BOOK 108R

Notes:
"Bk 8 Feb. 26, 1971 to Mar. 22, 1972" on spine
"SPH - 1971-72" on spine

Blank pages: inside front cover sheet, 4, 5, 46, 51, 70, 99, 100, 111, 131, 149, 172, 188, 237, 250-252, 302-304, inside back cover sheet

-page 39 has 1 small graph taped to it
-page 60 has 2 notes taped to it
-page 79 has 1 sheet taped to it
-page 93 has 1 photo taped to it
-page 248 has 1 piece of paper taped to it
-page 249 has 3 pieces of paper taped to it
-page 258 has 1 drawing taped to it
-page 265 has 1 drawing taped to it

Scanned by:
Sheila Finch
RSICC /Oak Ridge National Lab.
November 18, 1999

Book 8

SHAW'S

PIONEERS SINCE 1831

Account Book

No. S 149

NO UNITS

Journal . . . . . .

Ledger, Single Entry . .

Ledger, Double Entry .

Record Ruled (27 Lines)

Made in 150, and 300 Pages

MADE IN U. S. A.

TO REORDER, SPECIFY NUMBER, RULING AND THICKNESS INDICATED ON BACKBONE OF THIS BOOK.

2/26/71	Exp. 3.467 6.934" dia. diametral hole = ρ c	page.
	1st assembly 3.467 in RAD	7
	Spacings above section on RAD	11, 20
	& Plug	13
	U Buttons 189	15, 42
	Cf Evaluations He Sc worth ρ 17	16
	SS Buttons	18
	Stability @ DC	38
	Al Support plate (spider)	47
	Dummy Cf Traverses	50
	Cf E "	54
	Sect II Now 3.439" radius	61
	Rossi α	63
	Top oscillating	77
	Reactivity Meas.	85
	More of Meas.	88
6/10/71	6.885" Dia.	91
	Dummy Cf Traverse 217, 176, 116, 98, 105	
	Cf E " 195, 185, 182, 179, 119, 101, 107	
	Foil (U) Traverse 125, 127, 132, 133, 142,	
	Reactivity 126 U, SS & Al	
	" U 129, & 134, Bare sphere 137,	
	" Al 139	
	Bare Sphere 137, 162,	

Reactivities - Top Socket U Buttons p. 143
Al " p. 145
SS " p. 147

Foil Runs E to W. p. 150, 151, 155, 156, 159, 166, 167, 171
" " N to S 125, 128, 132, 133, 142, 204, 205, 206, 207
Day to day reactivity check p. 152, 153, 154, 155, 156, 157, 158

Supports (all) p. 152. Run 264 - 267

Poly Wall - 84, 158, with of "E" p. 191, 195

of Importance - 97, 105, 116 - 174, 191, - 201, - 208, - 212.

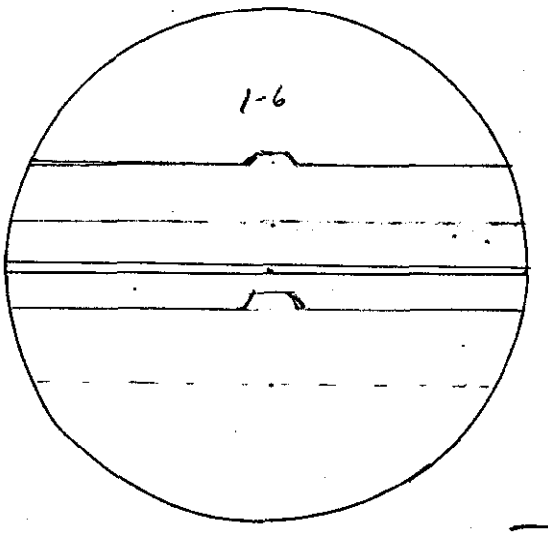
U - Buttons p. 189, 294

1/27/92 entry on 11/20/92

DATA BEGINNING AFTER ALTERATION OF SHERE Pg 248
~ 1/2" D HOLE SLIGHTLY PAST Center with plug
1" LONG HOLE FOR 3/8" Detector with plug

8-1/4 & 8-1/8 U buttons, all holes filled	253
16-1/4" Buttons all holes fillw	254
Rossi α with SFC in Center + Al Shim DC.	255
Add ^{3}He Sci to West side 14-1/4 butts. Al Shim DC	257
Cf 59 in 1" Hole 16-1/4 butts. Removed He Sci	258
TEMP MEAS on surface	261
CSA on SURFACE	265
Rα + RβN ap to	278

	Move SFC to R = 1.5" Cf 59 in 1" Hole	278
	Cf #2 on SURFACE	280
	Cf #59 in 1" Hole CENTRAL SFC	288
	Cf #59 in 1" Hole ^3He Scl	289
166, 167, 171	No Cf source ^3He Scl Rossi-α	290
,205,206,207		
7, 185, 186	Cf A on SURFACE ^3He Scl	293
	North of 1/16" SURFACE PATTERN	294-301
	RUNS WITH TEMP MEASUREMENTS	
's	368, 375, 378, 382, 385	
-212.		
248		
253		
254		
255		
257		
258		
261		
265		
278		



I 1-6 12,043
Ball joint 64
12,107 g.

II (1-8) + (1-10) 21,095
1.189"
Source plug 30
21,125 g.

III (1-11) + (1-12) 20,310 g.
2.905"

2.137"
0.767"
1.125"
1.038"
1.867" (27)
6.934"

Lower Section Added by JTM 6/16/93
Wt without pins
20010.29

R

Shear Pin for Oscillating Driver —
12-8-71 1/8" SS with .096" hole (#41 drill)

DIAMETER OF HOLE = 0.136"
10 FEB 72 Shear Pin was replaced with a good roll pin
Installed a solid stop for "bottom & TOP"
of the TOP drive

2.137"
0.767"
1.125"
1.038"
.867"
27
934"

John Mihelezo
J. J. Lynn
J. R. Taylor

DATE FEB 26 1971 SAFETY CHECK
TIME 14:30 PM BY Taylor & Lynn

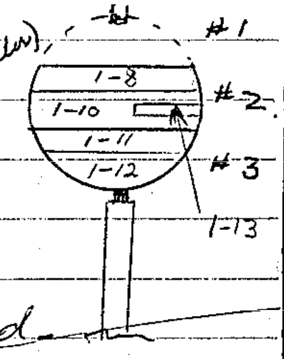
CHANNEL	A	B	C	D	E	F
RANGE	10x10^-12	OPR	L-10		900V	900V
SOURCE DIST.	18"	OK	6'		6"	OK
% F. S. TRIP	100		100		100	100
BLDG. ALARM	✓	✓	✓			
AUX OBS.	✓	—	✓	Rhoette OK		

SOURCES USED Neutron & Gamma MAGNETS Source OK ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. G.G.A Sphere Run 1
Date FEB 26 1971 Time 2:40 PM
Purpose 1st assembly of pcs of 235 U metal sphere. Pieces cut to 3.467" Sph. Radius.

3.467
2
6,934

Run #1 assembly of Center piece and Bottom
Raised ram to Center pc.
Center = 21,095 g. (1-8, 1-10, 1-13, 3 pins #16 g. (filler))
Ram = 20,310 (1-11, 1-12 + 3 pins)
Ram Motion ≅ 17.5%
No response.
Normal Drive Source (Pu #358) used



rill)

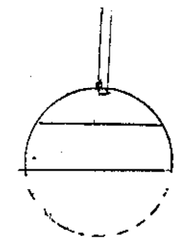
DATE MAR 1 1971 **SAFETY CHECK**
TIME 10:50 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12}	OPR	L-10		900V	900V
SOURCE DIST.	18"	ok	6'		6"	OK
% F. S. TRIP	100	–	100		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	—	✓			

R. Lovett OK
Kennett So. OK ✓

SOURCES USED N & H REMARKS
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

← (1-6 + Ball joint)



Run # 2 added top piece. 12,107 g.
Assembly of Sphere by bringing ram pc up.

No Source	1 min Cts	Table Position
#1	#3	Down
49	63	
51	46	
Source in	2 min cts	14"
162	264	
	1 min cts	
94	104	15"
82	125	
77	129	16"
91	138	
91	138	16½"
87	137	17"
123	130	17"
152	203	17.35"
164	240	17.35

Several counts discarded
because of noise, when introduced
telephone ring.
Observed by JTM, ERR, JJL & JRT

Run #2 Cont'd. (If completely closed up = 17.543)

Selsyn = 14.495 P = +340#

17.480 +7.8#

-15 mils = 26.2# or 1.75#/mil

17.470" ∞

-5 mils = 7.8# or 1.56#/mil

3 pieces = 53,505 gms.

Run #3 Placed 50 mil shims (3) on Ram pc.

Top piece in place.

Raised table 0.485 selsyn

Measured separation of pcs 2 & 3,

	Edge of Sphere	center of Sphere (measured inches)	
N	16.996"	17.018"	17.021"
W	17.014	17.021	.485
S	17.046	17.024	17.506
E	17.029	17.022	
Average	17.021	17.021	

Set stops so that table ~~can't~~ stop 50 mils sooner,

up #1 = 17.480

Sub Crit. Then Run #2 was closer than thought.

Run #4 Placed 31 mil shims (3) on pc 3.

up #1 = 17.510

k < 1, slight multiplication

Run #5 Placed 10 mil shims on pc #3.
k>1 : +40.3¢ Pitte

measured separation = 9.75 mils

7/22/54 9.75 → 4.5 = 5.25 mils
40.44
51.68 > = 11.44 2.18 ¢/mil

↙ 60.5 no gap
Run # 8.

Ru
Ru
R

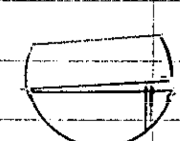
MAR 2 1971 SAFETY CHECK
0940 BY Taylor & Lynn

	A				E	F
	10x10^-12	OPR	L-10		900V	900V
	18"	OK	6'		6"	OK
	100	–	100		100	100
	✓	✓	✓	Rhoetts CR		
	✓	–	✓			
	N & H				✓	
✓		✓			✓	

Run #6 Repeat Run 5.
$k>1 = +40.44¢$

Run #7 Placed 5 mil shims on pc #3
Measured separation 4.5 mils
$k>1 = +51.88¢$
Top pc (#1) = \$14.00

Run #8 No Shims
Measured separation = 2 mils.
+2.5 mils $k>1 = +56.17¢$ 4.29¢ 1.72¢/mil



25 mr @ 1" by piece 2 & 3 after 10 min.

The 2 mils is caused by 1 pin fastening the two pieces together causes a four (4) mil gap on South west side.

Run#9 3 Thickness of al shim, ~ 4.5 mils each.

$k > 1 = +29.26$ ¢

Measured gap = 14.5 mils

Run#10 4 Shims on pc #3.

$k > 1 = +18.57$ ¢ Shortt
$+19.32$ ¢ Log N

Measured gap = 18.5 mils

$+18.80$ BF_3 #1
$+19.77$ BF_3 #3
Avg 19.12 ¢

Run#11 Repeat Run 10.

$k > 1 = 18.14$ Little
18.91 Log N
19.00 ¢ BF_3 1
19.32 " 3
Avg 18.84 ¢

Measured gap = 18.0 mils

Run #12 5 shims in place on pc #3.
1:45 PM

k > 1, + 7.07 ¢ Pitte.
7.62 Log N

measured gap = 23.5 mils
− 5.5 mils
Average = 7.35 ¢

11.77 ¢
2.14 ¢/mil
vs Run 11

2.15 ¢/mil

Run #13 7 Shims on pc #3.

Used plastic to get power
2⅜" x 2⅜" x 1"
33 ¢

9.9
10.43
15.8
5.37
47

k < 1, − 14.63 ¢ Pitte
− 15.80 log N
− 19.8 BF_3 1
− 19.29 BF_3 3

Log N ¢ Pitte Avg = 15.22 ¢
Measured gap = 34.0 mils

3 ¢/mil

Run #14 Filled Source hole (4.264" x .129" + 2.754" x .129")
235 u = 30 g. 17 g. + 13 g.
10.05? JTM 3/8/93

k < 1, − 4.73 ¢ Pitte
− 5.37 Log N − 277 cm
− 4.90 BF_3 #1 − 299.7
− 4.90 BF_3 #3 − 299.7
Avg. − 4.98 ¢

Shim = 11.8 ¢
Edgewise

Logn ¢ Pitte Avg = 5.05 ¢ Then Rod = 10.2 ¢

DATE MAR 3 1971	SAFETY CHECK					
TIME 0835 AM	BY TAYLOR & LYNN					
CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12}	OPR	L-10		900V	900V
SOURCE DIST.	18"	OK	6"		6"	OK
% F. S. TRIP	100	–	100		100	100
BLDG. ALARM	✓	✓	✓	Rhoettle OK		
AUX CTRS.	✓	—	✓			
SOURCES USED PuBe & Co^{60}		MAGNETS ✓				
TABLES ✓	LIGHTS ✓	AREA CLEARED ✓				

Run #15 6 shim thickness – Separation.

9:00 AM ERR & Y-12 personnel checking alarm system.
Asked by WTC to wait until utility people start air system

10:00 Ready –

			Period
k > 1,	+ 5.55 ¢	Pette	
	6.28	Log N	169.0
	6.12	BF_3 1	176.6
	6.21	BF_3 3	170.7
Average	6.04 ¢		

✱ Measured gap = 29.25 mils

vs R14

+ 4.75 ✱ mils   11.09 ¢   2.33¢/mil

Run #16 Added 6 (1/8" Buttons, 22 g. each) 132 g.
3 spaced on top pc and 3 spaced on Bottom pc.

k > 1	+ 15.59 ¢	Rhoette	—
	16.66	Log N	47.1 sec
	16.50	BF_3 #1	47.77
	16.91	BF_3 #3	46.03
	Avg + 16.42 ¢		

Reactivity of 6-1/8" U-Buttons Run 15-14

L_N = 10.38 ¢

Rhoette = 10.04 Av = 10.38 ¢

BF_3 #1 = 10.39

BF_3 #3 = 10.70

1.73 ¢/1/8" Button (with holding screws)

Run #17 Removed Buttons - Repeat Run #15.

k > 1	6.44 ¢	Rhoette	—	—
	6.88	Log N		152
	7.02	BF_3 #1	342	148.5
	6.97	BF_3 #3	345	149.8
	Avg = 6.83 ¢			

Run #18 Added 4 (1/4" Buttons, 44 g each) 176g
2 spaced sym. on top
2 spaced sym on Bottom

k > 1	+ 17.23 #	Pitt	—
	+ 19.66	Log N	+ 39.6 sec
	+ 18.20	BF_3 #1	41.35
	+ 19.14	BF_3 #2	38.0
AVG	+ 18.31 #		

vs Run #17 11.48 # 2.87 # / 1/4" Button

Run #19 Removed Buttons - Base Run (#15)

k > 1	Pitt +6.68 #	—
	Log N +7.18	144.4 sec
	BF_3 #1 +6.92	151.1
	BF_3 #3 +6.96	149.8
Avg.	6.94 #	

Run #20 Added Cf Dummy. (when? 11/20/96)
1:00 PM

k > 1,	Pitt 8.02 #	
	Log N 8.50	117.3 sec
	BF 1 8.22	122.5
	BF 3 8.14	123.8
Avg	8.22 #	

Dummy = 1.28 #

76g

Run #21 Base Run.

k > 1	Rhoette	+6.64¢	—
	Log N	7.32	141.1 sec
	BF_3 #1	7.28	142.0
	BF_3 #3	7.02	148.5
	avg.	7.07¢	

1 1/4" Button

Run #22 add HE^3

Rhoette	+11.91¢	—
Log N	12.53	70.8 sec
BF_3 #1	+ ~~7.79~~ 12.58¢	~~140.7~~ 70.4 sec
BF_3 #3	+ ~~7.19~~ 12.36¢	~~141.2~~ 72.1
Avg	+ 12.32¢	

∴ HE^3 CTR WORTH = +5.25¢

Run #23 BASE RUN

k > 1	Rhoette	6.24	
	Log N	7.05	147.7 sec
	BF_3 #1	6.63	158.9 "
	BF_3 #3	6.72	156.8 "
	Avg	6.66¢	

8¢

Run #24 added 6 ($\frac{1}{8}$" SS Buttons) spaced as U for Run #16.

$k > 1$

Rhoette	+12.26 ϕ	—
Log N	13.22	65.69 sec
BF_3 #1	13.12	66.44 "
BF_3 #3	13.02	67.1 "
Avg	12.91 ϕ	

6($\frac{1}{8}$" SS Buttons) = 6.25 ϕ

1.04 ϕ / $\frac{1}{8}$" SS Butt

Run #25 Bose Run -

$k > 1$

Rhoette	+6.42 ϕ	—
Log N	6.98	149.3 sec
BF_3 #1	7.07	147.2 "
BF_3 #3	7.07	147.2 "
Avg	6.89 ϕ	

Run #26 added 4 ($\frac{1}{4}$" SS Buttons) spaced as U for Run #18

Pitti	11.82	
Log N	12.72	69.27 sec
BF_3 1	12.41	71.66 "
BF_3 3	12.60	70.35 "
Avg.	12.39	

4($\frac{1}{4}$" SS) = 5.50 ϕ 1.38 ϕ / $\frac{1}{4}$ SS

for Run # 16.

9 sec

SAFETY CHECK

DATE MAR 4 1971

TIME 14:15 PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12}	OPR	500		900V	900V
SOURCE DIST.	18"	OK	6"		6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	✓	✓	✓	Rhoette OK		
AUX OTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #27 Repeat Run #26

$\frac{1}{8}$" SS Butt

k > 1	Rhoette	+12.04¢	—
	Log N	13.03	67.10 sec
	BF_3 1	13.02	67.10 "
	BF_3 2	12.85	68.4 "
	BF_3 3	12.94	67.75 "
	TMC	13.14	66.45
	Avg	12.84¢	

(Log N .03 for future counts)

sec

Run #28 Removed SS buttons.

Two shims in place (~ 9.5 mil separation).

(See Run #5, 6 & 14)

for Run #18

k > 1, Pette + 49.66 ¢

TMC 56.55 ¢

sec

Run #29 No shims (2 mil separation, see Run #8)

k > 1, Pette + 66.10¢

TMC + 68.7¢ >

8/1/4 SS

20

DATE MAR 5 1971 **SAFETY CHECK**
TIME 0825 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12} amp		1-10		900V	900V
SOURCE DIST.	18"	OK	6"		6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	✓	✓	✓		Rhett OK	
AUX CIRC.	✓	✓	✓			

SOURCES USED PuBe & Co60 MAGNETS ✓
TABLES — LIGHTS ✓ AREA CLEARED ✓

Run #30 Repeat Run #29 (no shims)

$k > 1$, Pulse = 66.63 ¢
TMC = ~~68.0~~ 68.0 ¢ 1.976 sec

Run #31 Repeat.

$k > 1$, Pulse = 66.70 ¢
TMC = 67.7 ¢ 2 sec
Avg. of 4 67.26 ¢

Measured gap = 5 mil on S
0 " on N } 2.5 mil

Run #32 1 Shim reporation (~ 4.75 mils)

$k > 1$, Pulse = 62.12 ¢
TMC = 63.0 2.60 sec

Run #33 Repeat — $k > 1$, Pulse = 62.33 ¢
TMC = 63.5 2.56 sec
Measured gap 4.75 mils Avg. 62.74 ¢

Run #34 2 Shim separation (~ 9.5 mil) BAD. 3 shims - one side !!

(**BAD** 3 Shims one corner)

Pette 46.36 ¢

TMC 48.2 6.02 sec

Run #35 2 shim separation (~ 9.5)

$k > 1$

Pette 51.77 ¢

TMC 53.06 ¢ 4.6 sec

Measured gap = 9.5 mils ←

Run #36 Repeat

Pette 51.05 ¢

TMC 52.2 ¢ 4.84 sec

Avg(4) = 52.02 ¢

Run #37 3 Shim Separation

$k > 1$

Pette = 38.61 ¢

TMC = 39.6 9.66 sec

Log N = 37.05 11.29 "

Avg. = 38.42

Measured gap = 14.75 mils

Run #38 Repeat –

Pette = 39.78 ¢

TMC = 41.2 ¢ 8.86 sec

Log N = 41.5 8.7 sec

Pette & TMC Avg = 39.80 ¢

Avg 40.82 ¢

Run #39 4 Shim separation. (~19.5 mils)

$k > 1$, Rhette +28.56# —
TMC 29.65 17.8 sec
Log N ~~30.04~~ ~~26.65~~ 17.37 ~~21.77~~ sec

Measured Gap = 19.75 mils

Run #40 REPEAT —

Rette = 28.17#
TMC = 29.45 18.02 sec
Log N = 29.12 18.41 sec

Run #41 5 Shims separation (~ 24.5 mils).

$k > 1$, Rette = +18.25# —
TMC = 18.83 39.09
Log N = 19.30 37.53 sec
BF_3 #1 = 18.91 38.8 "
BF_3 #2 = 18.91 38.8 "
BF_3 #3 = 19.00 38.5

Measured Gap = 24.75 mil

Run #42 REPEAT —

11:40 $k>1$, Pile = 18.05 ↑

TMC =	19.08	38.22 sec
Log N =	19.24	~~38.22~~ 37.73 "
BF_3 1 =	18.65	39.66 "
2 =	18.72	39.38 "
3 =	19.09	38.22 "

Run #43 REPEAT —

1:10 PM $k>1$, Pile = 18.21 ↑

TMC =	19.24	37.78 sec
Log N =	19.16	38.0
BF_3 1 =	19.26	37.64
2 =	19.18	37.93
3 =	19.47	37.06

Run #44 6 Shims separation (~ 29.5" m.l.)

$k>1$, Pile = 6.56 ↑

TMC =	7.09	146.6 sec
Log N =	6.96	149.83 "
BF_3 1 =	7.24	143.3
2 =	7.16	144.9
3 =	7.18	144.0

Run #45 REPEAT (6 shims) –

$k > 1$, Pcrit = 6.47 ¢

	TMC = 6.88	152	sec
Check →	Log N = 7.75	131.5	"
	BF_3 1 = 6.82	153.~~3~~	"
	2 = 7.02	148.3	"
	3 = 7.04	148.0	"

Run 7

Run #46 7 shim separation (~ 345 mils)

$k < 1$, Pcrit = −3.28 ¢

TMC = −3.~~28~~	360.7	sec
Log N = −3.99 ¢	358.3	sec
BF_3 1 = −3.~~97~~	360.1	
2 = −~~4.27~~	341.3	
3 = −~~4.14~~	346.2	

Run T

Measured Gap = 34.0 mils

Run

Run #47 REPEAT –

$k < 1$, Pcrit = −2.13 ¢

TMC = −2.63	523	
Log N = −3.15 ¢	443	sec
BF_3 #1 = −2.69	512	
2 =	502	
3 =	498	

Run

DATE MAR 8 1971 SAFETY CHECK
TIME 0840 AM PM BY Taylor & Lyman

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12}	OPR	2-10		900V	900V
SOURCE DIST.	18"	OK	6"		6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	—	—	—		Rhett OK	
AUX CHEC.	—	—	—			

SOURCES USED Rb-Be & Co^{60} MARKETS —
TABLES — LIGHTS — AREA CLEARED —

Run #48: 2 SHIM SEPARATION ; ADD 6 (1/8") 235/4 BUTTONS.

$k > 1$, Pitte = + 61.3 ¢
TMC = + 62.2

7 sec

3 sec Run # 49 2 SHIM Separation Repeat of #48

$k > 1$ pitc = 61.2 ¢
TMC = 63.9 2.51 sec

Run #50 2 Shim Separation (See Run #35)
$k > 1$, Pitte = 51.82
TMC = 53.2 4.51 sec

sec Run # 51 Repeat
$k > 1$, Pitte = + 52.02 ¢
TMC = + ~~53.0~~ 52.75 4.69 sec

Run# 52 2 Shim Separation ~~All~~ 6 (1/8") 235 U Buttons.

k > 1, Pitte = +61.53°
TMC = 62.1°, 2.31 sec.

Run# 53 REPEAT —

k > 1, Pitte = +61.48°
TMC = 62.0, 2.27 sec.

Run# 54 No Buttons (repeat Run# 50)

k > 1, Pitte = +51.65°
TMC = ~~51.5~~ 53.0°, 4.52 sec.

Run# 55 REPEAT —

k > 1, Pitte = +51.85°
TMC = 53.2 4.49 sec.

Run# 56 2 shims separation: add 6 (1/8") 235 U Buttons.
11:10
k > 1, Rhette = +61.57°
TMC = +62.7°; 2.69 sec

Run #57 REPEAT —

$k > 1$, Rhoette = +61.50 ¢

TMC = +63.20 . 2.59 sec.

Run #58 6 SHIMS SEPARATION WITH 6 (1/8") ^{235}U BUTTONS ON.

1:15 P $k > 1$,

Rhoette =	+16.37 ¢	—
TMC =	+17.02 ¢	45.6 sec.
Log N =	+17.29 ¢	44.59
BF_3 #1 =	17.21	44.91
BF_3 #2 =	17.24	44.73
BF_3 #3 =	17.21	44.91

Down for Photographer —

Run #59 REPEAT —

2:25 P $k > 1$,

(SEE Run #15, p.14)

Rhoette =	+14.05 ¢	—
TMC =	+15.75 ¢	51.2 sec.
Log N =	+14.94 ¢	55.19
BF_3 #1 =	+14.80 ¢	56.02
BF_3 #2 =	15.29	53.42
BF_3 #3 =	14.98	55.15

Heat from photo lights probable cause of difference - Measured gap = 28.5 mils

DATE MAR 9 1971 **SAFETY CHECK**
TIME 0820 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12}	OPR	6-10	CC	900V	900V
SOURCE DIST.	18"	OK	6"		6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	✓	✓	✓		Rhoette	
AUX CT.S.	✓	✓	✓		OK	

SOURCES USED PuBe & Co60 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #60 REPEAT - Six Shims operation + 6 (⅛") U buttons

$k > 1$

Rhoette = +16.53$^{\phi}$ —
TMC = +17.57 43.42 sec
Log N = +17.28$^{\phi}$, 44.15 sec.
BF_3 #1 = +17.42$^{\phi}$, 44.03
BF_3 #2 = +17.52, 43.65
BF_3 #3 = +17.36, 44.29

Run #61 Six Shims and no U buttons.

$k > 1$

Rhoette = +7.33$^{\phi}$ ~
TMC = +7.92 128.1 sec
Log N = +7.73, 131.9
BF_3 #1 = +7.71 132.6
BF_3 #2 = +8.03 126.1
BF_3 #3 = +7.88 128.9

Run #62 REPEAT —

$k > 1$ Rhoette = +7.53$^{\phi}$, —

TMC = +8.09 125.07 sec.

Log N = +8.12 124.5

BF_3 #1 = +7.95 127.7

BF_3 #2 = +8.21 122.7

BF_3 #3 = +8.19 122.5

Run #63 6 shims Separation with 6 (1/8") ^{235}U Button On.

$k > 1$ Rhoette = +17.21$^{\phi}$ —

TMC = +18.07 41.69 sec

Log N = +18.12$^{\phi}$ 41.44 sec

BF_3 #1 = +17.87 42.34

BF_3 #2 = +18.09 41.51

BF_3 #3 = +18.18 41.24

Run #64 6 shims and with 6 (1/8") ^{235}U Buttons On
REPEAT —

$k > 1$ Rhoette = +16.85$^{\phi}$ —

TMC = +17.87 42.34

Log N = +18.30 40.8 sec

BF_3 #1 = +17.87 42.34

BF_3 #2 = +18.17 41.30

BF_3 #3 = +18.24 41.04

Run #65 Six Shims and no u Buttons.

$k > 1$

Rhoette	= +7.75 ¢	—
TMC	= +8.55 ¢	116.3 psec
LOGN	= +8.34 ¢	120.2 psec
BF_3 #1	= +8.08 ¢	125.1
BF_3 #2	= +8.40 ¢	119.21
BF_3 #3	= +8.44 ¢	118.56

Run #66 Repeat

$k > 1$

Rhoette	= +7.53 ¢	—
TMC	= +8.14 ¢	123.8 psec
LOGN	= +7.95 ¢	127.6 psec
BF_3 #1	= +7.66 ¢	133.5
BF_3 #2	= +7.71 ¢	132.6
BF_3 #3	= +7.96 ¢	127.4

Run #67 Photo Run.

No Buttons, Source hole open.

 .267

DATE MAR 10 1971		SAFETY CHECK				
TIME 1100		BY Taylor and Lyman				
CHANNEL	A	B	C	D	E	F
RANGE	10×10⁻¹²	OPR	L-10		900V	900V
SOURCE DIST.	18"	ok	6"	0	6"	ok
% F. S.	100	–	100	T	100+	100
BLOCK	✓	✓	✓			
AUX	✓	✓	✓			
SCRAM	N	≠	Y			✓
TABLES ✓		LEADS ✓		ADDS CHECKED ✓		

16.39 sec

20.2 sec

5.1

9.21

8.56

Run # 68 — 7 Shim Separation. (Run #46, 34.0 mils)

Tables down = 9999.0

up no shim = 17.428

23.8 sec ~~#6.~~

27.6 sec

Dummy Source Traverse.

33.5 — USING A 0.267" LONG (10 MIL WALL THICKNESS) AL "DUMMY"

32.6 — SOURCE CfE.

27.4 — DUMMY CfE TMC

@ RADIUS (")

0

.5

1.0

1.5

2.0

2.5

3.0

→ 3.25

Run #69 Cf^{E} Source Traverse

@ Radius (in.)		BF_3 1 W	3 min Counts 2 S	3 E
0		117,561	144,519	122,470
		117,133	144,171	122,525
		117,347	144,345	122,497
2.0		83288	101115	85821
		83442	101730	86722
		83767	101815	87003
		83502	101220	86515
3.25		36402	43779	37145
		36076	42910	36836
		36239	43354	36990
Ratio	2.0/0	.7116	.70123	7063
	3.25/0	.3088	.3003	.30196

DATE MAR 11 1971 **SAFETY CHECK**

TIME 0830 AM BY Taylor & Miliaks

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12}	OPR	L-10		900V	900V
SOURCE DIST.	20"	OK	6"		6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	✓	✓	✓	Checked OK		
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

E
470
,525
497
1
3.
5
45
3.6

Run #70 — 7 shims spacers 3 (1/8") U-Buttons & hole filled except for "dummy" Cf source @ center.
$k < 1$ = $-4.2¢$

Run #71 — 6 shims spacers 3 (1/8") U-Buttons with "very slow table drive" @ 17.375 selsyn. The period is not stable enough.
Up position $k > 1$: $+6¢$ Log N

Run #72 — 6 spacers and no buttons
$k > 1$ = $+4.5¢$ Log N

Run #73 6 al spacers + 1 (2 mil Au) on each position
$k > 1$ = +3.8¢ Log N
NOTE: GAP measured 29.5 mils

Run #74 6 al + 2 (au) spacers
$k > 1$

	dummy of ¢		
Rhoette	~~+.051¢~~		
TMC	= .57 .59	2118	first half of run
		2110	last half of run
BF_3 1	= .61	2048	
BF_3 2	= .60	2087	
BF_3 3	= .61	2048	
LN			

Scrammed during scale change on "able".

Run #75 Repeat — $k > 1$

	dummy @ E		all fuel	
Charlie		1305 sec		
patti	0			
Tmc		1472 1st half		
BF_3 1	0.845 ~~.851~~ ¢	1472	1.43	743 sec
2	.845 .851	1474	1.34	917
3	.838 .085	1485	1.14	1075
LN	.935	1329	1.58	771

ΔK	L_N	$0.645\ \phi$
	$BF_3 \neq 3$	.302
	$BF_3 \neq 2$	.495
	$BF_3 \neq 1$	.785

$\Delta_N \sim 0.55$

36

36000
36881

DATE MAR 12 1971 SAFETY CHECK

TIME 0850 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10x10[12]	opr	L-10	0	900V	900V
SOURCE DIST.	15"	ok	6'	4	6"	ok
% F. S. TRIP	100	—	100	T	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED 227 + Co 13 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #76 — 6 al ~5 mil shims + 3 (2 mil Au shims) + 2(1/8") buttons.
(0.250")

Dummy Source (From Rutledge) at Center.

NOTE: after running with table @ 17.400" for over 3 hrs, the table came down to 17.380".

Moved table back up to 17.400" and cont data taking on second segment of Run #76 (i.e. dummy is out)

Source mockup at center

BF_3 #2	-.265	-4844
BF_3 #1	-.262	-4886
BF_3 #3	-.264	-4862
LN	-.241	-5304

Source backup out

BF_3 #2	.594	+2114
BF_3 #1	.563	+2226
BF_3 #3	.592	+2119
LN	.368	+3462

(1/8") tons.

Grp 33.5, 33.5, 34.0 Avg = 33.67

0"/62 4.7

ΔK	BF_3 #2	0.858 ¢
	BF_3 #1	0.825
	BF_3 #3	0.856
	LN	0.606

2,400

Some Markup = 0.250 rather than 0.272

:3 out)

Run #77 Reactivity check. Spacing of three al shims of E = 33.8 mils; W = 34.2 mils and S = 34.5 mils

GoP

Measured, E = 34, W = 34.5 & S = 35 mils

Avg = 34.5 mils

ρ = [redacted] - 0.9¢

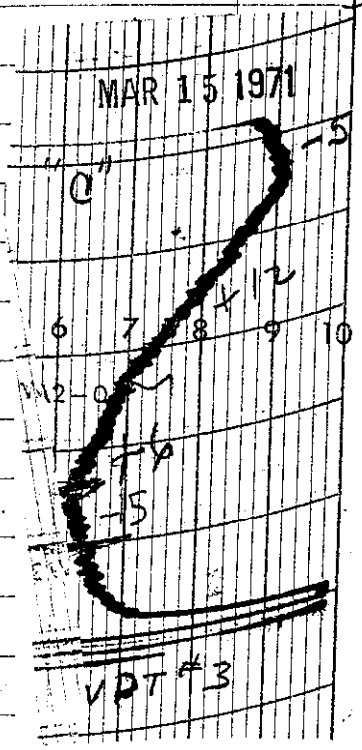
aced South spacer on pin (holding pc
nd 3 together) this should give
ivalent of 2 mil separations.

~~k~~ k < 1

Run #82 Added 1 (⅛") button, placed West spacer
13:00 on pin (as above), reduces separation ~ .5 mil,
∞, at shim @ 501

Time	Chart Reading Temp C. Fuel	Air	TMC Sum	2 min cts BF_3 s #1	#2	#3
13:55	24.84		2,925,241	106,700	128,395	108,779
14:28	24.82		2,992,494	111,945	132,783	112,324
15:00	24.68	25.24	2,954,203	109,584	130,339	109,685
15:20	—		—	107,543	128,615	109,227
15:28	24.54	25.46	2,962,093	109,602	129,977	101,512
15:44	—		—	113,953	135,558	115,129
15:48	—		—	115,731	137,425	117,845
15:55	24.50 ~~3,16~~	24.18	3,160,804	116,716	139,366	117,056
16:11	—		—	119,916	143,365	121,143

Run # 81 Placed South spacer on pin (holding pc 2 and 3 together) this should give equivalent of 2 mil separation.



SAFETY CHECK

DATE MAR 15 1971

TIME 0840 AM BY Taylor & [illegible]

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-13}	OK	L-70	}	500V	900V
SOURCE DIST.	15"	OK	6"	}	6"	OK
% F. S. DEFL.	100	=	100	}	100	100
BLDG. ALARM	✓	✓	✓	[illegible]		
AUX CKT.	✓	✓	✓			

SOURCES USED N & L MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run# 78 - Check for Reactivity Change over an extended period.
∞ ; using ($1\frac{7}{16}$" x $1\frac{7}{16}$" x $\frac{1}{4}$") Al Shim.
Apparently not good closure. Tables drifted off up light. When reclosure was made the period increased.

Run# 79 - Repeat - after moving stops to permit more pressure at closure -
Still some problems. Al shim out of range - $k > 1$

Run# 80 - Remove 1 ($\frac{1}{8}$") button. Reduce surface area of the spacers (Run # 77)

Still positive.

DATE MAR 16 1971 **SAFETY CHECK -**

TIME 08:20 AM BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	10X10'2 off	L+0	0	900V	900V
SOURCE BOX	18" ok	6'	4	6"	ok
% F. S. TRIP	100 —	100	T	100T	—
BLEED ALARM	✓	✓	✓		
AUX CHAN	✓	✓	✓		✓
SOURCES USED	227 & Co 18				
TABLES ✓	LIGHTS ✓	AREA CLEARED			

Run #83 Cont Run #82.
Only Change - West spacer off pin.
k < 1, al shim in

#83 Cont'd - Placed west spacer on pin.
Increased Al shim (2 7/8" x 2 7/8" x 1/4").
k > 1.

