BOOK71R

Notes:
"2% - Bk #3 H/X - 195, 404 & 500 59-60" on front
"Bk 3" on front
"Book #3" on front
"2%" on front

"#3" on spine
"2% - Bk #3 H/X = 195 404 501 59-60" on spine (please note front reads 500 and spine reads 501)
"2%" on spine

Blank pages: 5, 154, 160-162, 180, inside back cover sheets

-1 sheet taped to inside cover, 1 sheet tucked under first one
-pages 55/56 and 137/138 has a paperclip at top of each page
-page 166 have 2 graph sheet attached
-pages 203 and 204 have 1 long thin sheet stapled each
-pages 203 thru 208 are paper clipped together
-pages 207 and 246 have 1 thin sheet taped each
-page 244 has 1 graph sheet attached
-page 245 has 2 thin sheets taped

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

E-11

Weight of Numbers of White Blocks
Beryllium Oxide

1A	371.50	(2)
1B	375	(4)
2A	373.50	(4)
2B	371	√(1)
3A	373	(3)
3B	372	(2)
4A	372.50	(3)
4B	370.5	√(1)

150, 200 AND 300 PAGES

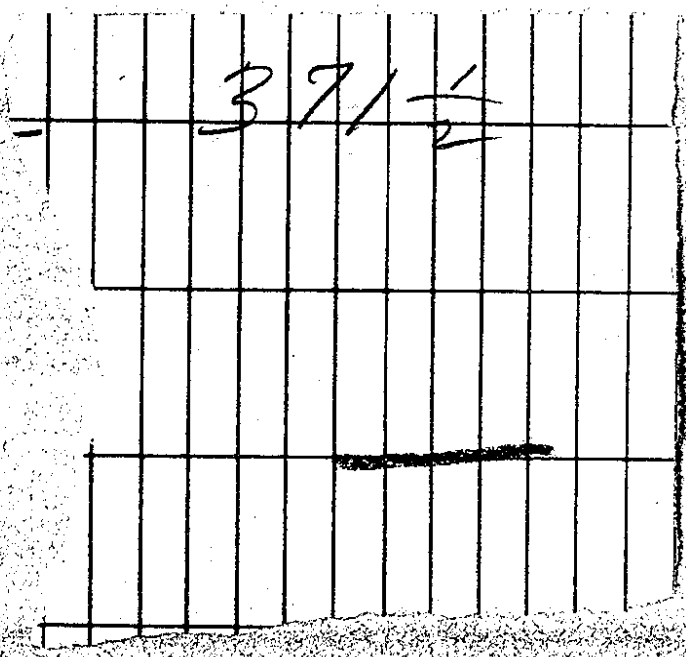
E IN THE U. S. A.

1A - 3B

1B - 2A

2B - 4B

3A - 4A


3 7 1 4

Small fission Counters

Center of Counter $1\frac{7}{16}$" to $1\frac{9}{16}$"

from end of probe.

#x = 404

H-X	Size	Page
404	24" Cylinder	6
"	44" "	9
"	60" "	15
"	52" Parallelepiped	18
"	44" "	22
"	36" "	23
"	28" "	25
"	26" "	27
"	✓ 24"X28" " (24X28)	28
"	✓ 24" "	29
"	✓ 20"X24" "	58
"	✓ 20"X22" "	78
"	19"X22" "	95
"	✓ 18"X24" "	97
"	20"X24" "	114
"	24"X24" "	120
195	30"X30"	147
~500		163
195	30"X30"	170

4

$\frac{H}{X} = 500$ p. 163

6

8-11-59

McCARTY
MIHALCZO
LYNN

INSTRUM.:	Pu Be.	—	—
Time 9.40 AM PM			
	10/100 opr.	10^{-10}	1/1000 Hood
	9"	18"	2" 1/2"
	95	100	90 100

Counters 1243

C.A. 290 84.8/15.2 Expr. 24C-1 Run 1

Sheet _____ Date 8-11 1959 9.40 AM PM

Purpose 24" Cylinder - Bare
Height 32"

LOADING CHANGE

Description 452 in^2 Base
.7256 g/in^3
327.97 g/in. Height
327.97 X 32 = 10,495 gms.

Mass $A-x$ — 46.44
Mass $A-4s$ — 42.26 gmU — 42 gms. for Rods gmU-235
Mass of Sleeve 4.18 g/4" for Rods gmU gmU-235
Total Mass gmU 10,463 gmU-235

Sub Critical

8-11-59
Run #2

LOADING CHANGE

34" High

Description Added 2"
327.97 x 2 = 655.94

Mass before change gmU 10,463 gmU-235
Mass of Change gmU 655.94 gmU-235
Total Mass gmU 11,118.94 gmU-235

Sub-critical

Run #3

LOADING CHANGE

35" High

Description Added 1"

Mass before change gmU 11,118.94 gmU-235
Mass of Change gmU 327.97 gmU-235
Total Mass gmU 11,446.91 gmU-235

CRITICAL POSITIONS

C.A. 290 84.8 / 15.2 Expr. 24 C-1 Run 3
Table Pos. 0-1 14-5 R

24" Bore (Diamter)
35" High
2.45 ± Excess

Control Rod	Channel
A - out	A 53 100/1000
C - 17.63	B .05
	C 3.8
	D 57 100/500
	E 2.7 900

Time Critl. 11:30 AM/PM Duration 24 min.

Rod ___ on 4.95 ± 2 sec period = 2.45 ± ___ ø/in.
Lexview Rd. 4 OA Sensitivity

8
8-11-59
Run #4

24" Dia. Bore

LOADING CHANGE

35.25" High

Description Added: 1/4" Layer

Mass before change gmU 11,446.91 gmU-235
Mass of Change gmU 81.25 gmU-235
Total Mass gmU 11,528.16 gmU-235

CRITICAL POSITIONS

C.A. 29 8K.8 / 15.2 Expr. 24C-1 Run 4

Table Pos. .01 11.41

Control Rod — Chan. #

1A - 20.25 — A 65 — 1000/100
2C - 18.48 — B .08
3 — C 5.2
4 — D 66 — 1000/100
E 1.0 — 800

Tim Crit 1:18 AM

Rod @ on 115 sec period = 8.85" Total Excess
Levelee Rd. @ Sensitivity 10 #/in.

2.45" = .3828
6.40

.3828 X 81 = 31 gms.

11,447
- 31
11,416 gms Critical Mass

35.00"
+ .38
35.38"

35.25" - 8.85 #
35" - 2.45
6.40 # / 1/4" in Height

1/4 X .3828 = .095

35.000"
- .095"
34.905" Critical Height

8-12-59

9

INSTRUMENT CHECK

Time 9:25 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"	12"	2"	½"
% F.S. Trip	85	0⅛	100	90	100+

Counters 1, 2 & 3

C.A. 29.0 84.8/15.2 Expr. 44C-1 Run 1

Sheet ____ Date 8-12 1959 Time 10:00 AM ~~PM~~

Purpose 44" Cylinder
16" High

1504 in² Base

LOADING CHANGE

Description		
1504 X .7256 = 1091.3 g/in. Height.		
1091.3 x 16 = 17,460.8 gms.		
	-87.8 gms for Rods	
	17,373.0 gms.	
Mass before change	gmU	gmU 235
Mass of Change	gmU	gmU 235
Total Mass	gmU	gmU 235

CRITICAL POSITIONS

C.A. 29.0 84.8/15.2 Expr. 44C-1 Run 1

Rods Out .611 In ____ Rod Pos. ____

Control Rod	Channel	
A - 20.25	A	37 100/150
C - 9.35	B	.0017
	C	5.2 10-12
	D	61 10/500
	E	.2 900

Time Crit. 10:15 AM ~~PM~~ Duration 8 min.

Limit Limited on Rod C Moved back 4".

1.0

8-12-59

(15.75" High)

Run 2

LOADING CHANGE

Description Removed 1" Layer from 1 quadrant

Mass before change gmU 17,373 gmU-235

Mass of Change gmU 273 gmU-235

gmU 17,199 gmU-235

Sub Critical

Run #3

LOADING CHANGE

Description Added: 1/4" layer to 1 quadrant

(15.8125" High)

Mass before change gmU 17,199 gmU-235

Mass of Change gmU 68 gmU-235

Total Mass gmU 17,267 gmU-235

CRITICAL POSITIONS

C.A. $\frac{270}{15.2}$ $\frac{84.8}{}$ Expr. 44C-1 Run 3

Table Pos. .01 B 8175 R

	Control Rod	Channel
A	.01	.50 $\frac{100}{100}$
C	8.06	.0022
3		C 7.0 10^{-12}
4		D 66 $\frac{100}{100}$
		E .2 900

Firm Crit. 11:23 AM ~~PM~~ Duration 6 min.

8-12-59
Run # 4

LOADING CHANGE

Description Removed $\frac{1}{4}$" layer from 1 octant
(15.78125" High)

Mass before change ____ gmU 17,267 gmU-235
Mass of Change ____ gmU - 34 gmU-235
Total Mass ____ gmU 17,233 gmU-235

CRITICAL POSITIONS

270 $\frac{84.8}{15.2}$ Expr 44 C-1 Run 4
.01 8180 P

	Channel	
A - .01 (out)	55	1000/200
C - 5.72	05	
	C 7.0	
	D 40	1000/250
	E 1.1	750

Trim Crit. 1:14 Duration 21 min.

Rod C @ out on 124.9 sec period = 8.2 ϕ Total Excess
Leveled Rd. C @ 5.72 Sensitivity ____ ϕ/in.

$\frac{8.2}{6.6} = 1.24242$

$\frac{6.6}{8.2} = .8048$

.8048
x 34 x 1.24242
27.3 gms.
42.2

Inserted Rod C to 8.06 (Previous Level, Run 3)
measured Negative period.

17,233
- 27
17206 gms
17,191 gms
Critical mass

Rod C 8.06 on 236.7 sec period = -6.6 ϕ
Leveled Rd. C @ 5.72 Sensitivity ____ ϕ/in.

6.6 ϕ = 1 octant ¼" thick

16.75" + (¼ x ¼) - (⅛ x ¼)$\left(\frac{8.2}{6.6}\right)$ = 15.774" Critical Height
- ⅛ x ¼ = 15.743

12

8-13-59

INSTRUMENT CHECK

Time 9:10 ~~PM~~ AM Source 8

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	opr	10^{-10}	$\frac{10}{1000}$	900V
Source Dist.	1.5"	0"	4"	0"	9"
% F.S. Trip	70	01C	100	50	100+

C.A. 270 $\frac{84.8}{16.2}$ Expr. 44C-2 Run 1

Sheet _____ Date 8-13- 1959 Time _____ AM ~~PM~~

Purpose 44" Dia Cylinder
11" High
Partially Reflected
1504 in² Bare

LOADING CHANGE

Description 1504 X .7256 = 1091.3
1091.3 X 11 = 12,004.3
24" on Fixed Table
20" on Movable Table

Mass before change	gmU	12,004 gmU-235
Mass of Change		- 87 gmU-235
Total Mass	gmU	11,917 gmU-235

System has 6" Reflector except top of movable table.

Sub Critical

Run #2 System has 6" Reflector Complete.

Sub Critical

Run #3 Added 1" Layer fuel on moveable Table.

664 in³ X .7256 = 482 gms U^{235}

+11,917

12,399 gms U^{235} loading

Run #4 Added 1" Layer fuel on stationay Table

1091.3 X 12 = 13,095 gms

− 87 gms for Rods

13,008 gms U^{235} loading

Run #5

Added ½" layer on one quadrant of Stationay table

376 in² 13,008 g.

188 in³ = + 136 g.

13,144 gms U^{235} - Loading

CRITICAL POSITIONS

C.A. 29 ~~15.2~~ 84.8 Expr. 44C-2 Run 5

Table Pos. .008 T. P 8130

	Control Rod	Channel
1	A-000	A 58 100/200
2	C-8.68	B .019
3		C 6.0 100/200
4		D 40
		E .4 75°

Tim Crit. 1:07 ~~AM~~ PM Duration 13 min.

14

8-13-59 ~~Added~~ Removed 1/4" layer of fuel on 1 quadrant of Stationary table

Run 6

13,144 gms.
- 68
13,076 gms.

CRITICAL POSITIONS

C.A. 29 848/15.2 Expr. 44C-2 Run 6

Table Pos. 1000 T. B. 8122

Control Rod	Chart	
A-0	A 61	100/500
C-3.49	.05	
	4.6	
	D 89	110/200
	E 1.0	750

Crit. 1:23 AM/PM Duration ____ min.

Rod C @ 0 on 128.1 sec period = 6.15 Sensitivity
Levelec RJ C @ 3.49

Inserted Rod C to 8.68 (Previous Level, Run 5)

Measured Negative period.

-128.1 Sec Pd.

15.78 ¢

15.78 - 6.15 = 9.63

6.15/9.63 = .639 = 64% of 1/4" on 1 quadrant needed.

12" + .64 (1/4 x 1/4) = 12.024

12" + .0038 = 12.0038"

Critical Height

68 x .64 = 44 gms.

Critical mass 13,008 + 44 = 13,049 gms.

Table 8-14-59

INSTRUMENT CHECK

Time 1:35 ~~AM~~ PM Source Y

	Channel A	B	C	D	E
Range	10/1000	0pr	10^{no}	10/1000	900V
~~Source Dist.~~	1"	0"	5"	0"	13"
% F.S. Trip	75	~~0pr~~	100	40	100

Counters 1 2 & 3

C.A. 2% 84.8/13.2 Expr. 60C-1 Run 1

Sheet ____ Date 8-14-1959 Time ____ ~~AM~~ PM

Purpose 60 Dia Cylinder

32" on Stat 11" on Stat. Table · 6" Reflector except

28" on Mov. 12" on Moveable Table East side & Top which is 3"

LOADING CHANGE

Description 60" dia Cylinder

11.452" High = 23,227.2 gi.

2800 X .7256 X 11.452 = 1,429 gi. for Rods

Mass before change ____ gmU-235

Mass of Change ____ gmU-235

Total Mass ____ gmU 23,135 gmU-235

CRITICAL POSITIONS

C.A. ____ Run ____

Expr. .40 T 8/25

Table Pos. ____ Control Rod ____

	Channel					
	A	B	C	D	E	
1	5/500	.0019	2.5×10^{-10}	1/200	0	
2	6.9	.0019	2.5 X 10	1/200	900	
3	6.5					
4						

1A - 20.29

2C - 16.87

Tim Crit. 1:50 ~~AM~~ PM Duration ____ min.

gms.

gms.

16

8-14-59

Run #2

LOADING CHANGE

Description 60" Dia Cylinder
11 3/4" High - 6" Reflector except outer bottom edges.
2800 X .7256 X 11.25 =

Mass before change ____ gmU 23,135 ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU ____ gmU-235

CRITICAL POSITIONS

C.A. 290 $\frac{84.8}{15.2}$ Expr. 60C-1 Run 2

Table Pos. ____ O ____ T. B.81K0

Control Rod	Channel
A-5.51	A 60 $\frac{10}{500}$
2C-20.69	B .0035
3	C 4.05×10^{-13}
4	D 82 $\frac{10}{2.00}$
	E .1 900

Tim Crit. 3:15 AM PM Duration 10 min.

8-17-59

INSTRUMENT CHECK

Time 11:00 AM PM

Source Pu Be

	Channel A	B	C	D	E
Range	10/1000		10^-10	10/1000	900V
Source Dist.	9'		25"	3"	1"
% F.S. Trip	90		100	85	100+

Counters 1, 2 + 3

LOADING CHANGE

Description 60 dia Cylinder - 6" Refl. Complete
11" High [12" on outer 4" corners)
2832 X .7256 X 11 = 22,603 gms.
- 142 for Rods
22,461 gms. U235

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

CRITICAL POSITIONS

C.A. 290 8X.8 / 75.2 Expr. 60 C-1 Run 3

Table Pos. 0.0.1 T B 8208

Control Rod		Channel	
1 A - 989.85 (out)	A	70	100/100
2 C - 4.66	B	.033	
3	C	4.6	100
4	D	90	100
	E	1.1	980

Tim Crit. 11:28 AM PM Duration ____ min.

Run # 4

LOADING CHANGE

Description 60" dia Cylinder 6" Reflector
10 31/32" High [12" on outer 4" corners]
2832 X .7256 X 10.96 = 22,522
− 142

10.95" Crits Height
22,380 Crit. mass

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 22,380 gmU-235

Rod C @ 989.40 (out) 98 sec period 10.2 Excess
Leveled Rd. C @ 1.85" Sensitivity ____

C.A. ____ Expr. 52 Q-1 Run 1
Sheet ____ Date ____ 95 Time ____ AM PM
Purpose 52" Parallel pipes
11" High
Completely Refl- 6"

LOADING CHANGE

Description 2704 in² Base
2704 X .7256 X 11 = 21,582 gms.
(1962.02) − 142

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 21,440 gmU-235

Just Critical

8-18-59

Run #2

INSTRUMENT CHECK

Time _____ AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	OPR	10^-1	1/1000	900 V
Source Dist.	8"		26"	3"	½"
% F.S. Trip	60	OK	100	85	100

LOADING CHANGE

Description 2704 in² Bore - 52" Parallelepiped
11" + ¼" Layer on ⅜ of top.
2704 X .7256 X 11.0937" = 21,766
- 142

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 21,624 gmU-235

Sub-Critical

20

8-18-59
Run 3

LOADING CHANGE

Completely Reflected

Description 2704 in² Base – 52 "Parallelepiped
11" on Stationary Table + 12" on 1/8 + 11¼" on 3/8 – Height
moveable Table

11" on stat. Table 11½" on moveable Table

Mass before change (7/13) = .538 gmU 10,556/in (1/13) = .462 gmU 9,064/in gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 21,868 gmU-235

Average Height = 11 7/32" or 11.218"

The above irregularities due to lack of small blocks.

CRITICAL POSITIONS

CA 290 84.8 +5.2 Expr. 52 β-1 Run 3

Table Pos. 01 TB. 2165

	Control Rod	Chan.
1	A - 989.85	92 10/500
2	C - 11.96	.0055
3		5.3 10 -12 10
4		D 50 500
		E 5 900

Tim Crit. 10:11 AM Duration 10 min.

30.9¢ EXCESS

5.24
6.07
5.9 | 30.9

$11\frac{7}{32} - \frac{5.24}{32} = 11\frac{1.76}{32}'' = 11.03125''$ Critical Height

$21,868 - 6(61) = 21,868 - 366 = 21,500$ Critical Mass.

LOADING CHANGE

Description 52" Parallelepiped - Comp. Reflected
2704 in² Base - 11.187" High
Removed ¼" layer from 1 octant. (61 gms)

Mass before change ____ gmU 21,868 ~~21,807~~ gmU-235

Mass of Change ____ gmU 61 gmU-235

Total Mass ____ gmU ~~21,807~~ 21,807 gmU-235

CRITICAL POSITIONS

C.A. 2% 84.8 / 15.2 Expr 52B-1 Run 4

Core Pos. 0 0 B - T R

Control Rod		Channel	
A 989.85	A	52	100/500
C 9.98	B	.05	
	C	6.8	
	D	80	100/100
	E	.2	750 V.

Tim Crit. ____ AM PM Duration ____ min.

Rod C @ ~~2.74~~ out on = 184.6 sec period = 9.2 ¢

Leveled Rd. C @ ~~2.74~~ out Sensitivity ____ ¢/in.

Rod C @ 2.74 on + 52 sec period = 15.8 ¢

Leveled Rd. C @ 9.98 Sensitivity ____ ¢/in.

Rod C @ 11.96 on = 238.5 sec period = 5.9 ¢ ← ¼" layer on 1 octant or 1/32"

Leveled Rd. C @ 9.98 Sensitivity ____ ¢/in.

C.A. 2% ~~8448~~ 15.2 Expr. 44P-1 Run 1

Sheet _____ Date 8-18-1959 Time 3:30 ~~AM~~ PM

Purpose 44" Parallelepiped

15.2975" High

Bare

LOADING CHANGE

Description 1936 in² Base ~~21,489~~

1936 X 1725.6 X 15.2975 = ~~21,421~~ gms.

1404.76 ~~1425~~ g/in

– 92 g for Rods.

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU ~~21,329~~ 21,397 gmU-235

Just Critical Rods out.

8-19-59

INSTRUMENT CHECK

T: AM PM Source

	Channel A	B	C	D	E
Range	10/1000	cps	10^{-10}	10/1000	900 ✓
Source Dist.	7"	0"	22"	2"	½
% F.S. Trip	85	OK	100	95	100 +

Counter 1, 7+3

C.A. 290 ~~15.2~~ 84.8 Expr. 36P-1 Run 1

Sheet Date 8-19 195~~9~~ Time 10:50 AM ~~PM~~

Purpose 36" Parallelpiped

16" ~~20~~ "X13"X36"

16 4/9" High - Moveable Table

Stationary " 20"X12"X36"

Bare

No Rods

LOADING CHANGE

Description 1296 in² Base 15,464

1296 X .7256 X 16.444 = ~~11,702~~

940.37 g/l

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 15,464 ~~11,702~~ gmU-235

Did Not Level — Measured positive period.

Log N = .07 Pos Period = 59.3 Sec Pd.

14.47 +

24 Run #2

Description 36" Parallelepiped
~~16.375~~ 16.375" High - ½ is 16¼" + ½ is 16½" Bare

Removed 1" layer from movable and added ½" layer on ½ of stack + ½" layer on ½ of Stack

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 15,398 gmU-235

Measured Pos. Period - 58.6 Sec
14.53 ¢

LOADING CHANGE

Run #3

Description 36" Parallelapiped
16.3125" High ½ is 16½", ¼ is 16¼" + ¼ is 16" Bare

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 15,339 gmU-235

Measured Pos. Period - 58.2 See pg 2.2 ¢

14.53
-2.2
12.33 ¢ = ¼" layer on 1 quadrant

16.301"
16.31" - Critical Height
15,325 33 Kg - Critical mass

Run 8-1

Run #1

C.A. ~~29~~ 84.8 ~~15.2~~ Expr. ~~8-28 P-1~~ Run 1

Sheet _____ Date 8-19 1959 Time 3:40 ~~AM~~ PM

Purpose 2.8" Parallelepiped
20" High
Bare

LOADING CHANGE

Description 1 784 in² Base
784 X .72 5-6 X 20 = 11,377

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 11,377 gmU-235

Super critical Tables at .1

Run #2
8-19-59

LOADING CHANGE

Description 784 in² Base
19.875" High - ½ in 20" + ½ in 19¾"

Mass before change _____ gmU 11,377 gmU-235

Mass of Change _____ gmU -71 gmU-235

Total Mass _____ gmU 11,306 gmU-235

~~Log~~ = .09 measured pos. period

62.98 See Rd.
13.93 ¢

26

8-20-59

Run # 3

INSTRUMENT CHECK

Pu B.

Time 8:02 AM

	Channel A	B	C	D	E
Range	1³/1000 opr	1⁻¹⁰		10/500	850
Source Dist.	10"	OC	24"	2"	1/2
% F.S. Trip	80		100	100	100

LOADING CHANGE

Description 28" Parallelepiped - Bare

19.813" - ½ in 20", ¼ in 19¾" & ¼ in 19½" Height

Mass before change	gmU	11,306	gmU-235
Mass of Change	gmU	-35	gmU-235
Total Mass	gmU	11,271	gmU-235

Measured Pos. period - 150.9 Sec Rd.

7.07 ¢

13.93

7.07

6.86 ¢ = ¼" layer on 1 quadrant.

19.75" - Critical Height

11.27 Kg. - Critical Mass.

12.97

-2.4

10.5

¼"

Run

8-2

244

10 53

.23 X

.23 X

2.72

10.65

C.A. 2% 84.8 / 15.2 Expr. 26 P-2 Run 1

Sheet ____ Date 8-20 1959 Time 10:05 AM / PM

Purpose

26" Parallelepiped - Bare

~~21.875~~" - 22" on ½ + 21.75" on ½

21.875

No Rods

LOADING CHANGE

Description 676 in² Base

676 X .7256 X 21.875 = 10,729

≠ 90.5 g/in

Light

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 10,729 ____ gmU-235

12.97
-2.44
10.53 ¢

¼" on ½ g Top

Measured pos. period - 69.5 Sec Pd

12.97 ¢

Channel A Scramed system. A = 1000/1000 100 +

Log N = .18 - Building Alarm did not sound. Relay in Rm #217 found to be faulty.

Run # 2

8-20-59

LOADING CHANGE

Description 26" Parallelepiped - Bare

21.75" High

244/10.53 = .23 = 23%

.23 X ½ = .03"

.23 X 61 = 13 g

21.72 with Higher

10.655 - Mass

Mass before change ____ gmU 10,729 ____ gmU-235

Mass of Change ____ gmU -61 ____ gmU-235

Total Mass ____ gmU 10,668 ____ gmU-235

Measured pos. period - 488.7 Sec

2.44 ¢

C.A. 29 ~~84.8~~ 15:2 Expr. 24X28 Run 1

Sheet _____ Date 8-20 1959 Time 3:53 ~~AM~~ PM

Purpose 24X28 - Paralleloped

22" High - Bare

No Rods.

LOADING CHANGE

Description 672 in² Base

672 X .2256 X22 = 10,727

487.6 g/in

Mass before change		gmU	gmU-235
Mass of Change		gmU	gmU-235
Total Mass		gmU 10,727	gmU-235

Sub Critical.

8-21-59

INSTRUMENT CHECK

Time 12:30 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	opr	10^{-10}	$\frac{10}{1000}$	900 V.
Source Dist.	11"	0"	16"	3"	1.5"
% F.S. Trip	90	___	100	80	100+

Counters 1, 2 9 3

C.A. 29/$\frac{84.8}{15.2}$ Expr. 24X28 Run 2

Sheet ___ Date 8-21 1959 Time 3:20 ~~AM~~ PM

Purpose 24X28 - Parallelepiped

22.25" High - Bare

2 Rods guide sleeves on

Stationary Table.

LOADING CHANGE

Description 672 in^2 Bore

87.6 g/in X 22.25 = 10,849 gms.

= 33 g for rods

Mass before change	gmU		gmU-~~235~~
Mass of Change	gmU		gmU-235
Total Mass	~~gmU~~	10,816	gmU-~~235~~

Did not level - ~~Stable~~

Slightly super Critical.

8-24-59

INSTRUMENT CHECK

Time 8:30 AM ~~P.M.~~ Source Ra Be

	Channel A	B	C	D	E
Range	10/1000	Opr	10^{-10}	10/1000	900 ✓
Source Dist.	10"	0"	23"	2"	1"
% F.S. Trip	85		100	95	100+

Counters 1, 2 & 3

C.A. 2½ 84.8/15.2 Expr. 24X28 — Run 3

Sheet ____ Date 8-24-1959 Time AM ~~P.M.~~

Purpose $\Delta\rho/\Delta h$ Measurements

24X28 — Parallelepiped — BARE

22" = Height for Negative periods

22.25" — " " Positive periods

1 Rod guide Sleeve on Stat. Table.

For Neg. Period. Power Achieved by use of PARAFFIN Reflector.

Run 3A - Positive Period — Log N 76.

		Counters 1	2	3
8:45 AM		~~172.1~~	79.2	68.3	74.7
	B — NEGATIVE PERIOD —	172.1	171	-	167.4
9:35 AM					
10:15 AM	C — NEG. PERIOD —	162.9	161	145.8	153.2
11:05 AM	D - POS. PERIOD —	86.9	84.9	72.1	83.8
11:30 AM	E - POS. PERIOD —	96.9	87.9	74.3	83.7
1:00 PM	F - NEG. PERIOD —	144.4	151.6	129.4	139.8
2:00 PM	G - NEG. PERIOD —	150.9	151.4	131.9	143.5

2:35 PM H - Pos. Period — 95.0 80.6

3:00 PM I - Pos. Period — 93.4 96.3 77.6 91.8

3:30 PM J - Neg. Period - 149.9 146.8 129.2 137.2

8-25-59

INSTRUMENT CHECK

Time 8:10 AM / PM Source Pu Be

	Channel A	B	C	D	E
Range	10/100	OPR	1	1/1000	900V
Source Dist.	8"	OK	24"	5"	1"
% F.S. Trip	9-		1-	95	100

Period changed by Wain

Continue Δ P/Δ h Measurements.

7 8:25 AM K - Neg. Period — 149.8 — 126.9 142.1

9:50 AM L — Pos. " — 98.8 98.8 80.6 94.8

10:20 AM M — Pos. Period - 97.7 99.3 82.1 5 947.8

.2 10:55 AM N — Neg. Period - 149.3 149.7 131.5 142.3

8 11:30 AM O - Neg Period — 146.6 146.9 127.9 138.2

1:00 PM P - Pos. " — 103.2 103.4 88.2 99.2

7

1:25 PM Q - Pos. Period - 103.2 105.8 96.3 99.8

.8 2:00 PM R - Neg " - 143.3 142.9 127.4 138.5

3.5 2:35 PM S - Neg Period — ✓

Water off - Temp Rising (Run #108) - Did not make Pro.

32

INSTRUMENT CHECK

8-26-59

Time 8:25 ~~PM~~ AM Pu Be

	A	B	C	D	E
Range	10/1000	cps	10^{-10}	10/1000	900V ✓
Source Dist.	11"	0"	17"	2"	2"
% F.S. Dep	90		100	85	100+

Counters 1, 2 + 3

Cont. $\Delta\rho/\Delta h$ measurements

		log N	Counters		
8:35 AM	Run 3 T – Neg. period –	138.0	127.2	119.7	129.7
	U – Pos. " –	117.3	120.3	99.6	115.2
	V – Pos. Period –	116.7	121	98.15	114.8
10:25 AM	W – Neg. " –	137.9	138.8	119.4	130.9
● 10:55 AM	X – Neg. Period –	139	135.4	122.8	131.5
* 11:55 AM	y – Pos. Period –	118.9	120.6	102.9	114.6
	Z – Pos Period –	117,3	120.7	102,9	114.7
12:50 PM	A_1 – Neg Period –	135,7	133.1	112.7	124,3
	B_1 – Neg. Period –	135.75	131.4	116,1	127.2 ~~126.6~~ –
1:50 PM	C_1 – Pos. " –	130.3	1334	109.4	126.7
	D_1 – Pos. Period –	130.3	135.7	109.4	126.8
2:45 PM	E_1 – Neg. " –	133.03	130.2	117.8	123.07
3:25 PM	F_1 – Neg Period –	130.32	123.6	111,8	120.7
3:55 PM	G_1 – Pos Period –	144.4	147.8	122.06	140.3

* Channel D – SCALE TRIP

8-27-59

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source Pu-Be

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	Opn	10^{-10}	$\frac{10}{1000}$	900V
Source Dist.	11"	0"	28"	2"	1.5"
% F.S. Trip	90	OK	100	95	100+

Counters 1, 2, 3

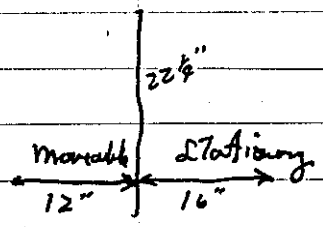
C.A. $29.0\frac{84.8}{15.2}$ Expr. 24X28-2 Run 1

Sheet ____ Date 8-27 1959 Time 8:35 AM ~~PM~~

Purpose Foil Traverse

29.2235

Horizontal Traverse at table Seperation



Pos.	-9	-7½	-6	-4½	-3	-1½	0	+1½	+3	+4½	+6	+7½
No.	32-B	34-B	16-B	9-B	7-B	30-B	24-B	18-B	37-B	13-B	40-B	26-B
											+9	
											4-B	

CRITICAL POSITIONS

C.A. $29.0\frac{84.8}{15.2}$ Expr. 24X28-2 Run 1

Table Pos. .61 T R

Control Rod	Channel	
A-	A 46	$\frac{1000}{100}$
C- 10.46	B .02	
	C 5.4	
	D 30	$\frac{1000}{200}$
	E 1.0	7.50

Tim Crit. 9:36 $\frac{50}{60}$ AM PM Duration 20 min.

34

8-27-59

C.A. $29_0 \frac{84.8}{15.2}$ Expr. 24X28-2 Run 2

Sheet _____ Date 8-27 1959 Time 11:40 AM PM

Purpose Foil Traverse

$29_0 U^{235}$

Pos.	-9	-7½	-6	-4½	-3	-1½	0	+1½	+3	+4½	+6	+7½	+9
No.	8-B	15-B	33-B	25-B	22-B	27-B	2-B	11-B	21-B	42-B	1-B	5-B	31-B

CRITICAL POSITIONS

C.A. $29_0 \frac{84.8}{15.2}$ Expr. 24X28-2 Run 2

Table Pos. 015 B=9136

	Control Rod		Channel	
1		A	65	100/500
2	C-933	B	.01	
3		C	4.5	
4		D	58	100/500
		E	.6	750

Fin Crit. 11:51 20/60 AM PM Duration 20 min.

C.A. 290 $\frac{84.8}{15.2}$ Expr. 24X28-2 Run 3

Sheet ___ Date 8-27 1959 Time 1:15 ~~AM~~ PM

Purpose Zero oil Traverse

290 K 235

+9	Pos. +9	+7½	+6	+4½	+3	+1½	0	-1½	-3	-4½	-6	-7½	-9
31-B	No. 17-B	35-B	21-B	6-B	28-B	3-B	20-B	36-B	38-B	29-B	41-B	39-B	19-B

CRITICAL POSITIONS

C.A. 290 $\frac{84.8}{15.2}$ Expr. 24X28-2 Run 3

Table Pos. 015 . 9125

	Control Rod	Channel	
1		A 62	100/500
2	C - 13.24	B .01	
3		C 8.8	
4		D 54	100/500
		E .6	750

Tim Crit. 1:40 $\frac{41}{60}$ AM PM Duration 20 min.

C.A. 290 84.8/15.2 Expr 24X28-2 Run 4

Sheet — 8-27 19 9 Time 2:30 AM PM

Purpose 290k-235 Foil Traverse

Vertical Traverse of Table Separation

-2	0	+2	+4	+6	—	-2	0	+2	+4	+6
Dpl 5	1	Dpl 2	Dpl 3	Dpl 4	—	C-21	C-6	C-23	C-2	C-3

CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. 24X28-2 Run 4

Table Pos. +02 -9125

Control Rod		(Chan.)
1	A 45	100/500
2 C-14.11	B .01	
3	C 8.7	
4	D 47	100/500
	E .6	758

Tim Crit. 2:46 AM PM Duration 20 min.

Run

8-28-59

INSTRUMENT CHECK

Time 8:30 AM ~~P.M.~~ Source Pu Be

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	OPR	10^{-10}	$\frac{10}{1000}$	900V.
Source Dist.	7"	0"	5"	2'	1.5"
% F.S. Tap	90	OK	100	90	100+

Counters 1 & 3

+6
C-3

C.A. 26 ~~848~~ Expr. 24X28-3 Run 1

Sheet Date 8-28-1959 Time AM PM

Purpose Bottom support structure evaluation.

Stack: - 24" X 28" X 22" - Bore

achived Log N Reading of .075 by use of 2 paraffin reflector. Removed and measured Neg. period - Log N Sec 2d

No Rods

Counters #1 #3

Run # 2 Repeat @ 1 - Log. N.

Counters #1 #3

C.A. 22 ~~8.48~~ 15.2 Expt (2 X 28) - 3 Run 3

Sheet _____ Date 8-28-1959 Time 2:50 ~~AM~~ PM

Purpose Bottom structure Evaluation.

Place paneled extrusions on top of stack as there are on bottom with 4' X 4' X 3/4" steel plate on al Centered above stack.

Achieved log N = .12 by use of paraffin reflector.

Remove measured Neg. period —

log N #1 #3

Run #4 Report #3

log N #1 #3

8-31-59

INSTRUMENT CHECK

Time 3:15 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	9pc	10^{-10}	10/1000	900 V.
Source Dist.	8"	0"	30"	2"	1.5"
% F.S. Tap	95'	OK	100	85'	100+

Counter 143

C.A. 2% 848/152 Expr. 24P-1 Run 1

Sheet _____ Date 8-31- 1955 Time 3:30 ~~AM~~ PM

Purpose 24" Parallelepiped
25" High
Base
No Rods

Achieved Log N = .15' by use of paraffin reflector.
Measured neg. period
Log N - 146.2 #1 Counter #3

LOADING CHANGE

Description 24" x 24" x 25" = 14,400 in^3
14,400 x .7256 = 10,448 gms.

Mass before change _____ gmU _____ gmU-235
Mass of Change _____ gmU _____ gmU-235
Total Mass _____ gmU 10,448 gmU-235

40

9-1-59

INSTRUMENT CHECK

Time 1140 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	open	10^{-10}	$\frac{1^0}{1000}$	900 V.
Source Dist.	12"	0"	26"	2"	1.5"
% F.S. Tap Counting	90	ok	100	90	100+

C.A. 2% ~~848~~ Expr. 24 P-1 Run 2

Sheet ____ Date 9-1-1959 Time 2:10 ~~AM~~ PM

Purpose Bottom Structure Evaluation

Stack - 24"x24"x24.75"

Al Ext. + Steel Plate as per p. 38.

Acheived log N = .16 by use of Paraffin.

Measured Neg. Period log N 146.6 #1 #3

148.5 145.9

Run #3 Repeat of Run #2.

log N #1 #3

146.6 152.4 147.9

Run #4 Removed al ext. + Steel plate. Added ¼" Fuel to stack.

24" X 24" X 25"

Neg. Period log N #1 #3

170.5 171.3 166.8

9-2-59

INSTRUMENT CHECK

Time 8:30 ~~PM~~ AM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	Open	10^{-10}	10/1000	900 V.
Source Dist.	13"	0"	30"	3.5"	1.5"
% F.S. Tap	90	O/C	100	80	100

Counters 1, 2 & 3

C-3 has been giving shorter periods than C, consistently. Chamber 1772 substituted for chamber 371 in counting system C-3. Both amplifiers at 4 millivolts

Counters

#1 + 3 - BF_3 Chambers Hooked to Printer

#2 - U^{233} Fission Chamber

C.A. 28 ~~84.8~~ 15.2 Expr. 24P-1 Run 5

Sheet ____ Date 9-2-1959 Time ____ AM ~~PM~~

Purpose Check Counters in preparation for a/c/h measurements.

9 Run 5A Did not Level. Measured Pos + Neg periods.

Log N = .25 Pos. 5 - Removed Reflector.

Log N = #1 P 54.07 N 166.9 #2 #3 Pos. 52.77 Neg. 165.5

B Repeat of A, with Counter adjustments (shielding)

log N #1 Pos. 157.5 #2 #3 - 166.1

Neg 166 165.86

k.

C Repeat of B, with counter adjustment.

C.A. 2% 89.8 / 15.5 Expr. 24P-1 Run 6A

Sheet _____ Date 9-2-1959 Time 2:15 ~~AM~~ PM

Purpose ΔP/Δh Measurement

Stack – 24" X 24" X 25" – For Neg. Periods
24" X 24" X 25.25" – For Pos. Periods

Time	Run	Period	LogN	Counters #1	#2	#3
2:15 PM	6A	Negative	161.8	161.5	160.7	163.6
2:50 PM	B	Positive	248	246.6	248.9	248.4

9-3-59

INSTRUMENT CHECK

Time 8:25 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	oper	10^{-10}	10/1000	900 V.
Source Dist.	9"	0"	29"	2"	2"
% F.S. Tap	90	OK	100	90	100

Continue 1, 2 & 3

Continued ΔP/Δh Measurements.

