	4134	149	4291	10	.017+
2"	8276	297	8632	20	.018
	12,467	450 7200	13,016	30	.018
31.00	4336	148	4268	10	.018+
4"	8671	304	8577	20	.019
	12,869	454 7264	12,768	30	.019
33.00	4272	133	3873	10	.019
6"	8703	269	7886	20	.020
	13,003	399 6384	11,794	30	~~.020~~ .019

Pulse 20

" 10

" 10

* See Note below

Core

$$S = \frac{N^{28}_{Reactor} \int_0^\infty \sigma_f^{28} \phi \, dE}{N^{25}_{Reactor} \int_0^\infty \sigma_f^{25} \phi \, dE}$$

36.

Power (B_i)	Counter #2 / Counter #3	235 Fission Flux #3/#1	235 Fission Flux normalized to one at center	238 Fission Flux #2/#1	238 Fission Flux normalized to one at center	S
.0170						
to 15. by ERR						
.017						
.017	.002207	1.0687	1	.3775	1	.07835
.017+						
.018						
.018	002144	1.044	.9769	.36095	.9561	.07611
.018+		.984		341		
.019		.989		350		
.019	002222	.9921	.9284	.3528	.9345	.0788
.019						
.020						
~~.020~~ .019	002114	.9070	.8487	.3068	.8128	.07505

Selsyn Reading	(Scaler) Counter #1 X256	(Scaler) Counter #2 X16	(Scaler) Counter #3 X256	Time (min)	Power (B	
35.00	4285	113	3366	10	.019	
8"	8676	233	6811	20	.019	
	13,082	351	10,285	30	.020	.00
37.00	4343	95.5	2806	10	.0195	
10"	8543	187.6	5505	20	.019	
	12666	279.5	8163	30	.019-	.00
39.00	4165	71.5	2149	10		
12"	8427	145	4350	10+10	.020	
	12164	215	6536	10+20	.020	.002
41.00	3931	37	3067	10	.018	
14"	7742	71	6058	10+10	.018	
	11733	108	9170	10+20	.019	.001
31.00	3824	131.5	3786	10	.018+	
4"	7510	249	7407	20	.01	
	11250	375	11148	30		
35.00	1144	33	879	3		
8"	2294	62	1757	6		.00
34.00	1124	34	931	3		
7"	2237	65.5	1850	6		
	3343	96	2757	9		.00

		235 Fission Flux		238 Fission Flux		
	#2/#3	#3/#1	normalized to one at center	#2/#1	normalized to one at center	S
		.7855		2637		
		.785		.2685		
	002135	.78619	.7356	.2683	.7107	0.07572
	.00214	.6445	.603	.2207	.5845	.076
	.00205	.5161	.483	.1698	.4497	.0728
	00118	.7815	.732	.092	.244	0419 ?
		.99004		.34388		
		.98628		.3315		
		.982	.919	3333	.883	
		.7855	.718			
	.0022	.7659	.71[illegible]	.2703		
		.8283	.775			
			.774			
	00218		.771	.2872	.769	

Selyon Reading	(scaler) Counter #1 x256	(scaler) Counter #2 x16	(scaler) Counter #3 x256	Time	Power	#
36	1127	27	791	3		.002
9"	2295	55	1609	3+3		002
33	1167	38	1051	3		
6"	2315	75	2059	3+3		002
58	1147	25	639	3		
11"	2312	45	1282	3+3		
40	1746	15	587	3		1
15" 13"	2296	31	1172	3+3		
41	1140	10	887	3		
14"	2286	20	1777	3+3		
42	1162	5	1455	3		
15"	2551	11	2899	3+3		
42.5	1228	6	1494	3		
15.5	2487	11	3012	3+3		
43.0	1267	5	1385	3		
16"	2539	8	2774	3+3		
44	1255	1	996	3		
17"	2494	3	1773	6		
27 0						

#2/#3	235 Fission Flux #3/#1	235 Fission Flux normalized to one at center	238 Fission Flux #2/#1	238 Fission Flux normalized to one at center
.002155		.654		
00214			.2596	.634
	.8634	.8257	.3256	.8625
00224	.8807	.824		
	.5571	.5212		
	.4793	.448		
	.5104	.4776		
	.778	75		
	.777	.727		
	1.235	1.15		
	1.233	1.154		
	1.217	1.138		
	1.211	1.133		
	1.092	1.022		
	.794	.74		

Selsyn Reading	Counter #1 ×256	Counter #2 ×16	Counter #3 ×256	Time
47	1252	0	175	3
20"	2466	1	351	6
40.5	1280	14	689	3
27.	1152	41	1214	5
0	2295	81	2458	

Returned Counters to Selsyn reading 27.45
U^{238} Counter ~ 1/8" beyond interface.

INSTRUMENT CHECK

Time 9:50	A	B	C	D	E
Source Dis	10/1000 Ofr	✓	10"	10/1000	900V.
% F.S. Trip	14"	✓	14"	14	14
	80	✓	90	100	100

C.A. 2% 98/8 Expr. 28-6 Run 4

Sheet _____ Date 8-22-58 Time 10:10 ~~PM~~ AM

Purpose Assembly 28"x28"x23.43"
Rotating foil holder w/ 1"
into reflector. U-Al alloy
foils.

CRITICAL POSITIONS

C.A 2% 98/8 Expr 28.6 Run 4

Table Pos. .01

Control Rod

A. 14.95" A 52 100/1000

B. 16.82 B .023

C 5.9 2.5 X 10⁻⁹

D 67 100/300

E 14 750 V.

Tim Crit. 10:38 18/60 ~~PM~~ AM Duration 20 min.

Countrate 27.45"

ctl #1 4170
" 2 180
" 3 4490

9 cts @ 27.0"

Ctrl #1 1937
" 2 74
" 3 2084

Counter # 5-3 fixed position same as run 3

C.A. 2% 92/8 Expr. 28-6 Run 5

Sheet _____ Date 8-22-1958 Time 12:40 ~~AM~~ PM

Purpose Fission Counter Traverse (Axial)

Same as Run 4

CRITICAL POSITIONS

C.A. 2% 92/8 Expr. 28-6 Run 5

Table Pos. .01 I T S

Control Rod		Channel	
A	14.80	A	47 100/1000
C	16.83	B	.019
3		C	6.5 25 X 10⁻⁹
4		D	59 100/5000
		E	1.2 730 V.

Tim Crit. 1:00 ~~AM~~ PM Duration _____ min.

Down 3:22 PM

Scalers Reading Amplifier + Scaler Settings same as p. 38

Scalers Reading	Scaler #1		Scaler #2	Scaler #3		Time	Power (B)
27.00							
0" from center	1265 1212	1.000	44 +12 46	1357 1306	1357	3 min.	.019
28.00							
1"	1287	.982	45 +12	1357	1340	"	"
29.00		1.99	43 +7		1261		
2"	1277	.991	44 +14	1326	1343	"	"
30.00							
3"	1233	1.025	41 +8	1271	1303	"	.0185

	x256 Scale #1		x16 Scale #2	x256 Scale #3		Time	Power (B_1)
31.00							
4"	1215	1.052	42 +8	1202	1264	3 Min.	.018
32.00							
5"	1190	1.075	42 +3	1137	1222	"	.018
33.00							
6"	1187	1.078	38 +4	1080	1164	"	"
34.00							
7"	1211	1.044	35 +1/4	1030	~~1090~~ 1076	"	.7929.018
35.00							
8"	1256	1.008	33 +9	982	988	"	.019
36.00							
9"	1268	.995	27 +6	903	904	"	.019
37.00							
10"	1267	.995	27 +1	814	815	"	.019
38.00							
11"	1283	.986	26 +0	727	737	"	.019
39.00							
12"	1276 1303	.971	20 +2 22 +0	648 665	685	"	.020
40.00							
13"	1265 1303	.971	18 +7 17 +5	647 666	686	"	.019 .020
41.00	1279	.990	12 +10	980	970	"	.020
" 14"							
41.5							
" 14.5	1271	.995	8 +6	1313	1306	"	.019
42.00							
15"	1282	.988	6 +13	1555	1537	"	.019

	Scaler #1	Scaler #2	scaler #3	Time	Power
45.5					
15.5"	1269	4 +1	1547	3 min.	.019
43.0					
16.0"	1278	3 +8	1416	"	.019
43.5					
16.5"	1281	2 +4	1237	"	.019
44.0					
17.6"	1292	2 +3	1036	"	.019
45.0					
18.0"	1304	1 +4	645	"	.019
46.0					
19.0"	1287	0 +8	373	"	.019
47.0					
20.0"	1288	0 +15	179	"	.019
49.0					
22"	1277	0 +5	74	"	
42.75	1277	5 +0	1481	"	.019
15.75"					
42.25	1277	5 +8	1557	"	~~.018~~
15.25"					
40.50	1246	15 +5	721		.0185
13.5"					
39.50	1241	17 +19	612		
12.5"	1259	19 +11	630		.0195

Power	
.019	McCarty
	Mihalczo
	Lynn
.019	
.019	
.019	
.019	
.019	
.019	
.019	
.08	
.0185	
.0195	

INSTRUMENT CHECK

Time 2:00 ~~AM~~ PM Source γ

	A	B	C	D	E
Channel	10/1000	opl	10"	100/1000	160 γ
Source Dist.	1.5"		16"	1.5"	13"
% F.S. Trip	85		85	75	100+

C.A. 29 $\frac{92}{8}$ Expr. ~~28-6~~ 26-1 Run ~~6~~ 1

Sheet ______ Date 8-25 1958 Time 2:38 PM

Purpose Fission Counter Traverse assembly 26" x 26" x 26" Comp. Refl.

LOADING CHANGE

Description

26 x 26 x 26 = 17,576

1.026 x 17,576 = 18,032

12A45 x 6.43 = 77.16

Mass before 7C4 x 4.124 = 28.86

106.00 g

Mass of Change ______ gmU ______ gmU-235

Total Mass ______ gmU 17,926.02 gmU-235

Sub-critical

CRITICAL POSITIONS

C.A. ______ Expr ______ Run ______

Sheet ______ Date ______ Time ______ P

Control Rod ______ Channel

1 ______ A. ______

2 ______ B. ______

3 ______ C. ______

4 ______ D. ______

50

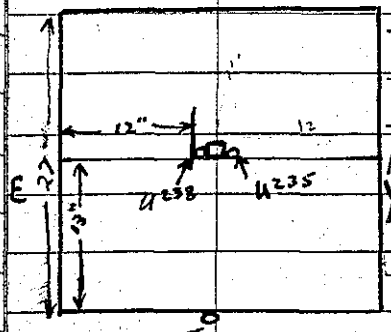
C.A 270 92/8 Expr. 26.1/8 6 Run 2X

She Do 8-25 1958 Time 3:18 AM/PM

Purp. Fission Counter Flux Traverse (Axial)
26"X26"X27" Comp. Reflected

LOADING CHANGE

Stat. Table



Description Added:

36-A-1	590.76
24-C-4	98.97
1-B-1	4.08

Mass before chg. gmU 69381 gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 18,619.83 gmU-235

U235 counter (wrapped in cd. for Item 8.) on movable table

CA 270 26.1/28 6 Run X 2

Rate 1.01

Channel

A 20.27	58	100/500
C 18.35	.011	
3	5.8	-9/500
E	37	/100
	.4	750

Time Out 3:35 AM/PM Operation

amplifier + Scaler setting same as page 51 38,

Scaler 1	~~Scaler 2~~	Scaler 2	Time	Power
25.925	679	~~826~~ 1	826	3	.011
0	6			
27.925	672	.983	804	3	.011
2"		Rel. activity		
29.925	661	.926	745	3	.011
4"				
31.925	659	.838	672	3	.011
6"				
33.925	662	.713	574	3	.01
8"				
35.925	668	.577	469	3	.01
10"				
37.825	681	.500	404	3	.01
11.5"				
39.925	669	.528	430	3	.01
12"				
38.425	670	.593	483	3	.01
12.5"				
38.925	675	.766	629	3	.01
13"				
39.925	651 684	1.21	966 1004	3	.01
14"				
~~13.5~~	667		804 ~~957~~		
40.925	699	1.125	~~557~~	3	.01
15				
41.925	686	.543	453	3	.01
17"				
19"	675	.152	108		

INSTRUMENT CHECK

Time 10:00 ~~PM~~ AM Source Co

	Channel A	B	C	D	E
Range	10 / 100	opr	10	11 / 1000	900V.
Source Dist.	1"	0"	15"	15"	16"
% F.S. Trip	85	~~OK~~	100+	75	100+

C.A. 290 ~~92~~/8 Exp ~~28-6~~ 26-1 Run 3 ~~8~~

~~Shee~~ ~~Da~~ ~~S~~ Time 9:17 ~~PM~~ AM

Purp Fission Counter Flux Traverse (Axial) horizontal

26" X 26" X 27"

Completely Reflected

See P. 50 for Counter locations

Loading same as run 2

CRITICAL POSITIONS

C.A. 290 92/8 Exp ~~28.6~~ 26-1 Run ~~8~~ 3

Table Pos. 1.01 T

	Channel	
A 20.27	A 5.0	1000/500
C 17.00	.115	
B	C 5.0	10-8
	D 99	1000/200
	E 6.0	690

Time Crit. 9:35 ~~PM~~ AM Duration Down at 2:04 PM

~ 50 min. after shutdown — 8R against fuel between tables

Selsyn Read.	256 Scaler #1	16 Scaler #2 238	256 Scaler #3	Time	Power
25.925					
0	103	145	4417	10	.018
"	208	296	8892	10+10	.019
	310	441	13267	10+10+10	.019
U^{238}	Fission Flux Traverse				
	x64	x16			
25.925	1120	429		5	.11
0"	2298	863	.9388	5+5	.11
26.975 1	1164	434		5	.11
~~27.925~~	2321	858	.92417	5+5	.11
27.925 2"	1138	409		5	.11
	2253	807		5+5	.11
29.925 4"	1115	375		5	.11
	2241	748		5+5	.11
31.925					
6"	1151	341		5	.11
	2302	678		5+5	.11
33.925					
8"	1143	288		5	.115
	2287	584		5+5	.115
35.925					
10"	1166	241		5	.115
	2347	480		5+5	.115
37.925					
12"	1169	170		5	.115
	2625	337		5+5	.115

Inserted table.

U^{238} Fission Flux Traverse

Selsyn Read	Scaler #1	Scaler #2	Time	Power
	cont. from previous Page			
37.925	3456	510	5+5+5	.115
12"				
38.925	1112	112	5	.115
13"	2221	218	5+5	.115
	3310	324	5+5+5	.115
39.925				
14"	1079	58	5	.115
	2165	112	5+5	.115
	3251	168	5+5+5	.115
41.925				
16"	1092	18	5	.115
	2198	37	5+5	.115
37.925				
12"	1084	161	5	.115
	2116	311	5+5	.115
36.925				
11"	993	173	5	.115
	1975	345	5+5	.115

INSTRUMENT CHECK

Time 9:40 AM PM Scaler 5

Channel	A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1000	900 V.
Source Dist.	1"	0"	18"	1"	15"
% F.S. Trip	80	OK	100+	80	100+

Counters 1, +2.

Fission Counters removed, BF_3 Counters 1, +2 replaced for normal operation.

C.A. 290 92/8 Expr. ~~28-6~~ 26-1 Run ~~X~~ 4

Sheet ____ Date 8-28-1958 Time 10:18 AM ~~PM~~

Purpose ~~Fission Counter Flux Traverse~~

26" X 26" X 27"

Completely Reflected

Loading Same as Run ~~X~~ 2

CRITICAL POSITIONS

C.A. 290 92/8 Expr. ~~28-6~~ 26-1 Run ~~X~~ 4

Table Pos. 011 T ____ R ____

Control Rod	Channel	
A- 20.27	A 5-8	100/500
C- 18.66	B .011	
	C 5.5	10^{-9}
	D 92	100/200
	E 5.5	900

Rod C @ 12:00 on 10/4 sec period = 9.3 ¢/in.

Leveled Rd. C @ 17.27 Sensitivity = 1.7 ¢/in.

Mr. T 10.35 A.M. AM 30 min.

56

C.A. 27. 98/8 Expr. 26-1 Run 5

Sheer _____ Date 8-28 / 8-28 1958 Time 1:30 PM

Purpose Cd impedance 2" square 11.2 gms 20 mil folded into 2" x ~3/4" box with open ends

Same loading as Run #2

CRITICAL POSITIONS

C.A. 20.92/8 Expr. ~~28-0~~ 26-1 Run 105

Tape Pos. .01

Control Rod	Channel
A 20.275	A 48 100/50
C 18.745	.0008
3	4.6 10
4	D 62 600/25
	E .1 900

Tim Crit. 1:45 ~~AM~~ PM Duration ____ min.

after Morn
log N to top of
ch extension

30 100/50

.0008

2.5 10

35 100/25

Rod C @ .15 82.5 ~~59~~ sec period = 11.2

Leveled Rd. C @ 15.955 Sensitivity

Rod C @ 15.955 on 100 sec period = 9.6

Leveled Rd. C @ 20.455 Sensitivity 2.1 V/in

Rod C @ 16.415 on 118 sec period = 8.55

Leveled Rd. C @ 20.450 Sensitivity 2.12

Rod C @ 17.51 on ~~117~~ 161 sec period = ~~7.3~~ 6.64

Leveled Rd. C @ 20.445 Sensitivity 2.27

Rod C @ 16.865 on 280 sec period = 4.15

Leveled Rd. C @ 18.70 Sensitivity 2.25

Cd. Sample Pos.	Period	Cents
0	100	9.6
0	-167	10.4
3"	116	8.55
3"	-176	9.6
6"	161	6.6
6"	-239	6.5
9"	280	4.15
9	-586	3.7
12"	690	1.77

Moving top of union

100/50

10-10

100 2nd

58

8/28/58

Lynn McCarty Mihalcyo

INSTRUMENT CHECK

Time 10:30 AM Source Y

Channel	A	B	C	D	E
Range	10/1000	opr	1"	100/1000	900V
Source Dist.	½"	0"	17"	1½"	13"
% F.S. Trip	90	6K	100	80	100+

C.A. 29° 92/8 Expr. ~~28-6~~ 26.1 Run ~~2~~ 6

Sheet _____ Date 8-28-1958 Time 10:50 AM

Purpose Cd. impedance 2" square 11.2 gms 20 mil folded into 2" x ~~n~~ 3/4 box with open ends 26"x26"x27" completely reflected

Same loading as run # 2

Log of Chamber moved to top of al extrusion

CRITICAL POSITIONS

C.A. 29° 92/8 Expr. ~~28-6~~ 26.1 Run ~~2~~ 6

.01

Channel		
A	20.275	54 100/50
C	13.940	
F		.0018
		6.8 10-10
D		65 100/25
E		0 900

Time Crit. 11:03 AM PST Duration 8 min.

Rod C @ .15 on 137 sec period = 7.6

Leveled Rd. C @ 13.940 Sensitivity _____ ¢/in.

C.A. 270 9/8 Expr. 26-1 28-6 Run DL 7

Sheet _____ Date 8-28 1958 Time 11:23 AM

Purpose Cd. Importance 2" square 11.2 gms 2 Ohd. folded into 2" x 2 3/4 box with open ends

Completely reflected

Same loading as Run # DL 2

CRITICAL POSITIONS

C.A. 270 9/8 Expr. 26-1 28-6 Run DL 7

Rod C @ 7.7 on 148 sec period = 7.6 ¢

Leveled Rd. C @ 13.91 Sensitivity ¢/in.

Trunnion

Channel	
A-20.275	A 20. 100/50 1/20
C-13.91	B .0019
	C 1.1 10-10 100/25
	D 22.5
	E .1 900

Tim Crit. 11:36 AM Duration 3 hr. 8 min. Down 2:32

Pos. + Neg. Period disagreement about the same as Recorded on p. 57. for the cd. Sample.

60

8/28/58

Mihalczo
McCarty
Lynn

INSTRUMENT CHECK

Time 8:50 — Source Y

	B	C	D	E
R	10/1000	opr	10 ~~m~~	10/1000	900
Source	½"	0"	16"	1"	13"
% F.S. Trip	85⁻	ok	100+	80	100+

C.A. 290 92/8 ~~28~~ 26-1 Run - ~~3~~ 8

~~Sheet~~ Do 8-29-58 9:07 ~~PM~~ AM

Purpose Cd Importance 2" Square 11.2 gms 20 mil folded into 2" x ~~2~~ 3/4 Box with Aperenda 26" x 26" x 27" Completely Reflected

Loading Same as previous Run

CRITICAL POSITIONS

C.A. 290 92/8 Expr. ~~28~~ 26-6 Run ~~3~~ 8

Table Pos. —

Control Rod — Channel

Check attached Sheet →

D

E

Crit. 9:20 ~~PM~~ AM Duration, 2 hrs. 5 min.

8/29/58 A.M

Counters #1 (5 min)	Counters #2	A	B	C	D	E	Rod A	Rod C	Sample
~~X16~~ 1053	~~X16~~ 1023	32.2 $\frac{100}{100}$	.01	8.6 10^{-10}	36.5 $\frac{10}{500}$	.2 900V	18.00	17.415	in
~~X256~~ 594	358 ~~252~~	31.3 $\frac{1000}{100}$	.10	7.2 10^{-9}	34.8 $\frac{100}{500}$	5.5 900V	18.00	17.378	in
									25.605
~~256~~ 1965	1014 ~~256~~	30.0 $\frac{1000}{500}$	.5	7.6 5×10^{-9}	46.5 $\frac{1000}{200}$	3.2 690V	18.00	17.39	in
~~256~~ 1800	~~257~~ 1003	29. $\frac{1000}{500}$	.5	7.4 5×10^{-9}	46 $\frac{1000}{200}$	3.3 690V	20.27	18.7	out
~~X16~~ 618	~~X16~~ 521	35.5 $\frac{100}{50}$	005	4.4 10^{-10}	44.5 $\frac{10}{200}$	.5 900V	18.00	17.39	in 25.605
		28.8 $\frac{1000}{500}$	.5	7.4 5×10^{-9}	45.5 $\frac{1000}{200}$	3.2 690V	20.27	18.70	out
				P.M.					
		32.6 $\frac{1000}{500}$	.5	8.4 5×10^{-9}	57.4 $\frac{1000}{200}$	3.8 690V	20.273	18.70	20.49 out
		21 $\frac{100}{100}$	.0054	5.2 10^{-10}	26 $\frac{100}{50}$	.2 690V	18.00	17.39	0.10 in
		71 $\frac{1000}{200}$	.48	7.4 5×10^{-9}	89.8 $\frac{1000}{100}$	3.3 690V	20.28	17.66	20.49 out

8-29-58

Hidalgo
Flynn
McCarty

C.A. 270 9 2/8 Expr. 26-1 / 2-8-6 Run 9 ~~14~~

Sheet _____ Date 8-29 1958 Time 1:32 ~~AM~~ PM

Purpose C.d. Signature 2" square 11.2 gms 20 Mil. folded into 2" x 2 3/16 Box with open end 26" x 26" x 27" Completely reflected

Loading Same as previous run

CRITICAL POSITIONS

C.A. 270 9 2/8 Expr. 26-1 / 2-8-6 Run 9 ~~14~~

Tube Pos. .01 T R

Control Rod	Channel
A-20.28	A 71 1000/200
C-18.66	B .48
	C 7.2 5X10 -9 1.000/100
	D 89.5
	E 3.4 690

Sample out

Tim Crit. 1.45 AM PM Duration 3 min.

Down 3:33

62

9/5/58

INSTRUMENT CHECK

Time 3:50 PM Source 8

Channel

	A	B	C	D	E
Range	10/1000	Opr	10"	10/1000	900 V.
Source Dist.	1"	0"	15"	1.5"	16"
% F.S. Trip	90	OK	100	90	100 +

Counters 1, 2 & 3

C.A. 2% 92/8 Expr. 26-1 Run 10

Sheet _____ Date 9/5 1958 Time 4:25 PM

Purpose Period Studies

Down 8:30 PM

A

LOADING CHANGE

Description 26"X26"X27 =

676 X 27 = 18,252 in³

18,252 X 1.026 g/in³ = 18,726 g ~~90~~ g c+S Rods

Mass before change _____ gmU 18,636 ~~3~~ g Sample gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 18,633 g. gmU-235

Run.	x256 Counter 1	x256 Counter 2	x256 Counter 3	A	B	C	D	Rad A	Rad C
A	144	34	26	27.5 $\frac{100}{100}$	.0061	7.6 10^{-10}	38.5 $\frac{100}{50}$	18.00	18.42
B				~~602~~				18.00	16.42
	Pulse height changed on #1								
C		331	641	60.2 $\frac{1000}{100}$	.152	6.0 25×10^{-9}	71.5 $\frac{100}{500}$	19.42	16.42
D								19.42	18.42
E	53	33	26	27.5 $\frac{100}{100}$	.006	7.3 10^{-10}	19. $\frac{100}{100}$	18.00	18.42
F								18.00	16.42
G	1064	339	634	59.5 $\frac{1000}{100}$	.155	5.6 25×10^{-9}	75 $\frac{100}{500}$	19.42	16.42
H								19.42	18.42
I	66	87	35	27. $\frac{100}{100}$	.0053	7.4 10^{-10}	38 $\frac{100}{55}$	18.00	18.42
J								18.00	16.42
K				55. $\frac{1000}{100}$	.145	5.2 25×10^{-9}	69.5 $\frac{100}{500}$	19.42	16.42
L								19.42	18.42
M				48.5 $\frac{100}{50}$	.0055	5.0 $\sim 25\times10^{-10}$	34 $\frac{100}{50}$	18.75	17.42
N									16.42
O									18.42
P								18.75	17.42

9-8-58
Mikalajo
Lynn
McCarty

INSTRUMENT CHECK

Time 10:00 AM PM Source 5 mg (8)

	Channel A	B	C	D	E
Range	10/1000	opr	10-11	10/1000	900 V.
Source Dist.	0"	0"		0"	9"
% F.S. Trip	75	OK		60	100+

Counters

C.A. 270 9z/8 Expr. 26-2 Run 1

Sheet _____ Date 9-8 1958 Time 10:14 AM PM

Purpose ~~Period Studies~~

Reflector Evaluation 26"X26"X27"
6" Reflector on all except Top
of Movable Table

Sub-critical

9-8-58
Mihalzo
Lynn
McCarty

C.A. 290 92/8 Expr. 26-2 Run 2
Sheet ____ Date 9-8 1958 Time 10:30 AM ~~PM~~
Purpose Reflector Evaluation
26" x 26" x 27 6/13"
6" Reflector on all except top of Movable Table which is bare

LOADING CHANGE

Description
Added
A-1 = 18 295.38
C-4 = 6 24.74
Mass before change ____ gmU 18,633 gmU-235
Mass of Change ____ gmU + 326.12 gmU-235
Total Mass ____ gmU 18,953 gmU-235

C.A. 290 92/8 Expr. 26-2 Run 3
Sheet ____ Date 9-8 1958 Time 10:50 AM ~~PM~~
Purpose Reflector Evaluation
same loading
6" Reflector on all except Bare on top of mov. Table
3" on bottom of mov. Table
Fore Runs

CRITICAL POSITIONS

290 92/8 Expr. 26-2 Run 3
Fuse Pos. .01 T ____
Control Rod Channel
A- .055 A 54 1/2 100/100
C- 14.50 B .011
up at 11.14 8.3 2.5 X 10^-10
Down 11:23 D 72 1.0/500 E.4 9 800

CA 270 9 2/8 26-2 4

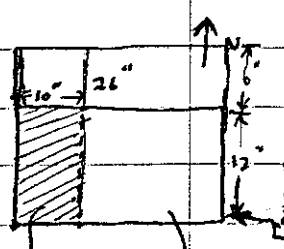
Sheet 9-8 58 Time 12:40 PM

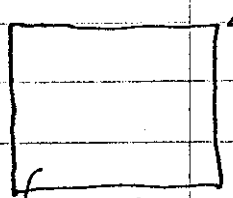
Purpose Reflector Evaluation

value of 1½" Paraffin type reflector.

Paraffin 10/26 of moveable table.

Top View





6" Paraffin type reflector

Movable half 28" high

Stationary 27" high

CA 270 9 2/8 26-2 4

Table Pos. 01

Channel

1	A 14.01	40	100/500
2	C 16.00	.05	
3		-4.02.5 $\times 10^{-9}$	
4		D 70	100/300
		1.4	900

Tim Crit. 12:58 PM Duration 60 min.

Rod C @ 16.00 on ___ sec period = ___

Leveled Rd. ___ @ 19.31 Sensitivity ___

4 A Worth of 1½" Paraffin

A1	level	Rod A - .055	Rod C - 14.5		C1
A2	+ 7.2¢	A .055	C - 16.00	Pencil produced by paraffin	
A3	level	A - 14.01	C - 16.00		
A4	+ 3.06¢	A - 14.01	C - 14.5	Pencil produced by paraffin	

C.A. 29.92/8 Expr. 26-2 Run 5
Sheet ____ Date 9-8 1958 Time 2:08 PM
Purpose Reflector Evaluation
Value of 3" Paraffin Top Reflector
1½" added to 1½" as shown p. 66.

Same as Run #4.

Value of first 1½" Paraffin 10.32 ¢

5. Value of second 1½" Paraffin

				0-1½	10.32 ¢
				1½-3	2.18 ¢
B1 +	A	14.01	C - 16.00	3-4½	.5 ¢
				4½-6"	.05 ¢
					13.05
B2 +	A	14.01	C - 14.5		
Bal	A	14.01	C - 17.07		

C.A. 29.92/8 Expr. 26-2 Run 6
Sheet ____ Date 9-8 1958 Time 2:54 PM
Purpose Reflector Evaluation
Value of 4½ Paraffin Top Reflector
1½" added to above run

C1 A 14.01 C - 17.30

value of 4 run print - 3.0c ¢ = value of reflector from 1½ to 4½

C.A. 37 12/8 26-2 Run 7

Sheet 9-8 Date 8/ Time 3:25 PM

Purpose Reflute Evaluation

Value of 6" Paraffin

1½" added to above run.

~~Same as Run #4~~

D-1 A - 1401 C 14.5

value from grind - 3.06 ¢ = value of last 4½ of refl.

D-2 A - 14.01 C 16.00

value from grind = value of last 4½" of Paraffin

CRITICAL POSITIONS

C.A. 27 92/8 Exp 26-2 Run 7

Table Pos. .01

A-14.01 A 67 100 500

C-17.36 .094

7.2 10-9

D 46.5 100 500

E 1.0 750 V

Tim Crit. 3:40 AM PM Rev 26

Summary of Paraffin Evaluation

Value of 1½ Inches of Paraffin.

Condition	Rel A	Rel C	Period	¢
a) Sand – no ppt	.055	14.5	∞	0
b) + period produced by addition of 1½" paraffin	.055	16.00	146.6	7.24 ¢
c) Sand with 1½" Paraffin	14.01	16.00	∞	0
d) + period produced paraffin	14.01	14.5	386.5	3.08 ¢
				10.32 ¢

Value of next 1½ Inches — Total Thickness 3"

a) + period produced by paraffin 1½" to 3"	14.01	16.00	536	2.21 ¢
b) + period produced by 1½ to 3" and part of the first 1½"	14.01	14.5	215	5.22 ¢ − 3.08 = 2.14 ¢
c) Sand	14.01	17.07	∞	0

Value of next 1½ Inches — Total thickness 4½"

a) + period produced by 1½ to 4½" plus 3.08 ¢ from first 1½"	14.01	14.5	193	5.73 ¢ − 3.08 = 2.65
b) Sand	14.01	17.3	∞	

Value of last 4½ Inches — Total thickness 6"

a) value of last 4½" – 3.00 ¢	14.01	14.5	191	5.79 ¢
b) value of last 4½"	14.01	16.0	402	2.86 ¢

Reflector Thickness (Paraffin)	Value
0 – 1½"	10.32 ¢
1½" to 3"	2.17 ¢
1½" to 4½"	2.65 ¢
1½ to 6"	2.86
From above data	
0 – 1½"	10.32 ¢
0 – 3	12.49
0 – 4½	12.97
0 – 6"	13.18

9-9-
Mike
Lyn
McCa

9-9-58
Mihalczo
Lynn
McCarty

INSTRUMENT CHECK

Time 8:40 AM PM Source 5 mg (X)

	A	B	C	D	E
Range	$\frac{10}{1000}$	OPR	10^{-11}	$\frac{10}{1000}$	900V
Source Dist.	0"	0"	10^{-10}	$\frac{1}{2}$"	8"
% F.S. Trip	70	OK	95	60	100

C.A. $29_0 \frac{92}{8}$ Expr. 26-2 Run 8

Sheet _____ Date 9-9 1958 Time 8:50 AM ~~PM~~

Purpose Zero Run

Plexiglas Evaluation (As Reflector)

Fuel - 26"X26"X27 $\frac{12}{16}$"

Refl - 6" except top of moveable table and 1 shield on ~~neo~~ bottom & mov. table

CRITICAL POSITIONS

C.A. $29_0 \frac{92}{8}$ Expr. 26-2 Run 8

Rods Pos. .01 T R

	Channel	
A: .055	A 4.2	$\frac{100}{100}$
C: 14.51	B .012	
	C 4.0	3×10^{-10}
	D 69	$\frac{10}{500}$
	E 4	900V

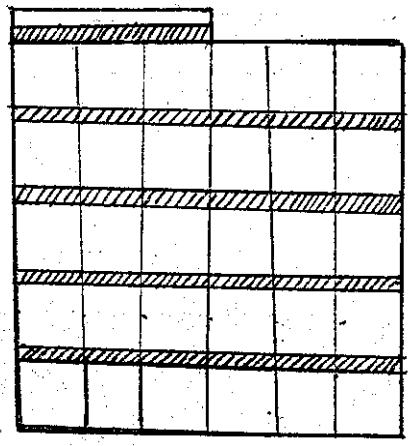
Tim Crit. 9:14 AM ~~PM~~ Duration 7 min.

9-9-58
Mihalczo
Lynn
McCarty

C.A. 270 92/8 Expr. 26-2 PWR 9
Sheet ____ Date 9-9-1958 Time 9:35 AM PM
Purpose Plexiglas Evaluation
~~1½" Plexiglas~~ (12"-18")
Same area covered as for paraffin shown on p. 66
Loading Same as Runs 4-5-6-7

Time	Run #	Top Reflector	Rod A	Rod C	Per.
9:40	A	1½" Plex.	.055	16.5	577
10:10	B	1½" Plex	13.295	~~16.5~~	∞
10:15	C	1½" Plex	13.295	14.51	3.99
		3" Plex.			
10:40	D	3" Plex	13.295	14.51	7.106
11:05	E	4½" Plex	13.295	16.505	
12:52	F	6" Plex.	13.295	16.505	
	Level		13.295	16.505	
1:25	G	1" Plex	.055	16.225	
	Level		12.135	16.25	
2:09	H	1" Plex	12.135	14.51	
2:35	I	½" Plex	055	14.51	

Time	Run #	Top Reflector	Rod A	Rod C	Per.
3:15	J	1" Par.	.055	16.25	
	level		12.62	16.25	
3:40	K	1" Par.	12.62	14.51	



9-10-58
Mihalczo
Lynn
McCarty

INSTRUMENT CHECK

Time 9:45 AM Source 5 mg (8)

	A	B	C	D	E
	10/1000	opr	10"	10/1000	900 V.
Source Dist.	0"		0"	1½"	7"
% F.S. Trip	75		100	65	100

Counters 1, 2 & 3

C.A. 2% 92/8 Expr. 26-3 Run 1
Date 9/10/1958 Time 9:05 AM
Purpose Preparation for Rod Calibration

6" Reflector on sides
3" on top + bottom

Removed loading of page 65 Run 2
Same loading as page 62 Run #10

CRITICAL POSITIONS

C.A. 2% 92/8 Expr. 26-3 Run I

.0.15

Control Rod	Channel	
A 20.27	A 60	10/200
C 15.09	B .0027	
	C 8.8	5 x 10⁻¹¹
	D 84	10/100
	E .1	900

Time Crit. 9:18 AM Duration 7 min.