#84 Cont'd - West off pin: ∅ on al Shim

Start Time	Sum TMC	Temp. Chart Rec. °C Fuel	Air	Start Time	2 min BF_3 #1	#2	#3
09:58	2,319,552	24.84	24.52	10:05	86,608	104,380	87,874
—	—			10:25	85,058	102,028	87,049
10:28	2,319,966	24.83	24.83	10:45	86,272	102,904	87,065
11:00		24.60	24.86	Tables drifted off up lights			
11:15	2,094,132	24.49	24.44	11:26	77,342	92,081	77,540
11:45	2,047,742	24.50	24.58	11:46	76,769	91,967	76,728
				12:06	74,591	89109	75680
12:15	2,100,948	24.42	25.06	12:26	77668	93212	78953
12:45	2,212,743	24.35	24.50	12:46	81535	97260	82,607

Continued —

—	—	—	—	13:06	82,195	98,115	83,354
13:15	2,295,999	24.46	24.68	13:26	86,471	103,128	87,682
				13:46	84365	10091.7	85,965
13:45	2,317315	24.42	24.96	14:06	85150	102159	86,804
				14:26	88272	105280	89851
14:15	2,390,685	24.52	24.56	14:46	90378	108232	91776
14:45	2,466,223	24.50	24.10	15:06	91364	108879	91593
15:15	2,494,737	24.50	24.97	15:26	91528	109083	92683 *
				15:46	92224	110162	93384
15:45	2,564,113	24.56	24.56	16:06	96575	115360	98580

MAR 17 1971 SAFETY CHECK

Taylor & Lynn

	10 A 10⁻¹² OSC L-10	900V 900V
	18" OK 6'	6" OK
	100 — 100	100 100
	" " "	Chattock
	" " "	
	N & h	✓
TABLES	✓	✓

SEE p. 37

U. BUTTON EVALUATION. (GAP = ~34 mils)

Run #85 Loading as per Run #84 (2 (1/8" buttons on)

1 - 1/4" Button, 1 - 1/8" Button and 1 - 1/16" Button spaced around top holes of the sphere.

k > 1

	1/4 + 1/8 + 1/16		1/8 + 1/16		1/16		NONE	
TMC	195.5 sec,	5.53 / 5.56	430.3 sec,	2.73 / 2.74	1044 sec	1.56 / 1.17 / 1.18	4185 sec,	0.301 / 0.302
BF_3 #1	197.5 sec,	5.48 / 5.51	411.2 sec,	2.85 / 2.86	753.2 sec	1.61 / 1.61	4140 sec,	0.304 / 0.305
2	192.8 "	5.60 / 5.62	411.2 "	2.83 / 2.86	891.8 "	1.37 / 1.38	4134 "	.305
3	194.1 "	5.57 / 5.59	411.2 "	2.85 / 2.86	995.7 "	1.23 / 1.23	4086 "	.305 / .308
Log N	202 sec,	5.38 / 5.41	432 sec	2.72 / 2.73	1086 sec	1.13 / 1.13	4500 sec	.230 / 0.281
		5.51		2.80		1.30		0.300
	Avg =	5.53		2.81		+ 1.31		+ 0.300

1/4" = 2.71 / 2.72

43.636 g.

1/8" = 1.50

21.761 g.

1/16" = 1.00 / 1.01

11.135 g.

Run #86 REPEAT —

k > 1

	1/4 + 1/8 + 1/16	1/8 + 1/16	1/16	NONE
Tm C	228.1 sec, + 4.86 4.84	556.5 ~~603.7 sec + 1.99~~ 2.15	1934 sec, 0.648	0.879 .2304 - 5561 sec, -.231
BF_3 #1	224.8 sec, + 4.92 4.90	541.1 sec, +2.21 2.20	1987 sec + .633 .628	- 6167 sec, -.206 .207
2	252.7 , + 4.44 4.42	591.0 , +2.04 2.0	1940 " .643 .645	- 5609 " , -.229 .228
3	226.2 , + 4.90 4.87	532.4 , +2.25 2.24	1645 " .756 .760	- 5329 " , .241 .240
Log N	231 sec, + 4.81 4.79	531 sec, +2.25 2.24	1843 sec, .676 .679	-4798 sec -.268 .267
	Avg. = 4.77 4.76	2.18 2.17	0.673 .670	-0.235 .234
	1/4" = 2.59 2.51	1/8" = 1.51 1.50	1/16" = 0.908 0.904	

Ti Buttons

2 Runs Avg 1/4" = 2.655 1/8" = 1.505 1/16" = 0.955

BUTTONS Avg	Avg MASS	Avg O.D.I.A.	I.D.
1/4 th. (.24980")	43.636 gm	0.87232"	0.177" (from drawing #10322)
1/8 (.12501)	21.761	0.87232	0.177 (from drawing #10322)
1/16 (.06250)	11.1347	0.87232	0.136
1/16 (.06275)	5.535	0.6250	0.136

MAR 18 1971 SAFETY CHECK

TIME 1:40 BY Taylor & Lynn

	A	B	C	D	E	F
	10x10⁻¹²	opr	L-10	0	900V	900V
	18"	ok	6'	u	6"	ok
%	100	—	100	T	100T	—
BLOCK	✓	✓	✓			
AUX	✓	✓	✓			

SOURCE N + γ ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #87 REPEAT —

	$\frac{1}{4}"+\frac{1}{8}"+\frac{1}{16}$	$\frac{1}{8}"+\frac{1}{16}"$	$\frac{1}{16}"$	None
TMC	✓ sec, 4.62 ¢	560.1 sec, 2.13 ¢ (2.13)	1934 sec, .647 ¢ (.645)	-4493 sec, -.288 (.285)
Log N	240.7 " , 4.64 ¢ (4.62)	614 " , 1.96 (1.96 ¢)	2236 " , .563 (.559)	3525 " , .365 (.364)
BF_3 1	224.1 " , 4.94 (4.91)	523.8 " , 2.28 (2.27)	2060 " , .609 (.606)	4298 " , -0.299 (.295)
2	223.6 " , 4.95 (4.92)	510.8 " , 2.33 (2.33)	2009 " , .624 (.621)	-4033 " , -0.319 (.318)
3	225.4 " , 4.91 (4.89)	515.2 " , 2.32 (2.31)	2078 " , .608 (.601)	-4049 " , -0.318 (.317)
	4.835 ¢	2.200	.6064 ¢	.3158 ¢
AVG	+ 4.860	+ 2.204 ¢	+ .6106	-.3176

$\frac{1}{4}$ = 2.656 (2.635 ¢) $\frac{1}{8}$ = 1.593 ¢ (1.594 ¢) $\frac{1}{16}"$ = .928 ¢ (.922)

Run #88 REPEAT —

		$\frac{1}{8}+\frac{1}{16}$	$\frac{1}{16}"$	
TMC	X	544.0 sec, 2.20 ¢	1791 sec, .700 ¢	X
Log N		630 " 1.92	1549 " .804	
BF_3 1		512.6 " , 2.33	1757 " , 0.711	
2		503.9 " , 2.36	1757 " , 0.711	
3		519.5 " , 2.30	1558 " , 0.802	
AVG		+ 2.222 ¢	+ .7456 ¢	

$\frac{1}{8}"$ = 1.476 ¢

DATE MAR 19 1971 **SAFETY CHECK**
TIME 9:30 AM BY Taylor and Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10X10⁻¹²	opr	L-10	0	900 V	900 V
SOURCE DIST.	18"	ok	6'	"	6"	ok
% F. S. TRIP	100	–	100	T	100 +	–
BLDG. ALARM	✓	✓	✓			
AUX OTHR.	✓	✓	✓			

SOURCES USED N 9 8 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #89 REPEAT –

	1/4 + 1/8 + 1/16			
TMC	214.9 sec, +5.10 / 5.12¢	497 sec, 2.39 / 2.40¢	+1700 sec, 0.732 / 0.737¢	-7052 sec, -.181 / -.181¢
Log N	221.6 ", 4.96 / 4.98	555.9 ", 2.15 / 2.16	2019 " .618 / .622	-8393 ", -.152 / -.153
BF₃ 1	224.1 ", 4.91 / 4.94	499.0 ", 2.38 / 2.38	1524 ", .814 / .818	-6736 ", .190 / .190
2	216.3 ", 5.07 / 5.10	500.3 ", 2.37 / 2.38	1576 ", .788 / .791	-6584 ", .194 / .192
3	215.0 ", 5.10 / 5.11	523.8 " 2.27 / 2.28	1602 ", .776 / .781	-6998 ", .183 / .183
AVG.	5.028 / +5.050	2.312 / +2.320	.7456 / +.7498	-0.180¢ / -0.180¢
	1/4" = 2.72 / 2.72¢		1/8 = 1.57 / 1.57¢	1/16" = .926 / .930¢

Left margin: None .285 / 13 sec -.288 / 364 / 5 " .365 / .295 / 8 " -0.299 / .318 / 3 " -0.319 / .317 / 9 " -0.318 / .3158¢ / -.3176 / .922 / .928¢

Run #90 REPEAT – USE Pette Jar Values –

Pette	+4.520¢	+1.909¢	+0.437¢	-0.552¢
		2.611¢	1.436¢	0.989

Avg Run #87 & #89 1/4" = 2.688¢ 1/8" = 1.582¢ 1/16" = 0.929¢

Avg Run 85, 86, 87 & 89 1/4" = 2.672¢ 1/8 = 1.543¢ 1/16 = 0.942¢

MAR 24 1971

DATE MAR 24 1971 SAFETY CHECK
TIME 9:45 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-12} amps		L-10	0	900	900
SOURCE DIST.	18"	OK	5'	"	6"	OK
% F. S. TRIP	100		100	"	100	"
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N & X MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Second shim drive mounted - (N→S)
11 threads/in 85.9 Revolutions = ~~7.80~~
7.809" travel as limits are now -

Run #91 Evaluation of 12" x 12" x ¼" Al ← plate welded to support the spider legs and air cylinder. Placed comparable size plate, except it is ½" thick to make up for other supports, 11" from sphere.

P = TMC = + 182.4 sec, 5.89 ¢
Log N = 196.0 " 5.62
BF_3 1 = + ~~451.2~~ 211.1 " 5.55
2 = ~~486.0~~ " 5.20
3 = ~~447.0~~ 194.1 5.59

over —

Removed plate -

ρ = TMC = + 218.9 sec, 5.04 ¢
Log N = + " 4.81
BF_3 1 = + 222.8 " 4.96
2 = + 217.1 " 5.07
3 = + 225.# " 4.92

Rem #92 ~~###~~ Placed plate 14" from Sphere.

ρ = TMC + 893 , 1.32 ¢
Log N + , 1.19
BF_3 1 + 956.7 sec, 1.28
2 + 956.7 " 1.28
3 + 874.4 " 1.40
6.47/5

Removed Plate —

ρ = TMC = 2046 sec, 0.58 ¢
Log N = " .57
BF_3 1 = 1463 " 0.85 ¢
2 = 1576 " 0.79
3 = 1385 " 0.89
3.64/5

MAR 25 1971

MAR 25 1971 SAFETY CHECK

10:30 ← Taylor & Lynn

F

16 x 10⁻¹¹	op	2-10	0	900 ✓	900 ✓
18"	ok	5'	u	6"	ok
100	-	100	7	100+	-
✓	✓	✓			
✓	✓	✓			
N 4 8				✓	
✓	✓			✓	

Run # 93 Loading — 34 mil spacing, 2 (1/8") buttons and dummy source at center. (℄ = 734 Selsyn Reading)

Al Shim @ 500 → 4 1/2" = −2.8¢

117 ∞ (~ 1" from fuel)

Run # 94 Added 1 (1/8") Button. (3 (1/8") Buttons Now on)

Al shim @ 117 $\rho = + 1.71¢$

20 in $\rho = + 6.58¢$

D. C. Reading

	Source position (Selsyn)	Shim position (Selsyn)	
A	734	227.8	D.C.
B	634	227.8	+
C	634	255	− ~~DC~~

OMIT

Position (selsyn Readings) -

		Dummy Swivel	Al shim	Pettis + TMC
	A_1	734	236	- 0.067
℄	A_2	734	223.5	+ .035
	A_3	734	227.8	- .015
	B_1	634	227.8	- .0425
1/2"	B_2	634	255	- .06
	B_3	634	243.85	∞
	C_1	534	243	+
1"	C_2	534	285	-
	C_3	534	259	∞
"	D_1	434	259	+
1½	D_2	434	300	-
	D_3	434	282	∞
2"	E_3	334	304	

SEE PAGE 52

2½"	F_3	234	~~324~~	327
3"	G_3	134	370	
3½"	H_3	034	385	

		Run	Position: Dummy Source	Position: AL Shim		Period	Counts 1 (10–40, 100 sec)	2
A_1		A_1						
A_2		A_2						
A_3		A_3						
B		B_1						
		B_2						
		B_3						
		C_1	534	243	+	13700	1593783	1605
		C_2	534	285	–	8177	1573769	1554
1"	✓	C_3	534	259	∞	–77986	1538090	1536
		D_1	434	259	+	10602	1553607	1568
		D_2	434	300	–	43744	1549411	1538
1½"	✓	D_3	434	282	∞	–38004	1521784	1517
		E_1	334	282	+	18121	1529725	15381
		E_2	334	320	–	25124	1519787	15137
		E_3	334	304	∞	–15282	1505547	14997
2"	✓	E_4	334	300	∞	+17390	1498731	1507
		F_1	234	300	+	+17237	1517571	15264
		F_2	234	340	–	–36203	1521056	15168
2½"	✓	F_3	234	327	∞	–21718	1503544 1512625	14966 1506
		G1	134	327	+		1452852	1509
		G2	134	375		–26501	1511823	1506
3"	✓	G3	134	370	∞			
		H1	34	370		+487519	1496716	1497
		H2	34	450			1498633	148
3.47"	✓	H_3	34	385	∞	+18,104	1427949	1435

...nts -40 100 sec	2 (900–130)	Ratio for 100 sec	Interpolated DC.
3	1605459	1.007326	> .01963 ⟹ 258.67
.9	1554641	1.0123038	
10	1536119	1.001283 ✓	DC ok on Charlie
7	1568330	1.009476	> .016778 ⟹ 282
11	1538178	1.0073021 4	
84	1517785	1.002634 ✓	DC ok on Charlie
.5	153819	1.005533	> .009521 ⟹ 304
7	1513747	1.003988	
7	1499707	1.006565	
31	1507374	1.00576 ✓	
1	1526400	1.005818	> .008584
56	1516861	1.002766	
14	1496637 / 1506149	1.004615 ✓ / 1.004333	1505243
2	1509528		1512199
	1506125	1.003780	
		✓	
16	1497023	1.000205	> 372
3	1484653	1.009416	
9	1435819	1.0055 ✓	

MAR 26 1971

[illegible] 1971

[illegible] MAR 26 1971	SAFETY CHECK					
TIME 8:25			Taylor and hyman			
[illegible]						F
[illegible]	10x10^-12	cpr	L-10	0	900V	900V
[illegible]	15"	ok	5'	4	6"	OK
[illegible]	100	—	100	T	100+	—
[illegible]	✓	✓	—			
[illegible]	✓	✓	✓			
SO[illegible]	N ≠ γ					✓
TAB[illegible]	✓		✓			✓

Run #95 Loading - as per Run #93 with an additional spacing of ~ 5 mils (Spacing = ~ 39 mils)
Source "CfE" in.

$\rho \cong -10¢$

		Selsyn "CfE"	Readings ~~Position~~ AL Shim
℄	A_1	734	227
½"	B_1	634	244
1"	C_1	534	261
1½"	D_1	434	281
2"	E_1	334	301
2½"	F_1	234	325
3"	G_1	134	351
3.47"	H_1	040	380

BF$_3$ 2 min Counts VDT +6

	#1	#2	#3	
A_1	208,186	179,946	157,151	
9:14	209,656	180,147	157,488	168971
9:17	210,826	180,491	158,605	
B_0	211811	180615	158079	10 min Wait
0934	210279	178793	156710	
0937	200053	177277	155869	167891
B_{01}	208,245	178350	156,837	20 min wait
Noise →	247,305	177,856	156,356	VDT +6
maybe	205,777	177,752	156,078	
	206,521	177,773	156,450	167181
C_1 10:17	200,011	165,499	146,760	20 min wait
10:20 →	229,025	167,161	147,179	VDT +6
10:23	197,916	167,158	146,622	156635
	196,478	165,612	147,088	
D_1	175,266	149,334	131,838	20 min Wait
	173,398	148,009	130,774	VDT +6
10:56 →	251,447	148,454	131,330	139819
10:59	203,679	148,213	130,598	

ound
9 mils)
, ≠

E_1	159,558	124,406	109,986	20 min wait
11:28	148,297	120,335	110,654	
11:31 →	237,524	120,106	110,965	VDT + 6
	157,343	124,988	111,063	

117813

F_1 →	118853	98033	87046	20 MIN WAIT
Noise →	88307	97898	87036	VDT + 6
	88510	98727	87706	
	88142	98443	87907	

92850

12:33				
G_1	84,666	69,221	61,495	20 min wait
12:37	84,590	68,317	60,949	VDT +6
12:40	83,926	69,301	61,178	
	097,637	69,040	61,139	

65080

H_1 →	73,380	38,763	34,798	20 min
→	108,466	38,269	34,323	VDT +6
Noise 1:14	53,897	37,832	33,632	
	67,439	38,407	34,415	

36305

Log N $A_1 = .0025$ → $H_1 = .00042$

Run #96 Cf "E" with ~58 mil separation. ≈ −50+
34 mils + 5 (5 al) see p. 13.

	A_2	B_2	C_2	D_2	E_2	F_2	G_2	H_2
Selsyn Cf E	734	—	534	434	334	234	134	
" AL	227	—	261	281	300	325	351	

	#1 BE3	#2	#3	NDT	
A_2	—	35,089	31,316	Good	
	45,610	35,563	31,461		33357
C_2	41465?	32308	29043	Good	
	44194?	32223	29197		30612
	~~11769~~	32258	28818		
D_2	-	28373	25982	Good	
		29029	25855		27293
		28750	25771		
E_2	33,790	24,607	21,790	Good	
	31,484	24,171	21,802		23021
	~~46,874~~	24,264	21,490		
F_2	46251?	18913	16991	Good	
	29619	18808	17025		17965
	—	18882	17169		

58

	#1	#2	#3	VDT
G2	17,402	13,320	11,930	Good
	20,322	13,409 ~~13,406~~	11,910	12:15
	18,035	13,199	11,920	
H_2	16,595	7,492	6,750	Good
	12,018	7,543	6,998	7:29
	←	7,5[illegible]	7,046	

RUN

Log N $A_2 = .0004$

$H_2 = .0001$

(

Run

APR 1 1971

SAFETY CHECK

DATE APR 1 1971
TIME 3:20 [illegible] Taylor & Lynn

[illegible]	A	B	C	D	E	F
[illegible]	10×10⁻	opr	L-10	0	900V	900V
[illegible]	15"	ok	6'	U	6"	ok
[illegible]	100		100	T	100+	
[illegible]	✓	✓	✓			
AUX [illegible]	✓	✓	✓			

SOURCE [illegible] N & γ [illegible] ✓
TABLES ✓ [illegible] ✓ [illegible] CLEARED ✓

Run # 97 REACTIVITY CHECK before returning pc III to Y-12 for radius reduction.

NO BUTTONS, SOURCE HOLE OPEN and SEPARATION of ~ 5 mils (al catcher foil thickness)

SEE p. 11

ρ = Pette + 51.33 ¢
TMC + 52.2 ¢

Run # 98 REPEAT –

ρ = Pette + 51.39 ¢
TMC + 52.3 ¢

51.81 ¢

Oil used when machining 235U
Percolan ethylene thermal | as
per
Clarifier bisphenol E. Meehens

Pg 59 —

Before Botton
after "

Closed (no ga
" " "

Pg 59 → 62

Rhoetta

Before Bottom cut & Pin Out, 5 mil Gap	+ 51.35 ¢
after " " " " " " " "	6.60
removal	+ 44.75
Closed (no gap) pin out	14.90
" " " pin in	25.87 ✓
TMC	26.50

APR 22 1971

APR 22 1971

09:20 Taylor and Lynn

A

F

10×10^{-11} open L-10 0 900 900

8" ok 4' 4 6" ok

100 100 T 100+

M-227 + Co^{60} (4/8)

Chamber for "A" now in paraffin pig.

C.A. Expr. Run

Date 19 Time AM PM

Purpose Reactivity check after machining Section III to a radius of 3.439.

Run #98 Repeat Run #97 except for radius change.

Section III = 19,790 g. (~~9213 wt~~ ~~JJL & JRT~~) 19,790

up #1 = 15.415

ρ = Pitte = 6.60¢

BF_3	1 =	7.26¢	142.4 sec
	2 =	7.13¢	143.6 "
	3 =	7.10¢	146.3 "
		7.02¢	

51.81¢
7.02
44.79¢

Run #99 Removed Spacers.
Complete Closure.

P = Pitte = 14.90 ϕ
BF_3 1 = 15.99
2 = 15.63
3 = 15.67
Avg = 15.55 ϕ

50.25
~~101.1~~
51.75
~~103.5~~
51.6
~~103.2~~

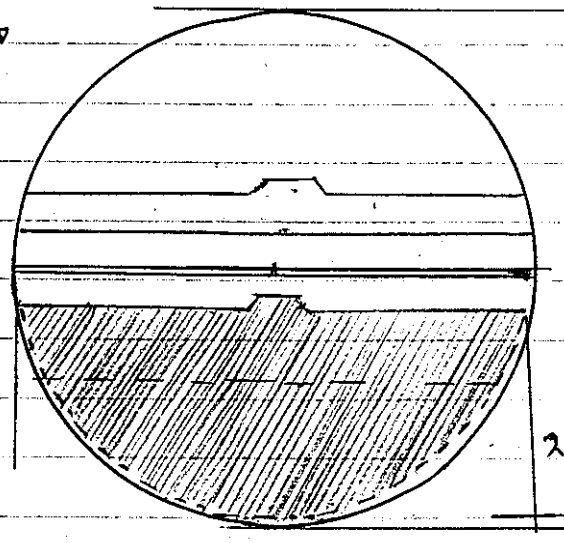
Run #100 Added Source plugs (30 gms).

P = Pitte = 25.87 ϕ ✓
Tmc = 26.50 ϕ
Avg = 26.19 ϕ

26.2 ✗

	Wt	Radius
I	12,107	3.467"
II	21,125	
III	19,790	3.439"

~~52,972~~ g.
53,022 g.



DATE APR 23 1971 SAFETY CHECK

TIME 09:55 AM BY

CHANNEL	A	B	C	D	E	F
RANGE	10X10" open	L-10	C	900	900	
SOURCE DIST.	8" ok	5'	4	5"	ok	
% F. S. TRIP	100	100	†	60+		
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N ≠ X BUCKETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 101 — Source plug in, He Det. up and ~19 mil spacing.

Rossi α using He Det.

∞ using Al shim.

137

767

1125

038

840

DATE APR 26 1971	SAFETY CHECK					
TIME 1:15 PM	Taylor and Lyon					
CHANNEL	A	B	C	D	E	F
RANGE	10X10^-11	ofr	L-10	0	900	900
SOURCE EFCT.	3"	OK	5'	L	6"	OK
% F. S. TRIP	100		100	T	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CLIP.	✓	✓	✓			
SOURCES USED	N + γ		MAGNETS	✓		
TABLES ✓	LIGHTS ✓		AREA CLEARED	✓		

Run #102 Added 1/16" X .875" U Button (11 g.) vs Run #101 on al shim.

Crit @ 1:35 PM

1 min BF3	1	2	3
	~~3488~~	~~4073~~	~~3418~~
	3761	4474	3569
	3750	4540	3597

APR 27 1971 CHECK

	09:10			Taylor & Lynn		
	A					F
	10x10"	L-10	0	900	900	
	7"	ok	5'	"	6"	ok
	100		100	T	100+	—
	✓	✓	✓			
	✓	✓	✓			
S	N & Y					✓
TABLES	✓		✓			✓

#101 Run# 103 Same as #102.

Cont'd Rossi α. crit @ 9:45 AM

C: L-13 @ 36 Down @ 4:12 PM

~ ½ Power of Run # 102

DATE APR 28 1971 **SAFETY CHECK**

TIME ____ AM PM BY ____

CHANNEL	A	B	C	D	E	F
RANGE	10X10"	Opr	L-10	@	960	900
SOURCE DIST.	8"	OK	5'	"	6"	OK
% F. S. TRIP	100		100	I	100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N & X MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #104 Same.

Cont'd Rossi α. ½ Power of Run #103,
Crit @ 8:40 AM Down 12:50 PM

1 min	BF_3 1	2	3
09:30	754	1046	742

"C" = 50 @ L-10

11:18	952	1062	870

Run #105 Removed the 1/16" fatton.
He^3 ctr and Cf^2 in place.

Section I (Top) on automatic oscillating drive. ~~Down~~ time = 54.4 sec.
∞ at Shim @ .760

"C" = 50 @ H-22

ctr time = 57 sec "C" = 50 @ L-10

Had some table trouble; an apparent air bubble in oil. Table dropped few units.

DATE APR 29 1971 SAFETY CHECK
TIME 0825 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10X10"	OPR	L-10		900	900
SOURCE DIST.	8"	OK	5'	X	6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	✓	✓	✓	Chvetko OK		
AUX CTRS.	✓	✓	✓			

SOURCES USED RaBe & Co⁶⁰ MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

"VENT. System" opened hand Valves hoping to eliminate up problem.

Run #106 Continue Run #105.
Check Level. ∞, at shim @ .725

"C" = 32 @ H = 21

STILL up PROBLEMS.
Down to check for trouble.

Run #107 Continue — Taped He^3 Ctr against U.
(with feed Valve open) L at shim .910

Section I cycle time = 57 sec + down time
@ 0.68" Separation 5 sec down time

Run #108 2.0" 14 sec " "C"
#109 2.9" 20 sec "
#110 4.0" 27 sec " C = 30 @ L-16
#111 5.0" 35 sec " "
#112 6.6" 45 sec " "

"A" = 30 @ 3X10-11

Run # 113 Added 2 Spacers. ~ -18 ¢
Spacing Now = ~ 28.5 mils
"leveled out" in ≈ 4 min (not oscillating).
C = L-16 @ 13 or L-10 @ 60
BF_3 # 2 = 1574 avg CPM

Run # 114 Added 2 Spacers. ~ -35 ¢
Spacing = ~ 38 mils
Level out in ≈ 5 min (not oscillating)
C = L-10 @ 35
BF_3 # 2 = 865 CPM avg.

Run # 115 Removed 4 spacers. D.C.
Spacing = ~ 18.5 mils

oscillating as per Run # 112.

-18 ¢
ting).

5 ¢
)

DATE APR 30 1971 **SAFETY CHECK**

TIME 08:20 AM BY Lynn & Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	10x10⁻¹¹	OPR	L-10	—	900	900
SCALE DIST.	8"	ok	5'		6"	ok
% F. S. TRIP	100	–	100		100+	✓
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			

SOURCES USED N & Y MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 116 — D.C.

Log N = .024 ∞ Al shim = 0.715

Oscillating 6.6", 57 sec ct + 45 sec down

"C" = 30 @ L-16 Log N =
"A" = 35 @ 3x10⁻¹¹

Section III to Y-12 for removing oil that seeped in cracks when the last machining was done.

MAY 11 1971

DATE MAY 11 1971 SAFETY CHECK

TIME 1:55 PM BY Lynn & Taylor

CHANNEL	A	B	C	D	E	F
RANGE	10X16"	opr	1-10		900	900
SOURCE DIST.	08"	OK	6'		6"	OK
% F. S. TRIP	100		100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N ✓ MARKERS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Did Not Run - Received Sect III. Was still warm from the degreasing process.

DATE MAY 12 1971 **SAFETY CHECK**

TIME 0830 AM BY TAYLOR & LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-11}	OPR	2-10		900V	900V
SOURCE DIST.	8"	OK	6'		6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	✓	✓	✓	Rhoette OK		
AUX CTRS.	✓	✓	✓			

SOURCES USED ~~Ra~~ Be & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #117 Repeat of Run #98. p. 61

Up #1 = 15,380

#3 = — ~

#4 = — 1

$k > 1$

Little = 7.15 ¢

TMC = 7.65 ¢ 133.8 sec

Log N = 7.36 ¢ ✓ 140.1 "

7.39 ¢

Run #118 Removed Spacers (~ 5 mil).

$k > 1$, Little = 15.79 ¢

TMC = 16.71 ¢ 46.9 sec

Log N = 16.50 ¢ 47.8 "

16.33 ¢

Run # 119 Added Source plug (^{233}U = 30g).

k > 1, Little = 26.58 ϕ

Tmc = 27.0 ϕ 20.2 sec

Log N = 28.43 ϕ 19.32 sec

27.34 ϕ

8 sec
.1 "

.9 sec
.8 "

74

DATE MAY 13 1971 **SAFETY CHECK**

TIME 0820 AM PM BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	10x10"	OPR	L-10		900V	900V
SOURCE DIST.	[redacted]"	OK	6'		6"	OK
% F. S. TRIP	100	—	100		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

Rhoette OK

SOURCES USED PuBe & Co60 MAGNETS

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #120 He^3 Det and Cf "A" Source in place.
4 Spacer (~ 5 mil each) separation.
Source plug in.

crit 08:45 ∞ Log N = .103
Al shim = 0.665
Rhoette = 1.5×10^{-8}

occillating the TOP Section via auto-cycler.
CT. TIME = 56 sec; TRAV. TIME: 45 sec; Ch. C @ peak = L-7 @ 65.
4:14 Hold 10 min - Log N reached 100065
Down 4:24 PM

DATE MAY 14 1971	-SAFETY CHECK-					
TIME 0810 AM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	10x10⁻¹¹	OVR	L-10		900V	900V
SOURCE DIST.	8"	OK	6'		6"	OK
% F. S. TRIP	10	—	100		100+	—
BLDG. ALARM	✓	✓	✓	Rhoettsd K		
AUX CTRS.	✓	✓	✓			
SOURCES USED	PuBe & Co60	MAGNETS ✓				
TABLES ✓	LIGHTS ✓	AREA CLEARED ✓				

Run #121 - ~~Control Run #120~~ He^3 & Cf A

6 Spacers (~29.5 mils) (Ref JTM Data Sphere Pg 67)

Critical Time = 09:00 Log N = .02

k < 1, -24.78¢ Del Shim = 6.00

Cutie -

up #1 15.35

#3 = 0

#4 = 0 Start 0940

Charlie = L-6 @ 55 (stable), BF_3 #2 = 365 CPM

Run #122 He^3 & Cf C (Ref JTM Sphere Book Pg 64)

Charlie = L-10 @ 55 (stable), BF_3 #2 = 1320 CPM

Run # 123 - 8 spacers (~39 mils) Separation

k ≤ 1, - 43.18 ¢ Tritte

He^3 & Cf C
Charlie = L-7 @ 70 BF_3 #2 = 830 CPM

Run # 124 4 spacers He^3 & Cf A in place.
(as run # 120) Al shim @ 0.52
accumulating LASL data.

Run # 125 Cf C vs LASL Data Taking.

Run # 126 Cf A = LASL Data Collection

DATE MAY 18 1971 **SAFETY CHECK**

TIME 0830 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-11}	OPR	L-D		900V	900V
SOURCE DIST.	8"	OK	6'		6"	OK
% F. S. TRIP	100	100	100		100	100
BLDG. ALARM	✓	✓	✓		Chrette OK	
AUX CTRS.	✓	✓	✓			

SOURCES USED RaBe & Cf^{60} MAGNETS ✓

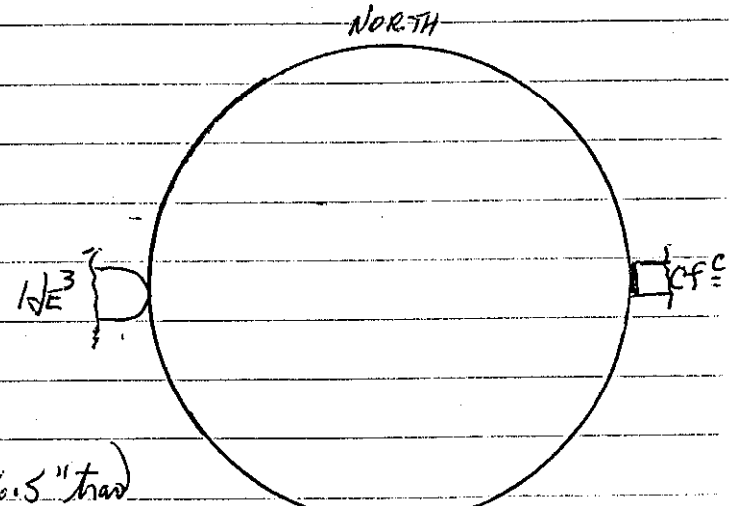
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

RUN # 127 CTRS UP are $1/E^3$ & Cf A, center rod in, no buttons. 4 Spacers separation. (≈ 18.5 mils)

critical @ 0845 ∞ $k_N = 0.03$; C. - H19@60

Selsyn #1 = 15.355, VDT # 3 = -2, VDT # 4 = -5, Al shim = 0.625

0920 oscillating Top for data accumulation. (Ref JTM Pg 78)



RUN #128 $1/E^3$ & Cf C 0955 (6.5" trav)

Run # 129 $1/E^3$ & Cf C 1310 (3.7" trav) Al shim

Down @ 1615

78

DATE MAY 19 1971 **SAFETY CHECK**

TIME 0810 AM ~~PM~~ BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-11}	OK	L-10	~~X~~	900V	900V
SOURCE DIST.	8"	OK	6'	✓	6"	OK
% F. S. TRIP	100	—	100	✓	100	100
BLDG. ALARM	✓	✓	✓	Rhettlock		
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

RUN #130 Make the usual check for "level" at high power (using TMK) and al shim @ 0.665 (cont run #129) occillating top (Ref JDM Pg 87) 08:55 Dn @ 14:55

20 May 1971

MAY 20 1971

4:20 PM

~~Eighth~~ Run #131

End

5	8	4	7	-	R	0	0	0	0	.
5	8	4	7	+	R	0	0	0	3	.
5	8	4	7	+	R	0	0	0	3	.
5	8	4	7	+	R	0	0	0	0	.
5	8	4	7	+	R	0	0	0	0	.
5	8	4	7	+	R	0	0	0	4	.
5	8	4	7	-	R	0	0	0	0	.
5	8	4	7	+	R	0	0	0	3	.
5	8	4	7	+	R	0	0	0	3	.
5	8	4	7	+	R	0	0	0	0	4
5	8	4	7	+	R	0	0	0	4	0
5	8	4	7	-	R	0	0	0	0	6
5	8	4	7	+	R	0	0	0	6	9
5	8	4	7	+	R	0	0	0	9	3
5	8	4	7	+	R	0	0	0	3	4
5	8	4	7	+	R	0	0	0	4	0
5	8	4	7	-	R	0	0	0	0	7
5	8	4	7	+	R	0	0	0	7	5
5	8	4	7	+	R	0	0	0	5	4
5	8	4	7	+	R	0	0	0	4	0
5	8	4	7	+	R	0	0	0	0	9
5	8	4	7	-	R	0	0	0	9	3

SAFETY CHECK

DATE MAY 20 1971
TIME 10:10 AM — Lynn & Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-11}	opr	L-10		900	900
SOURCE DIST.	8" ~~15"~~	OK	5'		6"	OK
% F. S. TRIP	100	—	100		100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N ~~&~~ 8 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

1" at Run# 131 — ∞, Log N = .027 #1 = 15.355
"C" = 63 @ H-19 #3 = -3
10:25 AM Al Shim = 0.675 #4 = -5.5.

oscillating top (JTM p. 95) 11:08 start
16:25 down

DATE MAY 21 1971 **SAFETY CHECK**

TIME 0815 AM/PM **BY** TAYLOR & LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10x10⁻¹¹	OPR	L-10	[illegible]	900V	900V
SOURCE DIST.	[illegible]"	OK	5'	[illegible]	6"	OK
% F. S. TRIP	100	—	100	[illegible]	100	100
BLDG. ALARM	✓	✓	✓	Rhoett OK		
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS —

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #132 more of same. Up positions same.
∞ @ 0840 ch C @ H19 (60); Lm: 0.025; A: 10×10^{-9} @ 42
Remotely moved Al shim selsyn = 0.758
0920 cycling the top (JTM Pg 102).
1130 down for 2 hrs
Run # 133 1330 Up and cycling again for comparison

Run #134 1510 ∞ Log N = .018
Stay up 10 minutes
Moved top away waited 5 minutes

Then recycle as above.