8:35 AM	6C	Positive	167.2	162.2	166.3	164.2
9:20 AM	D	Negative	187.9	191.5	190.5	—
10:00 AM	E	Negative	190.0	191.9	192.6	193.5
10:55 AM	F	Positive	160.7	161.5	158.7	162.3
11:30 AM	G	Positive	158.5	161.3	160.5	162.2

			①	②	③
12:40 PM	H	Negative	200.9	200.9	199.5	202.5
1:15 PM	I	Negative	200.9	198.8	197.9	201.4
1:55 PM	J	Positive	147.7	147.8	151.4	147.7
2:20 PM	K	Positive	146.6	148.4	150.6	146.6
3:00 PM	L	Negative	202	200.7	204.1	20.2

9-4-59

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source Pu-Be

Channel	A	B	C	D	E
Range	1/100	opr	10^{-10}	1/100	900
Source Dist.	13"		29"	25"	2"
% F.S. Trip	90	01C	100	80	100

8:25 AM Continued a P/A h Measurements. ③

6 M	Negative	215.6	220	215.4	220.6
9:15 AM	N	Positive	135.75	135.1	133.1	156.7
9:45 AM	O	Positive	135.75	136.5	134.5	136.6
10:30 AM	P	Negative	217.2	217.8	211.6	217.7
11:05 AM	Q	Negative	214.5	217.8	215.5	215.7

				①	②	③
	6R	Positive	133.6	135.3	134.8	136.5
	S	Positive	133	133.7	135.8	133
1:20 PM	T	Negative	213.9		215.4	216.8
2:00 PM	U	Negative	214.4	216.6	214.7	217.7
2:40 PM	V	Positive	135.75	136.9	135.7	137.6
3:10 PM	W	Positive	135.75	137.7	136	138.1
3:45 PM	X	Negative	217.2	213.1	211.2	213.2

9-8-87

INSTRUMENT CHECK

Time 8:40 ~~PM~~ AM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	OFF	10^{-10}	10/1000	900
Source Dist.	10"	0"	30"	3½"	2½"
% F.S. Trip	90	OK	100	80	100+

Counters 1, 2 & 3

Continued α p/s h Measurements #1 #2 #3

8:50 AM	6y	Negative	~~230.8~~ 228.1	234.8	230.8	234.2
9:45 AM	Z	Positive	~~121.2~~ 122.7	121.4	121.2	122.6
10:20 AM	A,	Positive	~~120.7~~ 122.7	122.3	120.7	1
10:50 AM	B,	Negative	233.5	233.8	232.8	233.6

C.A. 2½ 15.2 (848) Expr. 24 P-1 Run 7

Sheet ____ Date 9-8-1959 Time 1:00 PM

Purpose Reflector Savings Study

24" X 24" X 23"

LOADING CHANGE

Description 24" Parallelepiped
6" Top Reflector
24 X 24 X 23 = 13,248 in³
.7253 X 13,248 = 9612 gms.

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 9,612 gmU-235

Sub Critical.

LOADING CHANGE

Description 24" Parallelepiped
6" Top Reflector (Paraffin)
24" X 24" X 23.25" = 13,392 in²

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 9,717 gmU-235

Sub Critical

Measured Negative Period

7 A Log N #1 #2 #3

-137.9 Sec

B. Added ¼" Fuel. Measured Positive Period,

55 8.2 Sec

¼" Fuel = 10.14×10^{-4} Δk (235)

9-9-57

INSTRUMENT CHECK

Time 9:30 ~~PM~~ AM Source Pu Be

	Channel A	B	C	D	E
Range	10 to 1200	oper	10 to 10	10 to 1000	900
Source Dist.	10"	0"	28"	3"	2"
% F.S. Trip	90	OK	100	80	100

Counters 1, 2 & 3

Continued Reflector Studies.

7C Stack - 24" X 24" X 21" - ~~12~~ 11.5" Graphite Reflector on top.

Sub Critical.

D Stack - 24" X 24" X 22" - ~~12~~ 11.5" Graphite on Top.

Sub Critical

E Stack - Same - 14.325" Graphite on Top.

11:30 AM Achieved Log n = .18 by use of paraffin slab.

Measured Neg. Period -

Log N -127.1 #1 #2 #3

1:15 PM F Stack - Same - 17.25" Graphite on Top.

Measured Negative Period

Log N - 131.9 #1 #2 #3

3:30 PM G Stack - 24" X 24" X 25" - Bare
Measured Negative period.
Log N ~170.5 #1 #2 #3

9-10-JF

INSTRUMENT CHECK

Time 9:30 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	opr	10^{-10}	10/1000	900
Source Dist.	12"	0"	28"	3"	2"
% F.S. Trip	90	OK	100	85	100+

Counters 1, 2 & 3

Continued Reflector Studies.

7 H Stack - 24" X 24" X 23" - 8 5/8" Be Reflector on Top
Super Critical Table = .35

I Stack - 24" X 24" X 22½" - 8 7/8" Be on Top
Super Critical Table = .25

J Stack - 24" X 24" X 25" - 8 7/8" Be on Top
Super Critical Table = .2

7K Stack - 24" X 24" X 21" - $5\frac{3}{4}$" Be Reflector on Top.
measured Negative Period.
Log N -193.3. #1 #2 #3

L Stack - 24" X 24" X $20\frac{3}{4}$" - $8\frac{3}{8}$" Be on Top
measured Positive Period.
log N +56.5' #1 #2 #3

M Stack - 24" X 24" X $20\frac{1}{2}$" - $8\frac{7}{8}$" Be on Top
Just Critical

N Stack - 24" X 24" X $20\frac{1}{2}$" - $11\frac{1}{2}$" Be on Top
Measured Positive Period
log N +64.6 #1 #2 #3

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

9-11-59

Channel	A	B	C	D	E
Range	10/1000	opr	16^{-10}	10/1000	900 V
Source Dist.	10"	5"	30	2"	15"
% F.S. Trip	90	OK	100	85	100

Counters 1, 2 + 3

Continued Reflector Studies.

70 Stack - 24" X 24" X $20\frac{1}{4}$" - $14\frac{3}{8}$" Be on Top.
Measured Positive Period.
#1 #2 #3
log N

7P STACK - 24" X 24" X 20½" - 17¼" Be on Top.

MEASURED POSITIVE PERIOD

Log N	#1	#2	#3

φ STACK - 24" X 24" X 25" - BARE

Neg. Period

Log N	#1	#2	#3
R			

C.A. $29\frac{84.8}{15.2}$ Expr. 24P-1 Run 8

Sheet Date 9-11 1959 Time 1:05 PM

Purpose Horizontal Foil Traverse

290 h 235

Stack 24" x 24" x 25

8A

Pos. +9" 7½" 6" 4½" 3" 1½" 0 -1½" -3" -4½" -6" -7½" -9"

No. B-42 17 8 6 34 31 22 13 11 7 18 41 32

CRITICAL POSITIONS

C.A. $29\frac{84.8}{15.2}$ Expr. 24P-1 Run 8

Table Pos. 999.94 T... P...

	Control Rod	Chamber	
1	No Rods	A 46	100/500
2	Plastic Reflector	.01	
3	app. 4" from Stack	5.8	
4		D 50	100/500
		E .2	690 V.

Fim Crit. 1.45 AM PM Duration 20 min.

Horizontal Traverse (h^{235}, 29 Foils)

8B Pos +9", 7½", 6", 4½", 3", 1½", 0, -1½", -3", -4½", -6", -7½", -9

No. B-38, B-19, B-37, B-24, B-9, B-40, B-25, B-16, B-28, B-20, B-3, B-27, B-35 ↑

B_1 = .01, Other Readings Same as for Run 8A.

INSTRUMENT CHECK

Time ____ AM / PM

	A	B	C	D	E
Range	10/1000		10⁻¹⁰	10/1000	900 V
Source Dist	9"		28"	3"	2"
% F.S. Trip	85		100	70	100+

C.A. 290 84.8/15.2 Expr. 24P-1 Run 8-C

Sheet ____ Date 9-14 1959 Time 9:05 AM

Purpose Vertical Foil

290.u235 +u238

-9"

32

Pos.	6	4	2	0	-2	-4
No.	C-32	C-27	26	25	23	C-21
Dpl.	4	3	2	1	5	6

CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. 24P1 Run 8-C

999 +99% P.

Table Pos. ____

	Control Rod		Channel
1	No Rods	45	100/500
2	Plastic Reflector	.01	
3	Approx. 4" from Stack	6.6	100
		D 50	500
4		E 4	750

Last Crit. 9:14 AM Duration 20 Min. After

½", -9

27, 0.55

↑

A.

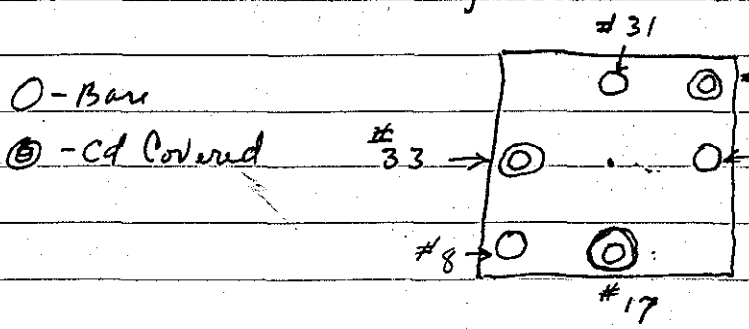
C.A. $290\frac{84.8}{15.2}$ Expr. 24P-1 Run 8D
Sheet _____ Date 9-14 1959 Time 11:00 AM
Purpose Horizontal Foil Traverse
$290 U^{235}$
Stack 24"X24"X25"

Pos.	9	7½	6	4½	3	1½	0	1½	3	4½	6	7½	9
No.	-39	-36	-33	-30	-29	-26	1	2	4	5	12	15	21

20 minute run.
Instruments reading same as Run 8C.

C.A. $280\frac{84.8}{15.2}$ Expr. 24P-1 Run 8E
Sheet _____ Date 9-14-1959 Time 1:20 AM PM
Purpose Cd Fractions Indium
3 Bare In.
3 Cd In.

Foils Located Symetrical About Center of Reactor



O - Bare
Ⓒ - Cd Covered

20 Min Exposure.
keff = .01 Slightly Sub Critical.
Readings ~ same as 8C.

C.A. 27 84.8/15.2 Expr. 24 P-1 Rm. 8F

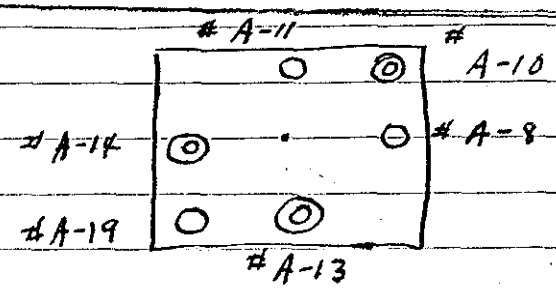
Sheet _____ Date 9-14-1959 Time 2:15 PM

Purpose Cd Fraction Gold (2 mil)

3 Bare Gold

3 Cd covered Gold

Chi
#2 = 30



20 Min Exposure

Log N = .11

Table = 999.94

Plexiglas Reflector

~ 4" from Stack

Ch A = 50 $\frac{1000}{500}$

D = 52 $\frac{1000}{500}$

C = 5.2

E = 2.0 @ 690 V.

54

9-15-59

INSTRUMENT CHECK

Time 2:05 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	60/1000	Opr	10^{10}	10/1000	980 V.
Source Dist.	11"	0"	28"	2½"	1"
% F.S. Trip	90	ok	100	90	100+

Counters

T.
.522
.318

C.A. 270 84.8/15.2 Expr. 24P-1 Run 8-D

Sheet ____ Date 9-15 1959 Time 2:54 AM PM

Purpose Preparation Run for Fission Counter Traverse

Stack-24"X24"X25.33" — ⅓ is 25"
½ is 25.5"

Ch. "E" out - Resistor burned out on Reset after Inst. Check.

#8-3-10" from Top.
#8-2-11" from Bottom

CRITICAL POSITIONS

C.A. 270 84.8/15.2 Expr. 24P-1 Run 8-D Top. 9478

Table Pos. 999:94 T B.3159

Control Rod	Channel
No Rods	A 68 100/500
on Control Rod Drive A → Plastic Reflecta	B .0095
10"X10"X¼"	C 6.1
14" away from stack	D 54 100/500
out-989.84	E out of circuit

Begin to See at .01 3:15 AM PM Duration ____ min.

Ter
c

Fission Counter entrance Holes at mid plane ¼" X ½" X 24". Fission Counter on drive from E to W.

9-16-59

INSTRUMENT CHECK

Time 8:45 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
	10/1000	off	10^{-10}	10/1000	900V
Source Dist.	10"	0"	25"	3"	2"
% F.S. Trip	85	OK	100	85	100+

Counters 1, 2 & 3

#8-3 10" from top

#1 Scaler - U238

#2 Scaler - 233 Back of Stack

C.A 296 $\frac{84.8}{15.2}$ Expr. 24 P-1 Run 8 H

Sheet ____ Date 9-16-59 Time 9:35 AM ~~PM~~

Purpose U238 Fission Counter Traverse

Stack 24"x24"x25

	Selsyn	Scaler #1 (64)	#2 (64)	#3 (64)
	3.80	196 22	1823 52	28 31
Ten minute Counts	4.80	203 18	1792 8	28 0
	6.80	200 21	1533 17	23 61
	8.80	158 4	1084 29	16 60
	10.8	103 4	682 51	10 42
	11.3	65 51	429 38	6 45

System sub critical.

Plexiglas Reflector (10"x10"x½") not enough to keep critical as counters were moved toward center.

C.A. 290 ~~848~~ Expr. 24 P-1 Run 8 I

Sheet _____ Date 9-16 1959 Time 1:35 PM

Purpose U^{238} Fission Counter Traverse

24" X 24" X 25.2"

Plastic Reflector
10.5" X 10.5" X 1"
on Rod Drive "A"

Zero Position
Selsyn = .8
End of Probe = 9/16" from E edge of stack

#8-3 - ~~Scaler~~ Ch #3 (Printer) - 10" from top of stack
U^{233} - ~~Scaler~~ Ch #2 Cascaded into #3 - 2" in back of "
#8-2 - ~~Scaler~~ Ch #1 - 11" from bottom of stack

	Selsyn	Scaler #1 (Scale 64)		Printer No. 3		#2 Cascaded	(Scale 64 X 64) #3
	3.49	11205	175.5	5817	135		463 24
10 Minute Counts	5.49	13081	204 25	6518	0 1		456 58
	7.49	14710	229 54	8131	0 43		459 12
	9.49	15647	244 31	9077	0 26		469 42
	9.99	15958	249 22	8818	0 7		461 22
	10.49	15728	245 48	8747	0 51		456 32
	10.99	15402	240 42	8621	0 11		456 12
	11.49	15007	234 31	8481	0 63		445 16
	12.49	15102	236 2	8385	0 10		460 52
	13.49	15492	242 4	8221	0 39		459 18
	14.49	14208	222 65	7475	0 41		446 65
	15.49	12115	189 19	6858	0 25		444 38
	16.49	11200	175 5	6392	0 23		449 25
	17.49	9969	155 49	5596	0 7		442 59

Log N .2 Tables 999.94 Top Mic. 1530 Bot. 1139

9-17-59

INSTRUMENT CHECK 57

Time 8:20 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	off	10^10	10/100	900 V
Source Dist.	8"	0'	32"	2.5"	2"
% F.S. Trip	90		100	85	100+

Reflector "X1" "A"

Repeat of Fission Counter Traverse

	Solaya	Scaler #1 (64)	Printer #3	#2 (64)	Cascaded #2 (64)
	2.49	9721 151 57	5023	0 13	1899594463 49
10 minute Counts	4.49	11646 181 62	6182	0 25	1811034442 47
	6.49	13221 206 37	6323	0 35	1811[6]0[19]4442 18
	8.49	14493 226 29	7100	0 47	1786799 436 14
	9.49	15118 236 14	7207	+9	178906 436 49
	9.99	14706 229 50	8055	+62	17774724 33 61
→	10.49	14521 226 57	8077	+57	1765120 430 60
	10.99	14792 231 8	8190	+45	1764352 430 48
	11.49	14252 222 44	7809	+51	1744448 425 57
	12.49	14371 224 35	8085	+55	1779072 434 22
	14.49	13597 212 29	7158	+51	1766400 431 16
	16.49	11571 180 51	6520	+22	1896256 462 61
	18.49	9420 147 12	4975	+27	1919168 468 35
	20.49	5694 88 62	3169	+51	1913920 467 17

9-18-59

Mihalczo
McCARTY
LYNN

20" X 24"

INSTRUMENT CHECK

Time 12:46 ~~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"	28"	2"	2"
% F.S. Trip	90	OK	100	90	100+

C.A. $\frac{270}{15.2}$ $\frac{84.8}{}$ Expr. (20X24)-1 Run 1

Sheet ____ Date 9-18-1959 Time 1:06 ~~AM~~ PM

Purpose 20" X 24" X 28" - Bare

Paraffin Slab - 12"X18"X1.5" at back of stack that can be pulled away

LOADING CHANGE

Description 480 in² Bare
398.28 g/in. Height
398.28 X .7352 = 9751.84 g
- 12.5 g for 1 rod

~~Mass before change~~	____ gmU	____	gmU-235
~~Mass of Change~~	____ gmU	____	gmU-235
~~Total Mass~~	____ gmU	9739.34	gmU-235

Sub Critical

Added 2" Fuel to Top.
20"X24"X30" — 10,448.4 g U^{235}
- 12.5"
10,436

Sub Critical

LOADING CHANGE

Description 20" X 24" X 32" - Bare

348.28 g/in X 32 = 11,144.86

-12.5 for 1 rod

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 11,132.46 gmU-235

Sub Critical

LOADING CHANGE

Description 20" X 24" X 32.5" - Bare

348.28 g/in X 32.5 = 11,319.1

-12.5

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 11306.6 gmU-235

be

Sub critical

LOADING CHANGE

2:45 PM

Description 20" X 24" X 33" - Bare

348.28 g/in X 33 = 11,493.2

-12.5 for 1 rod

1 rod

235

235

235

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 11,480.7 gmU-235

Sub Critical

1235

LOADING CHANGE

Description 20" X 24" X 33.5" - Bare
348.28 X 33.5 = 11,667.38
-12.5' for rod

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 11,654.88 gmU-235

Sub Critical

LOADING CHANGE

Description 20" X 24" X 34" - Bare
348.28 X 34 = 11,841.52
12.5' for rod

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 11,829 gmU-235

Sub Critical

LOADING CHANGE

Description 20" X 24" X 34.25" - Bare
348.28 X 34.25 = 11,928.5 gm
-12.5' for 1 rod

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 11,916 gmU-235

Sub Critical - Paraffin slab removed
Neg. Period 7 195 Sec = -8 ¢
Fixed Rod Neg. Pd = 1.04 Sec = -26 ¢

Safety = ~ 18 ¢

9-21-59

INSTRUMENT CHECK

Time 8:30 AM Source Pu Be

	Channel A	B	C	D	E
Range	10/100	Oper	10^{-10}	10/1000	900
Source Dist.	10"	0"	32"	2.5"	2"
% F.S. Trip	90	OK	100	90	100

Counters 1, 2 & 3

C.A. $29_0 \frac{84.8}{15.2}$ Expr. 20"x24"~~x24.25~~-1" Run 2

Sheet ____ Date 9-21 1959 Time 8:40 AM PM

Purp: 20"x24"x24.25" Bare Dy Foil Exposure (for Gilley)

Paraffin Slab 12"x18"x1.5" at back of stack

2 - ½" long wire Dy Foil placed at back ~~in front of plastic Reflector~~

CRITICAL POSITIONS

C.A. $29_0 \frac{84.8}{15.2}$ Expr. (20"x24")-1 Run 2

Table Pos. .037 T 8892 B 6279

Control Rod	Channel	
A-Plastic 733	A 64	1000/200
	B .054	
	C 4.5	
	D 68	1000/200
	E 1.2	690V

Crit Cal. 9:11 20/60 AM PM Duration 20 min

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9-21-59

C.A. 290 $\frac{84.8}{15.2}$ Expr. (20"x24")-1 Run 3

Sheet ____ Date 9-21-1959 Time 10:15 AM PM

Purpose 20"X24"X34.75" Bare - For Pos Period

$\Delta\rho/\Delta h$ Measurements

20"x24"X34.25" - For Neg. Periods

LOADING CHANGE

Description 20"X24"X34.75 Bare

348.28 X 34.75 = 12,102.73

- 12.5 / Rod

12,090.23

Mass before change	gmU		gmU-235
Mass of Change	gmU		gmU-235
Total Mass	gmU	12,090.23	gmU-235

	Run	Period	Log N	Counters 1	2	3
11:15 AM	3A	Positive	142.8	142.7	132.6	143.7
12:45 PM	B	Negative	293.2	300.6	296.5	302.1
1:45 PM	C	Negative	247.6	251.8	251.1	250.9
2:35 PM	D	Positive	168.3	170.0	169.2	170.3
3:10 PM	E	Positive	167.2	168.9	170.2	171.4
3:45 PM	F	Negative	282	251.7	259.3	253.5

For Neg. Periods - Acheived log N Reading of ~.15 by use of paraffin slab, then Demand.

9-22-59

INSTRUMENT CHECK

Time 8:45 PM Source Pu Be

	Channel A	B	C	D	E
Scale	10/1000 Cps	10^{-10}	10/1000	900V	
Source Dist	10"	8'	28"	3"	2.5"
% F.S. Trip	95	OK	100	85	100

Counters 1, 2 & 3

C.A. 29 84.8/15.2 Expr. (20"X24")-1 Run 2 B

Sheet ____ Date 9-22 1959 Time 9:05 AM

Purpose 20"X24"X34.25 Bare Dy Foil Calibration (for Grilling)

13 - ½" Dy-Wire Foils Taped on Circumference of Rotating wheel on outside of stack with 1" Plexiglas behind it.

CRITICAL POSITIONS

C.A. 29 84.8/15.2 Expr. (20"X24")-1 Run 2 B

Rod Pos. .037 T-2X29 B.6281

Control Rod	Channel	
Plastic at Back of mov. Table 6.20	A 67	1000/500
	B .156	[At Top of Stairs]
	C 7.5	
	D 78	1000/500
	E 3.5	690

Run Com. 9:28 10/60 AM PM Duration 20 min.

9 9-22-59

C.A. $\frac{290}{15.2}\frac{84.8}{}$ Expr (20" X 24") Run 3 H

Sheet Date 9-22 1959 Time 10:40 ~~A.M~~ P.M

Purpose $\Delta e / \Delta h$ Measurements

20" X 24" X 34.75" - For Pos. Pds

20"X24" X 34.25" - For Neg. Pds

	Run	Period	Log N	Counters 1	2	3	
10:35 AM	3 G	Negative	256.3	254.5	253	257.6	8
11:25 AM	H	Positive	167.2	167.6	165.6	168.3	9
11:55 Am	I	Positive	168.3	167.9	165.8	169.4	1
1:10 PM	J	Negative	255.2	256.5	253.6	257.2	1
1:50 PM	K	Negative	255.2	261.3	255.3	258.8	1
2:35 PM	L	Positive	165.6	167.5	164	168.9	
3:10 PM	M	Positive	168.3	168.9	166.4	169.9	
3:40 PM	N	Negative	263.9	255.2	257.5	257.7	

9-23-59

INSTRUMENT CHECK

Time 8:25 ~~PM~~ AM Source Ra Be

	Channel A	B	C	D	E
Range	10/1000	Off	10^{-10}	10/1000	900 V.
Source Dist.	11"	0"	28"	3"	2.5"
% F.S. Trip	90	OK	100	85	100+

Counters 1, 2 & 3

Continued α P/α th measurements ~~together~~

ters [3]	Run	Period	Log N (Not used)	Table II	Counters [2]	[3]
257.6	8:40 AM 3 O	Negative	217.2	215.1	214.6	217.2
168.3	9:50 AM P	Positive	162.9	165.5	163.	166.9
169.4	10:25 AM Q	Positive	162.9	166.3	163.3	167.4
257.2	11:15 AM R	Negative	276.9	265.0	264.2	264.8
258.8	12:40 PM S	Negative	264.9	264.6	261.9	266.8
168.9	1:40 PM T	Positive	160.2	162.8	159.6	163.3
169.9	2:10 PM U	Positive	162.9	163.0	161.8	164.2
257.7	2:45 PM V	Negative	265.	264	261.5	267.2

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9-24-59

INSTRUMENT CHECK

Time 8:20 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	off	10	10/1000	900 V
Source Dist.	1"		3"	3"	1"
% F.S. Trip	95	OK	100	95	100

Counter 1, 2 & 3

Continued Δ P/Δ h Measurements

Time	Run	Period	log N	Counter 1	2	3
8:35 AM	3 W	Negative	262.8	272.3	268.3	273.2
9:45 AM	X	Positive	155.3	155.3	156.1	159.5
10:35 AM	Y	Positive	153.1	156.5	156.3	158.4
11:15 AM	Z	Negative	271.5	268	270	272.6
1:00 PM	A_1	Negative	271.5	278	242.4	277.6
1:55 PM	B_1	Positive	154.2	155	155	157.7
2:25 PM	C_1	Positive	157.5	153.1	153.2	157.6
3:10 PM	D_1	Negative	272.4	278.4	272.1	

9-25-59

INSTRUMENT CHECK

Tme 8:50 AM PM

Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	Opr	10	10/1000	200V
Source Dist.	9"	0	28"	2.5"	2.5"
% F.S. Trip	90	OK	100	90	10% +

Counters 4 2 + 2 OK

C.A. 29.0 84.8/15.2 Expr (20"X24") - 1 Run 2-C

Sheet ____ Date 9-25-59 Tme 9:00 AM PM

Purpose Vertical Foil Traverse

29.2 23.5

20"X24"X34.50

Pos. +14 +12 +10 +8 +6 +4 +2 0 -2 -4 -6 -8 -10 -12 -14

No. C-16 C-8 C-18 C-34 C-4 C-33 C-12, C-21 C-32 C-27 C-10 C-39 C-15 C-14 C-43

CRITICAL POSITIONS

29.0 84.8/15.2 Expr (20"X24") - 1 Run 2 C

.038 T-5472-B 9-26-59

Stacks 20"X24X34.50

	Foil Run	Channel
Plastic 6.12	51	1000/100
	.014	
	4.0	
	D 76	1000/50
	E 2	690

Crit. 9:40 AM PM Duration 20 min.

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9-25-59

C.A. 2% $\frac{84.8}{15.2}$ Expr. (20"X24")-1 Run 2 D

Sheet _____ Date 9-25-59 Time 10:42 AM PM

Purpose 20"x24"x34.25 Bare

Dy Foil Calibration (For Willy)

13-$\frac{1}{2}$" Dy wire foils Taped on circumference of Rotating Wheel On outside of stack with 1" Plexiglas Behind it.

CRITICAL POSITIONS

C.A. 2% $\frac{84.8}{15.2}$ Expr (20"X24")-1 Run 2 D

Table Pos. .07 notched T R

Control Rod	Channel	
1 Plastic 99.59	A 60	1000/1000
2	B .22	
3	C 10.0	
4	D 56	1000/1000
	E 5.2	690

Time Crit. 10 57 AM PM Duration 20 min.

9-25-59

C.A. $29^0 \frac{84.8}{15.2}$ Expr (20"X24") Run 2 E

Sheet _____ Date 9-25 1959 Time 12:20 AM ~~PM~~

Purp. 20"X24"x34.25 Bare

Vertical Foil Traverse

29^0 M235

Pos. +14 +12 +10 +8 +6 +4 +2 0 −2 −4 −6 −8 −10 −12 −14

No. C38 C20 C44 C5 C1 C24 C22 C3 C46 C11 C2 C6 C9 C42

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CRITICAL POSITIONS

$29^0 \frac{84.8}{15.2}$ Expr (20"X24") Run 2 E

135 : I346 B927

Channel

Plastic 6.10 D 35 $\frac{1000}{100}$

B .012

C 48

A 28 $\frac{1000}{200}$

E 0

Tim Crit. 12:39 AM PM Duration 20 min.

C.A. 290 84.8/15.2 Expr. (20"X24") -1 Run 2F

Sheet _____ Date 9-25 1959 Time 2:00 AM PM

Purpose 20"X24"X34 (25?)

Vertical Foil Traverse 290 4 235

Pos. +14 +12 10 8 6 4 2 0 -2 -4 -6 -8 -10 -12 -14

No. C28 C13 C41 C29 C31 C25 C17 C45 C30 C18 C40 C26 C35 C7 C23

CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. (20"X24") -1 Run 2F

Table Pos. .037 T. 2509.8 9266

	Control Rod		Channel
1	Plastic 5.92	A 57	100/500
2		.01	
3		6.0	
4		D 51	100/500
		E .2	690

Tim Crit. 2:17 AM PM Duration 20 min.

9-28-59

INSTRUMENT CHECK

Time 8:35 AM

	Channel B	C	D	E
Range	10/1000 opr	10	10/1000	900 V.
Source Dist.	9"	0"	22"	23" 23"
% F.S. Tmp	91	OK	100	90 100 T

Counter 4.2 ± 3

12-14
7 C 23

C.A. $270\frac{84.8}{15.2}$ Expr (20"x24") - 1 Run

Sheet Date 9-28-59 Time 8:40 AM

Purpose 20"x24"x34.50

Horizontal Foil Traverse 270 4 235

Pos. +9 +7½ +6 +4½ +3 +1½ 0 -1½ -3 -4½ -6 -7½ -9

No. B35 B41 B37 B9 B31 B7 B3 B17 B16 B28 B11 B34 B40

CRITICAL POSITIONS

C.A. $270\frac{84.8}{15.2}$ Expr. (20x24) - 1 Run G

Table Pos. .038 T 0385 B 8248

Control Rod	Channel
Plastic 6.41	B 30 100/1000
	.0128 ~~sub-critical~~
	C 4.7
	D 33 100/1000
	E 2.8 900 V.

Time Crit. 9:22 19/60 AM PM Duration 20 min.

C.A. 270 84.85 / 15.2 Expt (20x24)-1 Run 2H

Sheet _____ Date 9-28-1959 Time 12:00 ~~AM~~ PM

Purpose Horizontal Traverse

270 U 235 Foils

Pos. +9", +7½, +6, +4½, +3, +1½, 0, -1½, -3, -4½, -6, -7½, -9

Foil # B-27, B-24, B-5, B-30, B-8, B-22, B-10, B-4, B-1, B-32, B-17, B-29, B-2

CRITICAL POSITIONS

C.A. 270 84.85 / 15.2 Expt (20x24)-1 Run 2H

Table Pos. -.038 T. .0385' T B² = .7198

	Control Rod		Channel
1	Plastic 6.15	A	45 160/300
2		B	1.01
3		C	5.0
4		D	53 100/300
		E	2.0 90 V

Tim Crit. 12:27 ~~AM~~ PM Duration 20

Run 2-I

Det. Readings same as above.

Pos. +9 +7½ +6 +4½ +3 +1½ 0 -1½ -3 -4½ -6 -7½ -9

Foil # B26 B18 B42 B39 B13 B12 B25 B38 B2 B21 B15 B33 B36

Crit. 1:45 PM Duration 20 min.

9-29-59

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000 μR	10	10	10/1000	900
Source-Dist.	11"	0K	28	3"	2.5"
% F.S. Trip	95	100	95	100	

C.A. 29 84.8/15.2 Expr. (20"x24") - 1 Run 2 J

Sheet ____ Date 9-29-1959 Time 8:45 AM

Purpose Bare & Cd. Covered Horizontal Traverse
2 mil Au Foils
Bare ~ 1" above cent
cd covers ~ 1" below center
20"x24"x34.75"

Position	9	7.5	6	4.5	3	1.5	0	-1.5	-3	-4.5	-6	-7.5	-9
Cd Cov. E	13	16	14	5	25	20	11	8	22	1	19	17	4
Bare	7	21	2	9	18	3	15	24	6	10	23	12	F-1

CRITICAL POSITIONS

C.A. 29 84.8/15.2 Expr. (20"x24") - 1 Run 2 J

Table Pos. .04 T0481 B 7148

	Control Rod	Channel	
1	Plastic 3.6	A .50	1000/1000
2		B .2	
3		C 9.2	
4		D 53	1000/1000
		E 4.0	690

9:13 42/60 AM Dennison 30

C.A. $^{290}\frac{84.8}{15.2}$ (20"x24")-1 Run 2 K

Sheet ___ Date 9-29-59 Time 1:55 PM

Purpose Vertical Traverse

^{290} & Depleted ^{235} & ^{238}

Pos.	0	2	4	6	8
^{290}	A-8	A-10	A-12	A-13	A-15
Dpl.	1	2	3	4	5

CRITICAL POSITIONS

C.A. $^{290}\frac{84.8}{15.2}$ Expr (20"x24")-1 Run 2 K

Scan No. 14 T 8498 B-6148

Screw driver turned by Lloyd Ellis

Control Rod — Counts

1 Plastic 3.55 — A 60 — 100/500

2 — .12

3 — 5.5

4 — D 64 — 100/500

E .2 — 690

Tim Crit. 2:14 AM PM Duration 20 min.

9-30-54

INSTRUMENT CHECK

Time 9:00 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	opr	10^{-10}	10/1000	900V.
Source-Dist.	11"	0"	26"	3"	2"
% F.S. Tap	95	97	100	90	100+

Counters 1, 2 & 3

C.A. 290 84.8/15.2 Expr (20" X 24") - 1 Run 4 A

Sheet ____ Date ____ 195__ Time ____ AM PM

Purpose Bottom Support Structure Evaluation

Stack: 20"X24" X 34.25"

Run 4A Reached log N reading of .18 by paraffin Reflector. Measured Negative period

	log N	[1]	[2]	[3]

4B Stack same. Added al extrusions on top of stack equal to bottom. Centered steel plate 4'X4'X 3/4" above stack on the al.

Reached log N = .001 by plastic reflector

System just Critical (on Positive side)

4C Repeat of Run 4A —

System accidently scrom by Wire along east side of Control Room. (Hit by hand while Turning off overhead lights.

76

10-1-59

INSTRUMENT CHECK

Time 9:00 AM Source Pu Be

	Channel A	B	C	D	E
Range	10^{3} 1000	OPR	10^{-10}	10^{-10} 1000	900 V
Source Dist.	18"	0"	27"	3.5"	25"
% F.S. Trip	90	OK	100	90	100+

Counters 1, 2 & 3

C.A. $290 \frac{84.8}{15.2}$ Exp (20"X24") - 1 4-D

Sheet _____ Date 10-1-59 Time 9:12 AM

Purpose Critical Height determination
no Rods

Stack 20"X24"X33.50"

LOADING CHANGE

Description 20" X 24" X 33.50 Bare
348.28 X 33.5 = 11,667.38

Mass before change _____ gmU-235

Mass of Change _____ gmU-235

Total Mass 11,667.38 gmU-235

Sub critical

10-1-59

Run 4E

LOADING CHANGE

Description 20"X24"X33.75" - Bare No Rods

348.28 X 33.75 = 11,754.45

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 11,754.45 gmU-235

Reached Log N = .18 by use of paraffin reflector.

Measured negative period.

Log N II I2 I3

78

C.A. 29848/152 Expr. 20"X22" Run Run 1A

Sheet _____ Date 10-1 1959 Time 2:10 ~~AM~~ PM

Purpose Critical Determination

20"X22"X40" - Bare

20"X22" Two (2) Safety Rods.

LOADING CHANGE

Description 20"X22"X40" = 17,600 in³

319.26 x 40 = 12,770.40

-23 for Rods

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 12,747.4 gmU-235

Sub Critical

Run 1B

LOADING CHANGE

Description 20"X22"X~~40~~42" = ~~18,480~~ 19,480

319.26X42 = 13,408.92

-23. for Rods

4.18g/4" for Rods

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU 13,385.9 gmU-235

Total Mass _____ gmU ~~13,408.9~~ gmU-235

Sub Critical

Run 1C

LOADING CHANGE

Description 20"X22"X 42.50" = 18,700

319.26 X 42.50 = 13,565.5

Mass before change ____ gmU 13,385.9 gmU-235

Mass of Change ____ gmU 159.6 gmU-235

Total Mass ____ gmU 13,545.5 gmU-235

Sub critical

Run 1D

LOADING CHANGE

Description 20"X22"X 43.50 = 19,140

319.26 X 43.50 = 13,887.81

Mass before change ____ gmU 13,545.5 gmU-235

Mass of Change ____ gmU 319.2 gmU-235

Total Mass ____ gmU 13,864.76 gmU-235

Just Critical (Positive Trend)

80

10-2-89

INSTRUMENT CHECK

Time 8:30 AM ~~PM~~ Source Pu Be

Channel	A	B	C	D	E
Range	$\frac{10}{100}$ Off	10^{10}	$\frac{10}{1000}$	900 V.	
Source Dist.	10"	0"	28"	3"	3"
% F.S. Trip	90	~~0~~ X	100	90	100

Counters 1, 2 & 3 ON

C.A. $29a\frac{84.8}{15.2}$ Expt (20"x22") Run 1 E

Sheet ____ Date 10 - 2 - 89 9:00 AM ~~PM~~

Purpose Critical Determination
Bottom Support Structure Evaluation

Stack 20" X 22" X 44"

LOADING CHANGE

Description 20" x 22" X 44" = 19,360
319.26 X 44 = 14,049.44

Mass before change: 13,864.76 gmU-235
Mass of Change: 159.63 gmU-235
Total Mass: 14,024.39 gmU-235

Measured Positive Period

log N — Counters 1 2 3

C.A. 290 $\frac{848}{15-2}$ Expr. 20" X 22" Run 1 7

Sheet _____ Date 10 - 2 1959 Time 1:42 PM

Purpose Bottom Support Structure Evo.

Stack - 20" X 22" X 43.50"

13,868# gas.

Added al extrusion on top of stack equal to bottom. Centered steel plate 4' X 4' X 3/4" above stack on the al.

Measured Pos. period.

log N — Counters: 1 2 3

Run 17 Removed al extrusion from top of stack.

Stack - 20" X 22" X 44"

Measured Positive Period.

log N — Counters: 1 2 3

235

235

235

82

10-6-57

INSTRUMENT CHECK

Time 8:15 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	OPR	10^{-10}	10/1000	900 V
Source Dist.	9"	0"	27"	2.5"	3"
% F.S. Trip	90	OK	100	90	100+

Counters 1, 2 & 3

C.A. 290 84.8/15.2 Bnd 20"x22" Run 2A

Sheet Dec 10 Time 8:40 AM

Purpose Δ R / Δ h Measurement

20"x22" x44" for Postive Period

20"x22" x43" for Negative Period

Time	Run	Period	log N	Counters 1	2	3
8:40 AM	2A	Negative	233.4			
9:30 AM	B	Positive	183.5			
10:10 AM	C	Positive	182.4			
11:00 AM	D	Negative	230.2			
12:50 PM	E	Negative	234.5			
1:30 PM	F	Positive	184.6			
2:05 PM	G	Positive	182.4			
2:50 PM	H	Negative	233.4			

10-7-59

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	opr	10^{10}	10/1000	900V
Source Dist.	15"	0"	40"	9"	1"
% F.S. Trip	90	ok	100	90	100

Counters 1, 2 & 3

Continued $\Delta\rho/\Delta h$ measurements.

Time	Run	Period	Log N	Counters ①	②	③
9:45 AM	2 I	Negative	242.06			
9:45 AM	J	Positive	174.8			
10:15 AM	K	Positive	172.7			
11:06 AM	L	Negative	241.6			
12:45 PM	M	Negative	247.6			
1:35 PM	N	Positive	172.1			
2:10 PM	O	Positive	171.0			
3:00 PM	P	Negative	23[illegible]6			

10-8-59

INSTRUMENT CHECK

Time 8:10 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/100	opr	10^{-10}	10/100	900 V
Source Dist.	8"		40	3"	1"
% F.S. Trip	90		100	90	10

10-8-19 Continued α P/α h Measurements.

Time	Run	Period	hog N	Counters 1	2	3
8:20 AM	2 Q	Negative				
9:10 AM	R	Positive				
9:40 AM	S	Positive				
10:10 AM	T	Projection blob Flat on al. Negative				
11:~~20~~ AM	U	Negative				
12:40 PM	V	Positive				
1:15 PM	W	Positive				
1:50 PM	X	Negative				
2:~~50~~ PM	Y	Negative				
3:40 PM	Z	Positive.				

10-9-59

INSTRUMENT CHECK

Time 8:45 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	8pc	10^{-10}	10/1000	900V
Source Dist.	11"	0"	28"	2.5"	3"
% F.S. Trip	90	OK	100	90	100

Counters 1, 2 & 3

C.A 290 84.8/15.2 Expr. 20"X22" Run 3A

Shot 10-9 1959 Time 8:50 AM PM

Purp. Vertical Traverse

290 U^{235} Foil

Stack 20"X22"X43 3/4"

Foil Pos. +20 +17½ +15 +12½ +10 +7½ +5 +2½ 0 -2½ -5 -7½ -10 -12½ -15

" No. G46 C-10 C-19 C-27 C-34 C-8 C-2 C-39 C-35 C-7 C-43 C-5 C-12 C-13 C-45 -17½ -20 C-18 C-23

CRITICAL POSITIONS

290 84.8/15.2 Expr. 20"X22" Run 3A

0.14 T .050 B. 0199

	Channel	
Plastic 2.75	A 49	100/500
	.01	
	C 5.0	—
	D 58	100/500
	E .2	750

Init. 9:38 AM ~~PM~~ Duration 20 min.