9-10-58
Mihalczo
Lynn
McCarty

C.A. 290 92/8 Expr. 26-3 Run 2
Sheet ..... Date 9-10 1958 Time 10:10 AM PM
Purpose Rod calibration
3" Reflector removed from
East + West side
26 x 26 x 27 92-13/257

Level	Rod A	Rod C
	20.275	11.685
	18.47	15.095
	13.83	20.69

CA 290 92/8 Expr. 26-3 Run 3
Sheet ..... Date 9-10 1958 Time 11:55 AM PM
Purpose Rod calibration
3" Reflector on all sides

	Rod A	Rod C
Level	19.915	0.15
Level	10.045	20.69

Run.	Time	Rod A	Rod A	Rod C	Period	Rod C ¢
A		19.915	23.604 ¢	0.15	∞	
B		10.045		20.69	∞	
						23604
C	11.25	18.915		0.15	427	2.816 ¢
D		18.915	20.778 ¢	10.425	∞	2.816 ¢
						20.758
E		17.915		10.425	398	5.011 ¢
						5.826
F	12.25	17.915	17.778 ¢	12.865	∞	5.826 ¢
						17.778
G		16.915		12.865	399	2.96
						4.786
H		16.915	14.818 ¢	14.60	∞	8.786 ¢
						14.818
I		15.915		14.60	454.3	2.77 ¢
						11.556
J		15.915	12.048 ¢	16.01	∞	11.556 ¢
						12.048
K	1:30	14.915		16.01	515	2.35 ¢
						13.906
L		14.915	9.698	17.05	∞	13,906
						9.698
M	2:00	13.50		17.05	375.2	3.028 ¢
						16.934
N		13.50	6.67 ¢	18.375	∞	16.934

Run	Time	Rod A	Rod C	Period	t
					6.57
O	2:35	11.90	18.575	443.7	2.71 ¢
					9.44
P		11.90 3.96 ¢	19.535	∞ 19.644	
					3.94
Q		10.045	19.535	586.3	2.09 ¢
					21.737
R		10.045 1.87 ¢	20.415	∞ 21.733	
S		.055	20.415	662	1.87
					25.604
T		10.045	20.415	∞	
U		9.30 ~~9.365~~	20.68	∞	

20.27
− 12.00
8.27"

20.68
14.00
6.68"

Total Value of Rods

Rod A 24.600 ¢

Rod C 32.55 ¢

78

9/11/58

Nicholas
Lynn

INSTRUMENT CHECK

Time 3:35 ~~AM~~ PM Source 10 mg (Y)

	Channel A	B	C	D	E
Range	10 / 1000 ~~oper~~		10 - 10	10 / 1000	900 V.
Source Dist.	1"		1.5"	1.5"	12"
% F.S. Trip	70		100	65	100

C.A 2% 92/8 ~~Expr.~~ 26-4 Run 1

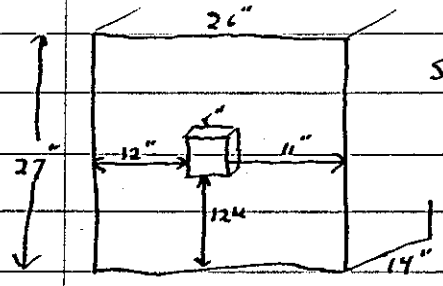
Sheet _____ Date 9-11- 1958 Time 4:15 ~~AM~~ PM

Purpose Zero Run for Reactivity Measurements

26" X 26" X 27"

3" Reflector on all sides.

Sample void 3"X3"X1" ~ Centering reactor



Stationary Unit

Run

A

Run	Sample	Rod A	Rod C	Period	¢
A		15.915 12.05 ¢	15.975 11.52 ¢	∞	
B	Be 252 gms $2\frac{7}{8} \times 2\frac{7}{8} \times 1$"	15.915	15.975		
C	same as B	15.915	17.905	∞	4.27 ¢
D	Carbon 273 gms $2\frac{7}{8} \times 2\frac{7}{8} \times 1$	15.915	15.975	→ ∞	
E	same as D	15.915	16.33	∞	.75 ¢
F	Pb 1514 gms $2\frac{7}{8} \times 2\frac{7}{8} \times 1$	15.915	15.52	∞	-1.4 ¢
G	Bi 1321 gms $2\frac{7}{8} \times 2\frac{7}{8} \times 1$	15.915	15.935	∞	~ -.09 ¢
H	Plexiglas 157 gms $2\frac{7}{8} \times 2\frac{7}{8} \times 1$	15.915	15.975		
I	Same as H.	16.025	20.68	∞	+11.1 ¢
J	Paraffin 127.5 gms $2\frac{7}{8}$ $2\frac{7}{8} \times 1$"	15.915	15.975		

80

		Rod A	Rod C	Period	ϕ
K	Sample J	16.445	20.685	∞	+ 12.15 ϕ
L	Steel Can 32.92 gms. 2 7/8" x 2 7/8" x 1" 8 side thick	15.915	15.235	∞	- 1.55 ϕ
M	Water in SS Can 130.08 gms H_2O distilled	15.915	19.955	∞	+ 10.65 ϕ

CRITICAL POSITIONS

CA 270 92/8 Exp 26 - 4 Run 1

Table Pos. .02

	Cam or Rod		Channel	
1	A - 15.915	A	68.	100/200
2	C 19.955	B	.048	
3		C	7.6	5×10^{-10}
4		D	42	100/200
		E	.2	900

Tim Crit AM PM Down 8:45 PM

5.4

9/12/58

INSTRUMENT CHECK

Time 4:00 — Source 10 mg (R)

				D	E
Range	10/1000	egr	10^{-10}	10/1000	900 ✓
Source Dist.	1"	0	1"	1"	16"
% F.S. Trip	80	OK	100	80	100

5.4

5.4

N

C.A. _____ Expr. 26-4 Run _____

Sheet _____ Date 9/12 1958 Time 5:00 ~~AM~~ PM

Purpose Reactivity measurements

26 x 26 x 27

3" Reflector on all sides

Run	Sample	Rod A	Rod C	Period	¢
N		15.50	16.435	∞	
O	Al. 2 7/8 x 2 7/8 x 1 357 gms	15.50	15.35	∞	-2.34 ¢
P	Fe 2 7/8 2 7/8 x 1 1048	.055	7.60	∞	-22.84
~~M~~ Q	Mg 2 7/8 x 2 7/8 x 1 ~~1155~~ 229	15.50	16.21	∞	-.52 ¢

		Rod A	Rod C	¢
R	NaF $2\frac{7}{8}$ $2\frac{7}{4}$ x1 344.5 gms	15.50	14.13	-4.64
S	Teflon $2\frac{7}{8}$ $2\frac{7}{8}$ x 1" 306 gms	15.50	15.08	-2.69
T	Carbon $2\frac{7}{8}$ $2\frac{7}{8}$ x1 229 gms	15.50 19.46	15.955 0.145	-1.04 ¢

CRITICAL POSITIONS

C.A. _____ Expr. IC-4 Run 1-A

Table Pos. .62 L _____ T _____ R _____

	Control Rod		Channel	
1	A 19.46	A	65	10%/300
2	C 5.00	B	.05	
3		C	8.5	5×10^{-10}
4		D	80.	$\frac{100}{100}$
		E	.2	90?

Tim Crit. _____ AM PM Duration 8:30 min.

9-15-58

Mihalczo
Lynn

INSTRUMENT CHECK

Time 4:20 ~~AM~~ PM Source 10mg 8

Channel

	A	B	C	D	E
Range	10 1000	opr	10^{-10}	10 1000	900 V.
Source Dist.	1"	0"	1"	2"	15"
% F.S. Trip Counters	85	OK	100	65	100

assembly
26"x26"x27"
3" Refl. on sides
2" " on Top & Bottom

C.A. 27 93/8 Expr. 26-5 Run 1

Sheet ____ Date 9-15-1958 Time ____ ~~AM~~ PM

Purpose Bare Indium Foil Exposure; Horizontal Traverse on center line.

Position	-12",	$-9\frac{1}{2}$",	$-7\frac{1}{2}$",	$-5\frac{1}{2}$",	$-3\frac{1}{2}$",	$-1\frac{1}{2}$",	0
number	7,	14,	34,	36,	23,	9,	25
Position	$1\frac{1}{2}$",	$2\frac{1}{2}$",	$3\frac{1}{2}$",	$5\frac{1}{2}$",	$7\frac{1}{2}$",	10",	N
number	19,	30,	1,	3,	12,	27,	N_2

Counter #1
Disc 100
11204x256

Counter #3
Disc 22
3619x256

CRITICAL POSITIONS

C.A. 27 93/8 Expr. 26-5 Run 1

Route Pos. .015 L ____ T ____ R ____

Control Rod		Channel		
A	15.09	A	62	100/500
C	15.60	B	.1	
		C	9.5	2.5×10^{-9}
		D	38.5	100/500
		E	.8	900

Tim Crit. 6:01:50 AM PM Duration 20 min

9-16-58
Mihalczo
Lynn
McCarty

INSTRUMENT CHECK

Time 11:10 AM Source 10mg γ

	A	B	C	D	E
Range	10/1000	OFF	10^{-16}	10/1000	900V.
Source Dist.	½"	0"	2"	15"	15"
% F.S. Trip	80	OK	100	75	100

Counters [illegible]

C.A. 290 92/8 26-5 Run #2
Sheet Date 9-16 1958 11:35 AM
Purpose Bare Indium Foil Exposure
Horizontal Traverse

Same foils in same positions as p. 83.

CRITICAL POSITIONS

C.A. 290 92/8 Expr. 26-5 Run 2

Table Pos. .015

Control Rod	Channel		
A - 14.83	A	38	1000/500
C - 15.85	B	.2	
	C	6.4	10^{-8}
	D	58	1000/300
	E	5	690V

Crit. 11:45 58/60 AM Duration 15 min

C.A. 29 9 1/8 Expr. 26-5 Run 3

Sheet _____ Date 9-16-1958 Time 4:45 ~~AM~~ PM

Purpose Bare Gold Horizontal Traverse at Outer line.

N = ± 5

Position	-12",	-9½",	-7½",	-5½",	-3½",	-1½",	0,
Number	17,	11,	13,	12,	10,	21,	3,
Position	1½",	2½",	3½",	5½",	7½",	10",	12"
number	27,	28,	15,	22,	4,	16,	20.

CRITICAL POSITIONS

C.A. 29 9 1/8 Expr. 26-5 Run 3

Table Pos. .015 T P

	Control Rod		Channel	
1	A 14.74	A	59	1000/1000
2	C 15.85	B	.4	
3		C	6.2	3×10^{-8}
4		D	36.5	1000/1000
		E	2.2	690V.

Tim Crit. 5:04 ~~5-5 AM~~ 60 PM Duration 40 min.

9-17-58

INSTRUMENT CHECK

Time 4:05 PM Source 10 mg (δ)

	A	B	C	D	E
Range	10 1000 opr	10⁻¹⁰		10 1000	900 V.
Source Dist.	1"	0"	2.5"	1"	15"
% F.S. Trip	80	ok 100	75	100	

Counters 1, 2 & 3

CA 2708 92 Exp. 26-5 4

Sheet ____ Date 9-17 1958 Time 4:15 AM PM

Purpose Bare Gold ~~Horizontal~~ Vertical Traverse at center line

26 x 26 x 27 parallelepiped

3" Paraffin on Sides 2¼" Plex on Bottom

1½ Paraffin ¾ Plex on top

B

15 Minute at ¼ Count.

Counter # 1
Disc - 65
Registers 6883
x 256

Counter # 2
Disc - 20
Registers 2177
x 256

Counter # 5
Disc - 65
Registers 5122
x 256

CRITICAL POSITIONS

Expr ____ Run ____

Channel

A - 12.43 A 73 1000/500

C 13.71 4

6.0 20 x 1/2 = 8

D 4.6 500/100

E 1.0 (79

Time Crit. 4:52 5/6 AM PM Duration 40 min

Pos. t.
F. l
Pos. t.
F. l

Position	$-12\frac{1}{2}$	$-10\frac{1}{2}$	-9	-7	-6	-4	$-2\frac{1}{2}$	-1
Foil #	10	7	22	11	21	16	28	24
Position	0	+1	+3	+5	+7	$+9\frac{1}{2}$	+11	+12
Foil #	19	3	26	8	4	1	15	12

88

9-22-58

INSTRUMENT CHECK

Time 4:30 ~~AM~~ PM Source δ (10 mg)

	Channel A	B	C	D	E
Range	10/1000	opr	10	10/1000	900 V.
Source Dist.	2"	0"	2"	1"	15"
% F.S. Trip	70	OK	100	80	100

C.A. 27 9⅛ Expr. 26-5 Run 8

Sheet ____ Date 9-22-1958 Time 9:50 AM PM

Purpose Horizontal Traverse
Bare Gold at midplane

normalizer.
N = 17

Position from Center	-12,	-9½,	-7½,	-5½,	-3½,	-2½,	-1½,	0,	
Number	11,	16,	20,	1,	12,	21,	15,	9,	
Position	1½,	2½,	3½,	5½,	7½,	10,	12,	13½,	14½, 15½
Number	14,	4,	7,	10,	18,	3,	8,	2,	13, 19

CRITICAL POSITIONS

C.A. ____ Expr ____ Run ____

Table Pos. 015 L ____ T ____ R ____

	Control Rod		Channel	
1	A 12.205	A	46	1000/1000
2	C 12.70	B	.5	-8
3		C	3.7	3x10
4		D	5-6	1000/530
		E	1.8	620

5:01: 31/60 ~~AM~~ PM Duration 40 min.

9-25-58

INSTRUMENT CHECK

Time 4:20 ~~AM~~ PM Source ~~Co~~ (10 meg)

Channel	A	B	C	D	E
Range	~~10~~ 1000	off	10^{10}	$\frac{10}{1000}$	900V
Source Dist.	1"	0"	2"	1"	15"
% F.S. Trip	85	OK	100	90	100

1½" Paraffin between Rustrak + log N

normalizer N=25

C.A. 27. $\frac{92}{8}$ Expr. 26-5 Run 6

Sheet ____ Date 9/25 195 8 Time 4:30 AM PM

Purpose Horizontal Traverse

Cd covered gold at indpelane

6" on two inches 3" on two inches 1 to 2¼ top + bottom plane of traverse.

Position from center	-12	$-7\frac{1}{2}$	$-3\frac{1}{2}$	$-1\frac{1}{2}$	0	$1\frac{1}{2}$	$3\frac{1}{2}$	$7\frac{1}{2}$	12	15.5	14.5
Number	14	2	6	7	26	24	1	9	18	23	8

15½

19

CRITICAL POSITIONS

C.A. ____ Expr 26-5 Run 6

.015 L T R

Channel	Grid Ref		
A	11.14	A 46	$\frac{1000}{1000}$
C	11.74	B .5	
		C 4.3	3×10^{-8}
		D 61	$\frac{1000}{500}$
		E 3.0	690

Firm Crit. ~~5~~ 5:25:45 ~~AM~~ ~~20~~ PM Duration 40 min.

90

9-29-58

INSTRUMENT CHECK

Time 11:10 AM — Source 8 10 mg

Channel	A	B	C	D	E
Range	10 / 1000 off		10^10		900V.
Source Dist.	1"	0"	2"	2"	13
% F. Trip	90	OK	100	80	95

Counters 1, 273

1½" Paraffin plate between reflector + Log N

C.A. ____ Expr 2C-5 Run 7

Sheet ____ Date 9/29 958 Time 11:30 AM PM

Purpose Horizontal Traverse with 4 255 Foils

2C x 2C x 27 Bare Foils

6" Paraffin on 2 sides 2¼" Top & Bottom

3" " " E + W

Normalizer

N = 30

Position	-12,	-9½,	-7½	-5½	-3½,	-1½	0	1½	5½	5½	7½	10
Foil #	5,	33,	15	31	20,	7	21	28	27	17	18	13
Position	12	13.5	14.5									
Foil #	23	37	32.									

CRITICAL POSITIONS

C.A. ____ Expr 2C-5 Run 7

Foil Pos. .015 ____ T ____

A - 15.4 A 69 1000/200

C - 14.83 C .15

C 7.0 10^-8

D 90 1000/100

E 1.1 750

Tim Crit. 11 48 AM PM Duration 15 min.

10-1-58

INSTRUMENT CHECK

Time _____ AM / PM Source 8 10 mg

Channel

	A	B	C	D	E
Range	10/1000		10^{-10}	10/1000	900 V.
Source Dist.	1"		4"	1"	12"
% F.S. Trip	85		100	80	100

Counters 1, 2 & 3

C.A. 290 92/8 Expr. 26-5 Run 8

Sheet _____ Date 10-1 1958 Time 1135 AM / PM

Purpose Horizontal Traverse

Cad. Covered U 235 Foils

26 X 26 X 27 — 6" Paraffin on 2 Sides - 2½" Top & Bottom

3" " " E & W.

Sub-critical

10-6-58

INSTRUMENT CHECK

Time 1120 AM / PM Source 8 10 mg

Channel

	A	B	C	D	E
Range	10/1000	Opr	10^{-10}	10/1000	900
Source Dist.	1"	0"	2"	1"	14"
% F.S. Trip	85	op	100	75	100

Counters 1, 2 & 3

10-6-58

C.A. 270 92/8 Expr. 26-5 Run 9

Sheet ____ Date 10-6-58 Time 11:32 AM

Purpose Horizontal Traverse

Cad. Covered #4 235 Foils

26 X 26 X 2.7 6" Paraffin on 2 sides 3 1/4" Refl on Top + Bottom

3" " " " E + W

10

Foils								
~~Position~~	25	12	16	10	13	4	19	26
Position from center	-2"	0"	2"	5"	8"	11"	14.5"	N

CRITICAL POSITIONS

C.A. 270 92/8 Expr. 26-5 Run 9

0:15

Channel

A - 15.50 A 70 1000/200

C. 16.385 B .16

C 7.7 10-8

D 43 1000/200

E 2.2 750 V

Crit. 11:48 05/60 AM Duration 15 min.

10-20-58

INSTRUMENT CHECK

Time 11:20 AM PM Source Ra 10 mg

	Chan. A	B	C	D	E
Range	10/1000	opr	10^{-10}	10/1000	900 V.
Source Dist.	1"	0"	4"	7"	13"
% F.S. Trip	85	OK	100	80	100

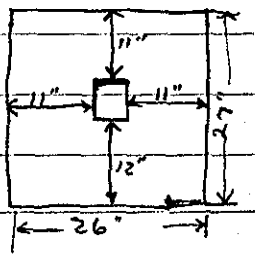
C.A. 2 9/8 Expr. 26-6 Run 1

Sheet ____ Date 10/20 1958 Time 11:30 AM PM

Purpose Initial Run on UF_4 particle size evaluation 26 x 26 x 27 co-reflector

Test hole 4" x 4" x 1" (~ at center of reactor)

Completely Reflected



CRITICAL POSITIONS

2 9/8 Expr. 26-6 Run 1

0.15 T ____ R ____

	Channel	
A-20.275	A 58	100/200
	B 011	
C-17.775	C 6.6	3×10^{-10}
	D 59	100/200
	E 5	900

Time Crit. 11:35 AM PM Duration 11 min.

10-20-58

C.A. 270 92/8 Exp. 26-6 Run 2

Sheet ... Date 10-20-58 Time 1:05 PM

Purpose Initial run on 4 Zr particle size

26" X 26" X 27"

Ref. 6" on 4 sides 3" top + Bottom

Void 4" X 4" X 1" as shown p. 93

CRITICAL POSITIONS

270 92/8 Exp. 26-6 Run 2

.015

Chemist

A-20.265 61 100/200

.61

C-11.34 7.2 3X10^-10 100/100

D 62 100

E .4 900

Time Crit. 1:20 PM Duration 5 min.

Sample 4" X 4" X 1" placed in void (1178 g. net wt)

Run #3 4 Zr 4 Particle Size > 149 Micron

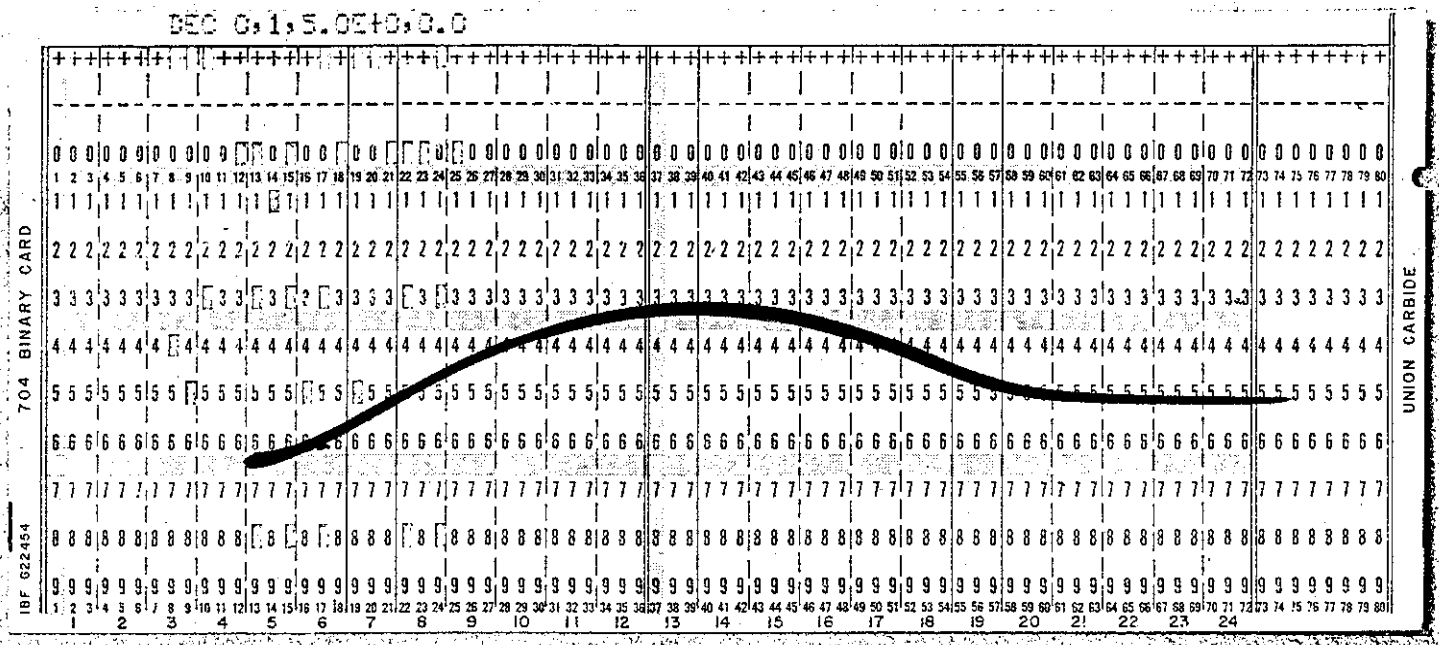
Delta K / K ~~10.3~~ ~8.2 ¢ +100 mesh

Run #4 4 Zr 4 Particle size -325 mesh < 44 mm

Δ K / K ~~8.6~~ ~8.6 ¢

Run #5 Δ K / K 8.8 ¢ -50 mesh < 297 mm

DEC 0.1,5.0E+0,0.0



INSTRUMENT CHECK

8:30 AM ~~PM~~ Source Y 10 mg

Check

	A	B	C	D	E
Range	10/1000	opr	10^{-10}	1/1000	960 V.
Source Dist.	1"	0"	2.0"	1"	15"
% F.S. Trip	90	OK	100	80	100

C.A. 22 92/8 Expr. 26 - 6 Run 6

Sheer _____ Date 10-21 1958 Time 9:00 AM ~~PM~~

Purpose Initial run on 2 1/2 x Particle Size (Same as Run 2)
26" X 26" X 27"
6" Reflector on 4 sides 3" Top + Bottom

Rod C @ 16.10 on 1.48 sec period = 7.15 ¢
Levelec Rd. C @ 16.10 Sensitivity ____ ¢/in.

Rod C @ 16.10 on 360 sec period = ____
Levelec Rd. C @ 16.10 Sensitivity ____ ¢/in.

Direct @ 60

Discrim @ 55

Counters 1 (scale 16, 2 min)	Counters 3	Log N	A	C	D	E	Rod A	C.	
826	609	.005	66 100/100	5.9 3×10^{-10}	68 10/500	1	900V	20.27 ~~20.70~~	10.96	Level
								18.00	10.96	Pos. Period
Scale 256										
390	278	.05	63 1000/1000	6.0 3×10^{-9}	63 100/500	3.8	900V	18.00	16.10	Level
								20.27	16.10	Neg. Period

Run 7 — UF_4 Particle Size > 149 microns (+100 mesh) Same as Run 3
10:15 AM
Rod C @ 16.10 on 215 sec period = 5.18 ¢ 5.16
Rod A = 19.00
Levelec Rd. C @ [redacted] Sensitivity ____ ¢/in.
Did Not Level

Run 8 — UF_4 Particle Size < 44 microns (-325 mesh) Same as R. 4
1:00 PM
Rod C @ 16.10 on ____ sec period = 5.33 ¢ 5.32
Rod A = 19.00
Levelec Rd. C @ 19.68 Sensitivity ____ ¢/in.

Rod A 18.00 ____ sec period = 3.21 ¢
Levelec Rd. A @ 19.00 Sensitivity ____ ¢/in.

96

Run 9 — UF4 Particle size < 297 microns (Regular Blk.) Run

2:30 PM. Rod C @ 16.10 on 212 + 5.29 ¢ +5.28
Rod A=19.00
Leveled Rd. C 18.73 ¢/in.

		ΔK/K	
Rod A @ 18.00	¢		1"x4"x4"
Leveled Rd. A @ 19.00	¢/in.	8.53¢	-325 mesh
		8.49¢	-50
		8.38	+100

10-22-58

INSTRUMENT CHECK

Time 8:30 AM Source γ 10 mg

	Channel A	B	C	D	E
Range	10/1000	oper	10^{-10}	10/1000	900V.
Source Dist.	1"	0"	1"	1"	15"
% F.S. Trip	85	OK	100	65	100

C.A. 2982 Expr. 2-6-6 Runs 10
Sheet ____ Date 10-22-1958 Time 8:45 AM
Purpose UF4 Particle Size Evaluation.
Rod A = 19.75"] in limit switches taped closed.
Rod C = 16.10] this gives ~3¢ excess reactivity
Runs were made by moving tables only

Run #10 UF4 Particle size < 297 microns (-50 mesh)

Run #11 ZrF_4 Particle size < 44 Microns (-325 mesh)

Run #12 ZrF_4 Particle size > 149 microns (+100 mesh)

Run #13 4" X 4" X 1" block of $\frac{H}{X} = 400$ material.

CRITICAL POSITIONS

% 92/8 Expr. 26-6 Run 14

Pos. .015 L T

Control Rod Channel

A 17.845 A 45 100/500

C 16.10 B .02

C 7.2 10^{-9}

D 60 100/200

E 750 V.

Tim Crit. AM PM Duration min.

4" X 4" X 1" Void at Center

10-23-58

INSTRUMENT CHECK

Time 2:05 AM PM | X on mg.

	Channel A	B	C	D	E
Range	10 / 1000	Opr	10"	∞ / 1000	900 V.
Source Dist.	1"	0"	2"	1"	14"
% F.S. Trip	88	OK	100	85	100+

26"X26"X27" ; 6" Refl on 4 sides; 3" Refl. on Top & Bottom

C.A. 270 92/8 Expr 26-7 Run 1

Sheet ____ Date 10-23-58 Time 2:20 ~~AM~~ PM

Purpose Foil Exposure to be used in ~~fuel~~ Normalization of flux measurements in different H/X mixtures.

Bore In foil #11 at center of Reactor. Bore In foil #1, @ 0, -3, 0.

CRITICAL POSITIONS

CA 270 92/8 Expr 26-7 Run 2

Last Pos. .015 T ____ P ____

	Channel		
A - 18.76	A	71	1000/100
C - 18.78/84	B	.053	
	C	6.6	2.5X10⁻⁹/100
	D	71	500
	E	2.2	840

Tim Crit. 2:35 07/60 AM PM Duration 20 min

10-24-58

Lynn McCarty

INSTRUMENT CHECK

Time 1:00 ~~AM~~ PM Source Y 10 mgs

	Channel A	B	C	D	E
Range	1000 opr		10^{-10} 1/100		900 V
Source Dist.	1"	0"	1½"	2"	15"
% F.S. Trip	90	OK	100	80	100

C.A. 270 ~~9z~~ 8 Expr 26-7 Run 2

Sheet Date 10-24-58 Time 1:45 ~~AM~~ PM

Purpose

See Run #1

Cad. ind foil #10 at center of reactor

Bare ind. foil N2

2-20

CRITICAL POSITIONS

C.A. 270 ~~9z~~ 8 Expr 26-7 Run 2

Table Pos. .01 L T R

A - 18.417
C - 18.515

Channel		
A	62	1000/200
B	.1	
C	7.6	5×10^{-9}
D	65	1000/100
E	1.1	750

Tim Crit. 2:02 07/60 ~~AM~~ PM Duration 20 min.

8:45 AM

10-24-58

Lynn McCarty

C.A. $270^{92}/_{8}$ Expr. 26-7 Run 3

Sheet _____ Date 10-24-58 Time 2:50 ~~AM~~ PM

Purpose

See run # 1.

Bare U^{235} metal foils #2

Bare Ind. foils N3

CRITICAL POSITIONS

C.A. $270^{92}/_{8}$ Expr 26-7 Run 3

Table No. .01 T P

Channel

A 18.76	A 63	1000/100
C 18.66	B .052	
	C 7.1	2.5×10^{-9}
	D 62	100/500
	E .3	750

Time Crit. $3:04^{01}/_{60}$ AM PM Duration 20 min

10-27-58

INSTRUMENT CHECK

Time 9:00 AM ~~PM~~ Source Y

	Channel A	B	C	D	E
	13 / 1000	off	10 -10	14 / 100	900 V.
Source D.	1"	0"	2"	1"	15"
% F.S. Trip	85	OK	100	80	100

Bare U^{235} metal foil #29, 1.0079 Bare In foil # N/

C.A. 290 92/8 Expr. 26-7 Run 4

Sheet ____ Date 10-27 1958 Time 9:33 AM ~~PM~~

Purpo See Run #1

CRITICAL POSITIONS

C.A. 290 92/8 Expr. 26-7 Run 4

Radio Fre. .015 T R

	Channel	
1 A - 18.75	53	100/500
2 C - 18.83	B .02	
3	C 8.2 10^{-9}	
4	D 68	100/200
	E 1.5	900

Tim Crit. 9:47 48/60 AM ~~PM~~ Duration 2.0 min.

Run #5 exit 11:03 AM 30 min

Cd Covered U^{235} #3 1.0136, Bare In foil #N4

Log N = .07 Rod A = 18.155 Rod C = 18.17

Run # 6 Bare Gold foil #226 (1⅛" dia, 2 mil); Bare In #N_2.
Crit. 12:06 $\frac{23}{60}$, 20 min. Log N = .01 Rod A = 18.535 Rod C = 18.57

Run #7 Cd. covered foil # 227 Bare In. #N_3
Crit. 1:03 $\frac{16}{60}$, 20 min. Log N: .02 Rod A: 17:5 Rod C = 17.6

Run #8 Bare U^{235} 2% #A1 Bare Ind. # N_5
Crit. 2:10, 20 min. Log N .02 Rod A = 18.545 Rod C = 18.695

Run #9 Cd Covered U^{235} 2% #A-2; Bare Indium # N_6
Crit 3:08 $\frac{04}{60}$, 20 min. Log N .02 Rod A 17.42 Rod C. 1745

10-28-58

INSTRUMENT CHECK

Time 9:00 AM ~~PM~~ Source γ

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/1000	900V
Source Dist.	1.5'		1"	1"	14"
% F.S. Trip	90		10%	80	100+

Counter 1, 2 & 3

Bare Alu. alloy #1 Bare Ind. #N1

C.A. 2.90 Expr. 26-7 Run 10

~~Sheet~~ Date 10-28-1958 Time 9:12 AM ~~PM~~

~~Purpose~~ See Run #1

CRITICAL POSITIONS

C.A. 2.90 Expr. 26-7 Run 10

.015 T R

Channel		
A	18.55	.67 100/200
C	18.25	.01
	C 5.8	$10^{2.9}$
	D 70	100/108
	E 1.0	900

Tim Crit. 9.30 32/60 AM PM Duration 2-0 min.

Run #11 C.D. Covered ~~Bare~~ Alu. alloy #2 Bare Ind #N2

Crit 10:40 25/60, 20 min Log N .02 Rod A 17.39 Rod C 17.485

CA. 207.92/8 Expr. 26-6 Run 15

Sheet _____ Date 10-28-58 Time 11:22 AM PM

Purpose Evaluation of Control Rods

CRITICAL POSITIONS

CA 207.92/8 Expr. 26-6 Run 15

B 015 T R

	Channel	
A-19.73	A 57	1000/200
C-16.62	.095	
	C 5.7	5×10^{-9} 100/1000
	D 5.6	
	E 1.8	750

Crit. 11:33 AM PM Duration 48 min.

Rod A @ 18.00 on _____ sec period = _____ ¢

Leveled Rd A @ 19.00 Sensitivity _____ ¢/in.

Rod A @ 18.00 on _____ sec period = _____ ¢

Leveled Rd A @ 19.73 Sensitivity _____ ¢/in.

10-31-58

INSTRUMENT CHECK

Time 8:45 ~~AM~~ PM Source γ 10 mg.

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/1000	900V
Source Dist.	1"	∅"	5"	1"	15"
% F.S. Trip	81	SC	100	80	100+

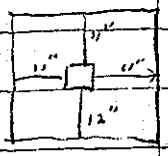
C.A. 27.92/8 Expr. 26-6 Run 16

Sheet ____ Date 10/31 1958 Time 12:45 ~~AM~~ PM

Purpose UFy particle size evaluation

14" on movable table 3" Reflector on all sides

12" on stationary "



5"×4"×4" Test Hole

4×4×4 on movable half

1×4×4 on fixed half.

T_2 = temperature at top core reflector interface

T_1 " in Center of core.

Run	Sample	Rod A	Rod C	T_2	T_1	Period
A	-50 mesh	14.5	16.61	.9084	9125	∞
B	-50 Mesh	15.5	16.11	9084	9125	3.00 +
C	-50 Mesh	13.5	16.11	909	9125	
D	+~~100~~ mesh	13.5	16.11	9086	9130	4.81 +
E	+200 Mesh	13.5	16.11	9095	9133	
F	+325 mesh	13.5	16.11	.911	.9125 9135	5.94 +
G	-325			.91	9104	
H		15.5	18.19	Tables for .25 & back together		∞
I		13.5	18.19			
J		15.5	18.19	Tables for .75 & back together		

11-3-58

INSTRUMENT CHECK

Time 8:40 AM ~~PM~~ Source ~~5 10 mc~~

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	~~off~~	10^{-10}	$\frac{10}{1000}$	900V.
Source Dist.	1"	0"	1.5"	1"	14"
% F.S. Trip	95	OK	100	80	100+

Counters 1, 2 & 3

C.A. 270 $\frac{92}{8}$ Exp. 26-6 Run 17

Sheet ____ Date 11-3-58 Time 8:48 AM PM

Purpose Wt % Particle size Evaluation

6" Reflector on all sides

5"x4"x4"

Run	Sample	Rods A	C	T_2	T_1	Period		¢
A	-325	13.675	20.695			∞		6"-2 sides
A	-325	19.225	20.695			∞		6" Refl
B	-325	17.50	20.695					
C	-325	17.5	20.695			205	5.494	
D	-325	17.5	20695	.8517	8512			
E	+100	17.5	20.695					
F	+100	17.5	20.695				6.5	
G	+10-	17.5	20.695					
H	-50	17.5	20.695					
I	-50	17.5	20.695				4.84	
J	-50	17.5	20.695					
K'	+100	17.5	20.695	4x4x4	+100		6.86	
K²	+100	17.5	20.695	1x4x4	-50			

Temp. Control for Rm #108 set at 53°F -4:15 PM 11-3-58

	Rods A	C	T_1	T_2	
L^1-50	17.5	20.695	8395	8350	5.06 ¢
L^2-50	17.5	20.695	8396	8363	

11-4-58

INSTRUMENT CHECK

Time 8:25 AM Source Y 10 mg.