Run #135 1610 ∞ Log N = .024.
Al Shim = .682

DATE MAY 24 1971 **SAFETY CHECK**

TIME 0820 AM ~~PM~~ BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10x10-11 OPR		2·10		900V	900V
SOURCE DIST.	8" OK		5"		6"	OK
% F. S. TRIP	100	100			100	100
BLDG. ALARM	✓	✓	✓	Rhoette OK		
AUX CTRS.	✓	✓	✓			

SOURCES USED $Pu Be + Co^{60}$ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 136 Cycling top (prior to checking at "high power") up positions same @ 0830. (JTM Log Pg 111)

Run # 137 check ∞ Ln @ .025 He^3 counter has no voltage on it.
at power for 12 min. Shim relays = 0.735

Run # 138 "Down" for 20 min. Turn power back from (0 to 1700 V on) He^3 counter.
→ cycling top as above, 10:30
Down @ 11:25

Run # 139 Up @ 13:00 for more cycling.
Dn @ 1600

DATE MAY 25 1971	SAFETY CHECK					
TIME 08:30 AM	BY Mihalczo & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	10x10⁻¹¹	opr	L-10	}	900	900
SOURCE DEFL.	8"	OK	5'	}	6"	OK
% F. S. TRIP	100	–	100	}	100+	
BLDG. ALARM	✓	–	✓			
AUX. CHG.	✓	✓	–			
SOURCES USED N & γ				MAGNETS ✓		
TABLES ✓	LIGHTS ✓			AREA CLEARED ✓		

Run #140 — Cycling top. No Reactivity Check. (J.T.M p. 117)

Start @ 08:38 Al Shim = .735
Down @ 11:40

Run #141 — cycling top. No Reactivity check.
¼" Scintillator now be used instead
of He^3.
Spacing = 5 Spacers (~24.5 mils)
Al Shim = .735

Start @ 13:43
Down —

Run #142 — 4 spacers (~19.75 mils).
Cf Dummy; ¼" Scint.
Al Shim = 0.345

Source Plug Out — Reactivity ~ -10¢
for Runs #140 & #141

DATE MAY 26 1971	SAFETY CHECK					
TIME 0820 AM BY TAYLOR - LYNN						
CHANNEL	A	B	C	D	E	F
RANGE	10x10^-11	OFR	L-10	X	900	900
SOURCE DIST.	8"	OK	5'		6"	OK
% F. S. TRIP	100	~	100	0	100+	100
BLDG. ALARM	✓	✓	✓	Rhoetts OK		
AUX CTRS.	✓	✓	✓			
SOURCES USED Pu-Be & Co^60						
TABLES ~	LIGHTS ✓	AREA CLEARED ✓				

p. 117) Run # 143 5 spacers (~24.5 mils gap). One (11 gram) button on top, center hole filled.
:5 ∞ @ hw = .0001; C = H6@46; Shim Sel = 0,40 (JTM Sphere Log Pg 124). L16@50; BF_3 #2 = ~4300 CPM
23 min data. Dn. for photographer.

) Run # 144 Con't above accumulation. 0953
Down @ 1615

-10⁴

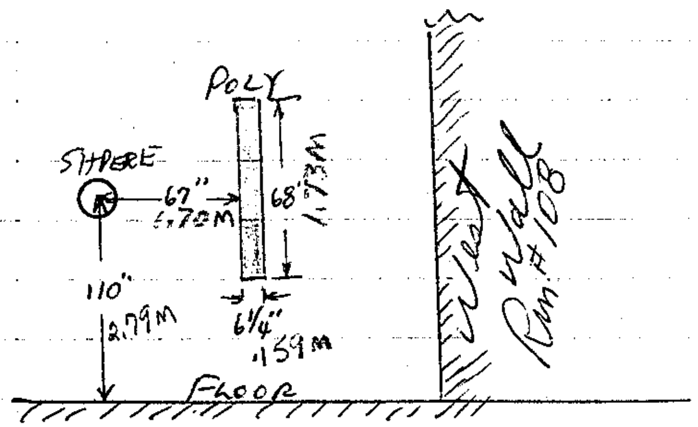
SAFETY CHECK

DATE MAY 27 1971
TIME 0915 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10X10⁻¹¹	OFF	2-10	[illegible]	900	900
SOURCE DIST.	8"	✓	5'	✓	6"	✓
% F. S. TRIP	100	—	100	✓	100	100
BLDG. ALARM	✓	✓	✓	Rhoglls		
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #145 Hang a polyethylene "wall" (110" wide, 2.79 M; 68" high 1.73 M and 6¼" thick .159 M) at a distance of 67 inches from the sphere horizontally (West) and centered otherwise.



(See JTM LOG Pg 126)
∞ Shim = 0.35
C = 2-16 @ 50
Lm = .0001
Repeat 26 MAY 71
LASL data for comparison

¼" scin on West side.
dummy Cf on east.

SAFETY CHECK.						
DATE MAY 28 1971						
TIME 0820 AM PM	BY TAYLOR & LYNN					
CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-11}	OPR	2-10	✓	900V	900V.
SOURCE DIST.	8"	✓	5'	✓	6"	2"
% F. S. TRIP	100	—	100	✓	100	100
BLDG. ALARM	✓	✓	—	Rhoetlock		
AUX CTRS.	✓	✓	✓			
SOURCES USED Pu-Be & Co^{60} MAGNETS ✓						
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓						

Run #146 No reactivity check. "Wall" removed, center filled, 1/4" scin & CF ∞, 5 spacers, Shim=0.40

0845 Cycling top for data (See JTM log Pg 129)

"REACTIVITY MEASUREMENT"

Run #147 Top Socket Removed. CP Dummy on 4 Spacers. 1/4" Steel up
3 - 1/8" U Buttons (66 g.) in Socket Hole.
k ∞
Pulled Buttons k < 1, -8.59 TMC

Run #148 3 - 1/8" SS Button (@ 26.78 gms) in Socket Hole.
Ram Fuel Support up.
k > 1, + 1.82¢ TMC

Worth
4.64¢ ← SS Buttons out k > 1, - 2.82¢ "
6.32¢ ← Support ↓ k > 1, - 9.14¢ "

DATE JUN 1 1971 **SAFETY CHECK**

TIME 13:00 ~~PM~~ BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	1 10X10⁻¹¹	OPR	L-10		900	900
SOURCE DIST.	8"	OK	6'		6"	OK
% F. S. TRIP	100	—	100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CHAN.	✓	✓	✓			

SOURCES USED N ≠ γ INTERLOCKS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #149 - As Run #147.

Rossi α @ $\log N = .005$ (JTM p. 132)

¼" Scint (N = 102). "C" = 68 @ H-12

Crit @ 13:30 "A" = 34 @ 3×10^{-9}

Start Data Collection 14:12

DATE JUN 2 1971 **SAFETY CHECK**

TIME 0810 AM PM BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-11}	OPR	L-10		900V	900V
SOURCE DIST.	8"	✓	6'		6"	✓
% F. S. TRIP	100	OK	OK		100	100
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			

SOURCES USED Rubbed Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED -

Run #150 Cont ∞ as run # 149. hv = .005

p. 132) critical @ 0830. (See ITM Pg 132)

Down @ 1555

SAFETY CHECK

DATE JUN 3 1971

TIME 0820 AM BY TAYLOR & LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10x10⁻¹¹	OPR	L-10	OFF	900 V	900 V
SOURCE DIST.	8"	✓	6'		6"	2"
% F. S. TRIP	100	—	✓		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #151 Top pc (Set I) back on drive, 4 Spacers (~19.5 mils), 1-1/8" Button & ~~1-1/16" Button~~ 1/4" Scint (NE 102) & Cf Dummy.

k ≥ 1, Al Shim = out "C" =

Run #152 5 spacers and 1-1/16" button back on.

∞, Al Shim = 0.42 "C" = 50 @ L-10

Cf ⊆ on.
cycling –

DATE JUN 4 1971 **SAFETY CHECK**

TIME 0815 AM PM BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	10×10^{-11} amp		2-10		900V	900V
SOURCE DIST.	8"	✓	6'		6"	2"
% F. S. TRIP	100	—	✓	0	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu-Be & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS — AREA CLEARED

Run #153 Check level (∞) @ $L_N \cong .00005$ and dummy cf "up".

Run #154 Cf$_c$ and cycle (Ref JTM Pg 139) same as run #152.

Run #155 — Check level - $L_N \cong .00005$ Dummy Cf up.

Run #156 - Cf "A" on + Cycling. 55.8 sec/cycle (JTM p. 139)
Remote shim @ 60 units

Run #157 Scin. and cf taken away.
Remote shim in all way.
4 spacers used.
added 1 (1/8") button
Period ≅ −0.59
At power 20 min.
Avg L_N = 0.06
Center of 1/2" x .129" @ "center" = 3.563" FROM EDGE
Center of 1/2" x .129" @ "edge" = 0.250" from edge.
Foils counted by Henry Morton.

DATE JUN 7 1971 **SAFETY CHECK**

TIME 0820 AM BY TAYLOR, LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10x10" OPR		2-10		900V	900V
SOURCE DIST.	8"	✓	6"	✓	6"	2"
% F. S. TRIP	100	—	✓	8	100	100
BLDG. ALARM	✓	✓	✓			
AUX CT'S.	—	✓	✓			

SOURCES USED PuBe + Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED —

Run #158 ¼" Scint (NE102) + Cf Dummy in place.
1-1/16" Button and 1-⅛" Button on.
Spacers (~ 24.5 mils)
∞, Al Shim = 36 s

Run #159 of "A" on.
Cycling - 10 Cycles 25", 57", 2 min, 3' & 5'

Start 09:38.

Run #160 Cf A cycling (see NTM Log Pg 140)

SECTION		DENSITY	Radius
I	11,883 g.	18.74	
II	20,815 g.	18.74	3.44285"
III	19,625 g.	18.72	

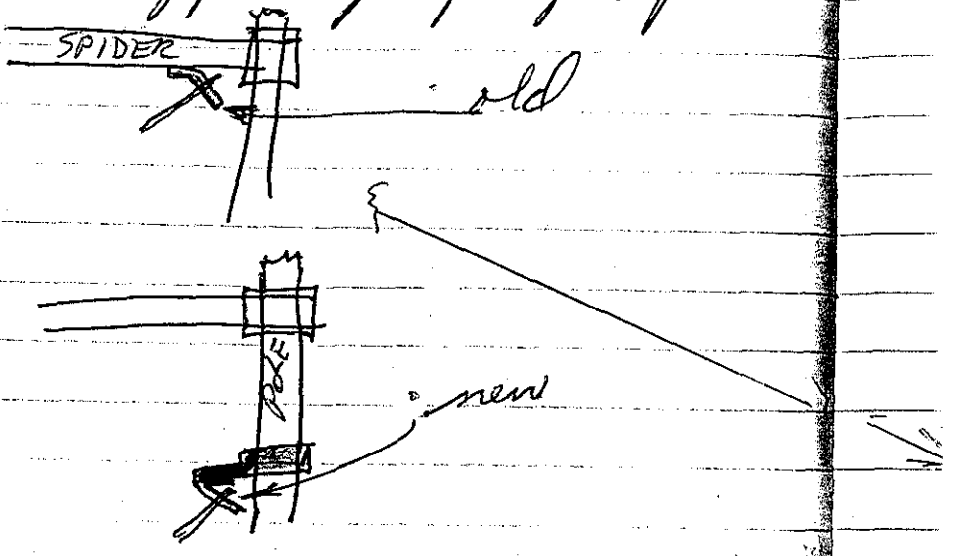
FINAL MACHINING

3/15/93 note by JTM

where did 3.44285 come from

JUN 22 1971

Made a change in the center section hanger. The rods were attached to a bracket which was fastened to the underside of the SPIDER. We now use the bracket which is fastened to the supporting upright poles.



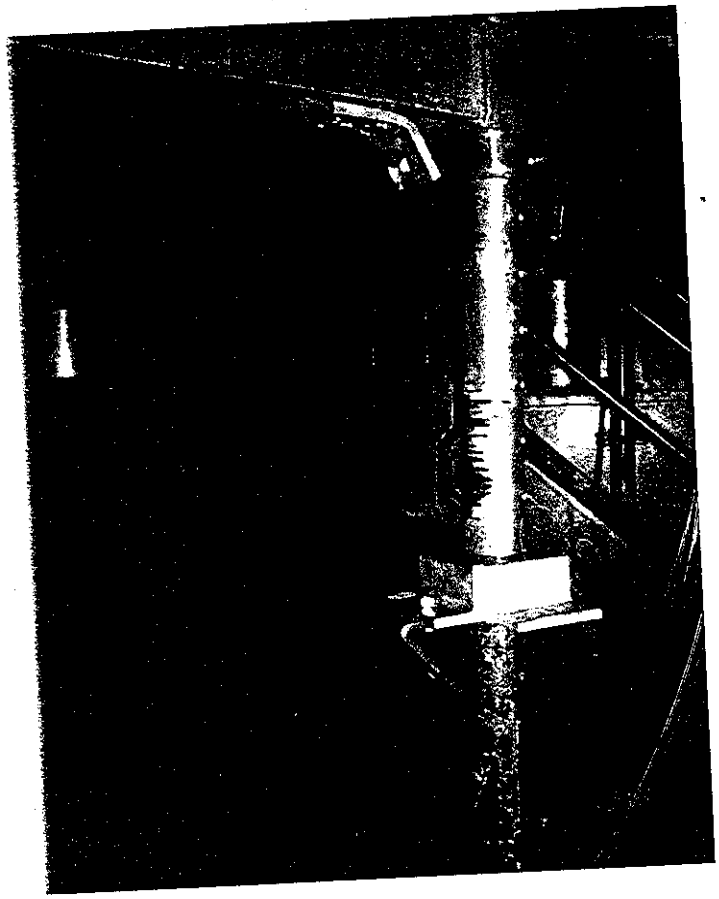
See photo on opposite page.

J. R. Taylor

J T Mealey

JUN 24 1971 Received the 3 segments of fuel.

JUN 25 1971 Installed fuel on appropriate supports



Original center fuel hanger was attached to the bottom of the SPIDER (top center of picture)

JUN 23 1971

New hanger is attached directed to the support posts (bottom of picture)

Fuel Mass: TOP = 11,883 gm (as per waybill)
CENTER = 20815 gm
BOTTOM = 19625 gm
52,323 g.

One Pin in the bottom piece protrudes about .5 mil and one pin is 5 mils below the surface. Other pin is even.

Top Ball joint = 64 g.
Center Hole plug = 30 g.
⅛" - Buttons = 22 g.

Center section hanger modification.

FROM Insp. Reports

Radii 3.4437" pole > Top
3.4420 Equ.

3.4433 > CENTER
3.4421

3.4427 Equ > Bottom
3.4433 Pole

Average = 3.44285"

DATE JUN 28 1971 SAFETY CHECK

TIME 0820 AM PM BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	1-10		900V	900V
SOURCE DIST.	24"	✓	6'		6"	2"
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓	Rhoette		
AUX CHNS.	✓	✓	✓			

SOURCES USED Pu Be & Co^{60} LATCHES ✓

✓ CAVITY ✓ AREA CLEARED ✓

6/28/71

MON., JUNE 28, 1971

Run

Run # 161 Reactivity of Sphere with new diameter / Rhoette = -29.45¢
No Buttons - No center rod.

up #1 = 22.305 Top = 0 (in)
#3 = 7
#4 = 2

Run # 162 Reactivity of Sphere with center fuel rod in.
Rhoette = -18.76¢
TPC =
Log N = -12¢?

Run # 163 Repeat → Rhoette = -18.80¢

Run # 164 Repeat.

Periods ?

.45¢

rod in.
8.76¢

12¢ ?

2¢

DATE JUN 20 1971 SAFETY CHECK
TIME 0830 AM BY Taylor-Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	OPR	L-10		900V	900V
SOURCE DIST.	18"	✓	3'		6"	2"
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓	Rhotrol OK		
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu-Be & Co-60 MAGNETS ✓
TABLES — LIGHTS ✓ AREA CLEARED ✓

Run #165 Reactivity check. Config "clean". i.e. no inst., shims, or planks etc. No buttons & center fuel rod is in.

	Rhotrol	LN	BF_3 #1	BF_3 #2	BF_3 #3	DMC
	sec.	108.6	-102.9	-104	-105.5	-93.3 ?
#165	-17.9¢	-21.7¢	-24.9¢	-24.3¢	-23.4¢	
		-110.7	106	106	106	-102.6
#166	-17.88	-20.7	-23.1	-23.1	-23.1	-25.2
		-109.1	-106	-108.9	104.6	
#167	-17.42	-21.5	-23.1	-21.6	23.9	
Avg	-17.60¢	-21.31¢	-23.70¢	-23.00¢	-23.47¢	-25.2¢ >

70
47
3 | 141
39

23.4

23.39

Run #168 Set up drives.
Reactivity calibration using mock source in preparation for CF trav.
10 - 1/8" U-Buttons on.
Shim @ 115 → ∞

Run #169 added 1 - 1/8" U button.
With "CENTER HOLE" DRIVE SET @ 7.408, the center fuel rod is flush on North side while the dummy source end is @ 109 mils on the South side. (i.e. 109 mils inside).

Ran traverse for data to establish equalizing positions (Δ) for rod drive vs. Shim drive.
(See results next Pg)

drive unit per inch calc:
6.631" source travel = 7.278 units
∴ 0.911102 units selsyn/inch

98 ± ℄	Rod Drive	Shim Drive	Period (sec)	Ratio	To Use Shim Pos.
−3.189" South	7.40[B]	210	−	-	200.5
		200	∞		
−2.945	7.14	—	—		197.6
−2.690	6.86	190	+		195.0
		195	∞		
−2.198	6.32	189	∞		189.0
−1.688	5.76	182	∞		186.0
−1.186	5.21	175	+22725	1.006622	180.0
		180	−121570	1.001234	
−0.685	4.66	180	−	1.007366	176.0
		170	+12668	1.011921	
−0.184	4.11	170	+20953	1.007184	172.5
		180	−6632	1.022876	
+0.317	3.56	180	−19613	1.007677	175.0
		160	+29196	1.05272	
+0.818	3.01	160	+3540	1.043283	179.4
		180	−112464	1.001335	
+1.319	2.46	180	+13813	1.0109181	184.3
		190	−10280	1.014698	
+1.829	1.90	190	∞		196.6
+2.321	1.36	190	+	1.014314	197.0
		210	−	1.034813	
+2.921	0.81	210	+	1.0070364	215.0
		200	+	1.019555	
+3.324	0.26	230	+	1.008439	228.0
		215		1.012733	
+3.442 North	0.13	240	−	1.013339	233.0
		220	+	1.04159	

JUN 30 1971

JUN 30 1971 SAFETY CHECK

	A	B	C	D	E	F
	$.3 \times 10^{-10}$ opn	$< 10^{-10}$				900 v
	2'		3'		3"	2"
	✓	✓	✓			
	Pa-B.	Co				
TA...	LIGHTS					

Run # 120 Traverse thru ℄ hole using Cf (E)
No U-Buttons, al shim ≃ 1.5" away, drives up.
Round edge of Source Moving North (2 min counts)

← GRAND AVG. CPM

		U-ROD DRIVE	SHIM DRIVE	BF_3 #1	BF_3 #2	BF_3 #3	
-3.189	A	7.40	200.5	42932	27268	36671	17914
8.100				42769	27251	36700	
		ch.A = 1×10^{-10} @ 71.0 (23.6)		42869	27719	36988	
		L_N = .00058		43441	27510	37810	
				AVG CPM = 21501	13719	18521	
-2.945	B	7.14	197.8	57210	35481	49304	
7.480				56389	35216	48045	23480
		chA = 3×10^{-10} @ 30.5		56502	35386	48908	
				56779	35644	48657	
				AVG CPM = 28360	17716	24364	

		U-ROD DRIVE	SHIM DRIVE	BF_3 #1	BF_3 #2	BF_3 #3	
-2.690	C	6.86	195.0	69584	43698	59589	
				69693	43585	59112	28779
		ch A = 3×10^{-10} @ 37.0		69627	43829	59736	
				69260	43232	59739	
			AVG CPM	34771	21793	29772	
-2.198	D	6.32	189.0	93565	58398	79659	
				93186	57970	79511	38948
		ch A = 3×10^{-10} @ 49.0		93804	58524	79658	
				93284	58040	79554	
				46480	29117	39798	
-1.633	E	5.76	186.0	114345	71419	96233	
				114917	71571	96876	47169
		ch A = 3×10^{-10} @ 59.5		115210	71591	96871	
		LN = .00086		57412	35764	48330	
-1.136	F	5.21	180.0	131113	82248	112048	
				132434	83146	113199	54577
		ch A = 3×10^{-10} @ 68.5		132076	83300	112820	
		LN = .0010		65937	41449	56345	
-0.685	G	4.66	176.0	143258	89400	121856	
				142688	89791	122386	59156
		ch A = 3×10^{-10} @ 74.5		143450	89723	122264	
				71566	44819	61084	

				148849	93449	127139
	H	4.11	172.5	223274 X⅔	140173 x⅔	190709 x⅔
		-.184		179364	93870	126935
ϕ 3.91		ch A = 3x10⁻¹⁰ @ 77.5		149872	93403	126809
		hν = .0012		74681	46787	63481
	I	3.56	175	147712	92376	125523
+.317		ch A = 3x10⁻¹⁰ @ 76.5		148113	92671	125314
				148156	92998	126603
				73997	46341	62907
	J	3.01	179.4	139910	88011	120146
.01818		ChA = 3x10⁻¹⁰ @ 72.5		209696 x⅔	130857 x⅔	178679 x⅔
				210775 x⅔	131781 x⅔	179073 x⅔
				70079	43773	59737
	K	2.46	184.3	126892	79431	107825
1.319				126646	78966	108382
		ch A = 3x10⁻¹⁰ @ 65.5		127933	79587	108785
				63579	39664	54165
	L	1.9	196.6	108137	67531	91724
1.829		ChA = 3x10⁻¹⁰ @ 57.5		108164	67572	92068
				108928	68011	92116
				54206	33852	45985
	M	1.36	197	87504	54478	74234
2.321		ch A = 3x10⁻¹⁰ @ 41.5		87357	54543	74385
				86410	53956	73851 m
				43545	27163	37080

Margin notes: 287779; 384448; 47169; 45577; 59156; 61650; 61081; 57863; 57469; 44680; 57979

N	0.81	215	93081 X 2/3	58287 X 2/3	79979 X 2/3
	Ch A = 3X10⁻¹⁰ @ 32.5		63277	39098	53577
			63099	38687	53813
			31351	14439	26767
O	0.26	228	36846	22653	31393
	Ch A = 3X10⁻¹⁰ @ 20.0		36252	22751	31586
			54819 X 2/3	34308 X 2/3	47440 X 2/3
			18274	11387	15774
P	0.13	233	29846 ~~29865~~	18352	25760
			29868	18509	25881
			30037	18536	26088
			14959	9233	13104

JUN 30 1971

Run #171 Repeat Run # 169 (Dummy Traverse)
Added 1 - 1/16" U Button.
∞ Servo := 150

Run #172 Added 2 - 1/8" U Button, Took 1 - 1/16" off -
Now 13 - 1/8" U Buttons on.

	Rod Drive	SERVO Stim	Period (Sec)	Ratio	DC
A-1	7.40	360		- 1.002825 >	356
2	7.40	330		+ 1.017951	
B-1	6.86	330		+ 1.007798 >	340
2	6.86	356		- 1.012311	
C-1	6.32	330		+ 1.001749 >	330.84
2	6.32	340		- 1.019467	
D-1	5.76	316		- 1.006536 >	311.4
-2	5.76	393		+ 1.023726	
E-1	5.21	293		+ 1.011219 >	310.1
2	5.21	305		+ 1.003158	
F-1	466	300		- 1.033252 >	289.7
2	466	290		+ 1.011332	
G-1	411	290		+ 1.002476 >	284.8
-2	~~356~~ 411	280		+ 1.007270	
H-1	356	280		+ 1.005543 >	304.8
-2	356	300		+ 1.002995	

I 1	3.1	300	+1.005070	> 305.3
I 2		320	−1.014122	
J 1	2.445?	320	−1.001427	> 318.3
	2.445	~~325~~ 335	−1.014475	
K 1	1.9	335	+1.002278	> 339.3
	1.9	351	−1.006137	
L 1	1.36	351	+1.02944	> 370.4
		381	−1.015977	
M 1	81	381	+1.007500	> 397.8
		411	−1.005916	
N	26	411	+1.013386	> 426.5
		451	−1.021247	
O	13	451	+1.001392	> 454.8
		481	−1.009594	

Run

From graph

Source	Drive	Shim		
7.4	3.56			
7.14	345			
6.86	3.41			
6.32	330		1.36	370
5.76	316.5		.81	398
5.21	303.5		.26	427
4.66	290		.13	455
4.11	285			
3.56	~~305~~ 292			
3.01	305			
2.46	318			
1.9	339			

5.3
8.3
.3
.4
8
.5
1.8

SAFETY CHECK

DATE JUL 1 1971
TIME 0830 AM PM BY Taylor & Mihalazo

	A	B	C	D	E	F
CHANNEL						
RANGE	3×10^{-10}	OFF	2×10		900V	900V
SOURCE DIST.	3'	—	5'		6"	2"
% F.S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓		✓	✓
AUX. CIRS.	✓	✓	✓		✓	✓

SOURCES USED PuBe & Co60 MARKERS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #173 TRAVERSE THROUGH CENTER HOLE CH E

No U Buttons Al Shim Square edge of source moving N

2 min counts

	Source Drive	Shim Drive	BF_3-1	BF_3-2	BF_3-3	A
A	7.4	356	$61848 \times 2/3 = 41232$	$38927 \times 2/3$	$52583 \times 2/3$	
	$A = .63 \times 3 \times 10^{-10}$		40897	25998	35446	17031
	23		41102	25855	35003	
		cpm	20550	12969	17576	
B	7.4	345	54281	33806	46554	.85
			80790 2/3	50212 2/3	69296 2/3	
			54105	33754	46694	22357
			27025	16825	23221	

	So. Drive	Shim Drive	BF #1	#2	#3	Ch. A (3×10^{-10})
C	6.86	341	65436	40818	56470	1.05
	Ln: .00050		66220	40964	57212	
			66715	41723	57892	
			33061	20584	28596	
D	6.32	330	88271	55198	75562	1.33
			89257	55405	75766	
			88560	55131	76478	
			44348	27622	37968	
E	5.76	316^5	108565	67311	93484	1.65
	Ln: .00078		108287	67863	92622	
			109218	67662	92133	
			54345	33806	46376	
F	5.21	303^5	125213	77479	105940	1.87
			125207	76971	106143	
			125237	78466	105705	
			62443	38819	52965	
G	4.66	290	136439	85385	116531	2.05
			137024	85886	117308	
			137061	86076	117420	
			68421	42891	58543	

27414
36646
44841
51409
56818

H	4.11	285	142210	88483	120882	2.1
			142091	88764	120304	
			142456	88213	120648	
			71126	44243	60306	
I	3.56	292	140897	88323	120500	2.08
			141083	87668	119910	
			140792	87937	120352	
			70462	43988	60127	
J	3.01	305	133284	82979	113986	2.02
			133936	83179	113449	
			133477	82528	114285	
			66783	41448	56953	
K	2.46	318	120220	75436	102408	1.85
			120818	75568	103204	
			121087	75150	—	
			60354	37692	51403	
L	1.90	339	102514	63552	86926	1.53
			102277	63655	86758	
			102617	64005	86707	
			51235	31869	43399	
M	1.36	370	82784	51363	69838	1.27
			81960	50979	70184	
			82113	51354	69755	
			41143	25616	34963	

N	0.81	398	58070	36127	50115	0.85
			58372	36580	50299	
			59193	37182	51031	
			29272	18315	25241	
O	0.26	427	34388	21683	30047	0.52
			34454	21280	29574	
			34965	21899	29976	
			17301	10810	14933	
P	0.13	455	28587	17810	24916	
			28302	17408	24875	
			27845	17638	24776	
			28246	8809	12428	

Run # 174. Resistivity Check Center hole filled
Al shim away (removed)

(Rhoette "check" on a positive: Rhoette = +9.53 ¢
→ check only ← Lm = +10.2 ¢)

Rhoette	Log N	BF_3 #1	BF_3 #2	BF_3 #3	UMC
20C −19.13¢	102.1 −22.5	101.6 −25.6	104.2 −24.1	102.9 −25.0	100.3 26.9

DATE JUL 2 1971 **SAFETY CHECK**
TIME 1315 AM PM BY Taylor & Cross

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OOR	2×10^{-10}	≤	900V	900V
SOURCE DIST.	3'	—	5'	≤	6"	2"
% F. S. TRIP	100	—	—	≤	100	100
BLDG. ALARM	✓	✓	✓		Rhett OK	
AUX OTPS.	✓	✓	✓			

SOURCES USED ~~Pu Be & Co~~ MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #175. EVALUATE 2 detectors (He^3 & Cf DUMMY)
Counters in place, no buttons, & filled.

	TMC	Lv	BF3 #1	#2	#3	Rhett
sec	?	149.8	137.1	138.5	135.5	~~11.14~~ ¢
¢		-12.0	-13.83	-13.60	-14.10	-11.14

#176 Detectors down.

	TMC	Lv	BF3 #1	#2	#3	Rhett
sec	?	107.1	97.1	95.9	100.3	~~-18.70~~ ¢
¢		-22.50	-29	-30	-27.0	-18.70
				-28 ¢		

#177 Detectors up (He^3 & Cf C), no buttons, & filled, walk planks down.

Start LASL Data collection @ 16:25
(JTM Bk p.165) Down @ 21:14

Run #178 – Reactivity check on Run #175 less walk planks !!
up @ 21:20

	TMC	Log N	BF3 1	2	3	putter
Sec	139.97	140.1	140.7	139.4	138.97	~~11.37~~ ¢
¢	-13.37	13.21	-13.26	-13.45	-13.50	-11.37

Avg. -13.4 ¢

13.36

(dummy)

JUL 8 1971

DATE JUL 8 1971			SAFETY CHECK			
TIME 09:30 AM			BY Lynn & Mihalczo			
CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	opr	L10		900	900
SOURCE DIST.	2"	ok	5'		5"	✓
% F. S. TRIP	100	—	100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CH.	✓	✓	✓			
SOURCES USED	N & Y		MAGNETS		✓	
TABLES ✓	LIGHTS ✓		AREA CLEARED		✓	

Run #179 - Cont'd LASL Data Collection as per Run #177.
Data Collection Start 09:46
(JTM Bk p.174) Cf "C"

Run #180 - Cf "A" replacing Cf C.
LASL Data Collection. (JTM Bk p.)

Run #181 - Removed Center fuel plug.
Cf C back in use. (JTM Bk p.)
LASL Data Collection. start 14:02

Run #182 - Reactivity Check. As Run #175 & #178.
up 14:43

	Time	Log N	BF_3 1	2	3	Pitte
Sec	-14.4	-133.5	-138.1	-141	-138.4	—
Cents	-13.16	-14.45	-13.66	-13.21	-13.59	-11.28

AVG: -13.49 ¢

JUL 5 1971

DATE	JUL 5 1971			CHECK	
TIME	10:15 AM	BY	Lynn & Mihalczo		
CHANNEL	A	B	C	E	F
RANGE	3X10^10 opr	L-10		900	903
SCOPE DIST.	2" OK	5'		6"	OK
% F.S. TRIP	100	100		100+	
BLDG. ALARM	✓	✓	✓		
ACX BLDG.	✓	✓	✓		✓
SCALERS USED	N & Y				
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓

Installed guide sleeve for top drive to minimize the screw Wobble - Set top cut limit @ 3.91 on Selsyn.

Run # 183 - He^3 # of Dummy in place, & filled, 8-½" buttons, walk planks down.

SERVO SHim @ #93 ∞.

(52,593 ge)

LN = .0005
"C" = 5.0
"A" =

184 - Cf ≡ on.

Oscillating top.

LASL Data Collection, start 11:42

36 sec/count

72 sec/cycle. Do ~ 20 cycles. Wait 2 min.

Lost some power after 100+ Oscillations. Found that drive pin was partially sheared.

DATE JUL 6 1971 SAFETY CHECK

TIME 6PM BY

CHANNEL	A	B	C	D	E	F
RATIO	3x10⁻⁹	opr	L-10		900	904
	3"	✓	5'		2"	✓
	150	—	100		500	
	✓	✓	✓			
	N & Y					
TABLE						

Run #185 ~~T2 1/2~~ 1/2 - 1/8" Buttons + 1 - 1/16 For DC

VDT # 3-9 VDT # 4 - 1

	Rod Drive	Servo Shim	RATIO		D.C.
A1	740	550	+ 1.026383	>	603
A2		620	- -1.008527		
B1	714	560	? 1.286494		590
B2		610	- 1.01469	>	
B3		580	+ 1.017204		
C1	686	595	+ 1.254437	?	
C2		615	- 1.008794	> ?	
C3		642 [redacted]	- 1.010673		

D1	632	599	+1.002320	>	604.3
D2		614	−1.0042205		
F1	576	599	−1.013079	>	589.4
E2		580	+1.012951		
F1	521	580	−1.012946		557.9
		565	+1.004155		
DC G	466	565	−1.009972		554.5
		550	+1.004294		
I1	411	550	−1.012033		556.0
		565	+1.018032		
I	356	565	−1.006658		557.3
		549	+1.007132		
J	301	575	+1.001970		580.2
		563	+1.006514		
K	246	563	+1.017550		582.1
		590	−1.007240		

L 1	1.90	600	+1.008834	615
		630	−1.0085675	
M1	~~+.36~~ 1.36	630	+1.0060867	645.1
		660	−1.007911	
N 1	.89	660	−1.004228	631.7
		704	−1.00797	
O 1	.28	704	+1.013641	742
		745	−1.01038	
P 1	13	745	+1.008506	767
		791	−1.009354	

Run #186

	Source Drive	Shim	#1	#2	#3	A
A	7.4	6.03	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	
			42471	26028	35992	
			42752	26178	36162	16,348
			42606	26160	35797	
		CPM	21,305	13,061	17,999	
B	7.14	596	54417	34135	46,867	
			54,492	34,263	45,837	
			54,483	34,356	46,364	22,592
			27,232	17,124	23,210	
C	6.86	590	66,538	41421	56,248	
			67041	41118	56,449	
Ch "A"	8.5 @ 10×10^{-10}		67024	41569	55,695	33,395
			33,434	20688	28,065	
D	6.32	578	88,757	55,270	75,460	
			88,788	55,195	75,437	
Ch "A"	12 @ 10×10^{-10}		88,845	55,979	75,337	36,670
			44,565	27,741	37,706	
F	5.76	567	109,795	68,289	91,866	
			110,438	68,608	92,300	
Ch "A"	15.5 @ 10×10^{-10}		110,537	68,200	91,699	45,016
			55,128	34,183	45,978 ←	

	Source	Al Shim	Ch "A" (10×10^{-20})	#1	#2	#3
F	5.21	558	17.5	127,489	79,091	106,804
				125,320	78,436	105,875
				126,074	78,649	105,379
				63,147	39,363	53,038
G	4.66	555	19.2	138,440	84,997	116,268
				137,590	85,651	116,627
				137,407	85,197	115,805
				68,906	42,641	58,117
H	4.11	556	20.0	142,960	88,186	119,784
				144,156	89,551	121,214
				143,387	89,070	120,448
$\epsilon = 3.41$				71,781	44,635	60,241
I	3.56	560	20.0	143,157	88,507	119,528
				142,586	89,093	119,529
				142,480	88,224	120,561
				71,370	44,304	59,936
J	3.01	572	20.0	135,182	84,423	113,535
				135,237	84,371	114,028
				135,927	84,909	113,411
				67,724	42,284	56,829

	Source	Al shim	ch 'A' (10×10^{-0})	#1	#2	#3	
K	2.46	588		123,356	76,427	103,374	303,157
			19.8	123,355	76,865	103,361	
				122,009	76,408	104,013	302,430
				61,453	38,283	51,791	
L	1.9	612	18.5	105,590	65,072	89,506	
				105,627	65,562	89,327	
				106,189	65,294	89,021	433,534
				52901	32655	44642	
m	1.36	650	15.5	85005	52938	71922	
				84975	52687	71885	
				85205	52936	71334	349,396
				42531	26427	35858	
N	.81	680	12.4	62,046	38,831	52,780	
				62,022	38,516	52,176	
				61,706	38,849	52,436	255,520
				30,962	19,366	26,232	
O	.26	742	8.5	37,603	23,047	31,944	
				37,664	23,113	32,068	
				37,891	23,273	32,409	155,501
				18,860	11,572	16,070	

	Source	Shim	ch Ä'	#1	#2	#3
P	0.13	767	08.0	30,575	19017	26,129
				30,660	19,049	26,487
				30,322	19,000	26,190
				15259	9511	13134

DATE JUL 7 1971	CRITICALITY CHECK					
TIME 08 05 AM	BY Taylor & Mihalczo					
CHANNEL	A	B	C	D	E	F
RANGE	.3x10^{-10}	OPR	L10		900V	900V
SOURCE DIST.	3'	—	5'		2"	2"
% F.S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓	Rhoetto OK		
AUX. CHAN.	✓	✓	✓			
SOURCE USED	PuBe & Co^{60}				✓	
TABLES	✓		✓		✓	

Run #187 Up @ 0840 Taking LASL data
(See JTM Cf Log data book Pg 187)
@ 21450 hrs John compared a Cf "foil" to Cf ⓒ using a BF_3 ctr.
BF_3 #3 → Cf ⓒ = 9269 CPM; "foil" = 573 CPM

Run #188 Cont'd Run #187.
189 Removed ⊈ Plug. Cont'd.