C.A. 2% 84.8/15.2 Expr. 20"x22" Run 3B

Sheet _____ Date 10-9-1959 Time _____ AM PM

Purpose Vertical Traverse
W235 2% Foils

Foil Pos. 20", 17½", 15", 12½", 10", 7½", 5", 2½", 0
" No. C-29, C-41, C-9, C-38, C-37, C-44, C-6, C-11, C-15

Foil Pos. -20", -17½", -15", -12½", -10", -7½", -5", -2½"
" No. C-24, C-17, C-31, C-16, C-22, C-33, C-21, C-14

CRITICAL POSITIONS

2% 84.8/15.2 Expr 20"x22" Run 3B

Pos 0.14 T .9429 B .0188

Plastic 3.04 A 48 1000/500

,01

C 3.0

D 54 100/500

E .2 750 V.

Tim Crit. 11:07 AM ~~PM~~ Duration 20/25 min

C.A. 2% 84.8/1.512 Expr. 20" X 22" Run 3C

Sheet ____ Date 10-9-1959 Time 11:15 AM/PM

Purpose Vertical Traverse

2% U^{235} Foils.

Stack - 20" x 22" x 43 3/8"

Foil Pos. 20", 17½", 15", 12½", 10", 7½", 5", 2½", 0

" # B-36, B-5, B-31, B-4, B-11, B-16, B-24, B-27, B-8

Foil Pos. -20", -17½, -15", -12½", -10", -7½, -5", -2½"

" # B-12, B-29, B-22, B-34, B-9, B-28, B-10, B-32

88

C.A. 2% 848/15.2 Exp. 20"X24" Run 3D

Start 10-9 9 3:30 PM

Pulp - Au Foil ~~&~~ Spacing Study

2mil Foils.

Stock - 20"X22"X43.5"

	Back	over	up	
+ = up or Right	0	0	0	= A-16 Cd covered
− = down or left.	0	4"	0	= A-7 " "
	0	0"	-6"	= A-12 Bare

Sub Critical - Did not Complete Run

10-12-59

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	Opr	10^{-10}	10/100	900 V.
Source Dist.	10"	0"	29"	2.5"	2.5"
% F.S. Trip	90	8K	100	90	100 T

~~Counter~~ 1, 2 + 3

C.A. Po 84.9/15.2 Expr. 20" X22" Run 3 E

Sheet _____ Date 10-12, 1959 Time 8:35 AM ~~PM~~

Purp. Foil Spacing Study

Stack - 20" X22" X 43.6"
added ½" on front row & each table

Foil Loading Same as p. 88.

Sub

CRITICAL POSITIONS

Run 3F

C.A. 270 848/15.2 Expr. 20"X22" Run 3 E

0.14 Top .8335 B. 0178

BARE
2 mil Au

Plate 6.99 (in)

½" g Stack B .155 → .125

D 40 → 34 1000/1000

E 3.2 → 2.7 690 V.

Pos.	#
0, 0, -6	A-18
0, 0, 0	A-15
0, 4, 0	A-9

Tim Crit. 9:00 30/60 AM ~~PM~~ Duration 20 min.

Crit - 11:16 AM
Duration 15 min.

Log N .17 → .25

C.A. 28 34.8/15.2 Expr. 26"x22" Run 3 G

Sheet _____ Date 10-12 1959 Time 2:35 AM PM

Purpose Foil spacing study
(2 mil Au)

Pos.	Bare Au	Pos.	Cd covered Au
0, -8, +1	A-3	0, -8, -1	A-6
0, 0, +1	A-17	0, 0, -1	A-2
0, +6, +1	A-4	0, +6, -1	A-1

Sub
CRITICAL POSITIONS

C.A 28 34.8/15.2 Expr 20"x22" Run 3 G

Cadmium Ratio 0.141 Typ. .5513 B .9182

Channel Rod Channel

Plastic 6.99 A 52 → 33 1010/500

B .15 → .07

C 7.0 → 3.6

D 64 → 31 1800/500

E 3.0 → 1.4 690 V.

Tim Crit. 2:55 PM ~~PM~~ Duration 20 min.

10-13-59

INSTRUMENT CHECK

Source Ra Be

Time 8:40 AM PM

	Channel A	B	C	D	E
Range	10/1000	opr	10"	1/1000	900V
Source Dist.	9"	8"	28"	25"	2.5"
% F.S. Trip	95	NC	100	95	100+

Ctrs 1, 2 + 3 NC

C.A. 290 84.8/15.2 Expr. 20"X22" Run 3 H.

Sheet _____ Date 10-13 1959 Time 8:50 AM PM

Purp. Horizontal Traverse

(2 mil Au) Bare

Pos. -9" -7" -5" -3" 0 2" 4" 6" 8" 9½"

Foil # B-11 B-12 B-7 B-6 B/15 B-9 B-5 B-13 B-4 B-16

3"

N - B-1 Bare (0,0,-8)

Slightly larger Critical

CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. 20"X22" Run 3 H

Cycle Pos. 0.14 Tg .5 K20 B .9280

Control Rod _____ Channel

Partial out

Channel		
A	45 → 61	1000/1000
B	.16 → .215	
C	8.1 → 10+	
D	43 → 60	1000/1000
E	3.2 → 5.0	690 V.

Crit. 9:05 AM PM Duration 25 min.

92 10-12-59

Reflector Savings - 6" Paraffin

10

	#1	#2	#3	Log N
4A-Bare	43.5 Negative			
4B-Reflected	42.0 Positive			

C.A. 290 84.8 / 5.2 Expr. 20"X22" Run ~~1~~ 0

Sheet _____ Date 10-13-1959 Time 1:55 PM

Purpose Horizontal Traverse
Cd Covered (2 mil Au)

Stack 20"X22"X44.36"

(0, 0, -9)

Pos.	+9½	+8	+6	+4	+2	0	-3	-5	-7	-9	N-B-10
Foil #	C-17	C-9	C-18	B-3	B-14	B-2	B-8	C-20	C-6	C-2	

CRITICAL POSITIONS

C.A 290 84.8 / 5.2 Expr. 20"X22" Run 0

Table Pos. -14 = 245 / B-6170

Central Rod		Channel
Plastic 6.43	47	1000/1000
	.17	
	8.12	
	45	1000/1000
	3.6	

Run Crit. 2:54 PM Duration 25 min.

10-16-59 — Overspeed Safety device wired in this date. Permanent magnet D.C. generator feeds a contact meter for each of the 3 table speeds; and removes motor (table drive) in case speed exceeds a pre-set limit for each speed. J. F. Ellis
There is no limit on Reverse Speed.

INSTRUMENT CHECK

Time 1:15 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range	~~10~~	oper	10^{10}	~~10~~	900V.
Source Dist.	10"	0"	31"	3"	2"
% F.S. Trip	95	OK	100	90	100+

Counters 1, 2 + 3

C.A 20 ~~84.8~~ 15.2 Expr 20"X22" Run 5A

Shee ~~AM~~ 10-16-59 Time 1:45 PM

Purpose Critical Determination -

Stack 20"X22"X42.50 - No Rods

LOADING CHANGE

Description 20"X22"X42.50 = 18,700

319.26 X 42.50 = 13,565.5

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 13,565 gmU-235

Sub critical

(0,-8)
B-10

94 Table Position – 0.08 Top .1499 Bottom .6173

10-16-59

Run 5B Stack 20" X 22" X 42.75" – No Rods
Reached Log n reading .17 by use of paraffin slab.
Measured negative period.
Counters.
Log n [1] [2] [3]

Run 5C – Repeat of 5B. Tables 0.08 Top .1452 B.6181
Reached Log N = .18 – Removed paraffin slab.
On neg period. Reactor Scrammed accidently
~3:15 PM When turning off overhead light in 108.

Reset – Continued run
Reached Log N = .15
measured negative period.
Counters
Log N [1] [2] [3]

10-19-59

INSTRUMENT CHECK

Time 11:05 AM PM Source Pu-Be

Channel	A	B	C	D	E
Range	10/1000	apx 10	10	10/1000	900V
Source Dist.	10"	0"	3.3"	3"	2.5"
% F.S. Trip	95	OK	100	90	100+

Counters 1, 2 & 3

C.A. 2% 8x8/15.2 Expr. 19"X22" Run 1A

Sheet ____ Date 10-19-59 Time 11:15 AM PM

Purpose Critical Determination

Stack - 19"X22"X52" - Bare
2 Safety Rods

LOADING CHANGE

Description 19X22X52 = 21,736
X18 in² Base X.7256 = 303.3 g/in height
303.3 X 52 = 15,771
- 18 g for Rods

Mass before change	gmU		gmU-235
Mass of Change	gmU		gmU-235
Total Mass	gmU	15,753	gmU-235

Sub Critical

Run 1B

LOADING CHANGE

Description 19"X22"X56" - Bare

303.3 X 4 = 1213.2 g added

Mass before change	gmU	15,753	gmU-235
Mass of Change	gmU	1213.2	gmU-235
Total Mass	gmU	16,966	gmU-235

Sub Critical

Run 1 C

LOADING CHANGE

Description 19" X 22" X 57" - Bare

1" = 303.3 g

Mass before change	gmU	16,966	gmU-235
Mass of Change	gmU	303	gmU-235
Total Mass	gmU	17,269	gmU-235

Sub critical

Run 1 D

LOADING CHANGE

Description 19" X 22" X 58" - Bare

1" = 303.3 g

Mass before change	gmU	17,269	gmU-235
Mass of Change	gmU	303	gmU-235
Total Mass	gmU	17,572	gmU-235

Sub Critical.

Run 1 E

LOADING CHANGE

Description 19" X 22" X 59" - Bare

1" = 303.3

Mass before change	gmU	17,572	gmU-235
Mass of Change		304	gmU-235
Total Mass	gmU	17,876	gmU-235

Sub Critical

Measured Negative - 530 Sec

(Log r only)

2.4 ¢

$CH = 15^{cm}$

$\left(\frac{\Delta\rho}{\Delta h}\right)^{-1/3}$ (.93)

$\left(\frac{\Delta\rho}{\Delta h}\right)^{1/3} = 1.075$

$\frac{\Delta\rho}{\Delta h} = (1.075^2)^3 = 1.243$

$\frac{1.243\ \Delta K \times 10^{-4}}{\Delta h}$

$\frac{1.94 = \alpha}{cm}$

1.24^{cm}

10-20-59

INSTRUMENT CHECK

Time 10:35 AM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	opr	10^20	10/1000	900V
Source Dist.	12"	0"	3¼"	3"	2.5"
% F.S. Trip	95	OK	10c	90	100T

Counters 1, 2 & 3

C.A. 270 84.8/15.2 Expr. 18"X24" Run 1 A

Sheet ____ Date 10-20-1959 Time 11:22 AM

Purpose Critical Determination

Stack - 18"X24"X56" - Bare

2 Safety Rods

LOADING CHANGE

Description 18"X24"X56" = 24,192

18 X 24 = 432 in² Base - 313.4 g/in² Highly

24,192 X .7256

Mass before change ____ gmU 17,553.7 gmU-235

Mass of Change ____ gmU -25 for Rods gmU-235

Total Mass ____ gmU 17,528 gmU-235

Sub Critical

Run 1 B

LOADING CHANGE

Description 18"X24"X56.25" - Bare

¼ X 313.4 = 78.4

Mass before change ____ gmU 17,528 gmU-235

Mass of Change ____ gmU 78 gmU-235

Total Mass ____ gmU 17,606 gmU-235

Slightly Super Critical ~ 1000 Sec Period (Estimated)

10-20-59

LOADING CHANGE

Description 18" X 24" X 57.25" - Base

Run 1C

Mass before change ____ gmU 17,606 gmU-235

Mass of Change ____ gmU 314 gmU-235

Total Mass ____ gmU 17,920 gmU-235

$\Delta P / \Delta h$ Measurements.

Stack - 18" X 24" X 57.25" For Positive Periods

- 18" X 24" X 56.25" ∞ (close)

- 18" X 24" X 55.25" For Negative Periods

Time	Run	Period	Log N	Counters [1] [2] [3]
2:20 PM	1C	Positive	181.3	
3:15 PM	D	∞ (+)	2292	
3:55 PM	E	Negative	263.3	

10-21-57

INSTRUMENT CHECK

Time 8:20 AM

Source Pu Be

Channel	A	B	C	D	E
Range	1K 100	Off	10^{-10}	1K 100	900V
Source Dist.	11"	0"	34"	2.5"	2"
% F.S. Trip	90	OK	100	95	100+
Counter	1,243				

Continued $\Delta P/\Delta h$ measurements

Time	Run	Period	Log N	Counters 1	2	3
8:30 AM	F	Negative	276.9			
9:35 AM	G	Positive	171			
10:25 AM	H	∞ (+)	1800.7			
11:10 AM	I	Negative	271.4			
12:30 PM	J	Positive	173.7			
1:55 PM	K	∞ (+)	2237			
2:50 PM	L	Negative	271.4			
3:45 PM	M	Positive	175.9			

10-22-59

INSTRUMENT CHECK

Time 8:20 AM PM Source Pu Be

Channel	A	B	C	D	E
Range	10/1000	opr	10	10/1000	900 V
Source Dist.	10"	off	30"	3"	2"
% F.S. Trip	95		100	95	100

Continued α/α th measurements

Time	Run	Period	Log N	Counter 1	2	3
8:25 AM	1 N	Positive	175.9			
9:45 AM	O	∞ (+)	2346			
~~11:00 AM~~	P	Negative	270.3			
12:30 PM	Q	Positive	183.5			
1:25 PM	R_1	∞ (+)	3246			
	R_2	∞ (+)				
2:40 PM	S	Negative	272.5			
3:30 PM	T	Positive	183.5			

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source Pu Be

10-23-59

Channel	A	B	C	D	E
Range	10/1000	opr	10	10/1000	900
Source Dist.	10"		6"	3"	2"
% F.S. Trip	80	off	100	90	100

10-23-59

Continued Δ P/O k Measurements

Time	Run	Period	Log N	Counters 1	2	3
9:35 AM	1 Z	Negative	276.8			
9:40 AM	V_1	∞ (+) > water off 235F Temp. & Humidity change (up)				
	V_2	∞ (+)				
10:50 AM	W	Negative (Temp?)	269.3			
1:25 PM	X	Negative	274.7			
2:10 PM	Y	∞ (+)	245.2			
3:20 PM	Z	Negative	274.1			

INSTRUMENT CHECK

Time 8:22 AM ~~PM~~ Source P. B.

10-26-59

	Channel A	B	C	D	E
Range	1/1000 cps		1-"	10/1000	900V
Source Dist.	11" ok		34"	3"	2"
% F.S. Trip	90		100	80	100

Channel "E" out of trig circuit for Run 1A, → F,

10-26-59 Continued α/αh measurements

Time	Run	Period	log N	Counters 1	2	3
8:35 AM	1 A_1	Negative	285.5			
9:50 AM	B_1	∞ (+)	1579			
1:25 PM	C_1	Negative	277.9			
2:10 PM	D_1	Negative	284.5			
3:00 PM	E_1	∞ (+)	1948			
3:50 PM	F_1	Negative	276.9			

INSTRUMENT CHECK

10-27-59

Time 8:25 AM PM Source Pu Be.

	Channel A	B	C	D	E
Range	1/1000 cpm		1"	1/100 cpm	out
Source Dist.	11"	OK	35"	25"	
% F.S. Trip	85		100	90	

New Photo Mult. tube in "E" after Run G, Not as sensitive as the old one. Max. Voltage of 1050 Recommended by. IECO's

Continued α/αh Measurements

Time	Run	Period	log N	Counters 1	2	3
8:40 AM	1 G_1	Positive	164			
9:55 AM	H_1	∞ (+)	1464			
11:20 AM	I_1	Positive	165			
12:25 PM	J_1	Positive	168.3			
1:05 PM	K_1	∞ (+)	Chan "D" Tripped without any apparent Tubes being Checked. Not in Program Run Repeat			
2:50 PM	K_1	∞ (+))	1897			
3:40 PM	L_1	Negative	280.1			

10-28-59

INSTRUMENT CHECK

Time 8:25 AM PM Source Ra Be

Channel	A	B	C	D	E
Range	1/1000	1	1	1/100	100
Source Dist.	13"	OK	35"		0"
% F.S. Trip	90	OK	100	100	100

Continued α P/α h Measurements

Time	Run	Period	Log N	Counters 1	2	3
8:40 AM	1 M,	Positive	165			
9:40 AM	N,	∞ (+)	1575			
10:40 AM	O,	Positive	162.9			
11:40 AM	P,	Positive	166.1			
12:55 PM	Q,	∞ (+)	1731			
2:00 PM	R'	Positive	166.1			

C.A. ~~2 90~~ 84.8 / 13.2 Expr. 18"X24" Run 2A

Sheet _____ Date 10-28-1959 Time 3:0[illegible] AM PM

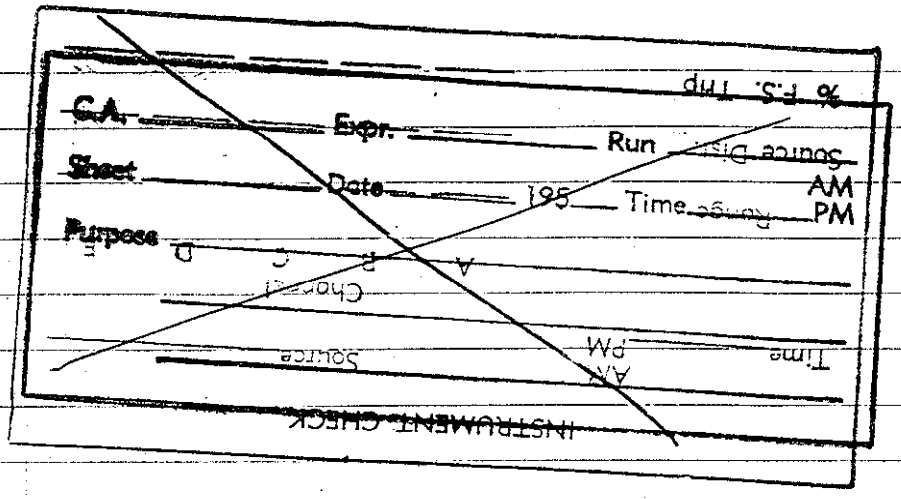
Purpose Paraffin Reflector Savings

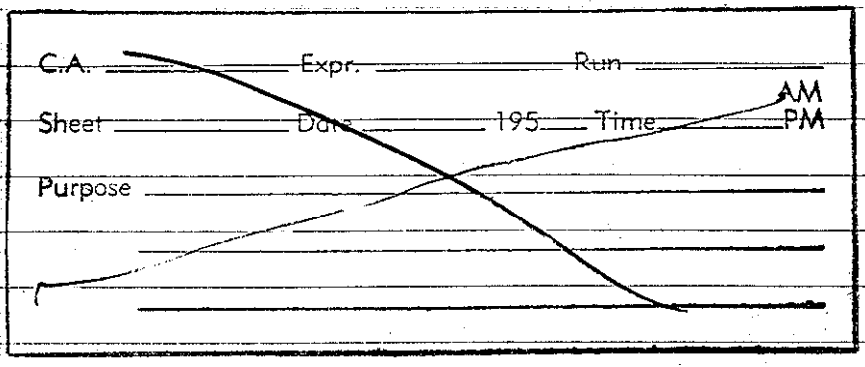
6" paraffin on top of stack.

Stack - 18"X24"X55.25"

Measured positive period -

2A.	Log N	1	2	3	
3:50 PM	Stack - 18"X24"X56.25" - 6" paraffin removed				
2B	Log N	1	2	3	





INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source

	Channel A	B	C	D	E
Range	10/1000	off	10^{-12}	10/1000	1250 V
Source Dist.	14"	OK	36	5"	1/2
% F.S. Trip	80		100	80	100

C.A. 290 84.8 15.2 Expr. 18" X 24" Run 3A

Sheet Date 10-29-99 Time 9:05 AM ~~PM~~

Purpose Vertical Traverse
U-235 Foil

Stack 18" X 24" X 56.75"

28.5" above bottom

Pos.	-24	-20	-16	-12	-8	-4	0	+4	+8	+12	+16	+20	+24
Foil No.	B-33	B-21	B-25	B-10	B-22	B-5	B-27	B-18	B-12	B-11	B-29	B-17	B-2

CRITICAL POSITIONS

C.A. 29° 84.8 / 15.2 Expr. 18"x24" Run 3A

.07 Top 8424 B. 8163

Channel

Plastic = 5.51 A 66.50 100/500

B .011

C 3.6

B 53.50 100/500

E .2 750V.

Tim Crit. 9:24 45/60 AM PM Duration 20 min.

24,025 feet

Run 3 B Pos. -24 -20 -16 -12 -8 -4 0 +4 +8 +12 +16 +20 +24

Foil No. B-15 B-30 B-26 B-6 B-9 B-4 B-20 B-31 B-42 B-35 B-1 B-38 B-32

1 lead

CRITICAL POSITIONS

C.A. 29° 84.8 / 15.2 Expr. 18"x24" Run 3 B

.07 T8393 B 8163

Channel

Plastic 4.76 A 68 100/500

B 011

C 5.6

D .54 100/500

E .2 750V

Tim Crit. 10:54 AM PM Duration 20 min.

Plastic in Position is 6.97

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10-29-59

Run 3C - Vertical Traverse.

Pos.	-24	-20	-16	-12	-8	-4	0	+4	+8	+12	+16	+20	+24
Foil No.	B-37	B-36	B-39	B-3	B-7	B-14	B-40	B-16	B-13	B-24	B-41	B-34	B-28

CRITICAL POSITIONS

C.A. 29a $\frac{84.8}{15.2}$ Expr 18"X24" Run 3C

Table Pos. .07 L $\frac{848}{39}$ B 16

	Control Rod	Channel	
Plastic 1.71		A .44	$\frac{1000}{100}$
2		B .014	
3		C 66	
4		D 63	$\frac{100}{500}$
		E .2	750

Tim Crit. 12:27 AM PM Duration 20 min.

C.A. 29a $\frac{84.8}{15.2}$ Expr. 18"X24" Run 3D

Sheet _____ Date 10-29 1959 Time 2:50 AM PM

Purpose Horizontal Traverse

U^{235} Foils (28.5" from Bottom)

Stack - 18"X24"X 57.42"

Pos.	+8	+6	+4	+2	0	-2	-4	-6	-8
Foil No.	C-22	C-21	C-6	C-44	C-3	C-46	C-18	C-19	C-43

25 min. Exposure

These foils exposed with reactor slightly sub critical. k_{eff} drifted from .012 down to .006

10-30-59

INSTRUMENT CHECK

Time 8:28 AM ~~PM~~ Source Pulse

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$ Opr		10^{-10}	$\frac{10}{1000}$	1050 ✓
Source Dist.	13"	0"	34"	3"	½"
% F.S. Trip	95	OK	100	80	100+

Counters 1, 2 & 3

C.A. $29.0\frac{84.8}{15.2}$ Expr. 18"X24" Run 3E

Shee[illegible] Date 10-30 195 9 Time 8:35 AM ~~PM~~

Purp. Horizontal Traverse

h = 235 Foils

Stock - 18"X24"X57.75"

Pos	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil No.	C-17	C-41	C-34	C-15	C-16	C-2	C-29	C-30	C-33

CRITICAL POSITIONS

C.A. $29.0\frac{84.8}{15.2}$ Expr 18"X24" Run 3E

[illegible] .07 T-4375 B-8135

[illegible] Rod

Plastic 2.75

Channel

A 53 $\frac{100}{1000}$

B .016

C 5.4

D 41 $\frac{100}{1000}$

E .2 750

[illegible] Crit. 8:47 $\frac{55}{60}$ AM PM Duration 20 min.

10-30-59

Run 37 Horizontal Traverse, 2% U^{235} foils.

Pos	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil No.	C-35	C-37	C-32	C-9	C-10	C-12	C-1	C-5	C-8

CRITICAL POSITIONS

A 290 84.8 / 15.2 Expr. 18"x24" Run 37

Cadmium Pos. .07 T 4299 .8149

Control Rod	Chamber
Plastic 997.92	A 53 1000/100
	B .017
	C 5.4
	D 66 1000/100
	E .2 750

Tim Crit. 10-8 25 AM / 6 PM Duration 20 min.

Run 38 12:10 PM Horizontal Traverse 2% U^{235} foils.

Pos.	-8"	-6"	-4"	-2"	0	+2"	+4"	+6"	+8"
Foil No.	C-38	C-7	C-11	C-4	C-40	C-20	C-27	C-45	C-25

10-30-59

CRITICAL POSITIONS

Run A 290 84.8/15.2 Expr. 18" x 24" Run 3 D

Module Pos. .07 T 3199.8-8169

	Control Rod	Channel
1	Plate 998.20	A 49 — 1000/100
2		B .016
3		C 4.8
4		D 60 — 1000/100
		E .2 — 750

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

12:30 PM Switch on Vibrating Reed meter "D" turned from 100 to 10 setting. Scraming system at Log N = .018 Reset Rerun foils.

11-2-59

INSTRUMENT CHECK

Time 8:15 AM PM Source Pu Ba

	Channel A	B	C	D	E
Range	10 / 500	opn	10 / 10	10 / 1000	1050 V.
Source Dist.	12"	0"	36"	25"	0"
% F.S. Trip	95	OK	100	80	100+

Counters 1, 4, 3.

C.A. 290 84.8 / 15.2 Expr. 18"X24" Run 3 H

Sheet ____ Date 11-2-59 Time 8:35 AM PM

Purpose Vertical Traverse

Cd. covered Gold foils (2 mil)

18"X24"X57 1/4"

Pos.	+25	+20	+15	+10	+5	0	-5	-10	-15	-20	-25
Foil No.	18	28	1	19	8	D-21	15	16	2	26	14

Slightly Super Critical

CRITICAL POSITIONS

C.A. 290 84.8 / 15.2 Expr. 18"X24" Run 3 H

Table Pos. .07B-.818E-.3601

Control Rod	Channel	
Plastic - out	A 47 - 55	1000 / 500
	B .09 - .11	
	C 6.5 - 7.5	
	D 43 - 51	1000 / 500
	E .3	690

Time Crit. 9:17 AM PM Duration 20 min.

Run 3I Cd covered Vertical Traverse - 2 mil Au Foils.

Pos. +25", +20", +15", +10", +5", 0, -5" -10", -15," -20," -25

No. G-7, G-17, G-11, G-24, G-4, G10, G-6, G-9, G-22, G-20, G-23

CRITICAL POSITIONS

C.A. 29, 84.8/15.2 Expr. 18"X24" Run 3 I

Table Pos. .07 T. 1105 T B. 9168

Control Rod	Channel	
Plastic out	A .50	1000/1000
2	B .2	
3	C 9.8	
4	D 60.5	1000/1000
	E .8	690 V.

Tim Crit. 11:00 AM ~~PM~~ Duration 30 min.

Run 3J Cd covered Vertical Traverse - 2 mil Al Foils

Pos. +25", +20", +15", +10", +5", 0, -5", -10", -15", -20", -25"

No. G-3 G-5, G-13, G-27, G25, G-8, H-29, H-5, H-20, H-13, H-17

CRITICAL POSITIONS

C.A. 29 84.8/15.2 Expr. 18"X24" Run 3J

Table Pos. 8846 B 8173 T 8398

Control Rod	Channel	
Plastic - out	A 49	1000/1000
2	B .2	
3	C 9.6	
4	D 45	1000/1000
	E 1.0	650

Tim Crit. 2:20 AM ~~PM~~ Duration 30

112

11-3-59

INSTRUMENT CHECK

Time 11:25 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10 / 1000	opr	10^-10	10 / 1000	
Source Dist.	12"	0"	3/4"	3"	1/2"
% F.S. Trip	9%	OK	150	80	100+

Counters 1, 2 & 3

C.A. 290 84.8 / 15.2 Expr. 18"X24" Run 4 A

Sheet ____ Date 11-3 1959 Time 11:55 AM PM

Purpose Bottom Support Structure Evaluation

18"X24"X55.25"

Added Al extrusion on top of stack. equal to bottom, centered steel plate 4'X4'X 3/4" above stack on the Al. Negative period.

4A Log N (1) (2) (3) counters

4B Stack 18"X24"X56.25"
Removed Al extrusion from top of stack
Measured Positive period.
Log N (1) (2) (3)

11-4-59

INSTRUMENT CHECK

Time 9:35 AM ~~PM~~ Source Ra Be

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	Off	10^{-10}	$\frac{10}{1000}$	1050 ✓
Source Dist.	13"	0"	33"	2.5"	½"
% F.S. Trip	90	OK	100	90	180?

Counters 1, 2, & 3

C.A. $2.90\frac{848}{15.2}$ Expr. 18"X24" Run 4C

Sheet ..... Date 11-4 1959 Time 10:10 ~~AM~~ PM

Purpose Critical Height Determination Without Rods

Stack - 18"X24"X55" No Rods

Removed safety blades.

Measured Negative period.

long N ① ② ③

al

D.

P. 58-77

11-4-59

C.A. 290 $\frac{84.8}{15.2}$ Expr 20"X24" Run 5A

Sheet ____ Date 11-4-1959 Time 3:05 PM

Purpose Preparation to rerun Δρ/Δh Measurements.
See pages 58-77 for work on stack with base 20"X24"
20"X24"X34½ - No Rods

LOADING CHANGE

Description 20"X24"X34.50"
348.28 X 34.50 = 12,015.66

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 12,015 gmU-235

achieved log N = .009 by use of paraffin slab.
Removed slab, had ~ 480 Sec positive period, or 2.5 ¢

11-5-59

INSTRUMENT CHECK

Time 8:30 AM PM Source Ra Be

	A	B	C	D	E
Range	10/1000	open	10^{-10}	10/1000	1050 V
Source Dist.	11"	0"	3¼"	3"	½"
% F.S. Trip	90	~~80~~	100	80	100
Counters	1, 2 & 3				

C.A. 270 84.8/15.2 Expr. 20"X24" Run 5 B

Sheet ____ Date 11-5 1959 Time 8:40 AM PM

Purpose Same as for run 5A

Added Rod on Stationary Table
Stack 20"X24"X34.50 – 1 Safety Rod.

Run B Leveled with Plastic at 3.52 – Not to be moved for next exps.

Time	Run	Period	Log N	Counters I	II	III
9:43 AM	5 C	Positive	154.2			
10:37 AM	5 D	∞ (+)	1392.0			
12:30 AM.	5 E	Positive	147.6			
1:07 PM	5 F	Positive	144.9			
1:55 P.M.	5 G	∞ (+)	1087			
2:55 PM	5 H	Positive	144.0			

11-6-59

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/1000	1050 V
Source Dist.	12"	0"	34"	3"	½"
% F.S. Trip	90	OK	100	85	100+

Counters 1, 2 & 3

Continued Δρ/Δh measurements

Time	Run	Period	log N	Counters 1	2	3
8:40 AM	5 I	Positive	134.6			
9:50 AM	J₁	∞ (+)				
	J₂	∞ (+) Plastic Moved to 99¼25-				
11:05 AM	K	Positive	171.5			
11:40 AM	L	Positive	169.4			
1:10 PM	M	∞ (+)	5112			
2:15 PM	N	Positive	169.4			
2:50 PM	O	Positive	171.5			
3:35 PM	P	∞ (+)	7666			

11-9-59

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	open	10	10/1000	1000 ✓
Source Dist.	13"	0	35"	2.5"	.5"
% F.S. Trip	90	OK	100	80	100+

Counters 1, 2 & 3

Channel "A" out of Scram Circuit (Erratic response at high levels)

Time	Run	Period	Log N	(1)	Counters (2)	(3)
8:45 AM	Q	Positive	178.1			
9:50 AM	R	∞	∞	∞	∞	∞
10:45 A.M.	S	Positive	173.7			
11:38 A.M.	T	Positive	174.8	178.1	177.9	181.0
12:50 P.M.	U	∞	∞	∞	∞	∞
2:07 PM	V	Positive	178.1	178.7	177.9	179.8 ✓
2:40 P.M.	W	Positive	176.4	180.0	178.1	180.2
3:25 PM	X	∞	∞	∞	∞	∞

11-11-59

INSTRUMENT CHECK

Time 8:25 AM Source Pu Be

	Channel A	B	C	D	E
Range	∞ / 1000	cps	10^{-11}	10 / 1000	1050 V
Source Dist.	3"	0"	35"	25"	½"
% F.S. Trip	100+	OK	100	95	100+

Counters 1, 2 & 3

C.A. 290 84.8 / 15.2 Exp. 18"X24" 6 A

Sheet Date 11-11 959 8:35 AM

Purpose Δ P/Δ h measurements

20"X24"X34.50" for level (∞ (+))

Stack 20"X24"X34.25" for ~~level~~ Negative periods

Time	Run	Period	Log N	Counters 1	2	3
8:35 AM.	6 A	Negative				
10:15 AM	B	∞ (+)				
11:75 AM	C	Negative				
1:00 PM	D	Negative				
1:50 PM	E	∞ (+)				
3:05 PM	F	Negative				

11-12-59

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~

Source Pu Be

Channel	A	B	C	D	E
Range	$\frac{10}{1000}$	off	10^{-10}	$\frac{10}{1000}$	900V.
Source Dist.	5"	0"	0"	3"	½"
% F.S. Trip	95	01C	No Response	95	100+

Counters 1, 2 & 3

Time	Run	Period	Log N	① ② ③ counters
8:40 AM	6 G	Negative		
10:00 AM	H	∞ (+)		
10:55 AM	I	Negative		
1:10 PM	J	Negative		
1:55 PM	K	∞ (+)		
3:05 PM	L	Negative		

11-13-59

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	~~2μ~~	Oper	10^{-10}	$\frac{10}{1.00}$	1050 V.
Source Dist.	~~2μ~~	0"	34"	2.5"	.5"
% F.S. Trip	~~2μ~~	OK	100	90	100+

Counters 1, 2 & 3

Time	Run	Period	Log N	Counters 1	2	3
8:30 AM	6 M	Negative				
9:30 AM	N	∞ (+)				
10:50 AM	O	Negative				
12:45 PM	P	Negative				
1:50 PM	Q	∞ (+)				
2:58 PM	R	Negative				

CRITICAL POSITIONS

C A 290 $\frac{84.8}{15.2}$ Exp 24P-2 Run 1

11-16-59 .075 T-7212 B-1172

Plastic 4.18 A 32 $\frac{1001}{1000}$

B .11

C- 6.2

D 32 $\frac{1000}{1000}$ ←

E 1.2 750 V.

Time Init. 3:28 PM Duration 40 min.

11-16-59

INSTRUMENT CHECK

Time ____ AM / PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/1000	1050 V
Source Dist.	8"	0"	3½"	2.5"	½"
% F.S. Trip	95	OK	100	85	100 +

Counters 1, 2 & 3

rs [3]

C.A. 270 8X.8 / 15.2 24 P-2 Expr. 24"X24" Run 1

Sheet ____ Date 11-16-1959 Time 2:25 AM / PM

Purpose Gold Cadmium Fraction

2 mil, 5/16" dia

Bare - No Rods

24"X 24" X 25.11

LOADING CHANGE

Description 24"X 24" X 25" = 14,400 in³

14,400 X .7256 = 10,448 gm

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 10,448 ____ gmU-235

Box	0, -1, +1	0, +1, +1	0, -1, -1	0, +1, -1
No	D-12	D-17	D-14	D-5
	Bare	Cd. covered	Bare	Cd. covered

Stack 24"X 24"X 25.11"

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11-17-59

Au cd Fraction

INSTRUMENT CHECK

Time 9:30 AM Source Pu Be

Channel	A	B	C	D	E
Range	10/1000	cps.	10^{-10}	10/1000	1050 V.
Source Dist.	11"	0"	34"	2.5"	½"
% F.S. Trip	90	OK	100	85	100
Counters					

Pos. Cd. Cd. 0, +1, +1 Bare 0, -1, -1

Foil no. #9 #33

Stack 24"X 24" X 25.11"

CRITICAL CONDITIONS

C.A 29. 84.8/15.2 Exp 24 P.2 Run 2

Tube .073 T7362B 8160

	Check
Plastic 2.01	A 57 1000/500
	B .11
	C 6.1
	D 54 1000/500
	E 1.2 750 V.

Time Crit. 10:05 AM Run 25 min.

Au Cd Fraction

11-17-59

	Bare		Cd. Cvd.	
Pos.	0, -1, +1	0, -1, -1	0, +1, +1	0, +1, -1
Foil No.	D-4	D-31	D-16	D-27

CRITICAL POSITIONS

C.A. 290 $\frac{84.8}{15.2}$ Expr. 24P-2 Run 3

Table Pos. .075 L T 7438 B 8170

Control Rod		Channel
Plate 4.33	A 57	1000/500
	B .115	
	C 6.1	
	D 5.6	1000/500
	E 1.3	750 V.

Tim Crit. 11:35 AM ~~PM~~ Duration 25 min.

Run 4 Indium Cd Fraction

	Bare		Cd. Cvd.	
Pos	0, -1, +1	0, -1, -1	0, +1, +1	0, +1, -1
Foil No	H-13	H-26	H-11	H-28

CRITICAL POSITIONS

C.A. 290 $\frac{84.8}{15.2}$ Expr. 24P2 Run 4

Table Pos. 075 L T 7375 B 8172

Control Rod		Channel
Plastic 4.42	A 35	1000/100
	B .02	
	C 4.0	
	D 64	1000/100
	E .2	750 V.

3:34 12 min.

124

11-18-59

INSTRUMENT CHECK

Time ___ AM PM Source Pu Be

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	Opr	10^{-10}	$\frac{10}{1000}$	1058 V
Source Dist.	11"	0"	32"	2.5"	½"
% F.S. Trip	90	0K	100	90	100+

Uses 1, 2 & 3

Sodium Bare Cd Fraction Cd. C.V.d

Pos	0, -1, +1	0, -1, -1	0, +1, +1	0, +1, -1
Foil No	#22	#25	#1	#10

CRITICAL POSITIONS

$270\frac{84.8}{15.2}$ Exp. 24 P-2 Run 5

.075 .7348 B-6178

Control Rod Channel

Plastic - 4.59 36 $\frac{1000}{100}$

.016

5.0

D 61 $\frac{1000}{100}$

E 1 750 V.

Tim Crit. 9:01 $\frac{15}{60}$ AM PM Duration 20 min.

Run 6 Cd Fraction U^{235} Foils (½" dia metal, U-al alloy)

	Bare		Cd. Cvd.	
Pos	0, -1, +1	0, -1, -1	0, +1, +1	0, +1, -1
Foil No	#13	#14	#1	#4

Slightly Sub-Critical

CRITICAL POSITIONS

CR 29 $\frac{84.8}{15.2}$ Expr. 24 P-2 Run 6

Table Pos. .075 T 7158. 6139

Control Rod	Channel
Plastic 6.99	A 57 → 28 $\frac{1000}{500}$
2	B .11 → .05
3	C 6.0 → 3.0
4	D 53 → 26 $\frac{1000}{500}$
	E 1.0 → .4

Tim Crit 10:44 $\frac{10}{60}$ AM PM Duration 20 min

Stack 24"x24"x25.11"

126

11-19-59

INSTRUMENT CHECK

Time 8:20 AM — Source Pu Be

	A	B	C	D	E
Channel					
Range	10/1000	opr	10	10/1000	1000
Source Dist.	10"	2"	3-4"	2.5"	½"
% F.S. Trip	95	OK	100	85	100

Counters 1, 2 & 3

C.A. 290 84.8/15.2 Expr. 24 P-2 7A

Sheet — Date 11-19-59 Time 8:35 AM

Purpose Calibration U-235 U-Al Alloy Foils
5 mil thick 5/16" dia.
Foil on rotating wheel
Stack 24" x 24" x 25"

Wt. gms.	location on wheel
.0169	1→8
.0170	9→14
.0172	15
.0173	16→18

11-19 Run

CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. 24 P-2 Run 7

Table Pos. .13 notebook T — R —

	Control Rod	Channel
Plastic	9.94.4	3.5 — 1000/1000
		.13
		7.2
4		D 3.2 — 1000/1000
		= 1.5 — 750 Y.

Tim Crit. 8:52 25/40 AM — Duration 40 min

C.A. 29 $\frac{848}{15.2}$ Expr. 24 P-2 Run 8 A

Sheet 11-19-195 Time 1:22 P.M.

