BOOK12R

Notes:
-This is a "paper copy" of a logbook previously copied by someone other than myself.

-"Book 1" hand-written on page 1.

Blank pages: 2, 6-8, 36, 64, 102, 140, 146, 157, 169, 185, 197, 202, 203, 214, 221, 242, 252, 263, 266.

Scanned by:
Sheila Finch
RSICC /Oak Ridge National Lab.
July 29, 1999

BOOK 1

	Assembly			P.
11"x7"	7" ID to 11" O.D. Bare	13 - 18	Sub Crit.	18
11"x7"	9" ID to 11" O.D. Fuel added to hole	19 - 22		
11"x7"	7" ID to 11" OD Fuel at Top + Bottom of hole	22-30		30
11"	11" O.D. Disc	37-49		49
13"x9"	9" I.D. to 13" O.D. 1" Refl	52-62		63
13"x7"	7" ID to 13" OD 1" Refl	65-70	✓	71
13"x7"	7" ID - 13" O.D. graphite Core	72-84	✓	
13"x7"	7" ID - 13" OD Bare	85-90	✓	91
13"x7"	7" ID - 13" OD 1" graphite Refl	95-100	✓	101
13"x7"	7" ID - 13" OD 1" Refl + graphite Core	103	✓	—
15" ✓	15" Solid Bare	104		113
15"x7"	7" I.D - 15" O.D. Bare	114-121	✓	122
"	7" ID - 15" O.D. graphite Core	123-127	✓	126
15"x9"	9" ID - 15" O.D. Bare	129-134	✓	134
"	9" ID - 15" O.D. graphite Core	135-	✓	138
✓	15" Solid (CTU Moved to Center of Room)	141		
13"x7"	7" - 13" Ring with 4" C. Refl.	147-151	✓	150
15"x9"	9" - 15" Ring with 3" + 4" C. Refl.	152-153	✓	153

		PAGES	
7" DIAMETER CYLINDER	SOLID	161 - 168	
	2 - 2 5/8"	170 - 176	
	2 - 2 3/4"	177 - 180	
	2 - 2 7/8"	181 - 184	
	2 - 3"	186 - 192	
	2 - 3 1/8"	193 - 196	
	2 - 3 1/4"	198 - 201	
11" DIAMETER CYLINDER	SOLID	204 - 213	
	2 - 1 3/4"	215 - 220	
	2 - 1 7/8"	222 - 226	
	2 - 2"	227 - 231	
	2 - 2 1/8"	232 - 237	
	2 - 2 1/4"	238 - 241	
	2 - 2 3/8"	243 - 247	
	2 - 2 1/2"	248 - 251	2.6038"
	2 - 2 5/8"	253 - 255	3.2678"
	2 - 2 3/4"	256 - 259	4.09"
	2 - 2 7/8"	260 - 262	
15" OD 9" ID BARE RECHECK	SOLID	267 - 268	
15" DIAMETER CYLINDER	SOLID	269 - 275	
	2 - 1 5/8"	275 - 279	
	2 - 1 3/4"	280 - 283	
	2 - 1 7/8"	284 - 287	
	2 - 2"	288 - 291	
	2 - 2 1/8"	292 - 294	
	2 - 2 1/4"	295 - 297	
	2 - 2 3/8"	298 - 300	also next book pg. 11

Passes & Counters

11" U disc	p. 42, 210, 218, 226, 238, 248, 260,
7" ID – 13" OD	p. 91
15" Solid	p. 110, 142, 283, 287, 291, 294
7" ID – 15" OD	p. 119
9" ID – 15" OD	p. 132, 139
7" Disc	p. 162, 171, 184, 191, 193
	*See p. 192

38"
8"

ook
11

1 Kg = 2.2046 lb

Metal Containers for K

B. H = 2.5" wt = 2360 g. Dia. = 6.973"
6.973"

C. H = 2.990 wt = 2435 g. Dia = 6.969"
.982
.995
.975
Avg = 2.9855

6.976

Graphite Weights (Discs)

	Dia.	Thickness	Weight (gms)
1.	25"	½"	6,868
2.	25	2	27,650
3.	21	2	19,263
4.	21	1	9,666
5a. A_2	19	1	~~7,914~~ Dia. Reduced new wt 7828
5b.	19	1	7838
6a	17	1	6,261
6b	17	1	6,268
7	15	⅛	625
8	15	¼	1,224
9	15	⅜	1,841
10	15	½	2,467
11	15	9/16	2,763
12a	15	1	4,903
b	15	1	4,915
c	15	1	4,915
d	15	1	4,781
13	15	1½	7,485
14	13	⅛	460
15	13	¼	916
16	13	⅜	1,386
17	13	½	1,834
18	13	9/16	2,064
19a	13	1	3,682
b	13	1	3,760
c	13	1	3,745
20	13	1½	5,509

Graphite ~~weights~~ (Discs)

#	Diameter	Thickness	Weight
21	11"	1/8"	325
22	11	1/4	656
23	11	3/8	988
24	11	1/2	1,309
25	11	9/16	1,474
26	11	1	2,628
27	11	1 1/2	3,929
28	11	2	5,273
29	9	1/8	221
30	9	1/4	445
31	9	3/8	668
32	9	1/2	883
33	9	9/16	998
34	9	1	1,771
35	9	1 1/2	2,675
36	9	2	3,533
37	7	1/8	130
38	7	1/4	266
39	7	3/8	404
40	7	1/2	536
41	7	9/16	602
42	7	1	1,065
43	7	1 1/2	1,618
44	7	2	2,131

Graphite Weights (Annular Rings)

	(I.D.) Diameter	(O.D)	Height	Weight	
1.	25" ~~27"~~	29"	10	48,475	
2.	25	29	10	48,850	
3.	21	25	9 1/2	39,000	
4.	21	25	8	32,800	
5.	19	21	8 1/2	15,072	
6.	19	21	6	10,633	
7.	17	19	7 1/2	12,172	
8.	17	19	5	8,142	
9.	15	17	6 1/2	9,164	
10.	15	17	4	5,640 ~~9,164~~	
11.	13	15	5 1/2	6,781	
12.	13	15	3	3,710	(A)
13.	11	13	4 1/2	4,696	
14.	11	13	2	2,082	
15	9	11	4 1/2	3,956	
16.	9	11	2	1,755	
17.	7	9	4 1/2	3,181	
18.	7	9	2	1,409	
19.	13	15	2	2439	
20.	13	15	3	3712	(B)
21.	15	17	2	2800	
22	15	17	3	4188	

12-17-62

J. T. Mihalczo
J. J. Lynn
D. E. McCarty

INSTRUMENT CHECK

Time 8:50 AM PM Source Pu Be + γ

		Channel A	B	C	D	E
Range	F	10/1000	opr	10^{-12}	10/1000	1050V.
Source Dist.	OK	7"	0	4'	3"	3"
% F.S. Trip		100+	OK	100	80	100+
~~BF_3 ctro~~		~~1, 2~~	~~1~~	~~3~~	~~OK~~	

C.A. U-Rings Expr. 7"ID-11"O.D. Run 1

Sheet _____ Date 12-17-1962 Time 9:20 AM

Purpose To obtain Critical assembly with 7" I.D. - 11" O.D. U-Rings. Assembled on CTU; 5 mil diaphragm ~~Source # PU 568 on diaphram in Center of Ring~~.

I Loading: on Ram - 1½" pc # 2740 7"I.D. - 9"O.D.
1½" pc # 2747 9"I.D. - 11" O.D.
1/8" pc # 2763 7" I.D - 9" O.D.
(Totaly 3") [redacted] - 3/8" pc # 2829 7"ID - 9"O.D.
3/8" pc # 2742 9"I.D. - 11" O.D.
3/8" pc # 2746 9"I.D - 11" O.D.
on Diaphragm 1" pc 2762 7"I.D - 9" O.D.
1" pc # 2745 9"I.D. - 11" O.D.

	#1 counter	#2	#3	
2 min	55 118	1 143	12 53	
cts	58 124	1 151	12 32	
T	29,170	806	6229	36,205
CPM	7,293	201,5	1,557	9,052
$\frac{1}{CPM}$	13711	4963	6422	11108

14
12-12-62

Run 2 Loading 2 - Added 1" pc #2738 7" I.D. - 9" O.D.
to Diaphram 1" pc #2776 9" I.D. - 11" O.D.
(4" Thick)

	ctr 1	ctr 2	ctr #3	
	66 +146	2 +48	14 +234	
	65 +79	2 +25	15 +54	
T	33,761	1097	7712	42,570
cm	8,440	274	1,928	10,643

VDT #3 = +12 Selsyn #1 = 23.875
#4 = +11.5 #2 = 24.065

$\frac{1}{cpm}$	1.1848	36496	.51867	9396
$\frac{1}{m}$	~~.8641~~	~~.7354~~	~~.8076~~	~~.8505~~

Run 3 Loading 3 - Added to Ram 1½" pc #2741 7" I.D. - 9" O.D.
1½ pc #2748 9" O.D. - 11" I.D.
(4½" Thick) Removed from Diaphram 1" pcs added for Loading 2

	#1	#2	#3	
2 min	76 +238	+229	16 +[illegible]	
	73 +167	1 +242	16 +60	
T	38,549	983	8,264	
cpm	9,637	246	2,066	11,949
$\frac{1}{cpm}$	1.0376	.4065	.4840	.8369

VDT #3 = +10.5 Selsyn #1 : 22.38
4 = +19.0 #2 : 22.568

12-17-62

Run 4 : Loading 4 - Added 1" pcs removed for Run 3.

5½"

		ctr #1	#2	#3	
2 min		111 +110	2 +139	21 +52	
		107 +143	2 +145	21 +42	
	T	56,061	1,308	10,846	
	CPM	14,015	327	2,711	17,053
	$\frac{1}{CPM}$	7135	3058	3688	5864

VDT #3 = +10.5 Selsyn # 1 = 22.38

#4 = +19. # 2 = 22.568

Run 5

Loading 5 Added to ~~Run~~ 9" 9/16" pc. #-2737-7" ID-9" OD.

(6 1/16") Diaphram 11" 9/16" pc #2767-9" ID-11" OD.

	#1	#2	#3	
	111 +207	2 +221	23 +63	
	120 +186	3 +4	22 +79	
	59,529	1505	11,662	
	14,882	376	2915	18,171
	6719	2659	3430	5503

VDT #3 = +10 Selsyn # 1 = 22.38

#4 = +19 # 2 = 22.568

12-17-62

Run 6 Loading 6 - Added 3/8" pc # 2736 - 7" I.D. - 9" O.D.
3/8" pc # 2743 - 9" I.D. - 11" O.D.

(6 3/16" Thick)

	141 + 60	3 + 66	24 + 120	
	147 + 119	3 + 55	24 + 157	
T	73,907	1657	12,562	
CPM	18,477	414	3,140	22,031
$\frac{T}{CPM}$	5412	2415	3184	4539

UDT #3 = +10 Selsyn #1 = 22.38
#4 = +19 #2 = 22,566

Run 7 Loading 7 - Added - 1/4" pc # 2775 - 7" I.D. - 9" O.D.
1/4" pc # 2778 9" I.D. - 11" O.D.

(6 11/16" Thick)

	ctr #1	#2	#3	
	154 + 108	3 + 125	26 + 77	
	154 + 4	3 + 103	26 + 27	
T	76,400	1,764	13,396	
CPM	19,100	441	3,349	22,890
$\frac{T}{CPM}$	5235	2267	2986	4368

UDT #3 = +10 Selsyn #1 = 22.38
#4 = +19 #2 = 22,566

12-17-62

Run 8 Loading 8 - Added - 1/4" pc # 2774 - 7" I.D. - 9" O.D.
1/4" pc # 2779 - 9" I.D. - 11" O.D.
(6 15/16")

	145 +59	3 +182	27 +189	
	145 +106	3 +201	26 +242	
T	76,055	1919	13,999	
CPM	19,013	480	3,500	22993
1/CPM	5259	2083	2857	4349

VDT # 3 = 10 Selsyn #1 = 22-38
4 = 19 #2 = 22,566

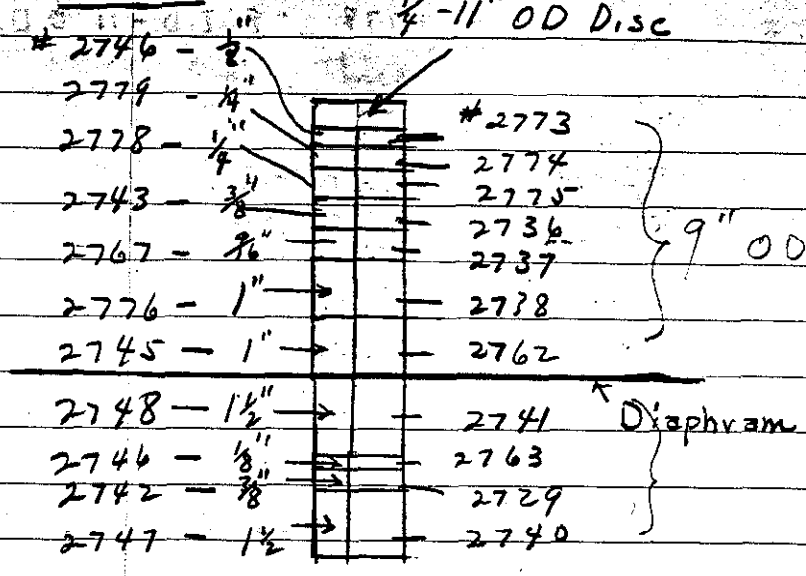
O.D.
O.D.

Run 9 Loading 9 Added 1/8 2773 7" ID 9" OD
1/8 2246 9" ID 11" OD
(7 1/16" Thick)

Cha. = 1	#2	#3	
159 101	3 193	29 29	
171 129	3 210	28 87	
167 217	3 255	28 13	
127,679	2962	21,889	
21,279	494	3,648	25,421
4700	2024	2741	3933

VDT #3 = 10 Selsyn #1 2238
#4 = 19 #2 22566

91" O.D.



12-1

Lo

H

Top

B

R

H

T

B

12-17-62

C.A. L. Ringe Expr. _____ Run 10

Sheet _____ Date 12-17 1962 Time 1:00 AM PM

Purpose To obtain critical assembly
Added 11 OD DISC - 1/4 in THICK
2803 TO TOP.

Loading 10 -

H = 7 5/16"

	Chn #1	#2	#3	
Top = 1/4	137 41	2 250	25 204	
B = 0	134 44	2 211	25 230	
T	69,461	1485	13,234	
C	17,365	371	3,308	21,044
CPM	5758	2695	3022	4752

Run 11 Loading 11 Added 7" dia. 1/4" # 2770 disc to bottom of assembly

H = 7 5/16"

T = 1/4"

B = 1/4"

	140 197	3 67	28 212	
	147 203	3 25	27 156	
	143 210	3 20	28 93	
	110,690	2416	21 709	Σ
	18,440	403	3,618	22,461
	5422	2481	2764	4452

Run 12 Loading 12 - added 3/8" #2729 on the 1/4" of Run 11.

H = 7 5/16"
T = 1/4"
B = 5/8"

	#1	#2	#3	
2 min	165 +125	3 +153	31 +218	
	169 +108	3 +186	32 +129	
	155 +32	3 +171	32 +26	
T	125,444	2824	24,693	
Cpm	20,907	470	4,115	25,492
cpm	4783	2128	2430	3923

Run 13 Loading 13 - Added 3/8" # 2728 on the 3/8" of Run 12

H = 7 5/16"
T = 1/4"
B = 1"

	#1	#2	#3	
2 min ct	196 +158	4 +115	38 +84	
	189 +128	4 +78	37 +243	
	101,401	2241	19527	
	25,350	560	4,882	30,792
	3945	1786	2048	32476

Run 14 Loading 14 - Removed 3/8"s added for Runs 12 + 13.

H = 7 5/16" added 1" per # 2731

T = 1/4"

B = 1 1/4"

		#1	#2	#3	
2 min		224 +245	5 +114	45 +250	
		228 +	4 +229	45 +123	
	T	115,957	2,647	23,413	E
	CPM	28,989	662	5,853	35,504
	$\frac{1}{CPM}$	3450	1510	1708	2816 ~~1278~~

Run 15 Loading 15 - Added 3/8" per # 2728 on 1" added in Run 14

H = 7 5/16"

Top = 1/4"

Bottom = 6 5/8"

		#1	#2	#3	
		343 +56	7 +241	67 +97	
		345 +233	8 +14	68 +175	
	T	176,417	4095	34,832	
92	CPM	44,104	1024	8,708	53,836
476	$\frac{1}{CPM}$	2267	9765	1148	1857

Run 16.

Loading 16 added 3/8" th 7" OD Disc # 2729

Expected to be critical this run small source in a drive was used ~10' PoBe source removed from room

H = 7 5/16"
Top = 1/4"
Bottom = 2"

Run 17 Loading 17 added 2 - 1/8 × 7" OD Discs #2768 #2769

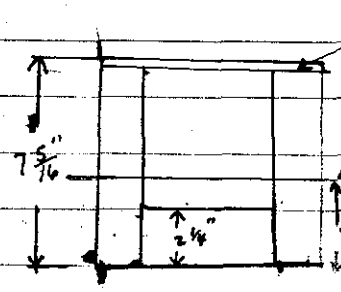
H = 7 5/16" 2 1/4 total fuel in bottom of hole
Top = 1/4"
Bottom = 2 1/4"

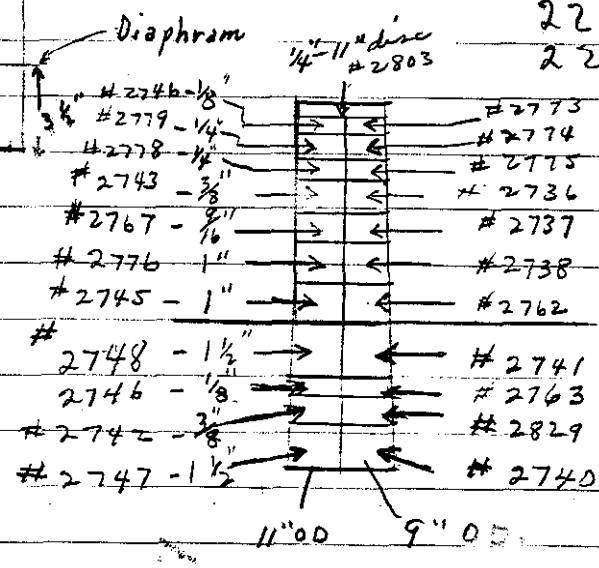
Super: Selsyn #1 = 22.11 Pos Period - 110.7 Sec Pd
Crit #2 = 22.296 9.1 ¢

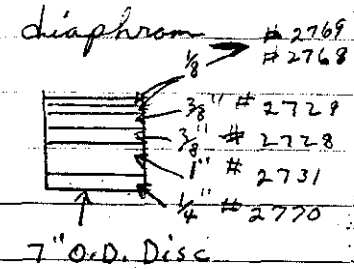
Level: Selsyn #1 = 22.10
#2 = 22.2875

measured when tables down
22.204
22.205
22.216
22.218

Run







729 12-18-62

INSTRUMENT CHECK

Time 9:20 AM ~~PM~~ Source Pu Be + γ

		Channel A	B	C	D	E
Range	F	10 / 1000	ope	10 -12	10 / 1000	1050 V.
Source Dist.	ok	2"	0"	30"	3"	0"
% F.S. Trip		80	ok	110	70	100+

ctrs 1, 2, + 3 ok

2768
2769

C.A. U-Rings Expr. _____ Run 18

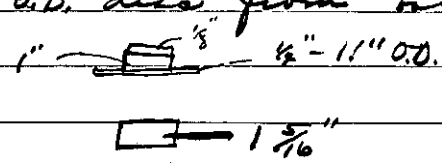
Sheet 7" ID - 11" OD Date 12-18 1962 Time _____ AM ~~PM~~

Purpose Obtain Critical

Sec Pd
¢

Super Critical @ Selsyn #1 = 22.26

Moved 1/4" - 11" O.D. disc from top of stack down 1 3/8" and moved 7" O.D. disc from bottom to top as shown



down

Run 19 Sub Critical

VDT #3 = +6 Selsyn #1 = 22.508

#4 = +17 #2 = 22.689

Moved 1/8" think Rings #2746 + #2763 to top of stack

Removed 3/8" - 7" O.D. disc from Bottom # 2729

Added 1/8" - 7" O.D " to bottom # 2768

#2769
#2768

2729
2728
2731
2770

Top - 1 3/8

Bottom - 1 1/16

Run 20 Removed the 1/8" added for Run 19

Added 1/4" - 7" O.D. # 2770
to Bottom

VDT #3 = +6 Selsyn #1 = 22.51
#4 = +17 #2 = 22.686

close to Critical Top - 1 3/8"
Bottom - 1 3/16"

Run 21 Same as Run 20 with plexiglas shim to get power.

Sub critical.

Run 22 Removed - 1"-7" OD disc + 1/4"-7" OD disc from bottom

Added — 3/8"-7" O.D. Disc # 2729
to Bottom 1 5/16" { 3/8"-7" " # 2728
9/16"-7" " # 2730

VDT #3 - 0%
#4 - "

#1 = 22.30
#2 = 22.48

> Super Crit.

*

Top = 1 3/8"
Bottom = 1 5/16"

Run 23 1/16 out the top – 22.309
9 mils different than previous run

Removed fuel from bottom of hole Added 1/4 + 1" x 700

At top 2 – 1/8 (4) 9/16 (9) 3/8 (6) 1 3/16 total above + 1/4 plate

Super Crit:

Top = 1 7/16"
Bottom = 1 1/4"

Run 24a At top – 1" + 1/4 = 1 1/4" + Plate

At Bottom – 1/8 ~~1/4~~ 1/8 3/8 9/16 = 1 3/16"
Moved another 1/16 from bottom to top

Pos Period – 57 Sec = 15¢
Inst. Scram [Zero low on "A" + "D"]

Crit.

C.A. U-Rings Expr. Run 24 b
Sheet Date 12-18-62 PM
Purpose Critical Condition
Selsyn #1 22.5
Repeat of 24a

Super Crit: Pos Period = ~~57 Sec = 15¢~~ 50.6 = 16.2¢

12-18-62

C.A. 25

Sheet AM PM

Purpose DIAPHRAM EVALUATION

ADDED 5 mill more to diaphram thickness T=+91.7 sec

Selsyn #1 22.5 #2 22.693 VDT #3 +5 #4 +2

Positive Period — 91.7 Sec = 10.5¢

~~10.5¢~~

16.2¢ − 10.5¢ = 5.7¢ for 5 mil addition to diaphram

C.A. 26

Sheet

Purpose Remove 1/8" of fuel 7"OD from bottom of hole and add to the top of the assembly

Selsyn #1 = 22.5 #3 = 5

#2 = 22.691 #4 = 2

with al shim on Servo out ~ 1¢ sub crit.