Run #190 Down Put Cf Ⓐ on. & ⊈ Plug in.
Cont'd LASL Data Collection.

Run #191 Reactivity check. Dummy Cf.
Down 22:30

	TMC	Log N	BF_3 #1	#2	#3
Sec	-144.3		-148.5 sec	-147.2	145.9
¢	-12.71	-11.7	-12.2	-12.33	-12.51

SAFETY CHECK

DATE JUL 8 1971

TIME 0900 AM BY Taylor-Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	L-10	}	900V	900V
SOURCE CHK.	3'	—	5'	}	2"	2"
% F. S. ...	100	—	—	}	100	100
BLDG. ...	✓	✓	✓	Rhoetto OK		
AUX ...	✓	✓	✓		✓	

SOURCES USED PuBe & Cf   MAGNETS

TABLES ✓ ... ✓   AREA CLEARED ✓

Run #192 Sleeve guide on; 8 (1/8") buttons on & filled. Cf DUMMY & He³ det. up. Servo shim mt'd on South. Other drive is down. Al shim @ ≈ 390 selsyn: ∞ (≈ 2")

Run #193 Remove dummy & put up Cf c. Accum. data via LASL by oscillating TOP. ct time = ~36 sec; separation time = ~24 sec.

Run #194 Remove Cf c. Put up Dummy
$k > 1$, Shim @ 1000

Run #195 - Removed 1-1/8" U button.
k ∞, Al Shim @ 380

DATE JUL 12 1971 **SAFETY CHECK**

TIME 1300 AM BY Taylor & Lyons

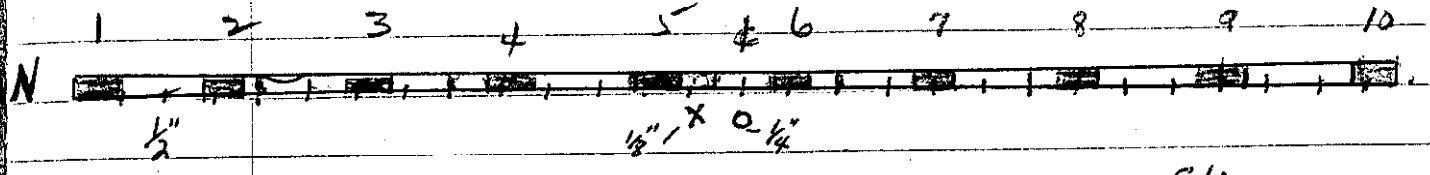
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	L-10	900V	900V	
SOURCE DIST.	2'	OK	5'	5"	OK	
% F. S. TRIP	100	—	100	100+	—	
BLDG. ALARM	✓	✓	✓	Rhoetto		
AUX CTRS.	✓	✓	✓			

SOURCES USED N + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 196

Foil Exposure — 235 U ¼" X .129" dia.



Time = 20 min Log N = .09 Shim @ 235

Down = 14:27 "C" = L-26 @ 45°

"A" = 10×10^{-8} @ 21

Foils Located as shown, Spaced ½" except per pos 5 & 6 which has spacing of ⅜", at ℄ running North & South.

12 - ⅛" U Button on.

Too Hot -

2×10^6 cts/min

JUL 13 1971

DATE JUL 13 1971	SAFETY CHECK					
TIME 13:45 AM/PM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	opr	L-10		900	900
SOURCE DIST.	30"	ok	5'		5"	ok
% F. S. TRIP	100		100		100+	—
BLDG. ALARM	✓	✓	✓			
AUX CHAN.	✓	✓	✓			
SOURCES USED	N & γ		MAGNETS			✓
TABLES ✓	LIGHTS ✓		AREA CLEARED			✓

Run# 197 - Reactivity Measurements
℄ hole open. 12 - ⅛" U Button on, with
Thermocouple under Top West button.
Al Shim 1140 (out)

$k < 1$

TMC	BF$_3$ #1		#2		#3
-136.1	14.0	-137.8	-13.7	-136.5	-14.1

-13.93¢

~~BP~~ Log N = -12.9¢

Run# 198 Same except ℄ hole now filled.

TMC	BF$_3$ #1		BF$_3$ #2		BF$_3$ #3	
	-581	-2.35¢	-584	-2.34¢	-612	-2.22¢

-2.30

Lin = -2.30¢

℄ pin = 11.63¢

Run #199 Now add 4 U buttons = 16 (1/8)" U buttons & still filled

Tmc	BF_3 #1	BF_3 #2	BF_3 #3	Temp C
¢	3.92	3.98	3.98	+25.5°

L_n = + 3.859

3.96 ¢

4 Buttons = 6.26 ¢

1 (1/8") = 1.565 ¢

Run #200. Remove the 4-1/8" U Buttons added above

Add 4-1/8" 55 buttons

L_N = +1.40 ¢

Tmc	BF_3 #1	#2	#3	25.2
¢	1.80 ¢	1.93	1.81	

1.81 ¢

4 55 (1/8) = 4.11 ¢

1 55 = 1.03 ¢

Run #201 Remove 55.

Add 4-1/8" Al Buttons

Tmc	BF_3 #1	#2	#3	25.0
3.93 ¢	0.50 ¢	0.59 ¢	+0.54 ¢	

L_n = + 0.50 ¢

0.54 ¢

4 Al = 2.84 ¢

1 Al = 0.71 ¢

3.22 ¢

2.30

1.63 ¢

The above values are for buttons only. Screws remained in place for Runs 200 & 201

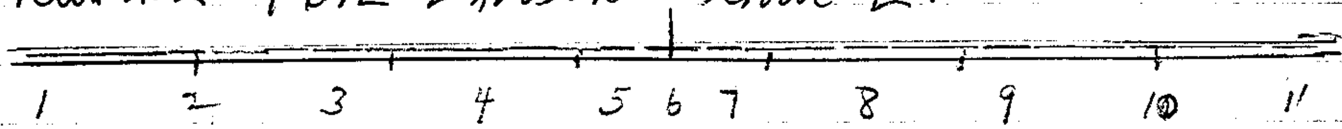
JUL 14 1971

DATE JUL 14 1971 **SAFETY CHECK**
TIME 10^30 AM **BY** Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3x10^-10	OPR	L-10	}	900V	900V
SOURCE DIST.	30"	OK	5'	}	5"	OK
% F. S. TRIP	100	—	—	{	100	100
BLDG. ALARM	✓	✓	✓			
AUX. [illegible]	✓	✓	✓			

SOURCES USED PuBe & Co60 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #202 FOIL EXPOSURE thru E.



"Too Hot" 10^6 cts/min

Time = 20 min
Down @ 11:36 A

Log N = .065
"C" = H-24 @ 50
"A" = 3x10^-8 @ 40

Foils = 1/4" Spacers = 1/2"
Foils symetrically placed leaving to" depressions at surfaces of sphere.

≃ 0900 hrs
Compared Cf A with new "brass ring Cf" from Kuehn. 14 Jul 71
BF3 ctr 5 min cts.

	@3"	@18"	Ratio X/A
So A →	10456	635	3" → 1.46
Brass Cf →	15136	878	18" → 1.60
Bkg →	233	233	—

SAFETY CHECK

DATE Jul 15 1971
TIME 10:00 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3x10^-10	opr.	L-10		900	900
SOURCE DIST.	30"	ok	5'		5"	ok
% F. S. TRIP	100	—	100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N # 8 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 203 Reactivity measurements —
Base $k < 1$.
12 - 1/8" Buttons with screws for 4 other buttons.

	TMC	Log N	BF3 #1	#2	#3	Temp. C
Sec	-528	-429	-599.3		-584.2	25.9°
¢	-2.60	-3.26 ¢	2.27		-2.33	

Run # 204 Added 4 (1/8" U) buttons (no screws).

	TMC	Log N	BF3 #1	#2	#3	Temp. C
Sec	+278	+297	+275.7	—	+277.5	
¢	+4.08	3.84	4.11	—	4.08	25.8°

Run # 205 Base

	TMC	Log N	BF3 #1	#2	#3	Temp. C
Sec	-702	-685	-661.9	—	-659.2	
¢	-1.92	-1.97	-2.04	—	-2.05	25.8°

Kuehn X/A

Run # 206 4 U (1/8") on.

	TMC	Log N	BF3 #1	#2	#3	Temp. C
Sec	+306	+305	+301.7		+301.7	25.2°
¢	+3.74	3.75	3.79		3.79	

Run #207 Base Run -

	TMC	Log N	BF3 #1	#2	#3	Temp
Run #207	BASE			-		
Sec	-657	-674	-644.9	-	-641.0	25.1
¢	-2.06	-2.00	-2.10	-	-2.11	
Run #208	4 u (1/8") on					
Sec	+292	+269	+266.3	-	+265.2	25.0
¢	3.90	+4.20	4.24	—	4.26	
Run #209	Base Run					
Sec	-730	-728	-674.9	-	-687.9	25.0
¢	-1.66	-1.67	-1.79	-	-1.76	
Run #210	4 u (1/8") on					
Sec	+275	+286	+273.6	-	273.6	24.8
¢	+4.11	3.98	4.14	-	4.14	
Run #211	Base					
Sec	-672	-648	-660.5	-	667.1	24.6
¢	-2.01	-2.09	-2.05	-	-2.02	
Run #212	4 u (1/8") on					24.8
	+274	+262	266.3		265.8	
	+4.13	+4.30	4.24		4.25	

DATE JUL 16 1971 SAFETY CHECK
TIME 1000 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3 x10^{-10}	OPR	L-10	900V	900V	
SOURCE DIST.	20"	OK	5'	6"	OK	
% F. S. TRIP	100	"	"	100	100	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe + Co^{60} MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 213 — Foil Exposure —
Loaded as page 128.

Time = 15 min
Down @ 10:38
At Shim = 175

Log N = .025
"C" = H-17 @ 78
"A" = 1X10^{-8} @ 43

1500 HRS Compared Cf A with new 16 July 71 Cf source from Kuehne brass

BF$_3$ cts, 5 min	@ 3"	@ 18"	Ratio A
Cf So. A	10452	633	3" → 22.24 ←
New Cf	226936	9661	18" → 25.20
Bkg	260	760	

DATE JUL 19 1971	SAFETY CHECK					
TIME 11:00 AM BY Taylor & Lynn						
CHANNEL	A	B	C	D	E	F
RANGE	.3 x 10^-10	OPR	h-10		900V	900V
SOURCE DIST.	20"	ok	5'		6"	ok
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED PuBe & Co60	MAGNETS ✓					
TABLES —	LIGHTS —	AREA CLEARED ✓				

Run # 214 – Foil Exposure –
Loaded as page 128.

Time = 15 min — Log N = .01
Down @ 11:30 — "C" = H-15 @ 44
Al Shim = 175 — "A" = .3 x 10^{-8} @ .16 Chart 54

Run # 215 – Foil Exposure – Loaded Same
Time = 12 min — Log N = .01
Down @ 14:19 — "C" = H-15 @ 44
Al Shim = 180 — "A" = .3 x 10^{-8} @ .16 chart 55

7 Kuehne 1030 hrs Compared Cf A with "19 July S.S. Cf plated source"

BF_3 cts, 5 min	@ 3"	@ 18"	Ratio X/A
Cf So A	10126	593	3" → 4.85
New 19 July S.S. Cf	48192	2210	18" → 5.49
Bkg	233	233	

DATE JUL 20 1971 SAFETY CHECK
TIME 08:30 AM BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OOR	L-10		900V	900V
SOURCE POS.	24"	OK	5'		6"	OK
% P. S.	100		100		100+	
ELEV.	✓	✓	✓			
AUX CHS.	✓	✓	✓			
SOURCES USED	N ≠ σ					✓
TABLES	✓	LIGHTS ✓		AREA CLEARED		✓

RUN #216 – REACTIVITY MEASUREMENTS – (BASE)
& pin out.; 16-⅛" U Buttons on.

	TMC	Log N	BF3 #1	#2	#3	Temp.
Sec	-214	-229	-216	-215	-214	25.9°
ℓ	-7.36	-6.76	-7.28	-7.32	-7.36	

Run # 217 ADD & ^{235}U Pin

Sec	+291	+286	+282.7	+280.1	+278.7	25.5
ℓ	+3.92	3.98	4.02	4.05	4.07	
	11.28	10.74	11.30	11.37	11.43	⟨11.224⟩

Run # 218 BASE

Sec	-220	-231	-224.1	-221.5	-221.8	25.4
ℓ	-7.11	-6.69	-6.91	-7.05	-7.03	

Run # 219 + & ^{235}U Pin

Sec	+290	+284	+272.3	+267.1	+281.4	25.3
ℓ	+3.93	+4.01	+4.16	+4.23	+4.03	
	11.04	10.70	11.07	11.28	11.06	⟨11.030⟩

		TMC	LogN	BF_3 #1	#2	#3	Temp
	Run #220	BASE					
	Sec	-229	-223	-209.8	-212.4	-229.3	25.1
	¢	-6.76	-6.99	-7.55	-7.43	-6.75	
	Run #221	+ ¢ ^{235}U Pin					
	Sec	+280	+287	+286.6	+289.2	+278.8	24.9
	¢	+4.05	+3.96	3.97	3.94	+4.07	
		10.81	10.95	11.32	11.37	10.82	<11.054>
)SE)							
	Run #222	Base —					
Temp:							
25.9°	Sec	-215	-214	-207.2	-206.5	-209.1	25.0
	¢	-7.32	-7.36	-7.68	-7.70	-7.58	
	Run #223	+ ¢ ^{235}U Pin					
25.5	Sec	+261	+272	+267.9	+274.1	+271.2	25.0
	¢	+4.32	+4.16	+4.22	+4.13	+4.17	
<11.224>		11.64	11.52	11.90	11.83	11.75	<11.728>
25.4	Run #224	Base					
	Sec	-224	-235	-222.8	-218.6	-217.6	25.0
	¢	-6.95	-6.55	~~-6.~~ 7.00	-7.17	-7.20	
25.3	Run #225	+ ¢ ^{235}U Pin					
<11.030>	Sec	+263	+284	+271.5	+273.6	+273.1	25.0
	¢	+4.29	+4.01	4.16	+4.14	+4.15	<11.124>
		11.24	10.36	11.16	11.31	11.32	

Run #226 Removed all (16) U Buttons only.
Screws for buttons left in place -

	Tmc	Log N	BF3 #1	#2	#3
See	-107.2	-109	-100.97	-100,97	-102,7
	-22.57	-21.67	-20.59	-26.59	-25.30
	-22.42	-21.54			

← Button Screws Removed.

Run #227	-101,0	-103.8	-100.3	-97.45	-97.7
	-26.5	-24.56			
	-26.36	-24.42	-27.14	-29.84	-29.57
	3.94	2.88			
	7,				
	4.00	2.89	.55	3.25	4.27

.187
.134

DATE JUL 21 1971 SAFETY CHECK

TIME 09-40 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	DIR	L-10		900V	900V
SOURCE DIST.						
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓	Rhett 10 C		
AUX CTRS.	✓	✓	✓			

SOURCES USED _____ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #228 — 2 - ⅛" U Buttons on.

	TMC	Log N	BG 1	#2	#3	Pette
Sec	-113.2	-111.3	-113.6	-110.3	-111.5	—
¢	-19.76	-20.52	-19.70	-20.95	-20.44	-14.92

Run #229 — 4 - ⅛" U Buttons on.

Sec	-122.1	-125.5	-123.5	-124.2	-122.5
¢	-16.72	-16.11	-16.60	-16.42	-16.85

Run # 230 — 0 Buttons (clean critical)

Sec	-100.15	-104.2	-102.1	-97.98	-97.45
¢	-27.04	-24.13	-25.54	—	—

Run # 231 — 8 Buttons on.

Sec	-184.1	-184.6	-181.4	-179.3	-179.3
¢	-8.90	-8.92	-9.14	-9.28	-9.28

Run #232 - Added 8 Screws (Buttons).

	Tmc	Log N	Bf3 1	#2	#3
Rec	-199.3	-194.0	-191.8	-192.8	-192.8
∅	-8.07	-8.36	-8.48	-8.42	-8.42

Run #233 - Add 4 buttons. (Now 12 with Screws + 4 Screws)

-722	-700	-690.5	-630.6	-651.4
-1.86	-1.93	-1.95	-2.15	-2.08

Removed the 4 screws only.

Run #234

-577	-552	-562.8	-552.4	-560.2
-2.36	-2.48	-2.43	-2.48	-2.44
.50	.65	.42	.63	.52

(134)

Run #235 -16 - 1/8" Buttons on -

+283.4	+305.4	+273.6	+282.7	+282.7
+4.01	+3.75	+4.14	+4.02	4.02

Bldg Alarm meter noticed to be Nervous.

DATE JUL 22 1971 **SAFETY CHECK**

TIME 09:00 AM ~~PM~~ BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	3X10'0	off	L10		900	900
SOURCE DIST.	24"	OK	5'		6"	OK
% F. S. TRIP	L00		102		L00+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED ✓ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

4 Screws

Run # -236 - 12-⅛" U Button. Base

	TMC	Log N	Ets #1	# 2	# 3	Temp.
Sec.	-481	-445	-485	-463	-477	24.8
¢	-2.88	-3.14	-2.85	-3.00	-2.91	

Run #237 + 4 al buttons ≠ screws.

Sec. -27740 — +160000 24.9

¢ ≏ ∞ ∞

Run #238 BASE (13 (⅛" U Buttons)

Sec	-1371	-1082	-1281	-1325	-1333	25.0
¢	-0.955	-1.22	-1.026	-0.99	-1.00	

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	TMC	LOG N	BF_3 #1	#2	#3	TEMP
Run #239 - add 3 - 1/8" Al Buttons						
Sec	+1085	960	+1082	+1065	+1030	25.0
±	1.13	+1.28	+1.14	+1.16	+1.19	
Run #240 ~~Base (rep run #238)~~ as you were Repeat Run #239						
13:00 Sec	+1192	+1264	+1264	+1281	+1212	24.8
±	+1.04	+0.98	+0.98	+1.05	+1.02	
Run #241 Base						
Sec	-1408	-1362	-1508	-1436	-1468	24.8
±	-0.93	-0.96	-0.86	-0.91	-0.88	
Run #242 Base (repeat)						
Sec	—	-1194	-1532	-1567	-1532	24.7
±	—	-1.10	-0.85	-0.83	-0.85	
Run #243 add 3 al						
Sec	+1054	+1295	+1089	+996	+978	24.8
±	+1.17	+0.96	+1.13	+1.24	+1.26	
Run #244 3 al (repeat)						24.7
Sec	+1026	+945	+996	+996	+952	
±	+1.19	+1.29	+1.24	+1.24	+1.29	

TEMP

Run #245 Base

25.0	Sec	-1406	-1352	-1435	-1437	-1411	24.8
	ϕ	-0.93	0.97	-0.91	-0.91	-0.93	

#239

24.8

24.8

24.7

24.8

24.7

DATE JUL 23 1971 SAFETY CHECK
TIME 10:15 BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	~~.03~~	L-10		900	900
SOURCE DIST.	8"	~~ok~~	3'		6"	ok
% F. S. TRIP	100		100		100+	
ELECT. ALARM	✓	✓	✓			
AUX CTRL.	✓	✓	✓			

SOURCES USED Co 60 (#18) BADGES ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

N & S

Run # 246 – Foil @ ℄. 12 - 1/8" Buttons.
27 – 1/4" Foils loaded as shown.

N 1A, 1, 2, 2A, 3, 4, 3A, 5, 6, 4A, 7, 8, 5A, 6A, 7A, 9, 10, 8A, 11, 12, 9A, 13, 14, 10A, 15, 16, 11A

Time = 15 min
Down @ 10:52
Al Shim = 185

Log N = .01
"C" = H-14 @ 61
"A" = $.3 \times 10^{-8}$ @ .17
Chan 60

SAFETY CHECK

DATE JUL 27 1971 TIME 0900 AM BY JRT & JVL

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OR	6^{-10}		900V	900V
SOURCE DIST.	8"	OR	30"		6"	OK
% F. S. DEP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓	Rhoite	OK	
AUX CTRS.	✓	✓	✓			

SOURCES USED ~~Cs137~~ Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 247 – Reactivity Measurements MA

Top Socket out – 13-⅛" and 1-$\frac{1}{16}_A$" Buttons on.

3-⅛" U Buttons in socket hole.

Al shim = 25

	TMC	LogN	Bt₃ #1	#2	#3	Temp.
#247A						
Sec	+571	+541	–	–	–	25.6°
ϕ	+2.10	+221	–	–	–	
#248B	-261	-257	–	–	–	
ϕ	-5.77 (7.87)	-587 (8.08)	–		–	25.5
#248A	+601	+613	+558	+581	+588	
	+2.03	+1.97	+2.15	+2.07	+2.05	25.5
#248B	-259	-275	-265	-260	-259	
	-582 (7.85)	-5.42	-5.66	-5.79	-5.82	25.5
#249A	+580	+613	+607	+581	+618	25.4
	+2.07	+1.97	+1.99	+2.07	+1.95	

144

	rma	hν	BF_3 1	2	3	°C
#249 B	-260	-260	-252	-250	-251	25.0
	-5.79	-5.79	-6.01	-6.06	-6.05	
#250A	+623	+623	+582	+584	+580	25.3
	+1.99	+1.99	+2.07	+2.06	+2.07	
#250B	-261	-260	—	—	—	25.1
	-5.77	-5.79	—	—	—	
#251 A	+605	+580	+589	+567	+592	25.1
	+1.99	+2.07	+2.04	+2.12	+2.03	
#251 B	-259	-266	-258	-254	-256	24.9
	-5.82	-5.64	-5.85	-5.96	-5.90	

2

JUL 26 1971

°C

JUL 26 1971

DATE JUL 28 1971 SAFETY CHECK

TIME 08:30 BY Taylor & Lynn

	A	B	C	D	E	F
	$.3 \times 10^{-10}$	Opr	L-10		900	900
25.3	24"	Opr	5'		6"	OK
	100		100		100	
	✓	✓	✓			
	✓	✓	✓			

SCANNER DOOR N 9 8 MARKERS ✓

TAPES ✓ LIGHTS ✓ AREA CLEARED ✓

25.1

Run # 253 - 15- 1/8" Al Buttons on.

3-1/8" Al Buttons in Socket Hole

25.1 Al Shim @ .075

A	Tmc	Log v	Bg 1	2	3	Temp
	-600	-564	-614	-605	-615	25.4
24.9	-2.27	-242	-2.21	-2.25	-2.21	
B	-269	-274	-276	-278	-271	25.5
	-5.56	-5.44	-5.40	-5.35	-5.51	
253 A	-588	-501	-589	-591	-602	25.3
	-2.32	-2.75	-2.31	-2.31	-2.61	
B	-272	-270	-276	-264	-264	25.4
	-5.49	-5.38	-5.40	-5.69	-5.69	

254 A	Tmc	log N	BF_3 1	2	3	Temp
Sec	-569	-575	-555	-555	-584	25.0
+	-2.40	-2.38	-2.47	-2.47	-2.34	
B	-272	-268	~~-287~~	-270	-270	25.0
	-5.49	-5.59	-5.15	-5.53	-5.53	
255 A	-576	-550	—	-542	-540	25.3
	-2.37	-2.49	—	-2.53	-2.54	
B	-260	-265	—	-270	-264	25.5
	-5.79	-5.66	—	-5.53	-5.68	
256 A	-573	-573	-	-547	-573	25.2
	-2.38	-2.38	—	-2.51	-2.38	
B	-274	-275	~	-276	-266	25.0
✓	-5.44	-5.42	—	-5.40	-5.63	

Avg = -5.47 +

JUL 30 1971

DATE JUL 30 1971 SAFETY CHECK

TIME 09:00 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{10} opr L-10				900	900
SOURCE DIST.	3'	ok	5'		6"	ok
% F. S. TRIP	100	=	100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N # 8 SHUTTERS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Temp

25.0

25.0

25.3

16 - 1/8" U Buttons on

25.5 3 - 1/8" SS Button in Socket Hole.

At Shot @ 09

	Run 257A	Tmc	Log N	BF3 1	2	3	Temp
	Sec	+338	+346	+347	+344	+341	25.0
25.2	ϕ	+ 3,42	+ 3,35	+ 3,34	+ 3,36	+ 3,39	

Avg = + 3,37

25.0	257B	-964	-858	- 900	- 844	- 961	25.0
		-1.28	-1.56	-1.48	-1.58	- 1.38	
		4,70					

Avg = -1.46 + Worth = 4.83 +

	258A	+369	+391	+352	+358	+357	24.9
		+3.15	+2.99	+3.30	+3.25	+3.25	

Avg = 3,19

	258B	-925	- 800	-944	- 952	-944	25.0
		- 1.44	- 1.67	- 1.41	- 1.40	- 1.41	

Avg = - 1.47 + Worth = +4.68 +

148

12:45

Run 259 A	Time	Log μ	BF_3 1	2	3	Temp.
Seconds	+350	+302	+362 ~~-364~~	+360	+365	25.0
cents	+3.31	+3.79	+3.21	+3.23	+3.19	

Avg = 3.35 ¢

259 B	-717	-870	-889	-902	-960	25.0
	-1.88	-1.52	-1.50	-1.47	-1.38	

Avg = -1.55 ¢

worth = 4.90 ¢

260 A	+370	+371	+365	+365	+367	24.9
	+3.15	+3.14	+3.18	+3.18	+3.17	

Avg = +3.16 ¢

260 B	-921	-702	-937	-943	-982	24.8
	-1.44	-1.92	-1.42	-1.41	-1.35	

Avg = -1.51 ¢ worth = +4.67 ¢

261 A	+368	+363	+353	+365	+371	24.8
	+3.16	+3.20	3.29	+3.18	+3.14	

Avg = +3.19 ¢

261 B	-986	-931	-1010	-928	-983	24.7
	-1.35	-1.42	-1.30	-1.43	-1.35	

Avg = -1.37 ¢ Worth = 4.56 ¢

B repeat at lower level .00021 → .00016

-941 sec → -1.41 cent

Avg worth 4.73 ¢

B repeat at still lower level .00105 → .0008

-979 sec → -1.36 cent

DATE AUG 2 1971 **SAFETY CHECK**

TIME 12:40 PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3 x 10^{-10}	OPR	L-10		900V	900V
SOURCE DIST.	30"	OK	5'		5"	OK
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 262 — Foils @ ℄. Center rotated so that foils are now east to west.

12 - 1/8" U Buttons on.

E 1A - 2A - 3A ^ ~~12,13~~ 4A ^ ~~14,15~~ 5A, 6A, 7A, ^15,14 8A - 9A (13,12) - 10A - 11A.

(6, 5, 4, 3, 2, 1 below)

15 - 1/4" foils as shown.

Time = 15 min
Down @ 13:12
Al shim = 200

Log N = .0175
"C" = H-18 @ 43
"A" = 3↑ @ 1 x 10^{-8}

DATE AUG 3 1971	SAFETY CHECK					
TIME 12:55	Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	.3 X10^-10	opr	L-10		900	900
SOURCE DIST.	30"	ok	5'		6"	ok
% F. S. TRIP	100	—	100		100+	—
ELEC. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED	N & S		OTHERS	✓		
TABLES ✓	LIGHTS ✓		AREA CLEARED ✓			

Run # 263 — Foils @ ℄. 12 - 1/8" Buttons on - 15 - 1/4" foils as shown -

1 - 2 - 3, ~~13,14~~ 12,13, 4, 14, 15, 5, 6, 7 - 8 - 9 - 10 - 11

Time = 15 min — Log N = .0175

Down @ 13:24 — "C" = H-16 @ 75

Al Shim = 200 — "A" = 1×10^{-8} @ 35

AUG 5 1971

SAFETY CHECK						
DATE AUG 5 1971						
TIME 0930 AM BY Taylor & Lynn						
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	L-10		900V	900V
SOURCE EFF.	24"	OK	OK		6"	OK
% F.S.	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX	✓	✓	✓			
SOURCES PuBe & Co^{60}				✓		
TABLES ✓		✓		AREA CLEARED ✓		

Run # 264 - Base Run For day to day reactivity check -
13 - 1/8" Buttons on. T.C. under one.
Al Shim Completely removed.

	TMC	Log N	BF_3 1	2	3	Temp. °C
sec	-1010	-989	-987	-1004	-1065	25.5°
¢	-1.32¢	-1.34	-1.34	-1.32	-1.24	

Avg = -1.31 ¢

Run # 265 - Added - Support structures -
a. Bottom b. Top c. 4 upright post
d. 4 hangers for center section.

	TMC	Log N	BF_3 1	2	3	Temp.
sec	+63.6	+64.5	+63.2	+62.8	+64.4	25.5°
¢	+13.54	+13.40	+13.60	+13.66	+13.42	

Avg = +13.52
Supports = +14.83 ¢

Run #266 – Repeat Run #265.

14:38

sec	+64.8	+64.2	66.4	65.1	65.1	24.5°
¢	+13.36	13.45	13.13	13.31	13.31	

Avg = +13.31 ¢

Run #267 – Repeat Run #264.

sec	-1055	-956	-823	-900	-961	24.5°
¢	-1.25	-1.39	-1.63	-1.48	-1.38	

Avg = -1.43 ¢

Supports = +14.74 ¢

ity

ne

Temp. °C

25.5°

Temp.

25.5°

DATE AUG 6 1971 SAFETY CHECK

TIME 0915 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3x10^-10	OPR	L-10	}	900V	900V
SOURCE DIST.	24"	OK	5'	}	6"	OK
% F. S. TRIP	100	–	–		100	100
BLDG. ALARM	✓	✓	✓			≠100+
AUX CIRC.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

FAX: (230ma)
magnet drop @ 95
high sens. trip -100
Low sens. trip = 100+

Magnet "drops" at 55 milliamperes. Operating @ 230 ma

Run# 268 – Repeat Run# 264.

	TMC	Log N	BF3 1	2	3	Temp.
Sec	-1153	-982	-1048	-996	-1126	24.5°
cents	-1.15	-1.30	-1.26	1.33	1.17	

avg -1.25±

30ma)
95
=100
=100+

AUG 9 1971

DATE AUG 9 1971 SAFETY CHECK
TIME 10:25 BY Taylor & Lynn
F
.3X10^-10 opr L-10 } 900 X 900 Y
24' off 5' } 6" op
100 100 100 100
✓ ✓ ✓
✓ ✓ ✓
N & γ ✓
TABLES ✓ ✓ ✓

230 ma

Run # 269 - Repeat Run # 264.

	TMC	Log N	BF3 1	2	3	Temp
sec	-953	-1003	-978	-970	-1056	24.7°
cents	-1.39	-1.32	-1.35	-1.36	-1.27	

Avg = -1.34 ¢

Temp. 24.5°

Run # 270 - ℄ foil exposure E to W
12 - 1/8" U buttons on.

E 1A - 2A - 3A - 4A - 5A, 6A, 7A - 8A - 9A, 12A, 13A, 10A, 14A, 15A, 11A

Time = 15 min Log N = .019
Down = 13:35 "C" = H-18 @ 42
Al Shim - 185 "A" = 1X10^8 @ 32

DATE AUG 10 1971 SAFETY CHECK

TIME 13 15 AM PM BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	6-10		900V	900V
SOURCE DIST.	24"	✓	5'		6"	2"
% F. S. TRIP	100	-	-		100	100
BLDG. ALARM	✓	✓	✓			
AUX CHAN.	✓	✓	✓			

SOURCES USED Rubee & Co 60 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED -

Run #271 & foil exposure (E&W)

1, 12, 13, 2, 14, 15, 3, 4, 5, 6, 7, 8, 9, 10, 11 West

Time = 15 min
Down = 13:45
Al Shim = 190

Log N = .018
"C" = 42 @ H-17
"A" = 34 @ 1×10^{8}

Run #272 Repeat Run #264.

	TMC	Log N	BF_3 1	2	3	°C Temp
Sec.	-936	-881	-975	-953	-962	25°
Cents	-1.42	-1.51	-1.36	-1.40	-1.38	

SAFETY CHECK

TIME 09:40 BY Taylor & Lynn

	$.3 \times 10^{10}$ opr L-10	Good Good ✓
	24" OK 5'	6" OK
	100 100	100+ 100
	✓ ✓ ✓	
	✓ ✓ ✓	
	PuBe # C60(#18)	✓
	✓ ✓	✓

Run #277 Repeat Run #264.

.0045 → .0025

	TMC	Log N	BF_3 1	2	3	Temp.
Sec	-881	-947	-1004	-970	-1004	25.0°
Cents	-1.51	-1.40	-1.32	-1.37	-1.32	

.0020 → .00095

Sec	-1006	-955	-926	-883	-944	25.0
Cents	-1.32	-1.39	-1.43	-1.51	-1.41	

°C
Temp
25°

Run # 274 – Polyethylene Wall as Run #145 p.84
except located on East side of Sphere.

	TMC	Log N	BF_3 #1	2	3	Temp °C
Sec	-1799	-1519	-1818	-1827	-1879	24.9
Cents	-0.72	-0.86	-0.71	-0.71	-0.69	

Run #275 Base (and Repeat of #264)

Sec	-1073	-1021	-1104 ~~-975~~	-1009	-975	24.6
	-1.23	-1.30	-1.32	-1.31	-1.36	

AUG 13 1971 Compare Cf^A with new Cf (χ this date)
BF_3 #3 ; 5 min cts

Cf^A @3"	Cf^A @18"	Cf$^\chi$ @3"	Cf$^\chi$ 18"	Bkg	3" Cf$^\chi$/Cf^A	18" Cf$^\chi$/Cf^A
8465	672	12766	925	(3" 222 / 18" 229)	1.52	1.56

Too weak, need a factor of 5 (not 1.5)
Took source back for weekend plating. [signature]

AUG 16 1971 – After additional plating.

8444	—	16196	—	231	1.94	—

→ Need more – back to Isotopes – [initials]

Sphere.

DATE	AUG 17 1971	SAFETY CHECK				
TIME	13:35 PM	BY Taylor & Lynn				
CHANNEL	A	B	C	D	E	F
RANGE	.3x10⁻¹⁰	opr	L-10		900	900
SOURCE DIST.	2'	ok	5'		6"	ok
% F. S. TRIP	100	—	100		100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED	N & Y		MAGNETS ✓			
TABLES ✓	LIGHTS ✓		AREA CLEARED ✓			

Temp°C

24.9

Run# 276 — ℄ foil exposure. (E to W)

1A – 2A – 3A – 4A, 12A, 13A, 5A, 6A, 7A, 14A, 15A, 8A – 9A – 10A – 11A.

24.6 Time = 15 min Log N = .0188

Down = 14:11 "C" = 46 @ H-18

Al shim = 165 "A" = 34 @ 1×10^{-8}

Compare Cf^A with Cf^X (ref. 16 Aug 71)

AUG 18 1971 BF₃, 5 MIN CTS

18" Cf^X/Cf^A	Cf^A @ 3"	Cf^X @ 3"	Bkg	Cf^X @ 3"/Cf^A
1.56	8555	28992	206	3.45

(1.5) DJ

Took it back for "more". JAT

—— JAT

160

SAFETY CHECK						
DATE AUG 19 1971						
TIME 0840 AM PM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	per	1×10		900v	900v
SOURCE DIST.	2'	ok	5'		6"	ok
% F. S. TRIP	100				100	100
BLDG. ALARM	✓	*	✓			
AUX CHS.	✓	✓	✓			
SOURCES USED Ra Be & Co60				MARKERS ✓		
TABLES ✓	LIGHTS ✓		AREA CLEARED ✓			

* Amber light on arbitrarily. "Jup" check OK.

Run # 277 - Repeat Run # 264. Support structure walk

	Tmc	Log N	BF_3 1	2	3	Temp
sec	-1082	-881	-894	-917	-1005	24.8°C
¢	-1.22	-1.56	-1.49	-1.45	-1.31	

Run # 278 Added Support Structures.

sec	+59.34	+59.37	+57.93	+57.30	+59.60	24.8
¢	+14.23	+14.22	+14.46	+14.57	+14.18	

Run # 279 Repeat Run # 278.

1:3:15	+60.18	+58.26	+59.2	+60.4	+60.1	24.7
¢	+14.17	+14.41	+14.25	+14.05	+14.10	

Run #280 Repeat #264

	TMC	Lot N	BF3 #1	2	3	°C
ghton	-846	-889	-899	-853	-926	25.0
ity.	-1.57	1.70	-1.48	-1.56	-1.43	
kOK.						