Purpose Bottom support Structure Evaluation

Stack 24" X 24" X ~~24~~ 25"

Reached Log N = .17, Measured Negative period.

Log N	147	Counters 1	2	3

11-19-59

Run 8 B Stack - 24" X 24" X 25"

Added al extension on top of stack - equal to bottom, centered steel plate 4'X4' X 3/4" above stack on the al.

128

11-20-59

INSTRUMENT CHECK

Time 10:25 ~~PM~~ Source PuBe

	Channel A	B	C	D	E
	10/1000	opr	10^{-10}	10/1000	1050 V
Source Dist.	10"	0"	34"	2"	½"
% F.S. Trip	85	~~OK~~	100	90	100 f

etrs 1, 2 & 3

C.A. $270\frac{84.8}{15.2}$ Expr. 24 P-2 Run 9 A

Sheet ..... Date 11-28-1959 Time 10:38 ~~PM~~ AM

Purpose Be oxide Reactivity Measurements

Stack - 24" X 24" X 25.5"

Void 4"X4"X1" at ~ Center of Fixed Table.
Be O Block 4"X4"X1" at ~ Center of Movable Table.
Weight of block - 371.50 gms
Sub Critical

Run 9-B

Stack
24"X24"X25.75

CRITICAL POSITIONS

C.A. $270\frac{84.8}{15.2}$ Expr. 24 P-2 Run 9 B

.075 T5255 ~~8~~ 9158

Control Rod	Channel	
Plastic 5.60	A 34	100/100
C- 6.825	B .0014	
	C 2.8	
	D 59	100/100
	E 0	

Tim Crit. 11:20 ~~PM~~ AM Duration 10 min.

11-20-59 Void 4"X4"X1" at ~ Center of each table.
Run 9-C Measured Negative period.
Log N

9D Added Be O #1A and #3B to Voids
Slight Positive period
did not Measure period

9E Void 4"X4"X1" at ~ Center of each table.

CRITICAL POSITIONS

C = 29,848/152 Expr 24P-2 Run 9E

Rod Pos. 075 ; T 4085. = 9179

Control Rod	Channel
Plastic-out	A 64 100/100
C - 9.81	B .0030
	C 2.8
	D 37 100/200
	E 0

Crit. 3:35 PM Duration 12 min.

11-23-59

INSTRUMENT CHECK

Time 9:10 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	10/1000 cps		10^10	10/100	1950
Source Dist.	8"	a/c	4"	3"	½"
% F.S. Trip	90		100	80	100

C.A. 20 848/15.2 Expr. 24 P-2 Run 9F

Sheet _____ Date 11-23 1959 Time 9:36 AM ~~PM~~

Purpose Be O Reactivity Measurements

9F Void at Center System ~ level.
Run Period log N Counters D E B
~~9F~~ ∞(+)

9G Placed blocks #1A 371.5 gms + #3B 372 gms in Void
Positive Period.

H Void at Center.
∞ (+)

I Blocks #1B 375 gms and #2A 373.5 gms in Void
Positive period.

J. Blocks #3A 373 gms and #4A 372.5 gms in Void.
Positive period.

K. Voids at Center.
∅ (+)

L. Blocks # 2B, 371 gms & #4B, 370.5 gms in Void.
Positive Period.

in Void

o in Void

11-24-59

INSTRUMENT CHECK

Time 11:20 AM ~~PM~~ Source Cu Bo

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	1/1000	1050 V
Source Dist.	8"	0"	OK	3"	½"
% F.S. Trip	Ntr 1, 2 & 3	90	OK	100	85

C.A. 2% 84.8/15.2 Expr. 24P2 Run 7B

Sheet ____ Date 11-24-1959 Time 11:40 AM ~~PM~~

Purpose U^{235} U-al Foil Calibration

5 mil thick, ⅜" dia.

Stock 24" x 24" x 25"

wt gms	location in wheel
.0177	2 → 10
.0176	11 → 15
.0175	16 → 18

Foil #2 from Run 7A p/126 in hole 1 to be used as Normalizer.

Bare
1 - 1¼" dia In

Cd Covered
1 - 1¼" dia Au
1 - 1¼" dia In

CRITICAL POSITIONS

C.A. 2% 84.8/15.2 Expr. 24P-2 Run 7B

Critic Pos. 0.15 Not Closed R

Control Rod: Plastic 4.39 C = 5.98

Channel:
A 61 1000/500
B .13
C 6.5
D 57 1000/500
E 2.4 750 V

Tim Crit. 12:00 Noon ~~PM~~ Duration 40 min.

At Center of stack at 3:50 PM
1200 MR

11-25-59

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

Original

	A	B	C	D	E
Range	10/1000 cps		10^{-10}	10/1000	10 to V.
Source Dist.	10"	0"	40"	2"	½"
% F.S. Trip	90	OK	100	80	100+

Ctrs 1, 2 & 3

C.A. 2% 8 4:8 / 1.5-2 Expr. 24 P-2 Run 10A

Sheet ____ Date 11-25 1959 Time 8:45 AM PM

Purpose Be O Reactivity Measurements.

~~Blocks #1A, 374.5 gms + 3B 372 gms.~~

Time	Run	Period	Log N	A Centro B	E
9:00 AM	10A	Positive			
9:45 AM	Void at Center. (4"X4"X2")				
	10B	∞ (-)			
10:45 AM	Block #1B, 375 gms and #2A 373.5 gms. in void.				
	10C	Positive			
11:20 AM	~~10D~~ Block #2A, 373 gms and #4A 372.5 gms.				
	10D	Positive			
11:55 AM	10E	Void at Center (4"X4"X2")			
		∞ (-)			
12:55 PM	10F	Blocks #2B, 371 gms + #4 B, 370.5 gms.			
		Positive			

134

11-27-59

INSTRUMENT CHECK

Time 10:33 AM ~~PM~~ Source PuBe

	Channel A	B	C	D	E
Range	10/1000	oper	10	10/1000	1050 V.
Source Dist.	8"	0"	36"	3"	1/3"
% F.S. Trip	95.	OK	100	80	1000

Chan 1, 2 & 3

C.A. 2% 848/15.2 Expr. 24P-2 Run 11

Sheet _____ Date 11-27-1959 Time 11:20 AM ~~PM~~

Purpose Foil Exposure for
1C-20" (Dr. Knight) (
Y-1D (Ogg & Goodin

Stack – 24" X 24" X 25.625"

CRITICAL POSITIONS

C.A. 2% Expr. 24P-2 Run 11

~~Table~~ Pos. .075 T. 80627 Bp. 4172

Control Rod	Channel	
plastic out	A	54 1000/1000
	B	.2
C = 19.03	C	9.2
	D	45 1009/1000
	E	1.0 690 V.

Tim Crit. 12:06 ~~AM~~ PM Duration 120 min.

11-30-59

INSTRUMENT CHECK

Time 9:30 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	opn	10^{-1}	1/1000	1050
Source Dist.	8"	out	40"	3"	1"
% F.S. Trip	80		100	40	105

C.A. 28 84.8/15.2 Expr. 24P-2 Run 7C

Sheet ____ Date 11-30 1959 Time 10:18 AM PM

Purpose U^235 U-al foil Calibration

Same foils in wheel as 7B p. 132

CRITICAL POSITIONS

28 84.8/15.2 Expr 24P-2 Run 7C

.085 Not Closed

	Channel	
Plastic out	S2	1000/1000
C. 20.62 in		.19
		9.0
	D	43 1000/1000
	E	.4 690 V.

Time Crit. 10.32 AM Duration 30 min.

136

12-1-59

INSTRUMENT CHECK

Time 11:15 AM/PM Source PuBe

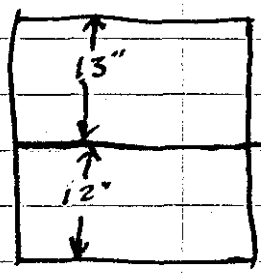
	Channel A	B	C	D	E
Range	10/1000	Opr	10^{-6}	10/1000	1030 V.
Source Dist.	11"	0"	36"	2.5"	½"
% F.S. Trip	90	OK	100	85	1000

C.A. 28 84.8/15.2 Expr. 24P-2 12A

Sheet ____ Date 12-1-59 Time ____ AM/PM

Purpose U^{238} Fission Counter Traverse

Stack – 24" X 24" X 25.3"



Selsyn = 1.07 when tip of probe is at East edge of stack. Counter Center ~ 1.75" from end of probe.

		Selsyn Reading	Counter Cycles	(For U^{238} ctr)	U^{233} Fission Ctr #2	U^{238} Fission Ctr #3
2:28 PM	10 Min	3.00	4.68	752^{+35}	X 256 = 192,547	6,296
2:39 PM	"	5.00	6.68	680^{+211}	X " = 174,291	7,732
2:50 PM	"	7.00	8.68	522^{+228}	X " = 133,855	7,032
3:01 PM	"	9.00	10.68	359^{+186}	X " = 92,090	5,392
3:12 PM	"	11.00	12.68	227^{+199}	X " = 58,161	3,514
3:22 PM	"	13.00	14.68	142^{+202}	X " = 36,554	2,204
3:33 PM	"	15.00	16.68	98^{+79}	X " = 25,167	1,404
3:43 PM	"	17.00	18.68	78^{+144}	X " = 20,112	930
3:54 PM	"	19.00	20.68	75^{+33}	X " = 19,238	680

12-2-57

INSTRUMENT CHECK

Time 8:25 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	1/1000	opr	10^{-10}	10/1000	103 V.
Source Dist.	11"	0"	36"	3"	½"
% F.S. Trip	95	OK	100	95	100?

Reel 12B

U^{238} Fission Traverse

E to W.

	10 min cts	U^{233} Fission Scaler #2	Selayne Reading for U^{238}	Counter % Counter	U^{238} Fission Printer #2
9:08 AM	"	$676^{+108} \times 256 = 173,164$	2.32	4.00	4,917
9:19 AM	"	$694^{+229} \times$ " $= 177,888$	3.32	5.00	6,220
9:30 AM	"	$678^{+104} \times$ " $= 173,672$	4.32	6.00	6,912
9:41 AM	"	$637^{+94} \times$ " $= 163,116$	5.32	7.00	7,331
9:52 AM	"	$673^{+229} \times$ " $= 172,517$	6.32	8.00	8,577
10:03 AM	"	$728^{+213} \times$ " $= 186,583$	7.32	9.00	9,901
10:14 AM	"	$710^{+105} \times$ " $= 181,865$	8.32	10.00	10,234
10:26 AM	"	$675^{+40} \times$ " $= 172,840$	9.32	11.00	10,132 —
10:37 AM	"	$661^{+87} \times$ " $= 169,303$	10.32	12.00	10,242 —
10:48 AM	"	$642^{+153} \times$ " $= 164,505$	11.32	13.00	9,869 —
10:59 AM	"	$612^{+89} \times$ " $= 157,761$	12.32	14.00	9,376 —
11:10 AM	"	$587^{+224} \times$ " $= 150,496$	13.32	15.00	8,720 —
11:20 AM	"	$583^{+109} \times$ " $= 149,357$	14.42	16.00	8,307 —
11:30 AM	"	$609^{+254} \times$ " $= 156,158$	15.32	17.00	8,001 —
11:41 AM	"	$601^{+37} \times$ " $= 153,893$	16.32	18.00	7,268 —
11:52 AM	"	$591^{+166} \times$ " $= 151,462$	17.32	19.00	6,396 —
12:02 PM	"	$610^{+180} \times$ " $= 156,340$	18.32	20.00	5,928 —

$\text{Log } N = .1^{+}$

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12-2-54

238/233

Same Traverse from W to E

		U^{233} Fission Scaler #2	U^{238} Fission Salsign	Cutie Counter	U^{238} Fission Printer #2
12:13 PM	10 min	640^{+25} X 256 = 164,092	18.32	20.00	6,301
12:24 PM	"	629^{+30} X " = 161,074	17.32	19.00	6,981
12:35 PM	"	575^{+121} X " = 147,321	16.32	18.00	6,989
12:52 PM	"	629^{+217} X " = 161,241	15.32	17.00	7,988
1:03 PM	"	526^{+118} X " = 134,774	14.32	16.00	7,313
1:19 PM	"	474^{+143} X " = 121,487	13.32	15.00	7,168
1:30 PM	"	341^{+139} X " = 87,437	12.32	14.00	5,270
2:15 PM	"	613^{+158} X " = 157,086	12.32	14.00	9,263
2:27 PM	"	534^{+19} X " = 136,723	11.32	13.00	8,204
2:38 PM	"	547^{+159} X " = 140,191	10.32	12.00	8,268
2:49 PM	"	581^{+84} X " = 148,564	9.32	11.00	8,758
3:00 PM	"	576^{+112} X " = 147,568	8.32	10.00	8,372
3:11 PM	"	556^{+186} X " = 142,522	7.32	9.00	7,353
3:23 PM	"	541^{+63} X " = 138,559	6.32	8.00	6,931
3:34 PM	"	535^{+55} X " = 137,015	5.32	7.00	6,204
3:45 PM	"	534^{+222} X " = 136,926	4.32	6.00	5,462
3:56 PM	"	545^{+74} X " = 139,594	3.32	5.00	4,856
4:07 PM	"	542^{+137} X " = 138,889	2.32	4.00	3,839

12-3-59.

INSTRUMENT CHECK

Time 12:45 AM/PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	opt	10	10/1000	100 V
Source Dist.	11"	0"	34"	2.5"	½"
% F.S. Trip	95	OK 100	80	100	

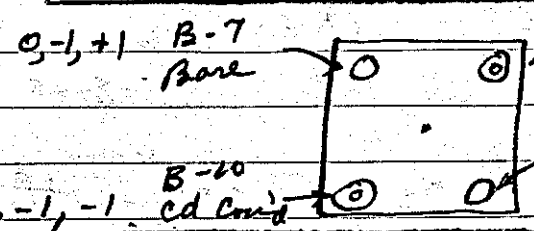
Ctrs 1, 2 + 3

C.A. 270 848/15.2 Expr. 24 P-2 Run 13A

Sheet ____ Date 12-3-59 Time 2025 AM/PM

Purpose U^{235} U-Al alloy (3/16" dia) Cadmium Fraction

Stack - 24" X 24" X 25.15"



CRITICAL POSITIONS

C.A. 270 848/15.2 Expr. 24 P-2 Run 13A

Rod Pos. .075 Time 8250 9189

		Channel
Plastic	6.77	.43 1000/1000
No Rods		.13
C		8.6
D		69 1000/500
E		1.6 690

Tim Crit. 1:49.05/60 AM/PM Duration 2.6 min.

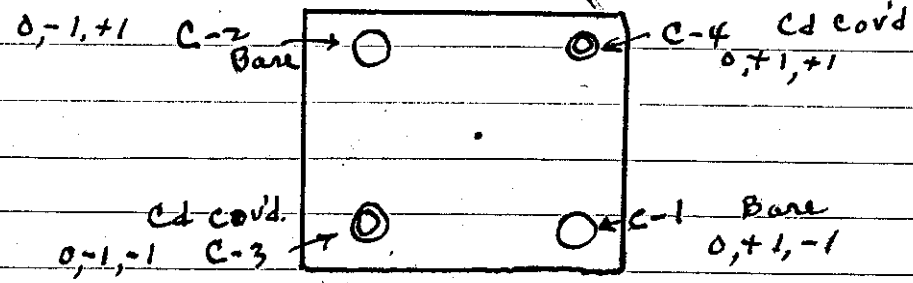
2:22.52/60

12-3-59

C.A. 290 84.8/15.2 Expr. 24 P-2 Run 13-B

Sheet _____ Date 12-3 1959 Time 3:17 ~~AM~~ PM

Purpose U^{235} U-al alloy (5/16" Dia)
Cadmium Fraction
20 mil Covers
Stack 24" X 24" X 25.15"



CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. 24 P-2 Run 13-B

Table Pos. 075 L T 84.45 R 9.195

	Control Rod		Channel
1	Plastic 6.72	A 39	1000/1000
2	No Rods	B 11	
3		C 9.0	1000
4		D 60	500
		E .8	690

Tim Crit. 3:20 ~~AM~~ PM Duration 15 min.

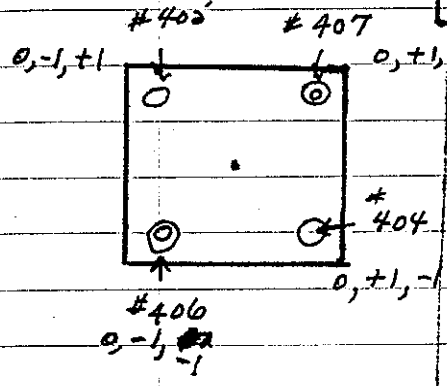
12-4-59

INSTRUMENT CHECK

Time 9:40 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	Opr	10	10/1000	1050 V.
Source Dist.	11"	0"	36"	3"	½"
% F.S. Thp	90	OK	100	85	100+

1 mil Au ⅝" dia for cd fraction.



C.A. 290 84.8/15.2 Expr. 24 P-2 Run 11 B

Sheet ____ Date 12-4-59 Time 10:13 AM PM

Purpose Foil Exposure for K-25 (Dr Knight) & Dr Henry

Stack 24"X24"X25.58"

Two safety rods & one control rod added to Stack

2 - ½" dia & 2 - 5/16" dia Copper foils for R.K.R.

CRITICAL POSITIONS

C.A. 290 84.8/15.2 Expr. 24 P-2 Run 11 B

Table Pos .072 T. 8172 B. 8182

Control Rod	Channel	
Plastic = 7.0 ¢	A 5.5	1000/1000
C = 16.80	B .195	
Inverted Rod C = 20.69	C 9.0	
Measured Neg. period	D 47	1000/1000
	E 1.0	690 V.

Tim Crit. 10:54 +6/60 AM PM Duration 120 min.

12-4-59

C.A. 29 84.8/5.2 Expr. 24 P-2 Run 11-C

Sheet ____ Date 12-4-59 Time 2:30 AM/PM

Purpose Series of negative periods

24"X24"X25.58

Run 11-~~D~~-C Rod-C at 20.69

Plastic - 7.015

Run 11-D Rod-C at 20.69

Plastic 6.48

Run 11-E

Rod C @ 20.69

Plastic 4.25

12-7-59

INSTRUMENT CHECK

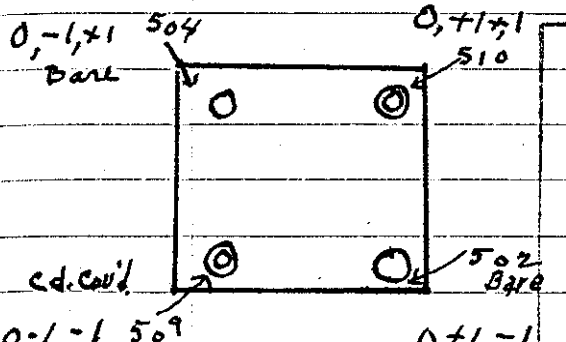
Time 10:00 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	40/1000	off	10-10	10/1000	1050 V
Source Dist.	11"	0"	36"	2"	½"
% F.S. Trip	25	02	100	85	100

also 1, 2 + 3

Au 5 mil, 7/16" dia

cd. Covd.



C.A. 290 84.8/15.2 Expr. 24 P.2 Run 13-C

Sheet ____ Date 12-7 1959 Time 10:10 AM PM

Purpose ~~2.235 Au 5 mils~~ (5/16" dia)

Cadmium Fraction

20 mil Covers.

Stack 24" X 24" X 25.60"

CRITICAL POSITIONS

C A 290 84.8/15.2 Expr. 24 P.2 Run 13-C

Table Pos. .07 L T 719.8 3132

Control Rod	Channel	
Plastic .702	A 63	1000/500
Rod C 17.61	.11	
	C 7.7	
	D 58	1000/500
	E .7	690

Time Crit. 1032 AM PM Duration 20 min.

C.A. 29 $\frac{84.8}{15.2}$ Expr. 24 P. 2 Run 13. D

Sheet _____ Date 12 - 7 1959 Time 12 55 AM PM

Purpose Au 5 mil (5/16" Dia)
Cadmium Fraction
20 mil Covers

CRITICAL POSITIONS

C.A. 29 $\frac{84.8}{15.2}$ Expr. 24 P. 2 Run 13. D

Table Pos. .07 II Tilt 7232 P. 016.8

Control Rod | Channel

Plate 702 | A 72 | 1000/500

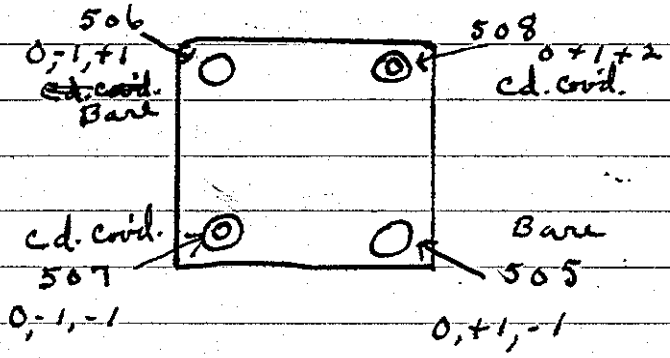
C 18.19 | S .14

3 | C 9.0

4 | D 68 | 1000/500

E .8 | 690 V.

Tim Crit. 1:16 $\frac{12}{60}$ AM PM Duration 20 ~~12~~



12-8-59

INSTRUMENT CHECK

Time 9:05' AM PM

Channel

	A	B	C	D	E
Range	10/1000	open	10^{-10}	10/1000	1050V
Source Dist.	11"	0"	32"	2"	½"
% F.S. Trip	85'	OK	100	80	100+

Ck 1, 2 & 3

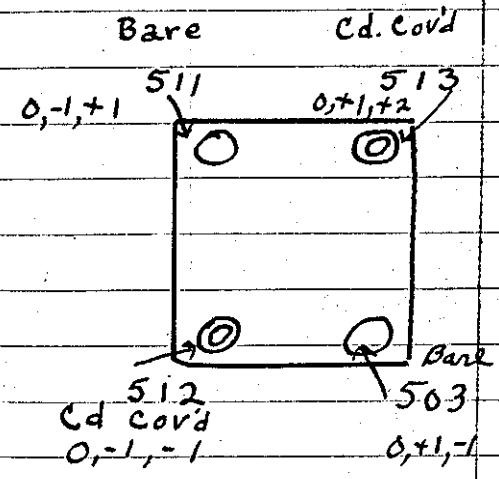
C.A. 290 848/15.2 Expr. 24 P-2 Run 13-E

Sheet ____ Date 12-8-59 Time 9:20 AM PM

Purpose Au 5 mil (5/16" Dia)

40 mil. Covers

Stack 24" x 24" x 25.76



CRITICAL POSITIONS

290 848/15.2 Expr. 24 P-2 Run 13-E

uble Pos. ____ 07 L T 6330 R 7188

Control Rod	Channel	
Plastic 7.02	A 66	1000/500
C - 16.48	S 13	
	- 8.0	
	D 61	1000/500
	E 7	690

Tim Crit. 10:08 28/60 AM PM Duration 20 min.

12-8-59

C.A. 29 84.8/15.2 Expr. 2 X P. 2 Run 13-7

Sheet _____ Date 12-8 1959 Time 11:30 AM

Purpose A 4 1 mil
Cadmium Fraction
20 mil Covers

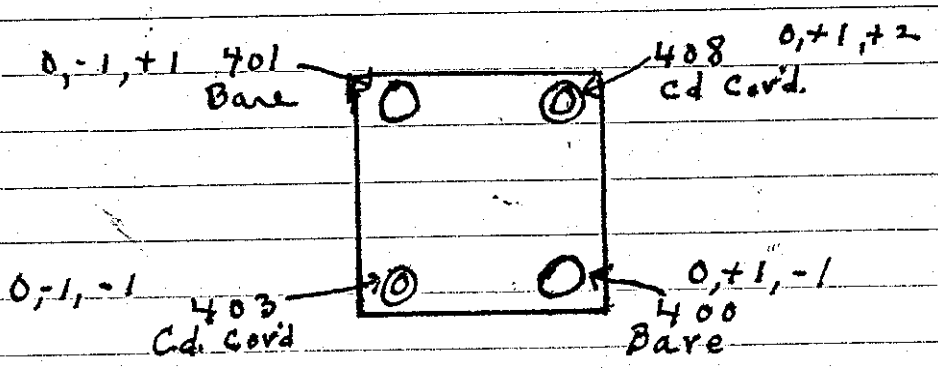
CRITICAL POSITIONS

C.A. 29 84.8/15.2 Expr. 2 X P. 2 Run 13-7

Table Pos. .07 L T 6165 P 3165

	Control Rod		Channel
	Plastic 7.02	A 71	1000/500
	C 20.08	B .14	
3		C 7.0	
4		D 66	1000/500
		E .7	690

Tim Crit. 11:48 58 AM / 60 PM Duration _____ min.



12-9-59

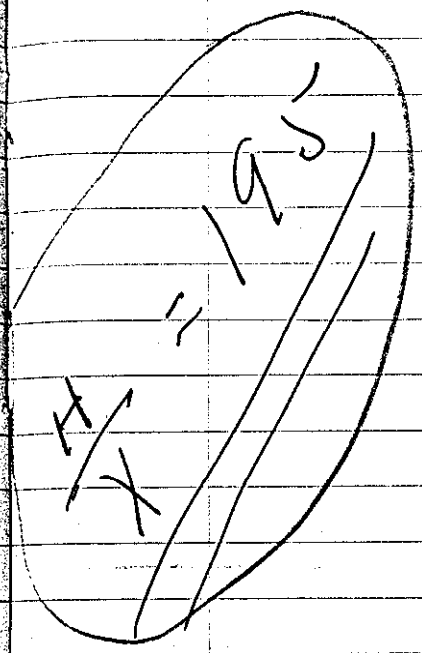
INSTRUMENT CHECK

Source Pu Be

Time 1:00 AM PM

	Channel A	B	C	D	E
	1/1000		10⁻¹⁰	10/1000	
Range	11"	8"	36"	3"	½"
Source Dist.	90	OK	10	80	100
% F.S. Trip					

Ctrs 1, 2 & 3



INSTRUMENT CHECK

C.A 2792/8 Expr. 30X30 Run 1

Time AM PM Source

Sheet Date 12-9 1959 Time 1:20 AM PM

Purpose Be O Reactivity Measurement

Channel

Range Be O Blocks 4" X 4" X 1"

Source Dist. Stack 30" X 30" X 31"

% F.S. Trip

1.026 gm/in³

LOADING CHANGE

Description 30" X 30" X 31.1" [½" layer on 3 Center Rows]

900 in² Base = 923.4 gms / 1" Height

923.4 X 31.1 = 28,717.7 grams

= 48.2 " for Rods

	gmU	gmU-235
Mass before change		
Mass of Change		
Total Mass	28,669.5	

Stack — 14" Deep on movable table, 1 safety rod.

— 16" Deep on Fixed table, 1 safety and 1 control rod, with void 4"X4"X2" . 14" up from al sptrusion, 13" in from either side.

12-10-59

INSTRUMENT CHECK

Time 8:35 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/100	1038V
Source Dist.	11"	0"	38"	3"	1"
% F.S. Trip	90	OK	100	80	100 X

Use 1, 2 & 3

C.A. 2% 92/8 Exp. 30"X30" Run 2

Sheet ____ Date 12-10 959 Time 8:55 ~~AM~~ PM

Purpose Be O Reactivity Measurement

Stack 30"X30"X31"

Run 2A Blocks # 1A, 371.5 gms and # 3B, 372 gms in void. Counter

9:10 ~~AM~~ Positive Period log N [1] [2] [3]

300.7

2B Void 4"x4"x2" at Center

10:30 ~~AM~~ ∞ (+) Period log N [1] [2] [3]

3682.0

2C Blocks # 1B, 373 gms and 2A 373.5 gms.

11:30 ~~AM~~ Positive Period.

301.3

2D Blocks # 3A, 373 gms and 4A 372.5 gms

12:25 ~~PM~~ Positive Period.

313.2

1:10 PM Void 4"x4"x2" at Center
Run 2E ∞ (+) Period —
Log N 6098 ① ② ⑫ 2

Run 2F Blocks #1 A & #3 B.
2:15 PM Positive Period
324.6

2G Blocks #1 B & #2 A
3:00 PM Positive Period,
319.7 2

2H Void at Center
3:45 PM ∞ (+) Period.
17,324

150

12-11-89

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

	Channel A	B	C	D	E
Range	1 mR	off	10^{-10}	10 / 1000	1050V
Source Dist.	11"	0"	35"	3"	1"
% F.S. Trip	85	ok	100	80	103+

Ctrs 1, 2 & 3

Continued Be O Reactivity Measurements.

9:10 AM Blocks # 1A + 3B.
Run 2I Positive Periods ① ② ③
Log N 376.7

J Void at Center
10:30 AM ∞ (−)
−1099 3

K Blocks # 2A + 1B.
12:20 PM Positive Period
380

1:10 PM Blocks # 1A + 3B
L Positive Period
382.2

1:55 PM Void at Center
M ∞ (−)
2741

N Block # 2A + 1B
3:00 PM Positive Period

12-14-59

INSTRUMENT CHECK

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

	Channel A	B	C	D	E
Range	10/1000	open	10^{-0}	10/100	1025V
Source Dist.	11"	∞	34"	2.5"	1/2"
% F.S. Trip	85	OK	100	80	100+

Ctrs 1, 2 & 3

Continued BeO Reactivity Measurements.

9:15 AM Block # 1A & 3B

Run 20 Positive Period. ctrs ① ② ③

log N - 388.5

10:05 AM Void at Center

2P ∞ (-)

2762.7

10:55 AM Blocks 2A + 1B

2Q Positive Period

377.3

12:45 AM Blocks 1A & 3 B.

2R Positive Period.

388.7

1:30 PM Void at Center

2S ∞ (-)

2380.4

2:25 PM Block 2A & 1B

2T Positive Period

388.7

3:05 PM Blck 1A & 3B

2U Positive Period

393.0

3:45 PM Void at center [new "E" Detector placed 1" from stack]

2V ∞ (-)

3224.4

12-15-59

INSTRUMENT CHECK

Time 8:30 ~~PM~~ AM Source Pa Be

Channel	A	B	C	D	E
Range	10/1000	Oper	10/100	10/1000	1050 V
Source Dist.	12"	0"	38"	3"	½"
% F.S. Trip	90	OK	100	75 ✓	100 ✓

Ctrs 1, 2 & 3

Continued Bo 0 Reactivity Measurements.

8:45 AM Blocks 2A & 1B.
Run 2W Positive Period.
Log N 362.6

9:95 AM Void at Center
2X ∞ (−)
3246.0

10:40 AM Blocks 1A & 3B
2Y Positive Period.
363.7

12:15 PM Blocks 2A & 1B
2Z Positive Period
386.58

1:00 PM Void at Center
2AZ ∞ (−)
2452.5

1:55 PM Blocks 1A & 3B
2B3 Positive Period
393.0

2:40 PM Blocks 2A & 1B
2C3 Positive Period —
387.6

3:25 PM Void at Center
2D2 ∞ (−)
2019.8

12-16-59

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source Pu Be

	Channel A	B	C	D	E
Range	.1/1000	9pc	10^{10}	1/100	1050V
Source Dist.	10"	OK	36"	3"	1"
% F.S. Trip	90		100	90	100

Continued Be O Reactivity Measurements

8:30 AM Blocks 1A & 3B
Run 2E3 Positive Period

10

9:25 AM Void at Center
2F2 ∞ (−)

10

10:15 AM Blocks 2A & 1B
2G2 Positive Period

12:30 PM Blocks 3A + 4A
2H2 Positive Period

2

1:20 PM Void at Center
2I2 ∞ (−)

3

2J3 Blocks 3A + 4A
2:20 PM Positive Period

2:55 PM Block 3A + 4A
2K2 Positive Period

4

3:30 PM Void at Center
2L2 ∞ (−)

4-13-60

INSTRUMENT CHECK

Time 9:05 AM ~~PM~~ Source PN-967

	Channel A	B	C	D	E
Range	~~10~~ 100	Opr	10^{-10}	~~10~~ 100	1000 V.
Source Dist.	8"		36"	2.5"	1.5"
% F.S. Trip	85		100	85	100

C.A. 290 $\frac{92}{8}$ Expr. 30" X 30" Run

Sheet Dg 4-13 1960 Time 9:20 AM

Purpose Reactivity Measurement

Zero Runs. Floor Scattering

Stack 30" X 30" X 31"

LOADING CHANGE

30" X 30" X 31"	923.4 gms	gmU	gmU-235
900 in² Base	28,625 gms	gmU	gmU-235
923.4 X 31"	48.2 gms for Rods		
	28,577.2	gmU	gmU-235

Description | Date of Change | Total Mass

CRITICAL POSITIONS

290 $\frac{92}{8}$ Expr 30" X 30" Run 3

.06 T-95/5 B-8318

~~C-8.4~~ A X5 $\frac{1000}{500}$

Rod C. dn. B. .02

~~B. 02~~ C. 8.4

D 26 $\frac{1000}{500}$

E .6 750 V.

AM/PM Start _____ Duration _____ min.

Slightly Positive

156

4-13-60

Run 3A

C.A. 270 92/8 Expr. 30"X30 Run 3A

Sheet [illegible] 4-13-60 Time 10:10 AM

Purpose: Reactivity Measurement
Covered area under block
stock with ¼" Thick Boral +-⅛" Cadmium.
Stack 30"X30"X31"

CRITICAL POSITIONS

C.A. 270 92/8 Expr 30"X Run 3A

.06 T 9495 8370

A 43 1000/500
.02

Rod C. In. 8.0

D 62 1000/200

E .6

Tim Crit. _____ AM PM Duration _____ min.

Slightly Positive.

4-14-60

Run 3-B

INSTRUMENT CHECK

Time 8:50 AM PM Source PN-467

Channel

	A	B	C	D	E
F					
Range	10/1000	Off	10	10/1000	1050
Source Dist.	6"		36"	3"	1"
% F.S. Trip	95		100	85	100+

Ctrs 1, 2 & 3

CA 29% 9 2/8 Expr. 30"X30" Run 3-B

Sheet Date 4-14-60 Time 9:18 AM PM

Purpose Reactivity Measurement

Repeat of Run 3A.

Removed - 4 - 4As 4X4X1 Block removed from each Corner of stock.

CRITICAL POSITIONS

CA 29% 9 2/8 Expr. 30"X30" Run 3-B

Tables .055 T 9492 B 8320

	Rod	Chamber
A		A 36 1000
B		D 41 1000/100
C	20.035	C 4.0 2X10-8
		B .0039
		E .4 840V.

Tim Crit. _____ AM PM Duration _____ min.

Level

C.A. 29092/8 Expr. 30"X30" Run 3-C

Sheet _____ Date 4-14 1960 Time 10:35 AM PM

Purpose Reactivity Measurement / Floor Reflection

Boral Removed from under Table.

LOADING CHANGE

Description _____

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

CRITICAL POSITIONS

C.A. 29092/8 Expr. 30"X30" Run 3-C

Table Pos. .035 I T 15.8320

Control Rod	Channel
C = 20.035	A 40+ 1000/100.
2 _____	B .004+
3 _____	C 4.0+ 2X10⁻⁸
4 _____	D 50+
	E .4+ 810 Vb

Tim Crit. _____ AM PM Duration _____ min

Slight Positive Period.

4-18-60

INSTRUMENT CHECK

Time 8:55 AM ~~PM~~ Source PN-967

		A	B	C	D	E
Range	F	10/1000	off	10^{-10}	10/1000	1050 V.
Source Dist.		8"	0'	36"	25"	1"
% F.S. Trip		85	OK	100	85	100 ↑

C.A. 2% 92/8 Expr. 30"X30" Run 3-D

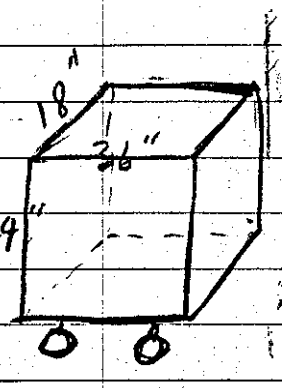
Sheet _____ Date 4-18-1960 Time 9:55 AM ~~PM~~

Purpose Floor Reflection studies

Placed Large Cart of Paraffin

40" East of Block Stack (same distance as from floor to bottom of Stack)

Cart of Paraffin 36"X 44"X18"



CRITICAL POSITIONS

C.A 2% 92/8 Expr. 30"X30 Run 3-D

Table For .055 T8492 B.8320

Channel

A	64	100/500
B	.0026	
C-2032	5.0	10^{-8}
D	34	100/500
E	0	750 V.

Tim Crit. 9:47 AM PM Duration _____ min.

Pulled cart away by rope and measured negative period.

$\frac{H}{X} = \sim 500$

5-3-60 Paraffin + UF_4 Blocks, 2% U^{235}, $\frac{H}{X} = \sim 500$.
.6484 g U^{235}/in^3, 371.17 g/in height
Block Stack 24" X 24" X 8", Source PR 467
directly under center of stack.
4,608 in^3, U^{235} = 2,969 grms.
5 min Counts (scale of 256)

Run	Counter #1	#2	#3	
	9 + 223	33 + 1	34 + 134	
	10 + 35	33 + 122	35 + 27	
	9 + 189	33 + 5	34 + 232	
	10 + 8	32 + 246	34 + 204	
	10 + 22	32 + 123	34 + 172	
	12,765	42,225	44,545	Σ
CPM	511	1,689	1,782	3982
$\frac{1}{CPM}$	1957	5921	5612	2511

164

5-4-60

INSTRUMENT CHECK

Time 9:05 AM PM Source PN-467

	Channel A	B	C	D	E
Range	10/1000	Opr	10^10	10/1000	1050 ✓
Source Dist.	8"		36"	25"	1"
% F.S. Trip	85		100	85	100+

C.A. 29 82/18 Expr. 24X24 Run 2

Sheet ____ Date 5-4-1960 Time ____ AM PM

Purpose Multiplication on approach to a critical stack Size for $\frac{M}{R}$ = 500 Material.

BARE

Stack 24"x24"x12" - 4,454 g U^{235}

5 min	—	37 +35	40 +92	
	12 +75	37 +179	40 +91	
	12 +56	36 +254	40 +33	
	12 +76	37 +71	40 +160	
	12 +79	37 +208	40 +189	
	12,554	47,851	51,765	
	628	1,914	2,071	4613
	1592	5225	4829	2168

Run 3 Stack 24"X24"X16" - 5,939 gms U^{235}

5 Min	16^{+102}	46^{+188}	60^{+53}	
	16^{+80}	46^{+219}	49^{+248}	
	15^{+178}	46^{+158}	49^{+207}	
	12392	35893	38396	
	8261	2393	2559	5778
	1211	4179	3906	1731

Run 4 Stack 24"X24"X20" - 7,423 gms U^{235}

5 Min	23^{+151}	69^{+4}	72^{+238}	
	24^{+65}	67^{+36}	72^{+223}	
	24^{+6}	67^{+108}	72^{+179}	
	18,398	52,116	55,936	
	1,227	3,474	3,729	8,430
	8150	2879	2682	1186

Run 5 $75^{\times 6}$ $201^{\times 27}$ $214^{\times 1}$

5 Min	19321	51,583	54,825	
	3864	~~366~~ 10317	10,965	25,146
	2588	9693	9120	3977

Stack 24"X24"X24" - 8,908 gms U^{235}

5-5-60

INSTRUMENT CHECK

Time 10:45 AM Source P. B.

	A	B	C	D	E
	1"/100 opr		15"	4/1000	105
Source	8"		3'	3½"	1½
% F.S. Trip	80	ok	100	93	100.