Top = 1 3/8"

Bottom 1 1/16"

C.A. _____ Expr. _____ Run 27

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Added NE 1 oz ½ on 2 SFC at radial surface on diaphragm

Loading Same as 26

VDT #3 = +5 Selsyn #1 = 22.50

#4 = +3 #2 = 22.692

Pos period — 72.7 sec = 12.6 ¢

Top = 1 3/8"

Bottom = 1 1/16"

28

12-17-62

INSTRUMENT CHECK

Time 8:35 AM ~~PM~~ Source Pu Be + γ

		Chan A	B	C	D	E
Range	F	10/1000	open	10^{-12}	10/1000	open
Source Dist.	OK	6"	0	4'	-11	3"
% F.S. Trip		100	OK		80	100?

ctr # 2 + 3 OK

C.A. _____ Expr. _____ Run 28

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Crit. Condition

Removed 1/8" - 7 O.D. from top

Top = 1 1/4"
Bottom = 1 1/16"

Sub Critical. VDT #3 = +5" Selsyn #1 = 22.50
#4 = +10 #2 = 22.689

Run 29 Removed 1/8" - 7 O.D. from Top
Added same to bottom.

Top = 1 1/8" or 1" + 1/8" + 1/4 plate
Bottom = 1 3/16" or 3/8 + 9/16 + 1/4
15/16

Run 30 Removed fuel from bottom of hole + added
1" Thick 7 OD + 1/4" Thick 7" OD = 1 1/4"
Top of plate same
1 1/8 = 1" + 1/8 + 1/4 11 OD PLATE = 1 3/8"

With plastic reflector up slightly subcritical
43 to 38 on Dog in 100 seconds
VDT 3 - +5 4 = +10
22.504 22.686

Run 31 Top - 1" ~~+ 1/8"~~ + 1/4 plate = 1 1/4"
Bottom - 1" + 1/4" + 1/8 = 1 3/8"
1/8" - 7" O.D. depression at top of stack
Pos period - Shim out

2.50
.689 Pos period - Al Shim in -

Run 32 Top same
Bottom same

Moved 1/8" rings from top of stack down just under 1/4" - 11" O.D. plate. Smooth top.

Sub Critical

Run 33 Returned to Conditions of Run 31
Top - 1" on the 1/4" - plate = 1 1/4"
Bottom - 1/4" + 1" + 1/8 = 1 3/8"
Reactivity adjusted by placement of Counters.

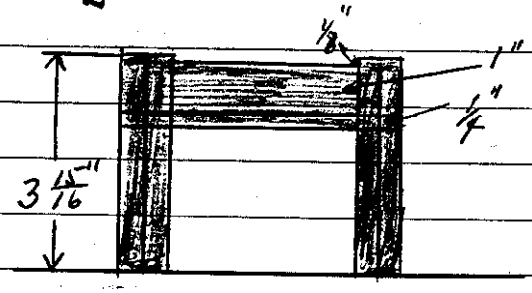
C.A. U-Rings Expr. _____ Run Run 33

Sheet _____ Date 12-19-1962 Time _____ ~~AM~~ PM

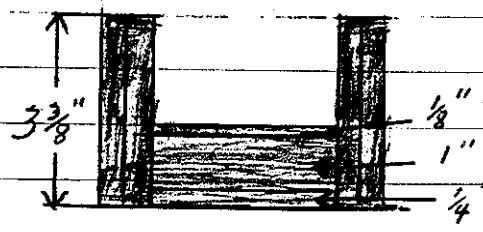
Purpose Power & measurements

Started Data Collection @ 3:30 PM

Fuel Loading as shown: Al (¼" X 1½" X 2⅜") Shim on Servo



diaphragm



Level:

VOT #3 = +6 Selsyn #1 = 22.508

#4 = +12 #2 = 22.679

Log N = .0013 (Top of Stairway)

Down 8:25 PM

12-20-62

INSTRUMENT CHECK

Time 8:30 AM ~~PM~~ Source $Pu\,B_2 + \gamma$

	Channel A	B	C	D	E
Range	10/1000	open	10^{-12}	10/1000	1050 V.
Source Dist.	9"	0	4'	5"	4"
% F.S. Trip	90	OK	100	80	100

F

C.A. U-Rings Expr. _____ Run 34

Sheet 7" ID + 11 OD Date 12-20-1962 Time _____ AM ~~PM~~

Purpose To evaluate reactivity of Counters used in Run 33. all Counters removed.

Clean critical

Negative period - 221.5 sec -7.2 ¢

UDT #3 = +5
#4 = +17.5

Selsyn #1 = 22.51
#2 = 22.688

C.A. _____ Expr. _____ Run 35

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Lower support Evaluation
support placed on top
T = + 135.7 = + 7.8 ¢

$\Delta\rho$ (support) = 15 ¢

Bottom Thickness (Fuel)

11" O.D. Ring

3.375 - 3.377
.374 - .375
.375 - .372
.373 - —
.375 - .374

3.37444"
8.57109 cm

9" O.D Rings

3.375 - 3.376
.375 - .376
.374 - .376
3.3753"
8.57334 cm

7" O.D Disc

1.379 - 1.380
.380 - .380
.381 - .380
1.380 = 3.50774 cm

7" O.D. Void

1.994 - 1.997 depth
1.994 - 1.997
1.9955 = 4.94157 cm

Top Thickness (fuel).

7" O.D. Depression

0.131 - 0.132
.132 - .131
.1315" = .3340 cm

7" + 11" O.D. Disc

1.250 - 1.251
.249 - .249
.245 - .245
.248 - .247
.254 - .255

1.2493"
~~3.17322~~ cm
3.17322

11" O.D. Rings 9" ID

3.945 3.945
3.945 3.945
3.945 3.946
3.947 3.947

3.9456
10.0219 cm

1/8, 1/8, 1/4, 1/4 3/8 1/4 plate
1" 1"

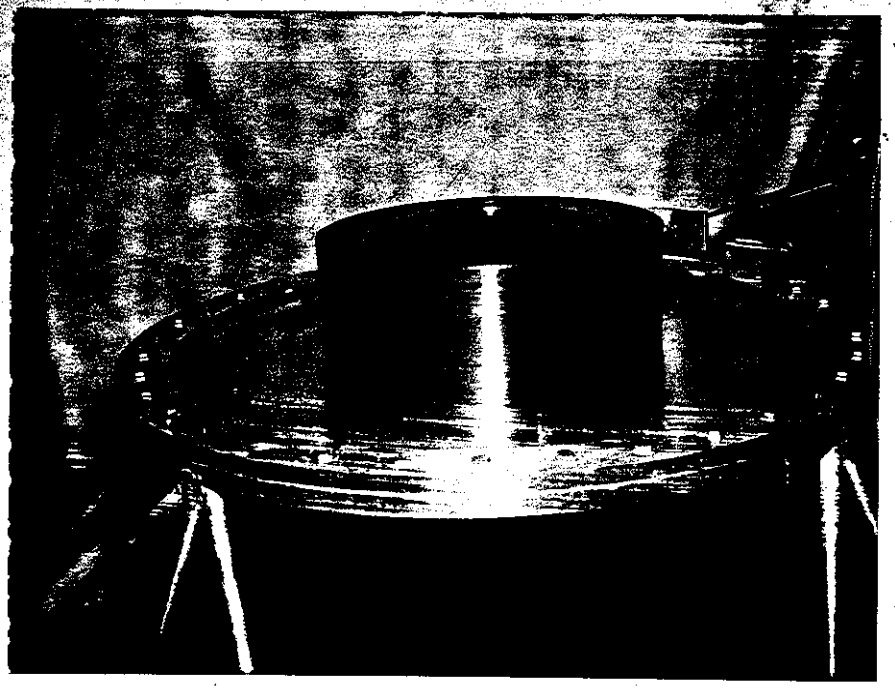
9" OD 7" ID

3.937 3.936
3.940 3.941
3.937 3.938
3.944 3.942
3.935 3.937

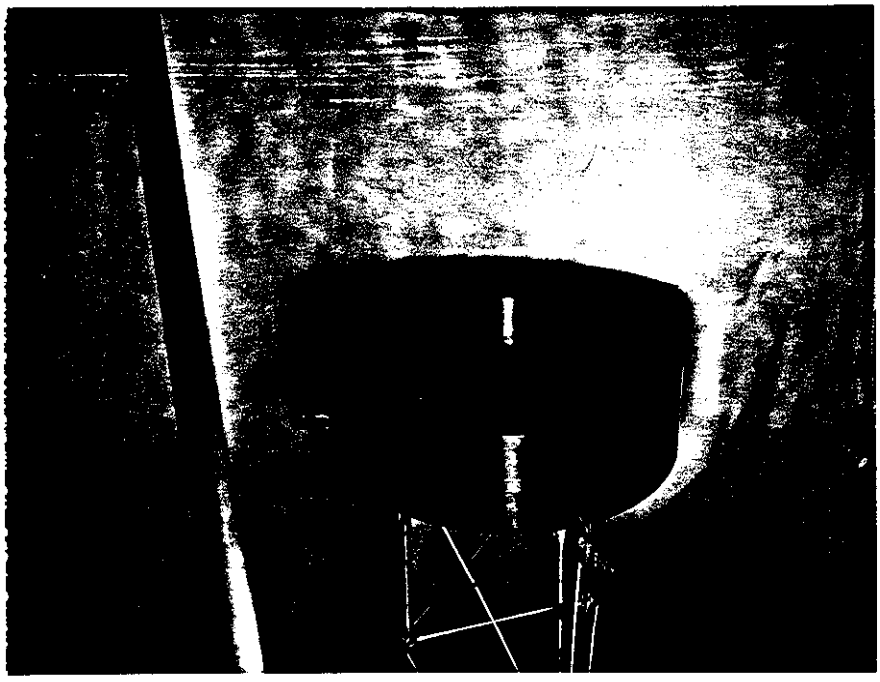
3.9387
10.0043 cm

1/8 1/8 1/4 1/4 3/8 1/4 plate
1" 1"

Top Half



Lower Half



Summary

Bottom annulus	Height	8.57109 cm	11 OD
		8.57334 cm	9 OD
	Av	8.5722	
	Mass	58.546 Kg	
Fuel in bottom of hole			
	Thickness	3.50774 cm	
	Mass	16.291 Kg	
Rings on top	Height + plate	10.0219	11 OD
		10.0043	9 OD
Mass on top	61.828 + 1.223 + 0.953		
	11.814		
	7.22		
Total mass		~~155.699~~ Kg	
		157.875	

1963

1-3-63

INSTRUMENT CHECK

Time ____ AM PM Source Po Be γ

Tables ok X Channel

	F	A	B	C	D	E
Range	ok	10/1000	opr	10^{-12}		1050
Source Dist.	Light	6"	ok	40"		2"
Trip	ok	100		100		100

C.A. U-11 OD Disk Expr. ____ Run 1

Sheet Bore Date 1-3 1963 Time ____ AM PM

Purpose 11 in dia discs ~~2.75~~ 2 3/8 in thick on each half

Loading I

Top 1/4" Plate 11 OD on diaphram (5 mil)
1" 7" OD 2731 9 OD 7 ID - 2738 11 OD 9 ID 2776

Bottom
1/4" 7 OD , 9 OD 7 ID , 11 OD 9 ID
1" 7 OD , 9 OD 7 ID , 11 OD 9 ID

Tables can go no closer than 1 inch change of speed switch at ~1.4 inches

VDT # 4 at 0 with selsyn 21.61 no significant multiplication

Loading 2.

Added 1½ - 9 OD 7 ID RING

Selsyn - 21.615 VDT #3 off scale #4 +11

Counter # 1 2

0 168 0 41

0 166 0 40

Loading 3

Added 7" OD 1½ th to top

Fine selsyn 0.001 Coarse 0.00 Table down

Critical 20.80 coarse 20.830 Fine

C.A. U-11 OD Disk Run 2

Sheet 1-3-63 AM PM

Purpose 2 3/8 11 OD on each half

Critical

C - 20.91 F - 20.892

0 - 0.00 F - 99.996

7" OD DISCS NOT SHIMED up ENOUGH

1-4-63

INSTRUMENT CHECK

Time 8:20 AM/PM Source Po Be γ

		Channel A	B	C	D	E
Tables OK	F				X	X
Light OK						
Range	OK	10/1000	opr	10^{-12}	0	1050
Counter 1+2 OK						
Source Dist.		5"		36"	u T	2"
% F.S. Trip		100	OK	100		100

Slow speed change 19.4 on coarse selsyn

C.A. U-11 OD Disk Expr. _____ Run 3

Sheet _____ Date 1-3 1963 Time _____ AM/PM

Purpose 2 3/8 11 OD on each half

Clean critical

Table down CS 0.00 FS - 0.001

A CS 20.92 FS 20.896 VDT #3 - 9 #4 - 4

Period + 96.6 sec + 10.1 ¢

B Level at 0.005 on Log N

CS 20.908 FS 20.8846 VDT #3 - 20 #4 - 05

FS - 11.2 mils Displacement

11 mils

$$\frac{\Delta K}{\Delta x} = \frac{10.1}{11.1} = 9.1 \text{ ¢/mil}$$

Selsyn Zeros C 0.00 F 99.9975

CA U-11 OD Disk Expr. _____ Run 4
Sheet _____ Date 1-4 1963 Time _____ AM PM
Purpose Rossi α-Two 2 3/8 11 OD DISCS
spaced

FS - 20.889 T = +

Critical - 20.875 - Fine selsyn varied down to 20.870 - no apparent explanation

Shut down to adjust flanges which actuate VDT indication

Critical at

FS	VDT 3	VDT 4
20.869	-3	off
20.868	-3	"
20.867	-3	"
20.89 [20.865	-4	"

Log N. = 0006

• Table up Coarse Selsyn 20.895
Fine Selsyn 20.865 #3 VDT = -3

Table down Coarse Selsyn 0.00
Fine Selsyn 99.998 Displacement 20.87

0.00
99.99

Motion of table to stop by Limit switch
20.920 in.

Separation of lower unit from diaphram with table down
22.931
22.913
22.917
22.924

Separation of lower unit from diaphram with table
C - 0.036
22.554 F - 0.003445
22.568
22.573
22.565

Table then Lowered
F 99.991 C - 0.00

1-5-63

INSTRUMENT CHECK

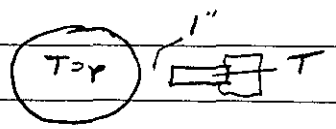
Time 9:15 AM ~~PM~~ Source RBe γ

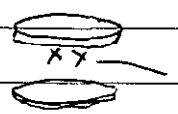
Tables or Light or Range	F	A	C	B or R	D	E
	OK	10/1000	1-12 ~~opr~~	~~10~~	0	1050
Source Dist.		5"	30"	0	u	1.5
% F.S. Trip		100	100	K	T	100

C.A. U-11 OD Disk Expr. Run 5

Sheet Date 1-5-63 AM PM

Purpose Reactivity of counters in 2 3/8 x 1100 Discs





2 SFC at Top plate

Counters in position

T = + 54.3 LN +15.5 ¢

Coarse selsyn 20.91

Fine selsyn 20.8865 - 8875

VDT # 3 +12.75

Spac. Fuel 22.9 22.4

1-5-63 Tables Lowered

VDT #3	-14	Δx	26.75
CS -	20.88		30
FS -	20.858		28 mils

Period $T = -187.3$

$\Delta \rho / \Delta x = -8.85$ ¢

Table Separation

Spacing + Fuel					
22.925	Down	CS	0.00	FINE SELSYN	99.9992
22.453	partially up		0.469		0.458
	up		20.91	Measured	20.887
	Motion up		20.91	20.906	20.895
			20.441	20.429	20.429

Spacing 2.019 inches 2.024 inches with table up on stop + positive period

C.A. U-110D DISK Expr. Run 6

Sheet Date 1-5 1963 T: AM PM

Purpose Counters Removed 2 SFC + NE-102-1/2

Clean critical

Table Down. 20.895 motion on piston as measured between Flange and Limit switch to stop motion

Selsyn readings 0.00 C

99.996 F

Distance between top of Fuel on bottom and diaphram
measured at 1100

2027 22.917 ; .911 ; 936 ; 926 Av ~~22.22~~
~~22.220~~ 22.922

Table part way up
Motion on piston 20.180 in

2.026 Spacing of Fuel + diaphram 22.220 ; .203 ; .209 22.190
Selsyn readings 22.206 Av
C - 00.715 Fine 00.7055

Table up
VDT # 3 +12 ~~#4~~
Coarse selsyn 20.91
Fine selsyn 20.8835
Positive Period T = + 83.6 + 11.25 ¢

Level T = ∞
VDT #3 +0 Separation 2.015 in
Coarse Selsyn 20.896 + 5 diaphram
Fine selsyn 20.869 $\boxed{2.020}$

Table Down
CS
FS

1-5-63

C.A. N-110D Disk Expr. _____ Run 7

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Support Structure Evaluation
Ring 5 mil SS + Lower support
put on ~ +10 on panel

190

Lower support removed

C.A. N-110D Disk Expr. _____ Run 8

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Evaluation of 5 mil diaphragm
And Ring

VDT #3 +0.0
Coarse Selsyn 20.896 T = + 62.4 arc
Fine Selsyn 20.869 + 14 ¢

Level

			$\Delta\theta/\Delta x$
VDT #3	−15.2	T = ∞	9.21 ¢/mil
FS	20.854		9.33

1-5-63 60-3-1

C.A. 11 O.D. Disk Expr. Run 9

Sheet Date 9 Time AM PM

Purpose Diaphram removed

Value of Ring

VDT #3 +0 Positive period

C Selsyn 20,895 T = + 184.6 sec

F Selsyn 20,868 + 5.95 ¢

Level.

			ΔR/Δt
VDT #3	−6.2	T = ∞	9.597 ¢/mil
C Selsyn	20.89		
F Selsyn	20,8605		7.9

C.A. 11 O.D. Disk Run 10

Sheet AM PM

Purpose Repeat of Clean critical

Positive Period T = ~~34.74~~ +56.5 sec ΔR/Δt

VDT #3	+ 14.5	+ 15 ¢	9.55
C Selsyn	20.91		
Fine Selsyn	20,885		8.33

-5-63 ~~Level~~ T = +

VDT #3 +0 D - $\frac{505}{42}$ in 150 sec

C Selsyn 20.895

F Selsyn 20.868

Level T = ∞

VDT #3 = -1.2

C Selsyn = 20.898

F Selsyn = 20.867

Negative Period T = -195.4 -8.45 ¢

VDT = -11 $\Delta\rho/\Delta x$ 8.62 ¢/mil

CS = 20.885

FS = 20.857 8.45

C.A. Willow Disc Run 11

Sheet Date 1/9 Time AM PM

Purpose Evaluation of Lower Support Column

VDT #3 - -1.2

C Selsyn 20.895 T = + 39.1 sec

F Selsyn 20.867

System Scrammed on A due to not changing trip level as power level was rising on a period

1-5-63

-5-6

E.A. U-11 OD Disc Run 12

Sheet ____ Du ____ 9 ____ Time ____ AM PM

Purpose Recheck of critical point after scram to see of fuel was disturbed enough to cause the reactivity to change.

Class system

VDT +15.5

Coarse Selsyn 20.91 T = + 118.3

Fine Selsyn 20.891 8.65 ¢

VDT − −1.2

CS 20.885 T = − 263 sec

FS 20.872 ρ = 5.8

8.65

14.45

ΔK/Δx

VDT 14.45/16.7 .865 ¢/mil

Critical + 5.5 mil on VDT 3

1-5-63

C.A. N-11 OD Disc Expr. _____ Run 13

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose AL Support Column - 5 mil diaphram
Al ring in position

~~VDT~~ ~13
20.88
20.867

CRITICAL

VDT #3 ~ -26

Coarse slaygn 20.86 VDD

Fine slaygn 20.845 852 - -21

Summary.