	A	B	C	D	
Range	10/100	Opr	10^{-10}	10/1000	9.00 V.
Source Dist.	1"	0"	2"	1.5"	1.4"
% F.S. Trip	90	OK	100	90	100+

Counters 1 & 3
2 out

C.A. 290 92/8 Expr. 26-6 Run 18

Sheet ____ Date 11-4 1958 Time 8 35 AM PM

Purpose U Zr Particle size Evaluation

Temperature Coefficient
6" Reflector small side

Run	Sample	Rods A	C	T_1	T_2	
				Begin 7850	7995	
A1	-50	17.5	20.695	Taken 7887	8048	
				Taken 7905	8048	
A2	-50	17.5	20.695	Together 7905	8050	
A3	-50	17.5	20.695	7905	8050	
				7929	8082	
A-4	-50	19.62	20.695			Incl
	Void			7955	8125	
B-1	4X4X5	11.385	.16			
B-2	"	11.26	.16			

#1 8523 12:10 F - start of F
#2 8582

#1 8527
#2 8538 F

#1 8518
#2 8527 F

#1 8523
#2 853c F end of F

#1 8523 Beginning of G
#2 8539

12:31 #1 8530
#2 8536

#1 8511
#2 8525 End of G 12:40

standard call gate w/ slit off
12:52 #1 8495 ↓ 8486
#2 8517 8461 H

#1 8476
#2 8460 Middle of Run H

#1 8496 Between H + I
#2 8474

11:23 #1 = 8512
#2 - 8517

11:27 #1 - 8516
#2 - 8576

11:30 #1 - 8531
#2 - 8590

#1 8520 11:32
#2 8574

SW

#1 #1 8533 11:35
#2 8600

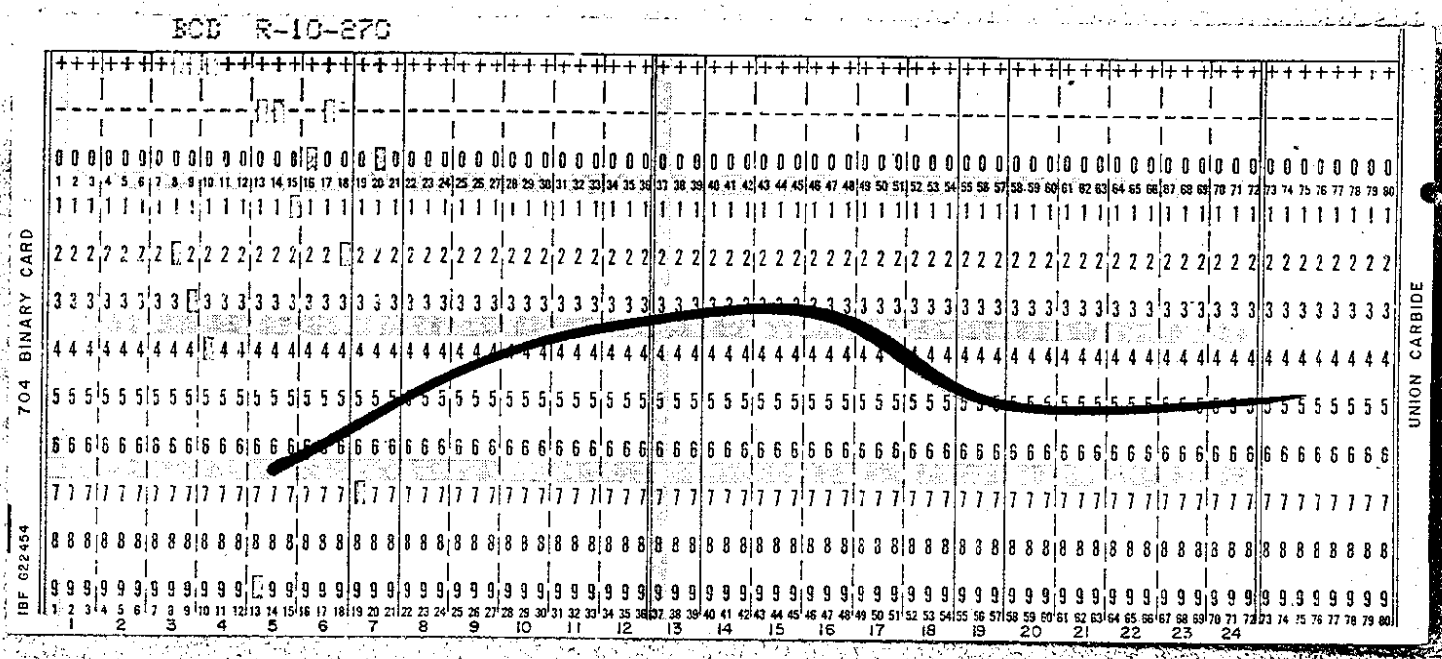
#1 8522 11:37
#2 8548

#1 8523 11:45
#2 8562

#1 8525 12:00 E
#2 8545

	Rim E			I	
1	8525	8535	#1	8496	
2	8545			8470	
	Rim F		#2	8474	
				8432	
1	8523				
	8527	852275		J	
	8518		#1	8464	
	8523			8448	
2	8582		#2	8436	
	8538			8407	
	8527				
	8536			K	
	Rim G		#1	8448	
				840	
=1	8523			8410	
	8530	852133			
	8511		#2	8458	
				8385	
=2	8539			8387	
	8536				
	8525				
	H				
#1	8495				
	8486	848825			
	8476				
	8496				
=2	8517				
	8461				
	8460				
	8474				

BOB R-10-270



108

11-5-58

INSTRUMENT CHECK

Time 9:00 AM PM Source β

	A	B	C	D	E
Range	$\frac{10}{100}$	Off	10^{-10}	$\frac{10}{1000}$	900 V.
Source Dist.	1"	0"	1.5"	1"	13"
% F.S. Trip	85	on	100+	80	100+

C.A. 37, 92, 8 Expr. 26 – 6 Run 19

Sheet ____ Date 11/5 1958 Time 9:30 AM PM

Purpose Temp Coeff evaluation.

178.1 sec period on 11/4/58 with R.ds out. 5×4×4 Vol

Run	T_1	T_2			
-A-	8509	8411			
	8493	8411			
	8496	8417			
	8486	8400			
	8494	8413			
	8475	8393			
	8486	8408			
	8474	8406			
	8485	8402			
Av.	8488	8407			
	70.8°	70.45	198.7 sec	199.8	199.3 sec
	68.73	69.5	temperature		178.1 sec

$\Delta T_1 = 2.07°F$ $\Delta T_2 = .95°F$

Run	Sample	Rods A	Rods C	T_1	T_2
-B-	-50	17.5	20.70	8558	8428
				8553	8435
Marble	4×4×4	T_1 = 190.4		8506	8408
		ϕ = 5.84		8515	8413
				8509	8414
			Av	8528	8420
-C-	-325	17.5	20.70	8514	8432
				8500	8435
	4×4×4	T - 184.6	ϕ 5.97	8505	8432
				8479	8422
			Av	8499	8433
-D-	+100	17.5	20.7	8507	8453
	4×4×4	T - 151.2	6.94 ϕ	8468	8442
				8470	8437
-E-	Empty Hole	15.5	27.6 8.12 ϕ 0.15	~~8485~~ 8465	8426
	∞ Period	18.06	:15	8465	8427
158	∞ Period	11.58	20.70	844	8417
				8455	8430

Rod C 0.15 to 20.70 = Rod A from 11.58 to 18.06

11-6-58

INSTRUMENT CHECK

Time 8:30 — Y

	10/1000	off	15^10	10/1000	900 V.
Source	½"	0"	3"	1"	13"
% F.S. Trip	85	OK	100	80	100+
Counters 1, 2 F3					

C.A. 27 92/8 Expr. 26-6 Run 20

Sheet ____ Date ____ 195__ Time ____ AM PM

Purpose Particle size evaluation - Repeat of previous using counter for pinch measure

Run		T_1	T_2	Rod A	Rod C	Period	
- A -	Level	.8626	.8637	11.385	18	184.6	5.96
	Determination	.8616	.8619				
		.8627	.8654	13.99	18	∞	
				13.98	15	200 sec	5.55
				15.945	15	∞	

Rod A Calibration

	Sec Pd	¢	Page
0 to 11.385		6.14 ¢	107
11.385 to 13.99	184.6	5.96	110
13.99 to 15.945	200	5.56	110
15.50 to 18.06	127.6	8.12	109
17.50 to 19.225	203	5.5	106
0 to 9.65	329	3.61 ¢	112

11-7-58

INSTRUMENT CHECK

Time 12:40 ~~AM~~ PM Source Y

	Channel A	B	C	D	E
Range	10/1000	OPR	10^{-10}	10/1000	900V
Source Dist.	1"	0"	2"	1.5"	14"
% F.S. Trip	85	OK	100	80	100+

C.A 290 92/8 Expr 26-7 Run 11

Sheet ____ Date 11-7 1958 Time 2:17 ~~AM~~ PM

Purpose Poile Exposure U235 Metal

Completely Collected

U^{235} #17 Normalizer ; U^{235} at #37 at Center

0, -1.5", 0

CRITICAL POSITIONS

C.A 290 92/8 Expr 26-7 Run 11

.015 T3.007 B-9170

Control Rods

A- 19.02

C 20.68

Channel		
A	71	100/200
	.01	
C	9.8	3X10 -10
D	64	100/100
E	1.2	900

Crit. 1:28 29/60 ~~AM~~ PM Duration 20 min.

Run #12 U^{235} #25 Normalizer ; U^{235} #15 cd Cored at Center

Critical 2:25 30/60 Log N .005 Dura. 20 min

Scale – 256 ° one minute count

t	Counter # 1	# 2	# 3
0	34 – 24 8728	9 – 21 2325	6 – 177 1712
2 min	48 – 167 12455	12 – 151 3225	9 – 127 2431
4	73 – 142 18830	18 – 41 4649	13 – 150 3478
6	107 – 160 27552	25 – 104 6504	19 – 236 5100
8	157 – 87 40279	34 – 61 8765	29 57 7481
10	224 – 56 57380	47 – 79 12111	41 – 86 10582
12	326 – 248 83704	64 – 18 16402	60 – 14 15374
14	469 – 212 120276	82 – 150 21142	86 – 134 22150
16		106 – 208 27344	124 – 98 31842
18		136 – 248 35064	179 252 46076
19.5		165 168 42408	255 –107 60269
21.0		193 – 248 49652	507 – 249 78841
22.5		228 151 58499	404 – 169 103587
24.0		272 – 41 69673	534 195 136897
25.5		318 42 81450	706
Discrimination setting	30	25	35

B	A	D
001	74 $^{1}/_{200}$	77 $^{10}/_{100}$
0015		
0022		
0032	91 $^{10}/_{500}$	42 $^{10}/_{500}$
005		
0068		
.01	69 $^{100}/_{200}$	61 $^{100}/_{100}$
.014		
.021	59 $^{100}/_{500}$	63 $^{100}/_{200}$
<.030		
.040	56 $^{100}/_{100}$	45 $^{100}/_{500}$
.052	72 $^{1000}/_{100}$	59 $^{100}/_{500}$
.065	46.5 $^{100}/_{200}$	
.09		

$\frac{H}{X}$ = ~ 350

11-11-58

INSTRUMENT CHECK

Time 8:35 AM ~~PM~~ Source β

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$ opr		10^{-10}	$\frac{10}{1000}$	900V.
Source Dist.	1"	0"	2"	½"	14"
% F.S. Trip	85	OK	100	95	100+

Counters

C.A 2% 87/13 Expr. 26M-1 Run 1

Sheet Date 11-11 1958 Time 8:53 AM ~~PM~~

Purpose Assembly of $\frac{H}{X}$ = 195 and $\frac{H}{X}$ = 26" X 26" X 20" - Parallelepiped assembly built 1 block $\frac{H}{X}$ = 195 to 3 block of $\frac{H}{X}$ = 4

LOADING CHANGE

Description $\frac{H}{X}$ = 195 blocks - 1.026 $g^{U^{235}}/in^3$

$\frac{H}{X}$ = 4 " - .7257 g/in^3

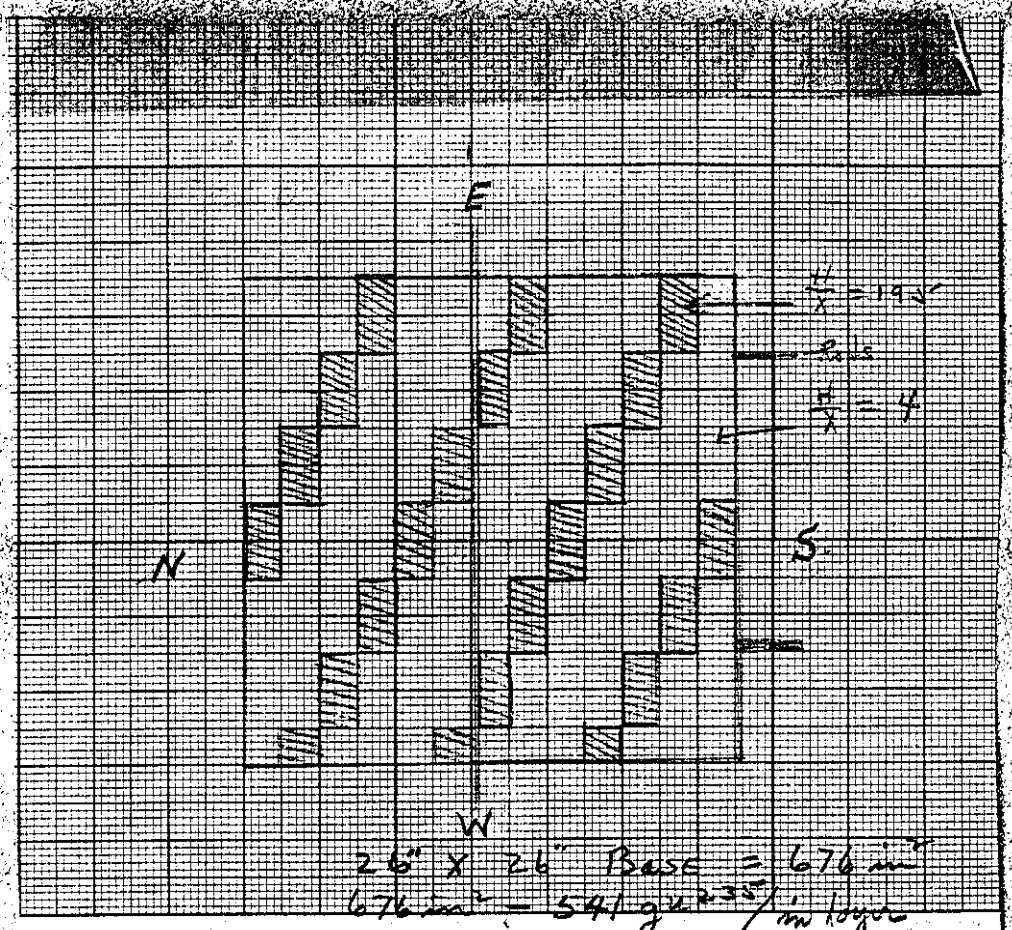
average = .8008 g/in^3

26 X 26 X 20 ~~X .8008~~ = 13,520 in^3 X .8008 = 10,826 g

Mass before change	gmU	gmU-235	- 82g
Mass of Change	gmU	gmU-235	10,764
Total Mass	gmU ~~10,764~~ 10,764	gmU-235	for rods

Sub Critical

Mixed blocks $\frac{H}{X}$ = 195 and $\frac{H}{X}$ =


E
N
S
W
$\frac{H}{X} = 19.5$
$\frac{H}{X} = 4$
26" X 26" Base = 676 in²
676 in² = 541 gr 2.35 / in² Layer

C.A. 27 87/13 Expr. 26M-1 Run 2

Sheet _____ Date 11-11-1958 Time 9:45 ~~PM~~ AM

Purpose 26" X 26" X 24" - Parallelepiped Bare

LOADING CHANGE

~~Description~~ Added 4" layer

26 X 26 X 4 = 2704 in³

2704 X .8008 = 2,165 g U²³⁵

~~Mass before change~~		gmU	gmU-235
~~Mass of Change~~		gmU 10,764	gmU-235
Total Mass		gmU 2,165	gmU-235
		12,929	

Sub Critical

C.A. 27 87/2 Expr. 26M-1 Run 3

Sheet _____ Date ~~10:25 PM~~ 11-11-58 Time 10:25 PM AM

Purpose 26" X 26" X 26" - Parallelepiped Bare

LOADING CHANGE

~~Description~~ ~~26~~ added 2" layer

26" X 26" X 2" = 1352 in³

1352 X .8008 = 1082.5 g U²³⁵

Mass before change		gmU 12,929	gmU-235
~~Mass of Change~~		gmU 1,082.5	g 235
Total Mass		gmU 14,011.5	g 235

Super Critical - Tables .35"

C.A. 270 87/13 Expr. 26M-1 Run 4
Sheet ____ Date 11-11 1958 Time 11:03 AM PM
Purpose 26" X 26" X 25" Parallelepiped
Bore

LOADING CHANGE

Description Removed 1" layer
26 X 26 X 1 = 676
676 X .8008 = 541 g u^{235}

Mass before change	gmU	14,011.5	gmU-235
Mass of Change	gmU	-541.	gmU-235
Total Mass	gmU	13,470.5	gmU-235

Super critical - Tables = .05"

C.A. 270 87/13 Expr. 26M-1 Run 5
Sheet ____ Date 11-11 1958 Time 11:24 AM PM
Purpose 26" X 26" X 25½" Parallelepiped
Bore

LOADING CHANGE

Description Removed ½" layer
26 X 26 X ½" = 338 Cu. in.
338 X .8008 = 270.5

Mass before change	grnU	13,470.5	gmU-235
Mass of Change	gmU	270.5	gmU-235
Total Mass	gmU	13,200.0	gmU-235

Cont. next Page

CRITICAL POSITIONS

290 87/13 Expt 26M-1 Run 5

.015 T 2942 B 9570

53 100/200

A - .05 .0046

C - 19. 8.0 3X10⁻¹⁰

D 87 10/500

E .2 900

Tim. Crit. 11:35 A.M. Duration ____ min.

Rod C @ 15.00 on 115 sec period = 8.7

Leveled Rd C @ 19.41 Sensitivity 1.97 ¢/in

8.7
6.5 &
15.2
Excess

CA 270 87/13 Exp: 26M-1 Run 6

Sheet ____ Date 11/11/58 Time 1:15 A.M. PM

Purpose 26" X 26" X 24 3/8" - Parallelepiped Bore

LOADING CHANGE

Description

cont. next Page

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU

LOADING CHANGE

Description Removed $\frac{1}{8}$" layer
26" x 26" x $\frac{1}{8}$" or 85 in^3
85 x .800.8 = 68.06#

Mass before change ____ gmU 13.200 gmU-235
Mass of Change ____ gmU 68.06 gmU-235
Total Mass ____ gmU 13.132.069 gmU-235

CRITICAL POSITIONS

C.A. 290 $\frac{87}{13}$ Expr. 26M-1 Run 6
Table Pos. 015 B9570.T2925

	Channel
A - .05	53 $\frac{100}{200}$
C - 15.025	.005
	C 8.03 x 10^{-10}
	D 84 $\frac{60}{500}$
	E 2 900

Tim Crit. 1:34 Duration 16 min.

Rod C 0 on 16.5 sec. period 6.5 Excess
Leveled Rd. C @ 15.025 Sensitivity ____ #/in.

24.5" = 15.2 Excess
24.375 = 6.5 Excess
or $\frac{1}{8}$" = 9.7 #

$\frac{6.5}{9.7}$ = .74 $\frac{1}{8}$ x .74 = .09"

24.375
.09
24.28" 0 excess

.74 x 85 = 63g

13,132
- 63
13,069 gU^{235} = 0 Excess

120

11-12-58

INSTRUMENT CHECK

9:50 Source γ

	B	C	D	E
	$\frac{10}{1800}$	opr 10^{-10}	$\frac{10}{1000}$	900 r.
Source Dist.	1"	0"	1.5"	1" 14"
% F.S. Trip	85	OK	100	80 100+

Counters 1, 2 & 3

C.A. 270 $\frac{89}{13}$ Expr. 28M-1 Run 1

Sheet _____ Date 11-12-1958 Time 9:55 AM ~~PM~~

Purpose 28" Diameter Cylinder
24" High

Bare

Sub-critical

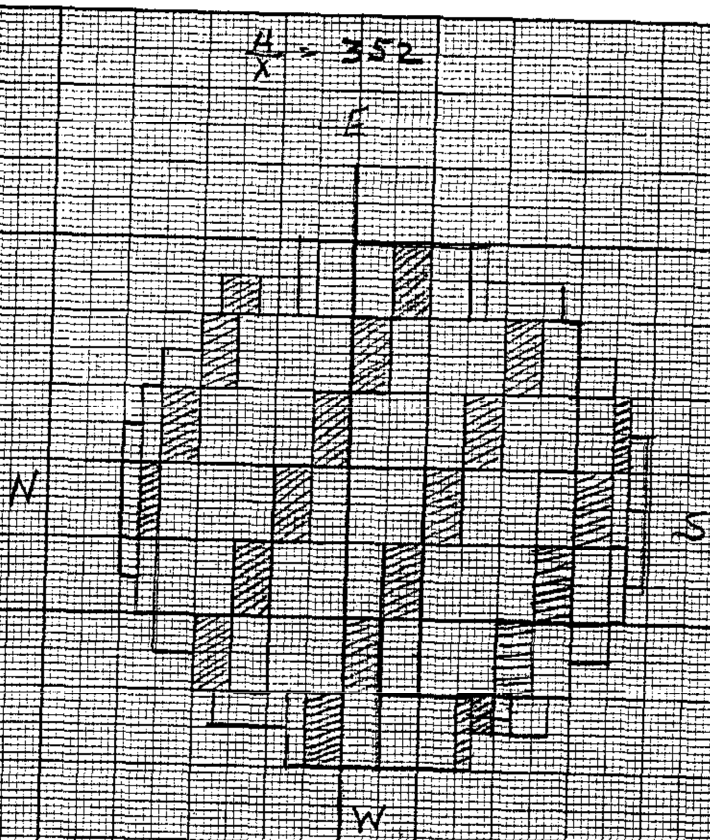
LOADING CHANGE

Description 28" dia. = 616 in² Base
616 X 24 = 14,784 in³
14,784 X .8008 = 11,839 g U^{235}
- (49) g for rods 55 grams

Mass before change _____ gmU 11,790 gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU _____ gmU-235



28" dia. cylinder

616 in² Base – 154 in² @ = 195

462 in² @ = 413

443 gm/1" layer

C.A. 290 $\frac{87}{13}$ Expr. 28M-1 Run 2

Sheet _____ Date 11-12-1958 Time 10:20 AM ~~PM~~

Purpose 28" Dia. Cylinder

24 $\frac{3}{4}$ high

Bare

Sub-critical

~~LOADING~~ CHANGE

Description Added: $\frac{3}{4}$ Layer [1" on 3 quadrants]

$\frac{3}{4}$ x 493 = 369.75

Mass before change _____ gmU 11,790 gmU-235

Mass of Change _____ gmU 369.75 gmU-235

Total Mass _____ gmU 12,159.75 gmU-235

*

C.A. 290 87/13 Expr. 28M-1 Run 3

Sheet ____ Date 11-12-95 8 me 11:20 AM PM

Purpose 28" Dia. Cylinder
~~25 1/4" high~~
25.29" High
Bare

25.29"
- .125 - one octant
25.165"
-.032
25.13" High
0 Excess

LOADING CHANGE +26 in³

Description added ½ # layer [2" on 1 quadrant]
½ X .493 = 246.5 g U²³⁵
26 X .8008 = 20.8
267.3 g U²³⁵

Mass before change	gmU	12,159.75 gmU-235
Mass of Change	g U	~~246.5~~ 267.3 gmU-235
Total Mass	gmU	~~12,406.2~~ 12,427 gmU-235

12,427 g
- 62 g - 1 octant
12,365 g
16 g
12,349 g U²³⁵ = 0 Excess
- 6 — Rods
12,343 g U²³⁵

CRITICAL POSITIONS

290 87/13 Exp. 28M-1 Run 3

.015 B-7550-2900 8.80
6.97
1.83

A .05 .61 100/200

C - 18.93 .006

9.8 3X10 = 10

D 51 100/100

E .2 900

11:35 AM PM Duration ____ min.

Rod C @ 0 on 113 sec period = 8.8 Excess

Leveled Rd. C @ 18.93 Sensitivity ____ ¢/in.

183/697 = 26.27% of one

26.27% X 62 = 16 g

26.27% X .125 = .03

C.A. 290 87/13 Expr. 28M-1 Run 4

Sheet ____ Date 11-12-95 8 Time 1:50 AM PM

Purpose 28" Dia. Cylinder
25.415" Tall
Bare

LOADING CHANGE

Description Added: 1/8 layer Li on octant
77 in³ × .8008 = 61.6 g. h-235

Mass before change ____ gmU 12,427 gmU-235

Mass of Change ____ gmU 61.6 gmU-235

Total Mass ____ gmU 12488.6 g gmU-235

CRITICAL POSITIONS

C.A. 290 87/13 Expr. 28M-1 Run 4

Table Pos. 015 B 6535 T 2890

Control Rod		Channel	
A	16.87	A	68 100/200
C	18.93	B	.0067
3		C	5.4 10⁻⁹
4		D	56 100/100
		E	2 900

Time Crit. 2:08 AM PM Duration 14 min.

Rod A @ .05 = 15.1 sec period = 6.97 one octant

Longest Rd. A @ 16.87 Reactivity ____ ¢/In.

8.8
6.97
15.77 +
Excess

see p. 122

6 in³

7.

3

6.2% of one octant

X62 = 16 g

X.125 = .032"

12-13-58

INSTRUMENT CHECK

Time 12:45 AM PM Source Y

Channel	A	B	C	D	E
Range	10/1000	off	15 10	10/1000	900V
Source Dist.	1"	0"	15"	1"	15"
% F.S. Trip	90	100	~~100~~	80	100+

Counters 1, 2 & 3

C.A. 2% 57/13 Expr. 24 M - 1 Run 1

Sheet _____ Date 12-13-58 Time 12:55 AM PM

Purpose 24" Dia Cylinder
22" High
Fully Reflected

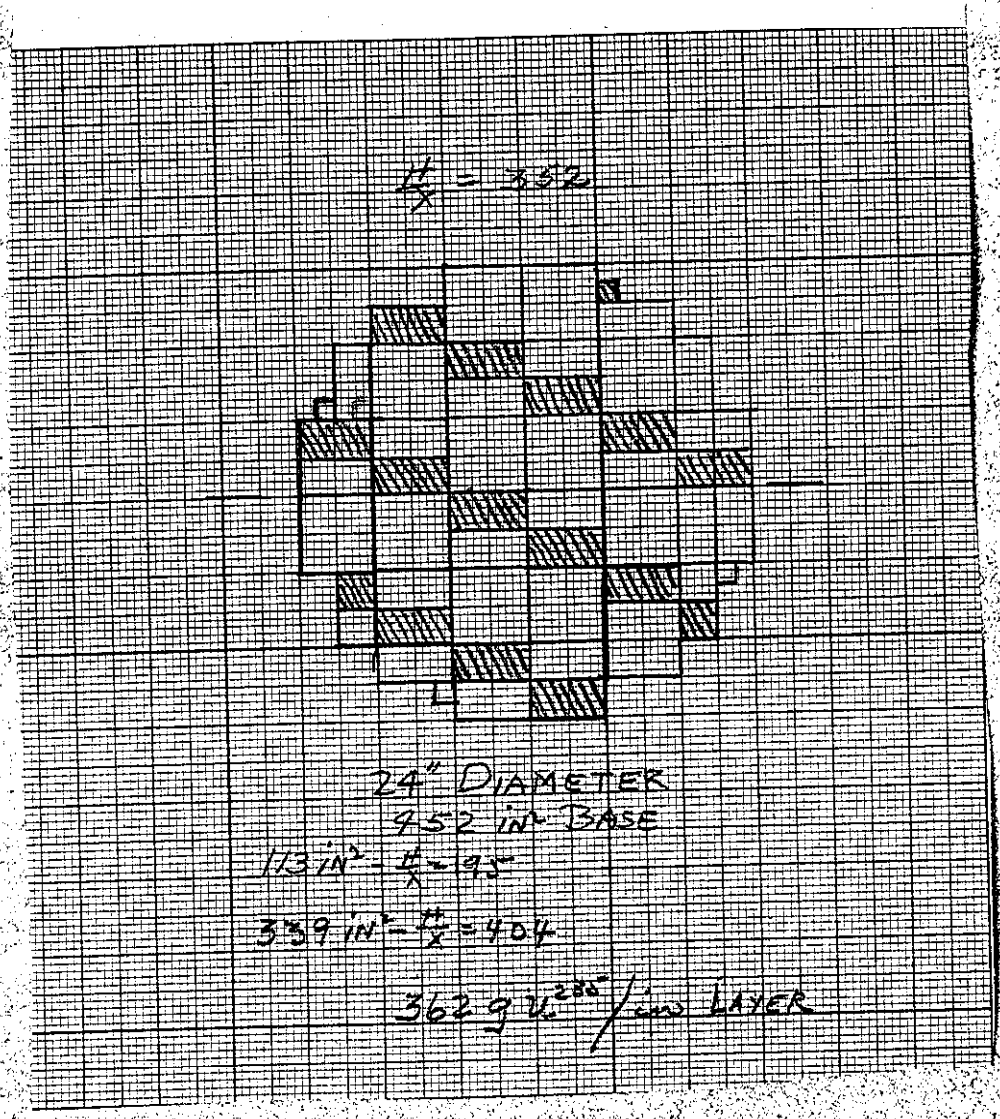
LOADING CHANGE

Description 24" dia. X 22" high = 9944 in³
9944 X .8008 = 7963 g U²³⁵
-54 for Rods
7,908 g. U²³⁵

Mass before change _____ gm U _____ gm U-235

Mass of Change _____ gm U _____ gm U-235

Total Mass _____ gm U _____ gm U-235


$I_x = 352$
24" DIAMETER
452 in² BASE
113 in² - $\frac{\pi}{4}$ - 195
339 in² - $\frac{\pi}{4}$ - 404
362 $\frac{lb}{in^2}$ / in LAYER

87
C.A. 29013 Expr. 24-11-7 Run 2

Sheet Date 12-13 1958 Time 1:35 PM

Purpose 24" Dia. Cylinder
23" High on Stationary
22" " " movable
Fully Reflected

LOADING CHANGE

Description added ½ layer [1" on ½ half]
½ X 362 = 181 g U^{235}

Mass before change gmU 7,908 gmU-235

Mass of Change gmU 181 gmU-235

Total Mass gmU 8,089 gmU-235

87
CRITICAL POSITIONS

C.A. 29013 Expr 24-11-1 Run 2

Code No. 05 3655 T 288°

Rod	Channel	
A- .045	72	100/100
C- 19.48	.0046	
	C 8.8 3 X 10⁻⁷⁰	
	D 57	10/500
	E 1.0	900

Rod C
0 to 17.64 = 15.5"
17.64 to 19.48 = 6.16
21.664
Excess

Time 1:52 PM Duration 9 min.

Rod C @ 16.30 on 88 sec period = 10.65 ¢

Leveled Rd. C 19.48 3.35

* Mixed Blocks 1 to 3 195 + 404

11-1

C.A. 29$\frac{87}{13}$ Exp. 24M-1 Run 3

Sheet ______ Date 11-13 1958 Time 2:22 PM

Purpose 24" Dia Cylinder

22.375" High

Fully Reflected

22.375
− .25
22.125
− .06
22.06" Hight

LOADING CHANGE

Description Removed 1/8 layer [1" from 1 octant]

$\frac{1}{8} \times 362 = 45.2$ g U²³⁵

Mass before change	gmU	8,089	gmU-235
Mass of Change	gmU	45	gmU-235
Total Mass	gmU	~~8,0~~ 8,044	gmU-235

8044
−90
7954
−23
7,931 g U²³⁵ 0 Excess

CRITICAL POSITIONS

29$\frac{87}{13}$ Exp. 24M-1 Run 3

Pos. 015 B655T 2875

Control Rod		Channel	
A − .03	A	49	100 / 200
C 17.64	B	.006	
17.64	C	58	3×10⁻¹⁰
4	D	75	10 / 50×
	E	1.2	900

Tim Crit. 2:38 PM Duration 10 min.

Rod C @ 0.15 on 53 sec period = 15.5 ¢ Excess

Leveled Rod C @ 17.64 Sensitivity ______ ¢/in.

2.51
6.16) 15.5

6.16 × 2 = 12.32

15.50
−12.32
3.18 ¢

$\frac{318}{616} = 51\%$

17.64
16.30
1.34"
@3.3
4.49 ¢

10.65
− 4.49
6.16 ¢ one octant

Mixed Bursts 1 to 7 145 + 404 127

11-14-58

INSTRUMENT CHECK

Time 9:40 ~~A.M.~~ P

	A	B	C	D	E
Range	10/1000	Opr.	10^{10}	10/1000	900V
Source Dist	1.5"	0"	3"	1"	1"
% F.S. Trip	85	OK	100	80	100

Counters, 1, 2 & 3

C.A. 2% 87/13 Expr. 22M-1 Run 1

Sheet _____ Date 11-14-1958 Time 9:50 AM ~~PM~~

Purpose 22"x22"x22" - Parallelpiped

Comp. Reflected.

LOADING CHANGE

Description 22"x22" = 484 in^2 Base

387.2 g/in Layer x 22 = 8,518 g U^{235}

- 52 g for Rods

8,466

	gmU	gmU-235
Mass before change		~~gmU-235~~
Mass of Change	~~gmU~~	gmU-235
Total Mass	~~gmU~~	gmU-235

350
+
9
64
start

11-14-58

CRITICAL POSITIONS

C.A. 2% 87/13 Exp. 22M-1 No. 1

Table Pos. .015 B 6565 T 2880

Control Rod	Channel
1A - 05	A 58 100/100
2C - 16.13	B .0047
3	C 7.2 3X10-10
4	D 45 500
	E 8 900

Tim Crit. 10:07 AM ~~PM~~ Duration 6 min.

[redacted]

Rod C @ 13.00 on 96 sec period = 10.0 ¢

Levelec Rd. C @ 16.13 Sensitivity 3.19 ¢/in.

Rod C
13.00 → 13.28 = .74 ¢
@ 3¢/in

Rod C 0 → 13.28 = 8.25 ¢

13.28 → 16.13 = 9.26

17.5 ¢ - Excess

22" X 22" X 21.73"

9.25 ¢
8.25 ¢
1.00

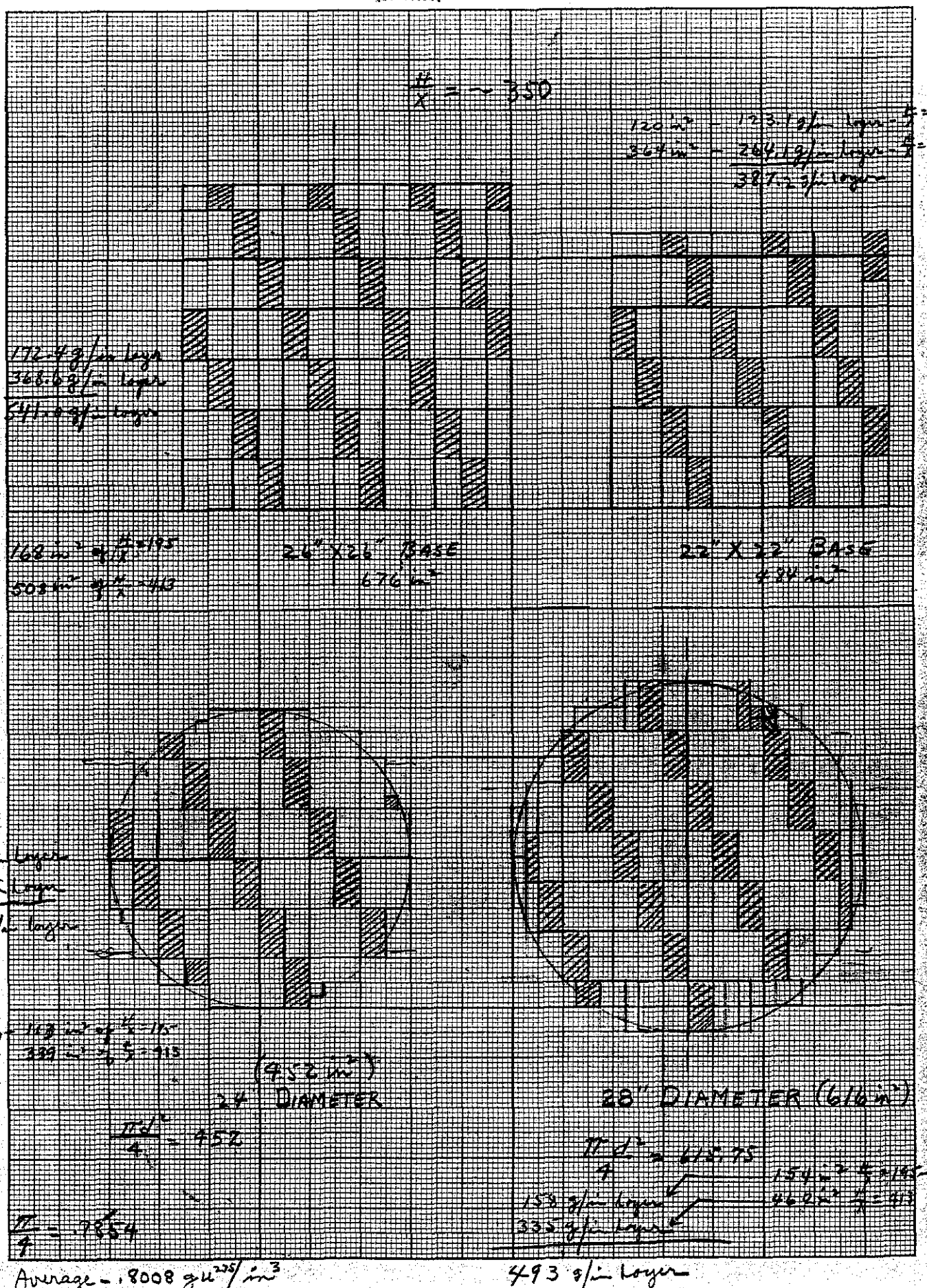
8418
- 54
8,364 gm U^{235} = 6 Excess

$\frac{1}{8.25} \times 48 = 6\ gm\ U^{235}$

$\frac{1}{8} \times .125 = .018$

$\frac{.015}{.125}$
.140

21.875"
- .140
21.735"
0 tight



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MILLIMETER

11-14-58

C.A. 27a 87/13 Expr. 22M-1 Run 2

Sheet ____ Date 11-14 1958 Time 2:32 AM

Purpose 2 2 X 2 2 X 21.875" Parallelipiped

Comp Reflected

LOADING CHANGE

Description Removed 1/8" layer of 1" from 1 octant

1/8 X .484 = ~~48.4~~ 60.5 in^3

60 X .8008 = 48 g U^{235}

Mass before change	gmU	8,466	gmU-235	8418
Mass of Change	gmU	48	gmU-235	-54
Total Mass	gmU	8,418	gmU-235	8364 g U^{235}

Rod C @ 7.15 on 2.13 sec period = 5.2 ¢

Leveled Rd. C @ 13.61 Sensitivity 2.46 ¢/in.

Rod A = 0

=.74 ¢/in

17.5¢

-9.24¢

8.26¢ - 1 octant

CRITICAL POSITIONS

CA 27a 87/13 Expr. 22M-1 Run 2

Table Pos. .015 B 1560 T 2852 P

Control Rod	Channel
A - 10.95	A 66 100/200
C - 13.28	B .011
	C 3.8 10^{-9} 100/100
	D 53
	E .1 650

Time Crit. 7.52 AM/PM Duration ____ min.