Run 6 Stack 24" X 24" X 26" – 9,650 gms U^{235}

on positive period with tables at 0.32

C.A. 29 82/18 Expr. 24 X 24 Run 7

Sheet _____ Date 5-5-1960 Time 3:10 AM PM

Purpose To get just Critical System
Removed back layer of 2"
Thick block from each Table.
Fixed 1" X 11" X 11" plexiglas Reflector to Rod Drive "A"

Run 7 on Positive period – Tables =0.18

Run 8 Removed blocks from East + West Rows of top (2" Blocks)

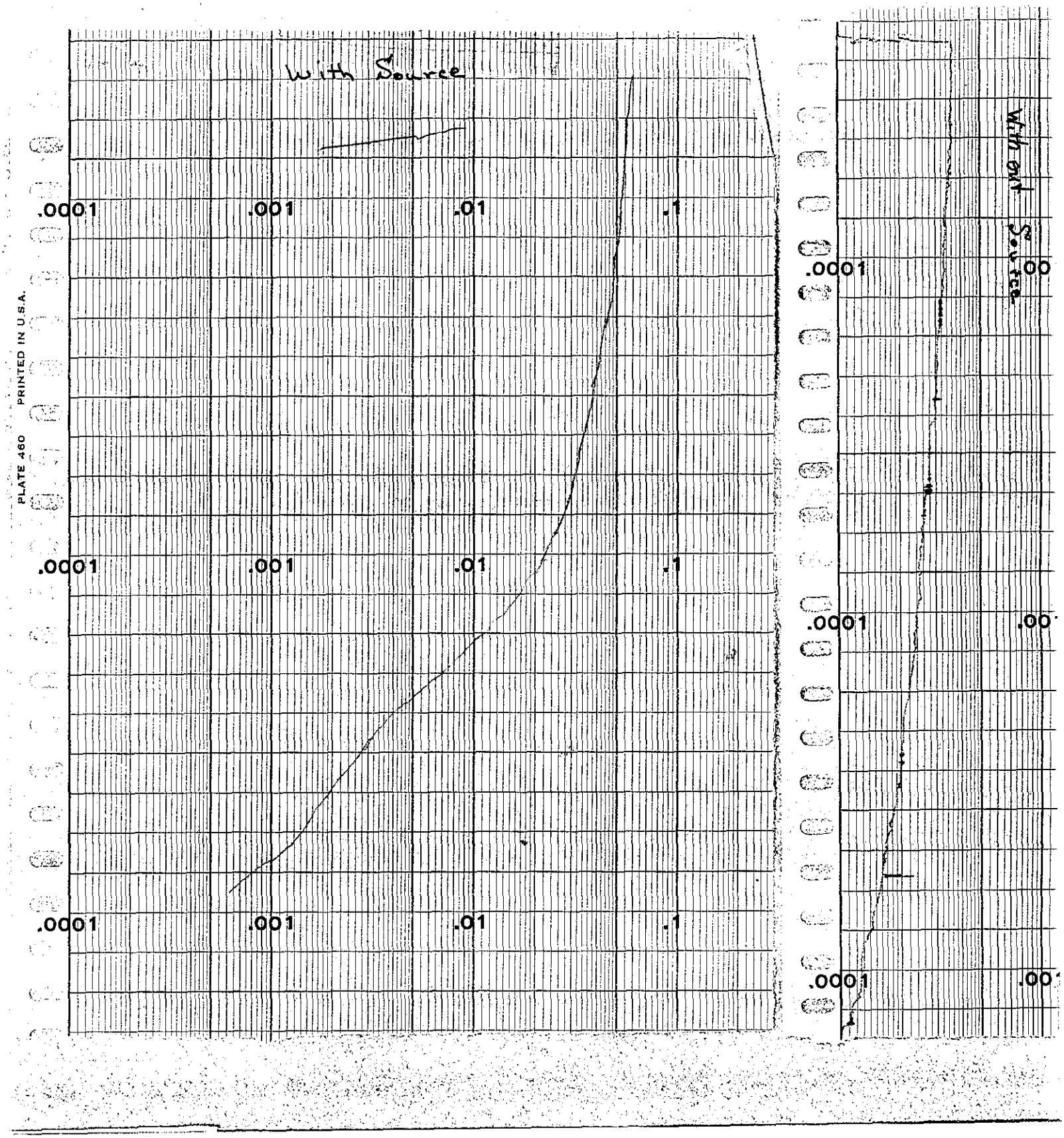

With Source
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PLATE 460 PRINTED IN U.S.A.

CRITICAL POSITIONS

5-5-60 8

Table .06

A. Reflector 5-4 $\frac{10}{1000}$

3.345 .00037

4.5 2.5×10^{-10}

D 4.5 $\frac{10}{200}$

E .1 1050 V.

Tim Crit. ___ AM PM Duration ___ min.

2

Run 9 Placed Source PR-467 above safety #8. #8 is 8" in west side of stack.

CRITICAL POSITIONS

2.90 $\frac{82}{18}$ Exp 24 x 24 Run 9

.06

"A"

1 Rods are out 23 $\frac{1000}{200}$

Pleas. 3,345 .06

80 2×10^{-8}

D 60 $\frac{100}{500}$

E 220 1000 V

Tim Crit 4:15 AM PM Duration 13 min.

168

5-6-60

INSTRUMENT CHECK

Time 8:40 AM ~~PM~~ Source P.Y-467

	Channel A	B	C	D	E
Range	10/1000	Oper	10^{-5}	10/1000	1000 V.
~~Source Dist.~~	8"	0"	3½"	2.5"	15"
~~% F.S. Trip~~	81	∞	100	81	100+

2 to 1, 2 + 3

No Source

CRITICAL POSITIONS

~~2%~~ 82/18 Expr 24 X 24 Run 10

Cntrl Rod Pos. L T P

Cntrol Rod	Channel	
A Reflector	A	52 10/100
3,345	B	100036
	C	8.2 10^{-10}
	D	50 10/1000
	E	0 600 V.

Tim Crit. _____ AM PM Duration _____ min.

5-9-60

INSTRUMENT CHECK

Time 11:30 AM PM Source PN-467

	Channel A	B	C	D	E
Range	F	10	10	10	
		1000	1000	1000	1050V
Source Dist.		7'	0	42"	2" 1"
% F.S. Trip		90	OK	180	85 180

Counters 4 2 0 3

C.A. 29 87/16 Expr. 22X22 Run 1

Sheet ____ Date 5-9-60 Time 1:00 AM PM

Purpose To Obtain Critical System with 6" Paraffin Reflector

LOADING CHANGE

Description 22"X22"X20" - Less Some Corner Blocks

484 in² Area x .6444 = 311.9 gms/in Height

311.9 X 20 = 6,238 gms

Mass before change ____ gmU - 41 " for Corners

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 6197 gmU-235

Sub Critical

170

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

5-17-60

Mihalczo
McCarty
Lynn

INSTRUMENT CHECK

Time AM PM Source PM-467

	Channel A	B	C	D	E
Range	$\frac{10}{1000}$	off	10^{-10}	$\frac{10}{1000}$	1050 V.
Source Dist.	7"	0"	36"	1.5"	1"
% F.S. Trip	90	ok	100	80	100+

Counters 1, 2 + 3

C.A. $29\frac{9z}{8}$ Expr. 31x31 Run 4

Sheet ____ Date 5-17 1960 Time 9:43 AM PM

Purpose Preparation for Be O Reactivity Measurements after Blocks have been heated for necessary period.
See p. 147 for runs before heating.
Block heated by R.A. Potter

Stack 30"x30"x31" - 28,625 gms. U^{235}
- 48 for Rds
28,577

Counters

CRITICAL POSITIONS

Channel #1 - U^{233} Fission Counter $29\frac{9z}{8}$ Expr 31x31 Run 4

Chan #2 = Printer #2 - Against West wall 108 .049 = 2435-7255

" #3 - " #1 - " South Wall 108

Channel		
	39	$\frac{100}{200}$
C = 21.9	.0015	
	8.2	2.5×10^{-12}
	D 27	$\frac{100}{200}$
	E 0	900

Tim Crit. 10:28 AM PM Duration 6 min.

C.A. 270 9/8 Expr. 30X30 Run 5A
Sheet ____ Date 5-17 1960 Time 11:15 AM PM
Purpose Be O Reactivity Measurements

30"X30"X31.1" - 28,669.5 gms U 235
Same Rod and Void arrangement as p. 147.

Run 5A Void 4"X4"X2" at Center
10:45 AM ∞ (+) period log N [1] [2] [3] Counters
.028 → .034

5B Blocks # 1B, 374 gms and 2A, 371.5 gms.
1:30 PM Positive Period log N [1] [2] [3]

5C Void at Center
2:30 PM ∞ (+) period log N [1] [2] [3]
.02 → .05

172

5-18-60

INSTRUMENT CHECK

Time 8:30 ~~PM~~ AM Source PN 467

	Channel A	B	C	D	E
Range	10/1000	off	10^{-10}	10/1000	1000 V.
Source Dist.	8"	0"	36"	1.5'	1"
% F.S. Trip	75	OK	100	90	100+

Ctrs #1, 2 & 3

Continued Be O Reactivity Measurements:

Rod C = 22.2"

5D 9:00 AM Void at Center Counters

∞ Period Log N 1 2 3

.02

5E 10:30 AM Blocks 1B and 2A in void.

+ Period Log N 1 2 3

INSTRUMENT CHECK

Time 12 40 AM PM Source Po Be

Channel	A	B	C	D	E
Range	10/100	open	1	10/100	1.50
Source Dist.	8"	OUT	3.5'	2"	1"
% F.S. Trip	100		100	90	100

C.A. 290 92/8 Expr. 31X31 Run 6

Sheet Date 5-24 1960 Time 1:15 AM PM

Purpose Be O Reactivity Measurement

CRITICAL POSITIONS

290 92/8 Expr 31X31 Run 6

06 T2X2F 9465

Channel		
	37	18.00
		1.00
	.009	
C-20.205	C 4.0	2X10-8
	D 59	10.0
		5.00
	E 0	7.50

Crit. 1:20 AM PM Duration 15 min.

5-24-60 · Block 1B and 2A in Void. Counters Rod C = 20.205

Run 6A Per Period Log N [1] [2] [3]

.002 → .006

6B Void at Center Rod C = Same

Per Period Log N [1] [2] [3]

.015

6C Blocks 1B + 2A = Void

Per Period Log N [1] [2] [3]

.005 → .015

5-25-60

INSTRUMENT CHECK

Time 9:00 AM PM Source PR-467

	Channel A	B	C	D	E
Range	1 / 1000	oper	10^{-10}	1 / 1000	1050V
Source Dist.	6"	OK	3'	1½"	1½"
% F.S. Trip	80		100	80	100

Counters 1 2 3

CA 29 9/8 Expr. 31X31 Run 6D

Sheet Date 5-25 1960 Time 9:15 AM PM

Purpose Cont'd Be O Measurements

Run 6D Blocks 1B + 2A ½ Void Rod C = Some
Pos. Period Log N [1] [2] [3]
~2° Temp. .005 → .06
Change

Run 6E Void at Center Rod C Some
∞ (+) Period Log N [1] [2] [3]
.01 → .04

F Levelled with Rod C = 21.995 Dropped Log N to .016
∞ (+) Period

G Blocks #3A and 4A. Blocks have not been heated. See first Runs. p. 148 Rod 21.995
Pos Period Log N [1] [2] [3]
.004 → .05

H Block #1B and 2A Rod C = Some
11:40 AM Pos Period Log N [1] [2] [3]
.003 → .01

I Void at Center Rod C = Some
1:05 PM ∞ (+) Period Log N [1] [2] [3]
.006 →

J. Blocks 3A and 4A Rod = Some
1:35 PM Pos Period. Log N [1] [2] [3]
.002 → .048

K Block 3A & 4A Rod C = 22.11
1:59 PM Pos Period
.001 →

6 L Void at Center Rod C = 22.11
3:00 PM ∞ (+) Period Log N [1] [2] [3]

6 M Block #1B + #2A Rod C = 22.11
~~3:45~~ ∞ Period log N [1] [2] [3]
4:00 PM 1013 →

5-26-60

INSTRUMENT CHECK

Time 8:05 AM ~~PM~~ Source Po Be -241

Tables OK F

	Channel A	B	C	D	E
Range	10/1000	Opn	10	10/1000	1050
Source Dist. OK	8"	o/c	5.5'	2"	1"
% F.S. Trip	95	100	80	100	

Cont'd Background Measurements.

6 N Block #1B + #2A
∞ Period Log N [1] [2] [3]
8:25 AM

6·0 Void at Center. ∞ Period (20)

6 P Removed 4 - 4 x 4 x 1/4" Foil From Corners of 1/4" Layer of Foil, Void at Center.

Q Blocks #3A and #4A Rod C = 22.38
∞ Period Log N [1] [2] [3]

R Removed 1 Row of "4" Layer of fuel from Movable Table.

2:40 PM Block #3A & #9A.

Poo. Period Log N [1] [2] [3]

S. Void at Center.

3:25 PM Negative Period Log N [1] [2] [3]

T Blocks #1B and #2A

4:00 PM ∞ (+) Period Log N [1] [2] [3]

5-27-60

INSTRUMENT CHECK

Time 8:15 AM PM Source PN-467

Table OK

	F	Channel A	B	C	D	E
Range	OK	1%/100		10	1%/100	105
Source Dist.		2"		3'	2"	1"
% F.S. Trip		90	90	100	90	100

Cont'd Be O. Measurements

6 U Blocks 1B + 2A

Log N [1] [2] [3]

6 V Void

6W	Blocks 3A-4A		Counters		
	Geo Period	hog N	1	2	3
6X	Blocks 3A-4A				
6Y	Void				
6Z	1B-2A				
6A1	1B-2A				
6B1	Void				
6C1	Blocks ″ 3A & ″ 4A				
6D1 1:45 PM	Block ″ 3A & ″ 4A				
6E1 1:50 PM	Void				
6F1 2:25 PM	Blocks 1B & 2A				

6G1 Blocks 1B and 2A.
2:43 PM Poo Period Log N Counters [1] [2] [3]

6H1 Void
3:12 PM ∞

6I1 Block 3A + 4A
Poo Period - Allowed power to Rise until System was trip by "F" at 108% full scale. Log N = .1 (Log N at Top of Stairway)

$\frac{H}{X} = \sim 500$

6-1-60

INSTRUMENT CHECK

Time 2:45 ~~AM~~ PM Source PN-467

	Channel A	B	C	D	E
Range	~~10~~ ~~1000~~ oper	10^{-10}	10 1000	1050 V	
Source Dist.	~~20.5~~"	0"	36"	~~2~~"	1.5"
% F.S. Trip	90	OK	100	90	100+

Counters 1, 2 & 3

C.A. 270 ~~82~~/18 Expr. 24X24 Run 11

Sheet Date 6 - 1 1960 Time 3:10 ~~AM~~ PM

Purpose Approach to Critical with $\frac{H}{X} \sim 500$.

BARE

2 Safety Rods - No Control Rods

LOADING CHANGE

Description 24" X 24" X 24.5" = 14,112 in^3

371.17 g/in height - 48 in^3 for rod

14,064 in^3

Mass before change gmU 9093.66 gmU-235

Mass of Change gmU - 30.93 for Rods gmU-235

Total Mass gmU ~~9,093~~ ~~gmU-235~~

9062.73

Sub-Critical

182

6-1-60

Run 12

LOADING CHANGE

Description 24" X 24" X 25" = 14,400 in^3

Mass before change ~~gmU~~ 9062.73 gmU-235

Mass of Change ~~gmU~~ 185.59 gmU-235

Total Mass ~~gmU~~ ~~9,247.9~~ 9248.32 ~~gmU-235~~

Sub Critical

Run 13

LOADING CHANGE

Description 24" X 24" X 25.5"

Mass before change ~~gmU~~ 9248.32 gmU-235

Mass of Change ~~gmU~~ 185.59 gmU-235

Total Mass ~~gmU~~ ~~9,433.9~~ 9433.91 ~~gmU-235~~

Critical.

Measured Positive Period

Counters

Log N [1] [2] [3]

6-2-60

INSTRUMENT CHECK

Time 8 15 AM PM Source P. B.

		Channel A	B	C	D	E
Table	F					
DIC Range	OK	10/1000	opr	10	10/100	100
Source Dist.		8"	OK	8"	2"	1/2"
% F.S. Trip		80	___	100	80	100

~~6" Paraffin on top of stock~~

Run 14 A Reflector Savings at 6" Paraffin
24 x 24 x 25.5" high 2 Safety rods. 4" in 4" up
Pos Period.
Log N [1] [2] [3]
+215 mc

14 B 24 x 24 x 23.75" + 6" Paraffin on top
Negative period
Log N [1] [2] [3]
-349.4

Run 15 A stock 24" X 24" X 25.25" - Al extrusions and steel plate on top of stock Al equal to amount of bottom, Steel 4' X 4' X 3/4"
Measured Positive period.
Log N [1] [2] [3]
+483.1

15 B Removed al + steel from top.
Stock 24" X 24" X 25.5"
+143.3

184

6-3-60

INSTRUMENT CHECK

Time 10:10 AM Source PR-467

	Channel F	A	B	C	D	E
	Y(OK)	1000	opr	10^{-10}	100	1031V
Source Pos.		3"		36"	1.5"	2"
% F.S. Trip		95		100	85	100+

C.A. 2% 93/8 Expr. 24 X24 Run 16A

Sheet _____ Date 6-3 1960 Time 10:25 AM

Purpose Graphite Reflector Savings

24"X24"X22 1/2"

16 A Six layers of Graphite on top of Stack
$6(2\frac{7}{8}) = 17.25$" of Graphite
Measured neutron period (Counters)

Log N	1	2	3
-x	75.5		

16 B 24 x 24 x 25.5" No graphite
Measured neutron period

Log N	1	2	3
+	121.3		

C.A. 270 92/28 Expr. 24X24 Run 17

Sheet Date 6-3-1960 Time 3:00 AM PM

Purpose Assembly with No holes

(No Rods)

24X24X25"

measured negative periods.

Log N [1] [2] [3]

186

6-6-60

INSTRUMENT CHECK

Time 9:35 ~~AM PM~~ Source PR-467

	Channel A	B	C	D	E
Range	10/1000	off	10	10/1000	
Source Dist.	7"	0°	36"	3"	1.5"
% F.S. Trip	85	OK	1000	90	100+

C.A. 22 ~~8-2~~ Expr. 24"X24" Run 18

Sheet ____ Date 6-6-1960 Time 10:15 ~~AM PM~~

Purpose Evaluate Floor Reflection

18 A Stack - 24"X24"X25½" (3-¼" Thick block at center) T&R

Placed 40"X42"X6" of Concrete blocks on cart - Centered with block stack. Cart 40" east of stack (same distance as floor to stack).

-21,150

Achieved power (Log N = .03-) by use of plastic reflector and levelled with same.

18 B Pulled Cart of Concrete away. Measured negative period.

log N	1	2	3	1
-1020				

C 2 To 82/18 Expr. 24"X24" Run 19
Sheet ____ Date 6-6-1960 Time 1:20 PM
Purpose Δp/Δh measurements
STACK — 24"X24"X25.25" - Pos. Periods
BARE — 24"X24"X25" - Neg. Periods

To achieve desired power level, plastic and/or paraffin slabs are to be used and are to be removed before period measurement is made.

Run 19A Negative period Counters
1:40 PM Log N [1] [2] [3]
-177

B Positive Period
2:25 PM

C Positive Period
2:50 PM

D Negative Period
3:35

6-7-60

INSTRUMENT CHECK

Time 8:05 AM PM Source P. Bc

Table 01c F

Channel	A	B	C	D	E
Range	1%/100	opr	15^10	1%/1000	105
Source Dist.	8"	01c	3'	2"	1"
% F.S. Tap	100	85	100	90	100

Counters

19E 8:40 AM		Negative Period -	Log N 184.6	[1]	[2]	[3]
9:18 AM	F	Positive Period -	~~222.6~~ 214.4			
9:42 AM	G	Positive Period -	211.7			
10:35 AM	H	Negative Period -	184.6			
11:15 AM	I	Positive Period -	215			
11:40 AM	J	Positive Period -	212.8			
1:	K	"F" tripped system (Checked by J.F. Ellis) at 1:20 PM, Log N = .001				
2:00 PM		Negative Period -	187.3			
2:40 PM	L	Positive Period -	213.9			
3:00 PM	M	Positive Period -	211.7			
3:45 PM	N	Negative Period —	188.4			

6-8-60

INSTRUMENT CHECK

Time 8:20 AM PM Source Po Be

Channel

Tables OK F	A	B	C	D	E
Range	1/1000 cps		10	10/1000	1050
Source Dist. OK	7"	OK	4½"	1½"	1"
% F.S. Trip 100	80		10	80	100

8:55 AM

Counters

190 NEGATIVE PERIOD - Log N [A] [D] [E]

187.3

9:45 AM P Positive Period - 208.5

10:05 AM Q Positive Period - 207.4

10:50 AM R Negative Period - ~~180~~ 184.6

11:30 AM S Positive Period - 213.9

11:58 AM T Positive Period - 209

U Negative Period

V Positive Period

2:40 PM W Positive Period

3:57 PM X Negative Period

190

96

8-9-60

INSTRUMENT CHECK

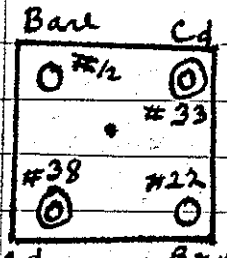
Time 8:55 AM PM Source PN-467

		Channel A	B	C	D	E
Tables OK	F					
Range		10 / 1000	opr	10 / 1000	1050	
Source Dist.		6"	0"	30"	1"	1"
% F.S. Trip	OK	82	8K	100	90	100

C.A. 290 82/18 Expr. 24"X24" Run 20A

Sheet ____ Date 8-9 1960 Time 9:05 AM PM

Purpose Indium Foils (5/16 Dia)
Cd Fraction
20 Mil Covers



Foil placed about Center of Reactor

CRITICAL POSITIONS

CA 290 82/18 Expr 24"X24" Run 20A

.068 8490-8218

A 40 1000/100

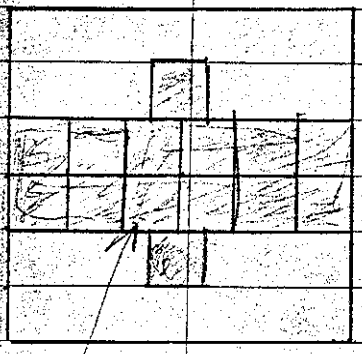
Plastic Ref. 15.45 .0098

5.2 2X10⁻⁸

D 67 100/500

E 0 690

Time Crit. 9:25 30/60 AM PM Duration 20 min.



1/4" Blocks on Top of Stack

Stack 24"X24"X25 14/36"

C. 2% 82/18 Expr. 24X24 Run 20 B

Sheet _____ Date 6-9-1960 Time _____ AM PM

Purpose Gold Foil (7/16" dia)
Cd Fraction
20 mil Covers

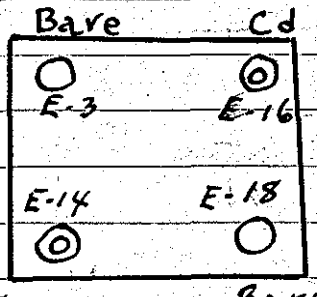
CRITICAL POSITIONS

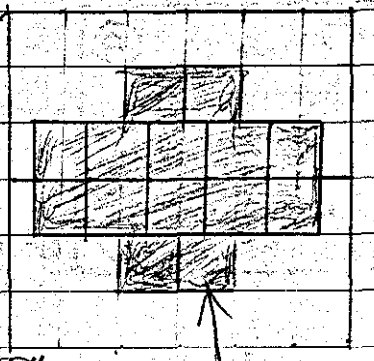
C A 2% 82/18 Expr. 24"X24" Run 20 B

Pos. .068 L T 7475 B-8218

	Control Rod	Channel
A	67	1000/500
Plastic Ref.	1300	
B	.065	
C	5.8	10^{-10} / 1000
D	41	500
E	.7	690

Tim Crit. 11:09 AM PM Duration 25 min.





Stack 2X"X24"X25 (19/36)"

1/4" Blocks on Top of Stack

C.A. 270 82/18 Expr. 24"X24" Run 20C

Sheet ____ Date ____ 19 ____ Time ____ AM/PM

Purpose U^{235} & & h-alloy (5/16 Dia)

Stack 24"X24"X 14/36 #5.1 @ 14/36

CRITICAL POSITIONS

C.A. 270 82/18 Expr. 24"X24" Run 20C

Plastic Pos. .068 L T7450 - 8218

Channel

I

A 69 1000/500

Plastic Ref. 1287

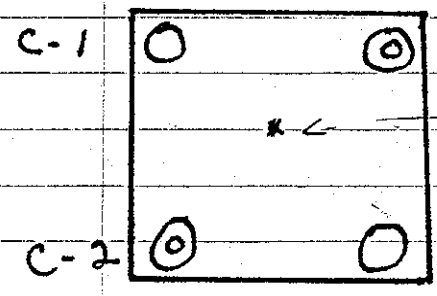
B .07

C 7.7+X10⁻¹¹ 1001

D 45 500

E .8 690

Tim Crit. 3:16 40/60 AM/PM Duration 25 min.



6-10-60

INSTRUMENT CHECK

Time 8:30 AM PM Source PN-467

	Channel A	B	C	D
Table F OK				
Range OK	1/1000	10^{-10}	1/1000	1050 V
Source Dist.	7"	36"	1"	1"
% F.S. Trip	85	100	90	100+

Ctr 1, 2 & 3 OK

C.A. 290 82/78 Expr. 24"x24" Run 20 D

Sheet ____ Date 6-10 1960 Time 8:40 AM PM

Purpose k^{235} + Dep. k^{238}

Pos. 0,-1,0 — 0,+1,0 Stack 24"x24" x 25.1 n 14/36

Foil # A-12 - Dpl 3

CRITICAL POSITIONS

C.A. 290 82/78 Expr. 24"x24" Run 20 D

Table Pos. -068 T 7978 P 8220

Control Rod	Channel	
1	A 83	1000/500
Plastic Ref. 988	B .08	
	C 7.3	10^{-10}
	D 53	1000/500
	E .8	690

Firm Crit. 8:56 AM PM Duration 25 min. 9-21

6-10-60

C.A. 290 82/18 Expr. 24"X24" Run 20E
Sheet Date 6-10 1960 Time 12:40 AM PM
Purpose Critical Height Determination

Stack 24"X24"X ~~25.25~~ 25.0625

Sub Critical - negative period
1 quadrant covered with 1/4" Blocks

6-10-60

C.A. 290 82/18 Expr. 24" Run 20 F
Sheet Date 6-10 1960 Time 1:30 AM PM
Purpose Critical Height Determination

24"X24"X 25.125

1 half covered with 1/4" Blocks.
Sub Critical - Negative period
Runs 20E & 20F done after foil measurements and foil (2% U235) had ~~punched some~~ block out of position

C.A. 290 82/18 Expr. 24X24 Run 20G
Sheet Date 6-10 1960 Time AM PM
Purpose Critical Height Determination

Repeat of Run 20F. after having tightened block stack.
Measured neg. period.

20G Raised power level with plastic reflector to log N = .062. Levelled plastic = 11.585'.
Then to Log N = .007 Short Look ~ Level. (+)
" " = .0006 - Slightly positive after 30 minutes.

6-13-60

INSTRUMENT CHECK

Time 9:15 AM PM Source PN 467

		Channel A	B	C	D	E
Tube	F	10			10	
% Range		1000	Opr	10	1000	1030 V
Source Dist.	8K	6"	"	40"	42"	1"
% F.S. Trip		80	8K	100	85	80+

Counts 1, 243 8K

C.A. 270 82/18 Expr. 24"X24" Run 20-H

Sheet 6-13-60 Time 9:50 AM PM

Purpose 270 k235 Horizontal Traverse

Std 24"X24"X 25 1/8"

Position	-2	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil #	C-3	C-20	C-40	C-32	C-33	C-12	C-11	C-7	C-10	C-8

CRITICAL POSITIONS

C.A 270 82/18 Expr 24"X24" Run 20-H

Mod 3 Pos .158 T D

Setting Rod

Plastic

	(Normal)
A-.65	1000 / 510
B-.065	
C-7.1	10-10
D-42	1000 / 500
E-1.0	750

Time Crit. 9:55 AM PM Duration 20 min

Foil 18 Foil

Run 20-J 29% U^{235} Horizontal Traverse

6-13-60 Stack - 24" X 24" X 25 1/8"

Position	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil #	C-18	C-29	C-44	C-38	C-27	C-22	C-24	C-45	C-9

CRITICAL POSITIONS

C.A. 29 82/18 Expr. 24"X24" Run 20-J

Table Pos. .068 T 6351 B 8220

Control Rod		Channel
1 Plastic Refl 15.58	67	1000/200
2	.03	
3	5.5	4×10^{-11}
4	D 50	1000/200
	E .5	750

Tim Crit. 11:06 23/60 AM PM Duration 20 min.

Run 20-J 2% U^{235} Horizontal Traverse

Pos. -8 -6 -4 -2 0 +2 +4

Foil # C-36 C-15 C-2 C-21 C-39 C-41 C-6

+6 C-17 +8 C-19

CRITICAL POSITIONS

C.A. 29 82/18 Expr. 24"X24" Run 20-J

Table Pos. .07 T 6270 B 8220

Control Rod		Channel
Plastic 16.87	A 52	1000/100
	D .014	
	C 8.7	2×10^{-8}
	D 47	1000/100
	E .3	750

Crit 1:37 40/60 AM PM Duration 20

198

6-14-60

INSTRUMENT CHECK

Time 9:00 AM / PM Source PN-467

	Channel A	B	C	D	E
Table	F				
OK Range	13/1000	opn	10⁻⁰	13/1000	1030V
Source Dist.	OK. 8"	0"	40"	3"	1"
% F.S. Trip	85	OK	100	90	100+

~~Counters 1, 2 + 3~~

C.A. 29 82/18 Expr. 24"X24" Run 20K

Sheet ___ Date ___ 19 ___ Time ___ AM / PM

Purpose Cadmium covered Gold Foil

Stack 24"X24"X25⅛

Pos.	-9	-6	-3	0	+3	+6	+9
Foil #	E-7	E-25	E-2	E-11	E-5	E-15	E-10

CRITICAL POSITIONS

C.A. 29 82/T8 Expr 24"X24" Run 20K

Table Pos. .068 T6360 T8220

Control Rod Channel

Plastic 16.77 A 74 1000/500

.07

C 8.0 10-10

D 4 8 1000/500

E 1.5 750

Tim Crit. 9:31 47/60 AM / PM Duration 25 min.

6-14-60 Cadimium Covered Gold
Run 20-L Stack 24"x24"x2 5/8

Pos	-9	-6	-3	0	+3	+6	+9
Foil No.	E8	E3	E17	E2	E1	E6	E22

CRITICAL POSITIONS

A. 29 8/8 (82) Expr. 24"x24" Run 20L

Table Pos. .07 T 6330 8220

	Control Rod	Channel
1	Plastic 16.65	A 70 1000/500
2		.07
3		C 7.8 10 -10
4		D 48 1000/500
		E 1.5 750

Tim Crit. 11:09 40/60 AM PM Duration 2-5 min.

200

6-14-60 Cd. covered Gold foil

Run 20-M Stack 24" X 24" X 25 1/8

Pos.	-9	-6	-3	0	+3	+6	+9
Foil No.	7-5	7-13	7-8	7-12	7-19	7-3	7-1

CRITICAL POSITIONS

C.A. 290 82/18 Expr. 24" X 24" Run 20 M

Table Pos. .07L T 6209 8220

	Control Rod		Channel
1	Plastic 16.6 / Ref.	A	68 1000/500
2		B	.065
3		C	7.4 10^{-10}
4		D	44 1000/500
		E	1.4 750

Run Crit. 1.51 50/60 ~~AM~~ PM Duration 25 min.

6-16-60

Run 20-N

INSTRUMENT CHECK

Time 9:15 AM Source PN 467

Table F

	Channel A	B	C	D	E
Range	10/1000 apr		10^{-10}	10/1000	10 volt
Source Dist.	65" ~~85~~		36"	1.5"	1.5"
~~%~~ F.S. Trip	~~85~~		100	90	101+

~~Counts~~ 1,2 & 3

C.A. 290 8/8 Expr. 24"x24" Run 20 N

~~Sheet~~ Date 6-16-1960 Time 9:40 AM ~~PM~~

Purpose Cd. Fraction 1 Mil Au

20 Mil. Covers

#400 #408

#401 #404

Stack 24"x24"x25 1/8

CRITICAL POSITIONS

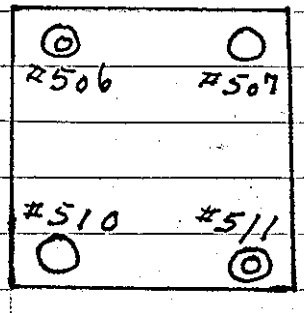
C.A. 290 8/8 Expr. 24"x24" Run 20 N

.068 T5530 8220

	Channel	
Plastic 11.70	72	1000/500
	.075	
	9.4×10^{-10}	
	D 46	1000/500
	E .8	690

Exit 9:57 33/60 AM ~~PM~~ Duration 25 min.

Run 20-O Ah Cd. Fraction
6-16-60 5 mil Foils 20 mil Covers
24" X 24" X 25 1/8"



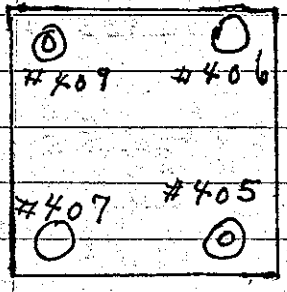
CRITICAL POSITIONS

C.A. 29.82/18 Expr. 24" X 24" Run 20-O
Table Pos. .07 5468 R 8220

	Control Rod	Channel
1	Plastic 12.58	A 7.0 1000/500
2		.075
3		C 9.1 10-10
4		D 46 1000/500
		E .8 690

Tim Crit. 11:08 22/60 AM PM Duration 25 min.

Run 20-P Ah Cd. Fraction
6-16-60 1 mil Foils 20 mil Covers.



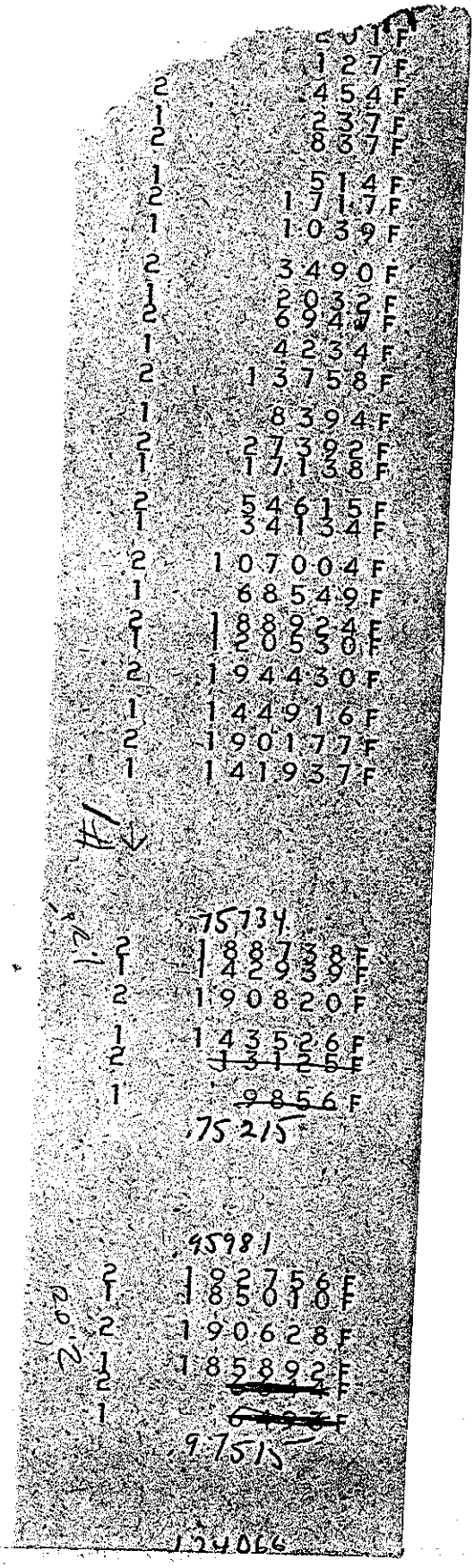
CRITICAL POSITIONS

C.A. 29.82/18 Expr. 24" X 24" Run 20-P
Table Pos. .07 5495 R 8220

	Control Rod	Channel
1	Plastic Ref. 11.71	A 6.8 1000/500
2		.075
3		C 9.8 10-10
4		D 50 1000/500
		E .8 690

Tim Crit. 1:51 20/60 AM PM Duration 25 min.