Support Structure Evaluation

	¢	mils VDT	CS	FS
Al ring	5.9 ¢			
5 mil diaphram	8.1 ¢			
Lower support column. -	18 ¢			
Total	32	31.5		1

2 – 11" dia disc spaced 2.02"

Fuel Arrangement

Bottom Fuel Part No. 7"	9"	11"	Thickness	Top Fuel Part # 7"	9"	11"	Thickness
* 2770	2775	2778	1/4"	2769	2773	2744	1/8
2729	2829	2743	3/8	2768	2763	2746	1/8
2734	2780	2747	1 1/2	2728	2736	2742	3/8
2771	2774	2779	1/4	2733	2741	2748	1 1/8
wt 28,053 g	18,310 g	22,885 g		2803	Plate –		1/4
69,248 gms				69,291 gms			

V = 3701.270 cm³ V = 3702.179 cm³

ρ = 18.7092 ρ = 18.7162

Bottom Fuel Thickness 11"	9"	7"	Top Fuel Thickness 11"	9"	7"
2.380	2.379	2.373	2.379	2.376	2.372
.379	.380	.372	.376	.376	2.376
.379	.380	.373	.380	.375	.374
.375	.378	.372	.378	.380	.378
Avg 2.378	2.379	2.3725	2.378	2.377	2.377

Avg = 2.37666 Avg = 2.37725

1-7-63 JJL

CTU

Selsyn #1	Selsyn #2	Measured Movement of Table East	Measured Movement of Table West
0.00	0.001	15.414	15.382
5.00	4.9925	20.413	20.380
10.00	9.9995	25.411	25.3795
15.00	14.989	30.404	30.382
17.00	16.986	32.400	32.375

52

1-9-63

INSTRUMENT CHECK

Time _____ AM PM Source Pu Be + γ

		Channel A	B	C	D	E
Range	F Hv = 8.0	10/1000	off	10^{-12}	10/100	1010
Source Dist.	OK	9"	0	5"	2.5"	2"
% F.S. Trip		95	OK	100	70	100+

Ctrs # 1, 2 + 3 OK

13"X9"
1" C Reflector

C.A. 2 - 13 OD Run 1
Shell 9 ID 1-9-63 9:30 AM
Purpose To Obtain Critical assem assembled on C.T.L. 10 mil Diaphragm 1" Graphite Reflector with 1" Cover on Top

Source # PN 568 on diaphragm in center of Ring
STACK 3 inches

Width	Thickness	Top Width	Thickness
11"		13"	
2745	1"	2756	1"
2748	$1\frac{1}{2}$"	Bot.	
~~2707~~	[redacted]	2757	[redacted]
2742	3/8	2751	$\frac{1}{2}$"
2746	1/8	2752	$\frac{1}{2}$"

# 1 Center	# 2	#3
1887	3 52	3 101
1842	3 12	11 201
1728	3 [redacted]	11 223
	3 20	

1-9-63 Run 2 Stack 4 inches
Added on Top

	Width	Thickness		Width	Thick.
#2776	14"	1"	2753	13"	1/2"
			2754	13"	1/2"

Counter #1	#2	#3
26 67	4 115	16 81
26 99	4 124	16 116

Run #3 Stack 5 inches
Added To Top

#	Width	Thickness	#	Width	Thickn.
2743	11"	3/8	2749	13"	3/8
2778	11"	1/4	2750	13"	3/8
2779	11"	1/4	2782	13"	1/4
2744	11"	1/8			

Counter #1	#2	#3
42 +191	6 +219	24 +209
42 +224	7 +38	24 +34

1-9-63 Run #4 ~~Stack~~ Stack 6 1/16 inches

Removed	Width	Thick
2743	11"	3/8
2778	11"	1/4
2779	11"	1/4
2744	11"	1/8

Added:

~~2747~~	Width	Thick
2747	11"	1 1/2
2767	11".	9/16
2755	13	9/16
2783	13	1/4
2780	13	1/8
2781	13	1/8

Counter #1	#2	#3
87 + 218	14 + 6	49 + 82
88 + 8	13 + 253	49 + 8

Run

[redacted]

13" X 9" — 1" C Reflector + C Core

C.A. _____ Expr. _____ Run 5

Sheet _____ Date _____ 19 ___ Time _____ AM PM

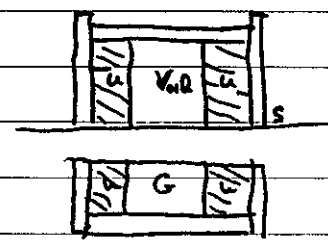
Purpose Reflector added 2" to hole ON RAM
(1/16" Fuel) 1" OUTSIDE REFLECTOR

Source in same position as previous run

107 242 16 119 63 36

Run 6 Removed 15" OD DISC of graphite FROM TOP ← ADDED
13" OD - 1" THICK ON TOP OF FUEL

Source now on diaphragm
outside of stack



#1 70 + 227 #2 10 + 248 #3 41 + 153

Run 5
Added 9" dia graphite Disc 1½" thick to the top
Void region

75 + + 107 6 + 54 40 + 4

Run 6 Added 9" dia Graphite 1" + 9/16 thick
117 217 19 252 81 149

Run 7 Added 1" T 9" OD to Top hole - Void Full

Tables at ~ 22.45 ? ~ + period counter jamming
Remove large source from diaphragm & install small source on drive

191^{16} ^{7} 1^{232} 6^{150}

Run 8 Added 1/2" T 13 OD Graphite to top
Super critical @ 22.25 ✓

Run 9 Removed 1/2" T 13 OD Graphite off top
Added 1/4" T 13 OD Graphite to Top

Super Critical @ 22.365 ✓

Run 10 Removed 1/4" T 13 OD Graphite off top
Added 1/8" T 13 OD Graphite to top.
Sub critical

~~Run 11~~

C.A. U-13 OD / 9 ID Expr. _____ Run 11

Sheet _____ Date 1-9 1963 Time _____ AM PM

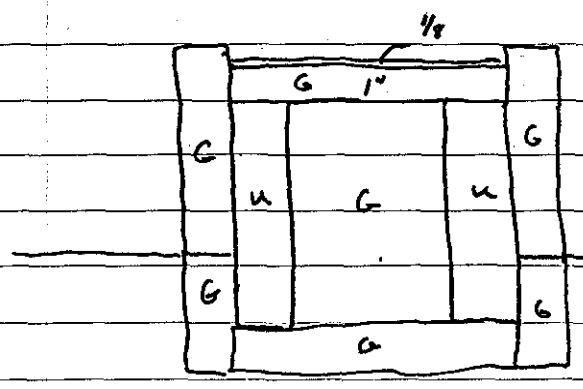
Purpose Clean Critical

13 OD - 9" ID 6 1/16 high

Graphite 9" OD 6 1/16" high in center

VDT 3 - +6 #4 +7 CS - 22.69

FS - 22.662



Negative period

10 mil diaphragm 30" Dia. RING

	LN	A	D
T =	$\frac{24}{15}$ - 625 sec	$\frac{705}{435}$ - 600 sec	$\frac{495}{3}$ 600 sec
T =	- 1330	- 1244	- 1182
ρ =	- 1.0¢	- 1.07¢	- 1.14

Avg = -1.07¢

58

1-9-63

C.A. 2 - 13" O D
9" I D
Run 12
Sheet _____ Date _____ 9 _____ AM PM
Purpose Planks removal repeat of clean critical

	Ln	A	D
T	2.22 $\frac{20}{9}$ 650	1.76 $\frac{55}{28}$ in 550	2.21 33/24 — 600 sec
	-815	-817	-756
	ρ = -1.66 ¢	-1.66 ¢	-1.78 ¢

Avg = 1.70 ¢

C.A. 2 - 13" O D
9" I D
Run 13
Sheet _____ Date 1-9 63 3:40 pm
Purpose Evaluation of Ring + Lower Support Column

VDT #3 = +6 #4 = +8

	Ln	A	D
T	+91.2 sec	91.0	—
	10.5 ¢	10.5 ¢	—

Avg = 10.5 ¢

C.A. _____ Expr. _____ Run 14

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose ~~To Makeup of~~ Lower support stand removal.

Support Ring Evaluation

VDT #3 = #4 =

	LN	A	D
T =	+195.4 sec	$\frac{52}{53}$ in 100	$\frac{5}{3}$ in 100
	5.7 ¢	202 Sec.	144 Sec.
Avg = 6.19 ¢		5.52 ¢	7.35 ¢

C.A. _____ Expr. _____ Run 15

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Repeat at clean critical

	LN	A	D
T	−902 Sec	$\frac{8}{6.7}$ 162 sec	$\frac{4}{7.4}$ 150 sec
		934 Sec	754 sec
ρ	1.38 ¢	1.33 ¢	1.65 ¢

Avg = 1.45 ¢

1-10-63

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source Pu Be + γ

	F	A	B	C	D	E
Range H.V.	8.0	10/1000	opr	10^{-12}	10/100	1050
Source Dist.	OK	1"	0	5'	1.5"	1.5"
% F.S. Trip		85	OK	100	80	100+

Ctrs #1, 2 + 3 OK

C.A. U-13" O D 16

Shed 9" I D 1-10-63 8:45 AM ~~PM~~

Purp. Evaluation of ~~[illegible]~~ lower Support Structure

VDT #3 = 6 #4 = 8

Measured Postive Period

Ln A D

~~Run 17~~

Run 16 Ln A D

+ 288 42/86 200 Sec. 37.5/80 = 200 Sec.

+ 279.7 + 264

4.04¢ 4.15¢ 4.35¢

Avg = 4.18¢

C.A. N-13" OD Expr. _____ Run 17
9" ID
Sheet _____ Date 1-10 1963 Time 9:20 AM PM
Purpose Zero Run

Stack on p. 57

VDT #3 = 6 #4 = 8.5

Selsyn #1-2269 #2-22,665

Measured Negative period.

Ln = $\frac{3.0}{1.5}$ in 71.5 Sec A = $\frac{78.5}{50}$ in 500 Sec. D = $\frac{66.5}{43}$ in 500 Sec

Avg: -1.22¢ -1030 Sec. -1108 -1141

-1.3¢ -1.2¢ -1.15¢

Run 18 Removed 13" Graphite Disc 1" thick - C from Top
Added $\frac{9}{16}$" + $\frac{1}{2}$" Graphite " 13" dia.
Top reflector now $1\frac{3}{16}$".

Avg. 8.27¢ Measured Positive period.

Ln A = $\frac{30.5}{93.5}$ in 150 Sec D = $\frac{240}{60}$ in 100 Sec

+ 133 Sec. = 7.82¢ 134 Sec. = 7.8¢ 109 Sec. = 9.2

Run 19 Placed 20" Diaphram on top of lower half of table, 10 mil thick

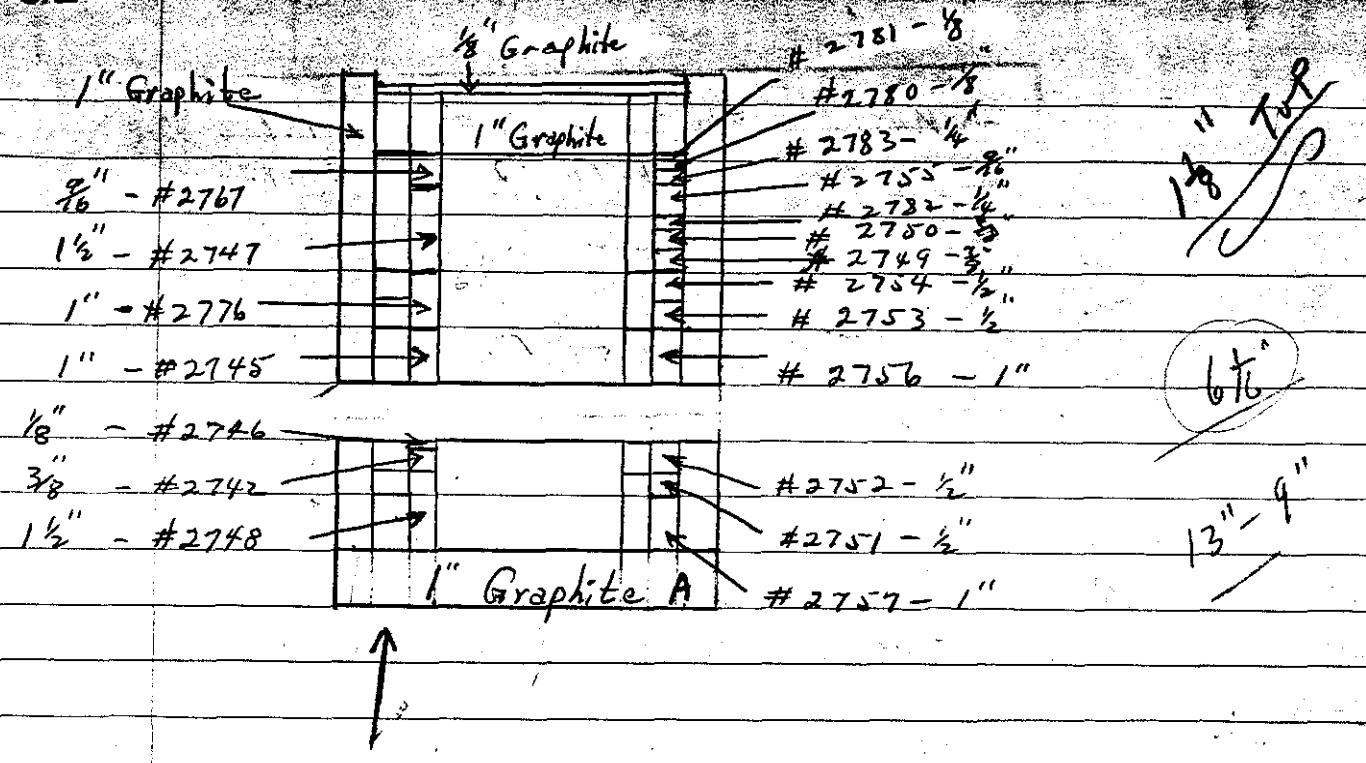
VDT #3 = 6 #4 = 8.5

Critical-level

00 Sec.

Period — ∞

$\frac{1}{16}$" X 13" C = 9.49¢ [Run 17 vs 18]



Loading of Run 11 p.57

Bottom fuel meas.		Top fuel meas.	
13" O.D.	11 O.D.	13 O.D.	11 O.D.
2.014"	2.009"	4.080	4.065
.011	.008	.080	.064
.012	.005	.077	.062
.012	.005	.078	.062
	.0055	.079	.065
		.080	.065
		.077	.063
		.078	.064
Av 2.01225	2.0065	4.078625	4.06375

Core graphite height same as 13 O.D. fuel.

Indentation at Top. 0.287" 0.289
(Depth) .2865 .28

Reactivity measurements made on 9 I.D. – 13 O.D. Fuel with 1" graphite reflector (except top) and complete graphite core.

Lower Fuel Support: 5.4 ¢ and 4.89 ¢

From 1⅛" to 1 3/16" Top Reflector (& 1/16" addition): ~~9.49~~ 9.06 ¢

20" dia., 10 mil thick diaphragm: 8.27 ¢

Plank walk way: 0.63 ¢

Support Ring (Diaphragm): ~~4.31~~ ¢ 6.96 ¢

Clean Critical Reactivity: −1.46 ¢

(13" x 11")	(11" x 1")
6.0911"	6.0702"

1-11-63

INSTRUMENT CHECK

Source PuBe + γ

Time 9:15 a

		Channel A	B	C	D	E
Range	F	10/1000	open	10^{-12}	10/1000	1050V.
Source Dist.	OK	4.5	0	S	1.5	1.5
% F.S. Trip		100	OK	C K	80	100+

6 to 1,273 OK

C.A. 7 I.D. - 13 O.D. Expr. _____ Run 1

Shell 1" Refl. Date 1-11-1963 Time _____ AM ~~PM~~

Purp. Multiplication Curve.

Loading: Ram - 2"

Diaph - 2"

Fuel Loading: 4"

	7-9	9-11	11-13	Thickness
Top	—	—	# 2754	½"
	—	—	2753 ✓	½" ✓
	2762	# 2776	2756	1"
	2738	# 2745	—	1"
Bottom	# 2763 ✓	# 2746 ✓	—	⅛"
	# 2736 ✓	# 2742 ✓	—	⅜"
	—	—	# 2752	½"
	—	—	2751	½"
	—	—	2757	1"
	2741	2748	—	1½"

Bottom graphite - 1" Complete

Top - " - Ring 13-15 by 5½" with 15" disk on top

66
1-11-63

Run 1 Sub Critical

Ch #1	#2	#3
252^{+49}	41^{+108}	148^{+132}

Run 2 Removed - [redacted] 15" disc from top. (graphite).
Placed - 13" dia disc (graphite) down in contact with fuel.
Super Critical.
Level = 22.27 Selsyn #1

Run 3 Fuel Loading: 3 7/8"

Removed from Top - 1" fuel from 7-9 + 9-11
1/2" " " 11-13
Added to top - # 2775 - 1/4" - # 2779 (7-9, 9-11)
11-13 2774 - 1/4" - 2778
2747 - 3/8" 2829 - 3/8" - 2743

Super Critical:
Level = 22.37

Run 4 Fuel loading: 3 3/4"
Removed 7-9 2775 - 11-13 2779 Both 1/4"
11-13 - #2747 - 3/8"
Added:
1/8" 7-9 # 2773 - 1/8 # 2744 9-11
1/4" # 2782 - 11-13
Sub-Critical

1-11-63

Run # 5 Fuel Loading $3\frac{13}{16}$"

Removed:

7-9	9-11	11-13
2763 $\frac{1}{8}$"	2746 $\frac{1}{8}$"	2753 $\frac{1}{2}$"
2736 $\frac{3}{8}$"	2742 $\frac{3}{8}$"	

Added

7-9	9-11	11-13
2737 $\frac{9}{16}$"	2767 $\frac{9}{16}$"	2755 $\frac{9}{16}$"

Sub-Critical

Run 6 Fuel Loading $3\frac{13}{16}$

Added 13" dia $\frac{1}{8}$" Graplite Disc to Top

Super Critical:

Level = 22.395

Run 7 Fuel - $3\frac{13}{16}$"

Top Reflector = $1\frac{1}{16}$"

Sub Critical.

Run 8 Fuel loading: $3\frac{3}{4}$" Same as Run 4

Top Reflector = $1\frac{1}{8}$"

Sub-Critical

Run 9

Fuel loading: $3\frac{3}{4}$"

Top Reflector = $1\frac{3}{16}$" Sub Critical

68

1-11-63

Run 10 Fuel loading 3 3/4"
Top Reflector 1 1/4"
Sub Critical

Run 11 Fuel loading 3 3/4"
Top Reflector 1 5/16"
Just critical - ∞

Run 12 Fuel loading 3 3/4"
Top Reflector 1 5/16"
20" diaphragm 10 mil S.S. placed on top of fuel on lower part of table.
Sub-critical

1-14-63

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Pu Be + γ

	F	A	B	C	D	E
Range	8.0	10/1000	off	10-12	10/1000	1050 ✓
Source Dist.	OK	7"		3'	1.5"	1.5"
% F.S. Trip		95		100	85	100+

~~ctrs~~ 1, 2 + 3 OK

C.A. 7" ID - 13 OD Expr. Run 13

Sheet 1" Reflector Date 1-14-1963 Time AM PM

Purpose Support Structure Evaluation

Fuel Support

Fuel Loading 3 3/4"

Top Reflector 1 5/16"

Measured Positive Period

Avg = 9.91¢

Lm	A = 27.5/73 in 100 Sec	D = 24.5/69.5 in 100 Sec
+ 98 Sec =	102.6 Sec	96 Sec.
10.01 ¢	9.7 ¢	10.02 ¢

Run 14

Diaphragm Evaluation

20" Diaphragm of 10 mil SS. Placed on top of fuel on lower half of table

Measured Negative Period

Lm	A = 55/28.5 in 150 Sec	D = 50/15 in 150 Sec
-206 Sec	228 Sec	~~140 Sec~~ ?
- 7.8 ¢	- 6.9 ¢	~~3.4~~ ?

Avg = -7.35 ¢

Run 15 Support and Diaphragm removed.

Support Ring Evaluation

Measured Positive Period:

Ln	A = 28/69 in 200 Sec	D = 34/61.5 in 100 Sec.
+ 212 Sec	222	170
+ 4.66 ¢	5.08 ¢	6.40 ¢

Avg = 5.38 ¢

Run 16 Zero Run

Support Ring removed

* VDT #3 = 5.4 #4 = 8.5

#1 22,698 # 22,668

Measured Positive Period

	Ln .001/.002 in 525 Sec	A = 33.5/49 in 300 Sec.	D = 26/46 in 400 Sec.
Avg = 1.66 ¢	757	789	702
	+ 1.64 ¢	1.57 ¢	1.76 ¢

Run 17 Removed board Structure — Positive Period.

VDT #3 = 5.8 #4 = 9.4

Ln .0008/.0011 in 650 Sec.	A = 61/79 in 500 Sec.	D = 53/72 in 500 Sec
+ .2044	+ 1938	+ 1639
+ 0.53 ¢	0.65 ¢	0.76 ¢

Avg = 0.65 ¢

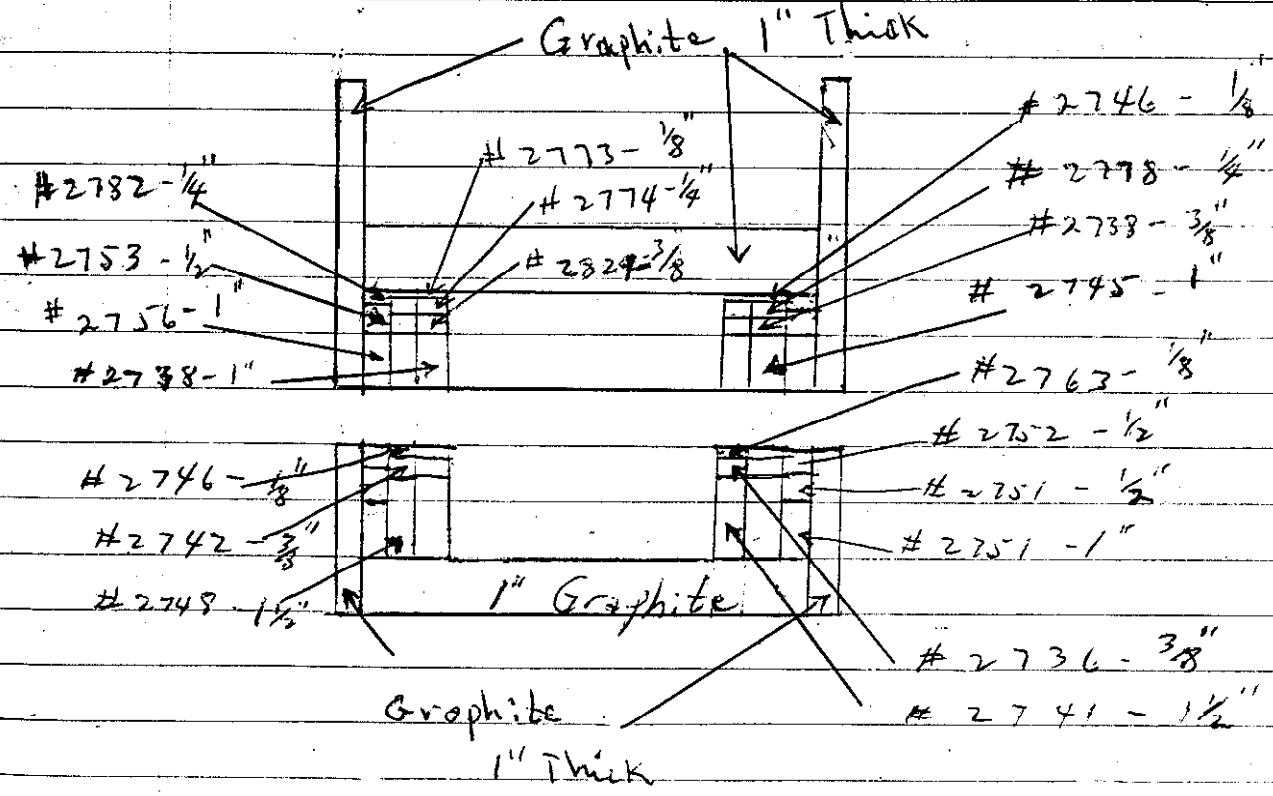
Reactivity Measurements made on 7" I.D. - 13" OD fuel with 1" graphite Reflector (except for Top)
Fuel = 3 3/4" ; Top Reflector = 1 5/16"

Lower Fuel Support : 8.25 ¢

20" diaphragm 10 mil thick : ~~[illegible]~~ ¢ 17.2 ¢

Diaphragm Support Rings : 3.72 ¢

Plank Walk Way : 1.01 ¢



Fuel & Graphite Arrangement

1-14-63

C.A. 7" I.D. 13" O.D. Expr. _____ Run Run 18
1" Reflector
Sheet _____ Date _____ 19 ___ Time 3:30 ~~AM~~ PM
Purpose add graphite Core