Rod C - 0 to 13.28 = 8.25

13.28 to 13.61 = .99 @ 3¢/in

9.24 ¢ - Excess

Rod C @ 0.15 on 1.24 sec period = 8.26 ¢/in

Leveled Rd. C @ 13.28 Sensitivity ____ ¢/in

Rod A = 10.95

130

Mixed Blocks 1 & 1 195 + 404

11/17/58

INSTRUMENT CHECK

Time 1120 ~~AM~~ PM Source Y

Chamber

	A	B	C	D	E
Range	$\frac{10}{1000}$	off	10^{10}	$\frac{10}{1000}$	
Source Dist.	1"	0"	3"	1"	13"
% F.S. Trip	85	off	100	80	100+

Counters 1,2 & 3

LOADING CHANGE

Description 24" X 24" X 20" – alternating blocks of $\frac{\#}{X} = 195$ and $\frac{\#}{X} = 404$. $= \frac{\#}{X} \sim 300$

$\frac{1.026 + .7257}{2} = \frac{1.7517}{2} = .8758\ g\ U^{235}/in^3$

$11{,}520\ in^3 \times .8758 = 10{,}089\ g\ U^{235}$

Mass before change ____ gmU ____ – 63 for rods ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 10,026 gmU-235

Sub Critical – Reset

LOADING CHANGE

Description Added 1" layer

$576\ in^3 \times .8758 = 504\ g\ U^{235}$

Mass before change ____ gmU 10,026 gmU-235

Mass of Change ____ gmU 504 gmU-235

Total Mass ____ gmU 10,530 gmU-235

24" X 24" X 21"

CRITICAL POSITIONS

27% 88.5 / 11.5 Exp. 24M-1 Run 2

Rod Pos. .01 L T 7828 8555

Critical Rod		Channel	
A	.05	A	73 10⁻³/10⁻⁶
C	19.53	B	.0048
		C	5.5 5x10⁻⁶
		D	52 1/500
		E	.5 900

Tim Crit. 2:45 AM PM Duration ____ min.

Rod C @ 16.00 on 65 sec period = 13.4 ¢

Levelec Rd. C @ 19.53 Sensitivity 3.8 ¢/in.

Rod C 0 → 14.38 = 9.8 ¢

14.38 → 16.00 = 5.8 @ 1.62" @ 3.6 ¢/in

16.00 → 19.53 = 13.4

29.0 ¢

132

Mixed 1 to 1 19.5 / 4.34

11/18/58

INSTRUMENT CHECK

Time 8:40 AM ~~PM~~ Source r

	Channel A	B	C	D	E
Range	10 / 1000	opr	10	10 / 1000	900 V.
Source Dist.	½"	6"	4"	½"	15"
% F.S. Trip	90	ok	100	80	100+

20.75
- .25
20.5" - 0 Height

LOADING CHANGE

Description Removed ¼ layer [1" from 1 quadrant]
¼ X 504 = 126 gm U235
24" X 24" X 20.75"

Mass before change	gmU	10,530	gmU-235
Mass of Change	gmU	126	gmU-235
Total Mass	gmU	10,404	gmU-235

29.0 #
9.8 # excess
19.2 # / quadrant

9.8 / 19.2 = 51%

CRITICAL POSITIONS

Exp Run
Date Pat. .01 T 2822 B75555

Control Rod		Channel	
A	105	A 72	1"/100
C	14.38	D 54	10/50
		B 005	
		6 8.9	3 x 10
		E .2	900

10,404
124
10,280 - 0 Excess

Tim Crit. AM PM Duration min.

Rod C @ 0 on 9.8 sec period = 9.8 ¢/in.
Leveled Rd. C @ 14.38 Sensitivity

(H X)
A4
A4s

$\frac{H}{X} = 404$

C.A. 2% $\frac{85}{15}$ Expt (3)22-1 Run 1

Sheet ____ Date 11-18-1958 Time 1:15 ~~AM~~ PM

Purpose 22"X22"X22" — Parallelepiped
Comp. Reflected
484 in² Bore — 351 g U²³⁵/1" Layer

12" on Stat. Table
10" " Movable "

LOADING CHANGE

A4 = 46.444 g U²³⁵
A4s = 42.268
4.176 g U²³⁵/4" for Rods

Description 22X22X22 = 10,648
10,648 X .7257 = 7,727 g U²³⁵
-52 for rods
7,675

Mass before change	gmU		gmU-235
Mass of Change	gmU		gmU-235
Total Mass	gmU	7,675	gmU-235

super Critical — .30" on table

22"X22"X21"

LOADING CHANGE

Description ~~Removed~~ Removed -1" layer from Top,
~~movable table. [1"X10"X22"] = 220 in³~~
~~220 X .7257 = 159.65 g U²³⁵~~
484 X .7257 = 351 g U²³⁵

Super Critical table .01"

Mass before change	gmU	7,675	gmU-235
Mass of Change	gmU	~~160~~ 351	gmU-235
Total Mass	gmU	~~7,515~~ 7,324	gmU-235

LOADING CHANGE

Description Removed — 1" layer from movable table
[22"X10"X1"] = 220 in³
220 X .7257 = 159.6 g U²³⁵

22"X22"X20.55"

Mass before change	gmU	7,324	gmU-235
Mass of Change	gmU	160	gmU-235
Total Mass	gmU	7,164	gmU-235

emm

134 *

CRITICAL POSITIONS

C.A. 2 80 80 (2) Expr. 3(22)-1 Run 2

Table Pos. .01 L 2810 T .7528

Control Rod		Channel	
1	A 16.045	A	48 100/100
2	C - 20.68	B	.0033
3		C	6.0 3 X 10⁻¹⁰
4		D	36 10/500
		E	.2800 V.

Tim Crit. ____ AM PM Duration ____ min.

Rod A @ 0 on 129 sec period = 7.9 ¢
Levelec Rd. A @ 16.045 Sensitivity ____ ¢/in.

20.68
-17.32
3.36 @ 4.8 ¢/in
16.1 ¢

27.1 ¢
16.1 ¢
43.2
7.9
50.1 ¢ Excess

27.1 ¢

LOADING CHANGE

Description Removed ¼ layer [1" from 1 quadrant]
120 in³ X .7257 = 87 g U²³⁵
22" X 22" X 20.3"

Mass before change	gmU	7164	gmU-235
Mass of Change	gmU	87	gmU-235
Total Mass	gmU	7,077	gmU-235

50 ¢
-35
16 ¢ for 1 quadrant

CRITICAL POSITIONS

C.A. 2 70 80 (3) Expr. (3) 22-1 Run 3

Table Pos. .01 L ____ T ____ P ____

Control Rod		Channel	
1	A 16.045 [7.9]	A	52 100/100
2	C 17.315 [27.1] 35.0 ¢	B	0038
3	Excess	C	6.2 3 X 10⁻¹⁰
4		D	37 10/500
		E	.2900 V

19.77" 0 High
6.88 kg 0 Excess
9,560 in³

Tim Crit. ____ AM PM Duration ____ min.

Rod C @ 15.00 on 95 sec period = 16.2 ¢
Levelec Rd. C @ 17.315 Sensitivity 47 ¢/in.

Rod C @ 50 sec period = ____ ¢
Levelec Rd. C @ 14.88 Sensitivity ____ ¢/in.
Rod A = 20.27

11/19/58

INSTRUMENT CHECK

Source Y

Time 9:20 AM ~~PM~~

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/1000	900V
Source Dist.	1/2"	0"	14"	1/2"	14"
% F.S. Trip	80	OK	100	85	100+

Counters 1, 2 & 3

C.A. 2% 85/15 Expr. (3) 21-1 Run 1

Sheet ______ Date ______ 195__ Time ______ AM PM

Purpose 21" X 21" X 21.5" – Parallelepiped.

Comp. Refl.

LOADING CHANGE

Description 21" X 21" = 441 in²

441 X .7257 = 320 g / 1" layer

320 X 21.5 = 6,880 g U235

-50 g for rods

Mass before change ______ gmU ______ gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass ______ gmU 6,830 gmU-235

Sub Critical

LOADING CHANGE

Description added 1/2" layer [1" to one half]

21" X 21" X 22"

~~[illegible]~~ 1'

Mass before change ______ gmU 6,830 gmU-235

Mass of Change ______ gmU 160 gmU-235

Total Mass ______ gmU 6,990 gmU-235

Leveled Rd. C @ 17.78

Rod A = 20.27

136 *

CRITICAL POSITIONS

C.A. _____ Expr. _____ Run _____

Table Pos. .61 L T R

Control Rod	Channel
A .05	A 46 100/100
C 16.20	B 0038
3	C 7.2 ~~3.5~~ X 10⁻¹⁰
4	D 79 10/200
22" - 1 high	E .2 900 V

Tim Crit. _____ AM PM Duration _____ min.

Rod C @ 14.00 on 85 sec period = 11.0 ¢

Leveler Rd. C @ 16.20 Sensitivity 5.0 ¢/in.

21.75 / .08 / 21.63" - 0 High

21"X21"X21.75" — Cong. Refl.

LOADING CHANGE

Description Removed ¼ layer [1" from 1 quadrant]

10 X 11 = 110 in³

110 X .7257 = 80 gu^235

Mass before change	gmU	6,990	gmU-235
Mass of Change	gmU	80	gmU-235
Total Mass	gmU	6,910	gmU-235

27.3
6.7
20.6 ¢

CRITICAL POSITIONS

C.A. _____ Expr _____ Run _____

Table Pos. .01 L T R

6.7 / 20.6 = 32%

Control Rod	Channel
A .05	A 78 10/500
C 12.08	B 0036
3	C 4.5 3 X 10⁻¹⁰
4	D 75 10/200
	E .2 900 V

80 / .32 / 25.6 g

6910 / 24 / 6,884.0 Excess

Tim Crit. _____ AM PM Duration _____ min.

Rod C @ 12.08 on 157 sec period = 6.25 ¢

Leveler Rd. C @ 12.08 Sensitivity _____ ¢/in.

?

11/20/58

Top Reflector Savings

INSTRUMENT CHECK

Time 8:45 AM ~~PM~~ Source γ

Channel

	A	B	C	D	E
Range	10/1000	opr	10^{-10}	10/1000	900 V
Source Dist.	1/2"	0"	4"	1/4"	12"
% F.S. Trip	85	OK	100	85	100+

Counters 1, 2 & 3

C.A. 2% 85/15 Expr. (3) 21-2 Run 1

Sheet ______ Date 11-20-1958 Time 9:15 AM ~~PM~~

Purpose 21" X 21" X 23.5" - Parallelepiped

Top Bare

Remaining Sides Reflected

Top Bare

LOADING CHANGE

23.500
−.138
23.362" — 0 Height

Description 21 X 21 X 23.5 = 10,363 in³

10,363 X .7257 = 7,520 g U²³⁵

− 50 g for Rods

7,470

Mass before change ______ gmU ______ gmU-235

7470
−44
7,426 g 0 Excess

Mass of Change ______ gmU ______ gmU-235

Total Mass ______ gmU 7,470 gmU-235

CRITICAL POSITIONS

C.A. 2% 85/15 Expr. (3) 21-2 Run 1

Channel

A — .06 A 47 100/200

C — 12.95 .006

4.4 3X10⁻¹⁰

D 41 10/100

E .2 900 V.

Rod C on 102 sec period

Leveled Rd. C @ 12.95 Sensitivity ______ ¢/in.

Sensitivity ______ ¢/in.

Top Reflector Savings 1.732"

C.A. 2% 85/15 Expr. (3) 21-2 Run 23

Sheet ____ Date ____ 195__ Time ____ AM PM

Purpose 21" X 21" X 23.625" – Parallelepiped, Top Bare Remaining Reflected

LOADING CHANGE

Description added 1/8 Layer (1" on one octant)

1/8 X 320 = 40 gmU-235

Mass before change	gmU	7470	gmU-235
Mass of Change	gmU	+ 40	gmU-235
Total Mass	gmU	7510	gmU-235

9.5
8.6
.9 ¢

9/86 = .104
10.4%

CRITICAL POSITIONS

C.A. 2% 85/15 Expr (3) 21-2 Run 2

Pole Pos. .01 .2768 .8520

Control Rod

A- .06 A 42 100/200

C- 15.12 .005

6.5 3X10^-10

D 36 18/1000

E .3 900 V.

Tim Crit. 10:15 AM PM Duration ____ min.

End C @ 12.95 on 11.7 sec period = 8.6 ¢

Level C @ 15.12 Sensitivity 3.96 ¢/in.

C.A. 2% 85/15 Expr. (3) 21-2 Run 3

Sheet _____ Date 11-20 1958 Time 1:15 AM PM

Purpose To Evaluate the effect of reflection from tables and floor.

LOADING CHANGE

Description Removed the ½ layer added for Run 2. 40 g U^{235}
21" X 21" X 23.5" – Bottom Bare
– Remaining sides reflected.

Mass before change	gmU	7,510	gmU-235
Mass of Change	gmU	- 40	gmU-235
Total Mass	gmU	7,470	gmU-235

22/table
added Aluminum extrusions (44) to top of reactor, then moved plexiglas from bottom to top. [6" Thick]

26.14¢ Excess

CRITICAL POSITIONS

C.A. _____ Expr _____ Run 3

.01

Level

① A + .06 58 100/100
C - 18.98

.0042

② A - 20.27 4.8 3 X 10^{-11}
C - 16.858 D 37 9/100

E .1 900

Tim Crit. 1:25 AM PM Duration _____ min.

Rod C 17.00 140 sec period = 7.8' ¢ 3.78 ¢/in.
18.98

C.A. 2% 95/15 Expr. (3) 21-2 Run 4

Sheet ____ Date 11-20-1958 Time 2100 AM PM

Purpose See Run 3

LOADING CHANGE

Description Removed ¼ layer of fuel [1" from one quadrant]

¼ X 320 = 80 gm U235

21" X 21" X 23.25" — Bottom Bare

— Remaining sides reflected.

Mass before change	gmU	7,470	gmU-235
Mass of Change	gmU	- 80	gmU-235
Total Mass	gmU	7,390	gmU-235

CRITICAL POSITIONS

Rod C 0 to 14.34 = 10.4 ¢

From 14.34 to 17.00 = 8.24 ¢

17.00 to 8.98 = 7.5

26.14 ¢ A = .055

a = 14.34

2% 95/15 (3) 21-2 Run 4

Table .01 .374 R .551

A	44	100/1000
B	.035	
C	5.6	2.5X10⁻⁹
D	49	100/500
E	1.8	900 V.

Tim Crit. 2140 AM PM Duration ____ min.

Rod C 0 @ .01 on 9.42 sec period = 10.4 ¢

Leveler Rd. C @ 14.34 Sensitivity ____ ¢/in.

A = .055

11-21-58

INSTRUMENT CHECK

Time 1:30 PM Source [illegible]

	Channel A	B	C	D	E
Range	10/1000	oper	10^{-6}	10/1000	900V.
Source Dist.	½"	0"	4"	1"	12"
% F.S. Trip	85	0%	100	80	100+

Counters 1, 2 & 3

C.A. 2% 85/15 Expr (3) 21-2 Run 5

Sheet ____ Date 11-20-1958 Time 2:00 AM/PM

Purpose Same

23.10" - 0 Height
7.342 - 0 Excess
with bottom
plexiglas on top.

CRITICAL POSITIONS

2% Expr (3) 21-2 Run 5

T ____

A = 0.05
C = 14.40

Channel		
A	70	1000/100
B	.1	
C	5.5	$\times 10^{-9}$
D	46	100/500
E	30	840V.

Tim Crit. ____ AM/PM Duration ____ min.

8.7 ¢
- .46
8.24 ¢

Rod C @ 17.00 on 190 sec negative period = 8.7 ¢

~~Leveler~~ Rd. C @ 14.4 Sensitivity 3.35 ¢/in.

Leveler Rd. IC @ 14.34 Sensitivity ____ ¢/in.
A = .055

142

11-24-58

[redacted]

Time 12:45 PM

	B	C	D	E
	$\frac{10}{10.00}$	off	10^{-10}	$\frac{.10}{1000}$ 900 V.
Source D	1"	0"	2"	1" 18"
% F.S. Tr	90	OK	100	75 100+

Counters 1, 2 & 3

C.A. $27 \frac{85}{15}$ (3) 23-1 Run 1

Sheet Da 11-24-1958 Time 12:53 ~~AM~~ PM

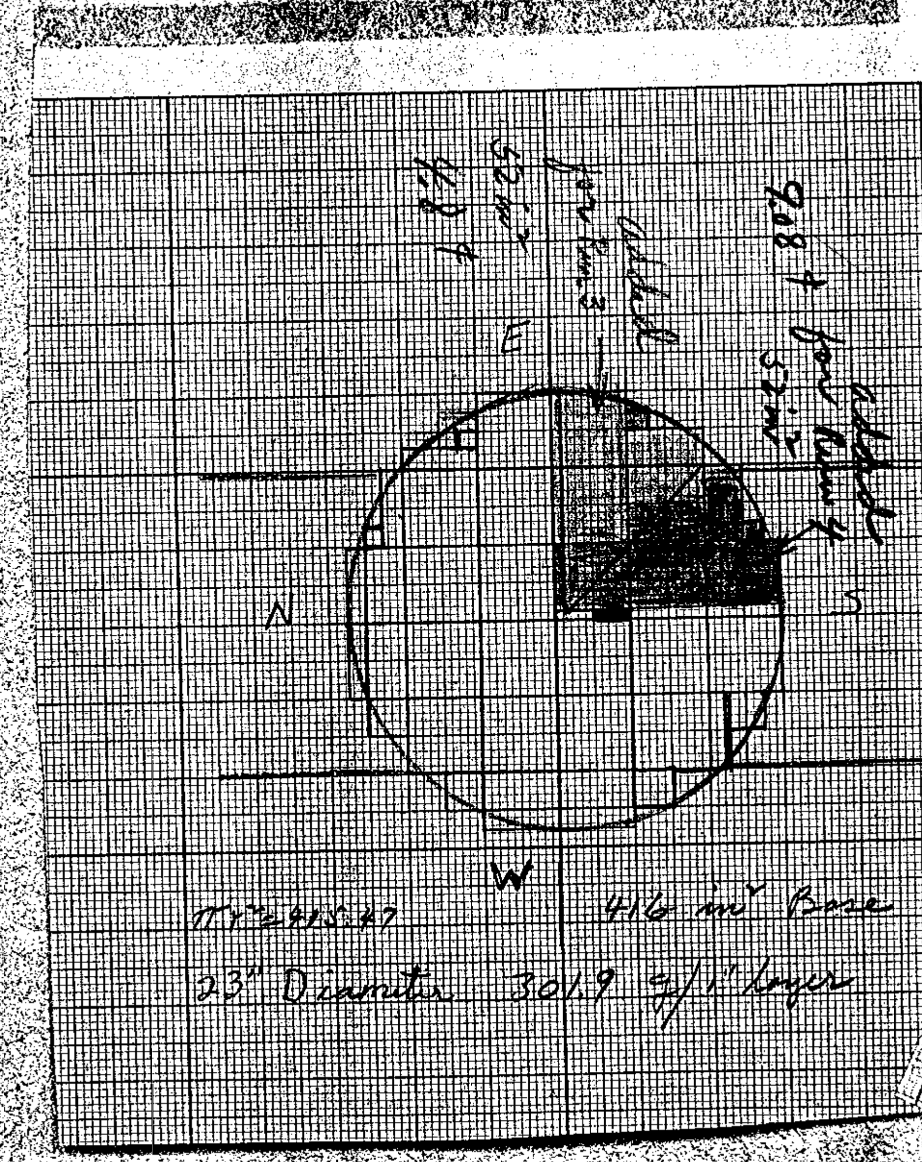
Purpose 23" Diameter Cylinder
21" High
Completely Reflected

LOADING CHANGE

Description 23" dia, 21" high 416 in² Base
.416 X .725 = 301.9 g/1" layer
301.9 X 21 = 6,340 g U²³⁵
= 42 g per rods

Mass before ch	gmU	6,298	gmU-235
Mass of Change	g-U		gmU-235
Total Mass	g U		gmU-235

Sub Critical


added
908 # for Run 4
52 in²
added
for Run 3
52 in²
4.8 #
E
N
S
W
πr² = 415.47
416 in² Base
23" Diameter 301.9 #/1" layer

C. 290 85/15 (3) 23-1 2

Sh. 11-24 1958 1:25 AM PM

Purp 23" Diameter Cylinder
22" High
Completely Reflected

LOADING CHANGE

Description Added 1" layer
302 g/" layer

Mass before change gmU 6,298 gmU-235

Mass of Change gmU 302 gmU-235

Total Mass gmU 6,600 gmU-235

CRITICAL POSITIONS

C. 290 85/15 Expr (3) 23-1 Run 2

Date .01 B-5525 2705

Channel 100 ~~1000~~ 100

A- .055 A 66

C- 16.29 B 0042

C 6.0 3X10 -10

D 41 10/5 00

E .3 900

Time Crit. 1:58 ~~AM~~ PM Duration 7 min.

Rod C @ 0 on 76 sec period = 12.05 ← Excess

Leveloc Rd. C @ 16.29 Sensitivity _____ ~~g/in.~~

11-24-58

G.A. 270 85/15 Expr (3) 23-1 Run 3

Sheet _____ Date 11-24-58 Time 2:25 ~~AM~~ PM

Purpose 23" Diameter Cylinder
22.125" High
Completely Reflected

LOADING CHANGE

Description added 1/8 layer (1" on one octant
1/8 X 302 = 37.703

Mass before change	gmU	6,600	gmU-235
Mass of Change	gmU	37.7	gmU-235
Total Mass	gmU	6,637.7	gmU-235

CRITICAL POSITIONS

CA. 270 85/15 Expr (3) 23-1 Run 3

Table Pos. .01 B. 5508 T 2695

Central Rod	Channel
A- .05	A 35 100/100
C- 17.58	B .6021
	C 4.6 2.5X10^-10
	D 55 / 208
	E .1 900

Tim Crit 2:44 ~~AM~~ PM Duration 9 min

Rod C @ 16.29 on 237 sec period 4.8

Leveled Rd. C @ 17.58 Sensitivity ____

12.0
4.8
16.8 ↑ Excess

11-24-58

C.A. 2°0 85/15 Expr. (3) 23-1 Run 4

Sheet ____ Date 11-24-1958 Time 3:54 PM

Purpose 23" Diameter cylinder
22.25" High
Completely Reflected

LOADING CHANGE

Description added 1/8 layer (1" on one octant)
1/8 X 302 = 37.73

Mass before change	gmU	6,637.7	gmU-235
Mass of Change	gmU	37.7	gmU-235
Total Mass	gmU	6,675.4	gmU-235

12/13.88 = 86.4%

.864 X .25 = .21"

22.00
.21
21.79" 0 Height

.864 X 75.4 = 65 g.

6,600
65
6,535 → 4"

0 Excess

CRITICAL POSITIONS

2°0 85/15 Expr. (3) 23-1 Run 4

.01 T 2670 B. 5505

Control Rod | Channel

A- .05 | 68 100/100
C- 19.74 | .0046
6.1 3X10 -10
D 43 1/500
E .3 900

Time Off 4:09 PM Duration 7 min

Rod C @ 17.58 on 111 sec period = 9.08 ¢

Levelec Rd. C @ 19.74 Sensitivity 4.20 ¢/in.

9.08
4.8
13.88 ¢
for
1 fuse draw

13.88
12.00
25.88 ¢
Total
Excess

11-25-58

INSTRUMENT CHECK

Time 3:05 ~~AM~~ PM Source 8

	Channel A	B	C	D	E
Range	100/1000	Off	10^{-10}	10/1000	900V
Source Dist.	1/2"	0"	4"	1/2"	10"
% F.S. Trip	90	OK	100	80	100+

Counters 1, 2 & 3 ~~inoperative~~

C.A. 2% ~~8D~~ 8D Expr. (3) 27-1 Run 1

Sheet ____ Date 11-25-1958 Time 3:15 ~~AM~~ PM

Purpose 27" Diameter Cylinder
24" High
Bare.

LOADING CHANGE

Description 27" diamter ; 572 in² Base
572 X .7257 = 415.1 g U^{235}/1" layer
415.1 X 24 = 9,962 g U^{235}
- 55 g U^{235} for Rods.

Mass before change	gmU	9,907	gmU-235
Mass of Change	gmU		gmU-235
Total Mass	gmU		gmU-235

Sub Critical

24.5" high

LOADING CHANGE

Description Added ½" layer of fuel. 207 gmu [1" on one half]
27" x 24½" Bare system
286 X .7257 = 207 gm U^{235}

Mass before change ____ gmU 9,907 gmU-235
Mass of Change ____ gmU 207 gmU-235
~~Total Mass~~ ____ gmU 10,114 gmU-235

CRITICAL POSITIONS

C.A. 37 85/15 Expt. 3) 22-1 Run 2

Table Pos. .01 L T 7672 B 5515 24.50

Control Rod		Channel		
1 A	.05	A 32	100/500	.11
2 C	19.53	B .009		24.39"
3		C 3.1	3.5×10^{-1}	
4		D 52	100/100	
		E .5	900	

10,114 · 93 / 10,021 g. U^{235}

Tim Crit ____ AM PM Duration ____ min.

Excess

Rod C @ 0 on 142.7 sec period = 7.4 ¢
Leveled Rd. C @ 19.53 Sensitivity ____ ¢/in. ✓

572 X 24.39 = 13,951 in^3

148

11-26-58

INSTRUMENT CHECK

Time 8:35 AM PM Date 8

	A	B	C	D	E
Range	10/1000	0	10^{-10}	10/1000	900 V.
Source Dist.	1/2"	0"	3"	1/2"	12"
% F.S. Trip	85	0/C	100	75	100+

Counters 1, 2, 4, 3

C.A. 270 8 1/2 Exp (3) 27-1 Run 3

Sheet Date 11-26-1958 Time 8:50 AM PM

Purpose 27 diameter Cylinder

24.75" High

Bore

LOADING CHANGE

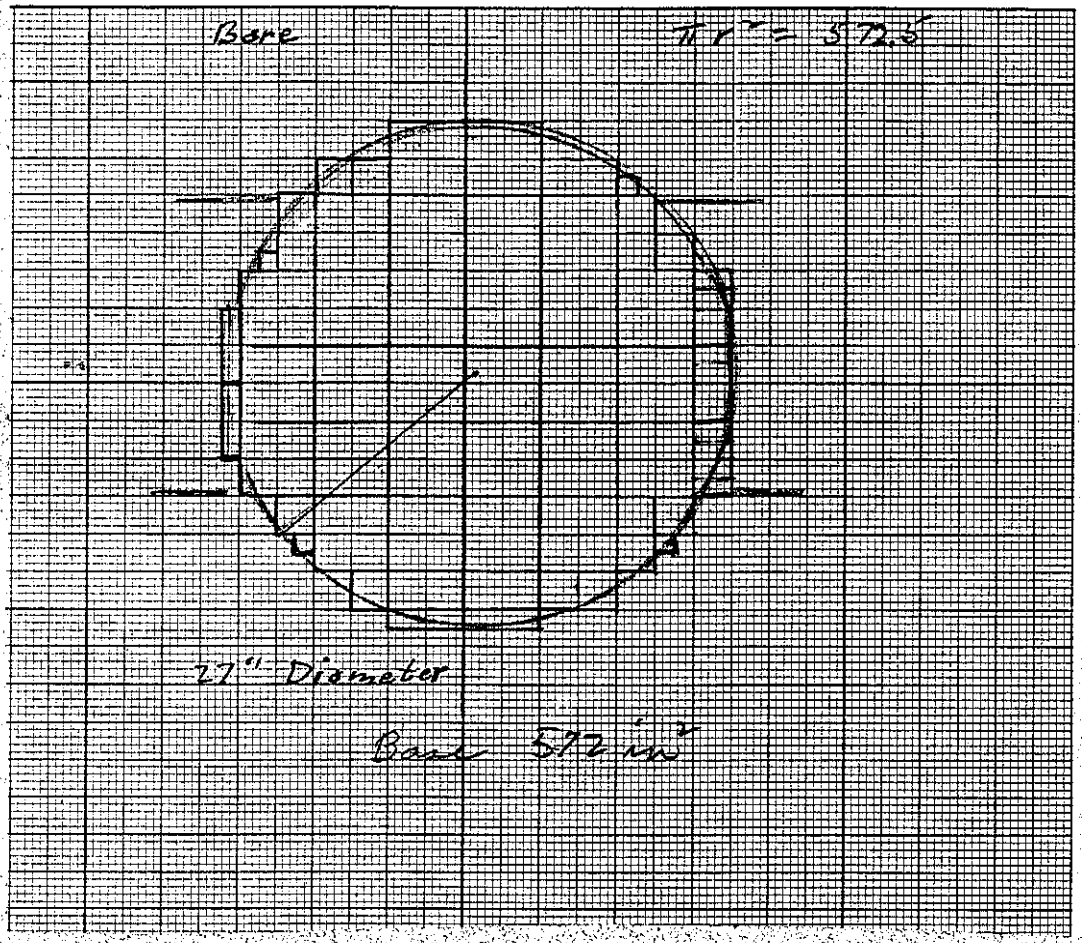
Description Added 1/4 layer on movable table (1" on 1/4 layer)

27" X 24.75" =

1/4 X 572 = 143 in³

143 X .7257 = 103.5 g U²³⁵

Mass before change	gmU	10,114	gmU 235
Mass of Change	gmU	103.5	gmU 235
Total Mass	gmU	10,217.5	gmU 235


Bare
$\pi r^2 = 572.5$
27" Diameter
Bare 572 in²

CRITICAL POSITIONS

290 85/5 Expr. (3) 27-1 Run 3

.01 B5500 T 2668

24.75" High

trol Rod	Chan
A - 18.64	A 53 100/500
C - 19.53	B .0065
	C 53 10-9
	D 68 10/500
	E .1 900

Tim Crit. 9.05 AM Duration 7 min.

Rod A @ 17.00 on 172 sec period = 6.34 ¢

Levelec Rd. A @ 18.64 Sensitivity 3.86 ¢/In.

longer

6.34
4.00
10.34 ¢
7.4
17.74 ¢
Excess

150

11-26-58

LOADING CHANGE

Description Removed 1/8 of layer [1" on one octant]
1/8 X 413 = 51.7 gU^{235}

Mass before change 10,217.5 gmU 10,217.5 gmU-235
Mass of Change 51.7 gmU 51.7 gmU-235
Total Mass 10,165.8 gmU 10,165.8 gmU-235

CRITICAL POSITIONS

C.A. 290 85/15 Expr (3) 27-1 Run 4

Table Pos. .01 B5505 T2651

24 5/8" high

Control Rod	Channel	
1 A- 15.87	A 68	100/200
2 C- 19.53	B .009	
3	C 5.2	10^{-9}
4	D 86	10/500
	E .2	900

Tim Crit. 9:44 AM Duration 9 min.

Rod A @ 0 on 126 ~~not noted~~ = 8.2 - one octant

Levelec Rd. A @ 15.87 Sensitivity ~~not noted~~

17.00
15.87
1.13" @ 3.7 #/in = 4#

7.4
8.2
15.6

11-28-58

INSTRUMENT CHECK

Time 11:05 AM PM Source Y

Channel	A	B	C	D	E
Range	10/1000	off	10	10/1000	900 V.
Source Dist.	½"	0"	3"	½"	9"
% F.S. Trip	85	OK	100	85	100+

Counters 1, 2 & 3

C.A. 270-85/15 Expr. (3) 27-1 Run 5

Sheet ____ Date 11-28 1958 Time 11:23 AM PM

Purpose Rerun of Run 4 after having restacked, using best blocks. Some blocks of this blend found to have burrows, apparently caused ~~by~~ when heating occurred.

CRITICAL POSITIONS

C.A. 270-85/15 Expr. (3) 27-1 Run 5

Rods Rod 1 .01 B 5510T 2642P

Control Rod	Channel	
A - 19.53	A 66	100/200
C - 16.06	B .008	
	C 6.5 10^{-9}	
	D 78	0/500
	E ←	

Crit. 11 32 AM PM Duration 8 min.

Rod C @ 0 on 113 sec period = 8.96 ¢

Leveler Rd. C @ 16.06 Sensitivity 3 ¢/in.

C.A. 290 85/15 Expr. 26-1 Run 1

Sheet ..... Date 11-28-58 Time 2:40 ~~AM~~ PM

Purpose 26 X 26 X 24 Parallelepiped

Bare

LOADING CHANGE

Description

676 X .7257 = 490.57 g. Layer

490.57 X 24 = 11,773 g U^{235}

62 g Fe Rods

Total Mass gmU gmU-235

Mass before change g.U g.U-235 11,711 g U^{235}

Mass of Change g.U g.U-235

Total Mass gmU gmU-235

Super Critical - Tables .4"

Description

LOADING CHANGE

11-28-58

C.A. 290 85/15 Expr. 26 - 1 Run 2

Shee Date 11-28 1958 Time 3:05 AM PM

Purp. 26 X 26 X 23 Parallelepiped

Bare

LOADING CHANGE

Description Removed: 1" Layer

Mass before change gmU 11,711 gmU-235

Mass of Change gmU 490.57 gmU-235

Total Mass gmU 11,221.57 gmU-235

Super Critical - Tables at .1"

Run 2-A

LOADING ~~CHANGE~~

Description Removed: ~~1~~ 1" Layer - 490.57g

26X26X22

Mass before change gmU 11,221.57 gmU-235

Mass of Change gmU 490.57 gmU-235

Total Mass gmU 10,731.00 gmU-235

Sub Critical.

154

12-1-58

INSTRUMENT CHECK

Time 8:55 AM Source 8

	A	B	C	D
Range	10/1000	Opr	10^{-10}	10/1000 900V.
Source Dist.	½"	0"	2"	1" 16"
% F.S. Trip	90	OK	100	75 100+

Counters 1, 2 & 3

C.A. 2% 85/15 Expr. (3) 26-1 Run 3

Sheet ____ Date 12-1 958 Time ____ AM PM

Purpose 26" X 26" X 22.125"

Bare

22.125"
-.06
22.06" - 0 Height

LOADING CHANGE

Description Added ⅛ layer (1" on one octant)

⅛ X 490.57 = 61.32

Mass before change	gmU	10,731	gmU-235
Mass of Change	gmU	61	gmU-235
Total Mass	gmU	10,792	gmU-235

CRITICAL POSITIONS

20 85/15 Expr. (3) 26-1 Run 3

101 -- B-8505 2582

A 12.71	42	100/200
C. 0.145	0.048	
	6.038×10^{-10}	
	D 46	10/500
	E 4	900

No @ 9.51 AM.

10,792
-32
10,760
0
Excess

15,380 in³

Rod A @ 0 cm 22.4 sec period = 5.45 - Excess

Average Rd. 4.0 12.71 Sensitivity ¢/m

C.A. 2-70 85/15 Expr. (3) 26-1 Run 4

Shee... Date 12-1 1958 Time 10:14 AM

Purpo... 26" x 26" x 22.25"

Bare

LOADING CHANGE

Description Added 1/8 Layer

Mass before change gmU 10,792 gmU-235

Mass of Change gmU 61 gmU-235

Total Mass gmU 10,853 gmU-235

CRITICAL POSITIONS

5.05/9.7 = 52%

C.A. 2 Expr. (3) 26-1 Run 4

Table Pos. 6.15 B 1532 T 2565

Control Rod Shim

.52 X 61 = 32g. A 15.96 A 58 100/200

C .145 C .007

9.9 3 X 10^-10

D 6.2 10/500

F .2 900

9.7
5.05
14.7 Excess

Time Calc. 10:26 AM PM Duration 7 min.

Rod A 1271 ... period = 9.7

Leveled Rd. A 15.96 Sensitivity ¢/in.

C.A. 290 85/15 Expr. (3) 26-1 Run 5

Sheet _____ Date 12-1 1958 Time 10:09 AM

Purpose 26" X 26" X 22"

Evaluation of Al boxes as reflector

4 Layers of Al Boxes placed above core

Bare

LOADING CHANGE

Description Removed: ¼ Layer [1" from 1 quadrant]

¼ X 488.5 = 122

Mass before change	gmU	10,853	gmU-235
Mass of Change	gmU	122	gmU-235
Total Mass	gmU	10,731	gmU-235

CRITICAL POSITIONS

C.A. 290 85/15 Expr (3) 26-1 Run 5

Fuels Pos. .015 B-6515T.2545T

Control Rod	Channel
A - 12.36	A 4K 100/500
C - .140	B .005K
	9.53X10⁻¹⁰
	D 4.7 10/500
	E .2 900

Time Crit. 11:27 AM Duration

Rod A @ 0 on 256 sec period = 4.45 ϕ

Levelec Rd. A @ 12.3 Sensitivity _____ ϕ/in.

14.75
-4.45
10.3

Quadrant
19.4 ϕ

$\frac{10.3}{19.4} \times \frac{1}{4}" + \frac{1}{4}$

.117" = Value
Trial.

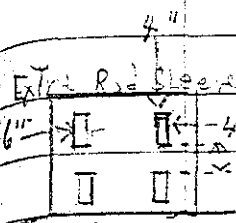
C.A. 29, 85/15 Expr (3) 26-1 Run 6

Sheet ____ Date 12-1-48 Time 1:32 PM

Purpose 26" x 26" x 22 1/4"

Evaluation of Rod sleeve holes.

Two sleeves placed symmetrical with existing one on movable table as shown, 1 Rod



LOADING CHANGE

Description Added: 1/4 layer [1" on 1 quadrant)

1/4 x 490.5 = 122.6

Removed: 27 g for Rod sleeve hole 122 - 27 = 95

Mass before change ____ gmU 10,731 gmU-235

Mass of Change ____ gmU 95 gmU-235

Total Mass ____ gmU 10,826 gmU-235

Sub-critical ? might be critial but at very low level.