Stack 24" X 24" X 25 1/8"



2 1 8 2 8 9 2 F
1 ~~6 4 9 3 F~~
.97515

1.24066
2 1 8 5 2 9 2 F
1 2 2 8 8 5 F
2 1 8 3 5 1 8 F
1 2 2 7 8 5 1 F
2 ~~1 7 6 1 7 F~~
1 ~~2 1 6 3 5 F~~
1.24157

1.46577
2 1 8 3 7 2 5 F
1 2 6 9 2 8 8 F
2 1 8 5 6 2 6 F
1 2 6 8 4 3 8 F
1.49612

2 ~~4 0 9 8 0~~ F
1 5 8 3 4 1 F

1.63444
2 1 8 7 2 3 9 F
1 3 0 6 0 3 2 F
2 1 8 6 8 7 2 F
1 3 0 5 7 4 3 F
1.16361

2 ~~1 6 1 3 8~~ F
1 2 6 2 8 3 F

1.79557
2 1 8 7 4 7 2 F
1 3 6 6 2 4 F
2 1 8 5 2 9 2 F
1 3 3 7 9 5 9 F
1.82392

2 2 4 5 1 0 F
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1 3 6 5 1 8 3 F
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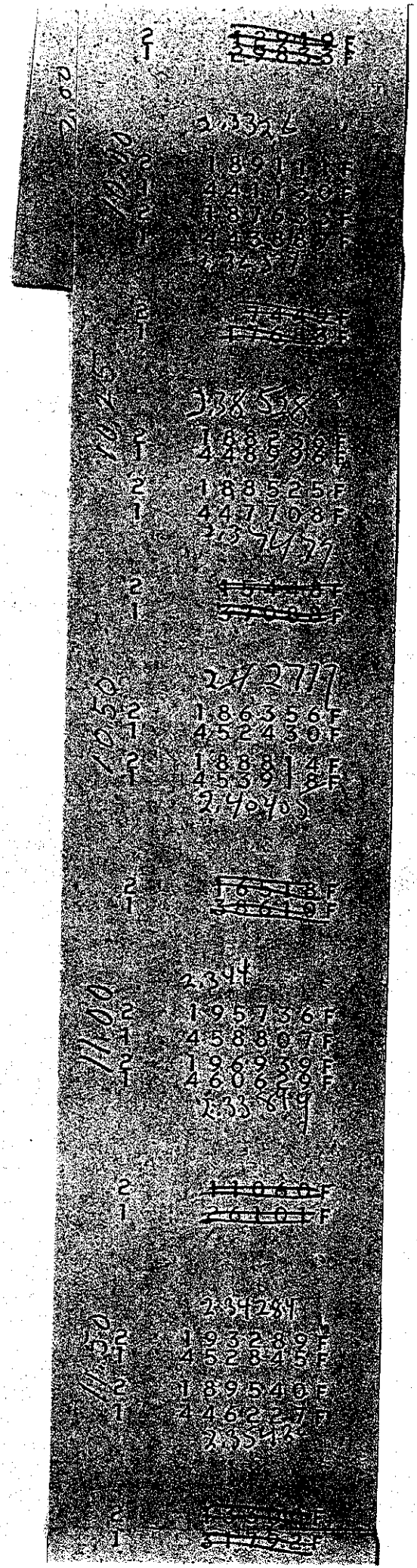
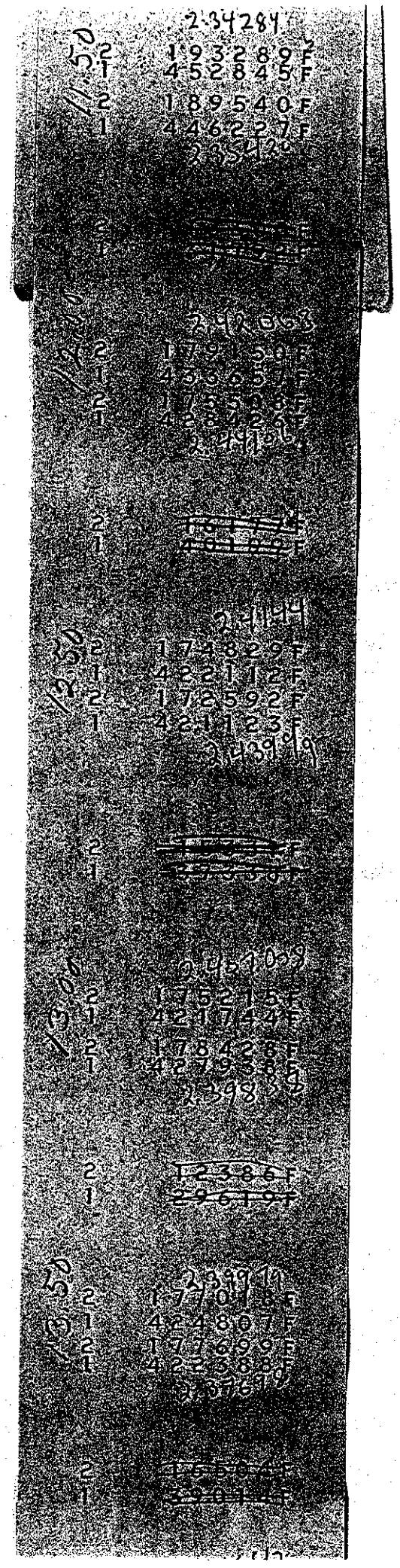
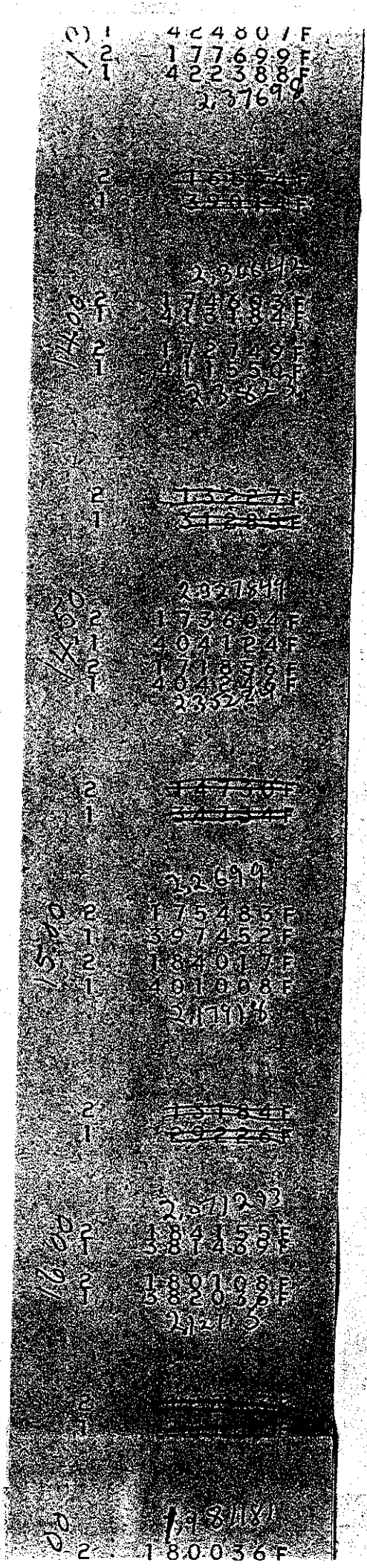
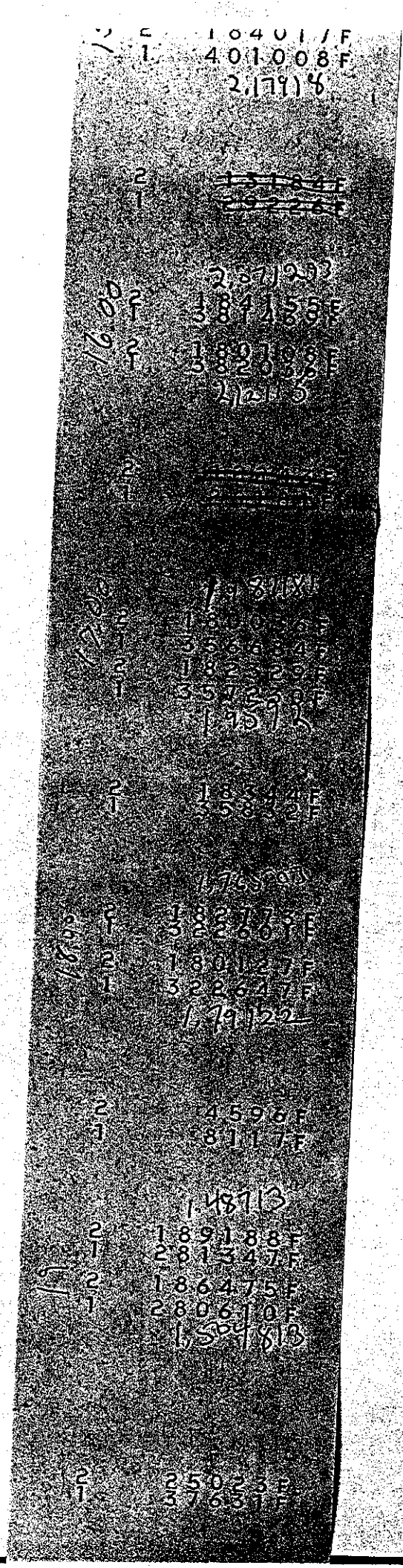
1 3 7 0 7 3 2 F









[redacted]

2 250237F
1 376317F

125324

2 191003F
1 239381F
2 193157F
1 240246F
1249174

2 73568F
1 91388F

101784

2 185425F
1 188733F
2 186739F
1 188421F
1009067

2 192664F
1 181448F

62541

2 192910F
1 130290F
2 194729F
1 131223F
67381

2 20501F
1 124599F
2 3888F
1 223F
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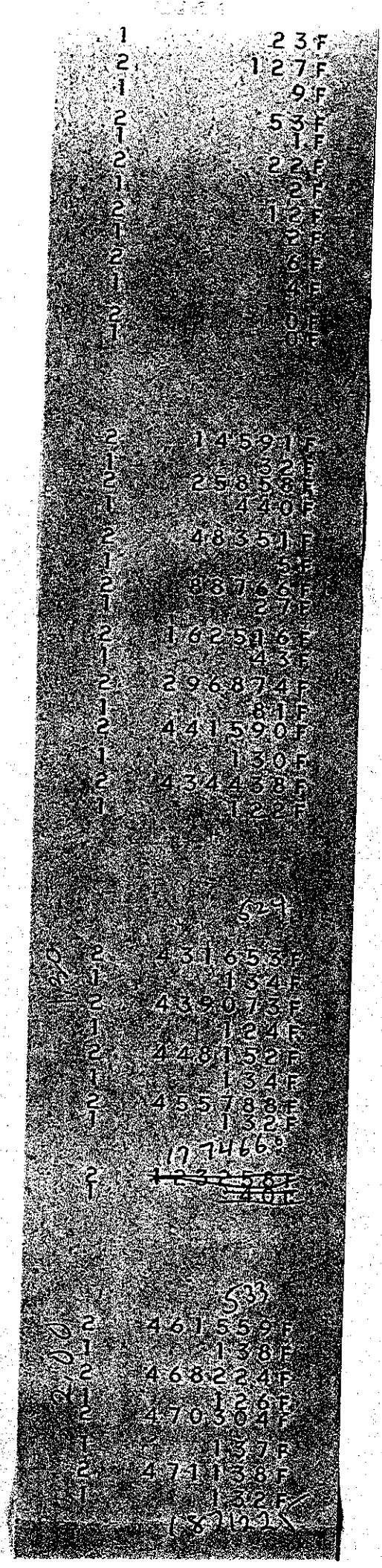
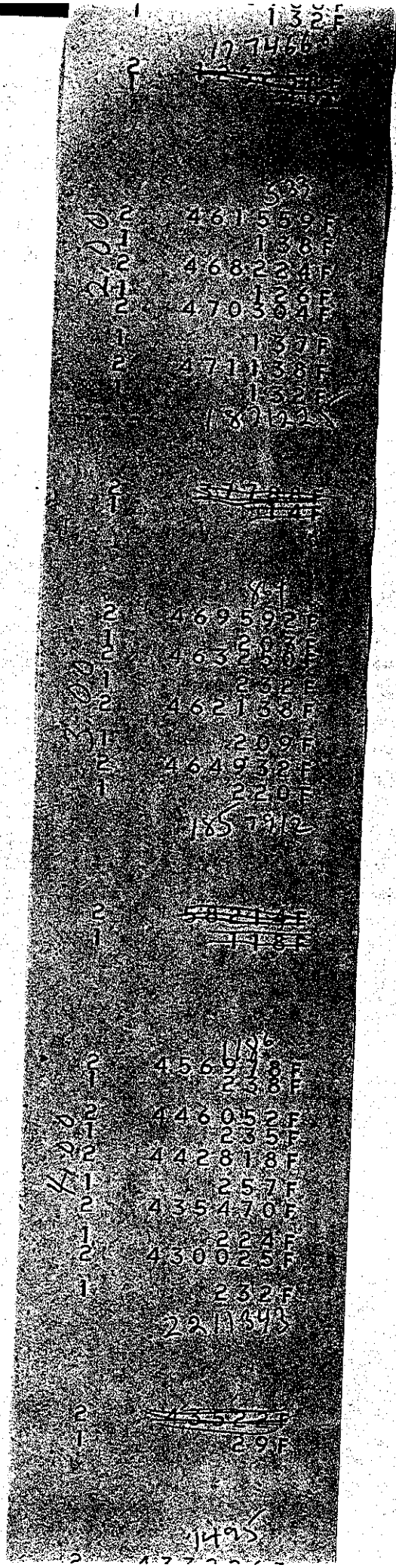
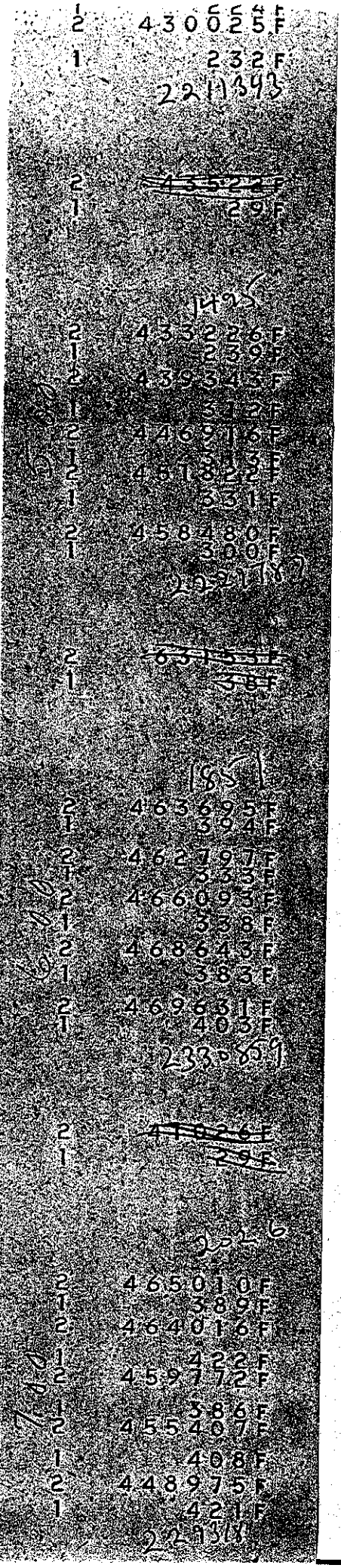
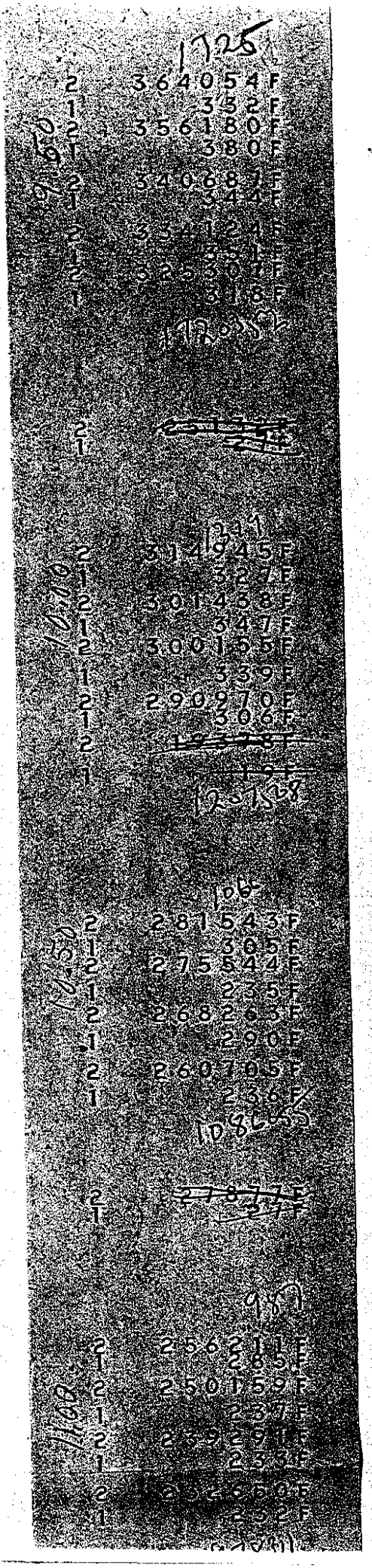
1 97F
2 533F
1 11F
2 22F
1 27F
2 127F
1 97F
2 66F
1 47F
2









108603

2 1 ~~2 7 8 7 7 F~~
~~2 7 F~~

9 8 1

2 2 3 5 6 2 1 F
1 2 8 5 F
8 2 2 5 0 1 5 9 F
1 2 3 7 F
2 2 3 9 2 9 1 F
1 2 3 5 F
2 2 3 2 6 5 0 F
1 2 3 2 F

9 9 8 0 4

2 1 8 4 1 3 F
1 1 2 2 F

9 3 8

2 2 2 5 2 8 9 F
1 2 4 3 F
2 2 1 9 3 2 4 F
1 2 2 1 F
2 2 1 3 9 2 1 F
1 2 2 1 F
2 2 0 8 6 5 5 F
1 2 2 2 F

8 6 1 8 1

~~2 1 6 5 4 6 F~~
~~1 7 F~~

8 5

2 2 0 0 8 5 3 F
1 2 1 3 F
2 2 1 9 5 6 2 7 F
1 2 0 1 F
2 2 1 8 9 7 3 9 F
1 2 1 7 F
2 2 1 8 5 8 1 9 F
1 1 8 4 C

7 9 2 0 8

2 1 7 8 4 0 F

H/X = 500 ~ ~ 203

6-17-60

INSTRUMENT CHECK

Time 9:50 AM

Source PN 467

	Channel					
Table OK & F	A	B	C	D	E	F
Range	OK	$\frac{10}{1000}$	off	$\frac{10}{10^{10}}$	$\frac{10}{1000}$	1050 ✓
Source Dist.		7"	0"	40"	2"	1"
% F.S. Trip		85	OK	100	90	100+

Counters 1, 2 & 3

Counter centers ~ 1.5" from end of probe (1 3/16 → 1 9/16)

C.A. 2% 82/18 Expr. 24 X 24 Run 21 A

Sheet ____ Date 6-17 1960 Time ____ AM PM

Purpose U^{235} Fission Counter

Horizontal Traverse

Counter Traverse 12½" from Bottom of Stack.

Stack 24" X 24" X 25.25"

log N = .04

Crit. 11:50 AM

Down 12.55

U^{233} Fission Counter as Normalizer, ~ 4" into back of stack. Traverse made from East to West in stack.

Point	Setsyn	Center of Counter
1	1.25	3.00
2	2.00	3.75
3	3.00	4.75
4	4.00	5.75
5	5.00	6.75
6	6.00	7.75
7	7.00	8.75
8	8.00	9.75
9	9.00	10.75
10	9.50	11.25
11	10.00	11.75
12	10.25	12.00
13	10.50	12.25
14	11.00	12.75
15	11.50	13.25
16	12.00	13.75
17	12.50	14.25
18	13.00	14.75
19	13.50	15.25
20	14.00	15.75
21	14.50	16.25
22	15.00	16.75
23	16.00	17.75
24	17.00	18.75
25	18.00	19.75
26	19.00	20.75
27	20.00	21.75
28	21.00	22.75
29	22.00	23.75

U^{233} on chan #1 printer #2
U^{235} on chan #3 printer #1

C.A. 29/82/18 Expr. 24x24 Run 21 B

Sheet _____ Date 6-17-60 Time _____ AM PM

Purpose U^{238} Fission Ctr Traverse

Replaced U^{233} Counter of Run 21A with U^{08} Counter.

Stack & Counter same as for 21A.

Log N = .11

Crit: 2:10 PM

U^{233} chamber on Chow #1 printer #2

U^{238} " " " #3 " #1

Point	Delayn	Center of Counter	Point	Delayn	Center of Counter
1	1.30	3.05	15	12.00	13.75
2	2.00	3.75	16	12.50	14.25
3	3.00	4.75	17	13.00	14.75
4	4.00	5.75	18	14.00	15.75
5	5.00	6.75	19	15.00	16.75
6	6.00	7.75	20	16.00	17.75
7	7.00	8.75	21	17.00	18.75
8	8.00	9.75	22	18.00	19.75
9	9.00	10.75		19.00	20.75
10	9.50	11.25		20.00	21.75
11	10.00	11.75		21.00	22.75
~~12~~	~~10.25~~	~~12.00~~		~~22.00~~	~~23.75~~
12	10.50	12.25			
13	11.00	12.75			
14	11.50	13.25			

System sub Critical as Chamber passed through Center. Log N = .0

Measured after shut down - End of probe 4 9/16" in West side of Stack.

150,248

133

2 27685F

1 31F

172863

137

2 1554855F

1 1331F

2 1526725F

1 134F

2 1489855F

1 140F

2 1447535F

1 128F

2 10239F

1 181F

136,913

149,5

2 1421025F

1 147F

2 1385615F

1 146F

2 1347985F

1 144F

2 1321935F

1 157F

2 [redacted]

1 [redacted]

123,714

132,5

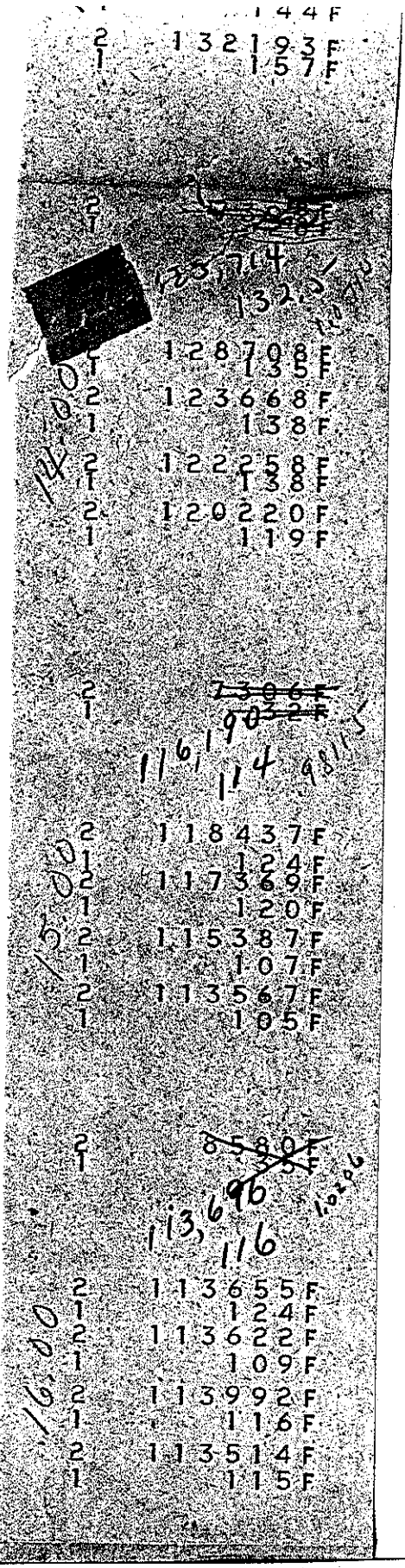
2 [redacted]

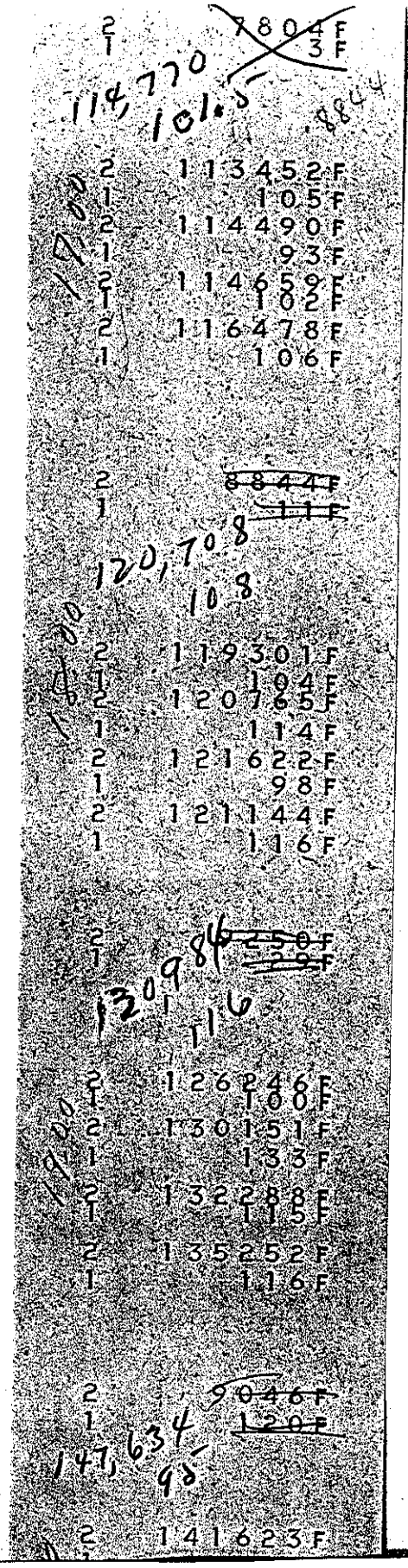
1 1287085F

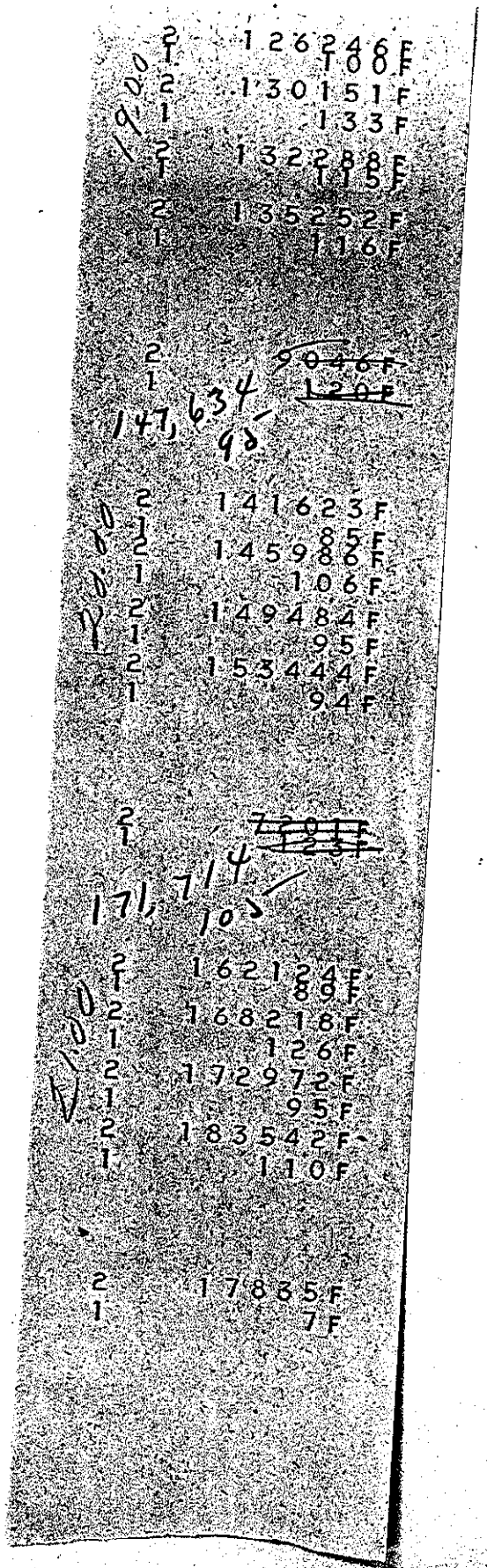
2 1236685F

1 138F

2 1222585F






2 1 2 6 2 4 6 F
1 1 0 6 F
2 1 3 0 1 5 1 F
1 1 3 3 F
2 1 3 2 2 8 8 F
1 1 5 F
2 1 3 5 2 5 2 F
1 1 6 F
2 9 0 4 6 F
1 1 2 0 F
147,634 - 98
2 1 4 1 6 2 3 F
1 8 5 F
2 1 4 5 9 8 6 F
1 1 0 6 F
2 1 4 9 4 8 4 F
1 9 5 F
2 1 5 3 4 4 4 F
1 9 4 F
2 7 2 3 F
1 2 3 F
171,714 - 103
2 1 6 2 1 2 4 F
8 9 F
2 1 6 8 2 1 8 F
1 1 2 6 F
2 1 7 2 9 7 2 F
1 9 5 F
2 1 8 3 5 4 2 F
1 1 1 0 F
2 1 7 8 8 5 F
1 7 F

Run 21A – U^{235} Traverse Center of Counter	$\frac{U^{238}}{U^{235}}$	Run 21B – U^{238} Traverse $\frac{U^{238}}{U^{235}}$	
1.50	0.7547	0.295	
2.25	0.9675	.285	
3.25	1.2911	.4645	
4.25	1.456	.5363	
5.25	1.638	.67046	
6.25	1.8097	.79413	
7.25	1.9729	.88349	
8.25	2.142	.95482	
9.25	2.3302	1.0326	
9.75	2.328	1.0027	
10.25	2.3491	1.09233	
10.50	2.380	—	
10.75	2.416	.9815	
11.25	2.3415	1.00888	
11.75	2.3485	1.0816	
12.25	2.4308	1.0556	
12.75	2.427	1.0846	.8852
13.25	2.4027	1.0710	1.0846
13.75	2.3884	—	
14.25	2.3823	.9812	1.0710
14.75	2.34	—	
15.25	2.2245	.98115	
16.25	2.0962	~~1.0206~~ 1.0202	
17.25	1.9702	.8844	
18.25	1.778	.8947	
19.25	1.496	.8856	
20.25	1.2490	.6435	
21.25	1.0134	.61148	
22.25	0.6746	—	

6-20-60

INSTRUMENT CHECK

Time 9:15 AM PM Source PN-967

	Channel A	B	C	D	E
Tables OK & OK	10/1000	0	10"	10/1000	1000 V.
Source Die	7	0"	36"	2"	1"
% F.S. Trip	85	OK	100	90	100+

C.A. 270 82/18 Expr. 24" X 24" Run 21C

Sheet ____ Date 6-20 1960 Time 9:30 AM PM

Purpose $n^{238} + n^{235}$ Fission Counter Ratios

U^{238} — #8-3

U^{235} — #C-3

End of Counter probes at center of stack, entered from South side of stack. Counters separated by 2" of fuel.

CRITICAL POSITIONS

C.A. 270 82/18 Expr. 24" X 24" Run 21C

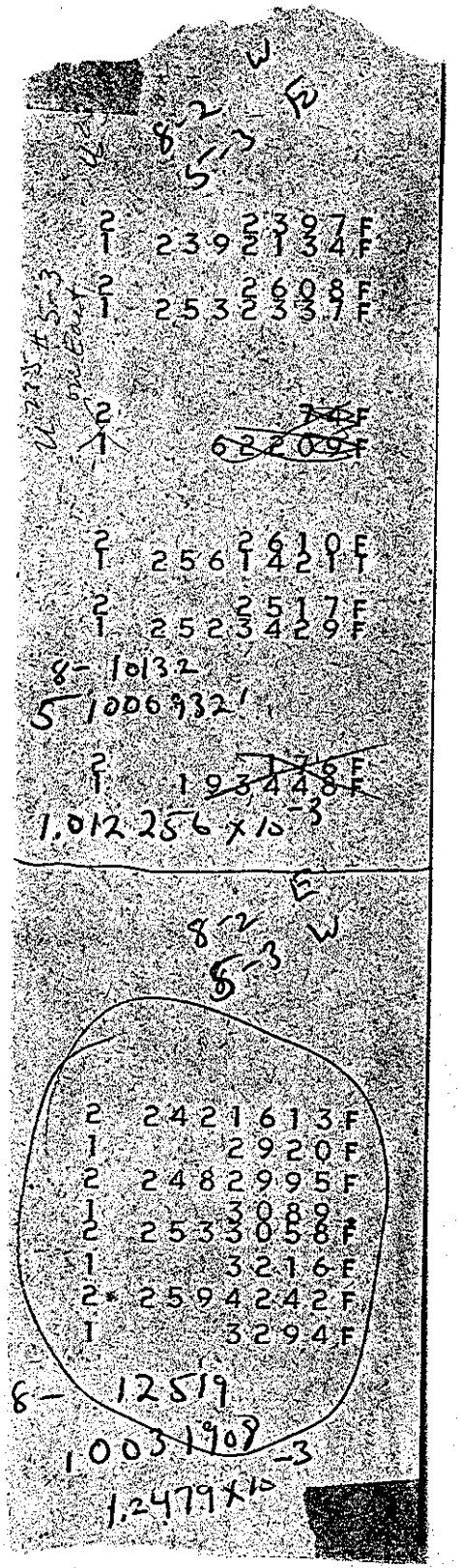
Table Pos. 07 T43 R22

Control Rod | Channel

Plastic 4.8

A	33	1000/1000
B	.06	
C	30	5X10⁻¹⁰
D	39	1000/500
E	4	650

Run Crit. 11:05 AM PM Duration 40 min.


W
F
8-2
5-3
2 2 3 9 7 F
1 2 3 9 2 1 3 4 F
2 2 6 0 8 F
1 2 5 3 2 3 3 7 F
2
1 6 3 2 0 9 F
2 5 6 1 4 2 1 0 F
2 5 1 7 F
1 2 5 2 3 4 2 9 F
8- 10132
5 1000932!
1 9 3 4 4 8 F
1.012256 x 10-3
F
W
8-2
5-3
2 4 2 1 6 1 3 F
2 9 2 0 F
2 4 8 2 9 9 5 F
3 0 8 9
2 5 3 3 0 5 8 F
3 2 1 6 F
2 5 9 4 2 4 2 F
3 2 9 4 F
6- 12519
1003 1909
-3
1.2479 x 10

Run 21-D
6-20-60

C.A. 29.82/18 Expr. 24"X24" Run 21 D
Sheet ____ Date 6-20 1960 Time 12:20 AM PM
Purpose U^{238} & U^{235} Fission Counter Ratios
Counters Interchanged

Plastic at 5.6

Run 21-E
6-20-60

C.A. 29.82/18 Expr. 24"X24" Run 21-E
Sheet ____ Date 6-20 1960 Time 2:15 AM PM
Purpose U^{238} & U^{235} Fission Counter Chambers.
U^{238} - # 8-2 - Chan # 3 - Printer #1
~~Switch~~ U^{235} - # 5-3 - " # 1 - Printer # 2

1. System tripped by "F" (without apparent reason) at 2:34 PM. Log N = .055

Run 21-F
6-20-60

C.A. 29.82/18 Expr. 24"X24" Run 21-F
Sheet ____ Date 6-20 1960 Time 2:55 AM PM
Purpose U^{238} & U^{235} Fission Counter Chambers
~~Chan~~ Leads to chambers switched in front of pre amps.

Log N = .06

U^{238} - #8-2 - West of Center - Chan #1 - Printer #2
U^{235} - #5-3 - East of Center - " # 3 - " # 1

22 G ~~Repeat~~ Repeat of Run 21 E. Log N = .055

6-21-60

INSTRUMENT CHECK

Source PN-467

Time ____ AM PM

	Channel A	B	C	D	E
Tables	F				
Range	OK	1"/100 cpm	20	10 k/100	1000 V
Source Dist.		6"	0"	36"	2" 1"
% F.S. Trip		90	OK	100	90 100

Counting

C.A. 2% 82/18 Appr. 24 x 24 Run 1 A

REFLECTED

Sheet ____ Date 6-21 1960 Time 2:30 AM PM

Purpose Approach to Critical with 24"X 24" parallelopiped Completely Reflected (6" Refl.)

1 Control Rod and 1 Safety Rod

LOADING CHANGE

Description 24" X 24" X 17" – 6" Refl.

.6444 g u^{235}/in^3, 371.17 g u^{235}/in height

6310 g u^{235}

– 31 " for Rods

Mass before change ____ gmU 6,279 gmU-235

Mass of Change ____ gmU ____ gmU-235

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

Run 1B Sub Critical

24" X 24" X 17.5" = 6,496 g u^{235}

– 31 " for Rods

6,465 g u^{235}

Sub Critical

Run D
1C

LOADING CHANGE

Description 24" X 24" X 18.5" - 6" Refl

Mass before change ____ gmU 6,465 gmU-235

Mass of Change ____ gmU 371 gmU-235

Total Mass ____ gmU 6,836 gmU-235

Super Critical - Tables = .27

6-23-60

INSTRUMENT CHECK

8:20 AM PM Source PN-467

Tables	F	A	B	C	D	E
		Channel				
Range	OK	10/1000	opr	10^{-10}	10/1000	1050 V
Scram Dist.		6"	0"	30"	15"	W.D.
% F.S. Trip		85	OK	100	95	100

Counters 1 & 2

LOADING CHANGE

Description 24" X 24" X 18" – 6" Reflector

Mass of Change	gmU	6,836	gmU-235
Mass of Change	gmU	186	gmU-235
☒ Total Mass	gmU	6,650	gmU-235

CRITICAL POSITIONS

C.A. 290 82/18 Expr. 24"x24" Run # 1D

Temp. .065 T. 8485 R. 8220

	Control Rod	Channel	
1		A 59	10/500
2			.0028
3	Rod C	21.90	$7.7\ 10^{-12}$
4		D 37	10/500
		E 0	690

Time Crit. 9:55 AM PM Duration 5 min.

Rod C in = 22.37

Rod C @ 19.39 66.8 sec period = 13.35 ¢

Lowest Rod C @ 21.9 Sensitivity 3.32 ¢/in.

LOADING CHANGE

Run 1E

Description 24" X 24" X 17.75" – 6" Reflector

Mass before change ____ gmU 6,650 gmU-235

Mass of Change ____ gmU 93 gmU-235

Total Mass ____ gmU 6,557 gmU-235

CRITICAL POSITIONS

CA 29a 82/78 Expr 24"x24" Run 1-E

Stable Pos 0.65 T0386 P-8220

Control Rod	Channel
	A 69 100/500
	B .0033
C – 16.82	C 8.5 10^-12
	D 45 10/500
	E 0 690

Crit: 9:53 AM/PM Duration 6 min

~~Rod C = 16.82~~

Rod C @ out 66.2 sec period = 13.44 ¢

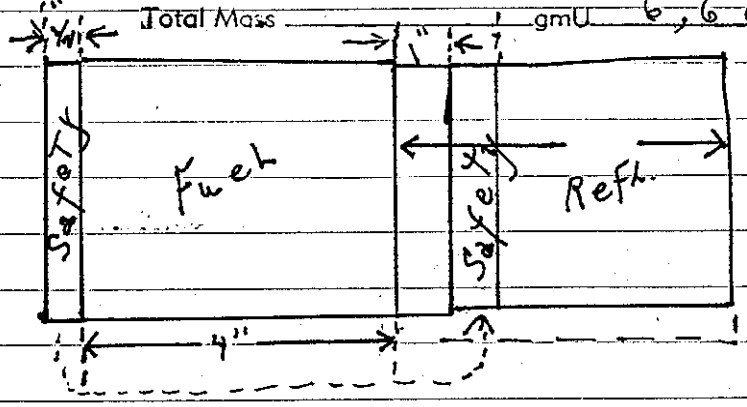
Levelec Rd C @ 16.82 Sensitivity X ¢/in.

Run 1-F
6-23-60

LOADING CHANGE

Description 2-¼" X 2¼" X 17.75

Mass before change ____ gmU 6,650 gmU-235
Mass of Change ____ gmU 15 5 gmU-235
Total Mass ____ gmU 6,665 gmU-235



Moved safety rod from fuel to reflector as shown

Rod C @ 16.82 dp 9.5 sec period 10.15
Levelac Rd. C 19.23 Sensitivity 2.5 ¢/in.

CRITICAL POSITIONS

C.A. 2902/18 Expr 2¼" X 2¼" Run 1-F
Table Pos. .065 T 9370 R 8220

	Rod	Channel
1	A	99 10/500
2	B	.004
3 C 19.23	C	8.0 10-12
4	D	5.0 10/500
	E	0. 690

Fuel Crit. 11:20 AM Duration 11 min.

Run 1-Y
6-23-60

LOADING CHANGE

Description 2"X2"X17.625

Mass before change ____ gmU 6,665 gmU-235
Mass of Change ____ gmU −46 gmU-235
Total Mass ____ gmU 6,619 gmU-235

CRITICAL POSITIONS

290 8/8 Expr 2"X2" Run 1-Y
Table Pos. 2065 T 8395 8220

	Control Rod	Channel
1		A 79 10/500
2		B 0%
3	C- 16.03	C 9.7 10⁻¹²
4		D 51 10/500
		E 0 690

Tim Crit. 1.2% AM PM Duration 7 min.

Rod C out 10.67 Sensitivity X ¢/in.
Level Rd C @ 16.03 90.1

6.505 Kg Crit. Mass

Rod C 0 to 16.82 = 13.44 ¢
16.82 to 19.23 = 10.15 ¢ 23.59 ¢
19.23 to 19.39 = 0.80 ¢ 24.39 ¢
19.39 to 21.90 = 13.35 ¢ 37.74 ¢

Critical Height

¼" from ½ of Top Rod C changed from 19.23 to 16.03
@ 4.21 ¢/in = 13.47 ¢ or ¼" Layer = 26.94 ¢

10.67 / 13.47 = 79.2 % 79.2 X ⅛ = .099 17.625" − 0.099 = 17.526"

C.A 20, 82/18 20"X20"X24" Reflected Run 1 A

Sheet _____ Date 6-23-1960 Time 3:50 PM

Purpose Approach to critical with 20" X 20" Parallelepiped Completely Reflected (6" Reflec.)

1 control Rod + 1 Safety - 1" into Reflector at Refl.-Fuel interface

LOADING CHANGE

Description 20" X 20" X 24" - 6" Reflector

257.76 g / in. height

6186 g U^{235}

- 15.5 " for Rods

Mass before change _____ gmU 6171.5 gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU _____ gmU-235

Sub-critical

Run

Stack — 12" Deep on Fixed Table,

— 8" " " Movable "

6-24-60

INSTRUMENT CHECK

Time 8:35 ~~PM~~ AM

PR-462

	Channel A	B	C	D	E
Table OK	F				
Range	1/1000		10	10/1000	10 dd V.
	OK		OK		
Source Dist.	6"		30"	2"	1"
% F.S. Trip	90		100	95	100

Otr 1, 52

Run 1 B

LOADING CHANGE

Description 20"x20"x25" 6" Reflector
257.76 g/in Height

Mass before change ____ gmU 6,171.5 gmU-235
Mass of Change ____ gmU 257.76 gmU-235
Total Mass ____ gmU 6,429.26 gmU-235

Rod C @ out on 55.8 sec period = 15.15 ¢

~~Levelac Rd. ____ Sensitivity ____ ¢/in.~~

Rod C @ in on 252 sec period = 3.82 ¢

~~Levelac Rd. ____ ¢/in.~~

∴ Rod C = 11.33 ¢

Super with Rod C in.

15.15 ¢ Exam

6-24-60
Run 1-C

LOADING CHANGE

Description 20" X 20" X 24.75 - 6" Refl.

Mass before change ... gmU 6429.26 gmU-235
Mass of Change ... gmU -64.44 gmU-235
Total Mass ... gmU 6364.82 gmU-235

CRITICAL POSITIONS

C.A. 290 82/18 Expr 20"X20" Run 1-C
Table Pos. ... 1065 T6425R 8220

Control Rod	Channel
1	61 10/500
2	.0028
3 C-18.19	9.0 10^{-12}
4	D 39 10/500
	E 0 750

Tim Crit. 10:46 AM/PM Duration 5 min.

3.25 + Excess

Critical Height = 24.68"

" Mass = 6.348 Kg.

6-24-60

Run 1-D

LOADING CHANGE

Description 20"X20"X 24.85" - 6" Refl.