Fuel loading 3"
7" Graphite 1" thick Placed in
Center of fuel on top
1" Reflector [redacted]
Sub-critical

Run 19 Added: $1\frac{1}{2}$" Graphite Disc 7" OD to Center of lower half of table

Sub-critical

Run 20 Added $\frac{3}{8}$" + $\frac{1}{8}$" Graphite disc 7" O D to Center of lower half of table

4 +1 +10	1 +7	4 11
3 6	1 3	3 7
3	1 6	4 10

1-15-63

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~ Source PuBe + γ

		Channel A	B	C	D	E
Range	$\bar{r}$	10/1000	Opr	10^{-12}	10/1000	
Source Dist.	Hv = 8	7"	0	5	2"	1.5"
% F.S. Trip	OK	100	OK	¼	80	100+

C.A. _____ Expr. _____ Run _____

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose _____

No Runs

ter

1-16-63

INSTRUMENT CHECK

Time 10:20 AM ~~PM~~ Source PuBe + γ

	Channel A	B	C	D	E
Range	10/1000	Opr	S	10/1000	1050
Source Dist.	7"	0	ICK	1"	1.5"
% F.S. Trip	100+	OK		80	100+

Ctrs 1, 2 + 3

C.A. 7:0 130.D Expr. _____ Run 21

Sheet _____ Date 1-16 1963 Time 10:20 AM ~~PM~~

Purpose _____

Fuel loading 3"

1" Reflector

Counter #1	#2	#3
0 52	0 14	0 84
0 46	0 26	0 86

Run 22

Fuel loading $3\frac{1}{8}$"

Added: 11-13 x $\frac{1}{8}$" 2781 9-11 x $\frac{1}{8}$ = 2744 7-9 x $\frac{1}{8}$ = 2773

0 74	0 21	0 85
0 71	0 26	0 78

Run 23 Fuel Loading $3\frac{1}{4}$"
Removed $\frac{1}{8}$" pieces
Added $\frac{1}{4}$" 11-13 = 2783 9-11 = 2778 7-9 = 2774

0 80	0 24	0 92
0 80	0 16	0 107

Run 24 Fuel Loading $3\frac{3}{8}$
Removed $\frac{1}{4}$" Pieces
Added $\frac{3}{8}$" 11-13 = 2750 9-11 = 2743 7-9 = 2829

0 99	0 35	0 98
0 101	0 35	0 114

Run 25 Fuel loaging $3\frac{1}{2}$"
Added $\frac{1}{8}$" pieces as in Run 22

0 138	0 41	0 126
0 162	0 34	0 143

173

Run 26 Fuel loading $3\frac{5}{8}$
Removed $\frac{1}{8}$" pieces as in Run 22
Added $\frac{1}{4}$" pieces as in Run 23

1+ 29	0 48	0 213
1+ 39	0 63	0 220

Run 27 Fuel loading $3\frac{3}{4}''$
Added: $\frac{1}{8}''$ Pieces as in Run 25

Counter #1	#2	#3
61 200	10 138	35 217
62 74	10 54	36 26
~~49~~		

Run 28 Fuel loading $3\frac{3}{4}''$
Top Reflector $1\frac{1}{8}''$

	#1	#2
Level	22.37	22.353
	VDT - off	Super Critical

Run 29 Fuel loading $3\frac{3}{4}''$
Top Reflector $1\frac{1}{16}''$
VDT #3 = +5.2 #4 = +7.9
#1 = 22.69 #2 = 22.663
Level at #1-22.45 #2-22.424
Measured Positive Period 82.5 Sec.
11.4 ¢ Expired

1-

2 mi.

Run

1-17-63

INSTRUMENT CHECK

Time 2105 PM Source PuBe + γ

	Channel A	B	C	D	E
Range F HV=8	10/1000	Off		10/1000	1050
Source Dist. OK	6"	0	5'	2"	2"
% F.S. Trip	85		100+	80	100+

Ctrs 1, 2 + 3 OK

C.A. 7 10 13 Exp. Run 30

Sheet Graphite Core Date 1-17-1963 Time 2:30 PM

Purpose To obtain Multiplication Curve (Large Source on diaphragm)

Fuel loading 4"

1" on top - 3" fuel on lower half

on Ram

7-9	9+11	11-13
# 2741 - 1½"	2748 1½	# 2757 - 1"
7262 - 1"	2776	2752 - ½
2774 - ¼"	2743 - 3/8"	2750 - 3/8"
2775 - ¼"	2744 - 1/8"	2780 - 1/8"
		2753 - ½

	Counters 1 X256	2 X256	3 X256
2 min	22 163	3 79	15 43
	23 190	3 24	15 91

Fuel Loading 4½"

Run 31 Added to top ½" fuel ; 9/16" graphite to core.

7-9	9-11	11-13
# 2829 - 3/8"	2778 - ¼"	2751 ½"
2773 - 1/8"	2779 - ¼"	

41 +100	6 +34	25 +149
41 +118	6 +16	25 +197

Run 32 Fuel Loading 5"

Added to Top ½" Fuel - ¼" graphite & Core

7-9	9-11	11-13
# 2736 - ⅜"	# 2742 - ⅜"	# 2749 - ⅜"
2763 - ⅛	2746 - ⅛"	2781 - ⅛"

Counter #1	#2	#3
129 33	19 85	79 50
130 239	20 31	79 13

Run 33 Fuel Loading 5½"

Removed 9 + 11 O D pieces in Run 31+32

" 9/16" + ¼" Graphite

Added

Added

7-9	9-11	11-13
# 2740 - 1½"	# 2747 - 1½"	2782 - ¼"
		2783 - ¼"

1½" graphite

Small Source used

Super Critical @ 22.3

Ru

-18-63

INSTRUMENT CHECK

Time 10:40 AM PM Source PuBe

	F	Channel A	B	C	D	E
Range	HV=8	10/1000	opn	10	10/1000	1050
Source Dist.	OK	6.5"	0	6'	1"	1.5"
% F.S. Trip		100+	OK	100	80	100+

Ctrs 1, 2 + 3 OK

C.A. 71D-130D Expr. _____ Run 34

Sheet _____ Date 1-18-63 Time 11:10 AM PM

Purp. _____

Fuel loading 5 3/8"
Graphite Core

32

7-9	9-11	11-13
2762 - 1"	2776 - 1"	2751 - 1/2"
2736 - 3/8"	2743 - 3/8	2782 - 1/4"
		2781 - 1/8"
		2749 - 3/8"
		2783 - 1/4"

Critical 22.36 Coarse #1 Selsyn

Run 35 Fuel loading 5 1/4" - Graphite Core
Level at 22.47

7-9	9-11	11-13
2775 - 1/4	2746 1/8	2781 1/8
	2744 1/8	

C.A. 710 130D Expr. 36 AM PM

Sheet Date 1-18-63

Purpose 710 130D GRAPHITE CORE

Clean critical

no plants

Period

Lw.	A	D
+ 40.2 sec	61/21 50 sec	80 43/30 35 50 sec
40.8	46.9 sec	2
40.5 18.7	16.9	36.1 sec 20.5
7 - 9	9 - 11	11 13
2762 - 1"	2776 - 1"	2749 - 3/8"
2775 - 1/4"	2779 - 1/4	2782 1/4

~~Run 37~~ Fuel loading 5
Graphite core

	13	11	9	
1/4				1/4
3/8	2782			
1/8	2749	2779	2775	
1/8	2781			
1/2	2751	2745	2738	1"
	2756	2776	2762	1"
1/8	2780			
3/8	2750	1 1/2 2747	1 1/2 2740	
1/2	2753			
1/2	2751			
1/2	2752	1 1/2 2748	1 1/2 2741	
1"	2757			
	OD		ID	

S.A. 7 ID 13 OD Expr. _____ Run 37
Sheet _____ Date 1-18 1963 Time 2:50 ~~AM~~ PM
Purpose Diaphragm Evaluation

Fuel loading
Graphite Core

2269 Coarse
VDT #3 + 4 1/2 #4 - 1

LN	A		D	
+149.8 su	74/22.5	200 su	74/19	200
	52.5/27	100	52/27	100
18.7		159.3	147.2	
- 7.1	16.9	152.7	152.7	
11.6	6.85	156.0	150.	7.1
	10.05	20.5		
		7.1		
		13.4		

S.A. _____ Expr. _____ 38
Sheet _____ Date _____ AM PM
Purpose Ring Evaluation

$\frac{5.4 + 4.55 + 5.1}{3}$ 4.9

LN	A			D		
+76 su	92/27	- 100	81.6	91/25.5	- 100	78.6
12.1	55/14.5	100	83.1	51/12.5	- 100	71.1
			82.3			74.8
			11.4			12.2

79365 V1.5

1-18-63

C.A. _____ Expr. _____ Run 39

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Lower Support Evaluation

~~Support resting on foot.~~

Log N	A	D
30.4 Sec	9/42 in 50 Sec	12/70 in 50 Sec
	65	93

C.A. _____ Expr. _____ Run 40

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose

~~Lower~~ Support on Crane

Log N	A	D
31.8 Sec.	12/55 in 50 Sec	10/57 in 50 Sec
	64 m	87.4

22 ¢

1,8

Measurements for TID-1300 with graphite core.

Bottom fuel

7-9	9-11	11-13
3.005	3.005	3.010
.006	.004	.010
.002	.000	.009
.002	.003	.009
.001	.005	.008
.001	.007	.009
.002	.005	.010
.002	.005	.010

Bottom fuel

7-9	9-11	11-13
2.251	2.252	2.260
.254	.249	.258
.248	.252	.260
.249	.252	.260
.248	.252	.258
.248	.250	.259
.248	.250	2.259
.248	.250	.258
.250		.259
.250		.259

Top fuel pcs.

7-9	9-11
# 2775	2729 - 1/4"
2762	2776 - 1"
2738	2745 - 1"
	11-13
# 2782	
2749	
2781	
2751	
2716	

13 OD 7 ID BARE

1-21-63

INSTRUMENT CHECK

Time 2:15 P.M. P.B. γ

Tables OK

	F	A	B	C	D	E
Range	OK	10/1000	opr		10/100	1050
Source Dist.	Light	3"		5'	1"	1.5"
% F.S. Trip	OK	100		100	80	100

C.A. U Bingo Expr. Run 41

Sheet 7" ID - 13 OD Date 19 Time 2:35 AM/PM

Bare

Purpose

Multiplication Curve

Stack: 5" { 3" on Ram
2" on Diaphram

Ctr	#1	#2	#3
2 min	62 +181 x 256	10 +95 x 256	41 +98 x 256
	63 +120	10 +190	40 +167

Stack: 5 9/16"

Run 42 added 9/16" to top 7-9 #2737 9-11 #2767 11-13 #2755

#1	#2	#3
296 +181	48 +128	185 +47
296 +96	48 +114	184 +187

Run 43 Stock: $5\frac{13}{16}$"

added $\frac{1}{4}$" fuel to top:

7-9	9-11	11-13
#2775	#2779	#2782

Super Critical @ #1 = 22,46

Run 44 Removed:

7-9	9-11	11-13
#2775 - $\frac{1}{4}$"	#2779 - $\frac{1}{4}$"	2781 - $\frac{1}{8}$"

Added: #2744 - $\frac{1}{8}$" #2763 - $\frac{1}{8}$"

Stock: $5\frac{11}{16}$" High

Sub Critical

1-22-63

INSTRUMENT CHECK

Time 8:20 AM Source PaBe + γ

	Channel A	B	C	D	E
Range F	10/1000	opr	10 12	10/1000	1050
Source Dist. HV = 8	6"	0	7'	1.5"	1.5"
% F.S. Trip OK	100+	OK	100+	80	100+

Counters 1, 2 + 3 OK

C.A. 7ID-130D Bare Expr. _____ Run 45

Sheet _____ Date 1-22-63 Time _____ AM ~~PM~~

Purpose Cont. multiplication

Stack: 5 11/16" + [1/8" on 7-9 Ring]

Removed: 7-9
2744 - 1/8"

added: # 2775 - 1/4"

Slightly super. Planks + other structure still up.

88

1-22-63

1-22

C.A. 7ED-130B Bare Expr. _____ Run 46

Sheet _____ Date 1-22 1963 Time _____ AM PM

Purpose Reactivity of Clean assembly.

Stack: 3" on Ram

2 11/16" + [1/8" on 7-9 Ring] on diaphragm

neg. Period.

VDT #3 = +4 #4 = 4.75 Selsyn #1 = 22.69

Log N	Channel A	Channel D.
− 730 Sec.	57/38 in 300 Sec	38/23 in 300 Sec
− 1.88¢	740 sec	599 sec
	1.85¢	X

C.A. _____ Expr. _____ Run 47

Sheet _____ Date _____ 19 ___ Time _____ AM ~~PM~~

Purpose Diaphragm Support Rings Evaluation

Positive Period.

Log N	Ch A	Ch D
+ 293 Sec	50.5/81 = 150 Sec	40/82 = 150 sec.
3.97¢	47.5/79 = 150 sec.	42.5/75 = 150 sec.
	319 Sec = 3.7¢	209 sec
	294 sec = 3.97¢	264 sec
		X

3.97
3.97
3.7
10.64
3.88

1-22-63

C.A. 71D - 130D Expr. _____ Run 48
Sheet _____ Date 1-22-19 63 Time _____ AM PM
Purpose Lower Support Structure Evaluation

Positive period

Log N.	Ch-A	Ch-D
+ 55 sec.	37/92 50 Sec.	37/97 50 sec.
+ 15.4 ¢	54.8 sec	44.7 sec
	15.4 ¢	X

C.A. 71D - 136D Expr. _____ Run 49
Sheet _____ Date 1-22-19 63 Time 11:16 AM PM
Purpose Diaphragm Evaluation [Support Structure still on]

VDT #3 = +4 #4 = -3.6

Neg. Period

Log N	Ch A.	Ch D
- 955 sec.	57.5/80 = 300 Sec.	66.5/41 300 Sec
- 1.42 ¢	905 Sec	778 Sec
	1.5 ¢	X

- 12.92
- 1.46 ¢
- 15.4
- 16.86

C.A. 71D 13.0D Expr. _____ Run 50

Sheet _____ Date 1-22 1963 Time 12 20 AM PM

Purpose Reactivity Check of clean assembly.
Repeat of Run 46

Negative period

Log N
- 782 Sec
- 1.74 ¢

A
69.5/48 in 300 Sec.
809 sec
1.67 ¢

D
67.5/36.5 in 300 Sec
660 sec
X

1.67
1.74
3.41

C.A. 71D ~~20~~ 13 D 51

Sheet 1-22-63 12 50 ~~AM~~ PM

Purpose Reactivity of contents for Rossi & measurement

Stock: 5 11/16" + [1/8" on 7-9 ring]

Positive Period

Log N.
275.8 Sec.
+ 4.17 ¢

A
65/34 200 Sec
309 sec
3.81

D
77/17 250 Sec
491 sec
X

453

4.17
3.81
2 | 7.98
3.99

$T = \frac{t}{\ln(\text{chart})}$

1-22-63

C.A. 710-1960 Run 52
Sheet Date 19 Time 1:35 AM PM
Purpose Reactivity Check in preparation for Rossi α Measurements

Stock: $5\frac{11}{16}$" + [$\frac{1}{16}$" on 7-9 Rings]

WOT #3 = +4.8 #4 = -3

Removed: 710 - $\frac{9}{16}$" Ring #2737
Added: 710 $\frac{3}{8}$" Ring 2773
" $\frac{1}{8}$" " 2729

Sub Critical

Run 53 $5\frac{11}{16}$" + [$\frac{1}{16}$" on 7-9 and 9-11 Rings] or
Removed: 9-11 X $\frac{9}{16}$ Ring # 2767 $5\frac{3}{4}$"
Added 9-11 X $\frac{3}{8}$" Ring # 2742 minus
" 9-11 X $\frac{1}{8}$ " # 2779 [$\frac{1}{16}$" on 11-13 Ring]

Positive Period:

log N	A	D
183 Sec.	$\frac{265}{73.4}$ in 200 Sec	$\frac{12}{50}$ in 200 Sec
+ 6.0 ¢	196 sec	144 sec

6.0
-4.17
1.83¢

Run 54: Moved large Scint. Ctr away ~ ½".
Pos Period. Log N = 4.72¢

Run 55 Stock: $5\frac{11}{16}$" + [$\frac{1}{16}$" on 9-11 ring] with large scint. ctr. against bottom of fuel.
Sub Critical

29.148
X 5.6873
165.78 Kg

157.93 Kg

Reactivity Measurements made on BARE 7" I.D. - 13" O.D. assembly.

Reactivity of Clean assembly as Run 46 p. 88

1.71 ¢ - Run 50
1.86 ¢ - " 46
2 13.57 = -1.79 ¢

Diaphragm Support Rings = +3.88 ¢

Lower Support for fuel = +15.4 ¢

Diaphragm (10 mil) = -16.86 ¢

	11"-13"	9"-11"	7"-9"
1/4	#2782	#2744	2774 1/4
9/16	#2755	#2767	2737 9/16
3/8	#2749	#2776	#2738
1/2	#2751		1"
1"	#2756	#2745	#2762
#2780 1/8"	#2750 3/8"		
	#2753 1/2"	#2747 1 1/2"	#2740 1 1/2"
	#2754 1/2"		
	#2752 1/2"		
	#2757 1"	#2748 1 1/2"	#2741 1 1/2"

Diaphragm

Bottom fuel measured

3.010	3.005	3.005
.010	.004	.006
.009	.000	.002
.009	.003	.002
.008	.005	.001
.009	.007	.002
.010	.005	.002
.010	.005	

1-23-63

INSTRUMENT CHECK

Source RiBe + γ

Time 8:45 AM ~~PM~~

		Channel A	B	C	D	E
Range	F	10/1000	0pr	3X	10/1000	1050V
Source Dist.	HV=8	6.5"	0	8'	1.5"	1.5"
% F.S. Trip	OK	85	OK	100	85	100+

C.A. ~~7LD-90D~~ 7-13 Expr. _____ Run Run 55

Sheet _____ Date 1-23 1963 Time 9:05 AM

Purpose Basic & Measurement

Loading same as Run 46 Page 88
Stack 5 11/16"

Servo @ 7.0
ch A = 75

VDT #3 = +4
#4 = -5.5

Selsyn #1 = 22.685
Log N = .0005

~~Run 56~~ Shut down: 4:05 PM

1-24-63

INSTRUMENT CHECK

Time 9:00 AM ~~PM~~ Source Pu Be + γ

		Channel A	B	C	D	E
Range	F HV = 9	10/1000	opr	3810	10/1000	1000
Source Dist.	OK	6"	0	7'	1"	7"
% F.S. Trip		95	ok	100	80	100+

ctr #2 ok

C.A. ~~7-10 900~~ 7-13 56

Sheet 1-24-63 Time 9 AM PM

Purpose

Repeat of Run 50

1 small pc al for holding plastic shim removed.

VDT #3 = 4 Selsyn #1 = 22.69

#4 = -4.75

Measured Negative period.

Log N	A	D	
377 sec	70/40 in 250 sec	72/30	300 Sec.
3.82 ¢	53/32 in 250 sec	78/41	200 Sec.

C.A. 7-13 Expr _____ Run 57

Sheet _____ Date 7-24 1962 Time 3:15 AM/PM

Purpose _____

Stack 3 3/4 high 1" Graphite Reflector

Sub-Critical

	7-9	9-11	11-13	
Top 1/4			2780	1/8
1/8	2734	2779	2782	1/4
3/8	2773	2746	2751	1/2
	38	2742		
1"	2762	2745	2756	
Bot 1/8			2754	1/2
3/8	2750		2752	1/2
	1 1/2 2748	1 1/2 2741	2757	1"

Run 58 Stack 3 7/8" high

Sub crit

Run 59 Stack: 3 15/16" high

Super @ 22.48

1-25-63

INSTRUMENT CHECK

Time 8:40 AM ~~PM~~ Source Pn Be & γ

		Channel A	B	C	D	E
Range	HV = 8	10/1000	Opt	3X	10/1000	1050 ✓
Source Dist.	OK	8"	0	6½'	2.5"	1.5"
% F.S. Trip		90	OK	100	85	100+

ctr #2 OK

C.A. 7-9 ID 7-13 9-11 OD 11-13 60

Sheet Date 1-25-63 Time 9:00 AM ~~PM~~

Purpose

Stack 3 15/16 on 7-9 & 9-11
3 3/4 on 11-13 Ring.

Super Critical 22.5

Run 61 LN - Two decades in 62.28 sec + 15.77 sec

3.9375 3 15/16 on 7-9 Ring
3.8750 3 7/8 on 9-11 + 11-13 Ring

1/16" (13-11) fuel = 30.46 # [Run 62 vs 61]
or
0.487 #/mil

.508

C.A. 71D 13 OD Expr. Run 62
Sheet 1" C Refl. Date 1-25 1963 Time 10 30 AM ~~PM~~
Purpose

Stack 3 ~~1/4~~ 7/8 1" graphite, on floater

VDT #3 x5 #4 = x2.5

	11-13	9-11	7-9	
TOP 1/8	2781	78	2775	1/4
1/2	2751	42	2529	3/8
1/4	2782	79	74	1/4
	1"	1"	1"	

-14.37

Bottom part of table Same as Run 57

Measured Negative Period Log h 134.6 Sec.

22.69 A 59/~~127.5~~ 27.5 in 100 Sec D -89/32 in 100 Sec.

Avg = -14.69 ¢

131.5 sec 78 Sec

Run 63 -15.00 ¢

C.A. 71D - 13 D Expr. Run 63
Sheet 1-25 1963 Time 11:00 AM
Purpose Diaphragm support Ring Evaluation

-14.69
+15.77
30.46 ¢

~~14.69~~
~~8.84~~
~~5.85~~

Stack 3 7/8"

Measured Neg Period

2 VS61

Ln = 189 sec A D

-8.75 ¢ 82/48 in 100 sec. 84/38 100 in Sec.

-186.3 Sec 126 Sec

Avg = -8.84 ¢ -8.92 ¢

1-25-63

Run 64

C.A. 71D-13 OD 64

Sheet Date 1-25 63 AM PM

Purpose Lower Support Evaluation

Lower support + ring added

LN	A	D
+ Period		
$\frac{5}{18}$ in $\frac{13.5}{50}$ 6750 sec	$\frac{42.5}{84}$ 250 sec	$\frac{40}{82}$ 250 sec
+ 368.3 sec	+ 366.8 sec	+ 348.3 sec
+ 3.22 ¢	3.23 ¢	4.6 ¢ X

Avg = 3.22¢

C.A. 71D 13 OD 65

Sheet Date AM PM

Purpose Diaphragm Evaluation.