LOADING CHANGE Run 7

Description Added: 1 1/8 layer [1" on one octant]

1/8 x 490.5 = 61

26" X 26" X 22 3/8"

Mass before change ____ gmU 10,826 gmU-235

Mass of Change ____ gmU 61 gmU-235

Total Mass ____ gmU 10,887 gmU-235

Cont'd Next Page

Without	2	Additional sleeves	22 1/4"	14.75 ¢
With	2	" "	22 3/8"	9.48
				5.27

Octant worth 9.7 ¢

$\left(\frac{1}{8} + \frac{5.27}{9.7}\,\frac{1}{8}\right) = .195$" for two sleeves or .386" for 4 control blade sleeves

12-1-58

CRITICAL POSITIONS

C.A. 290 85/15 Expr (3) 26-1 Run 7

Fuels Pos. 015 B6560T3385

	Control Rod	Channel
A	14.82	32 100/500
C	145	01
		8.9 5x10-10
D	46	100/100
E	3	906

Tim Crit. 2:42 ~~AM~~ PM Duration 9 min.

Excess

~~Rod~~ A @ 0 on 105 sec period = 9.48 ~~$~~

~~Deviation Rd.~~ A @ 14.82 ~~Sensitivity~~ ~~$/in~~

22 3/8 Run 7 - 10,887 g U^{235} - 9.48 ¢ Excess

22 1/8" Run 3 - 10,792 g U^{235} - 5.05 ¢ "

95 g U^{235} 4.43 ¢

122 g U^{235}/ quadrant

Run 4 gives 1 quadrant = 9.7 ¢

~~$/in~~ = ~~$1.18/in~~ ∴ 1 octant = 19.4 ¢

7

12-2-58

INSTRUMENT CHECK

Time 10:25 AM Source 8

Channel	S	G	D	E
	$\frac{10}{1000}$ OPR	15	10	$\frac{10}{1000}$ 900V
Source Dist.	1"	0"	3"	1" 14"
% F.S. Trip	80	OK	100	80 100

Coulter 1-2-3

C.A. $290\frac{85}{15}$ Expr. (3) 26-1 Run 8

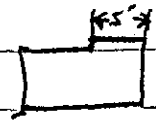
Sheet Date 12-2 1958 Time 10:55 ~~PM~~ AM

Purpose Foil Exposure

$26'' \times 26'' \times 22\frac{10}{26}''$

22" High with 5 inches on back of each table.

Bart



LOADING CHANGE

Description Removed control guides sleeves added for Runs 6 & 7.

Returned to normal stacks.

$26'' \times 26'' \times 22\frac{10}{26}''$

Mass before change $490.57 \times 22.385 = 10,919$ gmU $10,919$ g U^{235}

Mass of Change gmU -54 g U^{235} for Rods

Total Mass gmU $10,865$ gmU-235

Bare Val #1 and Bare In N-6

Cont. Next Page

C2 Fraction — .867

CRITICAL POSITIONS

C.A. 290 85/15 Expr (3) 26-1 Run 8

Table Pos. 015 B-657 F-321

Control Rod	Channel
A - 1268	A 81 100/1000
C - 7.18	B .05
	C 6.25X10⁻⁹
	D 43 100/500
	E 2X 900

Tim Crit. 11:18 35/60 AM PM Duration 19 min.

C.A. 290 85/15 Expr (3) 26-1 Run 9

Sheet Date 12-2-58 Time 1:00 PM

Purpose Fail Exposure

Cd Covered U-al #2, Bare In #N

26" X 26" X 22 14/26

7" Inch wide Layer on Bottom of rack Table.

10,865 / 75 / 10,940 gU²³⁵

added 104 in³ = 75 g U²³⁵

CRITICAL POSITIONS

290 85/15 Expr (3) 26-1 Run 9

Control Rod	Channel
A - 1236	32 1000/500
C - 743	.1
	4.42X10⁻⁸
	D 41 100/1000
	E 15 850

Tim Crit. 1:26 30/60 PM Duration 20

C.A. 2% 8D/12 Expr. (3) 26-1 Run 10

Sheet _____ Date 12-2-1958 Time 2:20 ~~AM~~ PM

Purpose Foil Exposure.

U^{235} in plexiglas container.

12 mg U^{235} in Capsule

1 Bare ~~Lead~~ Cadmium Covered

Description Added 2" wide layer on each table. + 75 g U^{235}

Substituted 1-A-5 for 1-A-4 — - 4

71 g U^{235}

Mass before change ____ gmU 10,940 gmU-235

Mass of Change ____ gmU +71 gmU-235

Total Mass ____ gmU 11,011 gmU-235

CRITICAL POSITIONS

C.A. 2% 8D/12 Expr (3) 26-1 Run 10

Date 12-2-58 Time 1657 T 302 P

	Channel	
A - 16.18	A 36	1000/500
C - 15.01	B 11	
	C 51 2X10	-8
	D 46	100/1000
	E 17	840

Time Crit. 2:39 37/60 ~~AM~~ PM Duration 20 min.

Cd Fraction Obtained .94

162

12-3-58

INSTRUMENT CHECK

Time 2:20 PM Source Y

	Channel A	B	C	D	E
	10/1000	ok	10^{-10}	10/1000	900 V.
Source Dist.	1"	0"	2½"	0"	15"
% F.S. Trip	85	ok	100	85	100+

Counters 1, 2 & 3

C.A. $270\frac{85}{15}$ Expr. (3) 26-1 Run 11

Sheet ____ Date 12-3 1958 Time 2:43 PM

Purpose 26" X 26" X 22 14/26

Bare Au Traverse
Horizontally at midplane.
Bare

CRITICAL POSITIONS

C.A. $270\frac{85}{15}$ Expr (3) 26-1 Run 11

Table Pos. .01 B657= 72990

Loading Same as for Run 9

10,940 g U^{235}

Control Rod	Channel	
A= 13.38	A 81	1000/1400
C= 13.40	B .45	
	C 6.04X10⁻¹¹	
	D 43½	1000/500
	E 2.0	690

Time Crit. $3:03\frac{38}{60}$ PM Duration 40 min.

D-Series

Foil Pos.	0	1½"	2½"	3½"	4½"	5½"	6½"	7½"	8½"	9½"
Number	0-6	12	25	32	15	29	7	20	1	2

Foil Pos	$10\frac{1}{2}$"	$11\frac{1}{2}$"	$12\frac{1}{2}$"	$-1\frac{1}{2}$"	$-2\frac{1}{2}$"	$-3\frac{1}{2}$"	$-4\frac{1}{2}$"	$-5\frac{1}{2}$"
Number	18	2	30	11	10	27	24	22

Foil Pos	$-6\frac{1}{2}$"	$-7\frac{1}{2}$"	$-8\frac{1}{2}$"	$-9\frac{1}{2}$"	$-10\frac{1}{2}$"	$-11\frac{1}{2}$"	$-12\frac{1}{2}$"
Number	31	8	26	16	13	4	23

12-4-58

INSTRUMENT CHECK

Time 9:20 AM Source S

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	opr	10^{-10}	$\frac{10}{1000}$	900 V.
Source Dist.	1"	"0"	2"	1"	15"
% F.S. Trip	85	OK	100	75	100+

Counters 1, 2 & 3

C.A. $2\%\frac{85}{15}$ Expr. (3) 26-1 Run 12

Sheet ____ Date 12-4 1958 Time 9:45 AM PM

Purpose 26" X 26" X 22 $\frac{11}{16}$"

Bare Al Traverse

~~Horizontally at Mid Plane~~

Bare

Foil Pos	0	$1\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$	$10\frac{1}{2}$	$11\frac{1}{2}$	$12\frac{1}{2}$
Number	E-22	8	9	17	2	16	18	14	4	15	24	10	12

Foil Pos	$-1\frac{1}{2}$	$-2\frac{1}{2}$	$-3\frac{1}{2}$	$-4\frac{1}{2}$	$-5\frac{1}{2}$	$-6\frac{1}{2}$	$-7\frac{1}{2}$	$-8\frac{1}{2}$	$-9\frac{1}{2}$	$-10\frac{1}{2}$	$-11\frac{1}{2}$	$-12\frac{1}{2}$
Number	E-19	21	11	1	5	6	13	23	7	20	3	D-3

N = E-25

Cont. Next Page

CRITICAL POSITIONS

C.A. 290 85/15 Expr. (3) 26-1 Run 12

Table Pos. 01 B 0585 T 2975

Control Rod	Channel	
A - 13.48	A 91	1000/1200
C - 13.50	B 53	
	C 6.6 4X2-11	1000
	D 48 1/2	500
	E 2.2	690

Tim Crit. 10:01 35/60 AM/PM Duration 40 min.

C.A. 290 85/15 Expr. (3) 26-1 Run 13

Sheet ____ Date 12-4 1958 Time 2:00 PM

Purpose Cd Covered ~~Bare~~ Al Traverse Horizontally at mid Plane 26"X26"X Bare

LOADING CHANGE

Description Added 1" across each table [Now 8" wide layer at back of each table]
52 in³ : 37.7 g U²³⁵
26"X26"X22 16/26

Mass before change	gmU	11,011	gmU-235
Mass of Change	gmU	37.73	gmU-235
Total Mass	gmU	11,048.73	gmU-235

C-Series

Foil Pos.	$12\frac{1}{2}$	$10\frac{1}{2}$	$8\frac{1}{2}$	$6\frac{1}{2}$	$4\frac{1}{2}$	$2\frac{1}{2}$	0
Number	17	20	4	14	13	6	C-5

Foil Pos.	$-1\frac{1}{2}$	$-3\frac{1}{2}$	$-5\frac{1}{2}$	$-7\frac{1}{2}$	$-9\frac{1}{2}$	$-11\frac{1}{2}$	n = C-16
Number	3	2	11	10	19	12	

CRITICAL POSITIONS

CA 270 $\frac{85}{15}$ Expr (3) 26-1 Run 13

Table Pos. .01 3.0544 T 296 R

	Control Rod	Channel
1	A 12.58	A out
2	C 12.44	B .86
3		C 10.0 4×10^{-11}
4		D 41 $\frac{1000}{1000}$
		E 4.2 6.90

Time Crit 2:28 $\frac{39}{60}$ AM PM Duration 40 min

Channel A is out of scram.

Layer title

166

12-5-58

INSTRUMENT CHECK

Time 12:45 ~~AM~~ PM Source Y

	Channel A	B	C	D	E
	10/1000	opr	10	10/1000	900V
Source Dist.	1/2"	0"	2"	1"	1.5"
% F.S. Trip Counters	90	OK	100	75	100+

C.A. 270 85/15 Expr. (3) 26-1 Run 14

Sheet _____ Date 12-5 1958 Time 12:55 ~~AM~~ PM

Purpose Bare Au Traverse Horizontally at Mid Plane

Bare

Same Loading as Run 11 — 10,940 gu^{235}

Foil Pos.	0	1½	3½	5½	7½	9½	11½
Number	F-3	9	1	20	19	17	13

Foil Pos.	-2½	-4½	-6½	-8½	-10½	-12½
Number	7	14	8	12	21	18

N = F-4

CRITICAL POSITIONS

C.A. 270 85/15 Expr. (3) 26-1 Run 14

Loose Pos. 01 B0559 T2945R

Control Rod	Channel
A-13.69	A 90 1000/1000
C-13.70	B .51
	C 6.5 4X10-10 1000/500
	D 46
	E 2.5 690

Tim Crit. 1:18 39/60 AM/PM Duration 40 min.

C.A 270 85/15 Expr (3) 26-1 Run 15

Sheet Date 12-5 '58 Time 3:20 AM/PM

Purpose

26"X26"X20½"

Bare - except 6" Reflector across Top

LOADING CHANGE

Description

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU-235

12-5-58

CRITICAL POSITIONS

C.A. 29/0 85/15 Expr (3) 2.6-1 Run 15

Table Pos. .015 .0560 1.2935

Control Rod	Chan #
A- 13.8K	.31 100/500
C- 4.56 out	B: .0092
	C 6.8 10^{-9} / 10
	D 72 500
	E .8 500

Time Crit. 3:39 AM/PM Duration 7 min.

Rod A @ .0 on 128 sec period = 8.1 ¢

Levelec Rd. A @ 13.8K Sensitivity _____ ¢/in.

12-5-58

C.A. 29o 85/15 Expr. (3)-26-1 Run 16

Sheet ____ Date 12-5 1958 Time 4:03 ~~AM~~ PM

Purpose

26"X26"X20 5/8"

Bare - Except 6" Reflector across Top

LOADING CHANGE

Description Added: 1" layer (1 octant)

Mass before ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU ____ gmU-235

CRITICAL POSITIONS

CA 29o 85/15 Expr (3) 26-1 Run 16

Table Pos. 015 A955ST2925

Control Rod	Channel
1 A - 17.04	A 85 100/200
C - 4.52 out	B .01
	C 56 10⁻⁹
	D 79 10/500
	E .8 900

Time Crit 4:17 ~~AM~~ PM Duration 4 min.

Rod ____ on ____ sec period = 11.7 ¢

Leveled Rd. 0 Sensitivity ____ ¢/in.

Critical Height 20.42

Top Reflector Savings 1.64"

$H/X = 195$

4/30/59

McCarty
Mihalzco
Lynn

INSTRUMENT CHECK

Time 10:15 AM

Source Pu Be

Channel

	A	B	C	D	
Range	10/1000	opr	10^{-10}	10/1000	900 V
Source Dist.	5"	0"	10"	2"	0
% F.S. Trip	95	ok	10	95	Loot

Counters 1, 2 & 3 ok

C.A. 2/0 93/8 Expr. 28 B,-1 Run 1

Sheet _____ Date 4-30 1959 Time 1:20 AM PM

Purpose 28" Parallelepiped
Completely Reflected

LOADING ~~CHANGE~~

Description 28" X 28" X 23"

(A-4) - 231 = 15,174.39
(A-4s) - 14 = 829.64
(A-2) - 49 = 1,608.18
(A-1) - 49 = 804.09

~~Mass before change~~ _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 18,416.30 gmU-235

Rod C @ 998.08 on 245 sec period = 4.66 ¢

Levelec Rd. C @ 8.11 Sensitivity _____ ¢/in.
Rod A = 16.15

Total excess 12.66 ¢
23" high Assembly

Rod C @ 8.10 on 130 sec period = 8.0 ¢

Levelec Rd. C @ 11.49 Sensitivity 2.36 ¢/in.

Rod A = 0.

174

4-30-59

LOADING CHANGE

Description 28×28 Added 1 quadrant 1" thick to 23" height. Height now 23.25

A-1 9 × 16.41
C-4 12 × 4.124
C-2 2 × 2.088

Mass before change gmU 18.416 Kg gmU-235

Mass of Change gmU 201. gmU-235

Total Mass gmU 18.617 Kg gmU-235

3,1-3

Rod C @ 10.56 on 91.2 sec period = 10.58 ¢

Levelee Rd. C @ 13.69 Sensitivity 3.38 ¢/in.

R.d A - 16.15

Rod C @ 8.10 on 151 sec period = 7.1 ¢

Leveled Rd. C @ 11.22 Sensitivity 2.27 ¢/in.

Rod A = 20.28

CRITICAL POSITIONS

CA- 2% $\frac{92}{8}$ Expt 28B-1 Run 2

Control Rod

A - .04

C - 15.625 A 77 $\frac{100}{500}$

.028

C 6.3 2.5×10^{-9}

D 61 $\frac{100}{200}$

E 1.2 690

Rm Crit. 3:15 AM PM Duration 37 min.

INSTRUMENT CHECK

Time 8:30 AM ~~PM~~ Source

	Channel A	B	C	D	E
Range	1%/100	oyr	10^{-10}	1%/100	900v
Source Dist.	8"		10	1"	0
% F.S. ~~Trip~~	80	OK	100	80	100

Level Rod A 19.89 Rod C = 11.49

Rod C @ 10.56 on sec period = 27 ¢

Levelec Rd. C @ 11.49 Sensitivity ¢/in.

Rod A - 19.89

CRITICAL POSITIONS

CA-270 E^2 Expr 28B-1 Run 3

L T P

Channel		
A - .04 -	A 54	100/500
C - 15.64	B .016	
	C 46	2.5×10^{-9}
	D 42	100/500
	E 6	690

Firm Crit. 9:06 AM ~~PM~~ Duration 33 min.

Rod C @ 13.69 on sec period = ~~7.6~~ 8.25

Leveled Rd. C @ 15.64 Sensitivity ¢/in.

C.A. 270 9-2/8 Expr. 28B-1 Run 4

Sheet ____ Date 5-1 1959 Time 11:00 AM

Purpose

Completely Reflected

LOADING CHANGE

Description Removed quadrant of 1" thickness that was added to run #2 = 201 gm

Added-49 A-4 = 200.63 gm

Mass before change ____ gmU 18.617 gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 18.617 gmU-235

CRITICAL POSITIONS

C.A. 270 9-2/8 Expr. 28B-1 Run 4

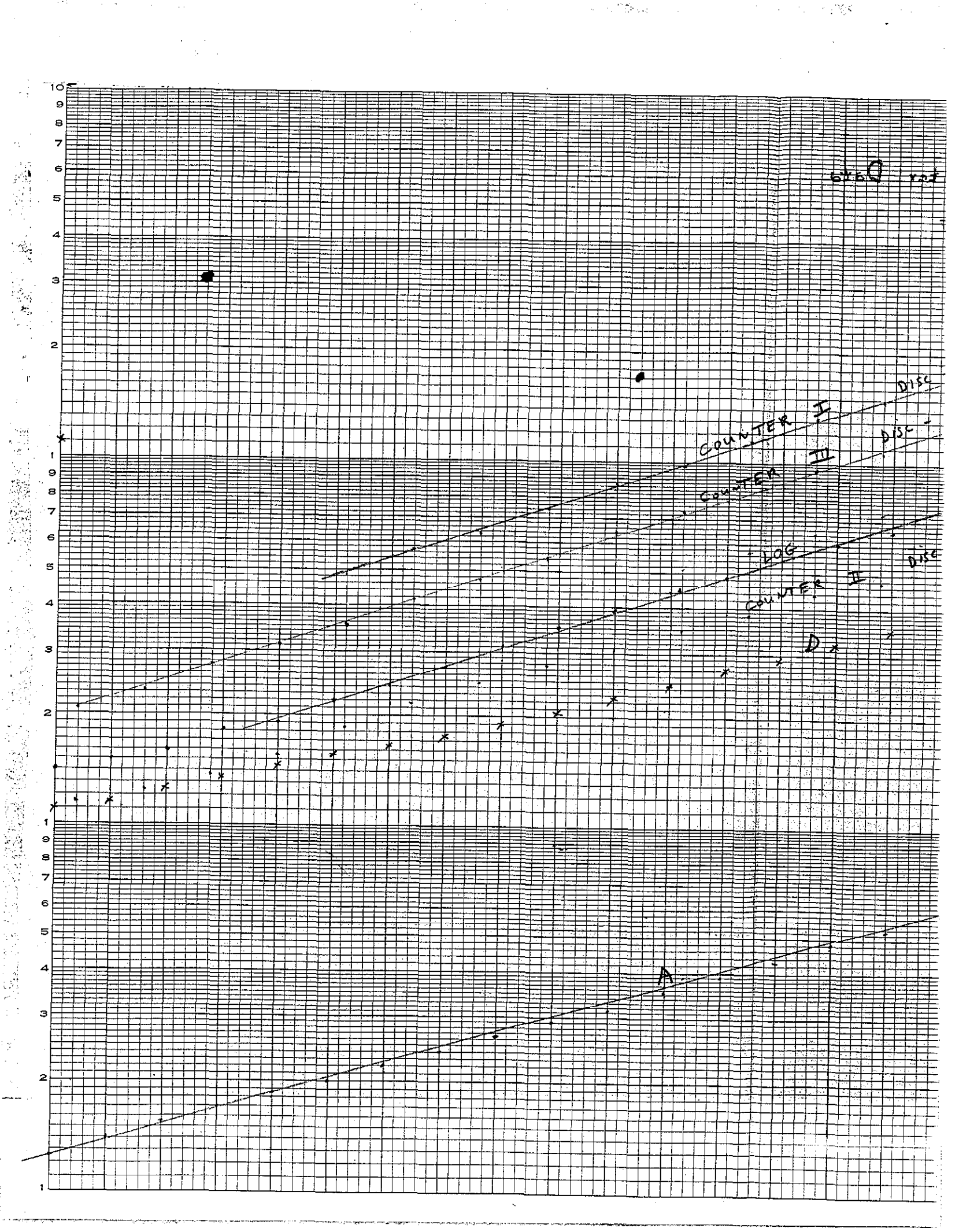
Table P.N. ____ T ____ R ____

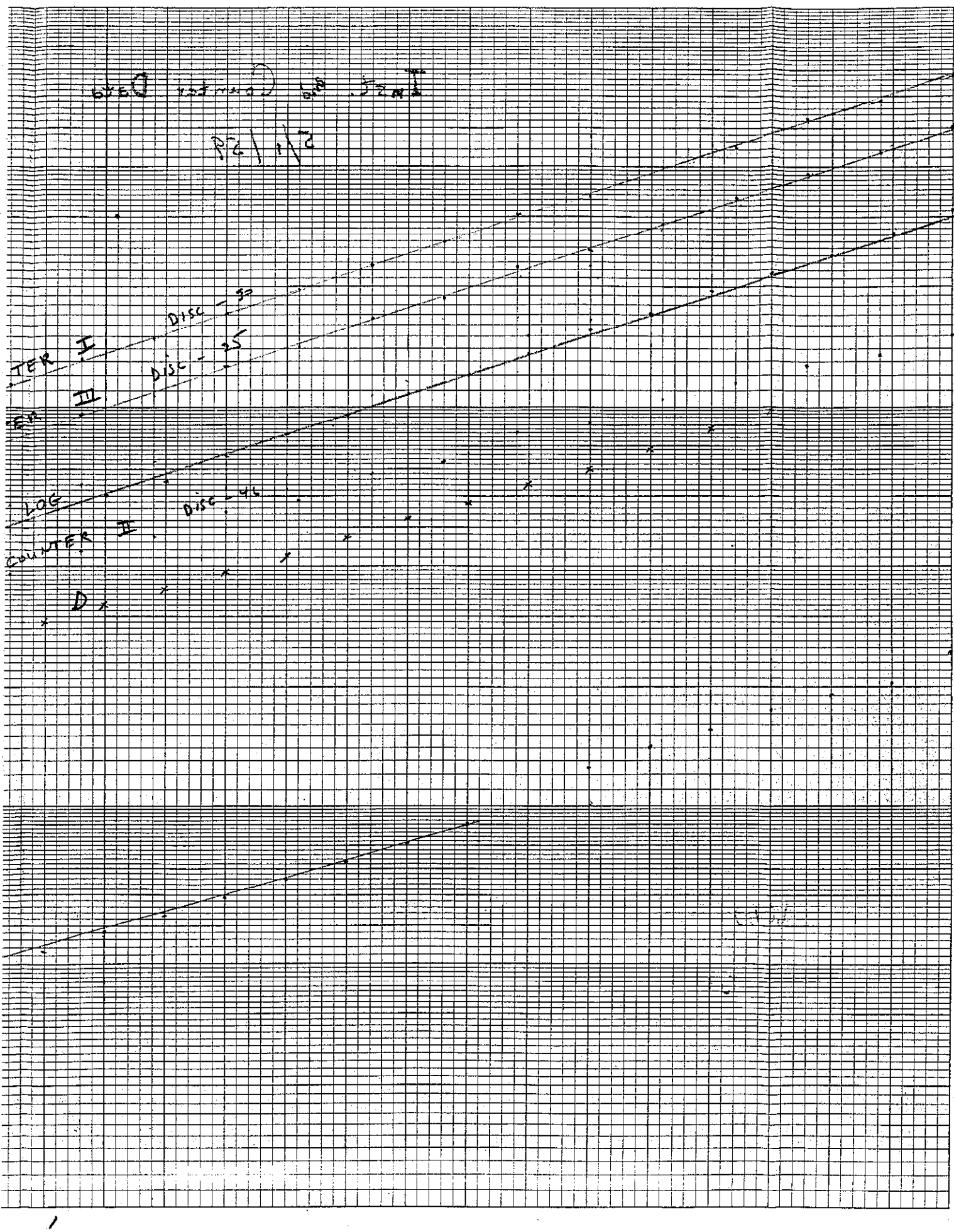
Control Rod	Channel	
A .04	A 74	100/500
C 15.60	B .022	
	C 5.6	2.5×10^{-9} / 100
	D 58	200
	E .7	690

Tim Crit. 11:10 AM ~~PM~~ Duration ____ min.

Rod C @ 13.29 on 138 sec period = 8.1 ¢

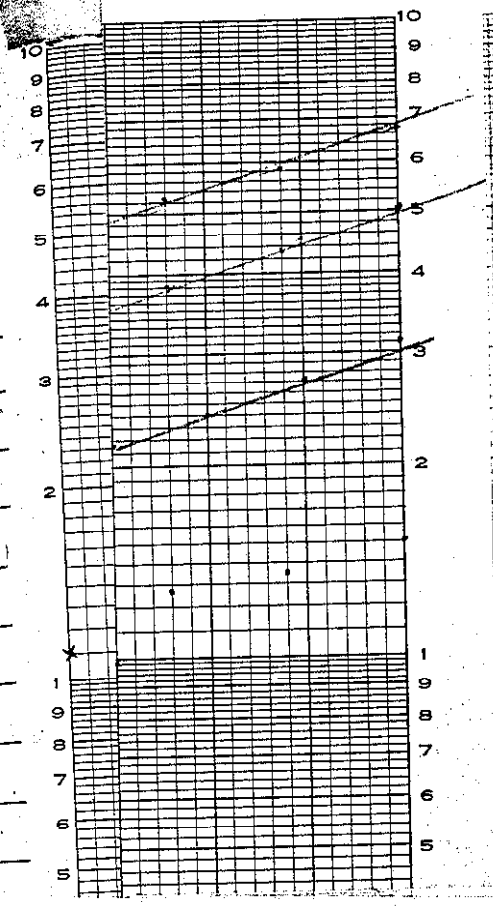
Levelec Rd. C @ 15.20 Sensitivity ____ ¢/in.


DISC
COUNTER I
DISC
COUNTER II
LOG
COUNTER II
DISC
D
A

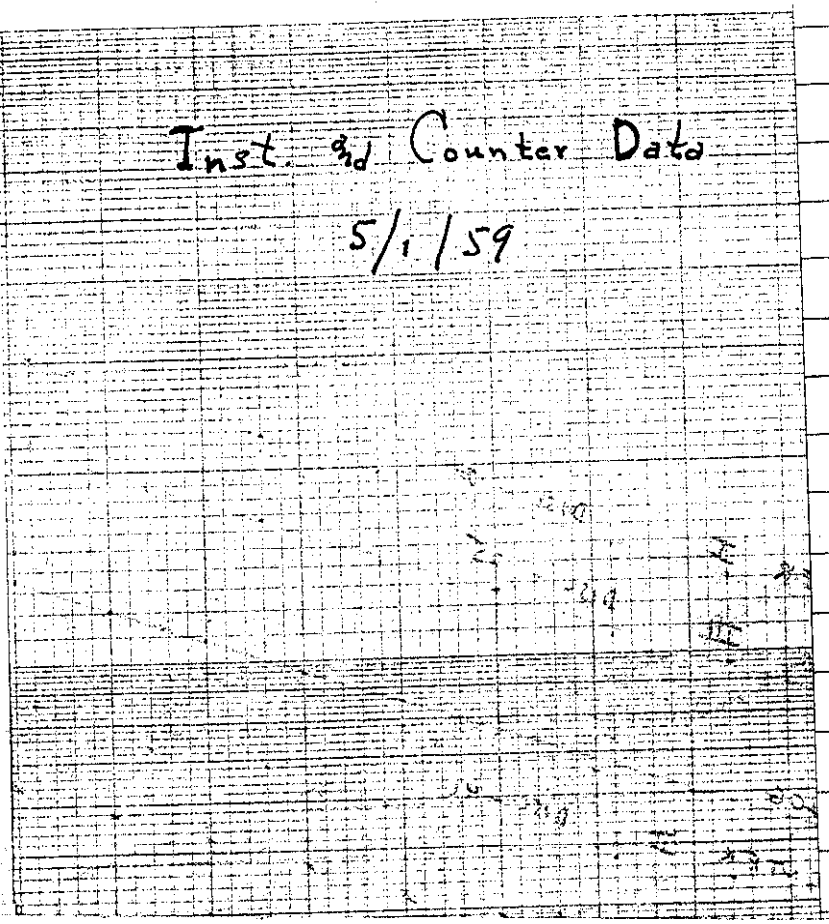

Disc - 50
Disc - 35
Disc - 46
LOG
II
D

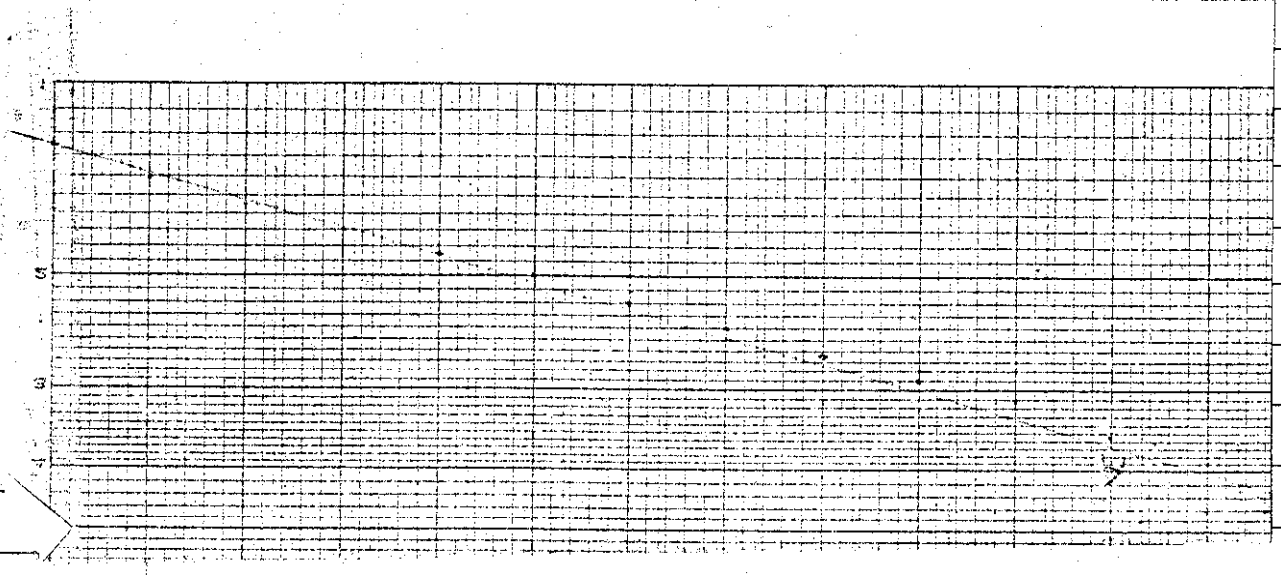
Inst. 3rd Counter Data

5/1/59



gm





C.A. 2% 92/8 Expr. 28 B-1 Run 5

Sheet: Date 5-1-1959 Time 2:00 ~~AM~~ PM

Purpose 28" X 28" X 22 15/16"

(3 quad. 23" high + 1 quad. 22 3/4")

Cans Off.

LOADING CHANGE

Description Removed - A-¼ (49) = 200.63 gm added for Run 4

" A-1 (16) = 262.56 gm

463.19

Added - A-½ (9) = 73.81

B-½ (13) = 26.55

A-¼ (9) = 36.85

Mass before Change B-¼ (13) = 13.33 gmU 18,617 gmU-235

57.73

Mass of Change A-¼ (14) = ~~44.44~~ gmU -250 gmU-235

B-1 (1) = 4.08

Total Mass 212.37 gmU 18,367 gmU-235

18,367 9/23/60

CRITICAL POSITIONS

2% 92/8 Expr. 28 B-1 Run 5

A .04 T. 000.0 T R

C 10.34 Channel

92 1000/100

.05

7.2 5 X 10⁻⁹

D 52 100/500

E 2.0 690

Tim Crit. AM PM Duration min

Rod C @ 998.08 on 106 sec period = 9.36 #

Levelec Rd. C @ 10.34 Sensitivity #/in.

C.A. 270 9/8 Expr. 28 B-1 Run 6

Sheet ___ Date 5-1 1959 Time 3:10 PM

Purpose 28" X 28" X 22 7/8"

(2 quad. 23" high + 2 quad. 22 3/8")

Completely Det.

LOADING CHANGE

Description Remove 1/4" from 1 quad. by same procedure as p. 178.

Mass before change ___ gmU 18,367 gmU-235

Mass of Change ___ gmU - 50 gmU-235

Total Mass ___ gmU 18,317 gmU-235

1pl. 9/22/66

CRITICAL POSITIONS

C.A. 270 9/8 Expr. 28 B-1 Run 6

Table Pos. ___ L ___ T ___

	Control Rod	Channel	
1	A .04	A 57	100/500
2	C. 8625	B .018	
3		C ~~6~~ 5.5	2.5X10⁻⁹
4		D 45	100/200
		E .5	690

Tim Crit. 3:20 AM PM Duration 25 min.

Rod C @ 998.08 on 202 sec period = 3.3^2 ¢

Leveled Rd. C @ 8.62 Sensitivity ___ ¢/in.

5/4/59

INSTRUMENT CHECK

Time 8:45 AM ~~PM~~ Source Pu Be

Channel	A	B	C	D	E
Range	10/1000	opr	~~9~~-10/10	12/1000	900V.
Source Dist.	7"	0"	9"	3"	0"
% F.S. Trip	85	ok	100	85	100+

Counters (4,7), +3 ok

C.A. 220 92/8 Expr. 28 B-1 Run ~~3~~ 7

Sheet ______ Date 5-4 1959 Time 9:25 AM ~~PM~~

Purpose 28" x 28" x 22 13/16"
(1 quad 23" + 3 quad. 22 3/4")
1 Comp. Refl.

LOADING CHANGE

Description Removed 1/4" from 1 quad. by same procedure as p. 178

Mass before change	gmU	~~18,517~~ 317	gmU-235
Mass of Change	gmU	- 50	gmU-235
Total Mass	gmU	~~18,467~~	gmU-235
		18,267	2/1R 9/22/66

Rod C @ 999.08 on ~~5.08~~ 1.064 sec period = 1.16 ¢

Leveled Rd. C @ 5.08 Sensitivity ______ ¢/in.

Rod A = 0

quadrant 1/4" thick = 4.36 ¢

Critical Height ~~22.54~~ $22.75 + \left(1 - \frac{1.16}{4.36}\right)\frac{1}{16} = $ ~~22.976~~ 22.796"

CRITICAL POSITIONS

C.A 27o 92/8 Expr 28-B-1 Run 7

Table Pos. I T P

Channel

1 A- .04 A 78 10/1000

C- 5.08 B .0042

3 C 6.5 3X10⁻¹⁰

4 D 51 10/500

E 2.2 900

Time Crit. 10:00 AM PM Duration 40 mins.

5/5/59

INSTRUMENT CHECK

Time AM PM Source PuBe

Channel	A	B	C	D	E
Range	10/1000	opr	10	10/1000	900
Source Dist.	12"	OK	15"	1"	0"
% F.S. Trip	80		100	80	100

ctrs 1, 2 & 3 - OK

C.A. 27o 92/8 Expr. 33 B-1 Run 1

Sheet Date 5/5/ 1959 Time AM PM

Purpose 33" dia Cylinder

30" High

844 in.² Base

Bare

2.976

.796

1

LOADING CHANGE

Description 33" dia. 30" High Bore

844 X 30 = 25,320 g.

- 98 g for Rods

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 25,222 gmU-235

Sub. Critical

Run 2

LOADING CHANGE

Description 33" dia. 31 High Bore

844 X 31 = 26,164

- 98

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 26,066 gmU-235

Sub Critical

5-

LOADING CHANGE

Description 33" dia. 31 1/4" High Bore

844 X 31.25 = 26,375

- 98 rods

- 3 outer Top edges (12" - 4")

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 26,274 gmU-235

CRITICAL POSITIONS

CA 2% 92/8 Expr. 33 B-1 Run 3

Table Pos. ______ L ____ T ____ R ____

Control Rod		Channel	
A .04	A	76	1000/100
C 15.44	B	.025	
3.	C	7.2	5x10⁻⁹
4.	D	57	100/500
	E	1.0	900V

Tim Crit. 4:10 ~~AM~~ PM Duration ______ min.

Rod C @ 998.08 on 202 sec period = 5.55 ¢

Leveled Rd. C @ 15.44 Sensitivity ______ ¢/in.

a 1" X 6" X 15" piece of plexiglas now on a control drive mechanism "D" to be used for extra reactivity when needed.

5-6-59

INSTRUMENT CHECK

Time ______ AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	0pr	1^{-10}	10/1000	900
Source Dist.	8"	015	12"	1"	0
% F.S. Trip	90		100	90	100.

184

5-6-59

C.A. 29o 92/8 Expr. 33B-1 Run 4

Sheet _____ Date 5-6-59 1959 Time 8:35 ~~PM~~ AM

Purpose 33" dia. Cy. Runs

LOADING CHANGE

Description Removed gradient 1/4" thick

844 X 1/16 = 52.72 in³

X1.026

54.

Mass before change gmU 26,274 gmU-235

Mass of Change gmU - 54 gmU-235

Total Mass gmU 26,220 gmU-235

CRITICAL POSITIONS

C.A. 29o 92/8 Expr. 33B-1 Run 4

Table Pos. _____ L _____ T _____ R _____

Control Rod	Channel
A-	A 80 100/50.0
C-	B .022
	C 92 2.5 X 10⁻⁹
	D 66 100/200
	E 5 820

Crit 8:50 AM ~~PM~~ Duration 28 min

1/4" of gradient north 5.55 - 2.75 + = 2.84

Critical Height 31 1/8"

C.A. $27_0\frac{92}{8}$ Expr. 30 B-1 Run 1

Sheet ____ Date 5-6 1959 Time 2:30 PM

Purpose 30"X30"X31" - Bare

30" High on Mov. Table

22 " " Stat "

15" on Mov. + 6" on Stat.