Mass before change _____ gmU 6364.82 gmU-235

Mass of Change _____ gmU ~~25.~~ gmU-235

Total Mass _____ gmU ~~6397.04~~ 6390.82 gmU-235

CRITICAL POSITIONS

~~290 8/2 18~~ Expr. 20"X20" Run 1-D

Table Pos. 065 TS KEFF 8220

Control Rod	Channel
	A 74 10/500
	B .0022
C = 20.86	C 8.2 - 10^-12
	D 44 10/500
	E 0 750

Crit. 11:25 ~~PM~~ AM Duration 5 min.

8.59 # Excess

3/8 of 1/4" Layer = 5.34 #

or

1/4" Layer = 13.35 #

$\frac{3.25}{13.35}$ = 24.3%

218

6-27-60

INSTRUMENT CHECK

Time AM / PM Source PR-467

	Channel A	B	C	D	E
Range	Table F OK	10/1000 OK	10	10/1000	1050V
Source Dist.	6"	0"	36"	2"	1"
% F.S. Trip	80	OK	100	90	100+

1 Control Rod + 1 Safety Rod (Fixed Table 20")

Run 1A

LOADING CHANGE

Description 36" x 36" x 12" - 6" Refl.
1296 in² Base
835.14 g U^{235}/in. height
10021 g U^{235} - 50 2 for Rods.

Mass before change ____ gmU 9,971 gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU ____ gmU-235

Sub Critical - No Inst. Response

Run 1B

LOADING CHANGE

Description 36" x 36" x 12.44" - 6" Refl.
13" on moveable + 12" on Fixed Table

Mass before change ____ gmU 9,971 gmU-235
Mass of Change ____ gmU 371 gmU-235
Total Mass ____ gmU 10,342 gmU-235

Sub critical - No Inst. Response

LOADING CHANGE

1C Description 36"X36"X18" - 6" Refl.

Mass before change ____ gmU 10,342 gmU-235
Mass of Change ____ gmU 464 gmU-235
Total Mass ____ gmU 10,806 gmU-235

Super Critical - Tables at 0.27

LOADING CHANGE

1D Description 36"X36"X12.89" - 6" Refl.
13" on 5/4 [redacted]
12.75" on 4/4 [redacted]

Mass before change ____ gmU 10,806 gmU-235
Mass of Change ____ gmU 91 gmU-235
Total Mass ____ gmU 10,715 gmU-235

Super Critical - Tables = 0.18

LOADING CHANGE

1E Description 36"X36"X12.72" - 6" Refl.
13" on 4/4
12.5" on 3/4

Mass before change ____ gmU 10,715 gmU-235
Mass of Change ____ gmU 139 gmU-235
Total Mass ____ gmU 10,622 gmU-235

Slight positive period at low level.
Est Crit. Height - 12.7"
Mass - 10.6 Kg

220

6-27-60

C. 270 82/18 Run 1A

Sh 6-27 60 3:05 ~~AM~~ PM

Pur

36"X36"X16" —

20" ~~Deep~~ on fixed table { 1 Control Rod, 1 Safety Rod

16" on movable Base

LOADING CHANGE

Description 36"X36"X16" ~~on Sh~~ - Bare

~~16" on Lower~~

13,362 g U235

- 50 g for rod

Mass before ____ gmU-235

Mass of Change ____ gmU-235

Total Mass ____ gmU 13,312 gmU-235

Sub critical

Run 1-B

LOADING CHANGE

Description 36"X36"X16.14" - Bare

16" on moveable

16.25" on Fixed

Mass before ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 13,429 gmU-235

Sub Critical

6-27-60

Run 1C

LOADING CHANGE

Description 36" X 36" X 16.30" - Bare
16.5" on movable
16.25" on Fixed

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 13,613 gmU-235

Sub critical

LOADING CHANGE

Run 2-D

Description 36" X 36" X ~~16.40~~ 16.38 - Bare
16.5" on half
16.25" on half

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 13,680 gmU-235

Sub critical.
Measured negative period = 1340 Sec Pd.

222

6-28-60
Run 1-B

INSTRUMENT CHECK

Time 9:05 AM ~~PM~~ Source PN-467

	Channel A	B	C	D	E
Range	Tobler F	OK			
	10/1000	Off	10	10/1000	1000 ✓
Source Dist.	6"	0"	30"	1½"	1"
% F.S. Trip	80	OK 100	95	100	

C.A. 290 82/18 Exp. 28"X28" Run 1-A

Shift Date 6-28 1960 Time 9:40 AM PM

Purp 28"X28" Parallelepiped Bare

Stack 28"X28"X20"

1 Control Rod and 1 Safety (16" each)

LOADING CHANGE

Description 28" X 28" X 20 = 1568 in³

784 in² Base

505.21 g/in Height

Mass of Fuel ... gmU 10,104 gmU-235

Mass of Ch... gmU -41 for Rods gmU-235

Total Mass gmU 10,063 gmU-235

Positive Period = 73 Sec

11.4 ¢

CRITICAL POSITIONS

29 $\frac{82}{18}$ Expr 28"X28" Run 1 A

07 TX528 7

	Control Rod	Channel
		A 70 $\frac{100}{500}$
		B .012
11.4 ¢	C = 18.61	C 5.92X10^{-8}
~~8.05~~ ¢		D 45 $\frac{100}{500}$
Excess		E .1 810

Dim Crit 10 $\frac{03}{}$ AM PM Duration 5 min

6-28-60

Run 1-B

LOADING CHANGE

Description 28"X28"X 19.94

Mass before change	gmU	10,063	gmU-235
Mass of Change	gmU	-32	gmU-235
Total Mass	gmU	10,031	gmU-235

Measured Positive Period Log N = ~~2.30~~ 178.1 Sec

17.8 Sec

6.12 ¢

~~3.94~~ ¢ Excess

~~8.05~~ 11.4

~~-3.93~~ 6.12

~~4.123~~ 5.28 ¢ for ¼ on one quadrant

Crit. = $20 - \frac{11.4}{5.28}(.0625) = 19.865$"

Crit mass = 19.865 X 505.21 - 41 = 9.995 kg

224

6-28-60

C.A. 290 82/18 Expr 24"X20" Run 1-A

Shee Date 6-28 1960 Time 1:25 PM

Pum 24"X20" Parallelpiped

Stack 24"X20"X26"

1 Control Rod and 1 Safety (12" each)

LOADING CHANGE

Description 24"X20"X26" - Bare

309.31 ~~g/in~~ height

480 in² Base

Mass before the ch... gmU 8,042 gmU-235

Mass of Change gmU - 30.93 for Rods gmU-235

Total Mass gmU 8,012.93 gmU-235

Run 1-B

LOADING CHANGE

Description 24"X20"X28"

309.31 ~~g/in~~ height

~~Base~~

Mass b... gmU 8,660 gmU-235

Mass of Chang... gmU - 30.93 for Rods. gmU-235

Total Mass gmU 8,630.93 gmU-235

6-28-60

Run 1-C

LOADING CHANGE

Description 24" X 20" X 28"

309.31 ~~in²~~ g/in Height

Mass before change ~~gmU~~ 8,630.93 gmU-235

Mass of Change gmU 309.31 gmU-235

Total Mass gmU 8,940.24 gmU-235

Run 1-D

LOADING CHANGE

Description 24" X 20 X 33"

309.31 ~~in²~~ g/in Height

Mass before change gmU 8,940.24 gmU-235

Mass of Change gmU 1237.24 gmU-235

Total Mass gmU 10,177.48 gmU-235

Run 1-E

LOADING CHANGE

Description 24" X 20" X 34.5"

309.31 g/in Height

Mass before change gmU 10,177.48 gmU-235

Mass of Change gmU 463.96 gmU-235

Total Mass gmU 10,641.44 gmU-235

226

6-28-60

LOADING CHANGE

Description 24" X 20" X 35"

Run 1-F 309.31 g./in Height

Mass before change ..... gmU 10,641.44 gmU-235

Mass of Change ..... gmU 154.65 gmU-235

Total Mass ..... gmU 10,796.09 gmU-235

Measured Positive Period

381 Sec 3.12 +

Measured Stack — Fixed Table = 35 1/8"

Moveable " = 35 3/16"

6-29-60

INSTRUMENT CHECK

Time 9:00 A

Source Pn 467

	Channel A	B	C	D	E
	Tabled F OK	1/1000	opr 10^-10	1/100	1000V
Source Dist.	6"	0"	36"	1½	0"
% F.S. Trip	90	ok	100	90	100+

C.A. 291 82/18 Expr. 20"X24" Run 1-9

Sheet Date 6-29-60 Time 9:03 AM

Purpose 20"X24" Parallelipiped

Stack 20"X24"X35"

LOADING CHANGE

Description 20"X24"X35" - Bare

309.31 g/in Height

Removed Safety Rod

Placed Safety Block in place.

Mass before change gmU 10,796.09 gmU-235

Mass of Change gmU +15.46 for rod gmU-235

Total Mass gmU ~~10,780.63~~ 10,811.55 gmU-235

Measured Positive Period

260 Sec

4.41 ¢

228

6-29-60

Run 1-H

C.A. 270 82/18 Expr. 20"X24" Run 1-H

She[illegible] Date 6-29-1960 Time 12:25 AM PM

Purp 20"X24" Parallelepiped

Stack 20"X24"X35"

LOADING CHANGE

Description 20"X24"X35"

Removed other Rod

Mass b[illegible] 10,811.55

Mass of Ch[illegible] gmU 10,780.63 gmU-235

Total Mass gmU 715.46 gmU-235 Rod

gmU 10,496.09 gmU-235

Counter #2 West Wall into Pointer #1

Counter #1 against South wall into pointer #2

" #3 in 233 fission Ctr against West inside of Stack

Pos Period - 108 Sec, 9.30 ~

Est. Critical Height - 34.6"

Mass - 10.7 Kg.

C... 130 87/18 Expr. 20" x 24" Bare Run 2 A

Sheet ____ Date 6-29-1960 Time ____ PM

Purpose Δρ/Δh measurements

20" x 24" x 34.75" for Pos. Periods

20" x 24" x 34.25" for Neg. Periods

(No Rods)

			Counters		
Run 2A 1:45 PM	Neg. Period -	Log N 204.7	☒	☒	☒
2B 2:33 PM	Pos. Period -	293.1			
2C 2:50 PM	Pos. Period -	297.5			
2D 3:40 PM	Neg Period -	206.3			

Stack

230

6-30-60

INSTRUMENT CHECK

Source PN-467

Time 8:05 AM PM

	Channel A	B	C	D	E
Range	Tables F	10/1000 ~~opr~~	10^-10	10/1000	1000V.
Source Dist.	ok ok	6"	9"	36"	2" 0"
% F.S. Trip		95	ok 100	85	100

s/s measurements Continued.

Run 2E	Neg. Period –	Log N	1	2	3
8:45 AM		217.1			
2F	Pos. Period –	271.4			
9:25 AM					
2G	Pos Period –	260.6			
9:50 AM					
2H	Neg. Period –	213.9			
10:50 AM					
2I	Pos Period –	267.1			
11:30 AM					
2J	Pos Per –	267.1			
11:50 AM					
2K	Neg Per –	217.1			
12.40 AM					
~~2K~~					
2L	Pos Period –	263.8			
2:05 PM					
2M	Pos Period –	260.6			
2:25 PM					
2N	Neg Period –	222.6			
3:20 PM					
2O	Pos Period –	250.8			
4:00 PM					

7-1-60

INSTRUMENT CHECK

Time 8:20 AM PM Source PN-467

	Channel A	B	C	D	E
Range	Tabulero OK 10/1000	opr	10^10	10/1000	960 V
Source Dist.	OK 6"	0"	36"	1"	0"
% F.S. Trip	85	OK	100	100+	180

Counters 1, 2 & 3

ΔP/ch measurements Continued.

Counters 1 2 3

2P Neg. Period – Log N 236.7 (printer Trouble)
8:55 AM

2Q Positive Period – 219.3
10:50

2R Positive Period – 217.1
11:10 AM

2S Neg Period – 247
1:15 AM

2T Positive Period – 206.3
2:16 PM

2U Positive Period – 206.3
2:30

2V Negative Period – 243.2
3:20

232

7-5-60

INSTRUMENT CHECK

Time 8:33 AM PM Source PN-467

	Channel A	B	C	D	E
Range	Tables F				
	1° / 1600	GPM	10^{-10}	10 / 1000	960 V.
Source Dist.	OK	OK			
	7"	0"	36"	2"	½
% F.S. Trip	90	OK	100	85	100 +

Ctrs 1, 2 & 3

C.A. 270 82/18 Expr. 20"X14" Run 3

Sheet — Date 7-5-60 Time 9:30 AM PM

Purpose Run 233 Rate Vertical Traverse

Stack 20"x24"X34.75"

Pos.	-15"	-12"	-9"	-6"	-3"	0	+3"	+6"	+9"	+12"	+15"
Foil #	C-19	C-22	C-45	C-24	C-29	C-15	C-2	C-29	C-17	C-18	C-9

CRITICAL POSITIONS

C.A. 270 82/18 Expr. 20"X24" Run 3A

.07 2689.32

Channel

32 1600/200

Plastic 10.70 .013

7.4 4X10⁻¹¹

D 44 1800/100

E .2 750

Run Crit. 9:35 AM PM Duration 20 min.

Building Alarm Test after Run Completed.

7-5-60 U^{235} Foils Vertical Traverse
Run 3-B Stack 20"x24"x34.75

Pos.	-15"	-12"	-9"	-6"	-3"	0	+3"	+6"	+9"	+12"	+15"
Foil #	C-43	C-42	C-38	C-37	C-32	C-40	C-21	C-6	C-36	C-12	C-31

CRITICAL POSITIONS

29% 82/18 Expr 20"x24" Run 3-B

.07 T2570

Control Rod — Channel

A 33 1000/200

Plan. Ref. 6.10 .013

C 7.4 4x10⁻¹¹

D 44 1000/100

E .2 750

Crit. 11:01 52 AM PM Duration 15 min

7-5-60 U^{235} Foil Vertical Traverse

Run 3-C

Pos.	-15	-12	-9	-6	-3	0	+3	+6	+9	+12	+15
Foil #	C-20	C-7	C-3	C-34	C-35	C-30	C-39	C-10	C-11	C-14	C-44

Plan. Ref. 6.3

CRITICAL POSITIONS

29% 82/18 Expr. 20"x24" Run 3-C

.07 1550 T

Control Rod — Channel

A 32 1000/200

C .013

7.4 4x10⁻¹¹

D 44 1000/100

E .2 750

Tim Crit. 1:07 49/60 AM PM Duration 15 min.

234

7-5-60 N^{233} Foil ~~Vertical~~ Horizontal Traverse

Run 3-D

Pos	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil #	C-33	C-8	C-46	C-25	C-1	C-41	C-13	C-5	C-16

CRITICAL POSITIONS

C.A. 290.82/18 Expr 2.0" X 24" Run 3-D

Table Fo .07 T 1560 P

Band Channel

1 A

2 Rbxfas 17.99 From .013 to .004

3 C

4 Sub Critical D

E

Tim Crit. 2:15 AM PM Duration 20 min.

7-6-60

Run 3-E

U^{233} foil

Horizontal traverse

Stack 20"X24"X34.75"

INSTRUMENT CHECK

Time 8:20 AM PM Source PN-467

	Channel A	B	C	D	
Tubes F	10/1000	off	10^{-10}	10/1000	960 V.
	OK				
	6"	0"	36"	1½"	½"
E.S. Trip	90	OK	100	90	100+

Pos.	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil #	C-16	C-28	C-12	C-31	C-9	C-42	C-21	C-35	C-3

CRITICAL POSITIONS

A 290 82/18 Expr 20"X24" Run 3-E

.07 T/535

Channel

Plastic 18.00 .03 to .009

3

4 Sub-critical D

E

Time Crit. 9:01 53/60 AM PM Duration 18 min.

236

7-6-60 U^{235} Foil Horizontal Traverse

Run 3-7

Pos	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil #	B-7	B-13	B-11	B-39	B-33	B-34	B41	B24	B-1

CRITICAL POSITIONS

C.P. 270 82/18 Expr 20"x24" Bank Run 3F

Table F- .07 T 1528 r

	Rod	Channel
1		A 36 1000/200
Plac. Pt. 17.39		B .014
3		C 8.0 4x10^{-11}/1000
4		D 50 100
		E .2 750

Tim. Crit. 11:38 AM PM Duration 15 min.

Assembly Size

51.112 x 61.317 x 88.657 cm

8

7-7-60

INSTRUMENT CHECK

Time 8:40 AM PM Source On: 467

	Channel A	B	C	D	E
Range	Tables F				
	1000	opt	10^{-10}	$\frac{10}{1000}$	760 V
Source Dist.	OK				
	6"	0"	36"	2"	½"
F.C. Trip	85	OK	100	85	100+

C.A. 2% 8% Expr. 20"X24" Run 4 A

Shee Date 19 Time AM PM

Purpose Support Structure Evaluation

Stack 20"X24"X 34.25" - T Safety Rod.

4A Placed at stations on top of stack equal to amount on bottom and steel plate 4'X4'X ¾" centered above stack. STRONG TEMP-HUMID CHANGE AT END OF RUN

Measured negative period. Counters

log N 1 2 3

8-11-60

INSTRUMENT CHECK

Time AM PM Source

	Channel A	B	C	D	E
Range	F OK Tables OK				
	1%10"	opn	10^{-10}	1%10"	1050
Source Dist.	6"	OK	36"	2"	0
F.C. Trip	80		100	80	100

238

Run 4B Repeat of Run 4A

Counters

Neg. Period Log N 1 2 3

274.6

4C Removed all extensions & steel plate from top added ½" Fuel to stack.

Stack - 20" X 24" X 34.75"

Pos Period Log N 1 2 3

1800

top

C.A. 2/6 82/18 Expr. 24x28" Run 1

Sheet _____ Date 7-11 1960 Time 1 20 PM

Purpose determine Hc with this base area

LOADING CHANGE

Description Initial Ht = 22" with 24x28" base
672 in² Base one Safety Rod
672 x .6444 = 433.03 g/in height
433.03 x 22 = 9526.66 gm U²³⁵
Mass before change _____ gmU -31 for Rod Hole gmU-235
Mass of Change _____ gmU _____ gmU-235
Total Mass _____ gmU 9495.66 gmU-235
Sub Critical

LOADING CHANGE

Description Height 22 3/4" 24x28" base
one Safety Rod
433.03 x 22.25"

Mass before change _____ gmU _____ gmU-235
Mass of Change _____ gmU _____ gmU-235
Total Mass _____ gmU 9634.9 gmU-235
-31
9603.9

Super Critical with ~ 100 sec period

LOADING CHANGE

Description ~~Scrub~~ Safety Rd removed
+ 1/4" off top now = 22 1/4 x 24 x 28

433.03 X 22 =

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 9526.66 gmU-235

Super Critical — 1000 Sec period.

7-12-60

INSTRUMENT CHECK

Time 7:25 AM PM Source Pu-Be

Tubes of F

	Channel A	B	C	D	E
Range	1"/100"	opr	1"	1"/100"	1"/2"
Source Dist.	5"	ole	45"	2"	2
% F.S. Trip 100	90		100	70	100

C.A. 2% 87/18 Expr. 24"X26" Bore Run 1A

Sheet _____ Date 7-12 19 60 Time ~~AM~~ PM

Purpose To Determine Critical Height of Stack with 24"X26" Bore.

LOADING CHANGE

Run 2B

Description 24" X 26" X 22.5" - Bare
624 in² Base - No Rods
624 X 16444 = 402 gm U-235/in Height
402 X 22.5" = 9048

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 9,048 ____ gmU-235

Sub Crit.

LOADING CHANGE

1C

Description 24" X 26" X 23" - Bare
402 X 23 = 9249

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 9249 ____ gmU-235

Sub Crit.

LOADING CHANGE

1D

Description 24" X 26" X 23.25"
402 X 23.25" =

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 9350 ____ gmU-235

Sub Crit. (slight)

242

7-13-60

INSTRUMENT CHECK

Time 10:15 AM ~~PM~~ Source PN-467

	A	B	C	D	E
Table F	1/1000	off	10^{-10}	1/100	960 V.
Source Dist.	6"	0"	30"	2"	0"
% F.S.	90	OK	100	80	100+

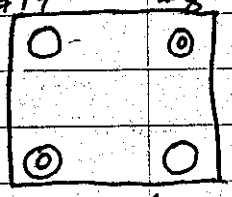
C.A. 2% 5/16 Expr. 24x24" Run 20 Q

Sheet _____ Date 7-13 1960 Time 10 25 AM PM

Purpose Ind foil Bore + Cd

Stack - 24" x 24" x 25 1/8" - (1/2" on Hall Eq)

Bore #19 Cd Cov'd #8



#17 Cd Cov'd #22 Bore

CRITICAL POSITIONS

C.A. 2% 83/18 Expr. 24"x24" Run 20 Q

Table Pos. .107 L T R

Channel

1 42 1000/100

2 .01

Plastic 14.97 S.0 4x10⁻¹

D 34 1000/100

E .2

Tim Crit 10:52 AM PM Duration 20 min.

7-15-60

INSTRUMENT CHECK

Time 9:3- AM ~~PM~~ Source P.B.

Tables OK F

	Channel A	B	C	D	E
Range OK	1"/1000	"	10"	4"/1000	1.50
Source Dist.	6"	SIC	4"	1"	0
% F.S. Trip	80		100	80	100

C.A. 2% 87/18 Expr. 24"X24" Run 20R

Sheet ____ Date 7-15-60 Time ____ AM ~~PM~~

Purpose 2% U^{235} Foil ~~Exposure~~ Bare and Dpl Foil Exposure

(2%)

A-7 Dpl #6

0	0
0	0

Dpl #5 A-8 (2%)

1 7/16" X 1 7/16" X 1/4" 2S al on top 7 stack. (for DWM)

CRITICAL POSITIONS

C.A. 2% 87/18 Expr. 24"X24" Run 20R

J's Pos. .0628 L T .1541 R .0268

Control Rod	Channel	
	A 43	1000/100
	B .01	
	C 513	4×10^{-11}
Plastic Refl. = 14.6	D 35	1000/100
	E 0	690

Tim Crit. 10:01 AM ~~PM~~ Duration 28 min.

C.A. 2/6/83 Expr. 24"x24" Bore Run 21 A

Sheet Date 7-12-1983 Time 3:30 ~~AM~~ PM

Purpose Bias Curve (at Power)

Amp. #1 & 2

U^{238} & U^{235} Fission Ctrs

Stack - 24"x24"x25½"

hog N=.02

~~Ctrs~~ Counters located at center of stack entered from South side. 12½" from bottom of stack. Ctrs Separated by 2" fuel.

Amp #1 - Bias = 18.9 to preamp #2

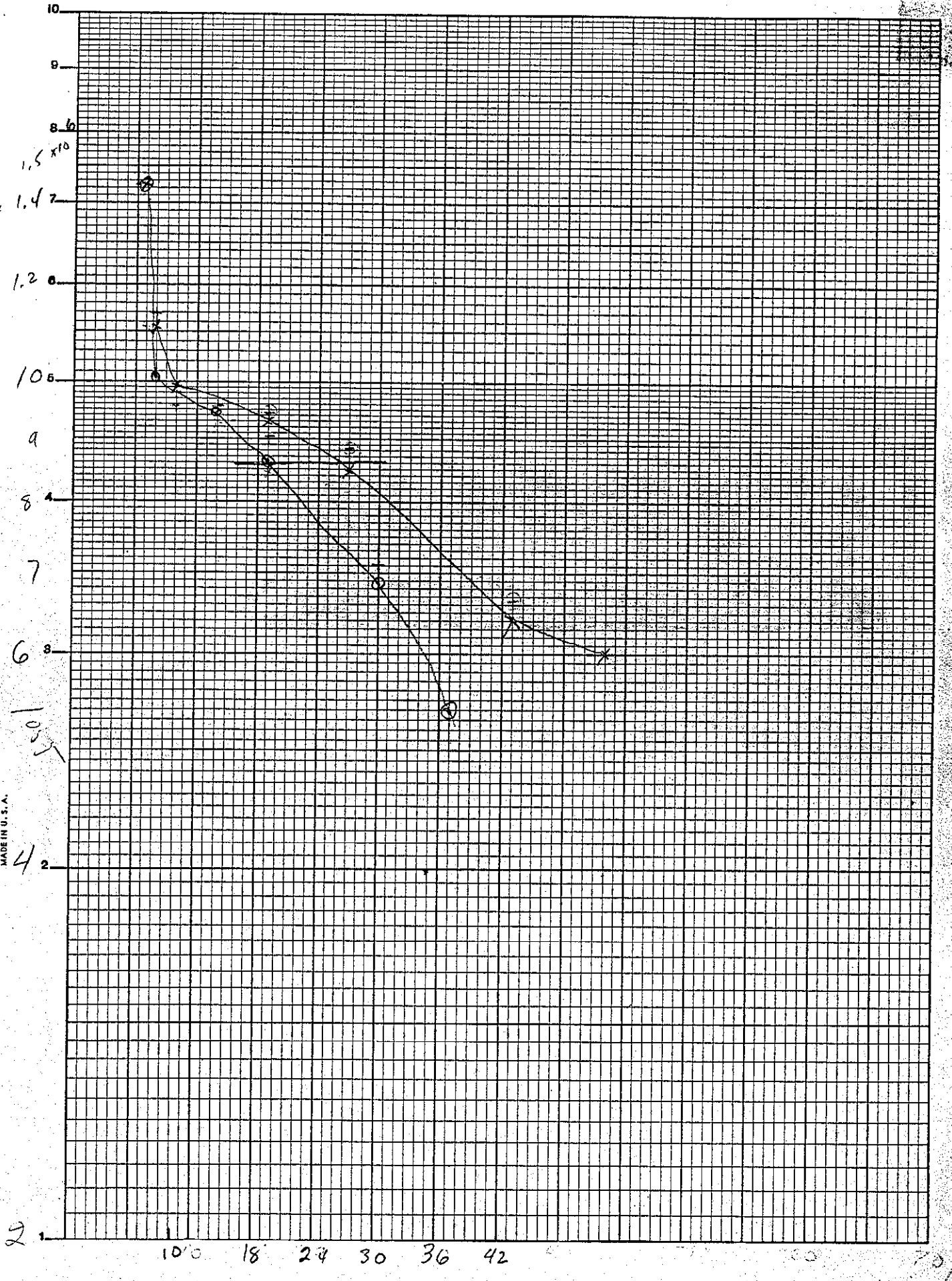
#2 - " = 27.6 " #1

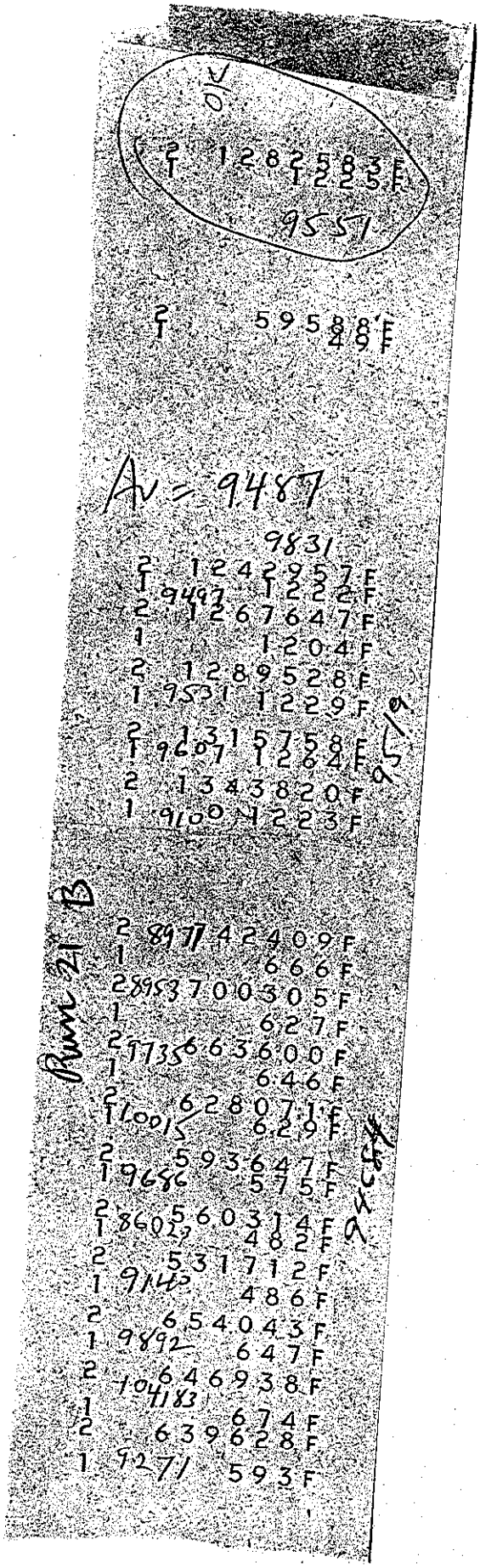
PHS Curve For 235 & 238 chambers

#2 PH.		#1 - 238		PH	#2 - 235		N	#3-233		Norm.
6		1111		7	1448376			175	216	45016
8	10	982	995	10	1014234	10272	1.0128	173	158	44446
14	10	942	929	19	957074	9434	.9858	178	96	45664
18.9		884	884	845	27	903675 ~~873~~	86409	.9562	179	252	46076
30		664	640	43	710748	6848	.96338	182	135	46727
37		543	615	530	474669	5378	1.1331	155	46	39728

~~Amp #1~~

	GAIN Fine	GAIN Course	Rise Time	Input
Amp. #1	1	32	0.8	—
Amp. #2	1	16	0.8	—


10
9
8
1.5 x10
1.4
1.2
10
8
7
6
4
2
10
18
24
30
36
42
KEUFFEL & ESSER CO., N. Y. NO. 358-52
Semi-Logarithmic, 1 Cycle X 6 to the ½ inch
MADE IN U.S.A.


Run 21 B
Av = 9487
Run 21 C

7-18-60

INSTRUMENT CHECK

8:25 AM PM Source PN-467

	Channel A	B	C	D	E
Table F	10/1000	oper	10^{-8}	10/100	980
Source Dist.	OK	OK	6"	0"	30"	2"	0°
% F.S. Trip	85	OK	100	90	100+

CA 290 82/18 Expr. 24"x24" Run 2 & B

Sheet ____ Date 7-18 1960 Time 8:30 AM PM

Purpose U^{238} and U^{235} Fission Counter Ratio.

Run 2B Amp #1 - Disc at 18.9 - Printer #2 - U^{235} on East Side

" #2 - Disc at 27.0 " #1 - U^{238} " West "

Log N = .022 ± .024 for 1st Counts

Reduced ~~LD~~ Level to Log N = .013

Run 2C Switched Counters in front & preamps.

Average Ratio of Counter Response

$$\frac{U^{238}}{U^{235}} = .9408 \times 10^{-3}$$

7-19-60

INSTRUMENT CHECK

Time 12:40 ~~AM~~ PM Source M-22b

	Channel A	B	C	D	E
Range Tables F	1/1000	~~off~~	10^-10	1/1000	960 V.
Source-Dist. ok	8"	~~off~~	36"	3"	8"
% F.S. Trip	90	ok	100	85	100+

C.A. 2% 82/18 Expr. 24"X24" Run 22A

Sheet ____ Date 7-19-1960 Time ____ AM PM

Purpose Reflector Savings

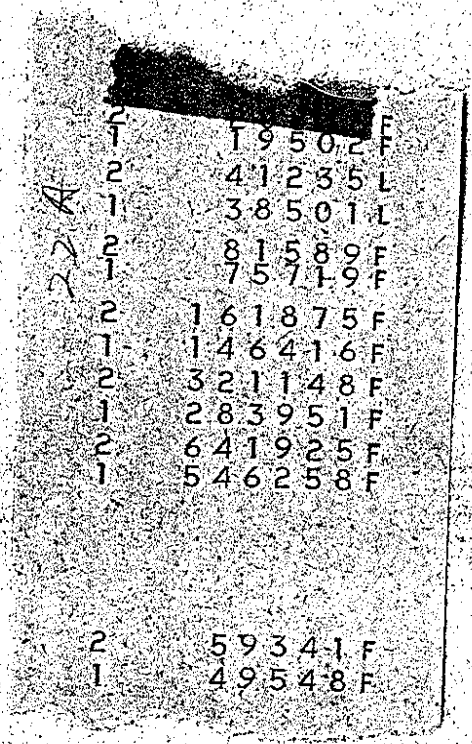
Stock - 24"X24"X23.75" - No Rods

Run 22A - 6" Paraffin on top of Stock. Counters [1] [2] [3]
Measured Positive Period. log N

22B - 6" Paraffin on top of Stock 24"X24"X23.75" with two safety rods 4" in and 4" up.
Measured Negative period -
Log N = [1] [2] [3]
-302.8 μa

22C Stock - 24"X24"X25.5" - Bare [1] [2] [3]
Positive Period - log N
+289.2 μa

22D Stock 24"X24"X23.75" - 6" of Concrete on top of Stock
Blocks (6"X6"X12") from [redacted] Tower Shielding Facility.
Neg Period - Log N -166.8 [1] [2] [3]


2 F
1 1 9 5 0 2 F
2 4 1 2 3 5 L
1 3 8 5 0 1 L
2 8 1 5 8 9 F
1 7 5 7 1 9 F
2 1 6 1 8 7 5 F
1 1 4 6 4 1 6 F
2 3 2 1 1 4 8 F
1 2 8 3 9 5 1 F
2 6 4 1 9 2 5 F
1 5 4 6 2 5 8 F
2 5 9 3 4 1 F
1 4 9 5 4 8 F

7-20-60

INSTRUMENT CHECK

Time AM PM

Channel

	A	B	C	D	E
Range	Tables F	10/1000	dpr 10^10	10/1000	960 V.
Source Dist.	OK OK	2"	0" 48"	3"	½"
% F.S. Trip		85	dk	90	100+

Ch = 1, 2 & 3

C.A. 290 82/18 Expr. 22" X 22" Bare 1A

Sheet Date 7-20-60 12:45 PM

Purpose Critical Height

22" X 22" X 34" Bare

LOADING CHANGE

Description 22" X 22" X 34" – Bare Two Safetys {2" in, 4" up / 4" in, 4" up

484 X .6444 = 311.9 g

311.9 x 34 = 10,604

Mass before change 10,604 gmU-235

Mass of Change - 28 for Rods gmU-235

Total Mass 10,576 gmU-235

Super Critical

Tables . 2 in

248

7-20-60

Run 1B

LOADING CHANGE

Description 22" X 22" X 33" - Bare 2 Safetys {3" ∠, 4" up / 4" ∠, 4" up
484 X .6444 = 311.9
311.9 X 33 =

Mass before gmU 10,576 gmU-235
Mass of Change gmU 311.9 gmU-235
Total Mass gmU 10,265.9 gmU-235

Slight Super Critical
~ 630 Sec Period.

7-20-60

Run 1A

G.A. 29 8/2 18 Expr. 20" X 22" BARE Run 1A
Sheet Date 7-20 60 Time 3:15 ~~AM~~ PM
Purpose Critical Height

LOADING CHANGE

Description 20" X 22" X 40" - Bare - 2 Safetys {3" ∠, 4" up / 4" ∠, 4" up
440 X .6444 = 283.5
283.5 X 40

Mass before gmU 11,340 gmU-235
Mass of Change gmU -28 for Rods gmU-235
Total Mass gmU 11,312 gmU-235

Sub Critical

7-21-60

INSTRUMENT CHECK

Time 8:30 AM PM M-226

	A	B	C	D	E
Range	Tables F	$\frac{10}{1000}$	opr 10^{-10}	$\frac{10}{1000}$	960
Source Dist.	OK	11"	5¼"	3"	½"
% F.S. Trip		85	100	90	100+

Etc

G.A. 290 $\frac{82}{18}$ Expr. 20"X22" Unit 1-B

Sheet Date BARE 7-21-60 Time 8:35 AM PM

Purpose Critical Height

Stack 20"X2½"X42"

LOADING CHANGE

Description 20"X22"X42" – Bore -2 Safety Rods

440 x .6444 = 283.5

283.5 X 42

Mass before change 11,312 gmU-235

Mass of Change ±569 gmU-235

Total Mass 11,879 gmU-235

Sub Critical

250

7-21-60 Critical Height

Run 1-C

LOADING CHANGE

Description 20"X 22"X 44" - Bare - 2 Safety Rods =
440 X .6444 = 283.5
283.5 X 44 =

Mass before change gmU 11,879 gmU-235
Mass of Change gmU + 567 gmU-235
Total Mass gmU 12,446 gmU-235

Super Critical - 172 Sec Period.

LOADING CHANGE

7-21-60 Run 1-D

Description 20"X 22"X 42 = Bare - Removed 2 Safety Rods
440 X .6444 = 283.5
283.5 X 42

Mass before change gmU 12,446 gmU-235
Mass of Change gmU ~~- 567~~ 283 gmU-235
Total Mass gmU ~~11,879~~ gmU-235
12,163
+ 28 for safety holes
12,191

Critical - Level

Neg Period - 42.5"
Pos " - 43.5"

Begin ΔP/oh Measurements

LOADING CHANGE

7-21-60 Run 2-A

Description 20"X 22"X 42.5 Bare
440 X .6444 = 283.5
283.5 X 41.5

~~12,191~~
12,163
Mass before change gmU ~~11,879~~ gmU-235
Mass of Change gmU - 142 gmU-235
Total Mass gmU ~~11,737~~ gmU-235

~~12,021~~
12,049

C.A. E9 82/8 Expr. 20K22 BARE Run 2A

Sheet ____ Date ____ 19 ____ Time ____ AM PM

Purpose Δp/αh measurements

neg. Period - 42.5" High

Pos. " - 43.5" "

Counters

2A Neg Period - Log N

2B Pos Period

2C Pos Period

2D Neg Period

~~2F Pos Period~~

~~2G Pos Period~~

~~2H Neg Period~~

~~2I Pos Period~~

7-22-60

INSTRUMENT CHECK

Time 8:20 AM PM Source Rn-226

Tables OK F

		Channel A	B	C	D	E
Range	OIC	10/1000	opn	10^10	10/1000	1050
Source Dist.		12"		3½'	2.5"	½"
% F.S. Trip		70		100	80	100

LOG N Counters 1 2 3

2E Neg. Period -

2F Pos. Period -

10:00 AM 2G Pos. Period -

2H Neg Period -

11:35 AM 2I Pos. Period -

2J Pos Period -

2K Neg Period -

1:50 PM 2L Pos Period -

2M Pos Period -

2N Neg Period -

2O Pos Period -

7/25/60

INSTRUMENT CHECK

Time 1 ~~AM~~ PM Source Pu Be

Tables OK F

Range OK

Source Dist.

% F.S. Trip

Channel	A	B	C	D	E
	1/1000		10"	1/1000	1050
	11"		32"	3"	D
	80		100	90	100

2P Pos. Period

2Q Neg. Period

2R Pos Period

7/25/60

INSTRUMENT CHECK

Time 8 10 ~~AM~~ ~~PM~~ Source Pu Be

Tables OK

Range F OK

Source Dist.

% F.S. Trip

Channel	A	B	C	D	E
	1/1000	6pm	15"	1/100	1050
	12"	OK	4'	3"	1/2"
	80		100	80	100

2S Pos Period

7-27-60

7-

INSTRUMENT CHECK

Time 8:10 AM ~~PM~~ Source Pu B_e

Tables OK

Channel	F	A	B	C	D	E
Range	OK	10/100	per	10^{-10}	10/100	105
Source Dist.		13"	OK	4'	4"	0"
% F.S. Trip		80		100	70	60

C.A. 296 82/18 Expr. 20 X 22 Run 3-A

Sheet ____ Date 7-27 1960 Time 8:30 AM ~~PM~~

Purpose Support structure combination 30 x 22 x 42.5 with support structure & one safety

Measured Negative period

Period -225.3 Log N

C.A. 296 82/18 Expr. 30 X 22 Run 3B

Sheet ____ Date 7-27 1960 Time 10:45 AM ~~PM~~

Purpose Removed Support structure & added 1" of fuel

H - 43.5"

Measured positive period

Period

7-28-60

INSTRUMENT CHECK

Time 3:25 AM PM

Source Pu Be

Channel	A	B	D	G	E
Tables For Ohr Range	1/1000	per	15"	1/1000	1-50
Source Dist.	7"		3"	4'	2"
% F.S. Trip	85		75 on dial	100	100

C.A. 2-0-82/18 Expr. 18"X24" Run 1-A

Sheet _____ Date 7-28 1960 Time 3:30 AM PM

Purpose 18 x 24 Critical height det with 2 Safetys

Bare

LOADING CHANGE

Description 18"X24"X52

18 X 24 : 432 in²

~~432~~ X ~~278.38~~ :

432 X .6444 = 278.38 g/1" Height

278.38 X 52

Mass before ch. gmU 14,475 gmU-235

Mass of Charge gmU -28 for Rods gmU-235

Total Mass gmU 14,447 gmU-235

Sub-critical

256

7-28-60
Run 1-B

LOADING CHANGE #

Description 18" X 24" X 53 Added 1 inch

Mass before change gmU 14,447 gmU-235
Mass of Change gmU +278 gmU-235
Total Mass gmU ~~14,555~~ 14,725 gmU-235

Sub-critical

7/29/60
Run
1-C

INSTRUMENT CHECK

Time 10:15 PM Source M-226

Channel	A	B	C	D	E
Range	10/1000	off	10^{10}	10/1000	1000
Source Dist.	16"	4'	3'	0"	
% F.S. Trip	100	100	100	100	

Added 1" to stack dimension.