LN	A	D
-127 sec	$\frac{58}{27.5}$ 100	$\frac{90}{32}$ -100
-15.65 ¢		X
	-133.9 Sec	
	-14.53 ¢	

Avg = -15.09 ¢

1-25-63

C.A. 7 ID - 13 OD Expr. _____ Run 66
Sheet _____ Date _____ 19 ___ Time _____ AM PM
Purpose Repeat of "Clean" Assembly

Stack 3 7/8" Source was in
VDT #3 = +5 #4 = +2.5
2.2.69

Run 67

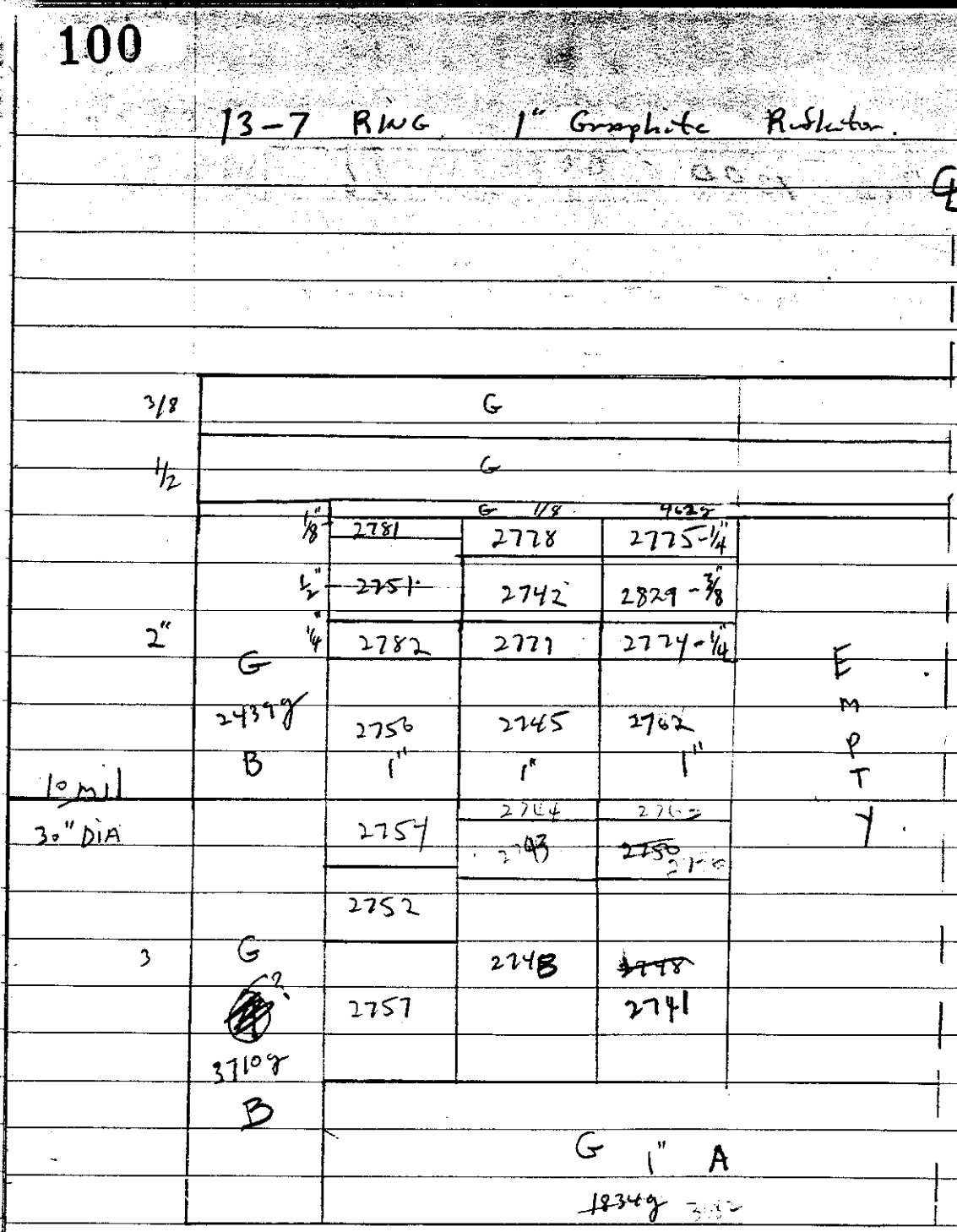
C.A. _____ Expr. _____ Run 67
Sheet _____ Date _____ 19 ___ Time _____
Purpose Repeat of Clean Assembly

PICTURE ON P-100

LN	A	D
-150.9 sec	775/36 100 sec	82/40 100
13.56 ¢		
	131 sec	139.3 sec
	15.01 ¢	13.59 ¢

Avg = 14.05 ¢

13-7 RING 1" Graphite Reflector.



Bottom Fuel Measured

11-13	9-11	7-9
2.012	2.000	2.002
.010	.000	1.998
.006	.000	1.999
.008	.004	2.000
.008	.003	
.006		

2.0083 2.0014 1.9996

Top Fuel Measured

11-13	9-11	7-9
1.880	1.877	1.875
1.880	.875	.875
1.879	.876	.876
1.881	.876	.875
1.880	.875	.876

1.8800 1.8758 1.8754

SUMMARY OF MEASUREMENTS

Reactivity of Chan assembly, 1" graphite reflector, as shown p. 100 = -14.37 ¢

Diaphragm Support Rings = +5.85 ¢

Lower fuel Support = +12.06 ¢

Diaphragm (10 mil) = -18.31 ¢

Fuel

(13 x 11)	(11 x 9)	(9 x 7)	
3.8883	3.8898	3.8752	Avg 3.8844

wt vol Avg 3.8853

9
875
875
876
875
876

13-7 1" Reflector Graphite Core

C.A. 7ID-130D Expr. _____ Run 68

Sheet _____ Date 1-25 1963 Time 2:45 ~~AM~~ PM

Purpose Obtain Crit. Conditions

Stack 3 3/16" 1" Reflector Complete
Core filled with Graphite

Super Critical.

Run 69 Fuel: 3 13/16" ; 1" Top reflector, with
3" - 13-15 graphite ring, which
leaves 3/16" protruding above top.

Super Critical

104

2-1-63

INSTRUMENT CHECK

Time 3:25 ~~AM~~ PM Source PuBe + γ

		A	B	C	D	E
Range	γ	10/1000	open	3x10?	10/1000	100mV
	HV=8					
Source Dist.	OK	6.5"	0"	10"	2"	0"
% F.S. Trip		100	OK	100	85	100+

Cts #2 - OK

C.A. 15 OD Solid Run #1

Sheet: Date 2-1-63 Time 3:40 ~~AM~~ PM

Purpose

1" fuel on Top 1" on Bottom
2" Bare

VDT #3 = +11 #4 = +4

Top disc: 7-9 9-11 11-13 13-15

2731=1" 2738=1" 2776=1" 2756=1" 27~~36~~39=1"

Disc Bottom 2732 2762=1" 2745=1" 2757 3735

Counter #1
0 +9
0 +12

Lebeyn 2273

2-1-62

Run #2 2½" Fuel - Bare

Added: Disc 7-9 9-11 11-13 13-15

Disc 2728 3/8 2829 3/8" 2746 1/8" 2752 1/2" 2760 1/2"

2768 1/8 2773 1/8" 2742 3/8"

#3 = +11 #4 = 0

counter #2

0 +11 0 +11

0 +8

Run #3 3" Fuel - Bare

2-4-62 Added: ½"

Disc. 7-9 9-11 11-13 13-15

2769 1/8 2736 3/8 2743 3/8" 2751 1/2" 2786 1/2"

2729 3/8 2763 1/8 2744 1/8

Counter #2

0 +78

0 +63

Run #4 3 1/16" Fuel - Bare

2-4-62 Removed ½" which was added in Run 3

Added: 9/16

disc 7-9 9-11 11-13 13-15

2730 2737 2767 2755 2766

Selayn 2232 Super Critical

INSTRUMENT CHECK

Source

Time AM PM

2-4-63

		Channel A	B	C	D	E
Range	F	10/1000	opr	3X	10/1000	1000
	HV=8	7"	0	7'	2"	3"
Source Dist.	OK	90	OK	100	95	100+
% F.S. Trip	Ctr #2 OK					

C.A. 15" Expr. Run 5

Sheet Solid Date 2-4-63 Time 10:15 AM PM

Purpose

Fuel 3 1/16" high - Bare

Selsyn 22.32 Super critical
Level at 22.29

Run #6 Fuel = 3 1/16" except 13"-15" Rings which is 3"
Removed: 15" - 9/16" ring #2766
Added: 15" - 1/2 " #2787

Selsyn 22.33
Level 22.30
Super critical

Run #7 3 fuel = 3 1/16" except 11"-13" + 15"-15" Rings.
-4-63 Removed: 11"-13" 9/16" Ring #2755
Added 11"-13" 1/2 " #2753
Selsyn 22.34
Level 22.31

Fuel 3" except 7" dia Disc which is 3 1/16"

Run 8 Removed: 7-9 9-11
#2737 9/16" 2767 9/16"
Added: #2736 3/8 2743 3/8
2763 1/8 2744 1/8

Selsyn 22.73 up V Super ~ 15 sec p.d
or
21 sec

Run 9 added 10 mil diaphragm on bottom fuel.
Position period - 41.25 sec
17.8 ¢

3"

Run 10 Fuel 3" + 1/16" on 7"-9" Ring.
Removed 7" Disc Replaced with 3/8" + 1/8"
" 7"-9" #2737 9/16" + Replaced with 1/16 ~~#2737~~
VDT #3 = +11.3 #4 = -3
Selsyn 22.735

2-4-63

Run 11 Removed 9"-11" 3/8" #2743 + 1/8" #2744
Added 9"-11" 9/16" #2767

Selsyn 22.73 Measured Neg. Period.
Counter #2
2 +159
2 +92
2 +89

-1.43 ¢

Log N = -966.3 sec = ~~0.14~~ ¢ = 1.4 ¢
A = 41/30.5 in 300 sec = -1024 sec = 1.32
D = 59/42 in 300 sec = -892 sec = 1.53

Run 12

C.A. 15" OD Solid Expr. Run 12
Sheet Date 19 Time AM PM
Purpose Diaphragm Support Ring Evaluation
+1.43 ¢

Selsyn 22.735
VDT #3 +11.8 #4 = -1.8
Just Critical (neg. trend)

Run 13
2-4-63

C.A. 15" Run 13
Sheet 2-4-63 2:00 AM
Purpose Diaphragm Evaluation
Negative Period
-6.4 ¢ Log N = -171 sec
-6.4 ¢

Selsyn 22.735 22.735
VDT #B +1.3 #4 -1.3

A = 68/33 in 150 sec = -209
D = 75/21 in 150 sec = -117

(2.08 ¢)

Run 14
2-4-63

C.A. 15" Expr. _____ Run 14
Sheet Solid Date 2-4 1963 Time 2:30 ~~AM~~ PM
Purpose ~~Diaphragm~~ Lower Fuel Support Structure Evaluation
23.6 ¢

¢ = ¢

4 sec = 1.32 ¢
892 sec = 1.53 ¢

Selayn 22.735 - Measured Positive Period

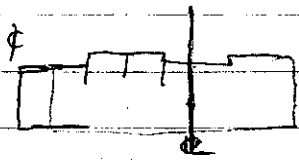
	A	D
Log N.	62/25 25 sec.	43.5/14 25 sec.
.0280/.0003 in 100	27.5 sec pd	22.5 ~~19.9~~ sec
+ 44.8 sec 17.2 ¢	20.2 ¢	21.2 ¢

Run 15 Clean Critical Assembly.
15" dia slab (disc)
3" High + [1/16" on 7"-9" and 9"-11" Rings.]

Measured negative period:

Log N	A	D
- 503 Sec	50.5/42.5 in 100 Sec.	81.5/59.0 150 sec
- 2.78 ¢	- 580 sec pd	- 466 sec,
Avg = - 2.73 ¢	2.4 ¢	3.02 ¢

Summary - 15" Solid Disc
Clean Critical = - 2.08 ¢
Diaphragm Support Rings = + 1.43 ¢
Diaphragm 16 mil = - 6.4 ¢
Lower Fuel Support = + 23.6 ¢



1 sec
0.4 ¢
Sec = 209 sec = 7.7 ¢
Sec = 117 sec

2-5-63

INSTRUMENT CHECK

Time 8:30 ~~PM~~ AM

Source Pu Be & γ

	Channel A	B	C	D	E
Range	10/1000	opn	3X	10/1000	1050
Source Dist.	6"	0	8'	2.5"	5"
% F.S. Trip	100	OK	100	100+	100+

F

HV = 8

OK

Ctr. #2 OK

C.A. 15" solid Run 16

Sheet _____ Date 2-5 63 Time _____ AM PM

Purpose Reactivity check in preparation of Rossi α

Stack: See Run 15 pg 109

Selsyn #1 = 22,738 UDT #3 = +12 #4 = -2.6

#2 = 22,731

~~Run 17~~

Data taking started @ ~ 11:30 AM

Shut Down @ 4:15 PM

2-6-63

INSTRUMENT CHECK

Source PuBe + γ

Time 8:20 —

	F	A	B	C	D	E
Range	HV = 8	10/1000	open	3X	10/1000	1050
Source Dist.	OK	5"	0	9'	2.5"	5"
% F.S. Trip		100	OK	100	80	100+

Ctr #2 - OK

C.A. 15" Expr. Run 17

Sheet solid Date 2-6-63 Time 10:05 AM ~~PM~~

Purpose Rosse L Measurement

Stack: same as run 15

2.6

2-7-63

INSTRUMENT CHECK

Time 8:45 AM ~~PM~~ Source Pu Be + γ

	F	A	B	C	D	E
Range	HV = 8	10 / 1000	Opr	3X	10 / 1000	1050 V
Source Dist.	OK	6"	0'	11'	2"	3"
% F.S. Trip		90	OK	100	85	100 T

Ors #2 = OK

C.A. 15" OD 18

Sheet Solid Date 2-7-63 Time 9:00 AM ~~PM~~

Purpose Evaluation of 1st light lower fuel support

VDT #3 #4 Selsyn #1 :
#2 :

Zero Run

Measured ~~positive~~ negative period -

Log N	Chan A	Chan D
P = -465	88/54 in 250 Sec	68/36.5 in 300 Sec
	-512	483
	2.73 ¢	2.92 ¢

Run 19 Placed light fuel support on top of fuel.

Measured positive period

Log N = 21.7 Sec

Fuel Loading for Bare 15" O.D. Solid Slab.

7" Disc	7-9	9-11	11-13	13-15
1/8 2769	9/16 2737	9/16 2767	1/2 2753	1/2 2787
3/8 2729				
1/8 2768	1/8 2773	1/8 2746		
3/8 2728	3/8 2829	3/8 2742	1/2 2752	1/2 2760
1" 2731	2738	2776	2756 7	2739
Diaphragm				
1" 2732	2762	2745	2757 6	2735

Measurements of 7" Disc from top of stack

2.004
2.005
2.007
2.005
2.005

Sec

13-15	13-11	11-9	9-7
2.006	2.007	2.068	2.067
2.005	.008	2.069	2.067
2.006	.008	.069	2.068
2.006	.007	.071	.068
2.005	.007	.071	.068
2.005	.006	.071	.068
2.0055	.006	.071	
2.0055	.007	.0695	

92 ¢

114

2-7-63

CA. 7" ID - 15" OD Expr. _____ Run 20

Sheet Bare Date 2-7 1963 Time 1:30 AM PM

Purpose

To obtain Critical assembly

4" Bare

Top	7-9	9-11	11-13	13-15
	2762-1"	2745	2753 1/2	2787 1/2
	2738-1"	2776	2752 1/2	2760 1/2
			2756	2739
Bot.	2773 1/8"	2742 3/8	2751-1/2	2761 1/8
	2829 3/8"	2746 1/8"	2754-1/2	2785 3/8
	2740-1 1/2"	2748-1 1/2"	2757-1"	2848 1/2
				2735 1"

Sub critical Counter # 2 0 +11

0 +14

Run 21 - 4 1/2" Bare

2-7-63

Loaded	7-9	9-11	11-13	13-15
to Top	2783 3/8"	2744 1/8	2780 1/8	2786 1/2
	2736	2743 3/8	2750 3/8	

Super Critical 21.19

Run 22 Stack $4\frac{3}{8}$"
2-7-63

Removed From Top

$2763\frac{1}{8}$" $2744\frac{1}{8}$ $2780\frac{1}{8}$ $2786\frac{1}{2}$

Added

$2784\frac{3}{8}$

Super Critical a 21.31

Run 23 Stack $4\frac{1}{4}$"
2-7-63 Removed $\frac{3}{8}$"

$2736\frac{3}{8}$ $2743\frac{3}{8}$" $2750\frac{3}{8}$" $2784\frac{3}{8}$

Added $\frac{1}{4}$

2775 2779 2782 2785

Super Critical 21.48

Run 24 $4\frac{1}{4}$" high except 13-15 which is $4\frac{3}{16}$"
2-7-63 Removed VDT 3 = +12 #4 = +3

$2787\frac{1}{2}$" Size 13-15

$2785\frac{1}{4}$ " "

Added

$2766\frac{9}{16}$ " "

$2758\frac{1}{8}$ " "

Selsyn #1 - 21.735 #2 - 21.737

Super Critical

log N 31 Sec. period

Run 25 Stack 2 inner Rings 4 3/4" 2 outer rings 4 3/16

2-7-63

Removed: 11-13 Ring 1/2" 2753

" " 1/4" 2782

Added:

" " " 9/16 2755

" " " 1/8 2780

VDT #3 = +12 #4 = +3.2

Log N D: 90/44.5-100 Secs A 78.5/42.5 100 Secs.

Selsyn #1 - 21.735 #2 - 21.737 -163 sec pd

= 142 sec = 13.2 * 10.7 *

Measured negative Period - 169 sec

10.17 *

#2775 - 1/4"	#2779 - 1/4"	#2782 - 1/4"	
#2736 - 3/8"	#2745 - 1"	2753 - 1/2	#2766 - 9/16"
#2737 - 9/16"		2752 - 1/2	#2760 - 1/2"
#2738 - 1"	#2776 - 1"	2757 - 1"	#2739 - 1"
#2829 - 3/8"	2742 - 3/8"	#2751 1/2"	#2785 - 3/8"
#2746 1 1/2"	#2748 1 1/2"	#2754 1/2" #2756 1"	#2848 - 1/2" #2735 1"
7-9	9-11	11-13	13-15

#2758 - 1/8"

#2773

#2746

#2761 - 1/8"

Fuel for 7" I.D. - 15" O.D. - ore

2-8-63

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Pa Be + X

	Channel F	A	B	C	D	E
Range	HV=8	10 1000	opr	3X	10 1000	1050
Source Dist.		7"	0	11'	2"	6"
% F.S. Trip		90	OK	100	85	100+

ch #2 =

C.A. 71D-150D Expr. _____ Run 26

Sheet _____ Date 2-8 1963 Time 8:25 AM ~~PM~~

Purpose _____

Stack - 2 inner Rings 4 1/4 - outer rings 4 3/16

VDT #3 = 11.8 #4 = 7.2

Selsyn #1-2 1.75 #2-2 1.785

C.A. 71D-150D Run 27

Sheet _____ Date 2-8 63 Time 10:20 AM ~~PM~~

Purpose _____

Stack inner + outer Ring = 4 3/16" Center rings 4 1/4"

VDT #3 = +12 #4 = +17.4

Added

7-9	9-11	11-13
2736 3/8	~~2774 1/4~~	2753 1/2
		2782 1/4

Run 28 Stack - Inner + outer ring $4\frac{3}{16}$" center rings $4\frac{1}{4}$"
2-8-63

VDT #3 = +12.4 #4 = 17.5

Selsyn #1 = 21.76 #2 21.7395

7" I.D. - 15" O.D. Bare ; Measured Thickness

Top Fuel				Bottom Fuel			
7-9	9-11	11-13	13-15	7-9	9-11	11-13	13-15
2.191	2.253	2.261	2.193	2.005	2.003	2.006	2.005
.191	.254	2.260	.193	.003	.005	.004	.006
.191	.253	.261	.194	.004	.006	.005	.007
.191	.2535	.260	.192	.006	.003	.005	.008
.190	.253	.2595	.192	.004	.003	.006	.007
.190	.252	.260	.191	.004	.004	.005	.007
	.2515	.260					.006

INSTRUMENT CHECK

2-11-63 Time 8:25 AM Source PuBe + γ

				C	D	E
Range	F	10/1000	opr	3X	10/1000	1050
Source Dist.	HV = 8	7"	0	11'	2"	6"
% F.S. Trip	OK	90	ok	100	80	100+

C.A. 71D-150D Expr. _____ Run 29

Sheet _____ Date 2-11 1963 Time 9:05 AM

Purpose Rossi ∝ Measurement

Stack same as Run 28

- 15
005
006
007
008
007
007
006

288 sec
10 sec.
50 sec.
213 sec
5.28 ¢

2-11-63

C.A. 7"ID 15"OD Run 30
Sheet Bare Time 1:25 ~~AM~~ PM
Purpose Reactivity of Clean assembly.