TEMP

24.8°C

24.8

24.7

SAFETY CHECK						
DATE AUG 20 1971						
TIME 08:55 AM PM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{10}$ cps		1-10		900	700
SOURCE DIST.	2'	bk	5'		6"	ek
% R. S.	100		100		100+	—
BLDG.	✓	✓	✓			
AUX CHS.	✓	✓	✓			
SOURCES USED	N & 8			LIGHTS	✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

Run #281 — Bare Sphere reactivity determination.
16 - 1/8" U buttons on.

	TMC	LOGN	BF_3 #1	#2	#3
SEC	+337	+333	+315	+311	+313
¢	+3.43	+3.48	+3.64	+3.69	+3.67

Run #282 Remove 2 $^{235}(U)$ buttons (and screws) = 14.

SEC	+2900	+4700	+3107	+3029	+2700
¢	0.43	0.27	0.40	0.41	0.47

Run #283 12 ^{235}U buttons on.

SEC	-477	-485	-511	-474	-531
¢	-2.91	-2.85	-2.70	-2.93	-2.59

Run #284 10

						Rhoitte
Sec	-256	-249	-263.8	-247.9	-253	—
¢	-5.90	-6.10	-5.69	-6.13	-5.99	-2.94

	TMK	LOGN	BF$_3$ # 1	2	3	Shaft
Run # 285	8					
SEC	-175	-190	-178.8	-177.2	-178.9	—
+	-9.60	-8.59	-9.32	-9.43	-9.31	—

(REF. 18 aug 71)

AUG 20 1971

Compare 20 aug 71 Cf: with our Cf:

Cf$^A_3$"	Cf$^A_{18}$"	Cf$^r_3$"	Cf$^r_{18}$"	Bkg	r/A 3"	r/A 18"
9208	653	44563	2768	223	4.93	5.92

BF$_3$ - 5MIN. CTS.

OK - Took to ZEDLER for preparation of shipment to Johns - Jack

DATE AUG 23 1971 SAFETY CHECK
TIME 0830 AM PM BY Taylor & Reedy

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OFF	2-10	900V	900V	
SOURCE DIST.	21	OK	5'	6"	OK	
% F. S. TRIP	100	—	—	100	100	
BLDG. ALARM	✓	✓	✓	Rhetta OK.		
AUX CHAN.	✓	✓	✓			

SOURCES USED Pu Be ~~#~~ Co60 MARKERS ✓
TABLES — LIGHTS — AREA CLEARED —

Run #286 Repeat run # 285
8 235 U Button on surface

	TMC	Log N	BF3 #1	2	3	Rhetto
Sec	-183.6	-185.0	-179.9	-179.1	-179.9	—
¢	-9.00	-8.90	-9.24	-9.31	-9.24	-7.23
					-9.26	

Run # 287 6

Sec	-144.9	-146.0	-143.7	-143.1	-145.3	—
¢	-12.64	-12.50	-12.80	-12.92	-12.60	-9.65
					-12.77	

Run # 288 4

Sec	-122.6	-126.0	-124.7	-123.9	-124.4	—
¢	-16.84	-15.99	-16.26	-16.48	-16.36	-12.45
					-16.37	

	ITMC	LOG N	BT-3 #1	2	3	Rhoett
Run #289	2					
Sec	-108.0	-110.0	-112.2	-110.6	-111.2	—
¢	-22.02	-2609	-20.16	-20.81	-20.57	-15.40
					-20.51	
Run #290	1					
Sec	-103.2	-107.8	-105.2	-107.1	-107.0	—
¢	-24.76	-22.12	-23.53	-22.48	-22.53	-16.83
					-22.85	
Run #291	0	Bare Sphere				
Sec	-98.3	-106.5	-105.4	-99.0	-100.7	—
¢		-22.80	-23.42		-26.60	-18.23
					-25.11	

SEP 8 1971

DATE	SEP 8 1971				
TIME	13:10			Taylor & Lynn	
RANGE	$.3 \times 10^{-10}$	opr	L-10	900	900
	8"	ok	2'	6"	ok
	10		100	100^T	
	✓	✓	✓		
	✓	—	✓		
SOURCE	Co60 #18				
TABLES	✓	✓		✓	✓

Run #292 Ea Foil Exposure. Poly Wall 67" east of sphere.
27 - ¼" X .129" foils.

E 1A, 1, 2, 2A, 3, 4, 3A, 5, 6, 4A, 7, 8, 5A, 6A, 7A, 9, 10, 8A, 12, 13, 9A, 14, 15, 10A, 11A,
12A, 13A,

Time = 15 min
Down = 13:41
Al shim = 140

Log N = .02
"C" = H·17 @ 57
"A" = 1×10^{-8} @ 34

DATE SEP 14 1971 SAFETY CHECK

TIME 13^10 AM PM BY Taylor & Lyman

CHANNEL	A	B	C	D	E	F
RANGE	.3X10^-10 OR 1-10				900V	900V
SOURCE DIST.						
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED N & X MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #293 Ti foil exposure with Poly-Wall 6¼" thick 67" to the East.

15 foils - ¼" x .129"

E 5A, 7A, 6A, 12A, 13A, —, —, 8A, 4A, 11A, 9A, —, —, 3A, —, —, 10A, 2A, 1A, 15A, —, —, 14A, —

Time = 15 min. Log N = .02

Dawn = 13:45 "A" = 34 @ 1 X 10^-8

at Slim = 175 "C" = 57 @ H-17

SEP 15 1971

DATE SEP 15 1971	SAFETY CHECK					
TIME 08:25 AM	BY Lynn & Taylor					
CHANNEL	A	B	C	D	E	F
RANGE	3X10⁻¹⁰	opr	L-10	}	900	900
SCOPE	4"	ok	5'	}	5"	ok
%	100+				100+	
BLOCK	✓	✓	✓	put new btry in B2		
AUX	✓	✓	✓			
SOURCES USED	N & 8			✓		
TABLES ✓	✓	AREA CLEARED ✓				

RUN #294A Base Run B - 1/8 U-Buttons Anet 3 S.Steelon.

	TMC	LOGN	BF3 #1	#2	#3	TEMP.
Sec	+799	+895	+790	+780	+766	C
¢	+1.53	1.37	1.54	1.56	1.59	25.4°

#294B Remove 3- SS- Buttons 1/8" thick from Surface (Screws also remove)

Sec	-1037	-707	-818	-833	-858	
¢	-1.28	-1.90	-1.63	-1.61	1.56	25.2

295A Base

Sec	+747.8	+687.5	+759	+773	+812	24.9
¢	+1.63	1.76	~~[illegible]~~ 1.60	1.60	1.50	

295B less 3-SS Buttons

Sec	-845	-707	-828	-820	-806	24.7
¢	-1.58	-1.90	-1.61	-1.63	-1.66	

	mc	hoaN	BF_3 #1	2	3	Temp C°
Run #296A	[redacted]		3 55. off			
Sec	-899	-698.5	-836	-851	-846	25.0°
¢	-1.48	-1.93	-1.60	-1.57	-1.58	
#296B	Base					
Sec	+913	+885	+832	+840	+837	24.9°
¢	+1.35	+1.38	+1.47	+1.45	+1.46	
Steelon #297A	Base					24.6°
Sec	+858	+895	+790	+812	+784	
¢	+1.43	+1.36	+1.54	+1.50	+1.55	
297B	-3	S. Steel				24.5°
Surface Sec	-858	-860	-833	-815	-831	
¢	-1.55	-1.55	-1.60	-1.64	-1.61	

DATE SEP 16 1971	SAFETY CHECK					
TIME 12 50 AM PM	BY Taylor & Lyon					
CHANNEL	A	B	C	D	E	F
RANGE	.3X10-10	OPR	L-10		900V	900V
SOURCE DIST.						
% S. S.	100+				100	100
BLDG.	✓	✓	✓			
AUX CH.	✓	✓	✓			
SOURCES USED	Nat		MAGNETS	✓		
TABLES	—	BLOCKS	✓	AREA CLEARED	✓	

RUN #298 & foil foil exposure, with Poly wall 67" E.

13 - ¼" X .129 u foils.

EAST 1, 2, 3, 4, 10, –, –, 8, 7, 9, 12, –, –, 13(N) Rcnt
–, –, 6, 5, –, –, –, –, –, –, 15, –, –.

Time = 15 min
Down = 13:27
Al Shim = 170

Log N = .018
"A" = 1X10⁻⁸ @34
"C" = H-17 @ 46

DATE SEP 17 1971	SAFETY CHECK					
TIME 13:00 PM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	.3x10^-10	OPR	L-10	}	900V	900V
SOURCE DIST.	2'	OK	5'	}	6"	OK
% F. S. TRIP	100			}	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED	N & Y		MAGNETS ✓			
TABLES ✓	LIGHTS ✓		AREA CLEARED ✓			

7" E. #299 ℄ foil exposure, Poly wall 67" E.

15 - ¼" x .129" 235U foil

14A, 3A, NA, 1A, 10A, -, - 2A, 9A, 5A, 11A, -, -, 4A, -, -, 13A, 8A, 12A, 6A, -, -, -, -, 7A, -, -.

Time = 15 Min — Log N = .018

Down = 13:53 — "A" = 1×10^{-8} @ 34

Al shim = 170 — "C" = H-17 @ 56

10^-8 @ 34

@ 56

DATE OCT 12 1971 SAFETY CHECK
TIME 1300 BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3X10^{-10}	OPR	L-10		900V	900V
SOURCE DIST.	18"	ok	8'		6"	ok
% R. S. TRIP	100		100		100 ✓	✓
BLDG. ALARM	✓	✓	✓			
AUX SYST.	✓	✓	✓			

SOURCES USED 227 & Co^{60} (#18) ✓
TABLES ✓ ✓ ✓

Run #300 Dummy Cf Source Traverse.
12-1/8" + 1-1/16" U Buttons on. Log N = .0008
"A" =

	Rod Drive	Servo Al Shim	Ratio	D.C.
A_1	7.35	375	+1.831	
A_2		425	+1.029	480
B_1	6.82	425	−1.0226	400
B_2		375	+1.0901	

DATE OCT 13 1971 SAFETY CHECK
TIME 0830 AM BY TAYLOR-LYNN

CHANNEL	A	B	C	D	E	F
RANGE	1.3×10^{-10}	OPR	1-10		900V	900V
SOURCE	24"	OK	5'		6"	OK
%	100	—	—		100	100
BLR	✓	✓				
AUX	✓	✓	✓			
SOURCE	PuBe #	Co^{60}			✓	
TABLE	✓		✓		✓	

CTU D_N = 0.005
SLOW = 21.10
UP = 22.315
VDT3 = +6
VDT4 = 0
TOP OUT = 4.02
IN = 0.02

λ_N = ≃.0003

Run #301 Dummy Cf source traverse to establish ∞ at each position of dummy by shim position.

	Rod Sel.	Shim Sel.	± ε (cm)	± ε (IN)	TMC Ratio	Shim Sel.
A_1	7.35	500	-8.106 ①	-3.191	-0.94021	
A_2	—	400	—	—	+1.04297	441.8
B_1	6.82	400	-6.760	-2.661	+1.025	446
B_2	—	370	—	—	+1.0413	
C_1	6.32	370	-5.730	-2.256	+1.0293	
C_2	—	420	—	—	+1.0020	424
D_1	5.74	420	-4.392	-1.729	+1.00167	
D_2	—	370	—	—	+1.0175	416

① End of dummy is 115 mils inside south edge.

	ROD SEL.	SHIM SEL	± ℄ (cm)	± ℄ (in)	TMC RATIO	SHIM SEL DC.
E1	5.21		-3.170	-1.248	-	

Had selsyn (shim) problem. ~~EKR~~ repaired same. Cont tomorrow.

7.350 End of dummy ℄ is 115 mils inside South.
0.182 End of dummy ℄ is @ edge of North.
0.046 ~~℄~~ of dummy ℄ is @ edge of North.

℄ Rod Drive = 6.634" = 7.304 units on selsyn
i.e. 0.9083"/unit.

OCT 14 1971 SAFETY CHECK
0820 Taylor - Lyman

$.3 \times 10^{-10}$ OPR L-10 | 900V 900V
24" O/C 5' | 6" OK
100 — — | 100 100
" " "
Pube & Co60 "
" " "

SHIM SELSYN FROM DATA CURVE →

Run # 302 Repeat Run # 301 after selsyn repaired.
LN = .0005 C = L-20 @ 55

	Rod Selsyn	Shim Selsyn	± ¢ (cm) South	± ¢ (IN)	TRX Ratio	Shim Sel DC	SHIM
A_1	7.35	500	-8.106	-3.191	-1.0934	430	450
A_2	—	400	—	—	+1.03847		
B_1	6.82	400	-6.760	-2.661	+1.02498	417	412
B_2	—	430	—	—	-1.0204		
C_1	6.32	430	-5.730	-2.256	-1.0400		
~~C_2~~	~~—~~	~~370~~	~~—~~	~~—~~	~~+1.0305~~	~~396~~	
C_3	—	370	—	—	+1.0420	401	390
D_1	5.74	370	-4.392	-1.729	-1.0198	359	365
D_2	—	330	—	—	+1.04935		

SHIM SELSYN FROM DATA CURVE ←

	ROD SELSYN	SHIM SELSYN	± ℄ (cm)	± ℄ (2n)	TMC Ratio	SHIM SEL. DC	
E_1	5.21	330	-3.170	-1.248	+1.02435	342	348
2	—	350	—	—	-1.01536		
F_1	4.66	350	-1.901	-0.748	-1.0202	339	332
2	—	320	—	—	+1.03581		
G_1	4.11	320	-0.632	-0.249	-1.03763	325	322
2	—	340	—	—	+1.01188		
→ ℄ H_1	3.84	340	0.0	0.0	-1.00486	333	310
2	—	320	—	—	+1.0094		
I_1	3.55	320	0.660	0.260	-1.0100	307	322
2	—	340	—	—	+1.0451		
J_1	3.01	340	1.906	0.750	-1.0220	330	330
2	—	320			+1.02235		
K_1	2.46	320	3.175	1.250	+1.08109	344	345
2	—	350	—	—	-1.02281		
L_1	1.91	350	4.444	1.750	+1.0441	374	366
2	—	390	—	—	-1.03005		
M_1	1.36	390	5.712	2.249	+1.01420	402	391
2	—	430	—	—	-1.0337		
N_1	0.52	430	7.650	3.012	-1.00896	427	440
2	—	410	—	—	+1.05619		
O_1	0.25	410	8.273	3.257	+1.05046	462	460
2	—	490	—	—	-1.02761		
P_1	0.046	490	8.744	3.4425	+1.03596	515	515
2	—	530	—	—	-1.02086		

450 412 390 365

DATE OCT 15 1971	SAFETY CHECK					
TIME 08^{30} AM	BY TAYLOR - LYNN					
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	EPR	L-10		900V	900V
SOURCE	20"	OK	3'		6"	OK
%	100	—	—		100	100
GEN	✓	✓	✓			
AUX	✓	✓	✓			
SCRAM	~~Probe~~ & Co^{60}				—	
TABLE	—	—			✓	

BF_3 #1 = 120" West
#2 = 100" South
#3 = 120" East

Run #303 ℄ TRAV: USING Cf^E THRU SPHERE (N & S)

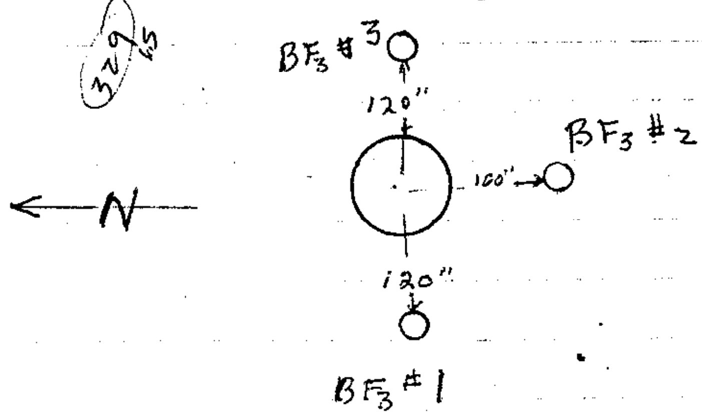
Background Source Rod in (No Source)

	BF_3 1	2	3	
1 min	~~78~~	~~48~~	60	No Top
	74	44	46	
5 min	397	233	219	
	~~396~~	289	245	

[The 1 min and 5 min rows are crossed through with a large X.]

5 min	305	444	338	Sphere
	352	463 (454) 90	324 (331) 46	
	(329) 65			

Avg CPM = 72



Log N	Rod (CF) Selsyn	Shim(AL) Selsyn	H ∠ (Inches)	BF3 #1	BF3 #2	BF3 #3	Char "A"	Avg. CPM
				2 min Counts			X10⁻¹⁰	
.00005	7.35	450	-3.191	29350	39318	27292	.58	
A				29437	39428	28172		
				29901	39780	27817		
				.2585	.12665	.12568		
				14,781	19,754	13880		
.0008	6.82	412	-2.661	47,843	63,817	44,509	.87	10 min Wait
B				48,319	64,285	44,719		.4246
				48,712	64787	44967		26,220
				.4273	.4337	.4138		
				24,146	32,148	22,366		
.00104	6.32	390	-2.256	65,460	86,665	60,338	1.18	
C				65220	86190	60361		
				66090	86609	61406		.5730
				.5724	.5821	.5603		35390
				32780	43154	30285		
.0013	5.74	365	-1.729	83484	108730	77854	1.50	
D				83310	109191	77235		
				83430	108418	77643		.7268
				.7282	.7325	.7163		44887
				41634	54300	38723		
.0014	5.21	348	-1.248	97049	126225	89786	1.75	
E				97081	126633	90199		
				97083	126542	89376		.8455
				.8489	.8539	.8301		52219
				48,836	63,233	44,889		
.00155	4.66	332	-0.748	107,570	139,019	101,113	1.80	
F				106,995	138,984	101,023		
				106,640	139,192	101,024		.9369
				.9363	.9380	.9349		57864
				53,534	69,533	50,527		

120" West
00" South
20" East

5)

P

ure

12

180
Log N

	RDP (cf) Selsyn	Shim (Al) Selsyn	± (Inches)	BF3 #1	#2	#3	Chan "A"	CPM
.0016	4.11	322	-0.249	113217	146617	105970	2.00	
G				112994	147284	106448		
				112803	146921	105419		.9879
				56,502	73,554	52,978		61,010
H .0016	3.84	310	0.0	114634	148662	108532	2.00	
				115127	148766	108823		
				113305	147363	106909		1.0000
				57,177	74,132	54,044		61,785
.0016	3.55	322	0.260	112433	146,840	104,278	2.00	
I				112108	145,342	103,108		
				112426	145434	105,254		.9782
				56,161	72,936	52,138		60,411
.0015	3.01	330	0.750	108,742	140,644	101,128	1.90	
J				109,727	141,309	100,512		
				108,531	140,472	99,923		.9454
				54,500	70,404	50,261		58,388
.00135	2.46	345	1.250	99,314	128,487	90,968	1.75	
K				99,148	129,006	91,398		
				98,799	127,506	91,919		.8583
				49479	64077	45913		53008
.0012	1.91	366	1.750	86,483	111,374	79,348	1.50	
L				86,516	110,938	79,913		
				86375	111,677	79,678		.7476
				43164	55575	39755		46165

Log
M
N
O
P

	Log ν	Rod (cf) Setting	Shim (Al) Setting	± δ (Inches)	BF_3 #1	#2	#3	"A"	CPM
	M .001	1.36	391	2.249	70,021	89,796	64,064	1.20	.6057 37406
					70,657	90,517	64,401		
9879					70,350	90,682	64,134		
.010					.6140 35107	.6081 45076	32034 .5977		.3629
	.00057	0.52	440	3.012	41945	54418	38464	0.74	22413
	N				42472	55008	39316		
0000					41580	53390	38164 .3563		
.785					.3661 20933	.3648 27040	19258		.2806
	.00046	0.25	460	3.257	32,690	42,042	30,486	0.58	17,334
	O				32,183	41,254	30,140		
9782					32,055	41,362	29,804		
411					.2825 16,155	.2803 20,776	15,072 .2789		.2088
	P .00035	0.046	575	3.4425	23,749	31,149	21,937	0.42	12,903
1454					24,362	31,256	21,908		
388					24,466	31,282	22,145		
					.2116 12,096	.2106 15,618	10,998 .2035		
8583									
208									
475									
65									

DATE OCT 18 1971 SAFETY CHECK
TIME 08 40 AM BY Taylor-Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	6-10	}	900V	900V
[illegible]	20"	OK	3'	}	6"	OK
[illegible]	100	—	—	}	100	100
ELEC [illegible]	✓	✓	✓			
AUD [illegible]	✓	✓	✓			
SOURCE	Pube & Co^{60}				✓	
TACH	✓		—		✓	

Run # 304 Repeat run # 303 (2 min counts)

	Log r	Rod (4)	Shim Al	± (Inches)	BF_3 #1	#2	#3	ch "A"	CPM
A	.00054	7.35	450	-3.191	29,468	39,582	26,598	.6	
				3.105	29,394	39,374	26,536		10,940
					29,723	39,777	26,619		.26426
					14,754 .12609	19,789 .12706	13,292 .12584		
B	.00085	6.82	412	-2.661	46,658	62,822	42,640	.9	25,434
				6.759	47,195	62,820	42,872		
					47,169	63,131	43,496		.42152
					23,504 .4157	31,296 .4280	21,502 .4187		
C	.0010	6.32	390	-2.256	63622	84865	59497	1.18	
				5.939	63824	84201	59868		34,719
					64395	85119	59553		.57541
					31,974 .5655	42,364 .5784	29,820 .5807		
D	.00118	5.74	365	-1.729	81,414	106,984	74,955	1.48	
				4.342	82,324	107,390	75,617		44,215
					82,104	107,092	75,984		
					41,307 .7205	53,578 .7327	37,759 .7353		.73279

Log N	Rod (Cf)	Shim (Al)	± ℄ (in.) (cm)	#1	#2	#3	Ch "A"	CPM 183
.0013	5.21	348	-1.248	95,503	124,586	90327	1.70	51,750
				95,118	124,211	90317		.85766
E			3.169	95,927	125,218	90,369		
				47,758	62,323	40,169		
	4.66	332	-0.748	105,539	137,189	97,912		56,824
				106,378	138,634	96,960		.94176
F			1.900	106,003	137,632	96,585		
				52,987	68,901	48,576		
.0014	4.11	322	-0.249	111,724	144,839	101,423	2.00	59,719
G				112,366	146,031	101,963		.98974
			1.632	111,624	144,033	100,969		
				55,952	72,482	50,721		
.00145	3.84	310	0.0	113,770	147,057	102,215	2.00	60,338
H				112,693	146,391	103,748		1.000
			0	112,806	145,280	102,128		
				56,545	73,121	51,349		
.0014	3.55	322	0.26	111,673	144,106	101,029	2.00	59,669
I				111,669	144,096	100,821		.98892
			1.660	112,370	145,129	102,998		
				55,980	72,221	50,807		
.0014	3.01	330	0.760	107774	139217	97793	1.90	57187
J				106191	138200	97580		.94778
			1.900	107316	139388	97230		
				53482	69378	48701		

h_N	Rod Cf	Shim AL	± ℄ (IN)	BF_3 #1	[illegible] 10^{-10}	2	3	AVG CPM
.00123	2.46	345	1.250	98627	1.74	127008	90117	52433
			3.175	99088		126878	90465	.8690
				98275		126129	88526	
				.8712		.8649	.8722	
				49267		63246	44785	
	1.91	366	1.750	85145		111057	78484	45,714
	[illegible]			85240		110,571	78734	.7576
			4.445	85801		110,760	77,066	
				.7551		.7576	.7604	
				42,698		55,398	39,047	
.0009	1.36	391	2.249	69,000	1.25	88,431	62,803	36,743
				68,991		89,085	63,002	.6090
			5.712	68,541		88,858	62,669	
				.6038		.6071	.6117	
				34,422		44,395	31,412	
.00054	0.57	440	3.012	41083	.72	52743	37465	21853
				41128		52945	37297	.3626
			7.65	41640		53186	37185	
				.3639		.3609	.3621	
				20577		26389	18592	
.00042	0.25	460	3.257	31,350	.57	40,605	28,467	16,843
			8.273	31,953		41,257	28,941	.2741
				31,488		40,254	28,863	
				.2744		.2783	.2800	
				15,799		20,352	14,379	
.00032	0.04	515	3.4425	23,514	.425	29,947	20,966	12,359
			8.744	23,329		29,942	21,545	.2048
				23,137		29,900	21,079	
				11,663		14,815	10,598	
				.2063		.2026	.2064	

SAFETY CHECK

DATE OCT 19 1971
TIME 0840 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	OPR	L-10		900V	900V
SOURCE DIST.	20"	OK	3'		6"	OK
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX	✓	✓	✓			

SOURCE USED Pube & Co^{60} ✓
TABLES ✓ ✓ AREA CLEARED ✓

Run #305 Repeat run #303 again.

Log N	Rod (cf)	Shim (Δℓ)	± ℄ (in)	#1	#2	#3	10^{-10} ch "A"	CPM
.00053	7.35	450	-3.191	29,851	39,965	28,704	0.58	16,331
				29,852	39,420	28,280		.2660
				29,835	39,725	28,268		
				.2636 14,923	.2721 19,861	.2603 14,209		
.00090	6.82	412	-2.661	48113	64117	46735	0.87	26518
				47878	63804	46774		.4320
			.422	48914	64722	47596		
				24086	.4386 32017	23452 .4298		
.00118	6.32	390	-2.256	64699	85079	62,381	1.18	35,530
				65210	86208	63,294		.5787
			.5772	64,467	85008	63,187 .5768		
				32,396	.5852 42,716	31,477		
.00145	5.72 (5.74)	365	-1.729	83,445	108,730	79,480	1.50	45,049
				82,124	107,034	79,063		.7338
				82,582	108,708	79,719		
				41,359	54,079	39,709		
				.7306	.7485	.7277		

186 log N	Rd (cf)	Shim Al	± ℄ (In.)	#1	#2	#3	Ch A	CPM
	5.21	348	-1.248	95,939 95,898 95,446 .8758 47,881	124,342 124,745 123,824 .8514 62,152	92,646 91,755 91,224 .8541 45,938	1.70	51,990 .8469
.00175	4.66	332	-0.748	105,364 106,264 105,856 .9336 52849	136,710 137,197 137,542 .9382 68483	102,031 101,558 101,451 .9354 50774	1.85	57369 .9345
.0018	4.11	322	-0.249	111,774 111,595 110,947 .9843 55,719	144,388 143,651 142,990 .9841 71,838	108,404 107,430 106,534 .9845 53,728	1.98	60,428 .9843
.00185	3.84 ℄	310	0	112,812 113487 113346 1.000 56,608	145637 145902 146431 1.000 72,995	108235 109324 109867 1.000 54,571	1.97	61,391 1.0000
.0018	3.55	322	0.26	113,853 110,718 112,349 .9926 56,187	143,270 142,806 144,256 .9820 71,722	107,235 106,987 107,700 .9833 53,653	1.95	60,520 .9858
.0018	3.01	330	0.750	109245 109017 107954 107786 54250 .9583	139836 139530 137589 138243 69,400 9508	105782 105303 103922 103454 52,308 .9585	1.88 1.70	58,653 .9554

CPM		Rd (cf)	Shim (Al)	t ¢ (IN.)	#1	#2	#3		
,990	.00765	2.46	345	1.25	97,682	125,841	94,295	1.70	
8469					98,012	126,753	95,743		53,199
					98,012	126,672	94,511		.8666
					.8646	.8660	.8693		
					48,944	63,211	47,441		
7369	.0014	1.91	366	1.75	85,280	109,351	~~76,996~~	1.48	46,250
9345					85,432	110,203	82,533		.7534
					85,666	109,652	82,082		
					.7548	.7517	.7541		
					42,730	54,868	41,154		
,428	.0011	1.36	391	2.249	69,085	88,645	66,259	1.20	37,262
9843					68,219	88,645	65,651		.6070
					68,267	88,146	66,900		
					.6052	.6061	.6099		
					34,262	44,239	33,284		
,391	.0007	0.52	440	3.012	40880	52674	39430	0.72	22283
.0000					41315	52409	40111		.3631
					41587	53213	40310		
					.3633	.3613	.3648		
					20565	26376	19909		
,520	.0006	0.25	460	3.257	31695	40643	30890	0.55	17,107
9858					31667	40474	30566		.2788
					31351	40335	30310		
					.2789	.2773	.2802		
					15,786	20,242	15,294		
8,653	.00042	0.040	515	3.4425	23,668	30,472	23,074	0.42	12,787
9554					23,649	29981	22,744		~~.2083~~
					23,383	30,105	23,095		.2083
					.2082	.2068	.2104		
					11,783	15,093	11,486		

DATE OCT 20 1971 **SAFETY CHECK**
TIME 0915 AM PM BY TAYLOR - LYNN

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	CPR	L-10		900V	900V
SCOPE DIST.	24"	OK	5'		6'	OK
% R. S. REP	100		100		100+	
BLDG. CLEARED	✓	✓	✓			
AUX CLR.	✓	✓	✓			
SOURCES USED	N ≠ x				MARKERS	✓
TABLES	✓				AREA CLEARED	✓

Run # 306 Button Reactivities.

Loading = 13 - 1/8" u buttons
1 - 1/4" u button
1 - 1/8" u button
1 - 1/16" u button
} To be removed for evaluations. (Buttons only, No screws)

A ρ = +

B 1/4" u removed ρ +

C 1/4" + 1/8" u off ρ = + $\pm \sum_{1}^{1\sigma}$

D — 1/4" + 1/8" + 1/16" off ρ =

~~Run # 307 Removed 2 - 1/8" u Button + Screws.~~

	TMC	BF_3 1	#2	#3
A	+ 6.11 ± 6.18	170.2 sec, 6.23 ± 6.26	177.2 sec, 6.02 ± 6.05	175.4 sec, 6.07 ± 6.10
B	+ 3.50 ± 3.49	321.4 " 3.56 ± 3.58	325.7 " 3.52 ± 3.54	318.8 " 3.59 ± 3.60
C	—	761.9 " 1.59 ± 1.59	623.3 " 1.93 ± 1.93	724.4 " 1.67 ± 1.68
D	—	—	—	—
A - B =	2.60 ± 2.61	2.67 ± 2.68	2.50 ± 2.51	2.48 ± 2.50
B - C =	—	1.97 ± 2.09	1.59 ± 1.61	1.92 ± 1.92

Run # 307 Leading = 11 - 1/8" Buttons

1/4" + 1/8" + 1/16" to be removed.

	TMC	BF3 #1	#2	#3
A	+533 sec, 2.24¢	+542.5 sec, 2.20¢	532.2 sec, 2.25¢	542.5 sec, 2.20¢
B	-459 sec, -0.28¢	-6900 sec -0.19¢	-12,320 sec -0.10¢	-11,000 sec, -0.12¢
C	—	—	—	—
D	-529 sec, -2.60¢	-521 sec, -2.64¢	-515 sec, -2.67¢	501 sec, -2.75¢

Run # 308 Repeat

	TMC	BF3 #1	#2	#3
A	+2.50¢	+475.9 sec, 2.50¢	4941 sec, 2.41¢	455.4 sec, 2.60¢
B	-0.25¢	-5745 " -0.22¢	-5318 " -0.23¢	-5160 " -0.24¢
C	-1.79¢	-743.4 sec, -1.81¢	-755 sec, -1.78¢	-747 sec, -1.80¢
D	-2.64¢	-498.2 " , -2.83¢	-512 " , -2.69¢	-515 " , -2.67¢

Run # 309 Repeat

	TMC	sec	¢	sec	¢	sec	¢
A	+2.33¢	+508.4	+2.34¢	+487.2	+2.44¢	+491.9	+2.42¢
B	-0.37¢	-812	-1.64¢	-781	-1.71¢	-819	-1.63¢
C	-1.74¢	-4403	-0.29¢	-3480	-0.37¢	-3480	-0.36¢
D	-2.50¢	-538	-2.54¢	-544	-2.57¢	-530	-2.53¢

2.20	DATE OCT 21 1971 — SAFETY CHECK
..., 2.20	TIME ___ AM/PM BY Taylor - Lynn
	CHANNEL: A B C D E F
	RANGE: .3x10-10 OPR L-10 { 900V 900V
−0.12	SOURCE DIST.: * OK 3' } 6" OK
..., −0.12	% ... TRIP: * – – } 100 100
2.32	BLDG. ALARM: ✓ ✓ ✓
..., −2.75	AUX ...: ✓ ✓ ✓
	SOURCE USED: PuBe & Co^{60} ... ✓
	TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

* 100 scale trip @ 65% @ 24"
150 scale trip @ ≈110% @ 20"

2.63
1.52
1.11

RUN #310 REPEAT RUN #303 BUT WITH POLY WALL (See p. 84) PLACED 67" NORTH OF SPHERE. (No Buttons = ≈ −20°)

		Source "E" ± ℄ (in)		BF_3 #1 (1 min cts)	2	3	Chan A	Avg CPM Less Bkg
.00034	7.35	450	−3.191	30,083	40,173	29,416	0.57	16,637
				29,926	40,392	29,643		.2662
				29,970	40,216	29,644		
				.2604 / 14,997	.2686 / 20,130	.2646 / 14,784		
.00049	6.82	412	−2.661	47,278	63,493	46,450		26,400
				47,662	63,722	47,144		.4224
				47,797	64,268	47,383		
				.4130 / 23,790	.4258 / 31,914	.4284 / 23,496		
	6.32	390	−2.256	66702	87449	64923		36,357
				65799	87200	64432		.5820
				65923	87644	64343		
				.5741 / 33,071	.5832 / 43,716	.5886 / 32,283		

Left margin: 2.59, 2.60, −0.25, −0.24, −1.79, −1.80, −2.67, −2.67, 2.41, +2.42, −1.63, −1.63, −0.37, −0.36, 2.58

192	Rod (Cf)	Shim Al	℄ (in.)	#1	#2	#3	Ch "A"		
.00082	5.74	365	-1.729	83,752 82,487 83,031 41,548 .7213	110,113 108,898 109,467 54,746 .7304	81,453 80,810 80,538 40,467 .7379	1.5	45,586 .7299	.00
	5.21	348	-1.248	97,317 96,801 96,797 48,486 .5418	126,819 127,186 127,070 63,513 .8473	93,419 94,204 93,992 46,936 .8558	1.73	52,978 .8483	
	4.66	332	-0.748	107,192 107938 108064 53,866 .9352	140,352 141,293 142058 70,617 .9421	103,358 104,523 104869 52,125 .9504	1.90	58,869 .9426	.0008
.001	4.11	322	-0.249	113,343 113,300 113,523 56,694 .9843	147,722 147,570 147,433 73,788 .9844	108,900 109,374 109,505 54,630 .9901	2.0	61,704 .9883	.0006
.00105	3.84	310	0 ℄	115252 115688 115054 57601 1.000	149481 150332 150459 74955 1.000	109440 110358 109658 54843 1.000	2.0	62466 1.0000	.0004
.00105	3.55	322	0.26	113426 113886 113645 56761 .9854	147365 147998 148320 73857 .9854	108610 108918 108858 54332 .9907	2.0	61650 .9872	.0003

	h_N	Rod (cs)	Shim (al)	℄ (in)	#1	#2	#3	A'' 10^{-10}	AN_6
45,586									
.7249	.001	3.01	330	0.750	109226	141670	104969	1.90	59,508
					109978	142793	105013		.9526
					109896	141786	105820		
					54,850 (.9675)	71,042 (.9478)	52,634 (.9597)		
52,978									
.8485		2.46	345	1.25	99848	128,596	95,300		
					99,641	129,736	95,959		54086
					99,293	129,288	95,897		.8658
					49,797 (.8645)	64,603 (.8619)	47,859 (.8726)		
58,869									
.9426	.0008	1.91	366	1.75	85,499	111063	82,515		46,765
					86,353	112,316	83,113		.7487
					86,343	111,427	83,147		
					43,032 (.7471)	55,801 (.7444)	41,463 (.7560)		
61,704									
.9883	.00068	1.36	391	2.249	70,020	89,827	68,620	1.25	37930
					69,897	90,367	68,002		.6081
					69,423	90,214	67,690		
					34825 (.6046)	44998 (.6001)	33986 (.6197)		
62466									
1.0000	.00045	0.52	440	3.012	42376	54860	40865	0.73	22,753
					41 417	53 436	40 203		.3643
					41 753	54048	40602		
					20,924 (.3633)	27,057 (.3610)	20,278 (.3698)		
61650									
.9872	.00035	0.25	460	3.259	32,016	41,349	31,077	0.57	1.7441
					31,920	41,372	31,432		.2792
					31,905	41,687	31,188		
					15,973 (.2773)	20,735 (.2766)	15,616 (.2847)		