LOADING CHANGE

Description 30 X 30 X 31 = 27,900 in^3

27,900 X 1.026 = 28,625 g.

= 96 fuel rods

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 28,529 gmU-235

CRITICAL POSITIONS

CA $27_0\frac{92}{8}$ Expr. ____ Run ____

Table Pos. ____ L ____ T ____ R ____

Control Rod ____ Channel ____

A

B Critical

C

D

E

Tm Crit. ____ AM PM Duration ____ min.

1

C.A. 29 92/8 Expr. 30 B-1 Run 2

Sheet Date 5-6-59 Time 2:30 ~~AM~~ PM

~~Purpose~~ 30" X 30" X 31" - Bare

Top is 31" except 1" X 2" X 30" at back of Movable table

all available ~~Stm~~ Small Blocks used.

LOADING CHANGE

Description 30" X 30" X 31" = 28,625 g.

- 96 g for rods

1" X 2" X 30" = 60 in^3 - 62 g

158

~~Mass~~ before change	gmU		gmU-235
~~Mass~~ of Change	gmU		gmU-235
~~Total~~ Mass	gmU	28,467	gmU-235

Sub Critical

5-7-59

INSTRUMENT CHECK

Time 10:45 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range	30/100	off	10^{-10}	10/100	900
Source Dist.	6"	--	7"	0	1/2
% E.S. Trip	80	OK	100	90	100

C.A. 27 9/8 Expr. 30 B-1 Run 3

Sheet ____ Date 5-7- 1959 Time 11:05 AM ~~PM~~

Purpose 30" X 30" X 31" - Bare

16" on Stat. Table

14" on Mov. Table

LOADING CHANGE

Description 30" X 30" X 31" = 27,900 in^3

X 1.026

28,625

-96

Mass before change ____ gmU ____ gmU-235

~~Mass of Change~~ ____ gmU ____ gmU-235

Total Mass ____ gmU 28,529 gmU-235

CRITICAL POSITIONS

CA 27 9/8 Expr. 30 B-1 Run 3

Table Pos. ____ L ____ T ____ R ____

Control Rod	Channel
A .04	A 87 1000/200
C - 12.26	B .1
3 Dead	C 7.4 10^{-8}
4 ____	D 60 100/1000
	E 1.2 750

Tim Crit. 11:35 AM ~~PM~~ Duration 14 min.

(C) Rod C @ 998.08 on 269 sec period = ____ ϕ/in.

Leveled Rd. C @ 12.39 Sensitivity ____ ϕ/in.

(A) Rod C @ 998.08 on 269 sec period = 4.3 ϕ/in.

Leveled Rd. C @ 12.26 Sensitivity ____ ϕ/in.

(B) Rod C @ 998.08 on 269 sec period = ____ ϕ/in.

Leveled Rd. C @ 12.37 Sensitivity ____ ϕ/in.

30 x 30 x 51" All Blade tube in
All Rods out.

	T	P
	258.5	4.45 ϕ
	260.6	4.4 ϕ
	266.1	4.32 ϕ
	268.2	4.3 ϕ
Av.	263.3	4.36 ϕ

5/11/59

INSTRUMENT CHECK

Time 8:25 AM PM Inst. Cu Bo

	Channel A	B	C	D	E
Range	8/1000	Opr	10^{-10}	10/1000	90 V.
Source Dist.	8"	0"	13"	3"	90
% F.S. Trip	80	on	100	8	No

C.A. 20 72/8 Expr. 30 B-1 Run 4

Sheet ____ Date 5-11-59 Time 8:45 AM PM

Purpose 30" X 30" X 31"

16" on Stat. table

14" " Mov. "

To elevate reflection caused by Al extrusions and table.

Placed equal number of Al extrusions on top of block stack (5 deep) as there is on bottom with a 4' X 4' X 3/4" steel plate on the Al centered above the stack.

Rod Calibration

condition	Rod A = 20.27	Rod C = 11.50	Period 2 55	¢
∞	20.27	14.60		4.5 ¢
+	17.00	14.60	256	
∞	17.00	16.845		4.47 ¢
+	14.00	16.945	382	
∞	14.00	18.510		3.1 ¢
+	0.045	18.51	426	
∞	0.045	19.88		2.82
∞	20.27	14.70		

14.89 ¢

C.A. 2% 92/8 Expr. 30 B-1 Run 5

Sheet ____ Date 5-11- 1959 Time 1:30 ~~AM~~ PM

Purpose 30"x30"x31" - Bare
al + steel on top

Rod A = 20.27

Rod C @ 998.06 on 138 sec period = 7.62 ¢

Levelec Rd. C @ 14.70 Sensitivity ____ ¢/in.

7.62
6.8
0.82

Rod C @ 7.00 on 138 sec period = 6.8 ¢

Levelec Rd. C @ 14.70 Sensitivity ____ ¢/in.

CRITICAL POSITIONS

C.A. 2% 92/8 Expr. 30-B-1 Run 5

Channel

1 A - 20.27	A 57	1000/1000
2 C - 14.70	B .09	
3 D = out	C 8.4	3×10^{-8}
4	D 37	1000/500
	E 1.4	750

Tim Crit. 1:30 ~~AM~~ PM Duration 60 min.

Steel plate + Al Boxes
Rod C 12.5 to 19.88 → 13.7 ¢

5/12/59

McCarty
Mihalzco
Lynn

INSTRUMENT CHECK

Time 8:30 AM

Source Pu. Be

	Channel A	Channel B			
Range	10/1000	oper	10^{-10}	10/100	900V
Source Dist.	8"	0"	14"	3"	0"
% F.S. Trip	85	OK	100	90	No

Osc 1, 2 + 3 OK

C.A. 270 92/8 Expr. 30 B-1 Run 6

Sheet ____ Date 5-12-1959 Time 8:50 AM

Purpose 30" X 30" X 31" Bare

Top is Bare

CRITICAL POSITIONS

C.A. 270 92/8 Expr. 30 B-1 Run 6

Control Rod	Channel	
A - 05	A 58	1000/1000
C - 12.825	B .11	
D - is out	C 7.0	3×10^{-8}
	D 38	1000/500
	E 1.6	750

Run Time 9:15 AM Duration ____ min

Rod C @ 97.806 on ____ sec period = ____ ¢

Levelec Rd. C @ 12.825 Sensitivity ____ ¢/in.

Rod A - .05

Rod C @ 97.806 on ____ sec period = ____ ¢
Levelec Rd. C @ 12.825 Sensitivity ____ ¢/in.
Rod A - .05

C.A. 270 9/8 Expr. 30 B-1 Run 7

Sheet Date 5-12 59 Time 11:00 AM

Purpose 30" X 30" X 30 3/4"

Bare

LOADING CHANGE

Description Removed 1" Layer 30"X30" X 1" = 923.4
Added 1/2" " 30"X30"X1/2" =
Added 1/4" " 30"X30"X1/4" = } 692.5

Mass before change gmU 28,529 gmU-235
Mass of Change gmU - 231 gmU-235
Total Mass gmU 28,298 gmU-235

1 piece of paraffin 1½"X12"X18" on East side of stationary table for positive period.

Pulled away by use of string and measured negative period.

negative period ___ sec.

___ ¢

C.A. 290 $\frac{92}{8}$ Expr. 30 B-1 Run 8

Sheet Date 5-12 1959 Time 1:12 PM

Purpose 30" X 30" X 31"

Bare

LOADING CHANGE

Description Removed 3/4" Layer

Returned 1" Layer

923.4g

923.5

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 28,529 gmU-235

Pos. Period Sec

4

C.A. 290 $\frac{92}{8}$ Expr. 30 B-1 Run 9

Sheet Date 5-12 1959 Time 2:15 PM EST

Purpose 30" X 30" X 30 3/4"

LOADING CHANGE

Description Removed 1" layer

Returned 3/4" layer

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 28298 gmU-235

1

C.A. 29o 9/8 Expr. 30 B-1 Run 10

Sheet 5-12-59 Time 3:15 PM

Purp 30" X 30" X 31"

Bare

14" on Moveable Table – 16" on Static Table

LOADING CHANGE

Description Removed 3/4" layer

Returned 1" layer

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 28,529 gmU-235

Pos Period — Sec

+

C.A. 29o 9/8 Expr. 30 B-1 Run 11

Sheet Date 5-12-1959 Time 4:00 PM

Purpose 30" X 30" X 30 3/4"

1

Sec 4

Neg Period

LOADING CHANGE

Description Removed 1" layer

Returned 3/4" layer

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 28,298 gmU-235

5-13-59 8:40 AM Pu Be

INSTRUMENT CHECK

	10/1000	opr	10/1000	900V.
Source Dist.	7"	0"	8"	2½"
% F.S. Trip	90	OK	100	90

9:00 A.M

Run-12 Height 30 3/4" Neg. Period — C —

10:15 AM

Run-13 Height 31" Pos. Period — C —

11:13 AM

Run-14 Height 30 3/4 Neg. Period — C —

A - Level at .00022 on Log N Rods A - 17.00 C - 12.03

Run 15 B - Plastic used to produce positive Rods A - 17.00
Then plastic withdrawn .002 on Log N C - 12.03
Neg. Period

C Plastic used to produce + T
Log N — .024 — Neg. Period.

D withdrew plastic. Levelled Rod A = 17.00
Log N = .19 Rod C = 9.84

E Reduced level by table Separation.
~~Levelled~~ Log N = .01+ Pos. Period
Rod A = ~~17.00~~ 17.00
" C = 9.84

The above runs made in an attempt to determine contributions of "built in Source" to level and Periods.

F - Log N Chamber moved to top of stairway Rm 108. Other Instruments moved back and Shielded
Level log N = .00022 Rod A = 17.00 Rod C = ~~10.99~~ 11.00

G - Produced Pos. Period with Plastic Reflector
Withdrew Plastic Reflector Log N = .0025
Rods the same - Neg. Period

H - Produced Pos. Period with Plastic
Withdrew Plastic. Level log N = .014
Rod A = 17.00 Rod C = 10.00

I - Same Procedure - Level log N = .125 Rods Same

CRITICAL POSITIONS

C.A. _____ Expr. _____ Run _____

Stable Pos. _____ L _____ T _____ R _____

Control Rod		Channel	
1	A - 17.00	A	85 1000/1000
2	C - 10.00	B	.125
3		C	5.0 4 x 10^11
4		D	94 1000/1000
		E	6.7 6400

Tim Crit. _____ AM PM Duration _____ min.

INSTRUMENT CHECK

	Channel A	B	C	D
Source	Pu Be			
	10/1000	10	0/1000	90
Source Dist.	10"	17"	3"	
% F.S. Trip	85	100	90	100

Ctrs 1, 2 + 3 OK

5/14/59

8:30 AM.

Run 15 Height 31" + Period ____ ¢

A Level Log N = .11 A = 74 1000/1000 D = 77 1000/500

Rod A = .04 Rod D = 12.73

B. Separated Tables Power dropped off scale on Log N. Tables put back together without external source lateral source built up to .0008 on Log N + system still on slight positive period.

C. Plastic inserted to produce positive period + then removed with Log N at .005.

Shutdown — 11:30 A.M.

D. 1:00 Pm. Physically removed source from rig, (to vault.) Control Rods set Same as for Run 15A Tables brought together, Observed rise.

E. Used Plastic to raise power to log N = .1 Rods Same. Neg. Period.

F- Levelled — log N = .095 Rod A = .04 Rod C = 12.56
A = 60.5 $\frac{1000}{1000}$ D = 63 $\frac{1000}{500}$

G- Dropped level Log N = .05 by table Separations
Observed ~~[illegible]~~ rise in Power. Rods Same

H- Dropped level to Log N = .026 By Table Separations
on Pos. Period. Levelled Rod A = .04 Rod C = 12.70

I- Dropped level by table Separation to log N = .013 - Level Rods Same.

J- Increased Power to log N = .13 with Plastic
Power dropping —
Levelled — Rod A = .04 Rod C = 12.49

Temperature Run [redacted]

5-15-59

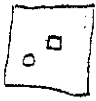
Time	#2 Center of Assembly	#1 West Side
9:15 AM	.8814	.8742
10:00	.8855	.8778
10:55	.8788	.8804
11:22	.8788	.8826
11:53	.8820	.8820
1:45	.8782	.8813
3:00	.8795	.8705

"TABLE" "IN" READINGS

5-15-59

MICROMETERS

	Setsyn	Top	Bottom
RUN 16 A	0.01	9595	9088
B	0.01	9505	9110
C	0.01	9490	9092
D	0.01	9505	9098
RUN 17A	0.01	9530	9089



5-15-57

INSTRUMENT CHECK

Time 9:40 ~~P.M.~~ A.M. Source Pu-Be

Channel	A	B	C	D	E
Range	$\frac{10}{1000}$	open	10"	$\frac{10}{1000}$	900V.
Source Dist.	8'	0"	12"	3"	1"
% F.S. Trip	80	OK	100	90	100

Run 16A - 30"X30"X31" - Bore

Rods out - Pas. Period - Ctss. 1 2 3 — 320 320 322 — log N 320 sec Pd

Leveled - log N = .13 - Ch. A = 80 $\frac{1000}{1000}$ D = 87 $\frac{1000}{500}$

Rod A = .04 Rod C = 11.85

11:25 AM

B. Dropped Level - By Table Separation

Level log N = .013 - Ch A = 78 $\frac{1000}{100}$ D = 72 $\frac{1000}{100}$

Rod A = .04 Rod C = 11.85

11:40

C. Dropped level - By Table Separation

log N = .0015 Ch A = 95 $\frac{100}{100}$ D = 92 $\frac{100}{100}$

Rod A = .04 Rod C = 11.85

D. Dropped Level - By Table Separation

Log N = .00023 Ch A = 90 $\frac{10}{200}$ D = 50 $\frac{10}{200}$

Rod A = .04 Rod C = 11.85

E. Increased Level - Polythene Reflector

log N = .0016 Ch A = 50 $\frac{100}{200}$ D = 88 $\frac{100}{100}$

5/15/59

200

Run 17 Rods Out – Pos. Period. – 323 Sec. Pd

Level – Log N = .12 Ch. A = 67 $\frac{1000}{1000}$ D = 72 $\frac{1000}{500}$

Rod A = .04 Rod C = 11.78

5/18/58

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu-Be

	Channel A	B	C	D	E
Range	1%/100	dpr	10^-11	1%/100	400 V
Source Dist.	15"		15"	3"	1½"
% F.S. Trip	80	OK	100	90	100

Ctrs 1,2,3 OK

C.A. 2 92/8 Expr. 30-B-1 Run 18

Sheet ____ Date 5/18 1959 Time 8:30 AM PM

Purpose a/a/h Measurement

30 x 30 x 30 3/4 to 1" Bare

18A - 30×30×31" — Pos. Period Log N 325.8 Sec ___ ±
Did Not Level — Rods out
Period from Ctrs ① 315.3 Sec ② 329.2 Sec ③ 315.3 Sec.

B - 30"X30"X30 3/4" - Neg. Period Log N 204.2 Sec ___ ±
Did Not level — Rods out
Produce neg period by removing paraffin reflector.
Period from Ctrs ① ~~422~~ 214.2 Sec ② ~~428.4~~ 214.2 Sec ③ ~~449.5~~ 209.8 Sec.

C.- Same as B - Neg. Period Log N 209.6 Sec ± 209 ±
Period from Ctrs ① ~~424.7~~ 212.3 Sec ② ~~432.5~~ 216.2 Sec ③ ~~446.9~~ Sec.

D.- Same as A. - Added an additional Log N, Beckman - Chamber Placed along side of other Chamber.
Period from ctrs ① 297.5 Sec ② 310 Sec ③ 305 Sec
" " Log N NEPA 296.4 BECKMAN 309.5

E Same as D - Log N NEPA 297.5 Sec Beckman 301.9 Sec
Ctrs Periods ① 295.7 Sec ② 304.7 Sec ③ 303.5 Sec.

202

5/19/59

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source Ra Be

	Chan A	B	C	D	E
Range	1/1000	OPR	10^{-10}	1/1000	900 V.
Source Dist.	7"	0"	16"	3"	1"
% F.S. Dep	80	ok	100	85	100 ?

C.A. 29 92/8 Expr. 30 B-1 Run 18

Sheet _____ Date 5-19 1959 Time 8:50 AM ~~PM~~

Purpose 30" X 30" X 30 3/4" - Bare

$\Delta P / \Delta h$ - Measurements

Run

18 F Produced neg. Period by removing paraffin reflector did not level - log N Counters

NEPA	Beckmon	①	②	③
235.6	236.7	- 237.4	- 242.3	- 234.5 ~~234~~

G 30" X 30" X 31" - Pos. Period Rods out. Did Not Level

Periods log N Counters

NEPA	Beckmon	①	②	③
244.3	254.1	245	257	248.8

H. Same as G - Pos. Period

Periods log N Counters

NEPA	Beckmon	①	②	③
227	240.	232.7	239.7	231.9

I 30" X 30" X 30¾" – Same as F – Neg. Period

Log N		Periods	Counters	
NEPA	Beckman	①	②	③
231.3	244.3	231.9	245	231

J. Same as I. – Neg Period

log N		Periods	Counters	
NEPA	Beckmon	①	②	③
236.9	~~221.5~~ 259.5	– 234.5	243.6	237.1

K- 30" X 30" X 31" – Same as G. – Pos Period

log N		Periods	Counters	
NEPA	Beckmon	①	②	③
246.5	253.	~~259.7~~ 259.7	276.6	271

Pos. Periods

	Log N		Counters		
	NEPA	BECKM	1	2	3
G	244.3	254.1	245	257	248.8
H	227	240	232.7	239.7	231.9
K	246.5	253	259.7	276.6	271
M	233.5	230.2			
N	222.6	229.1			
Q	221.5	219.4			

NEG. PERIODS

	Log N		Counters		
	NEPA	BECKM	1	2	3
F	235.6	236.7	238.4	242.3	234.5
I	231.3	244.3	231.9	245	231
J	236.9	259.5	234.5	243.6	237.1
L	238.9	243.2			
O	245.4	241			
P	245.4	249.8			

204

5/20/59

INSTRUMENT CHECK

Time 9:00 AM Source Pu Be

	A	B	C	D	E
Range	$\frac{10}{1000}$	OR 10^{-10}	$\frac{10}{1000}$	900	
Source Dist.	6"	0"	15"	3"	1"
F.S. Trip	85	OF	100	80	100 T

C.A. $29\frac{92}{8}$ Rep. 30 B-1 Run 18

Sheet 95 Time 9:10 AM

Purpose 30"X30"X30¾" - Base

$\Delta\rho/\Delta h$ Measurements

Run

18 L Produced Neg. Period by removing paraffin reflector.

Log N		Periods	Counters	
NEPA	Beckmon	①	②	③
238.9	243.2	244.9	244.9	239.7

M Pos Period -30"X30"X31"

Log N		Periods	Counters	
NEPA	BECKMAN	①	②	③
233.5	230.2	225.4	242.3	233.2

N Same as M - Pos. Period

Log N		Periods	Counters	
NEPA	BECKMAN	①	②	③
222.6	229.1	217.6	224.1	221

5-18-59

Time	W.S. Readings #1	Center #2
9.00	5706	8744
10:15	8595	8665
11:15	8698	.8801
1:30	8738	8715
2:05	.8734	.8802
3:10	8745	.8802

Temperature

5-19-59

Time	West Side #1	Between Table #2
8:45	8454	8476
10:20	8462	8512
1:00	8643	8662
1:50	8555	8566
3:50	8643	8611

5-20-59

Time	West Side #1	Between Table #2
8:50	8605	8622
10:05	8630	8658
11:10	8725	8690
1:05	8622	8657
3:20	8794	8765

5-21-59

10:00 AM	#1	#2
	.8670	.8711
11:00	.8686	.8725
1:30	.8720	.8730
2:20	.8731	.8735
3:20	.8641	.8637

5-22-57

	#1	#2
8:50	.8747	.8773
10:50	.8715	.8752
1:55	.8630	.8665
	.8701	.8735
2:30	.8701	.8735
3:30	.8724	.8754

O Same as L - Neg. Period

LOGN NEPA	LOGN BECKMAN	PERIODS (1)	COUNTERS (2)	(3)
245.4	241.	242,3	250.1	245

P Same as O - Neg. Period.

LOG N NEPA	LOG N BECKMAN	PERIODS (1)	COUNTERS (2)	(3)
245.4	249.8	247.5	250.1	239.7

Q Same as M - Pos. Period.

log N NEPA	log N BECKMAN	PERIODS (1)	COUNTERS (2)	(3)
221.5'	219.4	217,3	224.1	221,5'

206

5/21/59

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	.9 / 1000	OFF	10⁻¹⁰	10⁻¹⁰	700 V.
Source Dist.	~~8~~ 5"	0"	18"	9½"	1"
% F.S. Trip	75	OK	100	90	100

Counters 1, 2 & 3 OK

C.A. 2% 92/8 Expr. 30B-1 Run 18

Sheet ____ Date 5-21 1959 Time ____ AM PM

Purpose 30" X 30" X 31" for Pos. Periods
30" X 30" X 30¾" for Neg. Periods
Δρ/Δh Measurements

Run	Period	NEPA (Log N)	Beckman	Counters ①	②	③	Start uP Time
18 R	neg.	250.9	256.3	255.4	264.5	247.5	8:45
S	Pos.	223.7	229.1	224.1	233.2	226.7	10:20
T	Pos.	217.2	228.1	211.1	220.2	217.6	11:05
U	Neg.	249.8	248.7	250.2	258.	247.5	1:00
V	Neg.	238.9	250.9				1:88
W	Pos.	213.4	~~218.~~ 217.2				3:~~20~~ 00

5/22/59

INSTRUMENT CHECK

Time 8:25 AM Source Pu Be

	Channel A	B	C	D	E
	10/1000	OPR	10^{-10}	10/100	900
Source D	9"	0"	14"	2"	1"
% F.S. Trip	85	OK	100	85	100

Counters 1, 2 + 3 OK

Δρ/αh Measurements

Same as p. 206

Time	Run	Period	NEPA	BECKMAN log N	Counters ①	②	③
8:35 AM	18 X	neg.	244.8	250.3	251.5	258	255.5
10:15 AM	Y	Pos.	220.5	221.5	218.7	225.5	222.8
11:05 AM	Z	Pos.	220.5	224.8			
1:00 PM	A_2	Neg.	249.8	241.1			
1:58	A_3	Neg.	238.9	247			
2:55	A_4	Pos.	221.	223.7			

Start up Time

8:45

10:20

11:05

1:00

1:50

3:20

208

5/25/59

INSTRUMENT CHECK

Time 9:00 AM PM Source Ouke

	Channel A	B	C	D	E
Range	1/1000	Ar	10^{-10}	1/1000	90%
Source Dist.	7"	0"		2"	1/2"
% F.S. Trip	90	OK	100	BS	100

Counters 1, 2 + 3 OK

C.A. 290-92/8 Expr. 30 B-2 Run 1

Sheet Da. 5-25 1959 Time 9:05 AM PM

Purp. Foil Test Run

1 Gold Foil

1 Indium

1 Green salt

CRITICAL POSITIONS

C.A. 290-92/8 Expr. 30 B-2 Run 1

Rabbit Pos. 01 T

Control Rod	Channel
A. out	A 63 100/500
C - 11.45	B .005
D - out	C 4.8 2.5 X 10^-9
	D 83 100/200
	E 2 750

Tim Crit. 9:20 45 AM PM Duration 5 min

5/26/89

INSTRUMENT CHECK

Time 8:30 AM Source Pu Be

	Channel A	B	C	D	E
Meter	10/1000	OK	10^{-10}	10/1000	900 V.
Source Dist.	7"	0"	8"	2"	1"
% F.S. Trip	85	OK	100	90	100

Counters 1, 2 + 3 OK

C.A. 270 92/8 Expr. 30B-2 Run 2

Sheet Date 5-26-89 Time 8:45 AM PM

Purpose Rod Sleeve and Hole Evaluation

Removed all rods & Guide Sleeves.

Restacked filling rod holes.

LOADING CHANGE

Description 30" X 30" X 30.5"

900 X 30.5 = 27,450 in^3

27,450 X 1.026 = 28,163 g

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 28,163 gmU-235

Sub Critical - Measured negative period achieved Log N Level #1 by use of plexiglas reflectors on rod drive D.

C.A 29 92/8 Expr 30 B-2 Run 3

Shee 5-26-9 Time 1:10 PM

Purpose 29 U^{235} Foil Run
(98% UF_4 - 2% CH_2)

Horizontal Traverse thru Center at table Elevation.

0"	=	~~#~~ 2	-2"	=	+ 9 10
2"	=	3	-4"	=	+ 10 11
4"	=	4 5	-6"	=	+ 11 12
6"	=	6	-8"	=	+ 12 13
10"	=	7	-10"	=	+ 13 14
12"	=	8	-12"	=	+ 14 15
14"	=	9			

Stock - 30" x 30" x [30 3/4" on 3/4 & 30 1/2" on 1/2]

Did not Level - Due to No Rods

Log N = Close to .005 for 20 min.
(Slightly Negative)

5/27/59

INSTR...

Time 8:40 AM — Pu Be

	A	B	C	D	E
Range	10/1000	OHR	10^{-10}	10/1000	900 V.
Source Dist.	7"	0"	15"	0"	15"
% F.S. Trip	85	OK.	100	No	900+

Counters 1, 2 & 3 OK

C.A. 290 92/8 Exp 30 B-2 Run 4

Sheet ... Da 5-27-59 8:50 AM PM

Purpose Rod Sleeve & hole evaluations.
Same Condition as Run 2.
30" x 30" x 30.5"

Sub Critical – Measured Negative Period.
Achieved Log N = .1 by using plexiglass
reflector.

C.A. 27. 9 1/8 Expr. 30 B-2 Run 5

Sheet _____ Date 5/27 1959 Time 3:00 AM PM

Purpose Rod Sleeve & Hole Evaluation

Returned Safety and Control Rod to original Position in stack.

Stack - 30" X 30" X 31" = 28,529 gms

- 14" on Moveable Table - 16" on Stationary Table

Measured Positive Period.

CRITICAL POSITIONS

27. 9 1/8 Expr 30 B-2 Run 5

1.005 B. 9.93 T. 86.42 R

Control Rod	Channel
A- .02	A 85 ~~1000~~ 1000
C- 14.50	B .14
D- out	C 6.0 4×10^{-11}
	D 95 $\frac{1000}{500}$
	E 7.2 690 Volts

Crit. AM PM Duration 10 min

5/28/59

INSTRUMENT CHECK

9:40 AM ~~PM~~ Ph Be

	A	B	C	D	E
Range	10/1000	OPR	10·10	10/1000	900 Volts
Source Dist.	8"	0"	15"	3"	1"
% F.S. Trip	80	ok	100	85	100+

Counters 1, 2 + 3 ok

Table . . .

C.A. 2% 92/8 Expr. 30 B-2 Run 6

Sheet Date 5-28-1959 Time 9:55 ~~AM~~ PM

Purpose Different Thickness Gold Foil Exposure.

Bare & cd of each thickness located symmetrically (~ 1") about the center.

1 mil 405 Bare 406 cd. 2 mil. A-11 Bare A-12 Cd. 5 Mil. 509 Bare 510 Cd.

CRITICAL POSITIONS

C.A 2% 92/8 Expr. 30 B-2 Run 6

.008 959

	Channel
A-12.18	65 1000/1000
C 1.1.81	F 1
D-out	E 4.6 4X10⁻¹¹ 1000
	D 71 500
	F 53 690

Time Crit 10 18 10 ~~AM~~ ~~PM~~ Duration 20 min.

C.A. 290 9z/8 Expr. 3-0 B-2 Run 7

Sheet ... Date 5-28-9 Time 1:05 PM

Purpose

Stack 30.18" Wide - 31.11 High

Pos.	Barr #	Cd	Pos.	Barr #	Cd
Zirconium			Foils		
0"	10	31	-.2"	25	1
2"	23	36	-4"	12	
4"	13		-6"	19	
6"	11		-8"	8	
8"	28		-10"	34	
10"	26		-12"	22	
12"	17		-14"	35	
14"	33				

CRITICAL POSITIONS

C.A. 290 9z/8 Expr. 30 B-2 Run 7

Table No. .008 B 909

A 11.99 61 1000/500

S 11.10 C .05

C 8.8 2x10 -8

D 84 1000/200

E 2.1 690

Time Crit. 1:23 30/60 AM PM Duration 20 min.

INSTRUMENT CHECK

6-1-59

Time 10:10 Source Ra

	A	B	C	E
	10/1000 OPR	10 -10	10/1000	900 V.
Source Dist.	7"	0"	14"	2"
% F.S. Trip	85 ok	100+	90	100+

Counters 1, 2 + 3 ok

CA 290 92/8 Expr. 30 B-2 Run 8

Sheet Date 6-1 1959 Time 10:15 AM

Purp.

290 h 235 Fonda

Horizontal Traverse at table Separation

Stack 30"X30"X31 1/4"

Pos.	No.	Pos.	No.
0"	B-2	-1 1/2"	B-11
1 1/2"	3	-3	12
3"	4	-4 1/2	13
4 1/2	5	-6	14
6	6	-7 1/2	15
7 1/2	7	-9	16
9	8	-10 1/2	17
10 1/2	9	-12	18
12	10		

Coil

CRITICAL POSITIONS

CA $290\frac{92}{8}$ Expr. 30 B-2 Run 8

.01 B 9075

	Channel	
A- 11.15	69	$\frac{100}{1000}$
C- 10.92	.01	
D- out	C 6.4 5 X 10^{-9}	
	D 74	$\frac{100}{500}$
	E 1.0	750

Run Crit. 10:36 $\frac{40}{60}$ AM Duration 20 min.

CA $290\frac{92}{8}$ Expr. 30 B-2 Run 9

Sheet: D- 6-1 259 Time 1:15 PM

Purp.

290 h235 Foils

Horizontal Traverse at Table Separation

Stack 30" X 30" X 31¼"

CRITICAL POSITIONS

CA $290\frac{92}{8}$ Expr. 30 B-2 Run 9

.01 B 9089

	Channel	
A 11.23	64	$\frac{1000}{200}$
C- 11.48	.02	
D = out	C 8.1	10^{-8}
	D 73	$\frac{100}{1000}$
	E 2.2	750

Run Crit. 1 28 $\frac{32}{60}$ AM PM Duration 20 min.

Pos	No.	Pos	No.
0	A-1	$-1\frac{1}{2}$	A-9
$1\frac{1}{2}$	2	-3	-10
3	3	$-4\frac{1}{2}$	-11
$4\frac{1}{2}$	4	-6	-12
6	5	$-7\frac{1}{2}$	-13
$7\frac{1}{2}$	6	-9	-14
9	7	$-10\frac{1}{2}$	—
$10\frac{1}{2}$	—	-12	-15
12	8		

218

6-2-59

INSTRUMENT CHECK

Time 10:30 A.M. ~~P.M.~~ Source Pu Be

	Channel A	B	C	D	E
Range	1000 CPR		10^{-10}	1000	900 V
Source Dist.	8"		15"	2"	45°
% F.S. Trip	85		100	85	100+

C.A. 29 92/8 Expr. 28 B-1 Run 1

Sheet ____ Date 6-2 1959 Time ____ A.M. P.M.

Purpose 28" X 28" X 37" – BARE

14" on EACH TABLE

LOADING CHANGE

Description 28" X 28" X 37" = 29,008 in^3

29,008 X 1.026 = 29,762 g

– 45 g for Rods

Mass before change ____ gmU 29,717 gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU ____ gmU-235

Sub Critical

Base – 28" X 28" = 784 in^2

784 X 1.026 = 804.38 g/in height

Counter #2 replaced by U^{233} fission Counter.

CRITICAL POSITIONS

C.P. 290 9/8 Exp. 28 B-1 Run 1

Shim T S

Pump Channel

A

B C

D

E

Tim Crit. AM PM Duration min.

C.P. 290 9/8 28 B-1 Run 2

Shim 6-2 of 9 Time 12:50 PM

Pump 28" X 28" X 37 1/4". — For Pos. Periods

Δρ/Δh Measurements

36 3/4" High = 29,717 − 201.1 = 29,516 g. U^235 — For Neg. Periods

37 1/4" High = 29,717 + 201.1 = 29,918 g. U^235

Did Not Level.

Measured Positive Period — Rods Out

Log N 137.9 Counters (1) (2) (3)

2A Periods ~~+50 Sec (7 ¢)~~

Run 2 B — Negative Period — Rods Out

log N

Periods 228.1 counters (1) (2) (3)

ters.

220

6-3-57

Δρ/Δh Measurements

28"X28" Bare BARE

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Pu

	Channel A	B	C	D	E
Range	1/1000	OPR	10^{-10}	10/1000	900V.
Source Dist.	8"	0"	15"	2"	1"
% F.S. Trip	85	OK	100	90	100+

Counters 1, 2 & 3 OK

Run 2-C - Achieved log N = .15 by use of paraffin (15"X12"X18").

8:40 AM Produced Neg. Period by removal above paraffin.

Neg. Period - log N — Counters ① ② ③

236.7 Sec [redacted]

10:00 AM D - Pos. Period - log N.

135.8 Sec.

10:50 AM E - Pos. Period - 137.9

12:30 PM F - Negative Period - 238.9

1:25 PM G - Negative Period - 228.1

2:30 H - Pos Period - 135.7

6-4-59

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source Ra Be

	Channel A	B	C	D	E
Range	10 / 1000	OFF	10 / ~~10~~ 10	10 / 100	900 V
Source Dist.	8"	0"	1/4"	2 1/2"	1"
% F.S. Trip	80	OK	100	95	100

Continuation of ΔP/ah measurements

		Counters ① ② ③
8:35 AM	Run 2 I - Negative Period - log N	243.2
9:45 AM	J - Pos. Period -	133.8
10:20 AM	K - Pos. Period -	132.5
11:00 AM	L - Negative Period -	244.3
12:45 PM	M - Negative Period -	242.2
2:00 PM	N - Positive Period -	135.8
2:30 PM	O - Positive Period -	132.5
3:10 PM	P - Negative Period -	244.4

6-5-59

INSTRUMENT CHECK

Time 8:25 AM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	OPR	10^{-10}	10/1000	900 V.
Source Dist.	7"	0"	15"	2"	1"
% F.S. Trip	80	o.k.	100	85	100 ?

Counters 1, 2, & 3 - o.k

Continuation of a/sh measurements

8:30 AM Run 2 Q - log N - Counters ① ② ③

Negative

9:50 AM 2R - Positive Period -

10:20 AM 2S - Positive Period -

11:15 AM 2T - Negative Period -

12:50 PM 2U - Negative Period -

3:40 PM 2V - Positive Period -

6-8-59

INSTRUMENT CHECK

Time 9:00 AM Source Pu Be

Channel	A	B	C	D	E
Range	1/100	OFF	10^{-10}	1/100	200 V.
Source Dist.	8"	0"	16"	3"	2"
% F.S. Trip	85	OK	100	90	100+

Countrates 1+2+3 OK

C.A. ____ Expt. 28B-2 Run 1

Sheet ____ Date 6-8 1959 Time 10:50 AM

Purpose Foil Traverse Stack - 28"x28"x37¼" - BARE

2% U235 Foils

Horizontal Traverse At Table Seperation

Pos. -12, -10½, -9, -7½, -6, -4½, -3, -1½, 0, 1½, 3, 4½, 6, 7½, 9, 10½, 12

No. B-18, B-17, B16, B15, B14, B13, B12, B11, B10, B-2, B-3, 4B, 5B, 6B, B7, B-8, B9

Slightly Sub CRITICAL ~~POSITIONS~~

C.A. 270 92/8 Expt. 28B-2 Run 1

Channel A

Rods out .02 - drifted down to .012

C

D

E

Run Out 11:18 10/60 AM PM Duration 20 min.

C.A. 27 9 2/8 Expr. 28B-2 Run 2

Sheet ____ Date 6-8-1959 Time 2:30 PM

Purpose 27 U 235 Foil Traverse at Table Depression (Horizontal)

Stock 28" x 28" x 37½" on movable table

Position -12, -9, -7½, -6, -4½, -3, -1½, 0, 1½, 3, 4½, 6, 7½, 9, 12

No. of Foil A-15, A-14, A-13, A-12, A-11, A-10, A-9, A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-8

CRITICAL POSITIONS

27 9 2/8 Expr 28B-2 Run 2

.01 909 T P

	Channel
A-12.64	A 57 1000/200
C-11.40	.021
D- = out	C 4.2 2X10⁻⁸
	D 38 1001/200
	E .5 690

Tim Crit. 2:48 28/60 PM Duration 20 min.