Stack: 4 1/4" on 9-11 and 11-13 Rings
4 3/16 on 7-9 and 13-15 Rings

VOT #3 = +12 Selsyn #1 = 21.735
#4 = +4 #2 = 21.728

Measured negative period:

Avg.	Log N	Chan "A"	Chan "D"
-4.36	-386.5 Sec.	76/43.5 in 200 Sec	76/39.5 in 200 Sec.
	- 3.72 ¢	- 328 Sec	- 307 Sec.
		- 4.5 ¢	- 4.85 ¢

Run 31 7"ID" 15"OD" Lower Fuel Run 31
Sheet 2-11 63 1:45 ~~AM~~ PM
Purpose Lower Fuel Support Structure Evaluation
+22.01
Stack Same as in previous run

Measured positive period -

Log N 39.08 Sec A = ~~92/27~~ 92/27 50 Sec. 49/21 25 Sec.
~~Negative~~ 18.1 ¢ +44.7 Sec. +29.5 Sec.
Avg + 17.65 ¢ 17.2 ¢ 19.8 ¢

Run 32
2-11-63

C.A. 7" I.D. 15" O.D. Expt. Run 32
Sheet Date Time 2:45 ~~AM~~ PM
Purpose 10 mil Diaphragm Evaluation
17.13 ¢

VDT #3 = +12 #4 = +4

Selsyn #1 21.73 #2 21.728

+0.52 Log n .0008 / .00061 in 450 Sec. Chan. A 55/48 350 Sec. Chan. D 88.5/74 350 Sec. ~~55/48 350~~
Positive Period +2170 +2670 2010 Sec
+0.59 ¢ +0.47 ¢ +0.63 ¢

Run 33

C.A. 7" I.D. 15" O.D. Expt. Run 33
Sheet Date 2-11-63 Time 3:15 ~~AM~~ PM
Purpose Support Ring Evaluation
4.23 ¢
Stack Same as Run 30

Log n 239 Sec. A 87/50 150 Sec. 270 Sec D 84/40 200 Sec. 288 Sec
+4.75 ¢ 80/52.5 100 Sec. 74.5/35 150 Sec.
Positive Period 239 Sec 213 Sec
+4.75 ¢ +5.28 ¢

SUMMARY

Reactivity Measurements on 7" I.D.-15" O.D. Bare assembly.

Clean assembly: 4¼" high on 9-11 and 11-13 rings
4 3/16" high on 7-9 and 13-15 rings
− 4.36 ¢

Lower Fuel Support: + 22.01 ¢

10 mil diaphragm: − 17.13 ¢

Diaphragm Support Ring: + 4.23 ¢

.D.

2-12-63

INSTRUMENT CHECK

Time 1:30 AM PM Source Pu Be + γ

	Channel A	B	C	D	E
Range F HV = 8	10/1000	gpr	3X	10/1000	1050 V
Source Dist. OK	8"	0	11'	2"	7"
% F.S. Trip	95	OK	100	75	100+

Ctr #2 = OK

Core 7" ID 15" OD Expr. _____ Run 34

Graphite Core

Sheet _____ Date _____ 19 __ Time _____ AM PM

Purpose To obtain Critical assembly with graphite Core. ~~Ra~~

Stack: 4"

2" on Rom & 2" on diaphragm

VDT # 3 = +8 Selsyn # 1 = 21,685

4 = +2 # 2 = 21,678

Sub Critical.

Run 35 added 1/8" to 7-9 and 9-11" Rings

" 1/8" graphite to core

2744 - 1/8" - 9-11 ring

2763 - 1/8" - 7-9 " .

Sub Critical. Some Multiplication

Run 36 Added 1/8" 11-13 Ring to top # 2781

Super Critical

Log^n 18.1 secs.

Run 37
2-12-63

added: 9/16" 11"-13" 2755
9/16" 13"-15" 2766

Log^n +70.6 sec.

Run 38
2-12-63 Added 9/16" # 2767 9-11
3/8" # 2743 9-11
Sub-critical

Run 39 Removed 9/16" # 2766 13-15
Added 1/8" # 2760 13-15
1/8" # X'or # 2758 13-15

Measured negative Period = -.137 Sec

2-13-63

INSTRUMENT CHECK

Time 8:15 AM PM Source PaBe + 8

		Channel A	B	C	D	E
Range	HV = 8	0/1000	oper	3X	100/1000	1050V
Source Dist.	OK	4"	0	11'	1.5	8"
% F.S. Trip		95	OK	100	70	100+

Ctr #2 OK

C.A. 7" ID - 15" O.D. graphite core Expr. _____ Run 40

Sheet _____ Date 2-13-63 Time _____ AM PM

Purpose Reactivity of Clean assembly

Stack: 4 1/8" on 7-9 and 13-15 ring.
4 1/16" on 9-11 and 11-13 ring.

UDT #3 = +5 Selsyn #1 = 21.69
#4 = 0 #2 = 21.685

Measured negative period:

Log N	Chan "A"	Chan "D"
-15.02¢ -134.6 Sec.	66/20.5 in 150 Sec	85/35 in 100 Sec
~~-6.62~~ ¢ -14.3¢	-128 = 15.75¢	-113 = 19.9¢

Run 41 Placed Lower Fuel Support on Top Fuel:

Measured Positive Period:

Log N	Chan "A"	Chan "D"
+210.6 Sec.	73/30 in 200 Sec	62/20 in 400
5.35¢		
	225 = +5.0¢	324
+5.18¢		-4.55¢

Run 42 Added 70 mil SS Sheet on bottom grid.

UDT # 3 = +5 Selsyn #1 = 21.69

#4 = -1 #2 = 21.682

measured negative period:

Log n	Chan "A"	Chan "D"
- 176 Sec	$\frac{56}{18}$ in 200	$\frac{69}{36}$ in 100
- 9.65 ¢	- 148.5	154.5
	- 12.3 ¢	- 11.6 ¢

Run 43 added diaphragm support rings:

UDT # 3 = +5 Selsyn #1 = 21.69

#4 = -0.5 #2 = 21.680

Measured negative period:

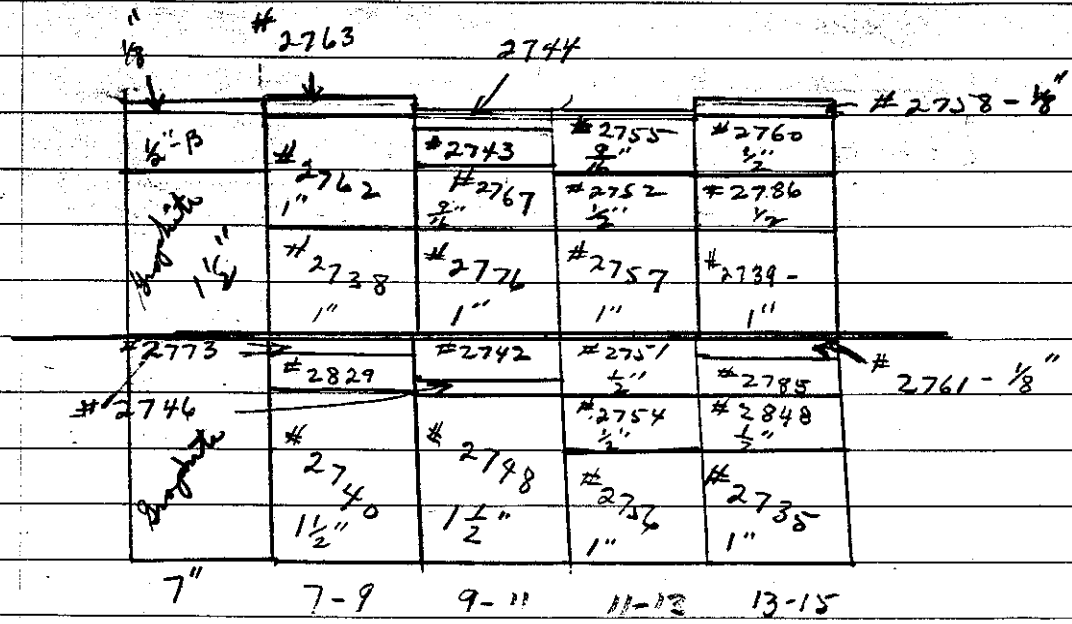
Log N	Chan "A"	Chan "D"
- 276.7 ¢	$\frac{75}{37}$ in 200 Sec	$\frac{55}{28.5}$ in 150
- 5.45 ¢ ✓	- 284 sec	- 160 sec
	- 5.3 ¢	11 ¢ ✗

Summary 15-7 graphite Core.

Chan Assembly: 4 1/8" graphite core
- 15.02 ¢ 4 1/8" on 7-9 and 13-15 rings
4 1/16" on 9-11 and 11-13 rings

Lower Fuel Support: + 20.02 ¢
10 mil Diaphragm : - 16.15 ¢
Diaphragm Support Rings: + 5.6 ¢

7" I.D. - 15" O.D. with graphite Core



Uranium Thickness (Top)

7-9	9-11	11-13	13-15	Top Graphite 5-7 Thick
2.127	2.068	2.069	2.128	2.131 1/8
2.126	2.068	2.069	2.128	2.131 1/2 B
2.126	2.068	2.069	2.129	2.131 1 1/2
2.127	2.0685	2.069	2.128	2.129
2.127	2.068	2.069	2.128	2.131
2.126	2.068	2.0695	2.128	2.130
2.127	2.068	2.069	2.1275	2.131
2.127	2.067		2.126	

Bottom Graphite 2" pc.

For Bottom Fuel Measurements see p. 118

2-13

9" I.D. – 15" O.D. – Bare

Bottom fuel same as p.118

Run 2-13

Top Fuel measurements

9-11	11-13	13-15
3.877	3.950	3.953
.878	.954	.955
.878	.954	.955
.877	.952	.954
.876	.951	.952
.876	.951	.956
.876	.953	.953

Run 2-13

2-13-63

CA 91B 150D Expr. Run 1
Sheet Bare Date 2-13 1963 Time 3:30 AM PM
Purpose To Obtain Critical Assembly.

Stack 5" - Bare

VDT #3 = +5 #4 = +.05

9-11	11-13	13-15
2776-1"	2782-1/4"	27-X-1/8"
2748-1 1/2"	2783-1/4"	2784-3/8"
2743-3/8"	2781-1/8"	2787-1/2"
2744-1/8"	2749-3/8"	2786 1/2"
	2753-1/2"	2760 1/2"
	2752-1/2	
	2757-1"	

Sub Critical

Run 2 Stack 5 on 13-15 Ring
2-13-63 5 9/16 9-11 + 11-13 Ring

Added
2767 2755 2766

Sub Critical

Run 3 Stack: 5 9/16"
2-13-63

Added

11-13	13-15
2750-3/8"	2785 1/4
2780-1/8"	2786 1/4

Sub Critical

130

2-14-63

INSTRUMENT CHECK

Source Pu Be + γ

Time 9:10 AM ~~PM~~

		Channel A	B	C	D	E
Range	F HV=8	10/1000	Opa	3X	10/1000	1050V.
Source Dist.	OK	8"	0"	11"	3"	6"
% F.S. Trip		100	OK	100	75	100+

Ctr #2 = OK

C.A. 9:D to 1 S O D Run 4

Sheet Bare Date 2-14-63 Time 9:20 AM ~~PM~~

Purpose To obtain Critical assembly

Stack 6 1/16" High

Super critical

VDT #3 = off #4 = off

Added 1/2" to 9-11 Ring

Level 21.28 21.290

Run #5 Stack 5 7/8" on 9-11 5 15/16" on 11-13 + 13-15

2-14-63 Removed 3/16" from 9-11

" 1/8" from 11-13 + 13-15

VDT #3 = +5.2 #4 = -1

21.68 21.6785

Sub-critical

Log^n = -141 Sec. period

- 13.3 ¢

A 91/37 150 Sec. D 80/24.5 in 100 Sec.

- 167 - 85 Sec

10.32 ¢

Run #6 Stack is $5\frac{15}{16}$"
2-14-63 Added $\frac{1}{16}$" to 9-11 Ring

VDT #3 = +5.2 #4 = -.02
#1 = 21.68 #2 = 21.6765
Log^n +85.8 Sec. A $\frac{72}{23}$ 100 Sec. D $\frac{82}{45}$ 50 Sec.
11.1¢ 92.1 sec 83.5
$5\frac{15}{16}$? 10.5¢ 11.4¢

Run #7 Stack $5\frac{7}{8}$" on 9-11 $5\frac{5}{16}$ on 11-13 + 13-15
Removed $\frac{3}{16}$" from 9-11
" $\frac{1}{8}$" from 11-13 + 13-15

VDT #3 = +5.4 #4 = 0

2743 - 3/8"	2780 1/8	2758 - 1/8"
	2782 1/4	2885 1/4
	2783 1/4	
	2750 3/8	2784 3/8
2745 - 1"	2749 3/8	2886 1/4
	2755 9/16	2766 9/16
2747 - 1 1/2	2753 1/2	2787 1/2
	2752 1/2	2760 1/2
2776 1"	2757 1"	2739 1"
2742 3/8	2751 1/2	2785 3/8
2746 - 1/8	2754 1/2	2848 - 1/2
2748 1 1/2"	2756 1"	2735 1"
9-11	11-13	13-15
$5\frac{7}{8}$"	$5\frac{15}{16}$"	$5\frac{15}{16}$"

Diaphragm

Diaphragm 1/8" - 2761

-15

0 in 100 Sec.
5 Sec

Same as p. 118
See P. 128 for Top.

2-14-63

C.A. 9 ID 15 OD Expt. Run 8

Sheet Bare Date 2-14 1963 Time 1:50 AM PM

Purpose To obtain Critical condition to ~~obtain~~ for Rossi ∞ Measurements

Stack: Same as Run #7

just crit. with Counters in place and servo shim.

INSTRUMENT CHECK

Time 8:20 AM

Source Pu Be + γ

Channel

	A	B	C	D	E
F	10/1000	Opr	3X	10/100	1000
Hv = 8					
Source Dist.	7"	0"	12"	2.5"	6"
% F.S. Trip	95	0K	102	75	100+

Ch #2 - OK

C.A. 9 ID 15 OD Run 9

Sheet Date 9 Time 9:05 AM PM

Purpose To obtain Rossi ∞ Measurement

Stack Same as Run #7

VDT #3 = +5 #4 = 0

Selsyn #1 = 21.68 21.6755

2-18-63

INSTRUMENT CHECK

8:45 AM PuBe + γ

	F	A			D	E
Range	HV = 8	10/1000	opr	x	10/1000	1050V
Source Dist.	OK	6"	0	2'	2"	3.5"
% F.S. Trip		75	OK	100	80	100+

ctr #2 = OK

C.A. 91D 150D Expr. Run 10

Sheet Date 19 Time 9:05 AM

Purpose Reactivity of Clean assembly

Stack 5 7/8" on 9-11 5 15/16 on 11-13 & 13-15

Sub Crit. measured negative period.

Log N = -148 sec pd
-12.3 ¢ ✓

A: 76/28 in 150 sec
= 68.5/32 in 100 sec
150 = 12.1 ¢
131 = 15.1 ¢

D = 92.5/40.5 in 100
= 73/31.5 in 100
121 = -17.4
119 = -18.0 ¢

C.A. 91D 150D Run 11

Sheet Bare Time AM PM

Purpose Evaluation of fuel Support

Stack same as previous run

Positive Period-Log N .008/.003 650 sec. A 75.5/46.5 350 Sec. D = 83.5/57.5 250 Sec.

653 721 672
1.88 ¢ 1.72 ¢ 1.80 ¢

2-18-63

C.A. 9" I.D. 15" O.D. Bore — Run Run 12
Sheet — Date 2-18-63 — Time 10:40 AM PM
Purpose Evaluation of Diaphragm Ring

Stack Same

Positive Period	A	D
Log^n 67.3 Sec.	98/24 in 100 Sec.	90/39 in 50
+13.3 ¢	71.1	59.8
	12.3 ¢	14.3 ¢

C.A. 9" I.D. 15" O.D. Bore — Run 13
Sheet — Date 2 18 63 — Time 10:55 AM PM
Purpose Evaluation of 10 mil Diaphragm

Positive Period	A	D
Log^n .004/.0018 = 730 Sec.	75.5/56 in 250 Sec.	91/77 150 Sec
	57.5/43 in 250 Sec.	72.5/47 350 Sec
1 38 + 915 sec	+ 633 sec 1.94 ¢	903 1.48
+1.37 ¢		25
SUMMARY 15-9 Bore	+ 865 sec = 1.44 ¢	810 1.54 ¢

Clean Assembly: 9-11 = 5 7/8"; 11-13 + 13-15 = 5 15/16" = -12.2 ¢
Lower Fuel Support: + 14.75 ¢
Diaphragm Support Rings: + 11.50 ¢
10 mil Diaphragm: - 11.78 ¢

-18-63

CA 9" ID - 15" OD Run 14
Graphite Core.
Sheet Date 2-18 1963 Time 1:05 AM PM
Purpose To obtain critical stack

Graphite Core

Stack: 5 7/16 9-11 - 5 7/16 on 11-13 + 13-15

Removed from	9-11	11-13	13-15
	2745-1"	2782 1/4"	2885-1/4
		2783-1/4"	2886-1/4

Added 2767 9/16

Super critical @ 21.31

Run 15 Removed: 11-13 13-15

	2780 1/8"	2884 3/8"
Added:		2886 1/4

50 Sec Graphite Core is 5 7/16"

350 Sec Stack 9-11 Ring is 5 7/16" 11-13 + 13-15 Ring @ 5 5/16"

.48

1.54

Super critical @ 21.36

2-18-63 Stack 9-11 Ring $5\frac{1}{2}$" other two $5\frac{5}{16}$ Graphite $5\frac{3}{16}$

Run 16 Removed 9-11 # 2767

Added " = $2778\frac{1}{4}$ & $2744\frac{1}{8}$"

Sub-critical

Run 17 Stack $5\frac{5}{16}$" Graphite $5\frac{5}{16}$"

Log^n A D

Sub-critical

Run 18 (11-13)(9-11) + graphite are $5\frac{5}{16}$"; outside Rings $5\frac{3}{8}$" (13-15)

Log^n = -495 sec.

= 2.814

Run 19 Stack same as Run 18

Placed counters

21.47 ∞

INSTRUMENT CHECK

2-19-63 Source

Time AM PM

		Channel A	B	C	D	E
Power	F	10/1000	cpm	X	10/1000	
	HV = 8	10"	0	2'	1.5"	6"
Source Dist.	OK	85	OK	100	80	100+
% F.S. Trip	Ctr #2 - OK					

C.A. 9" I.D. 15" O.D. Run 20

Graphite Core 2-19-63 Time 9:05 AM

Shee

Purp Reactivity of the Clean Assembly

Stack same as Run 18

Measured Negative period.

VDT #3 = +6 #4 = -1

Selsyn 21.685 # 21.680

Log^n A D

-630 88/46.5 in 400 Sec 60/34 in 300 Sec.

-2.18¢ -628 sec -529 sec

2-19-63 Evaluation of Diaphragm support rings.

Run 21 Measured Postive Period

Log^n 252 Sec. A = 96/44 in 250 Sec. D 85/44.5 in 150 Sec.

+ 4.55 ¢

+ 321 sec 232 Sec.

Run 22 Evaluation of 10 mil diaphragm.
2-19-63 measured negative period –

Log N	Chan 'A'	Chan "D"
- 250 sec	$\frac{88}{39}$ in 200 sec	$\frac{76}{37.5}$ in 150 sec
- 6.18 ¢	- 246 sec	213 sec.

Run 23 Evaluation of Lower Fuel Support.

Measured Positive Period

Log N = +137.8 sec	Chan A	"D"
	$\frac{83}{37}$ in 150 sec.	$\frac{70}{32.5}$ in 100 sec
	158 sec	131 sec.

SUMMARY 15-1 - G core

* Reactivity of Chan Assembly: - 2.185 ¢
Graphite Core $5\frac{5}{16}$"; 9-11 and 11-13 = $5\frac{5}{16}$"; 13-15 = $5\frac{3}{8}$"

Diaphragm Support Rings = + 6.29 ¢

10 mil Diaphragm = - 10.33 ¢

Lower Fuel Support = + 13.39 ¢

C.A. 9" I.D. - 15" O.D. Run 24

Sheet _____ Date 2-19-1963 Time _____ AM ~~PM~~

Purpose Rossi & measurements

VDT # 3 = +7 Selsyn #1 = 21.685

4 = +0.5 2 21.674

Log N = .00075

#2781-1/8

1/4	#2778 - 1/4"	#2782 - 1/4	#2836 - 1/4 / #2885 - 1/4
9/16	#2767 - 9/16"	#2749 - 3/8	#2784 - 3/8
1" x 2" Graphite	#2748 1 1/2"	#2755 - 9/16	#2786 - 1/2
		#2753 - 1/2	#2787 - 1/2
		#2752 - 1/2	#2760 - 1/2"
1 1/2"	#2776 - 1"	#2757 - 1"	#2739 - 1"
Graphite 2" pc	#2742 - 3/8 / #2746 - 1/8	#2751 - 1/2"	#2785 - 3/8" → #2761 - 1/8"
		#2754 - 1/2"	#2848 - 1/2
	#2748 - 1 1/2"	#2756 - 1"	#2735 - 1"
9"	9-11	11-13	13-15
3.320	3.312	3.324	3.385
.318	.313	.324	.384
.318	.313	.325	.385
.316	.312	.322	.384
.316	.314	.322	.384
.317	.312	.322	.385

measured graphite and fuel on diaphragm.

For Bottom Fuel measurements see p. 118

[redacted]

3-7-63

INSTRUMENT CHECK

Time 12:35 ~~AM~~ PM Source Ro Be + γ

	F	A	B			
Range	HV=8	$\frac{10}{1000}$	opr	X	$\frac{10}{1000}$	1050
Source Dist.	OK	8"	0	28"	3"	3"
% F.S. Trip		85	OK	100	65	100+

Ctr #2 - OK

15" diameter Solid cylinder u metal.

C.A. 15" Solid Run E-1

Sheet Bare Date 3-7-63 Time 3:00 ~~AM~~ PM

Purpose Reactivity check of 15" Solid slab after moving CTU to Center of Room.

Stack 3" High + [1/16" on 7-9 and 9-11 rings]

Measured Positive Period -

VDT #3 = +13 #4 = +13.8

Selsyn #1 = 17.74 #2 = 17.747

For Loading see page 113.

Measured positive period -

Log N Chan "A" "D"

1628 Sec pd

0.8 ¢

All scaffoling material necessary for loading, etc still in place for the above run.

3-8-63

INSTRUMENT CHECK

Time 9:30 AM ~~PM~~ Source Pu Be + γ

Channel

	F	A	B	C	D	E
Range	HV = 8	100/1000	Op	X	10/1000	1050V
Source Dist.	OK	9"	0	20"	~~70~~ 3"	9"
% F.S. Trip		100	OK	100	70	100

Ch #2 - OK

C.A. 15" Solid Run E-2

Sheet BARE Time 9:40 AM ~~PM~~

Purpose Scaffolding on either side of Rig was removed

Stack 3" High + [1/16" on 7-9 and 9-11 Rings]

Metal Separation ~17.5

VDT. #3 = +13 #4 = +12.5

Selsyn #1 : 17.74 #2 = 17.745

Measured position period -

Log N = 440 sec

3.2 ¢

C.A. 15" Solid Run E-3

Sheet 3-8-63 Time 11 30 AM ~~PM~~

Purpose Preparation for Rossi α Measurements

VDT #3 = 12.5 Selsyn #1 = 17.745

#4 = 6.5 #2 = 17.739

Log N = .0004

3-11-63

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Pu Be γ

Tables ok

Light ok F

	Channel A	B	C	D	E
Range	10/1000	opr	—	10/1000	105
Source Dist.	5"	⊙	4 ft	~~2.5~~ 2.5"	6"
% F.S. Trip	100	OK	100	80	100

C 15" solid Bare Expr. Run E-4

Sheet Date 3-11-1963 Time AM ~~PM~~

Purpose Continued Basic α Measurements.