194

	Rd (cf)	Shi (Al)	± t (in)	#1	#2	#3	Ch A	Avg CPM
.00026	0.046	515	3.44	24138	31278	23663	.043	13210
				24216	31636	24018		.219
				24461	31405	24286		
				12077 2096	15630 2093	11929 2115		

Avg CPM

3210
.2119

OCT 22 1971

OCT 22 1971 SAFETY CHECK
TIME 09:30 — Taylor & Lynn

RANGE	.3×10^-10	up	L10	900	900
	20"	ok	5'	6"	ok
%	100		100	100+	—
	✓	✓	✓		
AUX	✓	✓	✓		
	N48				
	✓		✓		✓

Run # 311 "Repeat Run # 310 (Poly Wall)"

Log N	"E" ¢	# 1	# 2	# 3	$\times 10^{-10}$ ch "A"	Avg. CPM
.00036	-3.191	30,294	40,736	29,259	0.58	16528
		30,127	40,260	28,974		.2663
		30006	40226	28953		
		.2614	.2702	.2667		
		15006	20114	14465		
.00052	-2.661	48550	64974	47265	0.90	26,882
		48556	65328	46988		.4331
		48937	65521	47754		
		.4240	.4378	.4363		
		24,341	32,637	23,668		
.00064	-2.256	65,797	86,963	64182	1.20	36,338
		66,469	87971	64773		.5835
		66,220	87557	64145		
		.5762	.5861	.5933		
		33,081	43,749	32,183		
.0008	-1.729	83,923	109,744	79,862	1.52	45,281
		82,793	109,020	79,539		.7296
		82,542	108,450	79,190		
		.7236	.7316	.7331		
		41,343	54,536	39,765		

196	"E" ± ¢	#1	#2	#3	Ch "A"	Avg CPM
.0009	-1.248	96,963	127,871	94776	1.72	53,033
		97,112	126,668	93,942		.8548
		97292	127,040	92,931		
		48,561	63,397	46,942		
.00099	-0.748	107,545	140,793	102,797	1.90	58311
		107,188	140,721	102,368		.9545
		106,913	140,334	102,232		
		53549	70218	51167		
.00102	-0.249	113,168	148052	108761	2.00	61108
		112286	146398	106618		.9875
		112599	146852	106533		
		56277	73460	53586		
.00103	0	114861	149,280	108219	2.02	62,064
	¢	115061	149,784	108,984		1.000
	1.0010	114544	148,173	108,253		
		57,411	74,541	54,242		
	0.26	112,610	147,367	108,700	2.02	61,591
		113,483	146,961	108,408		.9924
		114,400	147,832	108,879		
	.9847	56,749	73,693	54,339	1.0016	
	0.75	109138	141284	103616		59,154
		108622	141982	104678		.9531
		109517	141986	103945		
		54,546	70,875	52,040	.9594	
		.9501	.9508			

CPM	Log N	"E" ±¢	#1	#2	#3	ch"A"	Avg CPM
,033		1.25	99,395	128,633	94,363	1.76	53,752
548			98,442	127,788	93,504		.8661
			99,647	129,648	96,118		
		.8636	49,580	64,345 .8632	47,330 .8726		
,311		1.75	85,945	110,935	81,804	1.50	46,668
345			86,033	111,379	82,971		.7579
			86,067	111,660	83,066		
			43,608 .7491	55,690 .7471	41,307 .7615		
108	.00062	2.249	70282	90784	67505	1.24	37,996
9875			69839	90700	66785		.6122
			70666	91432	67255		
			35066 .8108	45396 .6091	33525 .6181		
064	.00038	3.012	41857	54321	40232	0.74	22630
000			42125	54423	39854		.3646
			41550	54310	39990		
			20857 .3033	27085 .3631	19947 .3677		
591	.0003	3.257	32,110	41,838	31,379	0.58	17,463
9924			32,042	41,381	31,097		.2814
			31,975	41,774	30,743		
			16,021 .2791	20,832 .2792	15,536 .2864		
9,154	.00014	3.4425	24,487	31,382	23,685	0.44	13,408
531			25,065	32,252	23,618		.2160
			24,806	32,164	23,682		
			12,393	16,000	11,831		
			.2159	.2146	.2181		

SAFETY CHECK

DATE OCT 25 1971 TIME 09^00 AM BY Taylor & Lippard

CHANNEL	A	B	C	D	E	F
RANGE	* 3x10^10	Opr	L-10		900	900
SOURCE	24"	ok	4'		6"	ok
%	180		150		100+	—
BLDG.	✓	✓	✓			
AUX	✓	✓	✓			

SOURCE N # 8 ✓

TABLES ✓ ✓ AREA CLEARED ✓

* See p. 191

Run # 312 — Repeat Run # 310 (Poly Wall)

Log ν	± "E" (in)	BF₃ 1 (2 min cts)	#2	#3	Ch "A"	Avg cpm
.00035	-3.191	30,018	40,457	29,282	0.58	16,654
	CF = 7.35	29,850	40,771	29,298		~~2483~~
	Al = 450	30,214	40,786	29,089		.2679
		.2627 15,014	.2728 20,336	14,611 .2682		
.00052	-2.661	46,781	62,063	—	0.90	25,752
	6.82	46,192	62,794	45,594		~~4419~~
	412	.4068	.4186	.4		.4146
		23,244	31,214	22,797 .41		
.00065	-2.256	64,971	86,628	63,095		35892
	6.32	64,966	87,004	64,199		~~5783~~
	390	65,315	86,234	63,644		.5748
		.5695 32,542	.5809 43,311	31,823 .5841		
.0009	-1.729	82,238	108,900	81,196	1.46	45686
	5.74	83,597	110,435	81,458		.7362
	365	83,376	110,791	81,638		
		41470	54939	40649		
		.7257	.7369	.7461		

Log N	"E" ± ℰ	#1	#2	#3	Ch "A"	Avg. 199 CPM
.0009	−1.248	96170	125994	92471	1.72	52426
	5.21	96878	125762	92182		.8479
	348	96618	126173	92748		
		48213 .9937	62898 .8429	46168 .8473		
.001	−0.748	101,496	138,379	101,750	1.90	57838
	4.66	106,233	139,300	102,026		.9318
	332	106850	140,201	101,997		
		53032 .9280	69585 .9333	50896 .9341		
.00102	−0.249	111,751	146,364	108,145	1.98	61139
	4.11	112,833	146,369	108,033		.9836
	322	112,825	146766	108,731		
		56170 .9889	73160 .9813	54086 .9927		
.00103	0	115195	149824	109358	2.02	62062
	3.84	113961	149004	109042		1.000
	310	114105	149044	108903		
		57145 1.000	74556 1.000	54485 1.000		
.001	0.26	112216	146,207	107,242	1.98	61,057
	3.55	112,330	146,725	107,203		.9839
	322	112,736	146,714	107,619		
		56,214 .9837	73,282 .9829	53,677	.9952	
.00095	0.75	108,112	140,495	105,913	1.90	59,143
	3.01	108,792	140,758	105,534		.9530
	330	109,067	141,049	104,862		.9541
		54,329 .9507	70,383 .9440	52,718 .9676		

200 hrg	"E" ± ¢(in.)	#1	#2	#3	ch A	avg. CPM
.0009	1.25 2.46 3.45	99248 99311 99471 49637	128697 128703 128642 64250	95319 95333 94966 47537	1.47	53808 .5676
.0008	1.75 1.91 .366 .7510	85568 86025 86309 42919	112243 111789 111458 55825	82806 83275 82446 41355	1.50 .7525	46700 .7525
.00068	2.249 1.36 391 .6047	69020 69080 68995 34578	89421 89756 89958 44956	66274 67502 66941 33,453	1.27 .6141	37,069 .6682
.00041	3.012 0.52 440 .3614	41539 41830 41655 20837	54255 54732 54161 27,191	40589 40525 40080 20,199	0.71 .3707	22,742 .3604
.00032	3.257 0.25 460 .2732	31257 30991 31414 15,610	40383 40250 40757 20,232	29920 30417 30826 15,193	0.55 .2759	17,011 .2741
.00024	3.4425 .04 515 .2051	23,357 23,567 23,406 11,722	29,958 30,046 30,314 15,053	22,993 22,710 22,725 11,405	0.42	12,727 .2053

SAFETY CHECK

DATE OCT 26 1971
TIME 0840 AM BY JRT & JJL

CHANNEL	A*	B	C	D	E	F
RANGE	.3x10^-10	OPR	L-10		900V	900V
SOURCE DIST.		OK	4'		6'	OK
% F. S. TRIP	100+	–	–		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pulsed Cf ✓ BUCKETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

* Slight trip adj. made. OK.

Run #313 Another repeat of Run #303 Pg 178
Cf E trav thru ¢ Sphere N-S.

Log x	"E" ± ¢ (in.)	#1	#2	#3	Ch "A"	AVG CPM
.00035	-3.191	29,765	39877	29,418	0.58	16462
	Cf = 7.35	29,841	40013	29,130		.2703
	Al = 450	30,099	40413	29,088		
		14886 .2661	19961 .2749	14540 .2700		
.00048	-2.661	45718	61525	45257		25,597
	6.82	46548	62182	45545		.4205
	412	46542	61782	45649		
		23,135 .4135	30,914 .4258	22,742 .4223		
.00062	-2.256	63954	84337	62614	1.42	35,258
	6.32	64339	84379	63073		.5798
	390	64494	84581	62879		
		32,131 .5743	42,216 .5814	31428 .5836		
	-1.729					
	5.74		SKIP			
	365					

202 Log N	"E" ± tc(sec)	#1	#2	#3	Ch "A"	Avg. CPM
.00085	-1.248	94,275	123,248	91,629	1.69	51,699
	5.21	95,107	124,585	92,396		.8532
	348	94,459	123,046	91,831		
		.8435	.8514	.8538		
		47,309	61,813	45,976		
.00085	-0.748	105,216	136,174	101,453	1.88	56724
	4.66	104,021	135,490	100,157		.9329
	.332	104,088	135,489	100,228		
		.9323	.9334	.9330		
		52163	67769	50240		
.0010	-0.249	109746	142300	107969	1.94	60049
	4.16	109598	142224	108349		.9916
	322	110045	142417	108999		
		.9800	.9801		1.0057	
		54833	71159	54154		
.00101	0	112,520	145,757	109217	2.00	60,800
E	3.84	111,798	145,535	107,555		1.000
	310	111,393	144,313	107,304		
		1.000	1.000	1.000		
		55,952	72,601	53,846		
.001	0.26	110,670	143,403	106,293	1.95	59,988
	3.55	110,719	143,883	105,753		.9864
	322	110,259	143,527	105,275		
		.9879	.9970	.9822		
		55,275	71,802	52,887		
.00097	0,75	106807	138003	102893	1.90	.9480
	3.01	106174	137523	101943		
	330	106142	136900	102161		
		.9944	.9956	.9940		
		53122	68648	51100		

cm	Log N	"E" ± E(cm)	#1	#2	#3	Ch Ä	Avg CPM
99	.00089	1.25	96958	126185	93992	1.74	52519
2		2.46	96258	125405	92922		.8638
		345	96369	125403	93469		
			48198	62693	46665		
2f	.00077	1.75	84286	108849	81074	1.50	45659
9		1.91	84645	109891	81017		.7511
		366	84075	108384	80955		
			42103	54432	40442		
4	.00063	2.249	68,279	88,996	66,442	1.23	37,255
6		1.36	68,834	88,672	66,738		.6130
		391	68,653	88,125	65,655		
			34,328	44,299	33,139		
00	.00039	3.012	41,145	53,106	39,646	0.71	22168
0		0.52	41,004	53,239	39,345		.3647
		440	40,711	52,776	39,382		
			20412	26430	19663		
88	.00038	3.251	31147	39700	29937	0.56	16,878
4		0.25	30916	40338	30345		.2779
		460	31226	39792	30398		
			15,548	19,972	15,113		
20	.00023	3.4425	23,177	29,376	22,341	0.43	12,472
		0.04	23,129	29,630	22,436		.2054
		518	22,877	29,261	22,282		
			11,531	14,711	11,177		

204 OCT 27 1971

Bldg evacuation drill @ ~~10:09~~ 10:09.

DATE OCT 27 1971 SAFETY CHECK

TIME 13:10 BY Taylor & Lynn

				C	F
	$.3 \times 10^{-10}$	opr	L-10	900	900
	24"	ok	5'	6"	ok
	100		100	100	
	✓	✓	✓		
	✓	✓	✓	✓	
	N & S			✓	
TABLES ✓		✓			✓

Run #314 - Foil Traverse at ℄, N & S

S 1A, 2A, 3A, 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A N

Time = 15 Min
Down @ 13:41
Al Shim = 450

LogN = .02
"C" =
"A" = 3.3×10^{-8}

OCT 28 1971

DATE OCT 28 1971	SAFETY CHECK
TIME 14:05	Taylor and Lynn
	.3x10^-10 gpr L510 — 900 900
	22' ok 5' — 6" ok
	.100 100 — 100+
	✓ ✓ ✓
	✓ ✓ X
	N & 8 ✓
TABLE ✓	✓ ✓

Run # 315 - Foil Traverse @ ℄, E & W.

[Center fuel pc rotated 90°]

W --1,--2,3,4,5,6,7,--8,--9,10,11,12,13,14,--15--.E

Time = 15 min — Log N = .02

Down @ 14:36 — "C" = 40.0 @ H-19

Al Shim = 311 — "A" = 3.6 @ $\times 10^{-8}$

NOV 3 1971

TIME 10:50 — TAYLOR & LYNN

3×10^{-10} OPY L-10 900 900

26" ok 4' 6" ok

100 100 100+ —

N ⊥ δ

RUN # 316 — Traverse at ℄, E & W.

℄

E 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 W

A Series

Time = 15 min

Down @ 11:30

Al Shim = 275

Log N = .02

"A" = 3.45 @ 10^{-8}

"C" = 48 @ H-18

NOV 4 1971

NOV 4 1971 SAFETY CHECK

10:50 — Taylor & Lyons

$.3 \times 10^{-10}$	Opr	L-10	900	900
26"	ok	4'	6"	off
100		100	100+	
✓	✓	✓		
✓	✓	✓		

N & 8 ✓

✓ ✓ ✓

[Center fuel pc rotated 90°]

Run # 317 — Traverse at ℄ N & S

℄

N 14, 13, 12, 5, 4, 3, 2, S

Time = 15 min — Log N = .02

Down @ 11:33 — "A" = 3.5 @ 10^{-8}

Al Shim = 310 — "C" = 36 @ H-19

DATE NOV 5 1971 SAFETY CHECK
TIME ___ BY ___

	A	B	C	D	E	F
[illegible]						
RA[illegible]	$.3\times10^{-10}$	opr.	Lto		900	900
SO[illegible]	24"	ok	4'		6"	~~ok~~
[illegible]	.100		180		100+	
EL[illegible]	✓	✓	✓			
AC[illegible]	✓	✓	✓			
SO[illegible]	N 98				✓	
RA[illegible]	✓	✓				✓

Centrifuge rotated 90°, Clockwise looking down

(Round edge moving west)

Run #318 – Cf "E" – Importance E to W.

(2 min counts)

Log α	"E" ± E (in)	#1	#2	#3	Ch "A"	Avg. CPM
.0004	−3.191	29,607	35,452	~~7,161~~	0.56	~~13,342~~
450		29,963	35,371	~~7,161~~		16,282
		29,759	35,229	~~7,164~~		(16190*)
		14,884	17,675	~~7,162~~		
	−2.661 (.530)	47,532	57,125	~~7,184~~ 52,166	0.84	26327
412		48,533	58,080	51,670		
		48,749	57,647	52,394		
		24135	28809	26038		
	−2.256	64503	75221	69257	—	
390		64188	75560	68738		34807
		64678	75072	69508		
		32195	37642	34584		
— 365	−1.729	80807	94487	86883	1.46	43768
		80869	94259	86640		
		81324	95071	87476		
		40500	47303	43500		

* Calc. using only #1 & #2 (ratioed) [initials]

Right margin: Ln / .0009 / .001 / .001 / ± / .001 / .001 / .0010

Ln	AL Shim	Cf E/E	#1	#2	#3	chA x10^-10	
.00098	348	-1.248	94,743	110,833	101,383	1.64	
			95,208	110,899	101,647		51,165
			95,187	109,980	101,093		.94[illegible]
			.8443	.8510	.84[illegible]		
			47,523	55,285	50,687		
.0011	332	-0,748	104,610	121,590	110,998	1.82	56,168
			104,531	121,546	111,356		.9297
			104,422	121,007	110,967		
			.9285	.9342	.924[illegible]		
			52,260	60,691	55,554		
	322	-0,249	111,339	128,826	118,606		59,488
			110,927	128,183	118,295		.9848
			110,604	127,040	116,970		
			.9856	.9852	.9837		
			55,478	64,008	58,978		
.00112	310	0	111,584	130048	119698	1.98	
			113,605	129790	120690		60,404
			112,532	129962	119359		1,000
			1,000	1,000	1,000		
			56,288	65,000	59,958		
.00111	322	0,26	112,159	128,786	118533	1.90	59,548
			111,939	127,737	117024		.9857
			110,466	128,234	116,994		
			.9906	.9866	.9800		
			55,761	64,126	58,759		
.00108	330	0.75	107261	122786	113175	1.80	57,247
			107336	123588	113997		.9472
			106246	123102	112957		
			.[illegible]	.[illegible]	.[illegible]		
			53,474	61,579	56,888		
.00102	345	1.25	97714	112434	103094	1.67	52,134
			97155	111808	102954		.8630
			97439	112493	103525		
				.8634			
			48,718	56,122	51,562		

Log N	Al. Shim	¢ of CfE	BF3 #1	#2	#3	ch A x10⁻¹⁰	
.0008	366	1.75	84,058	97,154	88,984	1.45	45,131
			84,566	96,840	89,363		
			84,070	97,238	89,904		
			42,116	48,539	44,709		
.00065	391	2.249	68,912	78,526	72,610	1.23	36,563
			68,286	78,888	72,215		
			68,819	78,691	71,998		
			34,202	39,351	36,137		
.0004	440	3.012	41,097	47,558	44,197	0.72	21,999
			41,217	47,283	43,160		
			41,327	46,944	43,219		
			20,607	23,626	21,763		
.00034	460	3.257	31,496	36,283	33,162	0.53	16,928
			31,516	36,458	33,239		
			32,094	36,618	33,846		
			15,851	18,226	16,707		
	515	~~3.4435~~ 3.382	26,515	30,252	27,476		13,924
			26,154	29,829	27,218		.2305
			25,781	29,994	27,407		
			13,075	15,013	13,684		
				.2310	.2292		
	Bgd		Source "E" removed from 108				
			~~242~~	~~314~~	~~294~~		
			205	266	240		
			184	249	210		
			202	245	229		
			198	218	200		
			98.5	122	110		

Run

DATE NOV 8 1971	SAFETY CHECK					
TIME 10:30			Lynn & Mihalczo			
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	opr	L40		900	900
SOURCE DIST.	2'	ok	4'		6"	ok
% F. S. TRIP	100		120		100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED	N #8			..CTS	✓	
TABLES ✓	LIGHTS ✓			CLEANED ✓		

Run # 319 To check oscillating equipment for noise, oscillated TOP ~ 30 times.

k < 1. check ok.

DATE NOV 9 1971

TIME 08:40

[illegible] CHECK

Taylor & Lynn

	A	B	C	D	E	F
CHANNEL						
RANGE	3×10^{-10} opr	L10			900	900
[illegible]	2'	ok	4'		6"	ok
[illegible]	100		100		100+	
[illegible]	✓	✓	✓			
AUX [illegible]	✓	✓	✓			
SOURCE [illegible]	N & γ					✓
TABLES ✓			✓	AREA CLEARED ✓		

Run # 320 – Cf "E" Importance E to W, after rotating Center fuel pc 180°

Log N	± "E" (in.)	# 1	# 2	# 3	Ch "A"	Avg CPM
.00052	-3.191	30726	41,081	32,982	0.60	17,283
		30,371	40,052	33,189		.2719
.2786		30,462	40,429	32,800		
		.2674	.2760	.2723		
		15,260	20,094	16,498		
.00080	-2.661	46291	61325	49742	0.86	26,292
	Al = 412	46136	61066	49904		.4135
.3877		46957	61798	49990		
		.4071	.4216	.4118		
		23,231	30,698	24,948		
.001	-2.256	64,356	85,504	69,742	1.20	36,470
		64,462	84,141	69,279		.5736
.6145		65049	84,516	69,419		
		.5662	.5810	.5735		
		32,311	42,306	34,740		
.00115	-1.729	83,058	106,902	88,963	1.50	46,443
		83,230	107,318	88,864		.7312 ✓
.7951		82,464	106,794	88,380		
		.7265	.7348	.7324		
		41,459	53,502	44,368		

	Log N	"E"	1	2	3	A K	Avg
	.0013	-1.248	95226	123136	101783	1.70	54682
			96065	123211	103037		.8452
	.8966		96343	124361	103047		
			.8400 47939	.8486 ~~64796~~ 61,785	.8470 51371		
	.0014	-0.748	106313	136677	113799	1.82	59299
			106444	136633	112606		.9339
	.9651		106172	135335	113401		
			.9314 53155	.9354 68108	.9349 56634		
	.00142	-0.249	111,321	142,810	118,523	1.98	62375
			111,546	142,540	118,782		.9824
Avg CPM	.9793		113,247	144,253	119,732		
7,283			.9866 56019	.9834 71601	.9823 59506		
2719	.00145	0	114,031	146,294	121,704	2.02	63,486
	℄		114,093	145,426	120,848		1.000
	Al = 310		114,292	145,147	120,907		
36,392			1,000 57069	1.000 72811	1,000 60,577		
4135	.00141	0.26	112481	143723	119288	1.97	62,557
			112618	144252	118845		.9851
	.9724		112130	143172	119350		
36,470			.9849 56,204	.9870 71,886	.9836 59,581		
5736	.00138	0.75	108048	137961	115580	1.87	60162
			107977	137344	114903		.9478
	.9517		108771	137970	114360		
46,443			.9486 54133	.9460 68879	.9488 57474		
,7312 ✓							

CTA table down @ 12:20

Back to Normal @ 12:30

Ln	"E"	57060 / 1	72311 / 2	605 / 3	chA	AVG
.00126	1.25	98,464	126,116	104,927	1.72	54,623
		97,810	124,858	104,231		.8603
.8690		98075	124751	103982		
		.8596	.8600	.8615		
		49,058	62,621	52,190		
.00120	1.75	85,760	109,568	91,216	1.50	47,612
		85,447	108,824	90,799		.7500
		85,308	109,278	90,874		
		.7491	.7500	.7508		
		42,752	54,612	45,482		
.00096	2.249	69,181	87,389	73,253	1.23	38,483
		69,970	89,039	73,601		.6062
		69045	87,981	73,234		
		.6080	.6052	.6050		
		34,699	44,068	36,681		
	3,012	41,542	53,080	43,760	0.75	23,121
		41,787	53,388	44,014		.3644
		41,308	53,130	44,175		
		.3640	.3653	.3630		
		20,772	26,600	21,942		
.00043	3,257	31,655	40,120	33,073	0.58	17,477
		31,257	40,229	32,874		.2752
		31,262	40,161	32,958		
		.2750	.2756	.2749		
		15,696	20,088	16,651		
.000355	3,393	26,072	33,529	27,494	0.44	14,253
		25,566	32,409	26,860		.2243
		25,392	32,486	26,757		
		.2249	.2253	.2232		
		12,838	16,404	13,518		

AVG

,623
8603

,612
500

,483
6062

,121
644

,477
752

,253
248

Run #321 Raised top - Re-loaded, as per Run #320, went to positions as indicated, to check for change during run (time).

Log N	"E"				ch A	Avg
.00068	-2.661	49,457	63,603	53,014	0.87	27730
	Al = 412	49,465	63393	52,946		.4333
		50,066	63945	53,247		
	.433	24831	31823	26535	.4337	
.0015	0.0	114,243	145,536	121,155		63,997
		114,486	146,834	122,972		1.000
	Al=310	115,404	148,385	122,940		
		57,355	73,459	61,178		
.00057	3.012	41,986	54,068	44,419	0.75	23,378
		42,199	53 302	44,585		.3653
	Al=440	42036	53,593	44,608		
		.3668 21,037	.3652 26,830	.3640 22,269		

DATE NOV 10 1971 **SAFETY CHECK**

TIME 0825 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3 X10^{15}	OPR	1-10		900V	900V
SOURCE DIST.	2'	OK	4'		6"	OK
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED $RaBe$ & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 322 — Repeat of 3 points of p. 215 with Al shim fixed, at position for the center point.

Log N	"E" ± δ(in.)	1	2	3	dc "A"	Avg.
.00072	-2.661	48,308	63,105	52,129	0.92	27264
		48,264	63,265	51,706		.4294
		~~48,832~~ .4276	~~63,835~~ .4336	~~51,890~~ .4271		
		24254	31701	25858		
.0018	0	113733	146123	120304	2.04	63443
		113260	146113	122212		
		113064 1.000	146385 1.000	120868 1.000		
		56676	73104	60548		
	3.012	43,886	56,040	46,090		24,183
		43,295	55,538	46,220		.3813
		43,079	55,342	45,804		
		.3831	.3805	.3802		
		21,711	27,520	23,019		

DATE NOV 11 1971 SAFETY CHECK
TIME ~~AM~~ BY Jaylon Lyons

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	4-10		900V	900V
SOURCE DIST.	2'	OK	4'		6"	OK
% F. S. TRIP	100	=	=		100	100
BLDG. ALARM	✓	✓	✓			
AUX ALARM	✓	✓	✓			
SOURCES USED	Rube & Co^{60}					✓
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

Calibration

Rod Silsyn in.

6.695 → 6.006 = .89709

7.244 → 6.507 = .89826

Aug. .89768"/unit Silsyn

Loading = 12($\frac{1}{8}$") u Buttons + 1($\frac{1}{16}$") u Button

Run # 323 Dummy Cf traverse to establish ∞ for position ⊙ at shim for Cf point.

	Rod Silsyn	Shim Silsyn	± ℄ cm	± ℄ in.	TMC Ratio		Shim Silsyn D.C.
A,	7.448	450	~~7.448~~ -8.105	-3.191	+1.1277		640
2		550			+1.0649		
B,	6.858	550	-6.759	-2.661	+1.0264		590
2		650			-1.0169		
C,	6.406	650	-5.730	-2.256	-1.0453		520
2		450			+1.0829		
D,	5.819	450	-4.392	-1.729	+1.0528		500
2		550			-1.0532		
E,	5.284	450	-3.170	-1.248	+1.0132		465
2		420			+1.04226		

Log N = .001

	℄ Rod. Sel(cm)	al. Shim Sel.	±℄ (cm)	±℄ (in)	TMC Ratio	calc al Shim-Sel (D)
F, 1	4.726	450	-1.900	-0.748	+1.0034	460
2		400			+1.0211	
G 1	4.171	420	-0.632	-0.249	-1.0125	415
2		390			+1.0636	
℄ H 1	3.893	420	0.0	0.0	+1.0345	465
2		530			-1.0535	
I 1	3.604	530	0.660	0.260	-1.0782	455
2		480			-1.0282	
J 1	3.058	480	1.905	0.750	+1.0860	~ 460 490
		450			+1.0037	
K 1	2.501	450	3.175	1.25	+1.0282	465
2		550			-1.1398	
L 1	1.944	550	4.445	1.750	-1.0078	525
		500			+1.02470	
M 1	1.388	600	5.712	2.249	-1.0053	580
2		700			-1.0370	
N 1	0.538	700	7.650	3.012	-1.01187	680
2		650			+1.01962	

	℄ Rod	Al Shim Selsyn	± ℄ cm	± ℄ (in.)	TMC Ratio	775
0,	0.265	650	8.273	3.257	Fl.0454	
2		750			+1.0098	
	~~0.058~~					
P,	0.100	750	8,649 ~~7.897~~	3.405 ~~3.109~~	+1.0448	1085
2		900			+1.0248	

Run #324 - Down - Reload as Run #323.

more Dummy to: Let Al (servo) level -

℄ Rod Selsyn	Al shim	
6.406	504 ↔ 494	500
3,893	463 ↔ 448	455
1.388	645 ↔ 520	580

DATE NOV 12 1971	SAFETY CHECK					
TIME 0830 AM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	.3X10[10]	off	L40		900	900
SOURCE DIST.	2'	ok	4'		6"	ok
% F. S. TRIP	100		100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED	N & X			MAGNETS	✓	
TABLES ✓	LIGHTS ✓			AREA CLEARED ✓		

Run # 325 Reloaded for Dummy Cf.
Go Log N Power 2 .0068
Allow Servo (Al Shim) to level.

Rod & Selsyn	Servo Selsyn (Al Shim) (Extreme reading)	D.C.
7.448	740 ↔ 550	645
6.858	578 ↔ 574	575
6.406	480 ↔ 468	—
5.819	510 ↔ 448	480
5.284	477 ↔ 480	480
4.726	478 ↔ 464	471
4.171	468 ↔ 414	440
4.037	420 ↔ 462	440
3.893	454 ↔ 468	460
3.749	458 ↔ 452	455

Cont'

Rod	Servo		
3.604	448	⟷ 440	445
3.058	456	⟷ 466	460
2.501	488	⟷ 495	490
1.944	502	⟷ 536	519
1.388	536	⟷ 616	575
0.538	628	⟷ 752	690
0.265	656	⟷ 778	720

Lowered Bottom measured to end of ℄ Rod = 0.159"
Raised Top " " " = 0.179"
RAISED Bottom " " " = 0.182"

Run # 326 – Do Some positions by hand.

Set west pellet flush with edge.

E

Drop 1 pellet at flush – ℄ of E" = -2.690"

Log N	Ch "A"	Al Shim	BF3	2 min Counts #1	#2	#3	Avg. Cpm
.0006	0.90	580		49,627	64,173	51,932	
				50,110	64,150	51,824	27,618
				49,247	64,226	51,845	27,485
				24,830	32,092	25,934	
				.4464	.4513	.4478	

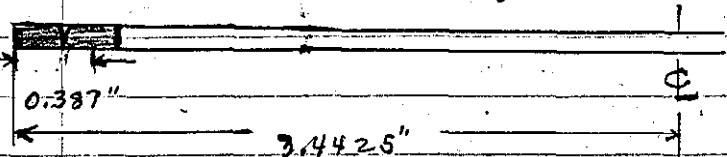
222

Run #32 0A Moved Center of Cf to Center of Sphere.

Log N	Ch A	Al Shim	#1	#2	#3
.0013	1.90	580	107,767	138,154	111,519
			107,344	137,912	112,138
			108,576	138,906	112,641
.0135	1.92	450	111,565	142,150	115,481
			110,652	141,824	116,442
			111,528	142,702	115,557
			55,624	71,113	57,913
			1.000	1.000	1.000

61,550

Run #32 0B Moved Center of Cf "E" to 3.056"



.00455	0.68	650	38,576	49,457	40,156	
			38,188	48,328	39,546	
			38,411	48,918	40,030	
			19,191	24,450	19,955	
			.3450	.3438	.3446	

Avg CPM: 21,199 : .3445

DATE NOV 15 1971 SAFETY CHECK.
TIME 0815 CHECKED BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	OPR	1-10		900V	900V
SOURCE TEST	2'	OK	4'		6"	OK
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu-Be & Co^{60} MAGNETS ✓
TABLES — LIGHTS — AREA CLEARED —

Run #327 Cf importance thru ℄ of sphere. Set positions by hand for accuracy. (E to W)

Log n	Ch "A"	± ℄ (in.)	#1	#2	#3	CPM
.00035	0.60	-3.151	30624	40,473	33032	17,480
		Al 0.004	31116	40,980	33181	.2850
		5640	31108	40,779	33359	
(0) (+40)			15,475	20,372	16,595	
.00052	0.93	-2.650	48,762	64,725	52,561	~~30,690~~
			48,972	64,971	52,421	27,720
(+40)		580	49,145	64,870	52,540	.4519
(1)			24,480	32,428	26,254	
.00065	1.22	-2.159	66419	86895	71174	38,151
			66761	86796	71482	.6130
		520	67150	87286	72285	
(2) (+30)			33,388	43,496	35,824	
.00080	—	-1.640	82830	107,618	88,928	46,608
			83521	107,020	88,290	.7607
(3) (+40)		485	83550	108,314	88,861	
			41,650	53,820	44,347	

Marginal notes: .2817, .2823, .2844 (run 0); .4447, .4600, .4449 (run 1); .6071, .6178, .6139 (run 2); .7777, .7647, .7600 (run 3)

Left margin: 61,550; 21,199 CPM; .3445

log N	Ch A	±t	#1	#2	#3		cpm
.00091	1.75	(min.)	96,960	124,159	103,674		53,880
		~~1.100~~ 1.138	96,493	123,577	102,826	.8840	.8798
④ (+40)			95,691	123,457	103,019		
		460	48,191	61,866	51,587		
.00097	1.87	0.637	105,246	135,326	111,228		58,714
			105,833	135,556	111,800	.9543	.9588
⑤ (+40)		455	105,674	135,082	111,831		
			52,792	67,661	55,690		
.00106	1.94	0.185	109,302	139,086	115,733		60,739
0			108,909	139,198	115,514	.9933	.9920
⑥		450	109,597	139,414	116,540		
			54,635	69,616	57,965		
.00104	1.94	0	110,280	141,472	116,641		61,242
(6.5) 0			110,158	140,509	117,088		1.000
		450	109,359	140,462	116,395		
			54,966	70,407	58,354		
.00104	1.93	0.356	109,085	139,060	115,640		.9922
			108,818	140,019	116,019		
(+40)		450	110,002	139,475	115,354		
⑦		.9942	54,651	.9908 69,759	57,869	.9917	
.00098		0.797	105,710	133,724	111,618		
			105,414	134,502	111,222		
⑧ -20		470	105,245	134,203	111,400		
			~~94,319~~	~~120,951~~	100,256		
			52,728	67,072	55,707		.9555
		440	.9593	.9524	.9546		

Right margin: ⑨ ⑩ ⑪ ⑫

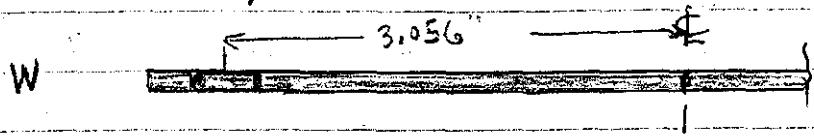
	Ch A	± (in.)	.8573	.8581	.8553	
			47,122	60,416	49,913	52,484
	1.66	~~1,398~~ 1,358	94,319	120,951	100,256	
⑨ +40			93,872	120,796	99,028	.8569
		490	94,573	120,750	100,196	
.00078	1.42	1,859	81,353	102,641	86,039	45,157
			81,316	103,731	85,973	.7375
⑩ +40			81,465	~~104,205~~	86,101	
		530	40,689	51,763	~~85,419~~ 43,019	
.00060	1.13	2,350	65,311	83,224	68,370	36,088
			65,610	83,006	68,684	.5893
			64,491	82,578	68,373	
⑪ +30		600	32569	41458	34238	
.00045	0.83	2.841	47,112	60,424	50,180	
			47,487	60,307	49,641	.4285
⑫ +30			47,147	59,969	50,012	.4279
		660	23624	30117	24972	
		3,307	29,418	37,058	30,583	
+0			29,252	37,138	30,889	.2643
-.292 +.276			29,139	37337	30,525	
.019		750	14635	18589	15333	
			.2662	.2640	.2678	
Source Away (5 min)			512	659	551	
Bkg Std.			506	638	539	
		cpm →	102	130	109	

DATE NOV 16 1971 SAFETY CHECK
TIME 0830 AM BY Taylor & Lipsi

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	CPR	L-10		900V	900V
SOURCE DIST.	2'	OK	4'		6"	OK
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED ~~Cube~~ Co[60] DOCKETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #328 C_5^E (center of source check)



"E" with Round End West, ℄ .387" from West edge of sphere. 2 min Counts.

Log N	Ch "A"	± ℄	#1	#2	#3	Avg CPM
.00041	0.68	+3.056	36,013	47,221	38,002	20,350
			36,317	47,639	38,558	
		Al shim 700	36,593	47,414	38,551	
			18,154	23,712	19,185	

Run #329 Same except Round END of "E" East.

.00036	0.64	+3.056	34,494	45,205	36,370	19,351
			34,763	45,574	36,707	
			34,337	44,678	36,202	
			17,266	~~24,243~~	18,213	
				22,576		

Run 329 b - Same except Al shim @ 680

.00036	0.66	+3.056	34816	45700	36887	19690
			35267	45797	37215	
			35233	45829	37453	
			17552	22886	18632	

Run #330 - "E" with Round End West, ℄ .387" from East edge of sphere.

E

.00035	0.65	-3.056	35,810	46,551	38,135	19,987
			35,502	46,386	38,290	
		Al Shim 640	35,199	46,045	37,848	
			17,752	23,164	19,045	

E E

Run #331 Same except Round End East.