INSTRUMENT CHECK

6-9-59 8:45 — Pu Be

Range: 10/1000 OPR 10^{-10} 10/1000 900V

Source Dist.: 8" 0" 16" 2" 1.5"

% F.S. Trip: 85 OK 100 90 100

Counters 1, 2 & 3 OK

C.A. 2% 92/8 Expr. 28 B-1 Run 2

Sheet ____ Date 6-9-1959 Time 8:50 AM

Purpose: Δ P/Δ h Measurements

28" X 28" X 37¼" - Pos. Periods

28" X 28" X 36¾" - Neg. Periods

Time	Run	Period	Log N	COUNTERS (1)	(2)	(3)
8:50 AM	2 ~~8~~ W	Negative				
10:10 AM	~~R~~ X	Positive				
10:40 AM	~~S~~ Y	Positive				
11:25 AM	~~*~~ Z	Negative				
3:20 P.M.	2 A-1	Negative				
4:	B-1	Positive				

C.A. $2\%\ \frac{9z}{8}$ Expr. 28 B-2 Run 3

Sheet ___ Date 6-9 -9 Time 1:30 PM

Purpose 2% L235 Foil Traverse at table operation (Horizontal)

Pos. -12, -10½, -9, -7½, -6, -4½, -3, -1½, 0, +1½, 3, 4½, 6, 7½, 9, 10½, 12, 13½

No. B-18, B-17, B-16, B-15, B-14, B-13, B-12, B-11 B-1, B-2, B-3, B4 B5 B-6, B7, B-8, B-9 B-10

CRITICAL POSITIONS

$2\%\ \frac{9z}{8}$ Expr. 28 B-2 Run 3

.01 B 909

A 12.87	54	1000/200
C 11.22	.022	
D-out	C 5.0	2×10^{-8}
	D 36	1000/200
	E .5	690

1:51 20/60 PM Duration 20 min.

Measured stack

HEIGHT		WIDTH	
95.7 cm	95.6 cm	71.6 cm	71.6 cm
95.8	95.6	71.6	71.6
95.6	95.9	71.6	71.7
95.6	95.7	71.55	
95.7	95.7	Average	71.606 cm
95.7	95.8		28.19"

Average 95.704 cm = 37.679"

6-10-59

INSTRUMENT CHECK

Time 10:00 AM PM Source Pu Be

	A	B	C	D	E
Range	10/1000	OPR	10^{-10}	10/1000	900 V.
Source Dist.	8"	0"	15"	2"	1"
% F.S. Trip	85	OK	100	90	100 +

Counters 1, 2, 3 OK

$16\frac{1}{2}$, $12\frac{1}{2}$, $13\frac{1}{2}$
B-8, B-9, B-10

C.A 27 9 1/8 Expr 28 B-2 Run 4

Sheet Date 6-10-1959 Time 10:10 AM PM

Purpose Vertical Foil Traverse thru midplane 290 U 235 Foils

Stack - 28" x 28" x 37 1/2"

Pos. -16½", -15", -13½", -10½", -9", -7½", -4½", -3", -1½", 0 (center)

No. B-38, B-37, B-36, B-35, B-34, B-33, B-32, B-31, B-30, B-19

Pos. 16½", 15", 13½", 10½", 9", 7½", 4½", 3", 1½"

No. B-29, B-28, B-27, B-26, B-25, B-24, B-23, B-22, B-21

CRITICAL POSITIONS

C.A. 290 9 1/8 Expr 28 B-2 Run 4

Trial Pu .01 B-909 T R

		Channel
A - 17.10	64	1000/200
C - 17.24	.024	
D - out	C - 6.0 2X10	= 8
	D 43	1000/200
	E 1.0	750

Tim Crit. 10:25 25/60 AM PM Duration 20

C.A. 270 92/8 Expr. 28 B-2 Run 5

Sheet _____ Date 6-10 1959 Time 12:20 PM

Purpose Vertical Foil Traverse thru Midplane 270 h²³⁵ Foils

Pos. -16½, -15, -13½, -10½, -9, -7½, -4½, -3, -1½, 0

No. C-19, C-18, C-17, C-16 C-15, C-14, C-13, C-12, C-11, C-1

Pos. 16½ + 15, 13½, 10½, 9, 7½, 4½, 3, 1½

No. C-10, C-9, C-8, C-7, C-6, C-5, C-4, C-3, C-2

CRITICAL POSITIONS

270 92/8 Expr 28 B-2 Run 5

Date Run .81 B.908 T R

Control Rod	Channel	
A-17.15	A 58	1000/20.0
C-17.15	B ~~8.2~~ .022	
D-out	C 8.2	10⁻⁸/1000
	D 38	/200
	E 1.0	750 V

Time Crit. 12 26 25/60 AM PM Duration 20 min

2% 92/8 28 B-2 6

6-10-57 2:00 PM

Vertical Foil Traverse
at Midplane 2% U^{235} Foils

Pos.	-13½, -10½, -9, -7½, -4½, -3, -1½, 0(Center)
No.	C-34, C-33, C-32, C-31, C-30, C-29, C-28, C-20
Pos.	13½, 10½, 9, 7½, 4½, 3, 1½,
No.	C-27, C-26, C-25, C-24, C-23, C-22, C-21

CRITICAL POSITIONS

2% 92/8 28 B-2 6

+01 B. .909

A. 17.15 A 63 1000/200

C - 17.17 B .024

D. out C +.5 2X10⁻⁸

42 1000/200

.9 75-0 V-

2:13 92/60 Duration 20

230

6-11-59

INSTRUMENT CHECK

Time 11:00 ~~P.M.~~ AM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	OPR	10^{-10}	10/1000	900 V.
Source Dist.	9"	5"	10"	2"	1"
% F.S. Trip	90	OK	100	90	100 ↑

Scaler #1 – U^{238} Fission Chamber – 2" Below Center

Scaler #2 – U^{233} Fission Chamber – 2" In Back of Stack

Scaler #3 – U^{235} Fission Chamber – 2" Above Center

C.A. 2% 93/8 Expr. 28 B-3 Run 1

Sheet _____ Date 6-11- 1959 Time 11:20 AM PM

Purpose Fission Chamber – U^{238} + U^{235}

U^{235} Fast Fission Measurements.

Stack – 28" X 28" X 37.5"

U^{238} = #8-2

U^{235} = #5-3

Scaler #1 – Dis ~~45~~, Gain Fine 1 Course 16, Rise 0.8 MS

10 min – 9 +238

Scaler #3 – Disc ~~23~~, Gain Fine 1 Course 16, Rise 0.8 MS

10 min – 4322 +191

hog N = .035"

10

10 x

1

1

1

1

1

1

1

SB3, 181

C.A. 42 92/8 Expr. 28 8-3 Run 2

Sheet ____ Date 6-1-1959 Time 1:30 PM

Purpose U^{235} FAST FISSION MEASUREMENTS

Scaler #2 on 256
Scaler #3 on 16

Log N = .15

Cascaded from #3

	Scaler # 1 (X256)	Scaler #3 (X256X16)
10 min	$31^{+222} = 8,158$	$2309^{+13} + 0 = 9,457,872$
"	$32^{+40} = 8,232$	$2294^{+9} + 7 = 9,396,375$
"	$30^{+209} = 7,884$	$2278^{+13} + 10 = 9,330,906$
"	$31^{+243} = 8,179$	$2301^{+19} + 11 = 9,425,211$
"	$31^{+91} = 8,027$	$2331^{+64} + 13 = 9,548,800$
	#1/#3	
	86248	
	87608	Av. $.8584 \times 10^{-1}$
	84493	
	.86778	
	.840629	

SCALE INVESTIGATION for CASCADING

		Scaler #2 on Scale 9/16 + Scaler #3 on 256
10 min	29^{+208}	1103^{+6} (X16X256)
1 "	3^{+53}	114^{+2} "
1 "	3^{+4}	112^{+11} "
1 "	2^{+239}	226^{+195} (X256X16)
1 "	2^{+233}	224^{+130} "
1 "	2^{+234}	112^{+51} (X64X64)
1 "	3^{+78}	112^{+12} "
1 "	3^{+29}	112^{+13} "

232

6-12-59

INSTRUMENT CHECK

Time 8:20 AM

Source Pa Be

	Channel A	B	C	D	E
Range	10/1000	OFF	10^{10}	10/1000	900 V.
Source Dist.	9"	0"	16"	2"	1.5"
% F.S. Trip	85	OK	100	90	100 ↑

C.A. 29 92/8 Expr. 28 B-3 Run 3

Sheet ____ Date 6-12-1959 Time 8:40 AM

Purpose U^{235} FAST FISSION MEASUREMENTS

Log N = .14

	SCALER #1 (SCALE 256)	SCALER #2 (SCALE 64, CASCADED FROM SCALE #3, SCALE 64) [Reg. x 64 + Int] 64 + Int
10 Min	$29^{+230} = 7,654$	1117^{+63} + 63 = 4,579,327
	R = .0016714	
10 Min	$30^{+151} = 7,831$	1122^{+33} + 14 = 4,597,838
	R = .0017039	
10 Min	$29^{+137} = 7,541$	1122^{+9} + 15 = 4,596,303
	R = .001640 7	
10 Min	$29^{+113} = 7537$	1110^{+39} + 59 = 4,549,115
	R = 001658 68	
10 Min	$30^{67} = 7747$	1147^{20} + 1 467072
	R = .0016586	
	$30^{127} = 7807$	1167^{53} + 0 4858171
	R = .001607	

Log N = .14 Run 4 - U^{238} - #8-2 - on Scalr #3

U^{238} - #5-3 - on scalr #2, Cascaded from scalr #1

Chamber Positions the same - Chambers ~~Circuits~~

were exchanged in front of Pre Amplifiers.

	Scaler #2 (Scale 64, Cascaded From Scaler #1, Scale 64)	Scaler #3 (Scale 64)
10 Min	$1266^{+54} + 27 = 5,189,019$	$129^{+12} = 8268$
	$R = .0015933$	
	$1277^{+25} + 55 = 5233247$	$131^{+39} = 8423$
	$.0016098$	
	$1236^{+16} + 46 = 5063726$	$123^{+28} = 7903$
	$.0015601$	
	$1261^{+25} + 36 = 5166692$	$128^{+40} = 8232$
	$.0015933$	
	$1279^{+57} + 61 = 5242493$	$128^{+31} = 8223$
	$.0015685$	
	1216^{17} 10 4981854	$123^{55} = 7927$
	$.0015893$	

.15857

234

Run 5 - U^{238} #8-3 - on SCALER #3
U^{235} #5-3 - on SCALER #1 to #2

log N = .14

only change was changing chamber #8-3 for #8-2 log

	SCALER #2, SCALE 64 CASCADED from #1 on SCALE 64	SCALER #3 SCALE 64
10 Min Counts	1305^{+12} + 28 = 5,346,076	131^{+2} = 8,386
	R = .0015686	
	1285^{+63} + 18 = 526741	130^{+12} = 8335
	0015823 7	
	1300^{+37} + 42 = 5327488	133^{+57} = 8569
	0016084 5	
	1313^{+60} + 57 = 5381945	137^{+9} = 8777
	0016308 2	
	1276^{+15} + 56 = 5227512	133^{+63} = 8575
	0016403 5	
	1240^{+6} + 60 = 508274	125^{+28} = 8028
	0015794	

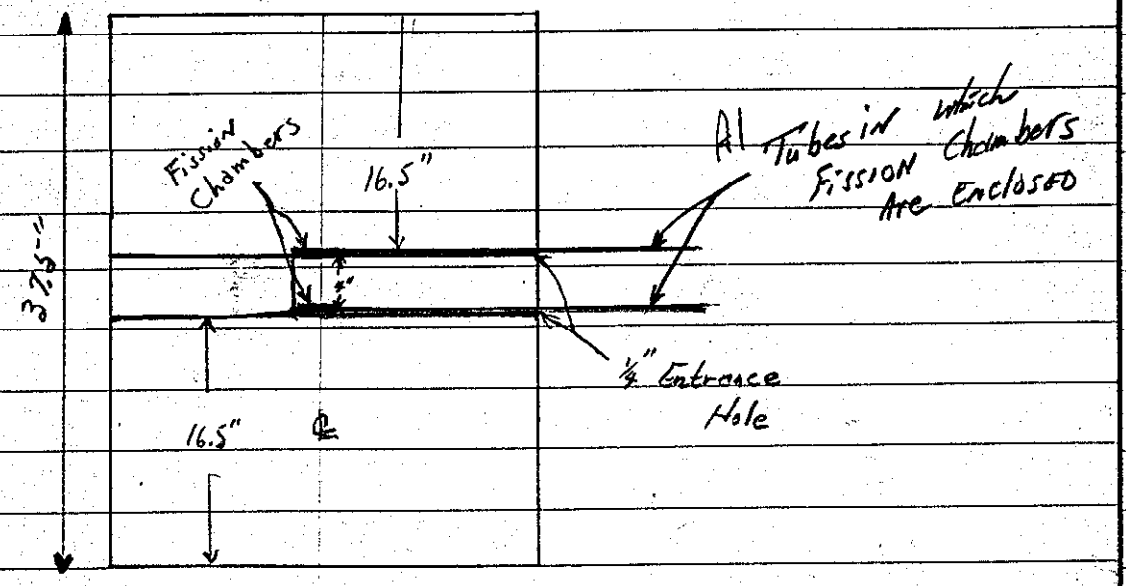
Av = .0016016 6

Run 6 – U^{238} #g-3 – on SCALER #1
U^{235} #5-3 – on SCALER #2 From #3

logN = .13 Exchanged Position of the 2 chambers by Changing in front of the Preamplifiers.

	SCALER #1 (SCALE 64)	SCALER #2, CASCADED from #3; SCALE 64 SCALE 64
10 Min Counts	$130^{+29} = 8,349$	$1178^{+24} + 54 = 4,826,678$
	$R = .001728$	
	$127^{+34} = 8,162$	$1160^{+53} + 12 = 4754764$
	$R = .0017166$	
	$128^{+17} - 8209$	$1166^{+5-} + 62 = 4776318$
	$R = .0017187$	
	$127^{+30} = 8,158$	$1157^{+54} + 34 - 4744269$
	.0017201	
	$126^{+40} = 8104$	$1137^{+53} + {}^{27}\ 4660571$
	.0017388 4	

Av = .0172465



236

6-15-59

INSTRUMENT CHECK

Time 10:05 AM PM

Source Bu Re

	Channel A	B	C	D	E
Range	10/1000	OPR	10	10/1000	900 V
Source Dist.	17"	0"	14"	3"	1/2"
% F.S. Trip	85	OK	100	85	100+

C.A. 290 9/8 Expr. 28B-2 Run 7

Sheet ____ Date 6-15 1959 Time 10:15 AM PM

Purpose Vertical Foil Traverse Thru Midplane 290 U^{235} + Dpl.

Pos Back 0", over +2"

Up 0", 4", 8", 12", 16"

Dpl. Dpl. #2, #3, #4, #5, #6

Pos. Back 0", over −2"

Up 0", 4", 8", 12", 16"

290 B-35, B-36, B-37, B-38, B-39

CRITICAL POSITIONS

C. A 290 9/8 Expr. 28 B-2 Run 7

Table .01 B-6075 R

	Channel	
A - 17.11	A 60	1000/500
C - 17.11	B .055	
D - out	C 9.7 2X10^{-8}	
	D 94	1000/200
	E 4.4	750

Tim Crit. 10 33 51/60 AM PM Duration 20 min.

Run #8 - Cd Fraction, Foils placed symetrical about Center of Reactor (~ 2" from Center)

BARE — Au (½" dia, 2 mil) H-5-9, In (7/16") H-23, U^{235} A-2

CD COVERED — " #63, " H-25, " A-1

½" dia, 5 mil metal

CRITICAL POSITIONS

C. A 290 9/8 Expr. 28 B-2 Run 8

Table .0 B-6079 R

	Channel	
I.A. 1503	A 52	1000/200
C. 15.37	B .02	
D. out	C 7.4 10^{-8}	1000/200
	D 35	
	E 1.4	750

Tim Crit. 1 48 48/60 AM PM Duration 20 min.

238

6-16-59

922,428

INSTRUMENT CHECK

Time 9:00 AM / PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	MR	10^{-10}	10/1000	900 V.
Source Dist.	8"	0"	16"	3"	1.5"
% F.S. Trip	85	OK	100	85	100+

C.A. 278 9278 Expr. 28 B-3 Run 7

Sheet ____ Date 6-16-1959 Time 10:45 AM / PM

Purpose U^{238} Fast Fission Measurement,

Log N = .0135

Au = .0015 3738

U^{238} #8-3 - on Scaler #1 - 2" Above Center.

U^{235} #5-1 - on Scaler #2, Cascaded from #3. 2" Below Center

Exchanged U^{235} #5-3 for U^{235} #5-1 in front of Pile Amp.

	Scaler #1 (Scale 64)	Scaler #2 (Scale 64, from #3, Scale 64)
10 Min.	$130^{+63} = 8,383$	$1327^{+39} + 24 = 5,437,912$
	R = .0015 4158	
"	$128^{+29} = 8,221$	$1321^{+44} + 14 = 5,413,646$
	R = .0015185	
"	$131^{+37} = 8,421$	$1304^{+15} + 61 = 5,342,205$
	R = .0015763	
"	$130^{+5} = 8,321$	$1312^{+57} + 56 = 5,377,656$
	R = .0015473	
"	$132 + 6 = 8,454$	$1327 + 35 + 60 = 5,437,692$
	R = .0015597	
	$124 + 14 = 7,950$	$1306 + 12 + 32 = 5,350,176$
	R = .0014837	

Log N = .135

Run 8 — U^{238} #8-3 — on Scaler #3 - 2" Below Center
U^{235} #5-1 — on Scaler #2, Cascaded from #1

Exchanged position of the 2 counters by changing in front of Pre amplifiers.

Scaler #2 (Scale 64, From Scaler #1, Scale 64) - Scaler #3

10 min 1300^{+53} $+32 = 5,328,224$ $120^{+41} = 7,721$

$R = .0014481$

" 1303^{+25} $+59 = 5,338,747$ $121^{+62} = 7,806$

$R = .0014621$

" 1306^{+63} $+29 = 5,353,437$ $120^{+18} = 7,698$

$R = .0014379$

" 1297^{+25} $+52 = 5,314,164$ $122^{+20} = 7,828$

$R = .0014730$

" 1278^{+25} $+38 = 5,236,326$ $121^{+14} = 7,758$

$R = .0014816$

" 1280^{+35} $+2 = 5,245,122$ $119^{+7} = 7,623$

$R = .0014533$

Average $R = .0014589$

Down @ 3:42 pm (for HP Info.)

240

6-17-59

INSTRUMENT CHECK

Time 8.35 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	OPR	10	10/1000	900V.
Source Dist.	7"	0"	16"	3"	1.5"
% F.S. Trip	80	OK	100	85	900

$\log N = .14$

Run #9

U^{238} #8-2 - On Scaler #3. 2" Below Center

U^{235} #5-1 - On Scaler #2 Cascaded from #1

Exchanged U^{238} #8-3 for U^{238} #8-2 in front of Beam

Scaler #2 (Scale 64 Cascaded from #1 Scale 64) Scaler #3

18 min. 1276^{+44} $+33 = 5,229,345$ $119^{+2} = 7,618$

$R = .0014568$

1270^{+45} $+54 = 5,204,854$ $117^{+13} = 7,501$

$R = .0014416$

1282^{+8} $+46 = 5,251,630$ $120^{+52} = 7,732$

$R = .0014723$

1280^{+18} $+47 = 5,244,079$ $119^{+38} = 7,634$

$R = .0014595$

1265^{+6} $+6 = 5,181,830$ $116^{+3} = 7,427$

$R = .0014333$

1263^{+33} $18 = 5,175,368$ $114^{+3} = 7,299$

$R = .0014103$

$Av = .0014456$

$\log N = .145$

Run 10 - U^{238} #8-2, 2" Above Center - On Scaler #1

U^{235} #5-1, 2" Below Center - on Scaler #2 from #3

Exchanged positions of the 2 chamber by changing in front of the pre amplifiers.

	Scaler #1 (Scale 64)	Scaler #2 (Scale 64 connected from #3, on Scale 64)
10 min.	$122^{+36} = 7,844$	$1269^{+30} \quad +34 = 5,201,078$
	$R = .0015081$	
	$120^{+35} = 7,735$	$1259^{+38} \quad +24 = 5,159,320$
	$R = .0014992$	
	$120^{+32} = 7,712$	$1273^{+36} \quad +32 = 5,216,800$
	$R = .0014783$	
	$120^{+39} = 7,719$	$1270^{+35} \quad +31 = 5,204,191$
	$R = .0014832$	
	$120^{+23} = 7,703.$	$1251^{+9} \quad +43 = 5,124,715$
	$R = .0015031$	
	$120^{+48} = 7,728$	$1268^{+44} \quad +20 = 5,196,564$
	$R = .0014871$	

$Av = .0014931$

242

6-18-59

INSTRUMENT CHECK

Time 2:25 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10 / 1000	opr	10^{-10}	10 / 1000	900 V
Source Dist.	8"	0"	15"	2"	.5"
% F.S. Trip	85	o/k	100	90	100

Counters o/k

C.A. 2½ 9⅞ Expr. 28B-4 Run 1

Sheet ____ Date 6-18- 1959 Time 2:50 AM PM

Purpose Bottom Reflection Evaluation.

Stack - 28" X 28" X 36¾"

Placed same amount of al strainers on top of stack as there are on bottom and steel plate 4' X 4' X ¾" center above stack on the al,

Achived power by plexiglas reflector.

T Negation Period.

#2 1075/Δn_2 = 1551 on

#3 1080/Δn_2 = 1558

Log N 1075/Δn_2 = 1551

C.A. 270 93/8 Expr. 28B-4 Run 2

Sheet _____ Date 6-18 1959 Time 3:30 ~~AM~~ PM

Purpose Same as Run 1

Removed Al + Steel from top.

Stack - Same

achieved power by use of parafin + plexiglass reflector. Negative period.

on
d
ck

244

6/22/59

INSTRUMENT CHECK

Time 1:00 ~~AM~~ PM Source Pu-Be

	Channel A	B	C	D	E
Range	1"/1000	gm	1-1"	1"/100	200 V
~~Source Dist.~~	8"		19"	2.5"	0"
% F.S. Trip	95	OK	100	90	100

C.A. 296 92/8 Expr. 28 B-5 Run 1

Sheet ____ Date 6-22 1959 Time 1:30 ~~AM~~ PM

Purpose Evaluation -5 Control Blade Guide Tubes

28x28 x 37

C.A. ____ Expr. 28 B-5 Run 2

Sheet ____ Date 6-22 1959 Time 3:15 ~~AM~~ PM

Purpose 28 x 28 x 36 3/4

6/23/59

INSTRUMENT

Time 9:45 AM PM

Pu Be

	A		C	D
	10/1000	gm	10^{-10}	10/1000 900 V
Source D.	~~8~~ 8"		14"	25" 0"
% F.S. Trip	80 C	OK	100	90 105

C.A. 27. 92/8 Expr. 28 B-6 Run 1

Sheet ____ Da 6-23 1959 Time 10 AM PM

Purpose 34 x 34 x 25 1/2" Ap/a h

Measurements

C.A. 290 92/8 Expr. 28 B-6 Run 2

Sheet ____ Da 6-23 1959 Time 11:20 AM PM

Purp. 34" X 34" X 26 3/4"

H

A' 26 3/4 ~65 sec period 13.6 ¢ A'' 86.88 per ~11 ¢

B' 26 1/2 348 per 4.2 ¢ 6.8

17.8 6.8 4.2

9.4 26

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	1%/1000	opr	15%	1%/1000	900
Source Dist.	4"	OK	12"	5"	0
% F.S. Trip	80		100	90	100

C.A. I 92/8 Expr. 28B-6 Run 3

Sheet ____ Date 6/24 1959 Time 8:40 AM ~~PM~~

Purpose ~~34 x 34 x 26 1/2 → 96 3/4~~

ΔP/ΔH

Run	H	II 1	II 2	II 3	Log N
A	26 3/4				164.5
B	26 1/2				- 157.4
C	26 1/2				- 157.4
D	26 3/4				+ 156.3
E	26 3/4				+ 153.4
F	26 1/2				- 159.1
G	26 1/2				- 158.5
H1	26 3/4				

6/25/59

INSTRUMENT CHECK

Time 8:30 Source Pu Be

	Channel B	C	D	E
	10/1000 opr	10	10/1000	900v
Source D	7" OK	14"	1.5"	0"
% F.S. Trip	90	100	95	100

Run	H	Ⅱ 1	Ⅱ 2	Ⅱ 3	Log N
I	26 3/4				
J 9:40	26 1/2				

For Run 1, 2, 3 Fixed tabl. 18 x 30 x 26.5
Movable " 16 x 34 x 26.5

C.A. 2 9/8 Expr. 28 B-7 Run 1
Sheet ____ Date 6/25 1959 Time 1:30 ~~AM~~ PM
Purpose Fixed Table 18 x 32 x 26 3/4
Movable " 16 x 32 x 26 3/4

Tables at .19 ~ 13.6 ¢ apiece

LOADING CHANGE

Description Removed 1/2" Fuel From Top of Assembly

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU ____ gmU-235

248

Run	Time	Height	#1	#2	#3	L.y N
A	1:45	26¼				+149.3
B	2:30	26				−150.4
C	3:05	26				−141.1
D	4:00	26¼				+149.8

6/26/59

INSTRUMENT CHECK

Time 8:10 AM Source Pu Be

	Channel A	B	C	D	E
Range	1/1000	opr	10	1/1000	900
Source Dist.	2"		12"	20"	0"
% F.S. Trip	80	OK	100	90	100

E	8:30	26¼			+144.5
F	9:10	26			−152.5
G	10:55	26			−154.7
H	12:30	26¼			+143.3
I	1:05	26¼			+143.3
J	2:15	26			−155.2
K		26			−154.7
L		26¼			+143.8

INSTRUMENT CHECK

6-29-59 8:30 — Pu Be

	Channel A	B	C
Voltage	14/1000 OPR. 10^{-10}		10/1000 900V.
Source Dist.	9"	0"	15" 3" 1½"
% F.S. Trip	85	O.K.	100 95 100

C.A. 20 92/8 (32X74) Expr. 29 B-7 Run 2

Sheet ____ Date 6-29-1959 Time 8:45 AM PM

Purpose Δρ/Δk Measurements

Stack — 32" X 34" X 26¼" - For Pos. Periods
32" X 34" X 26" - For Neg. Periods

(Three Rod Holes
2 on stationary
1 on movable)

Time	Run	Height	Log N	#1	#2	#3
8:45 AM	M	26¼"	+141.1			
10:15 AM	N	26"	- 157.4			
11:20 AM	O	26"	- 153.6 +141.1			
1:05 PM	P	26¼"	+142.2			
1:40 PM	Q	26¼"	+141.1			
2:20 PM	R	26"	- 154.7			
3:00 PM	S	26"	- 154.2			
3:45 PM	T	26¼"	+144.5			

250

6/30/59

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/100		15 10	1/100	900
Source Dist.	10"		18"	2"	0"
% F.S. Trip	80		100	90	100

C.A. 2 9/8 Expr. 28 B-7 Run 3

Sheet _____ Date 6-30-1959 Time 8:30 AM ~~PM~~

Purpose Δρ/ρ

Stock = Same

Time	Run	Height	Log N	~~I~~ 1	~~I~~ 2	~~I~~ 3
8:30 AM	U	26 1/4	+ 145.5			
9:30 AM	V	26 "	- 154.2			
10:10 AM	W	26 "	- 153.1			
11:10 AM	X	26 1/4 "	+ 146.5			
12:05 PM	Y	26 1/4 "	+ 146.6			
1:40 PM	Z	26 "	- 150.9			
2:20 PM	A_1	26 "	- 150.9			
3:15 PM	A_2	26 1/4 "	+ 149.8			

INSTRUMENT CHECK

Time ~~AM~~ ~~PM~~ Source

	Channel A	B	C	D	E
Range	10 / 1000		10 ×10	1 / 1000	900 V
Source Dist.	8"		14"	3"	½"
% F.S. Trip	90		100	85	100 +

C.A. 20,092/8 ~~32X34~~ ~~28B7~~ Run 4

Shee ... Time 8:55 ~~PM~~ AM

Purp. Horizontal Foil Traverse

20,092/8 235

CRITICAL POSITIONS

C.A. 20,092/8 ~~32X34~~ ~~28B7~~ Run ~~4~~ 1

.01 B-9098

Control Rod

Channel		
~~A~~	72	1000/100
C ~ 17.80	.02	
	7.01	10 - 8
D	62	100/1000
E	1.0	750

Time Crit 9:12 3/60 AM PM Duration 20 min.

Pos.	0	2	4	6	8	10	12	14	-2	-4	-6	-8	-10	-12
No.	C-38	11	19	4	26	3	21	33	37	29	32	10	25	22

C.A. 2% $\frac{9_2}{8}$ Expr 28 B-7 Run 5

Sheet Date 7-1 1959 Time 10 35 AM PM

Purpose Horizontal Foil Traversal
2% U^{235} Foils

CRITICAL POSITIONS

C.A. 2% $\frac{9_2}{8}$ Expr ~~28 B-7~~ 32x34 Run ~~5~~ 2

Table Pos. .01 B 9100

Control Rod	Channel
	A 40 $\frac{1000}{200}$
C - 19.91	B .02
	C 5.5 10^{-8}
	D 94 $\frac{1000}{100}$
	E 1:0 950

Tim Crit. 10 50 8/60 AM PM Duration 20 min.

Pos.	+ 0	1½	3	4½	6	7½	9	10½	12
No.	C-23	C-7	C-24	C-9	C-34	C-28	C-30	C-5	C-31

Pos.	- 1½"	-3"	-4½"	-6"	-7½"	-9"	-10½"	-12"
No.	C-36	C-40	C-18	C-43	C-12	C-20	C-14	C-13

C.A. 270 28B-7 Run 6

She 95 Time 2:20 PM

Purp Horizontal Traverse

2% 4^23° Foils

CRITICAL POSITIONS

C.A. 270 ~~3.8 3.4~~ 32 x 34 Run ~~6~~ 3

.01 B. .9895

Channel

1 C = 17.97 A 42 1000/200

2 .02

3 2.5 10^{-8}

4 D 97 1000/100

E 1.0 250 V.

Tim Crit 1:29 15/60 PM Duration 20 min.

Pos	+0	1.5	3	4.5	6	7.5	9	10.5	12
No.	C17	C-35	C-1	C-41	C-42	C-46	C-16	C-45	C-27
Pos.	-1.5"	-3"	-4.5"	-6"	-7.5"	-9"	-10.5"	-12"	
No.	~~B-14~~ C-2	C-15	C-6	C-8	C-44	B-23	B-10	B-14	

INSTRUMENT CHECK

7-2-59 Time 8:40 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	$\frac{12}{1000}$	OPR	10^{-10}	$\frac{10}{1000}$	900 V.
Source Dist.	8"	0"	13"	2"	.5"
% F.S. Trip	9%	OK	100	95	100+

Counters 1, 2, +3 OK

Vertical Foil Traverse thru Center 2% U^{235} Foils

Pos.	0	1½"	3"	4½"	6"	7½"	9"	10½", 12
No.	B-11	B-40	B-12	B-28	B-30	B-16	B-9	B-13 B-5
Pos.	−1½"	−3	−4½	−6	−7½	−9"	−10½,	−12
No.	B-34	B-20	B-3	B-36	B-2	B-7	B-32,	B-22

CRITICAL POSITIONS

2% $\frac{9z}{8}$ Exp ~~28B-7~~ 32X34 Run 9 4

.01 - B-910

Control Rod Channel

C - 18.79 A 42 $\frac{1000}{200}$

.02

$5.6\ 10^{-8}$

D 34 $\frac{1000}{200}$

E 1.0 750

Tim Crit. 9:05 AM PM Duration 20 min

C.A. 2% 92/8 Expr. 32x34 Run 5"

Sheet ____ Date 7-2 1959 Time ____ AM ~~PM~~

Purpose Vertical Foil Traverse thru center 2% U^{235} Foils

Foils Pos. 0", 1½", 3, 4½, 6, 7½, 9, 10½, 12

12 No. B-6, B-34, B-29, B-31, B-25, B-38, B-18, B-33, B-41

B-5 Pos. -1½", -3", -4½", -6," -7½", -9," -10½", -12"

12 No. B-8, B-26, B-37, B-17, B-21, B-4, B-24, B-35

3-22

CRITICAL POSITIONS

2% 92/8 Expr. 32x34 Run 5

Pos. .01 B .911

Channel

C 18.89 A 3.74 1000/100

B .02

C 5.6 10^{-8}

D 32 1000/200

E 1.0 75=0 V.

Pen Crit. 11:04 12/60 AM PM Duration 20 min.

256

C.A. 2% 9 7/8 Expr. 32 X 34 Run 6

Sheet _____ Date 7-2-1959 Time 1:07 ~~AM~~ PM

Purpose VERTICAL FOIL TRAVERSE

2% 4235 FOILS

Pos. 0, 1½", 3", 4½", 6", 7½", 9", 10½", 12"

No. A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-8, B-27

Pos. -1½", -3", -4½", -6", -7½", -9", -10½", -12"

No. A-9, A-10, A-11, A-12, A-13, A-14, A-15, B-42

CRITICAL POSITIONS

CA 2% 9 7/8 Expr 32 X 34 R 6

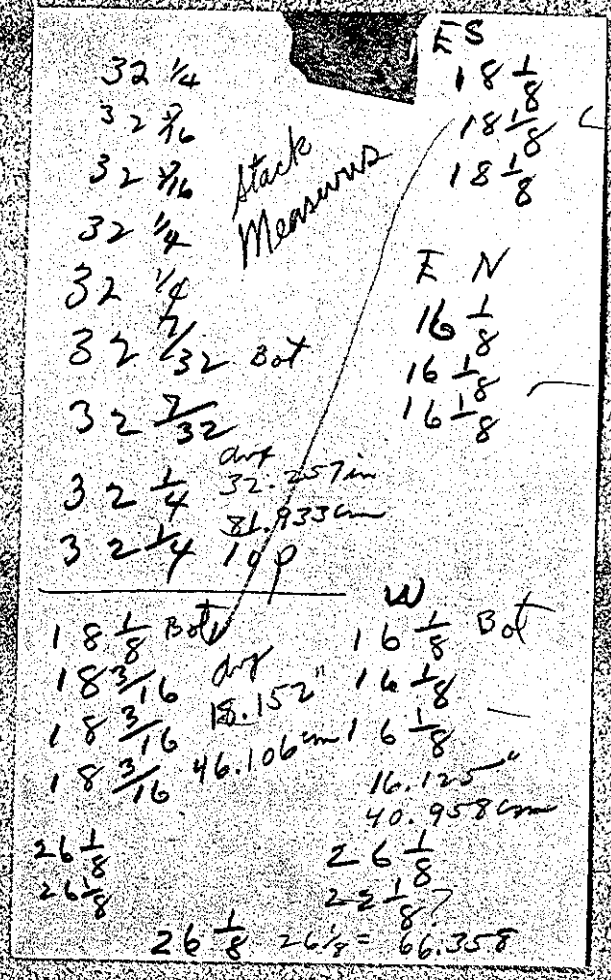
Table Pos. 1

Control Rod Channel

C 19.92

A	75	1000/100	(Erratic)
B	.02		
C	5.6	10^{-8}	
D	34	1000/200	
E	1.0	750 V.	

Tim Crit. 1:20 40/60 ~~AM~~ PM Duration 20 min.



Stack Measurements

32 1/4
32 7/16
32 7/16
32 1/4
32 1/4
32 1/32 Bot
32 1/32
32 1/4 Avg 32.257in
32 1/4 81.933cm
32 1/4 Top

18 1/8 Bot
18 3/16 Avg
18 3/16 46.152" 46.106cm
18 3/16

26 1/8
26 1/8
26 1/8 26 1/8 = 66.358

E S
18 1/8
18 1/8
18 1/8

E N
16 1/8
16 1/8
16 1/8

W
16 1/8 Bot
16 1/8
16 1/8
16.125"
40.958cm
26 1/8
22 1/8?

7-13-59

INSTRUMENT CHECK

Time 9:00 AM PM

Source Pu Be

	A	B	C	D	E
Range	1/1000	opr.	10^{10}	10/1000	900 V.
Source Dist.	9"	0"	14"	3"	½"
% F.S. Trip	85	OK	100	90	Lo+
Counter					

C.A. 270 92/8 32 X 34 Run 7

Shee 7-13-59 Time 9:10 AM PM

Purpose Evaluate Bottom REFLECTION.

Stack — 32"X34"X26" Bore

Reached log N reading of .18 by using paraffin + plastic reflectors, Removed some + measured negative period.

Run 8 — Stacked 5 layers of Al extrusions on top of stack and placed 4'X4'X¾" steel plate on this al centered above the block stack.

Measured positive period.

258

7/14/89

INSTRUMENT CHECK

Time 11:00 AM PM Source Pu Be

Channel

	A	B	C	D	E
Range	10 / 1000	Opr	10	10 / 1000	900 V.
Source Dist.	9"	0"	15"	3"	½"
% F.S. Trip	85		100	80	100

C.A. 29.92/8 Expr. 32X34 Run 9

Sheet ____ Date 7-14-1989 Time 10:15 AM PM

Purpose Control and Safety Rods and guide sleeve evaluation.

Stock - 32" X 34" X 26"

Removed al ejtrusion and steel plate from top. Removed control + safety sleeves 3 sleeves + 4 rods 2 on stack 1 on Monitor restacked solid stock 32" X 34" X 26".

Measured positive period. 1 min Counts - 10

Run 10

12:50 PM Repeat of Run 9.

Measured positive period - 30 Sec Counts

7-15-59

INSTRUMENT CHECK

Time 1:[illegible] ~~AM~~ PM

Source

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/1000	900 V
Source Dist.	8"	9"	14"	2"	½"
% F.S. Trip	90	OK	100	90	100+

C.A. 270 9/8 Exp 32 X 34 Run 11

Sheet [illegible] Da 7-15 ss 59 me 1:50 ~~AM~~ PM

Purpose Fission Chamber - U^{238} + U^{235} Fast Fission Measurements

Stack 32" X 34" X 26½"

Log N = .14

top of stack on Monday

U^{238} #8-2 on Scaler # 1 - 2" Below Center

U^{235} #5-1 on Scaler #2 Cascaded from #3, 2" above Center

all scaler on scale 64. Settings same as p. 230.