LOADING CHANGE

Description New load - 18 x 24 x 54"

Mass before change gmU 14,725 gmU-235
Mass of Change gmU 278 gmU-235
Total Mass gmU 15,003 gmU-235

7/29-60

LOADING CHANGE

Run 1-D Description Added 2"
Present 16 x 24 x 56"

Mass before change ____ gmU 12,003 gmU-235
Mass of Change ____ gmU 557 gmU-235
Total Mass ____ gmU 12,560 gmU-235
Sub-Critical

LOADING CHANGE

7-29-60
Run 1-E Description Added 1"
Stack 18" x 24" x 57"

Mass before change ____ gmU 18,560 gmU-235
Mass of Change ____ gmU 279 gmU-235
Total Mass ____ gmU 18,839 gmU-235
Positive Per about 400 sec.

8-1-60
Run 2-A (2A)
Not enough excess to achieve Power.

INSTRUMENT CHECK

Time 11:00 AM Source M-226

Channel

	A	B	C	D	E
Range	Tabs F	10		10	10
Source D	OK OK	1000 off	10" 0"	1000	960V
		10" 0"	12"	3"	0"
		90 OK	100	90	100+

C.A. 2½ 8¾/18 18"x24" Bore Run 2-A

Sheet Time 11:15 AM

Purpose Support Structure Evaluation

8-1-60 18"x24"x56" - Bore
Run 2-B (2B) Al extrusion and steel plate Center above stack.
Pos. Period —
8-1-60 Stack 18"x24"x57" Bore
Run 2-A Pos. Period
2C

(2C)

8-2-60

INSTRUMENT CHECK

Time 8:40 AM PM Source M-22L

	Channel A	B	C	D	E
Range	Table OK F	1/1000	opr	10	10/1000	960V
Source Dist.	10"	0"	4½"	3"	0"
% F.S. Trip	85	OK	100	85	100+

C.A. 270 82/18 Expr. 18"X24" Run 3-A

Sheet ____ Date 8-2-960 Time 8:40 AM PM

Purpose S P/ah Measurements

2 Safety rods removed
Bare

LOADING CHANGE

Description 18"X24"X55"

Mass before ch. gm U-235

Mass of Change gm U-235

Total Mass gm U 15,310 gm U-235

18"X24"X55" - for negative periods
18"X24"X57" - for Positive Periods

no Rods

8-2-60	Period	Log N	Counters 1 & 2	3
Run 3-A	Negative	182.4		
Run 3B	Positive	499		
Run 3-C	Positive	157.4		
3D	Negative	320.3		
3E	Positive	157.4		
3F	Positive	158.5		
3G	Negative (Boroffin Slab on Edge of Tables)	331.2		

Measured Stack Dimensions 18" x 24" x 56"

18" — 45.9 Cm	56" — 142.5 Cm	12" — 1 Table
46	142.75	30.4 Cm
45.9	143	30.6
45.9875 Cm 46	142.825 142.5	30.525 30.6
18.105" 46.1	56.23" 143	12.0325 30.6
45.9	142.5	30.7
45.9	143	30.6
46.15	143	30.6
46	143	30.4
46	143	
46		
46		

8-3-60

INSTRUMENT CHECK

Time 8:20 AM PM

Source Pu Be M-226

	A	B	C	D	E
Range	10/1000	Oper	10^{-10}	10/1000	960V
Source Dist.	9"	0"	36"	3"	0"
% F.S. Trip	Ex-	OK	100	90	100+

Continued α P/α h Measurements

Run 3H Negative period Log N 309.4 [1] [2] [3]

5

I Positive Period- 160.7

J Positive Period- 160.7

6

K Negative Period - 314.9

7

1:15 PM L Positive Period- 162.9

M Positive Period- 159.6

8

N Negative Period 314.9

9

O Positive Period 157.4

8-4-60

INSTRUMENT CHECK

Source Ra-Be

Time 8:25 ~~PM~~ AM

	Channel A	B	C	D	E
Range	Tubes ok / F. ok	10 / 100 cps	10^-10	10 / 100	960 V
Source Dist.	10"	0"	42"	3"	½"
% F.S. Trip	90	~~0~~ ok	100	96	100+

Continued a P/oth Measurements

		Log N	Counters 1	2	3
Run 3 P	Negative Period –	288.8			
Q	Positive Period –	175.3			
R	Positive Period –	175.9			
S	Negative Period –	286.6			
T	Positive Period –	173.7			
U	Positive Period –	173.7			
V	Negative Period –	287.7			
W	Positive Period –	171.5			
X	Positive Period –	172.6			
Y	Negative Period –	298.6			

8-5-60

INSTRUMENT CHECK

Time 8:30 AM PM Source Pu Be

Channel	A	B	C	D	E
Range	Tables OK F- OK $\frac{10}{1000}$	open	$\frac{10}{10}$	$\frac{10}{1000}$	960 V.
Source Dist.	11"	0"	42"	3"	0"
% F.S. Trip	90	90	100	85	100 +

C.A. $290\frac{82}{18}$ Expr. 18"X24" Run 4-A

Sheet ____ Data 8-5-60 Time 10^{25} AM PM

Purp. 290 & 235 Foil - Vertical Traverse

18"X24"X36"
Bare

Pos.	-21	-18	-15	-12	-9	-6	-3	0	+3	+6	+9
Foil #	B-41	B-42	B-32	B-2	B-24	B-27	B-33	B-10	B-8	B-14	B-19

Pos.	+12	+15	+18	+21
Foil #	B-30	B-11	B-31	B-26

CRITICAL POSITIONS

$290\frac{82}{18}$ Expr 18"X24" Run 4-A

.165

Plastic - out 33 $\frac{1000}{200}$

.01 - .015

8.04×10^{-11}

D 47 $\frac{1000}{100}$

E .2 750

Time $10\frac{42}{60}\frac{10}{AM}$ Duration 15 min

C.A. 270 $\frac{82}{18}$ Expr. 18"X24" Run 4-B

Shot [illegible] 8-5 960 Time 1:15 AM PM

Purp 270 n^{235} Vertical Traverse

Bar

Pos	-21	-18	-15	-12	-9	-6	-3	0	+3
Foil #	B-12	B-13	B-3	B-6	B-40	B-9	B-21	B-15 ~~B-5~~	B-16

+6	+9	+12	+15	+18	+21
B-36	B-18	B-4	B-28	B-29	B-38

CRITICAL POSITIONS

270 $\frac{82}{18}$ Expr 18"X24" Run 4-B

.17

Channel

Plastic-out A 35 $\frac{1000}{200}$

.009 to .017

C 5.3 10-10

D 49 $\frac{100}{1000}$

E 8 750

Tim Crit 1:32 ~~PM~~ Duration 15 min

8-8-60

INSTRUMENT

Time AM PM

	A	B	C	D	E
Range	Tubes F DK	0 / 1000	ops	10^10	11 / 1000 960V.
Source Dist.		11"	48'	3"	0"
% F.S. Trip		85	100	85	100

C.A. $29.0\frac{82}{18}$ Expr 18"X24" Run 4-C

Sheet Date 8-8-60 Time 8:52 AM PM

Purpose $29_0 u^{235}$ Vertical Traverse

Bare

Pos.	-21	-18	-15	-12	-9	-6	-3	0	+3	+6
Foil #	C-33	C-45	C-9	C-3	C-21	C-16	C-27	C-30	C-1	C-5

	+9	+12	+15	+18	+21
	C-29	C-19	C-44	C-24	C-43

CRITICAL POSITIONS

C. $29_0\frac{82}{18}$ Expr 18"X24" Run 4-C

.165

Plastic-out

	30	1000 / 500
	.01 To .03	
	5.0	2.5×10^{-10}
D	18	1000 / 500
E	.6	750

Time 9:11 3/60 AM PM Duration 13 min.

266

8-8-60

Run 4-D

C.A. 290 82/18 Expr. 18" X 24" Run ~~4-D~~ 4-D

Sheet ..... Date 8-8 1960 Time 10:45 AM PM

Purpose 290 k 235 Horizontal Traverse

Bare

Pos.	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil #	C-39	C-12	C-42	C-15	C-22	C-10	C-25	C-32	C-37

CRITICAL POSITIONS

C.A. 290 82/18 Expr 18" X 24" Run 4-D

Table No. .165 T P

Channel

1 Plastic-1.8, 1.8 A 32 1000/100

B .0075

C 5.0 4X10⁻¹¹

D 45 100/500

0 E .2 750

Test Crit. 11:05 AM PM 25

8-8-60 $2\%U^{235}$ Horizontal Traverse Bare

Run 4-E 18"X 24"

Pos.	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil#	C-18	C-41	C-40	C-36	C-2	C-14	C-17	C-31	C-7

CRITICAL POSITIONS

C.A. $2\%\frac{82}{18}$ Expr. 18"X24" Run 4-E

Table Pos. .165 T P

Control Rod		Channel
1 Plastic	16 17 A	51 $\frac{1000}{100}$
2	B	.013
3	C	5.1 10-10
	D	39 $\frac{1000}{100}$
	E	.3 750

Run Crit. 1:52 $\frac{53}{60}$ PM Duration 15 min.

4-F $2\%U^{235}$ Horizontal Traverse

Pos.	-8	-6	-4	-2	0	+2	+4	+6	+8
Foil#	C-35	C-8	C-4	C-38	11	C-20	C-46	C-34	C-6

CRITICAL POSITIONS

C.A. $2\%\frac{82}{18}$ Expr. 18"x24" Run 4-F

Table Pos. .165 T P

Control Rod		Channel
1 Plastic	11.07 A	53 $\frac{1000}{100}$
2	B	.013
3	C	4.2 10-10
	D	40 $\frac{1000}{100}$
	E	.3 650

2:52 $\frac{04}{60}$ 15 min.

268

8-9-60

n

INSTRUMENT CHECK

Time 12:45 ~~AM~~ PM Source Pu Be

	Channel A	B	C	D	E
Range Tables F	10/1000	Oper	10	10/1000	960V
Source Dist.	11"	0"	48"	4"	1/2"
% F.S. Trip	95	OK	100	85	100

C.A. 290 82/18 Exp. 24"X28" Run 1A

Shee Date 8-9 1960 Time 1:15 AM PM

Purp. Δt/0h Measurements

Bare LOADING CHANGE No Rods

Description 672 in² Bare 24"X28"X21.75

672 X .6444 = 433.03 gr

433.03 X 21.75 = 9,418.40

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 9,418.40 gmU-235

Logn 0 ▲ ☐

8-9-60

Run 1-A Negative Period -

1B Positive Period -

8-10-60

INSTRUMENT CHECK

Time 10:15 ~~AM PM~~ Source Pu Be

	Channel A	B	C	D	E
Range Tables OK	10	1000 cps	10^{-10}	$\frac{10}{100}$	960 V
Source Dist.	11"	8"	54"	3"	0"
% F.S. Trip	85	OK	100	85	100

C.A. 290 Expr 22" X 26" 1A

Sheet ____ Date 8-10-60 10:30 ~~PM~~ AM

Purpose Critical Height Determination

22" X 26" X 25.5

LOADING CHANGE

Description

22" X 26" = 572

572 X .6444 = 368.59

368.59 X 25.5 = 9,399.04

Mass before change ____ gmU-235

Mass of Change ____ gmU-235

Total Mass ____ gmU 9,399.04 gmU-235

.75

270

8-10-60

Run 1A

C.A. 270 82/18 Exp. 24"X26" Run 1A

Sheet ____ Date ____ Time ____ AM PM

Purpose Critical Height Det. in preparation for a P/ak measurement

Stack 24"x26"x23 1/2"

LOADING CHANGE

Description

24"x26" = 624

624 X .6444 = 402.10

402.10 X 23.5 = 9,449.35

No Rods

Mass before ____ gmU ____ gmU-235

Mass of Charge ____ gmU ____ gmU-235

Total Mass ____ gmU 9,449.35 gmU-235

Super-Critical

Run 1-B Stack 24"x26"x23" = 9,248.30 g.

neg. period — 143.8

Run 1-C Stack 24"x26"x23.25 = 9,350.70 g.

Positive period — 209

8-11-60

Temp. 69°F

Δ P/Δ h Measurements

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source Pu Be

	A	B	C	D	E
Range	Tables f	8 μv	10	10/1000	960 V.
Source Dist.	OK	11"	0"	48"	3"	½"
% F.S. Trip		85	OK	100	85	100+

	Period	Log N	Counters 1	2	3
1 D	Negative	— 152			
2 E	Positive	— 171.5			
F	Positive	— 184.6			
11:30 AM 3 G	Negative	— 148.2			
4	Added one (1) additional BF_3 Counter				
3:20 PM H	Positive	— 190			

272

8-12-60

Run 2-A

INSTRUMENT CHECK

Time 9:25 AM PM Source Pu Be

	Channel A	B	C	D	E
Range Tables OK / OR	10/1000	oper	10^{-10}	10/1000	960 V.
Source Dist.	10"	0"	48"	3"	½"
% F.S. Trip	90	OK	100	90	100+

C.A. 290 82/18 Expr. 24"X26" Run 2-A

Sheet ____ Date 8-12-1960 Time 9:40 AM PM

Purpose Horizontal Traverse

Cd. covered Gold Foil

Bare

CRITICAL POSITIONS

C.A. 290 82/18 Expr. 24"X26" Run 2-A

Table Pos. .065 T ____ P ____

Control Rod	Channel
Plastic 10.0¢	A 62 1000/500
LOADING ~~CHARGE~~	B 6
Description	C 6.5 2X5 10^{-10}
	D 98 1000/500
	E .6 690

Mass before change ____ gmU ____ amU 235

Mass ~~of Charge~~ Run Cmpl. 9:58 13/6 AM PM gmU Duration 30 min. gmU 235

Total Mass ____ gmU ____ gmU-235

Pos.	-12	-9	-6	-3	0	+3	+6	+9	+12
Foil #	D-4	D-6	D20	D-9	D-25	D-26	D-15	D-8	D-10

8-12-60

C.A. 270 82/18 Expr. 24"X26" 2-B

Shoot _____ Date 8-12 1960 Time 11:20 AM

Purpose Horizontal Traverse

Cd. Covered Gold Foil

Stack 23.25 High Bare

Pos.	-12	-9	-6	-3	0	+3	+6	+9	+12
Foil #	D-14	D-18	D-33	D-17	D-5	D-31	D-16	D-12	D-30

CRITICAL POSITIONS

C A 270 82/18 Expr. 24"X26" Run 2-B

Table Pos. .068 = R

	Control Rod	Channel
1	Plastic 10.04	A 40 1000/1000
2		B .075
3		C 79 2.5X10 = 10
4		D 45 1000/500
		E .8 690

Turn Crit. 11 32 AM PM Duration 30 min.

274

8-12-60

C.A. 270 $\frac{82}{18}$ Exp. 24"x26" Run 2-C

Sheet _____ Date 8-12 1960 Time 1:55 ~~AM~~ PM

Purpose Horizontal Traverse

Cd. covered Gold Foil

Bare

Pos.	-12	-9	-6	-3	0	+3	+6	+9	+12
Foil #	E-17	D-11	D-29	D-13	D-27	D-3	D-7	D-19	D-2

CRITICAL POSITIONS

C.A. 270 $\frac{82}{18}$ Exp. ~~24"x26"~~ Run 2-C

Table Pos. 1.07 T P

Channel

Plastic 11.4 A 39 $\frac{1000}{1000}$

.075

J 7.8 2.5×10^{-10}

4 D 44 $\frac{1000}{500}$

E .8 690

Tim Crit. 2:09 $\frac{10}{60}$ AM PM Duration 30 min.

8-15-60

INSTRUMENT CHECK

Time 8:15 AM — Pa Be

	A	B	C	D	E
Range	10/1000	opr	10^{-10}	10/1000	960 V.
Source Dist.	15"	0"	42"	3"	3"
% F.S. Trip	75	OK	100	85	100+

Temp. 71.8° F

Continued a/c/sh Measurement (See p. 271)

Run I — negative period — 137.9

5

J Positive Period — 287.7

K Positive Period — 277.9

6

L Negative Period — 138.4

3 7

12:45 PM M Positive Period — 279

N Positive Period — 271.4

4 8

O Negative Period — 137.9

5 9

P Positive Period — 276.9

Q Positive Period — 269.3

10

R Negative Period — 137.9

8-16-60

INSTRUMENT CHECK

Time 8:15 AM PM

Source Ba Be

Channel	A	B	C	D	E
Range	Tables of	10/1000 cps	10^-10	10/1000	960 V
Source Dist.	10"	0"	42"	3"	1/2"
% F.S. Trip	90	OK	100	90	100+

71 °F

Continued α h/o P measurements (.9 N)

S Negative Period – 138.4

T Positive Period – 268.7

U Positive Period – 276.9

V Negative Period – 141.4

W Positive Period – 266.0

X Positive Period – 262.7

1:30 PM Y Negative Period – 137.3

Z Positive Period – 266.0

A_1 Positive Period – 261.7

B_1 Negative Period – 139.0

8-17-60

Run 2-A

INSTRUMENT CHECK

Time 12:30 AM PM Source Ra Be

Trablo OK Channel

	A	B	C	D	E
Range	F 12/100	OK	10	12/1000	1000
Source Dist.	OK 12"	OK	2'	4"	1/2"
% F.S. Trip	90	100	80	100	

④

C.A 29.8z/18 Expr. 24"X26" Run 2-A

Sheet — Date — To — AM PM

Purpose Support Structure Evaluation

24"X26"X23" Base — No Rods

Al extrusion and steel plate centered above Stack. Log N

Run 2A Positive Period — 244.3

2B Al and steel Plate removed.

Stack — 24" X 26" X 23.25"

Positive Period — 1443 Log N

278

8-18-60

INSTRUMENT CHECK

Time 8:15 AM PM Source Ra-Be

	Channel A	B	C	D	E
Range	Jobbin OK 10/1000	Bpp	10^-10	10^2/1000	960 V.
	F OK				
Source Dist.	10"		6"	3"	0"
% F.S. Trip	85		100	85	100

C.A. 290 82/18 Expr. 24"X26" Run

Sheet Date 8-18- 1960 Time 8:35 AM PM

Purpose Horizontal Traverse

290 M 235 Foils

Height 23.3 Bare

Pos.	-12	-10	-8	-6	-4	-2	0	+2	+4	+6
Foil #	B-33	B-24	B-42	B-38	B-31	B-3	B-30	B-32	B-27	B-40

+8	+10	+12
B-14	B-8	B-26

CRITICAL POSITIONS

C.A 290 82/18 Expr 24"X 26" Run 2-D

Table Pos .068 T J

	Material Rad	Channel	
1	Plastic 3.2	A 5.9	1000/100
2		B .014	
3		C 5.4	10^-10
4		D 45	1000/100
		E .2	690

Tim Crit. 9:19 AM PM Duration 20 min.

8-18-60
Run
2-E

C.A. 29° 82/18 Expr. 24"X26" Run 2-E
Sheet _____ Date 8-18-1960 Time 11 AM ~~PM~~
Purpose Horizontal Traverse
290 u 235 Foils
Height 23.3 Bare

Pos	B-12	-10	-8	-6	-4	-2	0	+2	+4	+6	+8	+10	+12
Foil#	B-9	B-16	B-2	B-41	B-25	B-12	B-40	B-6	B-11	B-21	B-22	B-26	B-28

CRITICAL POSITIONS
C.A. 29° 82/18 Expr. 24"X26" Run 2-E
Data Film 07 T P
Channel
1 Plastic 5.0X 32 1000/200
2 .013
3 5 10-10
4 D 20 1000/200
E 0 690
Tim Crit. 11:16 55/60 AM PM Duration 20 min.

280

8-18-60
Run 2-7

C.A. 290 82/18 Expr. 24" X 26" Run 2-7
Sheet ____ Do 8-18 1960 Time 1:05 PM
Purpose Horizontal Traverse
N 238 Foils
Height 23. Bare

P.S.
Foil #

CRITICAL POSITIONS

C.A. 290 82/18 Expr 24" X 26" Run 2-7
Table Pos. .07 T ____ R ____

	Control Rod	Channel
1	Plastic 2.3	A 59 1000/100
2		B .015
3		C 5.5 10 -10
4		D 45 1000/100
		E .2 690

Tim Crit 1:17 20/60 AM PM Duration 20 min.

8-19-60

	A	B	C	D	E
Period Tables OK	10/1000 OK	10^{-10}	10/1000	960 V.	
Source Dist. F OK	11"	0"	5'	3"	1/2
% F.S. Trip	85 OK	100	80	100+	

CA 290 88/18 Expr. 20"X 20" Run 1

Sheet Date 8-19-60 Time 10:40 AM PM

Purpose Approach to critical

Bare

Measured Height 132.52 cm

Measured Width 51.118 20 w

Run A

LOADING CHANGE

Description 20"X20"X60" =

400 X.6444 = 257.76

257.76 X 60 =

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 15,465.60 gmU-235

Sub. critical

Run B

LOADING CHANGE

Description 20"X20"X60"

400 X .6444 = 257.76

257.76 X 68 =

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 17,527.68 gmU-235

Sub Critical

Run 1-C
Bare

LOADING CHANGE

Description 44"x44"x 15.25 - Bare
14" High on 3/4" g stack
15" High on 1/4" g stack

Mass before change ____ gmU 19,016 gmU-235
Mass of Change ____ gmU -57 for rods gmU-235
Total Mass ____ gmU 18,959 gmU-235

Super Critical

Run 1-D
Bare

LOADING CHANGE

Description 44"x44"x 15.13
14" High on 3/8" g stack
15" High on 1/8" g stack

Mass before change ____ gmU 18,867 gmU-235
Mass of Change ____ gmU -57 for Rods gmU-235
Total Mass ____ gmU 18,810 gmU-235

120 Sec Period
Super Critical ∴ Do Not have enough small size blocks to stack even top.

8-22-60

Run 1-A

INSTRUMENT CHECK

Pu Be

Time 10:30 AM ~~PM~~

	A	B	C	D	E
Range	~~10/1000~~	oper	10^{-10}	~~10/1000~~	960 ✓
Source Dist.	9"	0	6"	3"	0"
% F.S. Trip	80	OK	100	82	100+

C.A. 29 ~~82~~/18 Expr. 44"X44" 1-A

Sheet ... Date 8-22-60 10:30 AM ~~PM~~

Purpose Critical Height Determination

44"X44"X11.50 6" Reflector

LOADING CHANGE

Description 44"X44X11.50

1/2 # stack 12" High

" " 11" "

Mass before change ... gmU 14,346 gmU-235

Mass of Change ... gmU - 57 for Rods gmU-235

Total Mass ... gmU 14,289 gmU-235

Run 1-B

LOADING CHANGE

Description 44"X44"X11.75

3/4 # stack 12" High

1/4 " " 11" High

Mass before change ... gmU 14,658 gmU-235

Mass of Change ... gmU 57 for rods gmU-235

Total Mass ... gmU 14,601 gmU-235

Super Critical - 152 Sec pd. 7.0464

284

8-22-60
Run 1-C

LOADING CHANGE

Description 44" X 44" X 11.7656 - 6" Refl.
12" on ¾ of stack
11⅛" on ⅛ of stack
11" on ⅛ of stack

Mass before change ____ gmU 14,695 gmU-235
Mass of Change ____ gmU 57 for Rods gmU-235
Total Mass ____ gmU 14,638 gmU-235

Super Critical - 82.5 Sec Period - 11.455¢

11.455
7.046
4.409

Crit H = 11.75 - $\frac{7.046}{4.409}$ .015625 = 11.725"
.025

14,627.6
57
14570.6

8-23-60
Run 1-A

INSTRUMENT CHECK

Time 10:15 AM ~~PM~~ Pu Be

	A	B	D	E
Range Tables of F	12/1000	opn	10^-10 12/1000	960 V
Source Dist.	8'	0"	6' 3"	½"
% F.S. Trip	8x	OK	8x	100+

C.A. 290 8-2/1-B Expr. 28"X28" Run 1-A
Sheet ___ Date 8-23-60 Time 10 20 AM PM
Purpose Critical Height Determination

28X28X14.50 6" Reflector

LOADING CHANGE
Description 28"X28"X14.50"

Mass before chg.	gmU	7,325.0	gmU-235
Mass of Change	gmU	-36 for Rods	gmU-235
Total Mass	gmU	7,289	gmU-235

8-23-60
Run 1-B
Sub-critical

LOADING CHANGE
Description 28"X28"X14.75 6" Reflector

Mass b f r	gmU	7,451	gmU-235
Mass of Change	gmU	36	gmU-235
Total Mass	gmU	7,415	gmU-235

Sub-critical

286

8-23-60

Run 1-C

LOADING CHANGE

Description 28"X28"X15" 6" Reflector

28" x 28" = 784 in² Base

784 x .6444 = 505.209 / in Height

Mass before change	gmU	7,578	gmU-235
Mass of Change	gmU	-36	gmU-235
Total Mass	gmU	7,542	gmU-235

Sub-critical

8-23-60

Run 1-D

LOADING CHANGE

Description 28"X28"X15.25

Supercritical

Mass before change	gmU	7,704.30	gmU-235
Mass of Change	gmU	36 for Rods	gmU-235
Total Mass	gmU	7,668.30	gmU-235

Run 1-E

LOADING CHANGE

Description 28"X28"X15.125

Supercritical

Mass before change	gmU	7,641.15	gmU-235
Mass of Change	gmU	36 for Rods	gmU-235
Total Mass	gmU	7,605.15	gmU-235

Run 1-7

LOADING CHANGE

Description 28"x28"x 15" plus 1/4" Layer on 1/4 st top Period + 52 sec

Mass before		7608.3	
Mass of Change	gmU	-36	gmU-235 for Rod
Total Mass	gmU	7572.3	gmU-235 gmU-235

Super Critical - 52.1 Sec pd

7.5 Kg C M

288

8-24-60
Run 1-A

INSTRUMENT CHECK

Time ____ AM / PM Source Pu Be

Channel	A	B	C	D	E
	Tables OK F-1K	10/1000	opn	10^-10	10/1000	960V
Source Dist.		18"	6'	3"	0"
% F.S. Trip		85	100	85	100+

LOADING CHANGE

Description 21"X21"X21" : 6" Reflector

Sub-critical

44 X .6444 = 284.18

284.18 X 21 = 5,967.70

Mass before change ____ gmU 5,967.70 gmU-235

Mass of Change ____ gmU 27.06 for Rods gmU-235

Total Mass ____ gmU 5,940.64 gmU-235

8-24-60
Run 1-B

LOADING CHANGE

Description 21"X21"X21.12" ... 6" Reflector

1/4" layer on 200 Sq in of top

Sub-critical

Mass before change ____ gmU 6,001.88 gmU-235

Mass of Change ____ gmU 27.06 fuels gmU-235

Total Mass ____ gmU 5,974.82 gmU-235

8-24-60

Run 1-C

LOADING CHANGE

Description 21 X 21 X 21.22 6" reflector
½" layer on 200 sq.in. of top

Sub-critical

Mass before change gmU 6,630.99 gmU-235
Mass of Change gmU 27.06 gmU-235
Total Mass gmU 6,003.93 gmU-235

R 8-24-60

Run 1-D

LOADING CHANGE

Description 21" X 21" X 21.60" 6" Reflecto
added 1" layer on 168 sq.in of top

Sub-critical

Mass before change gmU 6,138.28 gmU-235
Mass of Change gmU 27.06 gmU-235
Total Mass gmU 6,111.22 gmU-235

Run 1-E

LOADING CHANGE

Description 21" X 21" X 22" 6" reflector
added 1" layer on sq.in of top

Sub-critical

Mass before change gmU 6,251.96 gmU-235
Mass of Change gmU 27.06 gmU-235
Total Mass gmU 6,224.90 gmU-235

290

8-24-60
Run 1-H

LOADING CHANGE

Description 21" X 21" X 22.14" 6" Reflecto
1/4" layer on 240 sq. in. of Top

Mass before change ____ gmU 6,291.74 gmU-235
Mass of Change ____ gmU -27.06 from Rods gmU-235
Total Mass ____ gmU 6,254,68 gmU-235

8-24-60
Run 1-D

LOADING CHANGE

Description 21" X 21" X 22.22 6" Reflector
22" Plus 1/4" Layer on 400 in² of Top.

Mass before change ____ gmU 6,314.47 gmU-235
Mass of Change ____ gmU -27.06 gmU-235
Total Mass ____ gmU 6,287.41 gmU-235

8-24-60
Run 1-H

LOADING CHANGE

Description 21" X 21" X 22.22 6" Reflector
Removed 1 Rod

Super Critical

Mass before change ____ gmU 6,287.41 gmU-235
Mass of Change ____ gmU +17 gmU-235
Total Mass ____ gmU 6,304.41 gmU-235

Per period +54.3

Find safety + had period +106.4
Width of Safety ρ(54.3) − ρ(106.4) =

8-25-60

Run 1-8

INSTRUMENT CHECK

Time 8:45 AM

Source Pu Be

Channel

	A	B	C	D	E
Range	Tables OK	1/1000 Opn	10^{-0}	1/100	960V
Source Dist.	F OK	11"	6"	3"	0"
% F.S. Trip		85		8	100+

LOADING CHANGE

Description 21"X21"X22" 6" Reflector

Removed 2nd Rod No rods now.

Mass before change	gmU	6,251.96	gmU-235
Mass of Change	gmU		gmU-235
Total Mass	gmU	6,251.96	gmU-235

Super Critical – 161.8 Sec pd

292

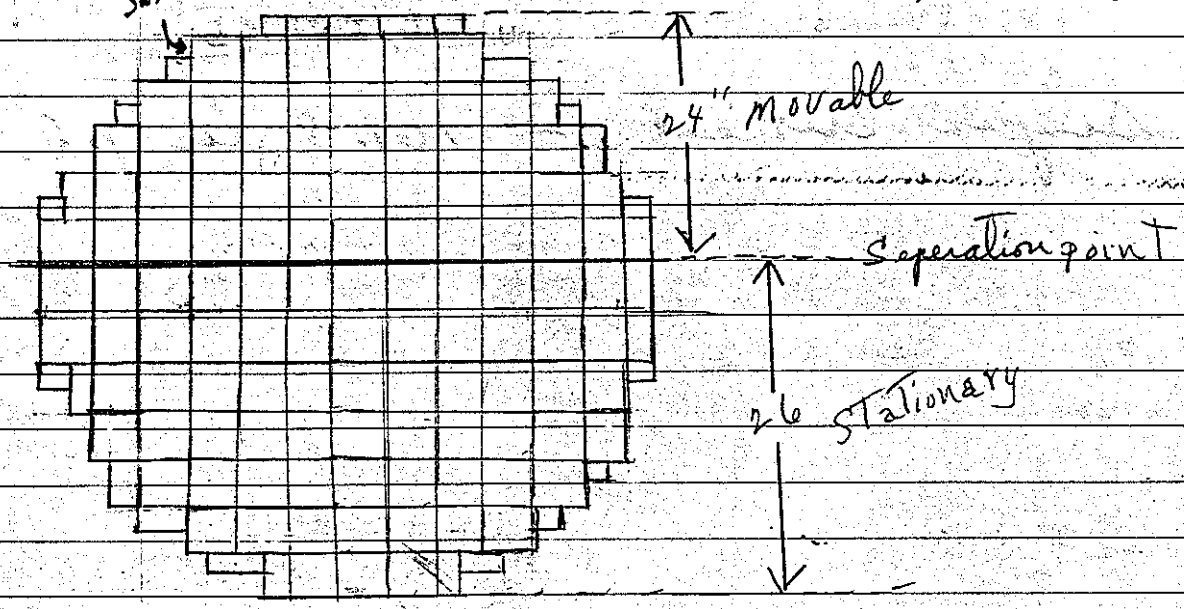
8-25-60
Run 1-A

CA 2020 82/18 Expr 50" Cylinder Run 1-A
Sheet Date 8-25-1960 Time 2:30 PM
Purpose Obtain Crit. Height & Mass

LOADING CHANGE 11.525" Height

Description 50" dia cylinder 1— 6" Reflector
12" on Stationary Table, 1032 in² - 1964 in² Base
11" on movable " , 932 in² - 1265.6 g/1" Height
1 Safety Rod on Fixe Table.

Mass before change	gmU	14,586	gmU-235
Mass of Change	gmU	- 28	gmU-235 for Rod
Total Mass	gmU	14,558	gmU-235



50" dia. Cylinder

Sub Critical

LOADING CHANGE

8-25-60 Description 50" dia cyl - 11.55" High - 6" Refl.
Run 1-B Added ¼" layer on one octant - 224 in²
Pos periph +388 sec

Mass before change ____ gmU 14,558 gmU-235
Mass of Change ____ gmU 31 gmU-235
Total Mass ____ gmU 14,589 gmU-235

LOADING CHANGE

8-25-60 Description 50" dia, 11.525" high - 6" Reflector - No Rod
Run 1-C 12" on stationary
11" on movable (Removed Rod)
T = +450 sec

Mass before ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 14,558 gmU-235

Critical height ~ 11.5"

8-26-60

INSTRUMENT CHECK

Time 1010 AM ~~PM~~ Source Ra Be

Tables OK F

	Channel A	B	C	D	E
Range	1"/100 cpm		1"	1"/100	1050
Source Dist. OK	13	OK	6'	3"	½"
% F.S. Trip	80		100	80	100

C.A. 20 ~~87/18~~ Exp 44" dia Run 1 A

Sheet _____ Date 8-26-60 Time _____ AM ~~PM~~

Purpose Obtain Crit Height & mass

LOADING CHANGE

Description 44" dia Cyl, 12" Height, 6" Refl, 1 Safety Rod on Fixed Table

1504 in² Base

~~Mass~~ 969 gmU/1" Height

Mass before change	gmU	11,628	gmU-235
Mass of Change	gmU	- 21	gmU-235 for Rods
Total Mass	gmU	11,609	gmU-235

Sub Critical

8-2 Run

S

8-2 Run

S

R

8-26-60
Run 1-B

LOADING CHANGE

Description 44" Dia. Cyl., 12.06 high 6" Reflector, 1 Safety Rod on fixed Table
1504 in² Base
969 gm/1" Height
added 1 quadrant to fixed table

Mass before change gmU 11,608 gmU-235
Mass of Change gmU 60.56 gmU-235
Sub-critical Total Mass gmU 11,669.56 gmU-235

8-26-60
Run 1-C

LOADING CHANGE

Description 44" Dia. Cyl. 6" Reflector
1504 in² Base Safety Rod Removed
969 gm/1 in Height

Mass before change gmU 11,669.56 gmU-235
Mass of Change gmU +21 gmU-235
Sub-critical Total Mass gmU 11,690.56 gmU-235

Run 1D

LOADING CHANGE

Description 44" Dia. Cyl. 6" Reflector
1504 in² Base Added 1 quadrant to
969 gm/1 in Height fixed table.

Mass before change gmU 11,690.56 gmU-235
Mass of Change gmU 60.56 gmU-235
Total Mass gmU 11,751.12 gmU-235

8-26-60

LOADING CHANGE

Run 1 A

Description 36" Dia. Cylin., 13" High, 6" Reflector
~~1934~~ in² Bare
~~835~~ g/1" Height
659.86 W Rods

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU 8,578 gmU-235
Total Mass ____ gmU ~~10,857~~ gmU-235

Sub Critical

LOADING CHANGE

Run 1 B

Description 36" Dia Cyl., 13.14" High, 6" Refl-
20" deep on Fixed Table, 13.25" Height
16" " on Movable Table, 13" High

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU 8,670 gmU-235
Total Mass ____ gmU ~~10,970~~ gmU-235

Sub-critical

LOADING CHANGE

Run 1-C
8-26-60

Description 36" Dia. Cyl., 13.19" High 6" Reflector
13.25 on Fixed Table
~~added~~ 13.25 on Movable table
13.0 " "

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU 8,706 gmU-235
Total Mass ____ gmU ~~11,017~~ gmU-235

Sub Critical

8-29-60

INSTRUMENT CHECK

Time 10 10 AM PM Source Pu Be

Tables of F OK

Channel	A	B	C	D	E
Range	1"/1000	sqr.	15"	1"/1000	10⁵
Source Dist.	8"		2'	3"	0"
% F.S. Dep	85		100	70	100

LOADING CHANGE

Description 36 Dia Cyl. 13.25" High – 6" Refl.
13.25" on Fixed Table
13.5" on ½ Z Movable Table
13.0" " " "

Mass before change ____ g ____ gmU-235

Mass of Change ____ g 8,743 gmU-235

Total Mass ____ gm 11,063 gmU-235

Super Critical – 160.7 Sec 82

8-29-60
Run 1-A

C.A. 2070 82/18 Exp 24 Run 1-A

Sheet 8-29-60 Time 2:00 PM

Purpose

~~2.5" x 2.5" x~~ 28" dia

Sub-critical

LOADING CHANGE

Description 6-1-6 Equiv Base, 15½" High – 6" Reflecto
396.9 grams per inch
15" on ~~Movable~~ Stationary
16" on Movable

Mass before change ____ g 6,153 gmU-235

Mass of Change ____ g ____ gmU-235

Total Mass ____ gmU 6,153 gmU-235

8-29-60

Run 1-B

LOADING CHANGE

Description 28" dia ~~28" X 15 3/4"~~ High, 6" reflector

616 Sq. in Base

1539.9 grams per inch

15 1/2 on fixed table

16" on movable table

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 6,252 ~~gmU-235~~

Sub Critical

Run 1C

LOADING CHANGE

Description 28" dia ~~28"~~ X16" High, 6" Refl.

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 6,351 ~~gmU-235~~

Sub Critical

LOADING CHANGE

Description 28" dia ~~28"~~ X 16 1/8" High, 6" Refl

16" on Moveable Table

16 1/8" on Fixed Table

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 6,400 gmU-235

Sub critical

LOADING CHANGE

Description 28" dia ~~28"~~ X 16 1/4", 6" Refl

Mass before change gmU gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 6,450 gmU-235

Super Critical - 152 Sec pd

8-30-60

Run 1-A

INSTRUMENT CHECK

Time 10:55 ~~PM~~ AM Source Pu Be

	Channel B	C	D	E
Range	Tubes OK F OK	10/100 cps	100 cps	10/1000 960 V.
Source Dist.	9"	0"	3"	½"
% F.S. Trip	90	OK	80	100 ±

Sub-critical

LOADING CHANGE

Description 24" ~~dia~~ " X 19.50" 6" Reflector

20" on mov. table

19" " fixed "

452 X .6444 = 291.26 gm per in Height

19.50 X 291.26 = 5,679

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 5,679 gmU-235

8-30-60

Run 1-B

LOADING CHANGE

Description 24" ~~dia~~ X 20" 6" Reflector

~~452~~ 452 X .6444 gm per in Height

20 X 291.26

Sub critical

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 5,825 gmU-235

8-30-60

Run 1-C

LOADING CHANGE

Description 24" ~~dia~~ X 20.125 6" Reflector

452 X .6444 gm per in Height

20.125 X 291.26 = 5,861

Sub-critical

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass ____ gmU 5,861 gmU-235

8-30-60
Run 1-D

LOADING CHANGE

Description 24" Dia. Cylinder 20.25 high
452 X.6444 6" Reflector
20.25 X 291.26

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 5,898 ____ gmU-235

Super critical
277.9 Sec Period.

8-30-60
Run 1-E

LOADING CHANGE

Description 24" Dia. Cylinder 20.31 added
452 X.6444 6" Reflector
20.31 X 291.26

Mass before change ____ gmU ____ gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 5,915 ____ gmU-235

Scrams
P. 102, 109, 75, 27, 94