.00035	0.68	-3.056	37,656	49,221	40,234	21,040
			37,050	48,399	40,200	
			37,219	48,877	39,869	
			18,637	24,416	20,051	

Run #331 b - Same except Al Shim @ 700

.00036	0.69		37,303	48,550	40,095	21,060
			37,504	48,503	40,179	
			37,762	48,794	40,385	
			18,762	24,308	20,110	

Run # 332 — Traverse "E" ℄ with the Round end of "E" facing east. E to W

E ——— ℄ ——— W

Log N	Ch "A"	± ℄ inches	#1	#2	#3	Avg. C PM
.00033	0.62	-3.151	33,726	43,863	35,905	18,969
			33,467	43,314	36,004	.3138
		Al Sim / 640 / 8,204	33,891	44,582	36,682	
			.3116	.3151	.3144	
			16,847	21,960	18,099	
.0005	0.94	-2.650	51,988	67,436	55,590	29,285
			51,931	68,046	55,487	.4845
		580	52,116	67,846	56,687	
			.4810	.4863	.4858	
			26,006	33,888	27,960	
.00063	1.23	-2.159	68,391	88,401	73,338	38,385
			68,600	88,436	73,578	.6353
	"	520	68,317	88,916	73,142	
			.6328	.6356	.6317	
			34,218	44,292	36,676	
.00085	1.72	-1.138	96,921	123,894	102,665	53,885
			96163	123534	102335	.8915
		460	96351	124277	103296	
			.8921	.8890	.8941	
			48,239	61,951	51,466	
.00095	1.90	~~-0.0~~ 0.0	108,759	139,519	115,818	60,693
		-0.024"	108,976	139,519	115,358	1.004
		450	108,528	139,629	116,376	
			54,377	69,778	57,925	
.00095	1.92	~~0.960~~	108,147	139,351	115,229	60,440
			108,068	138,339	114,837	1.000
		450	108,222	139,448	115,283	
			1.000	1.000	1.000	
			54,072	69,690	57,558	

log N	ch "A"	± ¢	#1	#2	#3	
.00079	1.62	+1,358	91,078	116,345	96,716	50,726
			90,921	116,526	96,504	.8343
		490	90,896 .8411	117,099 .8370	96,675 .8403	
			45,482	58,328	48,366	
.0004	0.79	+2,841	43,943	56,429	46,965	24650
			44,786	57,142	46,824	.4071
		660	44,377 .4103	56,503 .4067	46,738 .4069	
			22184	28346	23421	

285
1845

85
353

285
8915

93
1.004

40
080

11-18-71

2 min Background

#1	#2	#3
249	333	248
207	272	231
182	263	199

DATE NOV 17 1971	SAFETY CHECK					
TIME 10:00 AM BY Taylor & Lynn						
CHANNEL	A	B	C	D	E	F
RANGE	.3x10^10	open	1-10		900	900
SOURCE DIST.	2'	ok	4'		6'	ok
% F. S. TRIP	100	8	100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED N & Y				MAGNETS ✓		
TABLES ✓	LIGHTS ✓			AREA CLEARED ✓		

✓

Run #333 – Repeat Run #332.

Log N	Ch "A"	± $ inches	#1	#2	#3	Average CPM
.00035	0.60	~~3.191~~	30,819	40,984	33,400	17,491
0	Al Shim	-3.204	30,712	40,599	33,255	.2864
	640	8,138	31,253	40,853	32,969	.2780
			.2825 15,464	.2914 20,406	.2852 16,604	
.00052	0.94	~~2.661~~	49826	64,880	53,432	28343
+29		-2.677	49,901	65,731	53,654	.4642
	580		51,107	66,878	54,773	
			.4593 25,139	.4700 32,915	.4634 26,977	
.00064	1.27	~~2.256~~	69,952	90,569	75,024	39,256
+67		-2.137	69365	90653	74344	.6432
	530		70372	91015	75308	
			.6384 34,948	.6479 45,372	.6432 37,446	
.00076 +41	1.50	~~1.729~~	84,974	109,333	90,123	47,482
		-1.662	84,964	109,460	91,198	.7784
	490		84937	109,190	90,493	
			.7760 42,479	.7805 54,664	.7782 45,302	

232 Log N	CA"	(±) E inches	#1	#2	#3	AVG. CPM
.00084	1.67	~~-1.248~~	94,053	121,226	100,422	52,767
		-1.263	94,281	121, 313	101, 489	.8651
	470		94,442	121,602	100,983	
(-61)			.8610	.8666	.8671	
			47,129	60,690	50,482	
.00090	1.83	-0.748	103,631	133, 112	110,302	57,919
			103,508	132,964	110,710	.9495
	460		103,539	133,620	111, 158	
(-47)			.9459	.9512	.9510	
			51, 780	66,616	55,362	
.00091	1.92	-0.249	108,385	138,519	116,004	60,339
			108, 146	138,258	115,149	.9892
	450		107,928	138,680	115,037	
(-49)			.9879	.9887	.9911	
			54,077	69,243	57,698	
.00094	1.93	0	108,834	139,342	115,921	60,997
			109,747	139,962	116,774	1.000
	450	E	109,853	140,902	116,604	
(+200)			1.000	1.000	1.000	
			54,739	70,034	58,217	
.00091	1,92	+0.260	108,468	137,686	115,078	60204
			108,896	138,612	115,035	.987~
(+1)	455		107908 .9904	137771 .9854	114236 .9858	
			54212	69012	57389	
.00085	1,80	+0,750	103367	132291	111091	57708
			104037	132700	110375	.946
(-52)	460		102734	132757	109478	
			.9772	.9941	.9772	
			51690	66291	55142	
	480					

M	Log N	Ch "A"	± t inches	#1	#2	#3	cpm
767	.00079	1.65	1.250	93909	120712	100322	52,605
651				94798	120650	100364	.8624
	(-53)	480		95,022	120,975	100,135	
				.8638 47,288	.8623 60,389	.8612 50,137	
19	.00065	1.43	1.750	81974	104222	86785	45,204
95	(-54)	570	(X)	80883	103616	85677	.7411
				80750	103470	86,293	
				.7417 40,601	.7408 51,885	.7408 43,126	
339	.00054	1.13	2.249	65,155	83,268	69,383	36395 .5967
392	(-56)		(X)	65,414	83,623	69,094	
		570		65,764	84,080	69,327	
				.5978 32722	.5973 41829	.5949 34634	
997	.00033	0.68	3.012	38,749	50,121	40,783	21422
00				38,285	49,042	40,229	.3544
	(-44)	680	(X)	38,599	49,169	40,611	
				.3521 19272	.3530 24722	.3482 20271	
204			3.257	28437	36283	30073	15805
872				28424	36169	29759	.2591
	(-50)	750	(X)	28456	36578	30308	
				.2598 14220	.2595 18179	.2580 15023	
708			3.443	21162	26839	22228	11686
460	+136	7	(X)	21328	27238	22496	.1912
	or	900		20740	26669	22015	
	½ of "E"			20781	26752	22221	
				.1908 10501	.1929 13437	.1910 11170	

DATE NOV 18 1971 SAFETY CHECK

TIME 08:55 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3X10⁻¹⁰ amps		L-10		900	900
SOURCE DIST.	2'	off	4'		6"	out
% F. S. TRIP	100		100		100?	
BLDG. ALARM	✓	✓	✓			
AUX GRDS.	✓	✓	✓			

SOURCES USED N ≠ Y MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #334 — cf "E" & Traverse, Round End moving West.

2 min counts

Log N	16⁻¹⁰ Ch "A"	± ℄ inches	1	2	3	CPM
.00032	0.56	-3.204	29,017	38,494	31,449	16,466
Al shim			29,080	38,313	31,250	.2699
640		8.138	29,139	38,244	31,403	
0			.2664	.2740	.2697	
			14,539	19,175	15,684	
.00052	0.93	-2.677	48,737	63,797	51,359	27507
			48,608	63,755	52,200	.4510
580			49,410	64,468	52,791	
+29			.4482	.4573	.4476	
			24459	32003	26058	
		-2.137	66894	87571	72632	37,970
			67312	87677	72628	.6222
530			67725	88208	72819	
+67			.6167	.6274	.6226	
			33,655	43,909	36,347	
.0008		-1.662	82,857	106,975	88,534	46449
			83,117	107,876	88,782	.7621
490			82,954	106,556	88,421	
+41			.7602	.7654	.7607	
			41488	53568	44290	

L_N	ch A 10^{-10}	± ℄ (IN)	BF_3 #1	2	3	Avg. CPM
.00087	1.65	−1.263	92,961	119,214	98,644	52,127
			93,789	120,317	100,599	.8554
470			93,200	120,328	99,232	
−61			.8549	.9570	.8544	
			46,658	59,977	49,746	
.001	1.82	−0.748	104,009	132,754	110,996	57,736
			102,908	132,450	109,643	.9477
460			103,256	132,588	110,645	
−47			.9473	.9474	.9483	
			51,696	66,299	55,214	
.00104	1.92	−0.249	108124	138057	115120	60306
			108415	139300	115305	.9895
450			108 018	138142	115022	
−49			.9912	.9915	.9946	
M			54093	69250	57575	
466		0.0	108871	139985	116319	60926
899			109234	139916	116259	1.000
		℄	109341	139998	116243	
450			1,000	1,000	1,000	
+200			54574	69983	58220	
507	.00097	1.90	+0.260	107,868	138,217	114,912
10			107,925	137,871	114,331	.9894
455			109,032	138,854	116,080	
−41			.9920	.9882	.9886	
			54,138	69,157	57,554	
70	.00094	1.85	+0.750	104,178	132342	110,238
22			103,627	132,333	109,939	57,848
460			104,193	132,632	141,380	.9498
−52			.9540	.9462	.9491	
			52,066	66,218	55,260	
49	.00088	1.67	+1.250	94,825	121,383	100,733
21			94353	122,032	101,143	52761
			95,371	120,438	100,496	.8659
480			47245	60642	50395	
−53			.8657	.8665	.8656	

236 Ln	chA $\times 10^{-10}$	± ℄ (in)	BF# 1	2	3	avg.
.00025	1.48	1.750	82350	105056	86572	43838
			83089	104878	87582	.7523
⊗ -54	520		82324 .7506	104495 .7512	87713 .7496	
			41,294	52,572	43644	
.00062	1.17	2.249	67,230	85,709	71,000	37,225
			67,032	85,283	70,800	.6110
⊗ -56	570		66,849 .6142	84,550 .6110	70,598 .6080	
			33,519	42,757	35,400	
.00033	0.69	3.012	39,787	50,186	41,635	21,977
			39,981	50,411	42,070	.3607 .3596
⊗ -44	680		39,599 .3641	50,243 .3593	41,622 .3588	
			19,895	25,148	20,888	
		3.257	30,205	38,810	31,822	16883
⊗			30,861	38,856	32,347	.2771 .2759
-50	750		30,731 .2803	38,452 .2765	31,804 .2747	
			15300	19353	15996	
.00027	0.43	3,443	22,574	29,000	23,718	12,304
			22,037	26,367	23,401	.2020 .2036
⊗ +136	900		22,337 .2045	28,466 .1997	23,559 .2023	
			11,161	13,972	11,780	
.000175	0.33	3,579	18,629	23,868	19,889	10,369
			18,761	23,902	19,824	.1702 .1688
	900		18,690 .1624	23651 .1701	19613 .1693	
			9,348	11,904	9854	
.000169	.032	3,579	17667	22740	18634	9746
	900	Round end East	17394	22214	18231	.1599 .1576
			17425 .1608	22523 .1607	18,594 .1588	
			8748	11246	9243	

SAFETY CHECK

DATE NOV 22 1971

TIME 11:09 AM/PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3 x 10^-10	Off R	L-10		900V	900V
SOURCE DIST.	2'	✓	4'		6"	✓
% F. S. TRIP	100	–	–		100	100
BLDG. ALARM	✓	✓	✓			
AUX. CHTS.	✓	✓	✓			

~~SOURCES USED~~ Pu Be & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #335 – Reactivity Check for Rossi α.

8 – 1/8" U Buttons on. He Detector in place.

Al Shims = 9/10

DATE NOV 24 1971 SAFETY CHECK

TIME 13:40 MADE BY Taylor & Lynn

[illegible]	A	B	C	D	E	F
[illegible]	.3x10^10 gr L-40				900	900
SOURCE DIST.	2'	oK	4'		6"	oK
[illegible]	100		100		100+	
[illegible]	✓		✓	✓		
ADV. [illegible]	✓		✓	✓		
SOURCE [illegible]	N & γ					✓
TABLE ✓			✓			✓

Run # 336 - Loading = 7 - 1/8" U & 1 - 1/16" U Buttons.

Up #1 = 22,335 #3 = 0 #4 = 0

k ∞, Al Shim @ 360

Log N = .0001
"C" = 52 @ L-15

log N ≈ .00055
"C" = 67 @ L-22 Al Shim ≅ 400

Down @ 15:00

DATE NOV 29 1971 SAFETY CHECK
TIME 08[40] BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3×10⁻¹⁰	CPR	L-10		900V	900V
SOURCE DIST.	2'	✓	4'		6"	✓
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX GEGS.	✓	✓	✓			

SOURCES USED PuBe & Co60 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run# 337 - Rossi α as per Run# 336.

Data Collection Start @ 09:10
Down @ 14:03

Log N = .0005
"C" = 63 @ L-22
"A#1" = 39 @ 3×10^{-10}

DATE NOV 30 1971 **SAFETY CHECK**

TIME 0820 AM ~~PM~~ BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	.3 X 10^{-10} OPR		L-10		900V	900V
SOURCE DIST.	2'	"	4'		6"	"
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CTR'S.	—	—	—			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES — LIGHTS ✓ AREA CLEARED —

RUN #338 - Cont'd. Rossi L

Log N = .0001 Data Collection Start @ 08:38 A
Down @ 15:50 P

DATE DEC 6 1971 SAFETY CHECK
TIME 09:30 AM/PM BY Lynn & Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	ops	L-10		900	900.
SOURCE DIST.	8'	OK	5'		6"	OK
% F. S. IOP	100		100		100+	—
BEAM ALARM	✓	✓	✓			
AUX. SIG.	✓	✓	✓			

SCHOLD LOOP N & 8 LIMITS ✓
TALLIES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 339a – Loading = 6 (1/8") + 1 (1/16") U Buttons

He³ & Cf Dummy in Place.

~~k×∞~~, Log n = .0005

k > 1 "C" = 58 @ L-22

1590 sec ΔL = 399
0.78¢

Down ~~[illegible]~~

339 b – Down Replace Dummy with Cf ⓒ
Oscillate Top 50 cycles.

.8 min/cycle Down @ 12:08

Run # 340a – Dummy in Place.
15 min – Rossi α.

340 b – Cf ⓒ Repeat # 339 b.
50 cycles

Run # 341a - Dummy in Place.

15 mg Rossi α

#341 f - Cf

1 min / cycle, 40 cycles

Down 16:08

DATE DEC 7 1971	SAFETY CHECK					
TIME 09^15 AM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	$.3\times10^{-10}$	OPR	L-10		900V	900V
SOURCE DIST.	1'	✓	2'		6"	✓
% F. S. RESP	100	—	—		100	100
	✓	✓	✓			
AUX. CHAS.	✓	✓	✓			
SOURCES USED	Co^{60}					
TABLES ✓	LIGHTS ✓	AREA CLEARED ✓				

audibility check was made thru-out bldg of the beep, beep alarm on East End

Run #342 a Removed 1 (1/16") U-Button
@ shim ≃ 360 (dial)
Ln = .0005 A 38 (100 scale) on 3×10^{-10}.

Dummy Cf on East – He detector on West.

15 min. Rossi ∠ JTM = p.223

#342 b – Cf on

2 min cycles, 15 cycles 30 min

Run #343 a – Repeat #342 a ~~30~~ 15 min

b – " b 15 cycles 30 min

Run #344 a – Repeat #342 a 15 min

b " b, except 17 cycles. 34 min

Run #345 a – Repeat #342 a 15 min

b " b, except 20 cycles 40 min.

Down @ 16:00

SAFETY CHECK

DATE DEC 8 1971

TIME 08:25 AM BY Lynn & Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	.3×10⁻¹⁰	opr	L-10		900	900
SOURCE DIST.	2'	ok	4'		6"	ok
% F. S. TRIP	100		100		100+	
BLDG. ALARM	✓	✓	✓			
AUX OTRS.	✓	✓	✓			

SOURCES USED N & 8 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #346a — 6 (1/8") U Buttons. ∞ Al Shims.
Cont'd Rossi α. (Double)
Cf — 2 min cycles, 30 cycles

11:05A #346 b — Dummy Cf 15 min Single

Run #347 a — Repeat 346a = 30 cycles
b — " b = 15 min

Run #348 a — Repeat 346a = 11 cycles

Sheared pin in top drive after 11 (2 min) cycles. Down @ 1410 hrs.
A new shear pin was installed and the up & down positions verified.
Pin = 1/8" × 1" with @ .096" hole in its center. (al)
JRL

DATE DEC 9 1971 SAFETY CHECK

TIME 0835 AM BY Taylor & Lyman

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	OPR	$2 \cdot 10$	}	900V	900V
SOURCE DIST.	2'	O/L	4'	}	6"	OK
% F. S. TRIP	100	—	—	}	100	100
BLDG. ALARM	✓	✓	✓			
AUX OTPS.	✓	✓	✓			

SOURCES USED Ra Be & Co 60 MAGNETS ✓

TABLES ✓ LIGHTS — AREA CLEARED ✓

239

Run #349 a Reset stops for table to stop sooner by about 40 mils. Run

~~Delta~~ # 1 = 22.31, VDT #3 = +6, VDT #2 = +6

Cont'd Top Oscillation.

Cf ≅, 2 min cycle, 30 cycles

Timer Trouble, failed to raise top.

#349 b - Singe, with dummy Cf 15 min

Run #350 a — 1 min 59 sec cycle; 20 cycles

b - Repeat 349 b 15 min

Run #351 a - Repeat #350 a 20 cycles

2:22 PM b " #349 b 15 min

Run #352 a — Repeat #350 a 20 cycles

b " b 15 min

Down 16:00.

DATE DEC 10 1971 SAFETY CHECK
TIME 0850 AM PM BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	OPR	L-10		90V	90V
SOURCE DIST.	2'	OIC	41		6"	OIC
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	⌣	⌣	⌣			
AUX CTRS.	⌣	⌣	⌣			

SOURCES USED ~~Bi Be~~ Co60 MAGNETS ⌣
TABLES ⌣ LIGHTS ⌣ AREA CLEARED ⌣

* Run #353 a) Cont'd Rossi α. $\log N = 1000.5$
Cf Dummy, Single, 15 min

353 b Double Cf^c 2 min cts., 30 sec wait, 20 cycles
Cf^c touching on East, He ctr. touching on West side.
Pk oscillation example: ABLE ($1 \times 10^{-10} = 202$); CL-14@78

Run # 354 a – Repeat 353 a
" b_1 – Double, 2 min/cycle, 10 cycles
" b_2 – " " , 15 cycles

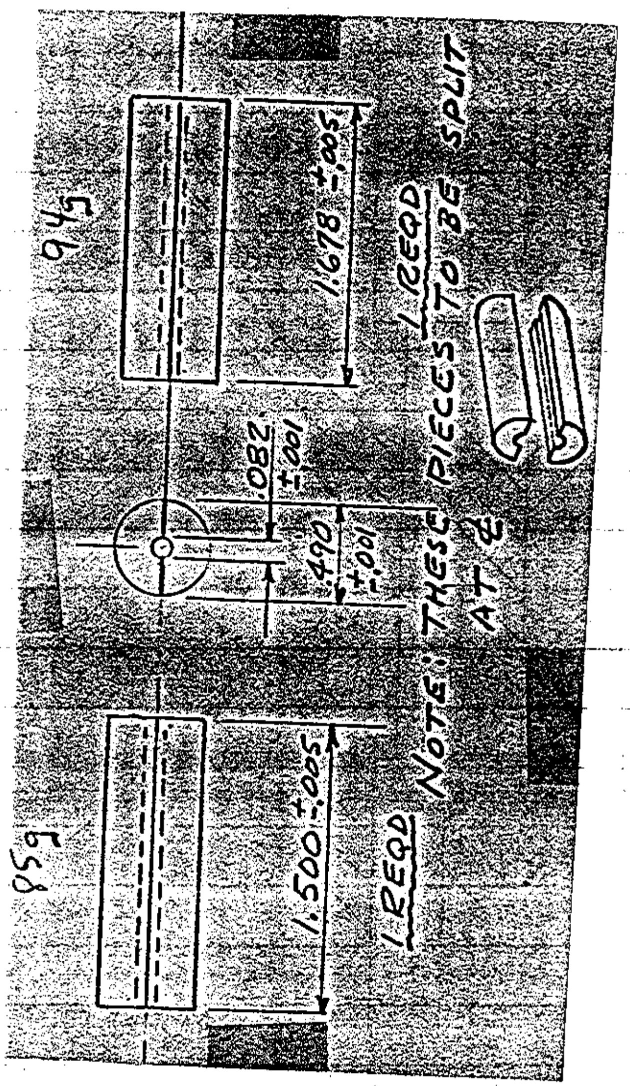
Run # 355 a – Repeat 353a
b – 2 min/cycle, 15 cycles.

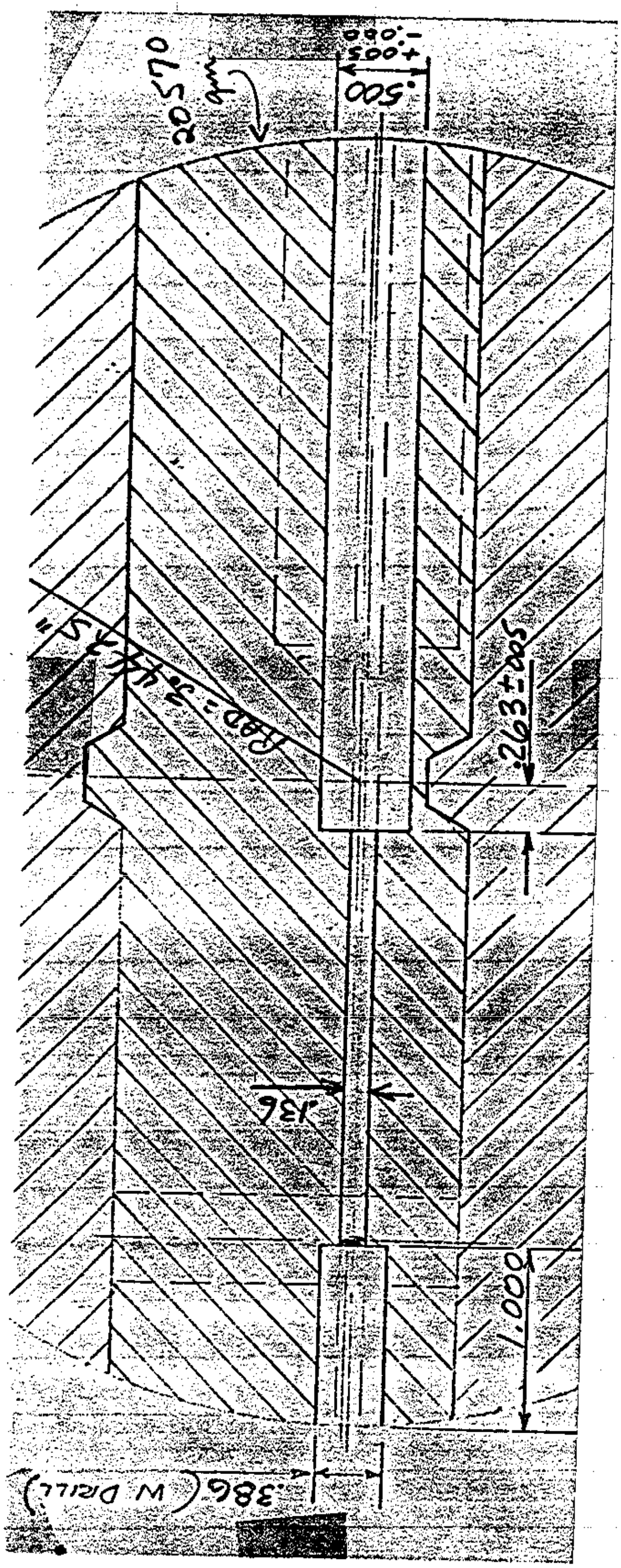
Run # 356 – Repeat 353a 15 min

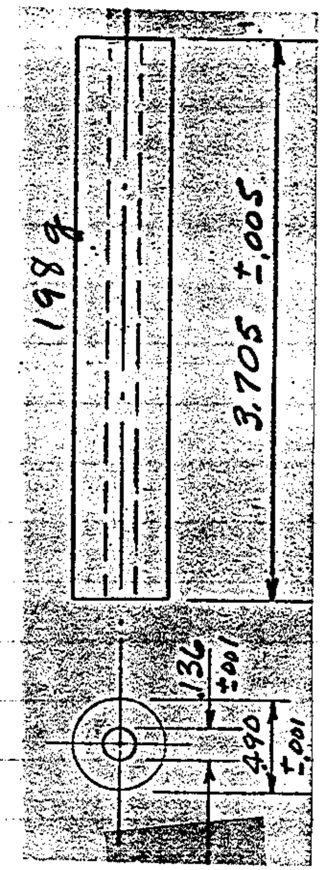
JAN 27 1972

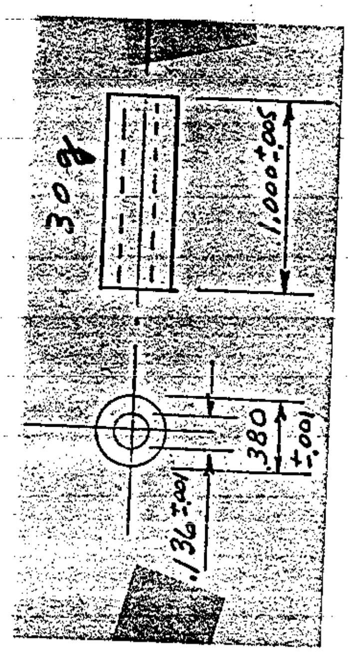
Central fuel piece has been altered and returned to 9213 on 26 Jan 72.
Mass main center piece = 20570 g.
Mass of 2 (½'s) 1.678" long = 94 g.
" " " " 1.500 " = 85 g.
Installed fuel onto hangers as before and aligned.

Mass of 3.705" long = 198 g
" 1.000 " = 30 g




.500
+.005
-.000
20.570
RAD=3.445"
.263±.005
.136
1.000
.386 (W. DRILL)


1.98 g
3.705 ±.005
.136 ±.001
.490 ±.001


1,000±.005
.380 ±.001
.136±.001

MIHALCZO
LYNN
TAYLOR

DATE JAN 27 1972 **SAFETY CHECK**
TIME 15 20 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$ OPR		$\lambda - 10.3 \times 10^{-10}$		900V	900V
SOURCE DIST.	2'	✓	6'	2'	6"	@
% F. S. TRIP	100	—	—	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX OTRS.	✓	✓	✓			

SOURCES USED $PuBe$ & Co^{60} MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

SEE P. 248 & 249

Run 354 Loading – 8 (1/4") U Buttons + 8 (1/8") U Buttons.
Plugs in Holes, NO Counters.

1 min c/s	#1	#2
15 sec	1972	2328
wait	1392	1706
	876	1089

$k < 1$, ~ 25¢

up #1 = 22.31
#3 = +6
#4 = -2

DATE JAN 2 8 1972 SAFETY CHECK
TIME 0850 AM BY Taylor & Lyn

CHANNEL	A	B	C	D	E	F
RANGE	$.3\times10^{-10}$	ORR	L-10	$.3\times10^{-10}$	900V	900V
SOURCE DIST.	2'	✓	5'	2'	6"	@
% F. S. TEMP	100	—	—	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX. CHNS.	✓	✓	No			

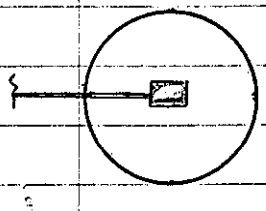
SOURCES USED $PuBe$ Co^{60} MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #355 — 16 (¼") Buttons. Plugs in. No Counters. R

$k < 1$,

#1	#2	Log N
−146 sec	−145.5 sec	−412
−12,5 ⁻⁴	−12,56 ⁻⁴	−3.4⁻⁴

Run #356 — Fission Counter now at Center of Sphere.



$k = 1$ @ Al Shim = 120

TYPICAL INST. RELATIONSHIP: $\lambda N = .00095$, C: L^8@65, A = 1×10^{-10}@77, D: 3×10^{-10}@58, BF_3 #2 = 50387 CPM

DATE FEB 2 1972 SAFETY CHECK
TIME 10 30 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3X10^{-10}	OPR	2-10	.3X10^{-10}	900V	900V
SOURCE DIST.	2'	OK	5'	2'	6"	@
% F. S. TRIP	100	—	—	100	100	100
BLDG. ALARM	✓	✓	✓			
ADA CTRS.	✓	✓	✓			

SOURCES USED Pu-Be & Co^{60} LASERS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #357 Rossi-alpha @ Delayed Critical. (Pg 11 of JTM book)
- W-Spiral - Fiss chamber inside @ center of sphere.
- Al shim (servo) @ ~1"

MASS: TOP = 12043g, TOP Ball socket = 64g, Center section = 20570g,
Bottom = 20310g, 1"x.38" filler = 31g, 2½"x.136" = 9g,
1.678"x.49" = 94g, 1.5"x.49" = 85g, 16 (¼" buttons) = 703g
TOTAL = 53909g

11:05 Up @ .003 hr. C = 2'0@65
16:15 DN

SAFETY CHECK

DATE FEB 3 1972
TIME 0835 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	6-10	$.3 \times 10^{-10}$	900V	900V
SOURCE DIST.	2'	✓	5'	2'	6"	@
% F. S. TRIP	100	–	–	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX OTRS.	✓	✓	✓			

SOURCES USED PuBe et Co^{60} MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #358 Same as #357 for Rossi-alpha (pg 16 JTM Log).
∞ via auto servo.
11:25 Up @ .003 kw
16:15 Dn

DATE FEB 4 1972 SAFETY CHECK

TIME 0820 AM PM BY Taylor & Lyman

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	$\lambda \cdot 10$	$.3 \times 10^{-10}$	900V	900V
SOURCE DIST.	2'	✓	5'	2'	6"	@
% F. S. TRIP	100	—	—	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED ~~Rubee Co~~ Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS — AREA CLEARED —

0s). Run #359 ADD He^3 counter to West side of sphere.
Remove 2 (1/4") U-Buttons. (ref run #357)
∞ via auto shim (@ ~ 2") @ .0001 Ln
(See Pg 18 of this log) Charlie = L^{15}@47
Up@08:45 Dn@13:35 for shim adjustment
& U-Button change
Remove 1 (1/4) & add 1 (1/8) U-Button
Run #360 Cont above data collection @ same power.
Up@13:45
Total buttons = 13 (1/4") & 1 (1/8") U-Buttons,
∞ shim @ ~ 1" now.

DATE FEB 10 1972 **SAFETY CHECK**

TIME 0910 AM PM BY Taylor-Lynn

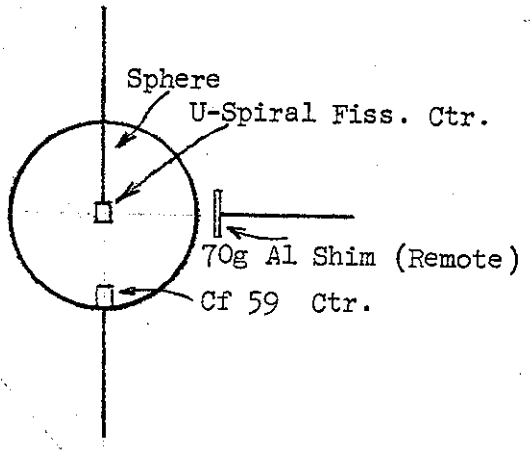
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OR	1/10	$.3 \times 10^{-10}$	900V	900V
SOURCE DIST.	18"	✓	5'	20"	6"	@
% F. S. TRIP	100†	—	—	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS — AREA CLEARED ✓

Run #361 Removed 1 - 1" fuel rod on South and replaced with CF 59 CTR.
ON 15:16 (1/4") U Buttons.

TOP VIEW



Power LN = 0.08 → SHIM = 0.2"
C@1123 = 60%
C = 2910 sec + 0.43¢
A = 3350 sec + 0.38¢
D = 2880 sec + 0.44¢
avg 0.42¢

TOTAL FUEL MASS = 53878g
(REF. Pg 255)

Run #362 Cycling TOP for Rossi-Alpha data (JTM Pg 28)
PEAK: 2 MIN CT, 30 sec wait (IN-OUT 4") LN = .0004, C = L²⁰@55
Sheared safety pin on TOP STOP @ 1140

Remove sheared Al pin. Installed a roll pin which fits tight. DIA. of shear pin hole = 0.136"

Run #363 Same for checkouts via JTM. (JTM Pg 29) On test installed a solid stop for the bottom of top drive traverse.

Run #364 More of same.

DATE FEB 14 1972 SAFETY CHECK
TIME 0950 AM PM BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10} DPR	L10	3×10^{10}	900V	900V	
SOURCE DIST.	18"	~	5'	2' 6"	@	
% F. S. TRIP	100	—	—	100	100	100
BLDG. ALARM	—	~	~			
AUX OTPS.	~	~	~			

SOURCES USED RUBE & Co 60 MAGNETS ~
TABLES — LIGHTS ~ AREA CLEARED ~

Run #365A Period check as is: ch A = 2760 sec - 0.45¢ 0.53
ch D = 2140 sec - 0.61¢

B High Power Inst Relationship @ ∞ Shim = ≈ .18
hv = 0.35 or est. 0.5 (considering saturation)
C: L^{28} @ 78, A: 10^{-7} @ 26, D: 10^{-7} @ 67, F: min. volts (~630) = 0.56, Bldg alarms = [A=160 MR, B=65 MR, C=80 MR].

Run #366 Various LASL etc. equipment data collection (see JTM Pg 30) (as run #362) Cycling etc.

Run #367 Check level (ref #365B)
A = -3450 - 0.37¢
D = -3100 - 0.42
avg - 0.40¢

DATE FEB 14 1972 SAFETY CHECK

TIME 0830 AM PM BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	1^{-10}	3×10^{-10}	900V	900V
SOURCE DIST.	2'	✓	5'	2'	6"	@
% F. S. TRIP	100	—	—	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED ~~Ra 226~~ Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Installed a Tc under a U-Button. Temp. OSC'd from 23.0°C to 25.3°C ≃ 1 cycle per hour.

Run #368 Reactivity Check @ high power LN: 0.3

Ch A = +3350 sec +0.38 ¢

Ch D: +3300 sec +0.38 ¢

Ch C: +2950 sec +0.42 ¢

avg. +0.39 ¢

Run #369 LASL Data collection. (from Pg 33) (as run #362) Cycling etc.

Run #370 Recheck reactivity (ref run # 368)

Ch A = +2166 sec + 0.58 ¢

D = +2290 sec + 0.55 ¢

avg +0.57

Run #371 More LASL data

DATE FEB 15 1972 **SAFETY CHECK**
TIME 0825 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	Same	→	→	→	→	→
SOURCE DIST.	2'	5'	2'	6"	@	
% F. S. TRIP	180	—	—	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe & Co60 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #372 Reactivity Check (as run #368) Shim dial = 20
A = +2560 sec + 0.49¢ → avg +0.51¢
D = +2340 sec + 0.54¢

Run #373 HASH data collection (as run #362) (JTM Pg37)

Is the Reactivity Check "above" the Cf^{59} Source?

	LN	+Period SEC	¢	CONDITIONS
(1)	0.38	2480	0.51	Reactivity check (Run #372)
	0.00043	262	4.31	During steady Rossi-Alpha-Run.
	0.00084	312	3.68	"
	0.0013	645	1.87	"
	0.00173	762	1.60	"
	0.00258	1009	1.22	"
	0.0046	1273	0.97	"
	0.0080	1566	0.80	"
(2)	0.0105	1600	0.78	"
	0.020	2320	0.54	"
(3)	0.038	2500	0.50	"
(4)	0.030	2200	0.57	Reactivity check (Run #374)

NOTE: Item (1) & (4) compares to item (3) however item (2) is usually as high as Rossi-alpha goes. Looks OK.

Run #374 Reactivity Check @ 1610 hrs.