To - 10 min

	Scaler #1	Scaler # 2	#3
	106 +21 = 6,805	1311 + 47	+19 5,372,583
		R = .0012663	
using ~30" leads	102 +62 = 6,598	1295 + 13	+52 5,305,204
		R = .0012436	
from Chambers	98 +42 = 6314	1241 + 55	+12 5,086,668
to pre amps		R = .0012412	
	99 +21 = 6,357	1226 + 42	+40 5,029,424
		R = .0012652	
	97 +14 = 6,222	1227 + 51	+1 = 5,029,057
		.0012372	
	97 +31 = 6,239	1226 +52	+21 = 5,025,045
		.0012415	

260

7-15-59

Run 12 Chambers positions the Same - Chambers were exchanged in front of Pre Amplifiers. U^{238} counter gave ~ 1 register/min. (Scale 64)

7-16-49

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source Pu Be

Chamber	A	B	C	D	E
Range	10/1000	off	10	10/1000	900 V.
Source Dist.	8"	0"	1¼"	3"	½"
% E.S. Trip	85	~~0~~	100	85	100 *

Run 13 U^{238} #8-3 on Scaler #1 - 2" Below center

U^{235} #5-1 on scaler #2 Cascaded from #3, 2" above center

On Scalers on Scale 64

10 min

Scaler #1	Scaler #2	#3
$121^{+26} = 7,770$	1485^{+24}	$1 = 6084097$

$R = .0012771$

Changed lead (about 1 ft longer) from #8-3 to pre amp. Count rate down ~ 30%.

Run 14 Same counter + scaler set up as Run 13.

* Two leads of low attenuation made up ~8" in length now used from Chambers to pre amps.

10 min Scaler #1 Scaler #2

117 +56 = 7544 1539 +31 +31 = 6,305,759

R = .0011963

117 +36 = 7,524 1534 +4 +33 = 6,283,553

R = .0011974

118 +8 = 7,560 1465 +21 +19 = 6,002,003

R = .0012595

A 1 mil volt signal was fed simultaneously into the pre amps & the 3 counters and gains were adjusted to give the same output with all discrimanators set at 15.

	Gain Fine	Gain Coarse	Rise Time	Disc.
#1	.64	8	0.8 μs	15
#2	.965	8	0.8 μs	15
#3	.64	16	0.8 μs	15

INSTRUMENT CHECK

7-17-59

Time 8:20 AM PM

Source Ra Be (#227)

	Channel A	B	C	D	E
Range	10/1000	3per	10^{-10}	10/1000	___
Source Dist.	8"	0"	14"	3"	½"
~~o~~ F.S. Trip	85	ok	100	90	100+

Counters

Log N = .1357 Log

Run 15. U^{238} #8-3 - On Scaler #1 - 2" Below Center

U^{235} #5-13 - On Scaler #2 Cascaded from #3. 2" above Cent.

10 Min	Scaler #1	Scaler #2	#3
	$115^{+29} = 7,389$	1339^{+51}	$+43 = 5,487,851$
	$R = .0013464$		
	$113^{+0} = 7,232$	1286^{+23}	$+29 = 5,268,957$
	$R = .0013725$		
	$112^{+53} = 7,221$	1278^{+1}	$+6 = 5,234,758$
	$R = .0013794$		
	$114^{+44} = 7,340$	1301^{+9}	$+0 = 5,329,472$
	$R = .0013772$		
	$112^{+43} = 7,211$	1308^{+10}	$+41 = 5,358,249$
	$R = .0013457$		
	$117^{+13} = 7,501$	1301^{+5}	$+22 = 5,329,238$
	~~$R = .0014075$~~		
	$R = .0014075$		

$\alpha N. = .0013714$

Run 16 Exchanged leads to the 2 counter in front of the pre amps.

U^{238} #8-3 - on Scaler #3 - 2" Below center

1=.135 Log N = .15 U^{235} #5-1 - on Scaler #2, Cascaded from #1 - 2" Above Center

	Scaler #2	#1	Scaler #3
10 Min.	1402^{+63}	$+15 = 5,746,639$	$141^{+18} = 9,042$
	$R = .001573$		
2" Above Cent.	1422^{+54}	$+18 = 5,827,986$	$142^{+37} = 9,147$
	$R = .0015694$		
87,851	1387^{+52}	$+18 = 5,684,498$	$140^{+34} = 8,994$
	$R = .0015821$		
957	1371^{+44}	$+43 = 5,618,475$	$138^{+45} = 8,877$
	$R = .0015799$		
758	1359^{+60}	$+50 = 5,570,354$	$137^{+42} = 8,810$
	$R = .0015815$		
472	1348^{+17}	$+58 = 5,522,574$	$136^{+28} = 8732$
	$R = .0015811$		
249	$\bar{w} = .0015778$		
238			

Log N = .13

Run 17
12:40 PM

Exchanged physical position of the 2 Chambers.
U^{238} #8-3 - on Scaler #3 - 2" above center
U^{235} #5-1 - on Scaler #2, cascaded from #1 - 2" Below Center

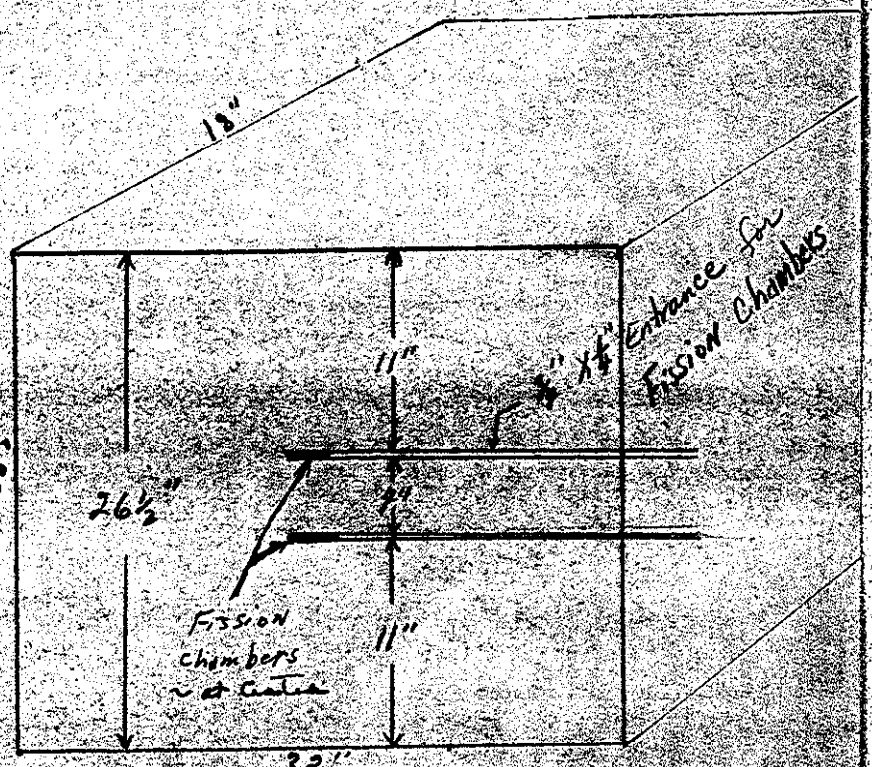
	Scaler #2	#1	Scaler #3	
10 Min	1368^{+21}	$+46 = 5,604,718$	151^{+9}	$= 9673$
		$R = .0017258$		
	1330^{+54}	$+37 = 5,451,173$	145^{+56}	$= 9,336$
		$R = .0017126$		
	1307^{+49}	$+24 = 5,356,632$	146^{+23}	$= 9,367$
		$R = .0017486$		
	1305^{+28}	$+40 = 5,347,112$	148^{+57}	$= 9,529$
		$R = .0017820$		
	1284^{+28}	$+15 = 5,261,071$	145^{+6}	$= 9,286$
		$R = .0017650$		
	1254^{+6}	$+31 = 5,136,799$	142^{+38}	$= 9,126$
		$R = .0017765$		

$$Av = .0017517$$

Run 18
3:45 PM

Log N = .135
Run for (Ellis) counter checks.

(Ignore Data from p. 259 – 264)



STATIONARY TABLE INTERFACE

STACK - 34" X 32" X 26½"

13

10,

Center

INSTRUMENT CHECK

7-20-59	Time 1:45 ~~AM~~ PM	Source Pu Be				
		Channel	A	B	D	C	E
Run 19	Range		14 / 1000	OPR	10 / 1000	-10 / 10	900V
	Source Dist.		9"	0"	3"	1K"	1"
Fast Fission Measurements	% F.S. Trip		85	OK	80	100	100+

Counters recalibrated - New gain and discrimination settings. Counter #1 — Gain 16 x 1 - Disc 36 (R346-.845)
#3 - Gain 16 x 1 - Disc 30

Log N = .13
Rod A = 18.46
Rod C = 17.4

U^{238} #8-3 - 2" above center — On Scaler #1

U^{235} #5-1 - 2" Below Center — On Scaler #2 Cascaded from #3.

	Scaler #1	Scaler #2
10 min	505^{+13} (scale 16) = 8,093	1394^{+35} = 5,712,064
	R = .0014168	
	$125^{+26} \times 64$ = 8,026	1359^{+19} = 5,567,680
	R = .0014415	
	117^{+56} = 7,544	1327^{+27} = 5,437,120
	R = .0013874	
	123^{+39} = 7,911	1357^{+34} = 5,560,448
	R = .0014227	
	125^{+28} = 8,028	1357^{+53} = 5,561,664
	K = .0014434	

Δr = .0014223

266

7-21-59

INSTRUMENT CHECK

Time 8:20 AM PM Source P

	Channel A	B	C	D	E
	10/1000	0pm	10	10/1000	900V
Source D	9"	6"	14"	3"	½"
% F.S. Trip	80	OK	100	85	100

(Switched ~~from 8, preamps~~)

Run 20

Log N = .14
Rod A = 18.46
C = 17.5

Exchanged leads from Counters to pre amps.
U^{235} #5-1 – 2" Below Center – On Scaler # 2 Cascaded from #1
U^{238} #8-3 – 2" above Center – on Scaler # 3

	Scaler # 2	Scaler # 3	Ratio #8-3 / #5-1
10 min. counts	$1417^{+24} = 5,805,568$	$129^{+42} = 8,298$	.0014293
	$1442^{+18} = 5,907,584$	$131^{+9} = 8,393$	.0014207
	$1430^{+25} = 5,858,880$	$128^{+30} = 8,222$	.0014033
	$1424^{+39} = 5,935,200$	$131^{+2} = 8,386$	.0014371
	$1417^{+19} = 5,805,248$	$129^{+48} = 8,304$	.0014304
			Av = .0014241

Run 21

Changed U^{238} Counters – #8-2 for #8-3,
U^{235} #5-1 – 2" Below Center – on Scaler #2 Cascaded from #1
U^{238} #8-2 – 2" Above Center – on scaler # 3

	Scaler # 2	Scaler # 3	Ratio #8-2 / #5-1
10 Min Counts	$1255^{+30} = 5,142,400$	$111^{+24} = 7,128$	.0013861
	$1380^{+11} = 5,653,184$	$121^{+34} = 7,778$	.0013759
	$1343^{+44} = 5,503,744$	$121^{+58} = 7,802$	.0014176
	$1352^{+22} = 5,539,200$	$123^{+49} = 7,921$	.0014299
	$1380^{+49} = 5,655,616$	$122^{+43} = 7,851$	.0013881
			Av = .0013995

all Scalers on Scale 64

Run 22 Exchanged leads from Centers & pre amps.

U^{238} #8-2 – 2" Above Center – on Scaler #1

Run #= .125 U^{235} #5-1 – 2" Below Center – on Scaler #2, Cascaded from #3

	Scaler #1	Scaler #2	RATIO #8-2 / #5-1
10 min	$111^{+21} = 7,125$	$1245^{+12} = 5,100,288$	.0013968
Counts	$113^{+30} = 7,262$	$1257^{+57} = 5,152,320$	.0014094
	$115^{+2} = 7,362$	$1247^{+28} = 5,109,504$	.0014421
	$112^{+5} = 7,173$	$1221^{+13} = 5,002,048$	.0014340
	$112^{+5} = 7,173$	$1216^{+45} = 4,983,616$	.0014393

Av = .00142 43

Run 23 Exchanged U^{235} #5-3 for U^{235} # 5-1.

U^{238} # 8-2 – 2" Above Center – on Scaler #1

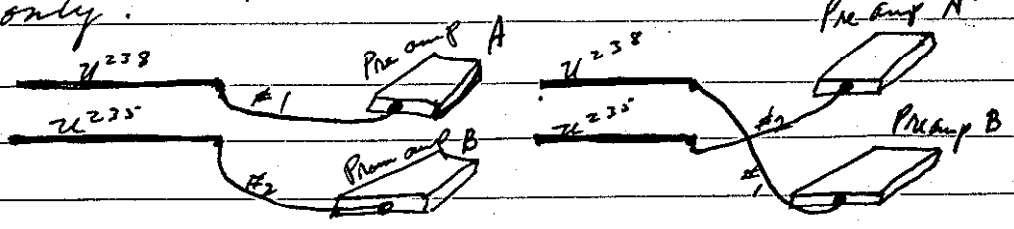
U^{235} # 5-3 – 2" Below Center – on Scaler #2, Cascaded from #3

	Scaler #1	Scaler #2	RATIO #8-2 / #5-3
10 min	$114^{+0} = 7,296$	$1124^{+18} = 4,605,056$	.0015843
Counts	$118^{+23} = 7,575$	$1124^{+39} = 4,606,400$	.0016444
	$118^{+40} = 7,592$	$1142^{+32} = 4,679,680$	.0016223
	$114^{+20} = 7,316$	$1136^{+30} = 4,654,976$	.0015716
	$116^{+24} = 7,448$	$1127^{+46} = 4,619,136$	.0016124

Av = .0016070

● Exchanging leads – meaning to change from one pre amp to the other, one end of the lead only.

Example



7-22-59

INSTRUMENT CHECK

Time 8:25 AM Source RaBe

	Channel A	B	C	D	E
Range	10/1000 oper		10^{-10}	10/1000	900 V.
Source Dist.	10"	0"	14"	3"	½"
% F.S. Trip	85	OK	100	90	100 T

all Scalers on Scale 64

Run 24

Log N = .13
Rod A = 18.46
C = 17.4

Fast Fission Measurements.
Exchanged leads in front of pre amps.
U^{235} #5-3 – 2" Below Center – On Scaler #2, Cascaded from #1
U^{238} #8-2 – 2" Above Center – on scaler #3

	Scaler #2	Scaler #3	RATIO $\frac{\#8-2}{\#5-3}$
10 Min Counts	1194^{+9} = 4,891,200	117^{+24} = 7,512	.0015358
	1181^{+62} = 4,841,344	116^{+5} = 7,429	.0015344
	1183^{+13} = 4,846,400	115^{+21} = 7,381	.0015229
	1174^{+51} = 4,811,196	116^{+31} = 7,455	.0015495
	1181^{+57} = 4,841,024	116^{+39} = 7,463	.0015416
			AV = .0015368

Run 25
10:20 AM

Exchanged U^{238} #8-3 for #8-2.
U^{235} #5-3 – 2" Below center – On Scaler #2, Cascaded from #1
U^{238} #8-3 – 2" Above Center – On Scaler #3.

	Scaler #2	Scaler #3	RATIO $\frac{\#8-3}{\#5-3}$
	1191^{+50} = 4,840,576	120^{+55} = 7,735	.0015979
	1161^{+5} = 4,755,776	115^{+51} = 7,411	.0015583
	1177^{+59} = 4,824,768	115^{+50} = 7,410	.0015358
	1193^{+22} = 4,887,936	120^{+12} = 7,693	.0015738
	1192^{+46} = 4,885,376	120^{+42} = 7,722	.0015806
			AV = .0015692

Run 26 Exchanged leads in front of pre amps.

12:40 PM U^{238} #8-3 – 2" Above Center – On Scaler #1

Long N = .1135 U^{235} #5-3 – 2" Below Center – On Scaler #2, Cascaded from #3

Rod A = 18.46

Rod C = 17.

10 min counts

	Scaler #1	Scaler #2	Ratio $\frac{\#8\text{-}3}{\#5\text{-}3}$
	$116^{+19} = 7,443$	$1114^{+44} = 4,565,760$	.0016301
	$115^{+62} = 7,422$	$1110^{+55} = 4,550,080$	.0016311
	$117^{+59} = 7,547$	$1117^{+50} = 4,578,432$	.0016498
	$116^{+12} = 7,436$	$1114^{+9} = 4,563,520$	.0016294
	$115^{+25} = 7,385$	$1117^{+33} = 4,577,344$	.0016133

Av. = .0016307

7-22-59

C.A. 290 92/8 Expr. 32X34 B Run 1

Sheer Date 7-22 1959 Time 2:35 PM

Purpose Horizontal Traverse near Center
U^{238} + U^{235} Foils

Pos. -6 -3 0 +3 +6 Up 1"

U^{235} A-15 A-12 A-1 A-7 A-8

Pos -6 -3 0 +3 +6 Down 1"

U^{238} Dep. *-6 *-5 *-2 *-3 4

CRITICAL POSITIONS

290 92/8 Expr 32X34 B Run 1

T-0 B-8.0

A - 17.51 42.5 1000/500

C - 16.535 .05

8.0 C 2X10 -8

D 77 1000/200

E 10 6.90

Tim Crit. 2:47 27/60 AM PM Duration 20 min.

7-23-59

INSTRUMENT CHECK

Time 3:15 ~~AM~~ PM Source r (10 mg)

	Channel A	B	C	D	E
Range	10/1000	Off	10	100/1000	900 V
Source Dist.	5"	0"	22"	0"	9"
% F.S. Trip	70	OK	100	65	100

C.A. 290 92/8 3 2 X 3 X B Run 2

Sheet ~~No~~ 7-23-59 Time 3:30 PM

Purpose U^{238} Fission Counter Traverse

U^{238} #8-3 — 2" Above center - on Scaler #1

U^{233} — 2" on back of stack - on Scaler #2

U^{238} #8-2 — 2" Below center - on Scaler #3

U^{238} counters mounted on rod drive (east to west)

Selsyn = 0.65 - Counter Probe Tip 4" from east side

Selsyn	Scaler #1	Scaler #2	Scaler #3
0.65"	$108^{+31} \times 64$	$2732^{+182} \times 256$	$107^{+52} \times 64$
12.64"	$179^{+40} \times 64$	$2791^{+177} \times 256$	$184^{+42} \times 64$
24.64"	$53^{+15} \times 64$	$2786^{+129} \times 256$	$53^{+33} \times 64$

1"

x 1"

Log N = .21

Rod A = 18.+

Rod C = 17.+

272

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source ~~Pu Be~~ Y

Channel	A	B	C	D	E
Range	10/1000	opr	10	10/1000	900 V
Source Dist.	1.5"	3"	0"	12"	
% F.S. Trip	70	100	50	100	

7-24-59

Run 3

Log N = .21

Rod A = 18.00

Rod C = 16.+

U^{238} Fission Counter Traverse

Counters same as on previous run (Page 271)

Delays = 0.665" - Probe Tip + 1/16" in from east side.

Time	Delays (Center to Center)	Scaler #1 (x256)	scaler #2 (x256)	Scaler #3 (x256)
9:04 AM	0.665"	5.8 26^{+55} = 6,711 (99198 / 12176)	2642^{+169} = 676,521 (96739)	25^{+146} = 6,546
	2.655"	7.8 32^{+211} = 8,403	2685^{+169} = 690,089 (11834)	31^{+231} = 8,167
10 min Counts	4.650"	9.8 37^{+109} = 9,581 (13901)	2692^{+57} = 689,209	36^{+116} = 9,332
	6.650"	11.8 40^{+10} = 10,250 (15306)	2615^{+193} = ~~516,033~~ 669633	39^{+65} = 10,049
	8.650"	13.8 43^{+17} = 11,025 (16405)	2625^{+50} = 672,050	42^{+47} = 10,799
	10.650"	15.8 43^{+19} = 11,027 (16333)	2637^{+39} = 675,111	42^{+91} = 10,843
	11.160"	16.3 43^{+76} = 11,084 (16,572)	2612^{+158} = 668,830	41^{+246} = 10,742
10:22 AM	11.650"	16.8 43^{+63} = 11,071 (16,168)	2674^{+182} = 684,726	43^{+185} = 11,193
	13.655"	18.8 42^{+101} = 10,852 (16015)	2646^{+237} = 677,613	40^{+216} = 10,456
	15.650"	20.8 39^{+163} = 10,147 (14683)	2699^{+87} = 691,031	38^{+99} = 9,827
	17.650"	22.8 35^{+203} = 9,163 (13181)	2712^{+243} = 694,515	35^{+123} = 9,083
	19.650"	24.8 31^{+4} = 7,940 (11281)	2749^{+67} = 703,811	30^{+67} = 7,747
	21.650"	26.8 24^{+193} = 6,337 (8862)	2793^{+17} = 715,028	24^{+100} = 6,244

assuming center of Counter is 1.75" from end of probe.

C1/C2

Run 4 Repeat of Run 3. (all scalers on 25-6)

Time	Selsyn	Scaler #1	Scaler #2	Scaler #3
1:12 PM	0.640"	$25^{+249} = 6,649$	$2654^{+53} = 679,477$	$26^{+86} = 6,742$
	2.660"	$32^{+153} = 8,345$	$2621^{+105} = 671,081$	$31^{+205} = 8,141$
10 min Counts	4.650"	$34^{+65} = 8,769$	$2454^{+5} = 628,229$	$33^{+89} = 8,537$
	6.650"	$37^{+37} = 9,509$ ~~8,537~~	$2420^{+223} = 619,743$	$36^{+108} = 9,324$
	8.655"	$38^{+179} = 9,907$ ~~9,324~~	$2387^{+29} = 611,101$	$37^{+19} = 9,491$
271)	9.655"	$40^{+9} = 10,249$	$2446^{+172} = 626,348$	$39^{+59} = 10,043$
6e.	10.670"	$39^{+178} = 10,162$	$2391^{+14} = 612,112$	$38^{+173} = 9,901$
3(x256)	11.655"	$38^{+123} = 9,851$	$2394^{+67} = 612,931$	$37^{+231} = 9,703$
: 6,546	12.650"	$37^{+203} = 9,675$	$2377^{+1} = 608,513$	$37^{+112} = 9,584$
8,167	13.650"	$39^{+207} = 10,191$	$2505^{+248} = 641,528$	$38^{+252} = 9,980$
1,332	15.650"	$37^{+118} = 9,590$	$2537^{+32} = 649,504$	$37^{+81} = 9,553$
0,049	17.655"	$34^{+41} = 8,745$	$2550^{+106} = 652,906$	$33^{+4} = 8,452$
0,799	19.665"	$29^{+164} = 7,588$	$2636^{+151} = 674,967$	$29^{+47} = 7,471$
1,843	21.650"	$23^{+18} = 5,906$	$2647^{+162} = 677,794$	$22^{+165} = 5,797$
10,742				
11,193				
0,456				
9,827				
083				
747				
9,244				

274

7-27-59

INSTRUMENT CHECK

Time ~~2:20~~ ~~AM~~ PM Source X

Channel

	A	B	D	E
Range	$\frac{10}{1000}$	OVR 10^{-10}	$\frac{10}{1000}$	900 V
Source Dist.	1"	0"	1.5"	0"	9"
% F.S. Trip	70	OK	100	60	100+

C.A. $290\frac{92}{8}$ Expr. 30-C Run 1

Shr 7-27 1959 Time $3\frac{10}{}$ ~~AM~~ PM

Purp Critical Height measurement

30"X30"X30.5"

Restacked without any rods. 30"X30"X30.5"
Measured positive period ~ 125 Sec.
Did not level. Log V reached .09

16" on Moveable Table
14" on Stationary Table.

7-28-59

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Bi Be

	Channel A	B	C	D	E
Range	1%/1000	opr	15"	1%/1000	900 V
Source Dist.	8"	0"	16"	2"	0"
% F.S. Trip	85	OK	100	80	100 ×

Int. Trip No chart Response

C.A 2% 9/8 30-C Run 2

Sha 7-28-59 Time 8:30 AM ~~PM~~

Purp Critical Height Measurements

30" X 30" X 30.5" — For Positive Periods

~~30" X 30" X 30.5" — For Negative Periods~~

Run ~~2~~A - Positive Period - Log N

			Counters 1	2	3
8:40 AM	2A	"			
9:05 AM	2B	"	—		
9:25 AM	2C	"	—		

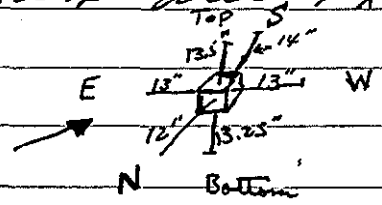
C.A. 27₀ 92/8 Expr. 30-C Run 3

Sheet ____ Date 7-28-1959 Time 2:25 AM PM

Purpose Particle size Studies.

Stack - 30" X 30" X 30 3/4"

Stacked assembly - 30" X 30" X 30 3/4" with 4" X 4" X 4" void at ~ center.



Void

Achieved log N reading .17 by use of parafin & plexiglas reflector.

Removed and measured negative period.

Log N = counters

1 2 3

7-29-59

INSTRUMENT CHECK

Time 8:20 AM PM Source Ra Be

	Channel A	B	C	D	E
Range	~~10/10000~~	~~off~~	10	1/1000	900V.
Source Dist.	13"	0"	13"	3"	½"
% F.S. Trip	85	OK		85	100+
Counter	1, 2 & 3 OK				

Stack = 30"x30"x30¾" with void 4"x4"x4"

Run 3 B Partial Size Studies,

8:40 AM Neg. Period Log N - Counters 1 2 3

C. Filled Void with Block A-4 #213, Wt = 4.715 gms
Removed ¼" Layer from top of Stack - 30"X30"X30.5"
~ 400 Sec Period.

D. Replaced ¼" layer - Stack - 30"X30"X30¾",
Measured Pos. Period - Log N, Counters 1 2 3

E. Repeat of D. " —

F. Removed A-4 #213, Neg. Period -

12:40 PM G. Removed 12" X 14" X ¼" Feed from South East Corner. (Top)
Neg Period - Log N 1 2 3

H. 100+ mesh Block 4"X4"X4" in Void.
Pos Period. Log N 1 2 3

I. Repeat of H.

Run 3 J Removed 100+ Mesh Block
1:50 PM Neg Period - Log N 1 2 3

K Repeat of J. -

L. -325 Mesh Block ¼"X¼"X¼" in Void
Pos. Period log N 1 2 3

M Repeat of L.

N. Removed -325 mesh block
Neg Period -

7-30-59

X -325 Mesh block in void
Pos. Period -

Y Repeat of X -

Z Void -

INSTRUMENT CHECK

7-30-59 8:30 —

Source Pu Be

Channel

A	B	C	D	E
10/1000	oper	10^{-10}	10/1000	900 V.
9"	0"	14"	5"	½"
% F.S. Trip	90	OK	100	85	100+

Counters 1, 2 + 3 OK

Run 30 Particle size Studies. Void 4"x4"x4" at center

Negative Period - Log N 1 2 3

P A-4 #213 in void.

Bos Period —

Q Repeat of P —

R Void - [Log N to .5] —

Ch. A+D out of Scrom.

S Repeat of R —

12:25 PM T +100 med Block in Void

U Repeat of T —

V Void

Neg. Period —

2:15 PM W Repeat of V —

280

7-31-59

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source γ

	Channel A	B	C	D	E
Range	10/100	Opr	10	10/100	900V
Source Dist.	8"		15"	3"	6"
% F.S. Tap	70	OK	10>	90	10>

C.A 2% 9 3/8 Expr 30-C Run 4

Sheet _____ Date 7-31 1959 Time 8:35 AM ~~PM~~

Purpose Be O Reactivity Measurement

Stack - 30" X 30" X 30 3/4"

Void .3" X 3" X 4" at ~ Center of Reactor achieved log N reading of . By using paraffin + plexiglas reflector. Measured Neg Period.

4A log N / Counters 2 3

B Placed two - 2" dia X 1" Thick (106 gms) disc of Be O in Void -

Neg Period -

C.A. $290\frac{9z}{8}$ 30-C 4-C

Sheet 7-31-59 1:15 AM

Purpose Copper foil Exposure for D.W. Magnuson

Stack -30"X30"X30 3/4"

CRITICAL POSITIONS

C.A $290\frac{9z}{8}$ Expr 30-C Run 4-C

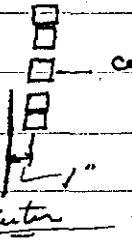
Table F .01 L T R

		Channel
1 A - out	7.0	1000/500
2 C - out	.1	
3 D - out	6.0	4×10^{-11}
4	D 6.0	1000/500
	E 1.0	650 V.

Tim Crit. 1:37 AM PM Duration 20 min.

5 gms)

5 - Cu Foil 1"X1"X.01" (??)



Vertical center

282

8-3-59

INSTRUMENT CHECK

Time 11:25 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000 opr		10	10/1000	900 V.
Source Dist.	8"	0"	15"	3"	1"
% F.S. Trip	85	OK	100	90	100

C.A. 290 92/8 Expr. 30-C Run 5

Sheet Date 8-3 1959 Time 12:35 ~~AM~~ PM

Purpose [redacted] C/Sh Measurements

14" on Stationary - 2 rod guide sleeves

16" on Moveable - 1 rod guide sleeve.

30"X30"X30 1/2 - for neg. Periods

30"X30"X30 3/4 - for Pos periods.

Run 5A Neg. Period hog N , Counters 2 3

B Pos " - Too Slow

Removed 1 guide sleeve from Stationary Table.

8-4-59

INSTRUMENT CHECK

Src. Ra Be
8 on E

	A	B	C	D	E
	10/1000	off	10^{-10}	10/1000	900 V.
Source Dist.	8"		15"	3"	7"
% F.S. Trip	90		100	90	100
Counters					

Δ P/Δt Measurements - Counters

			Log N	1	2	3
Run 5	C	Neg Period -	351.9			
	D	Pos Period -	127.6			
	E	Repeat D -	127.1			
11:00 AM	F.	Neg Period -	369.2			
	G.	Repeat of F -	377.9			
	H.	Pos. Period -	126.0			
	I.	Repeat of H -	124.9			
	J.	Neg. Period -	380.1			
2:50 PM	K	Repeat of J. -	393.1			
	L	Pos. Period	126			

284

8-5-59

INSTRUMENT CHECK

Time 8:20 AM PM Source Sr 90

	Channel A	B	C	D	E
Range	10/1000	0pr	10-1.0	10/1000	900V
Source Dist.	8"	0"	16"	25"	1.5"
% F.S.	90	01C	100	90	100+

Counters 1, 2 + 3

Δ C/ch Measurements

			Counters 1	2	3
Run 5	M	Neg. Period, Log N			
		401.8			
	N	Pos. Period,	121.6		
	O	Repeat of N,	120.5		
10:55 AM	P	Neg. Period,	400.2		
	Q	Repeat of P,	391.5		
	R	Positive Period	123.8		
1:45 PM	S	Repeat of R —	120.5		
	T	Neg. Period —	402.9		
	U	Repeat of T —	401.8		
	V	Pos. Period —	123.8		

8-6-59

INSTRUMENT CHECK

Pu Be

Time 8:25 AM ~~PM~~

	Cha A	B	C	D	E
Range	10/1000	one	10^{-10}	10/1000	900 V
Source-Dist.	10"		16"	2"	½"
% F.S. Tap	90		100	90	100+

Counters 1, 2 & 3

a/a h Measurements

		Counters 1	2	3
Run 5 W	Positive Period – Log N			
X	Neg. Period –			
Y	Repeat of X –			
12:25 PM Z	Pos. Period –			

C.A. 2% 9 2/8 Expr. 30 C Run 6

Sheet _____ Date 8-6- 1959 Time 1:30 AM PM

Purpose $U^{235} + U^{238}$ Foil Comparison

2% U^{235} Foils + Depleted foils

Position (up)	U^{235} (1" West of Center)	U^{235} (1" East of Center)
-4	A-11	Dpl - 5
-2	A-13	-4
0	A-1	-1
2	A-7	-2
4	A-14	-3

CRITICAL POSITIONS

2% 9 2/8 Expr. 30-C Run 6

Time For _____ 01 L _____ T _____ R _____

	Control Rod	Channel
A	14.51	40 1000/500
		05 -11
C		2.74X10 1000
D		80 200
E		1.0 690

Time Crit. 1:42 30/60 AM PM Duration 20 min.

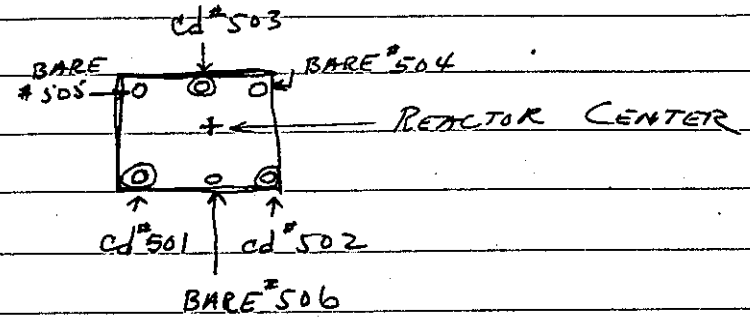
C.A. 2% 97/8 Expt. 30-C Run 7

Shaft ____ Date 8-6-1958 Time 3:30 PM

Purpose Gold Foil Exposure

5 Mil Au Foils

Cd Covers of 40 Mils



EXPOSED at Log N = .1 for 30 mins.

288

8-7-59

INSTRUMENT CHECK

Time 8:50 AM ~~PM~~ Source Pu Be

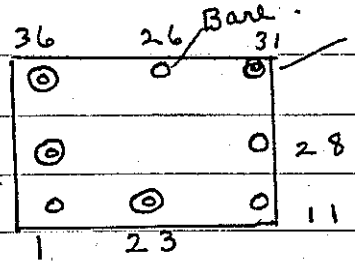
	Channel A	B	C	D	E
Range	10/1000 opr		10	10/1000	900 V.
Source Dist.	8"		18"	2"	½"
% F.S. Trip	95		100	80	100

Counters 1, 2 + 3

C.A. 290 92/8 Expr. 30-C Run 8

Sheet ____ Date 8-7 1959 Time 9:05 AM ~~PM~~

Purpose In dium Foil Exposure
20 mil Covers



CRITICAL POSITIONS

C.A. 290 92/8 Expr. 30-C Run 8

Scale Pos. 01 L T P

Control Rod	Channel	
1 A ~~19~~ 13.98	A 42	1000/500
2	B .05	
3	C 3.0 4 X 10⁻¹¹	1000
4	D 90	200
	E 3.0	750

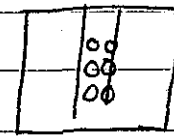
9:19 20 min.

C.A. 270 92/8 Expr 30-C Run 9

Sheet Date 8-7-1959 Time 12:30 ~~AM~~ PM

Purp. U-Al alloy Jail Exposure
20 mil Cd Covers.
10 wt percent U in Al.

0 - A 6 Bare
0 - A 4 Cd. Covered
+2 - A 3 Cd. Covered
+2 - A 5 Bare
-2 - A 1 Cd. Covered
-2 - A 2 Bare



CRITICAL POSITIONS

C.A. 270 92/8 Expr 30-C Run 9

Table No. 01

	Elem	Chan
A	11.81	42 1080 500
B		05
C		3.0 4 X 10 -11
D	88	1000 200
E	2.5	750

Tim Crit. 12:48 40/60 ~~AM~~ PM Duration 20 min.

27% HX 195 Pulse Neutron work in South wing

Approach to critical 30 x 30

1)	16 on Fixed	28" high	4 Log N -	6×10^{-13}
	14 on Movable	29" high	3 Log N -	7×10^{-13}
			IC 2 -	.05
2)	16 on Fixed	29" high	4 Log N -	8.5×10^{-13}
	14 on Movable	29" high	3 Log N -	1×10^{-12}
			IC 2 -	.07
			BF_3 -	63 x 16 + 2
3)	16	30	4 Log N	1.3×10^{-12}
	14	29	3 Log N	2×10^{-12}
			IC 2	.13
			BF_3	118 x 14 + 11
4)	16	30	4 Log N	6×10^{-12}
	14	30	3 Log N	9×10^{-12}
			IC 2	5.5 3×10^{-12}
			BF_3	449 x 16
5)	16	30 1/4		
	14	30 1/4		

5) Supercritical : 30 1/4" high T=+152 sec 4.5×10^{-4}

6) 30 x 30 x 30 with 1/4 on 18x18 of top centered
T = +259 2.8×10^{-4}

7) 30 x 30 x 30 with 1/4 on ~~16 x 16~~ movable 4x16 Fixed 6x18 of top 172 in^2
T = +675 1.17×10^{-4}

8) 30x30x30 w. 1/4" x ~~8 x 8~~ 12 x 10
Slightly supercrit

9) 30 x 30 x 30 w 1/4 x 10 x 10 Slightly Subcrit
T : -5750

Repeat T = ∞

56 approaches 15 sec pulsing

3/17/61

Pulsing at Critical with 28 HX 195

30 x 30 x 30 + 10 x 10 x 1/4 antenday

3/23/61

Pulsing at Critical with 28 HX - 195

30 x 30 x 30 + 10 x 10 x 1/4