VDT # 3 = 10.0 Selsyn #1 = 17.74

4 = 2.0 #2 = 17.739

Log N = .0004

3-12-63

INSTRUMENT CHECK

Time 8 20 AM ~~PM~~ Source Ra, Be

		Channel				
Tables OK	F	A	B	C	D	E
Light OK						
Range	OK	10/1000	opr	–	10/1000	105°
~~Source~~ Dist.		2"	OK	4'	2"	8"
% P.S. Trip		100		100	70	100

C.A. 15" Solid Bare Expr. _____ Run E-5

Sheet _____ Date 3-12-1963 Time 8:30 AM ~~PM~~

Purpose Continued Rossi α measurements

UDT # 3 = 8.0 selsyn #1 = 17.74

4 = 0 # 2 = 17.748

Critical @ 8:45 AM Log N = .0004

-13-63

INSTRUMENT CHECK

Time 8:05 AM ~~PM~~ Source Pu Be γ

Tables OK

~~F O~~ Light OK

	F	Channel A	B	C	D	E
Range	OK	10/1000	opn	—	10/1000	1050
Source Dist.		6"	OK	6'	1"	10"
% F.S. Trip		100		100	70	100

C.A. 15" Solid Expr. _____ Run E-6

Sheet Bare Date 3-13-63 Time 8:20 AM ~~PM~~

Purpose Continued Rossi α measurements

UDT #3 = 8.0 Selsyn #1 = 17.74

#4 = 0 #2 = 17.748

Critical @ 8:25 AM Log N = .0004

3-26-63

INSTRUMENT CHECK

Time 9:30 AM PM Source Pu Pu γ

		Channel A	B	C	D	E
Tables ok						
Light ok	F	10/1000	opr	X	10/100	1050
Range	ok					
Source Dist.		3"	OK	?	1"	10"
% F.S. Trip		100			70	100

7"-13"
C. 4" C. Refl. Expr. _____ Run 1
Sheet _____ Date _____ 19 __ Time 10:00 AM

Purpose To Check Reactivity of 2" of Fuel with 4" C. reflector.
1" Fuel on Diaphram
1" Fuel on Ram

No apparent Multiplication.

3-28-63

INSTRUMENT CHECK PoBe

Time 8:30 AM ~~PM~~ Source γ

Tables OK
Light OK F

	Channel A	B	C	D	E
Range OK	10/1000	Opr	X	10/1000	1050
Source Dist.	8"	OK	30"	1"	8"
% F.S. Trip	95		100	90	100

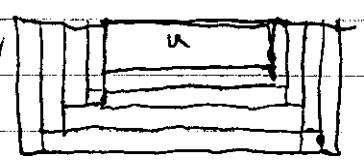
~~7"-13" Ring~~
~~C.A. 4" C. Refl.~~ Expr. B-28-63 2

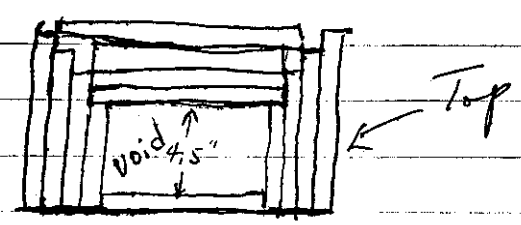
Sheet _____ Date _____ 19 Time 10:00 AM ~~PM~~

Purpose 13-7 4" G reflector 1st Loading

PoBe Source #563 on diaphragm against C.

		7-9	9-11	11-13
Top	1" Thick	2762	2776	2757
Bottom	1/8	2773	1/8 2746	1/2 2751
	3/8	2829	3/8 2742	1/2 2754
	1 1/2	27'	1 1/2 2748	1" 2756

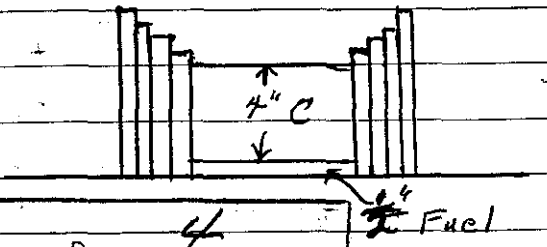




Super Critical @ Selsyn #1 = 18.265
#2 = 18.248

7"-13"
C.A. 4" Refl Expr. _____ Run 3
Sheet _____ Date _____ 19 ___ Time _____ AM PM
Purpose 2½" Fuel with 4" Carbon Refl.

Super Crit. #1 = 18.32



7"-13"
C.A. ~~4" C Refl~~ Expr. _____ Run 4
Sheet _____ Date _____ 19 ___ Time _____ AM ~~PM~~
Purpose 2⅜" Fuel with 4" Carbon Refl.

Super Crit #1 = 18.41

7"-13
C.A. 4" C Refl. Expr. _____ Run 5
Sheet _____ Date _____ 19 ___ Time _____
Purpose Same as above run except for Source Change. Source # 467 on drive used.

Super Critical #1 = 18.51

7"-13" U-Rings
C.A. 4" C. Refl. Expr. _____ Run 6
Sheet _____ Date 3-28-1963 Time 1:20 AM PM
Purpose 2 1/4" Fuel with 4" C. Refl.

(*)

Est Crit Height

2 5/16"

UDT #3 = +8.0 Selsyn #1 = 18.685
#4 = -14.0 #2 = 18.666

Sub critical
No significant multiplication.

7" I.D. - 13" O.D. U-Ring
* C.A. 4" C. Refl. Expr. _____ Run 7
Sheet with C. Core Date _____ Time 1:50
Purpose 2 1/4" Fuel with 4" C. Refl.
1" Thick 7" O.D Carbon disc
added to Bottom

Sub Critical: UDT #3 = 8.0 Selsyn #1 = 18.68 +
#4 = -14.0 #2 = 18.665

C.A. Same Expr. _____ Run 8
Sheet _____ Date _____ Time _____ AM PM
Purpose added additional 1"-Thick
7" C. disc to Bottom

7" I.D. - 13" O.D. U-Ring

C.A. 4" C. Refl Expr. _____ Run 9-

C. Core

Sheet _____ Date 3-28 1963 Time 2:30 ~~AM~~ PM

Purpose _____

Fuel = 2 3/8"

C Core = 2 3/8"

C Reflector = 4" + (see p. 149)

Super Critical: VDT = Off

Solsyn #1 = 18.49

#2 = 18.473

(*) Est Crit Height = 2 5/16" ± 1/16"

68 +
.665

3-29-63

INSTRUMENT CHECK

Time 9:30 AM ~~PM~~ Source P. B. γ

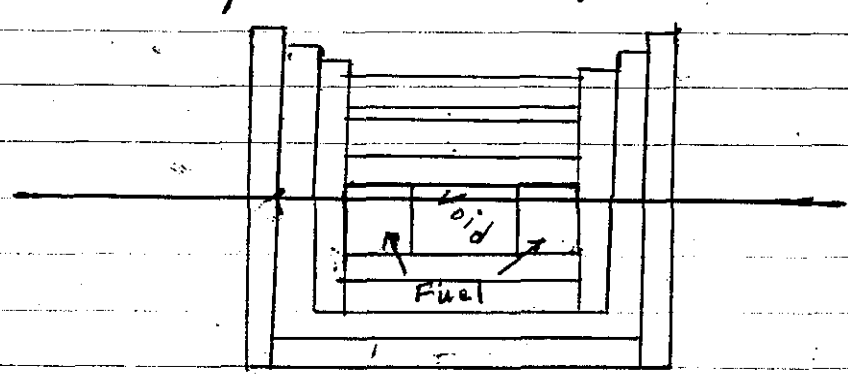
		Channel A	B	C	D	E
Tables ok	F	10/1000	opr	X	10/1000	1050
Light OK	OK	18"	OK	30"	1	8"
Source Dist.						
% F.S. Trip		70			80	100

9" ID - 15" OD
4" C Top + Bottom
3" C Radial
Sheet ___ Date ___ Time ___ AM PM

Purpose Assembly of 15-9 4" Bottom refl
3" Side reflector
1" Fuel on Room
1" Fuel on diaphragm

UDT #3 = +8.0 Selsyn #1 = 18.68
#4 = -14.0 #2 = 18.—

Sub Critical
No significant Multiplication



Run

Ru

C.A. 9-15 Expr. _____ Run 2

Sheet Refl. Date 3-29-1963 Time 10:10 AM ~~PM~~

Purpose 9" I.D. - 15" O.D. Fuel with 4" Top + Bottom C and 3" Radial C.

2" Fuel on Ram

½" Fuel on diaphragm

Bottom Fuel

2"	2776	2757	2760 / 2787
	2745	2756	2735
	9-11	11-13	13-15

diaphragm

Top Fuel

⅛	2746			
⅜	2742	2754	2848	½"
	9-11	11-13	13-15	

Super Critical @ 18.49

Run 3 Bottom Fuel Same

Fuel = 2¼"

Top Fuel

2779	2783	2886	¼"
9-11	11-13	13-15	

Sub Crit.

Run 4 Bottom Fuel Same

Fuel = 2⅜"

Top Fuel

Added

2746	2781	2758	⅜"
9-11	11-13	13-15	

VDT #3 = +7.0 Selsyn #1 = 18,685

#4 = -20 #2 = 18,670

Sub Critical:

(*) Est. Crit. Height: Run 2 vs Run 4 = 2 7/16" ± 1/16"

9" I.D - 15" O.D
4" Top + Bottom C. Refl.
C.13" Radial Exp. Refl. Run 5
Sheet Carbon Core Date 3-29-63 Time 12:40 AM
Purpose Added 2" C. Core to bottom

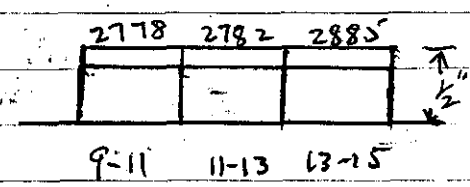
Fuel = 2 3/8"

VDT #3 = 17.0 Selsyn #1 = 18.69
#4 = ? #2 = 18.670

Sub critical

Run 6 Bottom Same + Added 1/4" Fuel and 1/2" C Core to Top.

Fuel = 2 1/2"
Bottom + Top C. Refl = 4"
Radial C. Refl = 3"
C. Core = 2 1/2"



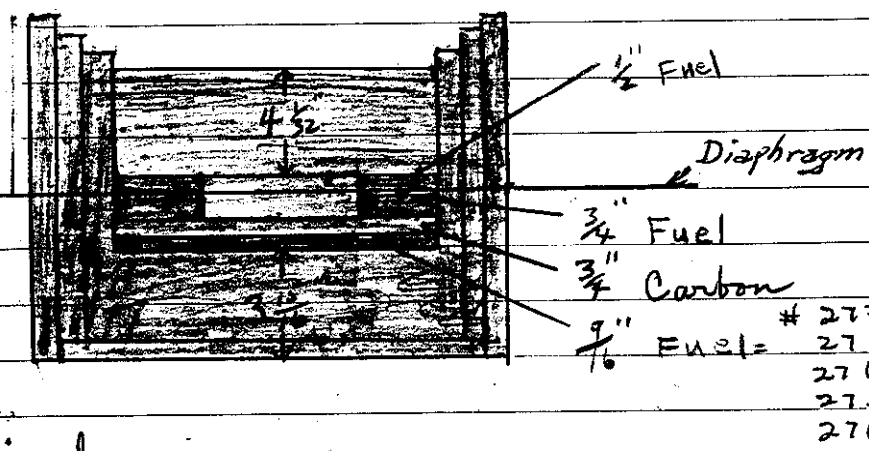
Super Crit @ 18.49

⊛ Est Crit Height = 2 7/16" ± 1/16"

C.A. 9-15 Expr. _____ Run 7

Sheet _____ Date 3-29-1963 Time 2:20 ~~AM~~ PM

Purpose obtain crit. assembly with fuel and Carbon as shown below



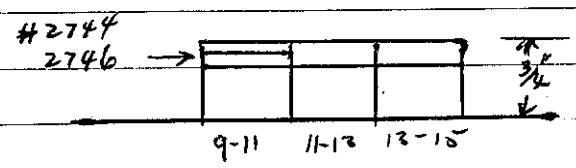
1/2"

Sub Critical -

ctr # 2 1^{+156} x256

3 15^{+24} x64

Run 8 Added 1/4" Fuel to Top



Bottom Same -

Fuel above diaphragm = 3/4"

sub critical -

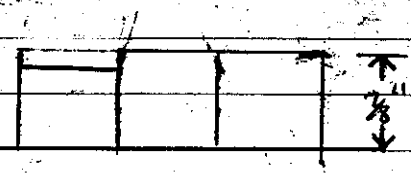
ctr #2 = 1^{+254} (x256) #3 = 5^{+76} (x256)

1^{+238} 4^{+194}

Run 9. Added $\frac{1}{8}$" Fuel to 11-13 and 13-15 ring.

Bottom Same.

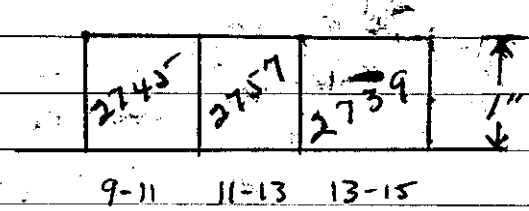
Fuel Above diaphragm = $\frac{7}{8}$"



Sub Critical -

ctr #2	#3
1^{+171} (x 256)	20^{+45} (x64)

Run 10 Bottom Same : Top 1" of Fuel



Sub Critical

ctr #2	#3
2^{+140} (x256)	69^{+17} (x64)

Run 11 Bottom Same : Added $\frac{1}{8}$" to 9-11 ring & Top
4:08 pm Source #563 present
Close to Critical, probably slightly negative

4-1-63

Mihalczo
Lynn
Taylor

INSTRUMENT CHECK

Time 9:45 AM ~~PM~~ Source P.B. γ

Tables ok
Light ok

		Channel A	B	C	D	E
Range	F	10/100 - opr		X	10/1000	1050
Source Dist.	OK	18"		2'	1"	10"
% F.S. Trip		80		100	80	100

C.N. 15" – 11" Expt. Run 1

Sheet 3" Refl. Date 4-1-1963 Time AM PM

Purpose Assembly of 11" I.D - 15" O.D. rings with 3" Thick Carbon Reflector

Top Same as Run 11 p.156 Bottom - 2" Fuel and 3" Refl.

UDT #3 = 7.0 Selsyn #1 = 18.69
#4 = -20. #2 =

Sub Critical:

#2 (x256) #3 (x256)
3+ 4+85

Run 2 added 1" Fuel to Bottom
Top = 1" Fuel; 3" Reflector

Fuel = 4"

Sub Crit: #2 #3
12+70 (x256) 34+40 (x64)
14+ 35+28

Run 3 Bottom Same:
Top – $\frac{17}{16}$" Fuel ; 3" Refl.
Fuel = $4\frac{1}{16}$"
Sub Critical

Run 4 Bottom Same:
Top – $\frac{19}{16}$" Fuel ; 3" Refl.
Fuel = $4\frac{3}{16}$"
Sub Critical

#2 (x256)	#3 (x16)
4	12 + 1
4	11 + 4

Run 5 Bottom Same:
Top = $\frac{21}{16}$" Fuel ; 3" Refl.
Fuel = $4\frac{5}{16}$"
Super Critical @ # 1 = 18.50
2 = 18.497

Bottom Fuel

2753	2787
2752	2786
2756	2735

11-13 13-15

Diaphragm

#2780
#2781

Top Fuel

2788	2785
2782	2786
2755	2766

#2758
#2761

Diaphragm 11-13 13-15

* Est Crit Height: $4\frac{1}{4}$" $\pm \frac{1}{16}$"

C.A. 15-11
3" Top + Bottom Refl. Run 6
Sheet 2" Radial Refl 4-1-1963 Time 8:20 AM PM
Purpose
Obtain Crit. Height

Bottom fuel same; Added 3/16" Fuel to top.
3" Top + Bottom and 2" Radial.

Sub Critical: Fuel = 4 11/16"

Run 7 Bottom same: Added 1/16" fuel to top.

Fuel = 4 3/4"

Super Critical #1 = 18.59

Est Crit Height = 4 23/32" ± 1/32"

#2780 #2761

#2782	#2886
#2750	#2784
#2757	#2739
11-13	13-15

← Top Fuel

↑ Diaphragm

For Bottom Fuel see p. 159

4-2-63

INSTRUMENT CHECK

Time 10:42 AM Source PuBe + γ

		Channel A	B	C	D	E
Range	F	10/1000	open	X	10/1000	1050V
	HV = 8					
Source Dist.	OK	2'	0	20"	3"	4"
% F.S. Trip		80	OK	100	70	100 +

Ctr # 3 - OK

Contact
22.17
22.156

Zero
UDT #3 = +6
#4 = +8

Selsyn #1
#1 22.17
#2 22.197

C.A. 7" Disc Bare Expr. Run 1

Shear Date 4-2-63 Time 1:00 AM PM

Purpose 7" dia disc. Bare.
Fuel = 5"
2½" on diaphragm
2½" on beam

#2734
#2732
#2731
#2733

Super Critical @ #1 22.06
#2 = 22.049

Thickness of Top: S 2.501; E 2.5015; N 2.502; W 2.502; SW 2.502
East Vernier Calip S 2.500; N 2.502; SW 2.502 & 2.500
ALL AVG 2.5014"

4-3-63

INSTRUMENT CHECK

Time 8:45 AM ~~PM~~ Source R. B. γ

Tables OK

Light OK F

	Channel A	B	C	D	E
Range	10/1000	opr	X	10/1000	1050
Source Dist. OK	10"		30	4"	5"
% F.S. Trip	100		100	80	100

C.A. 7" Cyl. ~~Disc~~ Expr. _____ Run 2

Sheet _____ Date _____ 19 ___ Time _____ AM ~~PM~~

Purpose To obtain a Critical height in preparation for Rosie α

Fuel = 4 15/16" ~~2 1/2" on Diaphragm~~ ~~2 7/16 on Ram~~

Top Fuel Same:

Sub critical: VDT #3 = 11.0 Selsyn #1 = 22.115
#4 = 20. #2 22.110

W 2.439
S .439
E .439
N .439
NW .439
SE .439

#2729
#2730
#2733 ← Bottom Fuel

Run 3 added: 10 mil; 2 7/8" dia. disc to top

Sub Crit: No appreciable difference.

Discovered: Flanges moved wrong direction for Run 2

Run 4 Readjusted flanges;
~~Repeat~~ Repeat of Run 2

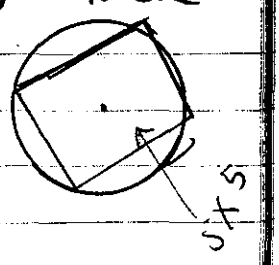
Sub Crit. Selsyn #1 = 22.23
#2 =

Run 5 Added 5"x5"x 1/32" fuel to top

Sub Critical Selsyn #1 = 22.23

C.A. 7" ~~Cyl~~ Cyl. Expr. _____ Run 6
Sheet _____ Date _____ 19 __ Time 12:45 ~~AM~~ PM
Purpose Obtain Crit Height

Top View of Stack



2.115 Removed the 5x5x1/32 from top
2.110 Added 5"x5"x 1/16"

Super Critical +38 sec Selsyn #1 = 22.23

Run 7 Removed the 5"x5"x1/16"
Added 5"x5"x 1/32" > to center top.
2 — 2"x2"x 1/32"

Super Crit. Selsyn #1 = 22.23

Contact = 22.14

Run 8 Moved the 2" x 2" x 1/32" fuel pcs - one to
2:20 pm either side of the 5 x 5 x 1/32 pcs.
Placed 2-Small fission ctrs, 1 Scint. ctr. in place -
Super Critical VDT #3 = +10 Selsyn #1 = 22.23
#4 = +16 #2 = 22.22

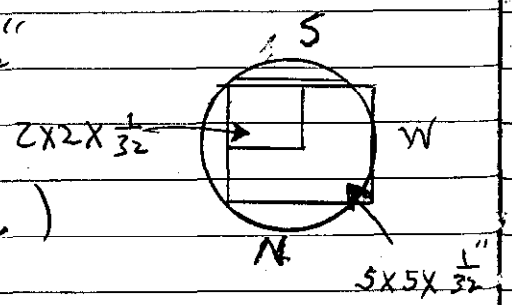
Run 9 Removed 1 - 2" x 2" x 1/32" ; placed other 2 x 2 x 1/32
at center of Stack.

Super Crit. - Selsyn #1 = 22.23
#2 = 22.22

Run 10 Removed the 2" x 2" x 1/32.

Sub Critical Selsyn #1 = 22.23
#2 = 22.20

Run 11 Placed the 2" x 2" x 1/32"
as shown



Just Crit: (neg. Trend.)

Selsyn #1 = 22.23

22,14

4-4-63

INSTRUMENT CHECK

Time 8:10 AM Source Pu Be + γ

		Channel A	B	C	D	E
Power	HV=8	10/1000	open	X	10/1000	1050V.
Source Dist.	ok	12"	0	30"	4"	6"
% F.S. Trip		100	ok	100	75	100+

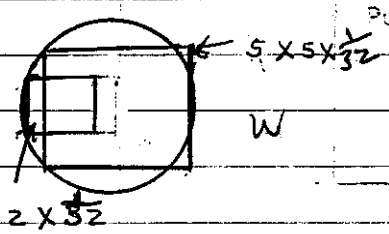
C.A. 7" Cyl. Expr. _____ Run 12

Sheet Bare Date 4-4-1963 Time _____ AM/PM

Purpose Rossi α measurements

Fuel = 4 15/16" + [5 x 5 x 1/32 / 2 x 2 x 1/32] as shown

Top View of Stack



Data Taking Started @ 10:00 AM

VDT # 3 = 10.0 Selsyn # 1 = 22.23

4 = 11.5 # 2 = 22.217

Log N = .0005 ∞ period

Down @ 3:05 PM

Run 13 Removed the 3 Counters used for Rossi α measurments

Measured negative period -

Log N — 162.8 sec 10.7¢

Char "A" 71/35 150 - 213 sec 7.54

"D" 94/27 in 150 80/40 in 150 7.39 216 sec

Run 14

C.A. 7 Cyl. Expr. _____ Run 14

Sheet _____ Date 4-4-63 Time _____ AM PM

Purpose Diaphragm Support Rings Evaluation

Fuel Same

Measured a Negative Period

LN	A	D
-384 sec	81/31 450 sec	93/42.5 in 250 sec
3.75 ¢	-480 sec	-374
	2.93	3.86

Reactivity of Run 13 is the value of the counter

Diaphragm Support Rings Run 13 minus Run 14

10.7
- 3.75
6.95 ¢

4-5-63

INSTRUMENT CHECK

Time 4:00 AM Source P.B.