D = +2250 sec +0.56 ⎫ 0.57 avg
A = +2273 sec +0.56 ⎬
C = +2100 sec +0.59 ⎭

DATE FEB 16 1972 **SAFETY CHECK**
TIME 0820 AM BGC BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	1^{10}	$.3 \times 10^{-10}$	900V	900V
SOURCE DIST.	2'	✓	5'	2'	6"	@
% F. S. TRIP	100	✓	✓	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX OTR'S.	✓	✓	✓			

SOURCES USED Pu Be & Co^{60} MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #375 Reactivity check: $L_m = 0.3$ Shim ~~bd~~ = 35
C = +35000 sec; A = +29000 sec → Avg = +32000 sec
tc 0900 = 25.5°C tc @ 1530 = 24.3°C. (= +0.03

Run #376 LASL data collection. (as run #362) (JTM 206. Pg 40)
Cycling etc.

Run #377 Recheck reactivity (ref run #375)
∞ as per C-A & D.

Ru

DATE FEB 17 1972	SAFETY CHECK					
TIME 0820 AM	BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	✓	✓	✓	✓	✓	✓
SOURCE DIST.	2'	✓	5'	2'	6"	@
% F. S. TMP	100	✓	✓	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED PuBe & Co^{60}	MAGNETS ✓					
TABLES ✓	LIGHTS ✓	AREA CLEARED ✓				

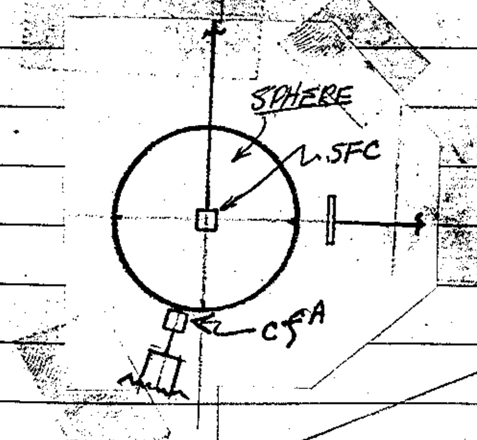
Run #378 Remove Cf^{S9} from Sphere - Replace with 34 g. of fuel. (Ref run #361) Put a Cf dummy on outside of Sphere surface. Make Reactivity check.

MASS = 53912 g

∞ with al shim ~~do~~ @ 290 as per C, A, D, Lw.

tc @ 10:45 = 24.85°C

tc @ 15:05 = 24.7°C



Run #380 Reactivity Check:
D = +2535 sec +.49¢ } 0.55¢
C = +2107 sec +.62

Run #379 LASL data collection (Ref JOM B944) VIA Cf A
Peak: 4 min ct, 30 sec wait, C = L12 @ 74 Lw = Est .00008
Cycling etc.

DATE FEB 18 1972 **SAFETY CHECK**
TIME 0945 AM BY Taylor & Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	OPR	2^{10}	3×10^{-10}	900V	900V
SOURCE DIST.	2'	✓	4'	2'	4'	✓
% F. S. TRIP	100	✓	✓	100	100	100
BLDG. ALARM	✓	✓	✓			
AUX OVER.	✓	✓	✓			

SOURCES USED ~~Pu-Be~~ Cf MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 381 Reactivity Check as run # 378 but using a dummy Cf^2 (stainless Steel) shim sel = 800
C = +23400 sec
A = +23500 sec
D = +22000 sec
avg +23000 sec $\lambda_n = .0028$

Run # 382 Cf^2 now replaces the dummy - Cycling etc. LASL etc data collection (JTM Log Pg 46)
EXAMPLE PERIOD: 2 MIN CT, 30 sec wait, C = L19@65, $\lambda_N = .0003$

tc @ 11:00 = 24.9°C ; @ 14:15 = 24.7°C

Run # 383 Dummy Cf^2 now replaces Cf^2 Reactivity Check
C = +4723 sec = .27 ¢
A = +3123 " = .40 ¢
D = +3835 " = .33 ¢
0.33 ¢

DATE FEB 22 1972 SAFETY CHECK -
TIME 08:45 AM PM BY Lynn & Rohrer

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	opr	1×10	$.3 \times 10^{-10}$	900	900
SOURCE DIST.	2'	ok	5'	}	6"	ok
% F. S. TRIP	100	—	100	}	100+	100
BLDG. ALARM	✓	✓	✓			
AUX CKTS.	✓	✓	✓			

SOURCES USED RaBe + Co MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Scram light on — no other indications.
Pushed all instruments resets. No Results.
Called E R R — found Power Supply to "D" out.

Run # 384 — Back to SFC & Cf 59, See p. 258

Reactivity Check "C" = 72 @ (H = 22 ?
"A" = 42 @ 1×10^{-9} ?

Log = .14

with Servo = 32

Run # 385 — Cycling Top — 2 min cto. (See JTM p. 49)
Then Steady Run (30 mins. maybe)
t C @ 11:00 = 25.6° C 16:20 24.5° C

JRT in @ 1500 hrs.
Ionics Model 630 returned to rack.

Run # 386 Reactivity Check = C = -4900 ish, — 0.26 ¢

FEB 23 1972 SAFETY CHECK

BY JTM & IC

	A	B	C	D	E	F
	3×10^{-10}	opr	L-D	0	900	900
	2'	✓	3'	↓	4"	✓
	100	–	✓	↑	100	100
	✓	–	–			
	–	✓	–			
	R Bc - Cr				✓	
	✓	✓			–	

Assembled to DC LN 0.3

#Run 387 A REACTIVITY CHECK A + LN Pos

$\frac{50}{77.5}$ in 5 min on C

+ 18798 sec

#387 B Raised Top + lowered to lower Power on LN to 0.07 to see if same rod effects ρ determination

Negative period on C

$\frac{73}{69}$ in 5 min on LN + A negative

−5323 sec −0.24¢

#Run 387 C RAISED TOP AGAIN AND LOWERED IT BACK

LN 0.04

$\frac{366}{345}$ −7>49 sec −0.18¢

Run #388	Cycling 2 min. See JTM p 54 -
	JCT & ... in @1500 hrs.
Run #389	Reactivity check preceding JTM "H" $\Delta N = 0.24$
	ΔN & "C" = ∞
Run # 390.	Cont ... calibration. Steady & Cycle.
Run # 391	Reactivity check preceding JTM "J" $\Delta N = 0.24$
	$k < 1$ = -2630 sec, -0.49¢ as per Charlie
	Move Shim in slightly: ΔN & C = ∞
Run #392	Cont: Steady & Cycle
Run #393	Reactivity check preceding JTM ("L") $\Delta N = 0.21$
	C = -18000 sec
Run # 394	Cont: Steady & Cycling
Run # 395	Reactivity Check: preceding JTM "N" $\Delta N = 0.22$
	ΔN & C = ∞
Run # 396	Cont: Steady

DATE FEB 2 4 1972	SAFETY CHECK					
TIME 0825 AM	BY JTM + JC					
CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	opr	L-10	0	900	900
SOURCE DIST.	2'		3'	4	3'	✓
% F. S. TRIP	100%		100	T	100	
BLDG. ALARM	✓	✓	✓			
AUX. CHRS.	✓	✓	✓			
SOURCES USED PuBe Co^{60}		MAGNETS OK				
TABLES OK	LIMITS OK	AREA CLEARED ✓				

Run #397 REACTIVITY CHECK

TABLE DROPPED DOWN THRU HYDRAULIC RUNDOWN

F dropped table magnet release without scram

VDT 3 +8

VDT 4 +0

A meter 2.2×10^{-8}

LN 0.24

C H-28 65

∞ Period LN + A C + $\frac{65}{64}$ in 5 min.

Shim @ 25

Run# 398 Reactivity Check preceding JTM "K" LN=0.28

C = +2270 sec; +0.56¢ LN = +2270 sec; +0.56¢

#399 ~~[illegible]~~ Cont. & cycling

#400 Reactivity Check after JTM "M" LN = 0.3

C = +2490 sec; 0.51¢

→ Move shim slightly out, = 31.

LN & C = ∞

Run #401 Cont & cycling

TC @ 16:15 = 24.5°C
20:50 = 24.6
22:40 = 24.6

Run #402 Reactivity check:

"C" = +4798 sec   +0.26¢

lea

.5

N=0.28
-0.56¢

0.3

FEB 25 1972

SAFETY CHECK

DATE FEB 25 1972 TIME 8:25 AM BY JTM + I.C.

CHANNEL	A	B	C	D	E	F
RANGE	3×10⁻¹¹	oper	L-10	0	900	900v
SOURCE DIST.	1"	ok	4'	✓	2	0
% F. S. TRIP	100	ok	✓		100	100
BLDG. ALARM	✓	✓	✓			
AUX SYS.	✓	✓	✓			

SOURCES USED Pu-B - Cf DOSSETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

JTM log Pg 67

Run #403 Reactivity check LN 0.27 ∞

VDT 3 +7.8 A 27 10×10⁻⁸ ∞

VDT 4 +3.0 C 77 H -28 - 75.8/74 5 min

Run Cf 59 in hole —12483 sec

C & D SHim 42

Run # 404 Thermocouple came loose site Took it out

+ screwed down Bubble screw

Reset SHim 49 = ∞

15:00 SRT & JLL in for 15:00 — 23:00 shift.
Remote source found "in". Has been in all day but is of no significance as per JTM.
Removed remote source and con't data taking.

Run# 405 Reactivity check after JTM "J" LN @ 0.2
LN & C = ∞

#406 Continuous and Cycling runs.
#407 Reactivity check after run "N"
C = -3,000 sec ie ∞
#408 Continuous & cycling runs. End of shift at end of "C".

FEB. 28 1972

SAFETY CHECK

DATE 2.28 1972
TIME 08:40 AM BY Mihalczo & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3×10⁻¹⁰	opr	L-10		900V	900V
SOURCE DIST.	6"	0	5'		6"	ok
% F. S. TRIP	100	"	100		100+	100
BLDG. ALARM	✓	–	–			
AUX. CTGS.	–	–	–			

SOURCES USED PuBe Cf[252] MAGNETS ok
TABLES ok LIGHTS ✓ AREA CLEARED ✓

Run #409 Reactivity check — up #1 = 22.188 ; #3 = +7 ; #4 = +1
Log N = .28 ; "C" = 78 @ H-28 ; "A" = 90.5 @ 3×10^{-8}
Servo = 30 Cf[252] & SFC as p. 258
k = 1

Continuation of alternating oscillating and steady runs.

JTM p. 74	Steady (Single)	Time	Oscillating (Double)
Log N = .002	C	0939	—
	—	1021	D
Log N = .002	E	1118	—
	—	1156	F

Run #410 Reactivity check — "C" = +9280 sec, +0.14¢
"A" = +12600 " , +0.10¢

Log N = .0008 Servo = 35	G	1326 PM	—
k = 1	—	1405	H Timer NOT STOP on 2'
	—	1453	H
Log N = .0028	I	1600	—

DATE FEB. 29 1972 SAFETY CHECK

TIME 08:30 AM PM BY Mihalczo & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	opr	L-10		900V	900V.
SOURCE DIST.	1'	OK	5"		6"	OK
% F. S. TRIP	80		100		100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Ra Be + Co 60 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #411 – Reactivity Check

Log N = .15 "C" = 54 @ H-28

SERVO = 33.5 "A" = 49 @ 3×10^{-8}

k = 1 (JTM p. 78)

Continuous – Single		Time	Double
Start Log N = .0018	C	0907	—
	—	0946	D
Log N = .0028	E	1049	—
	—	1125	F

Run #412 – Reactivity Check – "A" = +8398 asec, 0.15 ¢

"C" = +7350 " , 0.17 ¢

Start Log N = .0028	G	1258 PM	—
	—	1335	H
.0028	I	1434	—
	—	1514	J

Run #413 – Reactivity check – "A" = ∞

"C" = ∞

DATE MAR 1 1972 SAFETY CHECK
TIME 0825 AM BY Taylor & Mihalczo

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{10}$	OPR	λ-10		900V	900V
SCRIBE DIST.	1'	✓	5'		6"	@
% F. S. TRIP	100+	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			

SOURCES USED RuBE & Co^{60} MAGNETS ✓
TABLES — ✓ LIGHTS — ✓ AREA CLEARED ✓

Run# 414 Reactivity check - initial = λ − 0.7¢ Shim @ 33.5
λ_0 = 0.25 ; C = k^{28}@76 ; A = 2.5×10^{-7} ; TIME = 0900
shim adjusted to 18.0, all unit read ∞
Take out TOP and reinsert → ∞

Run# 415 Running cont. of cycling runs via HISL & THC. T=0920
JTM log Pg 82 Typical "SINGLE" STARTS @ λ_0 = .002
TYPICAL "OSC." PEAK, 2 min, = .0003 λ_0

Run# 416 Reactivity check → λ_0, C & A = +6500 pcc, +0.19¢
T = 1300 hrs.

Run# 417 Cont as run# 415

Run 418 Reactivity Check
λ_0 = .2 C 2544 2200 (.49)(.51)
λ_0 .1 C 2328 2270 (.54)(.53)

C $\frac{73}{65}$ 5 min + 2584 cm = +0.49¢
$\frac{455}{45}$ 5 min + 2328 cm = +0.54¢
LN $\frac{.14}{12}$ 7 min + 2270 ~~+0.52¢~~
λ_0 $\frac{24}{20}$ • ~~####~~

DATE MAR 2 1972	SAFETY CHECK					
TIME 0830 AM	BY Mihalczo & Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	.3x10^10	Off	L-10		900	900
SOURCE DIST.	2'	OK	5'		6"	OK
% F. S. IMP	100		100		100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED	PuBe & Co60					✓
TABLES ✓	LIGHTS ✓	AREA CLEARED ✓				

Run #419 Reactivity Check. Servo = 19, ρ = +3840 sec
+0.33¢

L ~ 0.34 servo = 26.3, ρ = ∞

Run #420 – Begin Steady state and Cycling Runs. @ 0927

Run #421 Reactivity Check: L ~ = 0.50
Shim still @ 26.3 C = +3040 sec, +.42¢

Change shim to 35 C = ∞

Run #422 Running continuous & cycling runs JTM B 88
T = 1410 hrs.

.49¢
54¢
52¢

DATE MAR 3 1972 **SAFETY CHECK**

TIME 0815 AM PM BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	L-10		900V	900V
SOURCE DIST.	2'	✓	5'		6"	@
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX CHAN.	—	✓	✓			

SOURCES USED $Pu-Be$ & Co^{60} MAGNETS ✓

TABLES — LIGHTS ✓ AREA CLEARED ✓

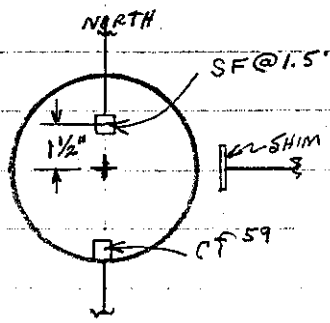
Run #423 Move SFC to 1½" North of Sphere ℄. Same fuel except that 2-¼" U Buttons were removed = 14 (¼" U-Button). Shim is too close for operation. TIME = 09:45 ≃ ∞ @ Shim = 10 i.e. within 0.1¢ via C.

Run #424 Add 1 (¼" U-Button) = 15 U-Buttons On.

Reactivity: ∞ as per C, k_N, & A $k_N = 0.34$

TIME: 10:25 FUEL MASS: 53834gm SHIM SEL = 80

REF Pg 255



Run #425 Running continuous ¢ cycling data (JTM Pg 91)

TYPICAL 2 MIN CYCLE PEAK: $k_N = .0004$; Cont' $k_N = .003 \rightarrow .006$

Run #426 Reactivity Check: TIME = 13:30 hrs. L_W = 0.35
as is (shim = 80) ρ = + 5100 pcc, + 0.25 $

Change Shim to 90 = $\rho = \infty$

Run #427 As run #425
14:20 hrs. while at a very low power, we "had" a buzzer. Immediate watch was put on Rm 108 door at top of stairs as well as one person going to check South Cell. Within seconds however Magnuson informed Mihalczo that the South Cell Truck Door had been inadvertantly cracked and that all was and is O.K.

Run #428 Reactivity Check as the. Run H p 94
slightly position
L_W = 0.32 $\frac{74}{32}$ in 5 min +10949 pcc from C

MAR 6 1972

8:20 UTM - ER.

	A	B	C	D	E	F
	3x10^-8	opr	L-10 [struck]	0	800	800
	2'	✓	4	4	2"	✓
	100	–	1 [struck]	1	100	100
	✓	–	–			
	–	–	–			

PuBe Co60 ✓

TABLES ✓ ✓ ✓

Run # 429 Reactivity Check. Cycled tables before reactivity check 24 times together for 0.1 min

<u>ALL Buttons on</u>

Cf #2 on surface. ∞ period

SFC at Center AL Shim 1150

Run # 430 2 Singles 2 Doubles Then reactivity check

SLIGHTLY NEGATIVE

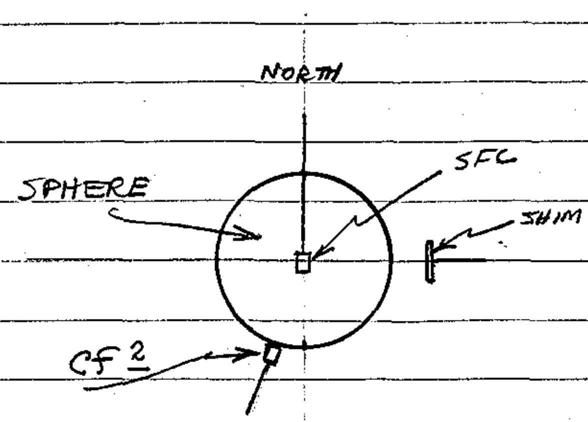
AL Shim 1150

See Pg 265 266

Conf as Pg 265 <u>Run # 378</u>
except CF 2 is used as in <u>run # 381</u>
[illegible]

Run # 431 Reactivity Check: "C" = + 9300 sec; <u>+.14¢</u>
no changes made. LW was @ ~~.34~~ 0.34

Run# 432 Reactivity check: 16:15 hrs; hw = 0.34; "C" = +3900 sec; +0.33¢



DATE MAR 7 1972 — **SAFETY CHECK**

TIME 8:30 — **BY** JTM. + ER.

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	0	L-10	0	400	800
[illegible]	2'	P	5'	u	1st	
[illegible]	100	R / O	100	T	100	100
[illegible]	✓	✓ K	✓			
[illegible]	✓	✓	✓			

[illegible] PuBe Co⁶⁰ — [illegible] ✓

[illegible] ✓ — [illegible] ✓ — [illegible] ✓

Run #433 — Reactivity check — 20 – 0.1 min cycles before going up to measure reactivity

VDT #3 +8

Ct #200 surface — VDT #4 +3

C + 8249 sec + <u>0.154</u> ¢

Run #434 – Reactivity Check – 12:30 hrs — LN = .35

"C" = $\frac{715}{69}$ or +8430 sec ¢ +<u>0.151</u>

Run #435 Time: 15:50 — C = +5000 sec; <u>0.25</u>¢ — LN = 0.34

TYPICAL Run (SINGLE continuous) LN .005 → .009 (JTM Pg 104) I left ERR a note and tracing concerning (Ln problem B1) JRT.

Run # 436 Time = 18:50 C = ~~—~~ (DC) - 8

VDT now #3 = +11 ; #4 = +8

Run # 437 Time = 21:50 C = - 28000 sec 10

c ¢
151

v = 0.34

SAFETY CHECK

DATE MAR 8 1972 TIME 8:30 AM BY J.T.M + ERR.

CHANNEL	A	B	C	D	E	F
RANGE	3×10^{-10}	opr	L-10	0	900	800
SCALER SETT.	2'	✓	✓	~	2^N	
% H. V. SUPP.	100		100		100	100
ELEC. ALARM	—	✓	—			
AUX. OPER.	—	—	—			
SOURCE USED	Pu Be	Co^{60}			✓	
TABLES	—	[illegible]	—	[illegible]	✓	

Run #438 Reactivity Check VDT #3 7
VDT #4 2

Removed one 1/4" Button Put on 1/8" Button
Negative moved Al shim to 400 to level
∞ period. Shim at 400

Run #439 Reactivity Check VDT #3 10 ∞ period
R now VDT #4 5

Run #440 Reactivity Check – "C" = $\frac{68}{64}$ in 600 sec
13:30 hrs. = – 9900 sec, – 0.13¢

Run # 441 Reactivity check: Time = 16:50; VDT #3 = +11; #4 = +7
Channel C = ~22000 sec
Ref JTM log Pg 111

Run #42 Reactivity check: Time = 19:45

Channel C = -2862 sec ; - 0.45¢ Shim @ 400

→ change Shim to 310 → ∞

TYPICAL: 2 min cycle peak ΔN = .00033

3 min cycle peak ΔN = .00050

Continuous run ΔN = .006 → .008

DATE MAR 9 1972 SAFETY CHECK

TIME 8:30 AM BY JTM + ERR.

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	2-10	0	900	900
SOURCE TEST	2'	OK	5'	½	2'	0
% F. S. TRIP	100		100		100	100
ELEC. ALARM	✓	✓	—			
AUX CHEC.	✓	✓	—			

SOURCE USED Pu-Be Co-60 LIGHTS ✓

TABLES — LIGHTS — AREA ALARMS ✓

Run #443 REACTIVITY CHECK

VDT # 3-8 VDT # 4-3

Cycled tables 10 Times Before going up to maximum ρ

T = ∞ AL Shim 385

Run # 444 Reactivity check after run D ρ / h

12:15 T = ∞

Run# 445 Reactivity Check: Time = 15:20; hv = 0.3

C = -21100 sec (Ref Pg JTM 119)

VDT #3 = +11 ; #4 = +7

Run# 446 Reactivity Check: Time = 17:50 C = -20400 sec (-.06)

Run# 447 Reactivity check: Time = 20:25 C = ∞

DATE MAR 10 1972 SAFETY CHECK

TIME 7:30 AM BY JTM + JTT.

CHANNEL	A	B	C	D	E	F
RANGE	3x10^-10	0	L 10	0	900	900
SOURCE DIST.	2ft	ϕ	5 ft	"	2 1/5	100°
% F. S. TRIP	120	B	120	T	100	100
BLDG. ALARM	✓	✓	✓			
AUX CKTS.	✓	✓	✓			

SOURCES USED Ra-Be Co^60 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run # 448 Reactivity Check VDT # 3 8

VDT # 4 2

Cycled tables 10 times before (movement

Shim 385 T = ∞

Run # 449 Reactivity check VDT # 3 10 Above D

80/25 in Shim +46.48 sec VDT # 4 5 +0.27¢

Moves SHim TO 435 T = ∞

Run # 450 Reactivity check after H ; LN = 0.3

C = +12500 sec ; +0.1¢

Run # 451 Reactivity check after JTM-L ; Time = 17:40

C = +7200 sec ; + 0.18¢

Run # 452 Reactivity check @ 20:30 C = +5150 sec ; +0.24¢

DATE MAR 13 1972 SAFETY CHECK

TIME 0910 BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	1/10		900V	900V
SOURCE DIST.	2'	OK	5'		2"	@
% F. S. TYP	100				100	100
BLDG. AGAIN	✓	✓	✓			
AUX GEN.	✓	✓	✓			

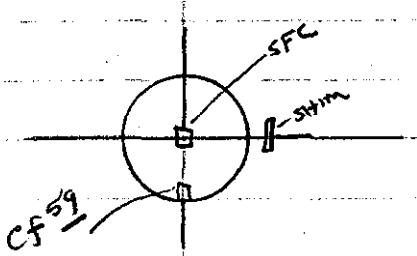
SOURCES USED RaBe & Co^{60} INTERLOCKS ✓

TABLES ✓ LEADS ✓ AREA CLEARED ✓

Run #453 Cf^{59} as in run #361 except $L_W = 0.3$
Buttons = 1 (1/4") & 2 (3/8").
Shim @ Sel = 85 → MASS = 53922g

Run #454 Reactivity Check: Time = 12:25 →

Run #455 " " " = 16:10 $T = -12000_{-.11}^{+}$ sec,



DATE MAR 14 1972 **SAFETY CHECK**
TIME 0820 BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	40		900V	900V
SOURCE DIST.	2'	ok	5'		2"	@
% F. S. TRIP	85*	—	—	—	100	100
BLDG. ALARM	✓	✓	✓			
AUX OTES.	✓	✓	✓			

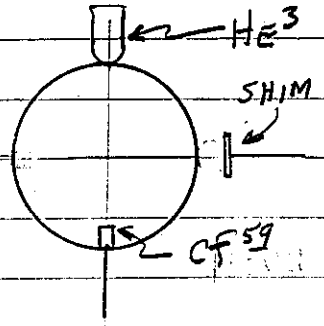
SOURCES USED PuBe & Co^{60} MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

* adjusted to trip @ 100 before start-up

Run # 456 Cf^{59} one South just inside the edge.
He^3 on North touching outside edge
Sphere otherwise filled with U.
12 - 1/4" U-Buttons on TOTAL MASS = 53736 g.
Shim 800 (out)
T = +83 sec ; $\underline{\rho = +11.1\%}$ $\lambda_N = .003$

0.3
.2g
11¢

Run # 457 Remove 5 - 1/4" U-Buttons.
Total U-Buttons on = 7 TOTAL MASS = 53516 g
Shim pos. = 155 → $\underline{\rho = \simeq \infty}$



TOP SECTION	12 043 g
TOP SOCKET	64
CENTER SEC.	20 570
BOTT. SECTION	20 310
7- 1/4" U-BUTTONS	308
3.7" FILLER = 198+14	212
2.125" FILLER FOR .136"	9
	53 516 g

→ Mucho LASL runs with this log Pg 135

DATE MAR 15 1972 SAFETY CHECK

TIME 0820 AM BY Taylor & Lynn

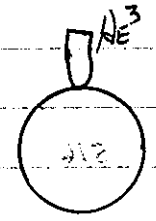
CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	110		900V	900V
SOURCE DIST.	2'	OK	5'		2" @	
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX OTLS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ~ LIGHTS ✓ AREA CLEARED ✓

Run #458 Cont data taking via STM log Pg 141

DC1
Run #459 Remove Cf 59 and replace with the 34 gm U filter. Mass = 53550 gm.
Remove 1 (1/16") button → Total Buttons = 6
Shim sel. ~ ∞ = ≃ avg 200
Data collection STM Pg 147 with dN @ .0002



A = $.3 \times 10^{-10}$ @ 46
Shim sel setting = 460
Shim sel dial = ≃ 200 avg.

DATE MAR 16 1972 **SAFETY CHECK**

TIME 08²⁰ AM BY VRT & JJL

CHANNEL	A	B	C	D	E	F
RANGE	.3X10^{-10}	OPR	L^{10}	.3x10^{-10}	900V	900V
SOURCE DIST.	2'	OK	5'	2'	2"	@
% F. S. TRIP	100	–	–	100+	100	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu Be Co^{60} MAGNETS ✓

TABLES — LIGHTS ✓ AREA CLEARED ✓

Run #460 Cont data as run #459 See DJM Pg 151

" ~~—~~ " @ hN = .0002 ; C = L^{8} @ 56

Dn @ 1620.

02

7.

SAFETY CHECK

DATE MAR 17 1972

TIME 08^{20} AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	L^{0}	$.3 \times 10^{-10}$	900V	900V
SOURCE DIST.	2'	OK	5'	2'	2"	@
% F. S. TRIP	100	—	—	—	100	100
BLDG. ALARM	✓	✓	✓			
AUX DETS.	✓	✓	✓			

SOURCES USED PuBe & Co^{60} MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #461 Con't data VIA JTM Log Pg 156. @0830 hrs.

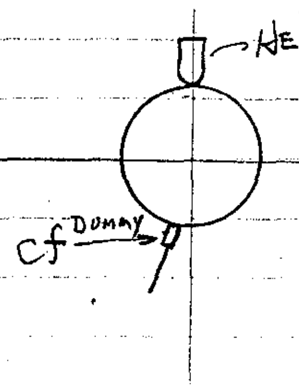
UP Pos = Sel #1 = 22.19 ; VDT #3 = +7 ; VDT #4 = +3

h_N = .0002 ; $C = L^{18}$ @ 56

→ Raise Power to h_N = .005 @ 0945 hrs.

$C = H^{13}$ @ 57 ; $A = 10 \times 10^{-10}$ @ 38 ; Shim Set @ 38

Run #462 13:15 hrs. - Put up dummy Cf on South Side at surface of the Sphere.



∞ Shim sel = 534

→ h_N @ .005

→ h_N @ .0002

Run #463 15:05 hrs Put Cf^{A} (replacing dummy)
all else same.

Cycling: typical = Ln (not on scale @ peak of 2 min ct. C = L"@ 20 @ peak.

Dn @ 16:20

ide

DATE MAR 21 1972 SAFETY CHECK
TIME 0820 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	$.3 \times 10^{-10}$	OPR	10^{-1}		900V	900V
SOURCE DIST.	2'	OK	5'		6"	@
% F. S. TRIP	100	—	—		100	100
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			

SOURCES OUT PuBe & Co⁶⁰ MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Run #464A Reactivity Worth evaluation of 1/16" U-Button on surface of the sphere.

All holes of sphere filled.
8 - 1/4" U-Buttons on surface.
Base Run also has 1 - 1/16" ≃ 11g & 1 - 1/16" ≃ 6g

TMC = +2790 sec ; +0.452¢ 450 shim @ 90

~~BF_3 #1 : +3289 +0.38~~

4613 BF_3 #2 : +3016 +0.42 .416

BF_3 #3 : +2486 +0.51 .504

see Pg 301

Run #464B Pull (by string) the ≃ 11g 1/16" button

TMC = -2770 sec ; -0.467¢ .461 - .465

~~BF_3 #1 : -3289 ; -0.337 .7 ÷~~

2 : -2679 ; -0.483 .475 - .481

3 : -2723 ; -0.470 .465 - .473

see Pg 301

464C **Pull the ≃ 6g 1/16" U button** –
TMC = −1483 sec; −0.884¢ −.874 .447
BF_3 #1 = — —
2 = −1520 −0.860¢ −.857 .377
3 = −1540 −0.849¢ −.846 .379

465 A Base run as (464A)
TMC = +2855 sec; +0.441¢ .439 Shim @ 100
BF_3 #2 = +2802 +0.450 .448
3 = +2780 +0.454 .452
A = +3057 +0.412 .411
C = +2890 +0.435 .433
LN = +3556 +0.356 .354

465 B **Pull the ≃ 11g 1/16" U-Button** Away as in (464B)
TMC = −2743 sec −0.463¢ −.461
BF_3 #2 = −2585 −0.500 −.498
3 = −2498 −0.519 −.516
A = −3234 −0.400 −.398
C = −2523 −0.513 −.511
LN = −2402 −0.540 −.537

465C Pull the ≈ 6g 1/16th as 464C

TMC = −1496 sec.	−0.875	−.871
BF_3 #2 = −1596	−0.820	−.815
3 = −1565	−0.830	−.832
A = ~~−2003~~	−	
C = −1444	−0.903	−.903
LN = −1468	−0.890	−.885

466A Base as (464A)

TMC = +3411 sec	+0.370	+.369 Shim = 93
BF_3 #2 = +3691 sec.	+0.341	+.341
3 = +3582	+0.353	+.351
A = +3183	+0.396	+.395
C = +3242	+0.387	+.388
LN = +3811	+0.332	+.332

466B Pull ≈ 11g 1/16 as run 464B

TMC = −2566 sec	−0.503	−.501
BF_3 #2 = −2563 sec	−0.505	−.503
3 = −2726	−0.474	−.472
A = −2692	−0.481	−.479
C = −2287	−0.566	−.565
LN = −2496	−0.520	−.519

466C **Pull ≈ 6g 1/16** as in run 464C

TMC =	−1369 sec	−0.956 ¢	−.954
BF_3 #2 =	−1485	−0.880	−.878
3 =	−1519	−0.860	−.858
A =	~~−2240~~	~~−0.579 ¢~~	
C =	−1378	+0.955	−.948
LN =	−1587	−0.821	−.820

DATE MAR 22 1972 SAFETY CHECK
TIME 0820 AM/PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	.3×10⁻¹⁰	OPR	1.0		900×	900×
SOURCE DIST.	2'	OK	5'		6"	@
% F. S. TRIP	100	—	—		100	100
ELEC. ALARM	✓	✓	✓			
AUX. STAS.	✓	✓	✓			

SOURCES USED PuBe & Co60 — BARRIERS ✓
TAGS — LIGHTS — AREA CLEARED ✓

467A Cont Same Reactivity checks (as run # 464A)

TMC =	+3378 sec	+0.370 ¢	.372 Shim @ 110
BF_3 #2 =	+3238	+0.389	.388
BF_3 #3 =	+3146	+0.402	.399
Ch A =	+3772	+0.334	.334
Ch C =	+3128	+0.403	.402 ✓
LN =	+4002	+0.316	.315

Run #467B Pull 11gm 1/16" (as run 464B)

TMC	= −2478 sec;	−0.523 &	−.521
BF_3 #2	= −2443	−0.530	−.525
3	= −2166	−0.600	−.597
A	= −2605	−0.497	−.495
C	= −2170	−0.548	−.546
hN	= −2350	−0.551	−.549

Run #467C Pull 6g - 1/16" (as run 464C)

TMC	= −1356 sec;	0.970 &	−.964
BF_3 #2	= −1352	−0.971	−.967
3	= −1344	−0.978	−.973
A	= −1283	−1.023	−1.020
C	= −1358	−0.965	−.962
hN	= −1190	−1.106	−1.103

Run #468A Base (as 464A)

TMC	= +2124 sec	+0.589 &	.585	Shim = 90
#2	= +2409	+0.521	.520	
3	= +2380	+0.528	.526	
A	= +2634	+0.478	.476	
C	= +2188	+0.573	.571	
hN	= +2660	+0.473	.471	

Run #468B Pull 6g 1/16"

TMC	+58200	+ 0.022	.022
#2	+63630	~~0.019~~ .020	.020
3	+54075	~~0.023~~	.023
A	+51250	~~0.025~~	.025
C	+43800	0.030	.029
LN	+42700	~~0.032~~	.030

Run #468C Pull 11g 1/16"

TMC	-1733 sec	- 0.753	-.749
2	-1760	- 0.740	-.738
3	-1809	- 0.720	-.717
A	-1982	- 0.691	-.653
C	-1662	- 0.786	-.782
LN	-1732	-0.753	-.750

Run #469A Base (as 464A)

TMC =	+1962 sec;	+0.637	.636	shim = 90
2 =	+1956	+0.641	.640	
3 =	+1847	+0.678	.674	
A =	+2067	+0.590	.604	
C =	+2010	+0.623	.621	
LN =	+2198	+0.571	.569	

90

Run #469B Pull 11g 1/16"

TMC = -7019	-0.182	±	-.182
2 = -6557	-0.196	±	-.195
3 = -6452	-0.198		-.198
A = -7567	-0.171		-.169
C = -6289	-0.204		-.203
LW = -5085	-0.255		-.252

Run #469C Pull 6g 1/16

TMC = -1998	sec	-0.651	± -.648
~~2 = -1577 ?~~		~~-0.828~~	
~~3 = -1592 ?~~		~~-0.820~~	
A = -2144		-0.605	-.603
C = -1751		-0.744	-.742
LW = -1989		-0.654	-.651

Run #470A Base (as run 464A)

TMC = +1810	sec	+0.691	± .688 Shim@90
2 = +1829		+0.684	.681
3 = +1765		+0.708	.730
A = +1678		+0.744	.741
C = +1768		+0.710	.704
LW = +1948		+0.643	.640

#470B Pull 11g 1/16"

TMC =	-7761 sec;	-0.165 ±	.165
2 =	-7171	-0.177	.177
3 =	-6548	-0.196	.195
A =	X	X	
C =	-8681	-0.148	.148
LN =	-12600	-0.101	.101

#470C Pull 6g 1/16"

TMC =	-2306 sec;	-0.562 ±	.560
2 =	-2314	-0.556	.554
3 =	-2344	-0.551	.549
A =	-2481	-0.522	.520
C =	-1956	-0.665	.663
LN =	-2044	-0.636	.634

SUMMARY: #464 → #470

1/16" (11.135 gm)	.8597 ±	0.0020 ±	.07721
	0.8602 ±	0.0021 ±	.07725 ±/gm
1/16" (5.535 gm)	0.4297 ±	0.0022 ±	.07763 ±/gm
	.4282	0.0022	.07736

→ CONTINUED IN LOG BOOK NUMBER 9. ←

WORK REQUEST-SPECIAL INSTRUCTIONS

REQUEST NO.	ISSUE	
3034	"C"	CRITICALITY STUDIES

INSTRUCTIONS FOR CLEANING OF BOTTOM SPHERE

(1) PLACE PART IN AN ULTRASONIC BATH FILLED WITH PERK (PERCHLOROCTYLENE) AND CLEAN FOR (4) HOURS AT ROOM TEMPERATURE.

(2) VACUUM HEAT TREAT PART FOR 3 HOURS AT A TEMPERATURE OF 350-400°F. USE A FURNACE WHICH CAN MAINTAIN A VACUUM OF 10 MICRONS OR BETTER.

(3) THIS IS ~~A~~ ORALLOY PARTS 7880-72 & 7880-71 bonded together.