Tables ok

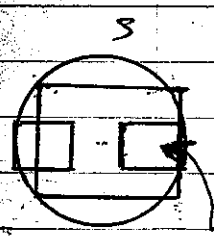
Light ok

	F	A	B	C	D	E
Range	OK	1/100	opr	X	1/100	1050
Source Dis		2'	OK	3'	4	
[illegible]		100		100	70	100

C.A. 7" dia Cyl. Opr. _____ Run 15

Sheet _____ Date _____ 19 ___ Time 8:30 AM ~~PM~~

Purpose Evaluation of diaphrom + Support Structure Clean Critical Rim



added 2X2X 1/32 to top as shown

UDT #3 = 10 Selsyn #1 = 22.23

#4 = 10 #2 = 22.222

Just Crit. ∞

Run 16 added 20" dia. 10 mil thick diaphragm to top & bottom fuel

LN	A	D
-119 sec	- 36/32 100 141	- 80/33 in 100 113
-18.0 ¢	13.2	14.99

C.A. _____ Expr. _____ Run 17

Sheet _____ Date 4-5-1963 Time 9:40 AM

Purpose Evaluation of Bottom Fuel Support

Measured Negative period:

Log N = -499 Sec "A" = $\frac{69}{36}$ - 350 sec "D" = $\frac{80}{45}$ in 300

-2.81¢ 541 sec 525

-258 2.66

⊗ Summary: $4\frac{15}{16}$" +

1. Clean Critical Assembly
   $4\frac{15}{16}$" + [5"x5"x $\frac{1}{32}$" + 2 - 2"x 2"x $\frac{1}{32}$"] p. 167
   ∞

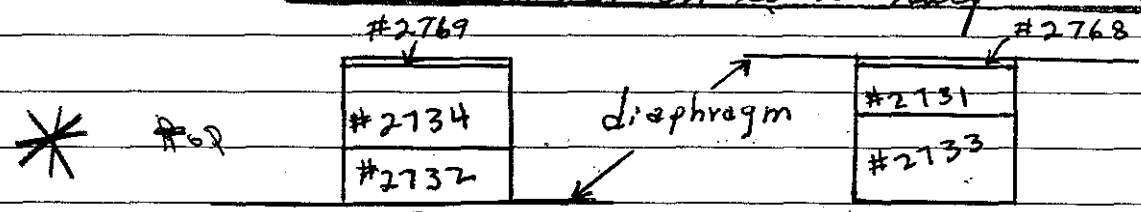
2. Support Ring Value
   5.36 ¢

3. 10 mil Diaphragm
   -15.4¢

4. Bottom Fuel Support
   12.7¢

Selsyn Zero
#1 = 0.0
#2 0.019

C.A. 7" dia. Cyl. ~~pot~~ Separation Expr. _____ Run 18
Sheet _____ Date 4-5-1963 Time 10' AM ~~PM~~
Purpose Find Critical separation for 2-7" dia. cylinders
2 5/8" Fuel on each half



Positive Period – Selsyn #1 = 21.838
#2 = 21.823

LogN = 130 Sec
+8.0 ¢
4 mils or 2¢/mil

Level – Selsyn #1 = 21.83
#2 = 21.819

Counters in position Selsyn #1 0.00
#2 0.0175 0.018

Beginning VDT #3 = +3.0 Selsyn #1 = 21.82
#4 = +1.5 #2 = 21.814

End #3 = 2.0 Selsyn #1 = 21.82
#4 = 1.3 #2 = 21.812

4:15 PM

Top THICKNESS → Mic = 5 2628 · F 2628 · N 2628 · [illegible]

4-8-63

#1 = 0.010
#2 = 0.00

Table down

INSTRUMENT CHECK

Time 8:10 AM ~~PM~~ Source P. Bc γ

Tables ok
Light ok

		Channel A	B	C	D	E
Range	F	10/1000	op	X	10/1000	1050
Source Dist.	OK	30"	ok	3'	4"	5"
% F.S. Trip		90		100	80	100

C.A. 7" dia Cyl Expr. _____ Run 19

Sheet _____ Date 4-8-1963 Time _____ AM ~~PM~~

Purpose Continued Rosie & Measurements. 2 5/8"

VDT #3 = +2.5 Selsyn #1 = 21.82
#4 = +1.0 #2 = 21.796

Log N = .00055

Servo on Chan "D" @ 10/1000
Servo Signal @ 3.0 — D = 32.5

At Shutdown Shim ~1" from stack
Selsyn #1 21.82² #2 21.794
VDT #3 +3 #4 +1

Table Down
Selsyn #1 0.00 #2 99.998

Top Thickness → Mic = S 2.628, E 2.628, N 2.628, W 2.629
East Vernier = 2.628 2.625 2.627 2.629
Avg 2.6279

Measured separation at shutdown

E - 21.923 N - 21.927 W - 21.915 - S 21.917

SW - 21.915 SE - 21.927

Average separation 21.921

Separation at flange and upper limit switch 21.799 21.800

C.A. _____ Expr. _____ Run 20

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Reactivity value of counter

Counter Removed

At upper limit light Selsyn #1 - 21.83 #2 21.799

* Rossi α made with separation of 0.127 in from selsyn #2

VDT #3	VDT #4	Selsyn 1	21.82
+2.6	1.9	2	21.7945

#20	Log N (-271.4)	A 57/38.5 (100 sec)	D 75/41.5 (150 sec)
	5.58¢	-255 sec	-253 sec
		6.0¢	6.08¢

#21	Shim on drive moved out		
	LN (-191.1)	A 75/56 (50 sec)	D 84/36 (100 sec)
	8.65¢	-171.2	-118
		9.97¢	18.2¢

$\Delta\rho/\Delta x$

22. Table at upper limit to measure positive period

Selsyn #1 21.828" #2 21.798

VDT #3 - +9 VDT # 4 - +8.5

Log N (+167.2) A 74/35 (150 sec) D 46/91 (100 sec)

6.5¢ 200.8 5.57¢ 146.6 7.25¢

23. Lowered table to measure $\Delta\rho/\Delta h$

VDT 3 7.1 #4 6.9 Selsyn 2 21.796

∞ ∞ ∞

24. Lowered table to

VDT 3. +3.6 #4 3.0 Selsyn 2 21.7935

Log N (−136.8) A 60/28 (100 sec) D 84/35 (100 sec)

#2 13.9¢ −131.6 14.9¢ −1.14 19.6¢

Table Down Selsyn #1 0.01 #2 99996

* Separation at Critical

21.921 − 21.796 0.125 in

* $\Delta\rho/\Delta x^{22+24} = \dfrac{6.5 + 13.9 + 5.57 + 14.9}{5.4 + 5.5} = 3.75$ ¢/mil D not used.

* Reactivity of counter in R-α = 5.85 ¢

Reactivity of shim — 3.52 ¢

C.A. _____ Expr. _____ Run 25.

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Value of diaphram and diaphram support ring

Diaphram placed on top of lower uranium & ring added

VDT #3 = +3.6 #4 = +3 Selsyn 1 = 21.825

2 = 21.7945

Log N = (+84.7) A 75/40 (50 sec) D 60/19 (100 sec)

25. 11.2¢ 79.6 86.9

11.7¢ 10.9¢

✓ Level VDT #3 −1.2 #4 −2.0

26 LN = (−131.4) 15.0¢ A = 83/35 (100 sec) D = 70/28 (100 sec −109

VDT #3 −8 #4 − −8 −116 18.9¢ #1 = 21.808 21.2¢

#2 = 21.7815

27 Value of lower full support. (vs 26)

a. Positive period @ #3 = −1.2 #1 = 21.82

#4 = −2.0 #2 = 21.7905

Log N = (+76.0) "A" 49/14 (100 sec) "D" 62/35 (50 sec)

12.2¢ 79.8 87.6

11.7¢ 10.9¢

b. Level #3 = -5.7 #1 = 21.815
∞ #4 = -5.8 #2 = 21.7833

c. Negative Period #3 = -8 #1 = 21.81+
(Vs Run 26) #4 = -8 #2 = 21.782

Log N (-175.9) Chan "A" 60/28 (250 sec) "D" 65/30 (200 sec)
9.68¢ -328 4.5¢ -258 5.92¢

* Measurement of Bottom 2 5/8" Fuel.

2.632 2.629 2.6305 2.6295 2.630

Av = 2.631

* Value of Diaphram

$\frac{25.1 + 26.6}{2} = 25.8$ ¢

$\frac{8.3 + 8.9}{2} = 8.6$ mils

* Value of lower fuel support.

$\frac{12.2 + 11.7 + 10.9}{3} = 11.6$ ¢

$\frac{3.8 + 4.5}{2} = 4.15$ mils

$\Delta\rho/\Delta x$ Run 25 + 26

$c = \frac{24.2 + 30.1 + 32.1}{22.6} \frac{2}{3} = \cancel{3.93} = 2.62$ ¢/mil

$\Delta\rho/\Delta x$ Run 27a + c

$\frac{54.9/3}{12.8/2} = 2.86$ ¢/mil

TOP THICKNESS

Mic = S 2.752 ; E 2.752 ; N 2.753 ; W 2.753

East Vermts 2.752 2.751 2.750 2.752

Avg 2.7519

C.A. 7" dia Cyl Expr. _____ Run 28

Sheet _____ Date _____ 19 ___ Time _____ AM PM

Purpose Critical Separation of 2 - 2¾" Thick, 7" dia cylinders.

TOP		BOTTOM
#2770		#2771
#2734	Diaphragm	#2731
#2732		#2733

28a Positive Period VDT #3 = 13.9 Selsyn #1 = 21.595
#4 = 2.6 #2 = 21.561

Distance from flange to upper limit switch 21.561

Log N = +212.8 Chan "A" $\frac{85}{51}$ (100 sec) "D" $\frac{77}{45}$ (100 sec)
5.28¢ 196.1 sec 186.2 sec
5.68¢ 5.9¢

b Level VDT #3 = 11.9 Selsyn #1 21.595
∞ #4 = 0.8 #2 = 21.5585

c Negative Period VDT #3 = +8.0 Selsyn #1 = 21.585
#4 = -2.9 #2 = 21.5555

Log N = -178.1 Chan "A" $\frac{81}{48}$ (100 sec) "D" $\frac{80}{43}$ (100 sec)
9.5¢ 191.6 sec 161.1 sec
8.6¢ 10.9¢

Measured Separation - N 21.794 E 21.813 W 21.789 S 21.79
SW - 21.794 SE 21.790 E 21.800 Ar 21.796
- 21.558
238

Selsyn Readings with Table down
#1 0.00 #2 99996

* From Fine Selsyn Separation 0.238 in. CRITICAL

$\frac{\Delta P}{\Delta x}(a-c) = \frac{(14.78+14.28+16.8)/3}{(5.5+5.9)/2} = 2.68$ ¢/in.

29. Diaphragm and support ring evaluation.

a. VDT #3 = +7.9 SELSYN #1 = 21.59

VDT #4 = −2.9 ~7.52¢ SELSYN #2 = 21.556

Log N = + 137.9 CHAN "A" = 49/28 (100 sec) 178.7 sec CHAN "D" = 67/31 (100 sec) 129.7 sec or 8.0¢

b. Level VDT #3 = +4.2 6.12¢ SELSYN #1 = 21.58

∞ VDT #4 = −6.9 SELSYN #2 = 21.552

$$\phi = \frac{(9.5+7.52)+(8.6+6.12)+(10.9+8.0)}{3} = 16.88$$

2.19

$$\text{Mils} \quad \frac{(11.9-4.2)+(0.8+6.9)}{2} = 7.7$$

30. Evaluation of lower support structure:

a. Positive Period

VDT #3 = +4.2 SELSYN #1 = 21.585

VDT #4 = −6.9 SELSYN #2 = 21.5525

Log N = +91.2 CHAN "A" = 71/45 (50 sec) CHAN "D" = 71/41 (50 sec)

10.61¢ 110 sec 91.1 sec

9.14¢ 10.6¢

b. Level VDT #3 = −0.3 SELSYN #1 = 21.58

∞ VDT #4 = −11.3 SELSYN #2 = 21.549

$$\phi = \frac{10.61+9.14+10.6}{3} = 10.12$$

2.27

$$\text{Mils} = \frac{(4.2+0.3)+(11.3-6.9)}{2} = 4.45$$

4-9-63

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Po Be + γ

Tables ok

Light ok F

		Channel A	B	C	D	E
Range	OK	10/1000	opr	X	10/1000	1050
Source Dist.		2ft	OK	3ft	4"	8"
% F.S. Trip		100		10	80	100

C.A. 7" dia Cyl Expr. _____ Run 31

Sheet _____ Date _____ 19 ___ Time _____ AM ~~PM~~

Purpose Rosse α measurements

2 3/4

Fuel as shown p. 177

~ 1/4" Separation ✓

Thickness of Fuel on bottom: Avg

2.750, 2.751, 2.751, 2.750, 2.750 2.7504

VDT # 3 = +9.6 Selsyn #1 = 21.59

VDT # 4 = −4.2 Selsyn #2 = 21.5585

Log N = .00056 ∞ PERIOD

Servo on Channel "D" @ 10/500 = 55.5

Servo signal @ 491 units

Started run @ 0855 HRS ENDED run @ ≈ 1420 HRS.

Measured thickness of 2 7/8 TOP:

Mic: S 2.878; E 2.878; N 2.879; W 2.879

E. Vermis: 2.875 2.878 2.877 2.877

Avg 2.8772

C.A 7" dia Cyl Expr _____ Run 32

Sheet _____ Date _____ 19 _____ Time 2:40 ~~AM~~ PM

Purpose Critical Separation of 2 - 2 7/8" Thick, 7" dia Cylinders.

#2728		#2729
#2734	Diaphragm	#2731
#2732		#2733
Top Fuel		Bottom Fuel

Measured bottom fuel thickness - Avg.
2.880, 2.880, 2.880, 2.879 - 2.880

Measured Separation (Shut Down) -
21.675, 21.669, 21.664, 21.665, 21.663
21.670 Avg = 21.668

32 a Measured Positive Period - VDT #3 = 13 Selsyn # 1 = 21.34
Shim was in #4 = -7.2 #2 = 21.311
Log N = + 173.7 Chan "A" 92/52 (100 sec) "D" 85/55 (100 sec)
6.27¢ 175.1 229.9
6.21¢ 4.92¢

32 b Level ∞ Shim was in
VDT # 3 = +9.1 Selsyn 1 = 21.33
VDT # 4 = -10.1 Selsyn 2 = 21.307

32 c Negative Period Shim rods in 3

VDT # 3 = +1.1 Selsyn #1 = 21.32

VDT # 4 = -18.1 Selsyn #2 = 21.2992

log N = — 114.7 Chan "A" = $\frac{84}{37}$ (100 sec) Chan "D" = $\frac{89}{58}$ (50 sec)

19.3¢ 122.0 116.8

17.1¢ 18.6¢

32 d Level ∞ Shim out 33

VDT # 3 = +12.2 Selsyn #1 = 21.34

VDT # 4 = -7.5 Selsyn #2 = 21.3095

Remeasured Separation at shutdown

E - 21.671 N - 21.663 W 21.663 SW 21.660 S 21.663

SE 21.663 Av 21.6638

Selsyn Readings Table Travel - 21.3135

#1 0 00 .3503

#2 99996 34

$$\Delta\rho/\Delta h \; 32(a\ c) = \frac{\left[(6.27+19.3)+(6.21+17.1)+(4.92+18.6)\right]/3}{(10.9+11.9)/2}$$

$$= 2.12$$

34

33a Evaluation of diaphragm and rings.

Positive Period

VDT #3 = +12.2 Selsyn #1 = 21.34

VDT #4 = −7.7 Selsyn #2 = 21.3105

Log N = + 44.5 Chan "A" = $\frac{91}{42}$ (50 sec) Chan "D" = $\frac{70}{35}$ (25 sec)

17.5¢ 64.7 36.1

13.7¢ 20.3¢

33 b Level ∞ Period

VDT #3 = +3.5 Selsyn #1 = 21.325

VDT #4 = −17.0 Selsyn #2 = 21.303

Value of diaphragm 17.17 ¢

9.1 mils

34 a Evaluation of support stand

Positive Period

VDT #3 = +3.5 Selsyn #1 = 21.328

VDT #4 = −17.0 Selsyn #2 = 21.303

82.0 = 11.5¢

Log N = + 83.6 Chan A = $\frac{88}{26}$ (100 sec) Chan D = $\frac{84}{47}$ (50 sec)

11.3¢ $\frac{88}{49}$ (50 sec) 85.9

85.1 = 11.1¢ 11.0¢

34b Level ∞

VDT #3 = −3.0 Selsyn #1 = 21.315

VDT #4 = −23.5 Selsyn #2 = 21.2955

4-10-63

INSTRUMENT CHECK

Source Pu Be + γ

Time 8:30 AM ~~PM~~

	F	A	B	C	D	E
		Channel				
Range	HV=8	10/1000	off	X	10/1000	1050
Source Dist.	OK	2'	0	3'	4"	8"
% F.S. Trip		75	OK	100	100	100+

C.A. 7" dia. cyl. Expr. _____ Run 35

~~Size~~ 2 - 2 3/8" Date Apr 10 63 Time 8 55 AM ~~PM~~

Purpose Rossi α measurements

FUEL AS SHOWN Pg 181

~ 3/8" SEPARATION

VDT #3 = +8.2 Selsyn #1 = 21.33

#4 = -3.0 #2 = 21.3085

log N = .00052 ∞ PERIOD

Servo on channel D @ 10/500 = 55.0

Servo signal @ 491 units

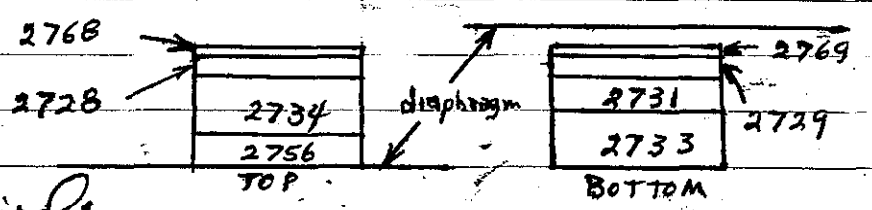
Stopped @ 1405 hrs.

36

C.A. 7" dia. cyl. Expr. _____ Run 36

~~Shot~~ 2-3" Date Apr 10 19 63 Time 2:15 ~~AM~~ PM

Purpose Critical Separation of 2-3" thick, 7" dia cylinders



36 a Positive Period:

VDT #3 = -4.2 Selsyn #1 = 21.09

VDT #4 = +3.0 Selsyn #2 = 21.061

LogN = + 57.9 Chan A = 60/27 (50) Chan D = 86/30 (50)

14.6¢ 62.7 47.5

13.94 16.84

36 b Level ∞

VDT #3 = -13.5 Selsyn #1 = 21.07

VDT #4 = -9.0 Selsyn #2 = 21.051

Measured THICKNESS TOP:

Mic: S 3.005 ; E 3.004 ; N 3.004 ; W 3.005

East Vernier 3.003 3.002 3.003 3.004

avg 3.0038

36c Negative Period

VDT #3 = -18.8 Selsyn #1 = 21.068
VDT #4 = -21.1 * Selsyn #2 = 21.045

* VDT #4 suddenly "jumped" down 7.1 mils. relative to 36b readings

Log N = — 181 9.34
Chan A: 66/37 (100 sec) 172.7 9.88
Chan D = 79/31 (150 sec) 167.2 10.4
83/34 (200 sec) 224 7.08

Table down Selsyn #1 0.01
#2 99996

Measured separation @ shutdown: E 21.532; N 21.530; NW 21.530; S 21.530; SE 21.530 Avg → 21.530

Measured thickness of bottom: E 3.007; N 3.006; NW 3.007; W 3.007; S 3.008; SE 3.006 Avg → 3.0068

Measured distance from flange #3 to relay → 21.080

$$\Delta \rho / \Delta x = \frac{\left[(14.6+9.3)+(13.9+9.88)+(16.8+8.52)\right]/3}{14.6} = 1.67 \text{ ¢/mil}$$

37a Evaluation of diaphragm and support rings:
Positive period

VDT #3 = −13.8 Selsyn #1 = 21.082
VDT #4 = +9 − (?) Selsyn #2 = 21.0325

Log N = + 50.7 16.24
Chan A = 82/35 (50 sec) 58.7 14.64
Chan D = 64/16 (50 sec) 36.1 20.24

37 b Level ∞

VDT # 3 = −23.5 Selsyn #1 : 21.072
VDT # 4 = −2.8 (?) Selsyn #2 : 21.022 38

Moved up 5 mils on #3 = −18.5 #1 : 21.075
#4 : + 2.5 (?) #2 : 21.0275

Moved back on #3 : −23.2 #1 = 21.075
#4 = −11.1 (?) #2 = 21.022

3

Rigidity of support stand

$$= \frac{10.35 + 10.25 + 9.46 + 9.92 + 9.3 + 11.45}{6} \quad 10.12$$

38a Evaluation of support stand.

~~Level ∞ with support in place.~~

VDT #3 = +0.8 Selsyn #1 = 21.075

VDT #4 = -6.9 (?) Selsyn #2 = 21.022

Positive period

Log N = + ~~50.7~~ 94.1 +10.35¢

Chan A = 49/29 (50 sec) 95.3 +10.25¢

Chan D = 78/50 (50 sec) 112.4 + 9.0¢

91/55 (50 sec) 99.4 + 9.92¢

38b (taken) Level ∞ (support still in place)

VDT #3 = -6.0 Selsyn #1 = 21.065

VDT #4 = -10.5 (?) Selsyn #2 = 21.0145

38c Measure Negative Period (after moving support away remotely)

VDT #3 = -6.0 Selsyn #1 = 21.065

VDT #4 = -10.5 (?) Selsyn #2 = 21.0145

Log N = - ~~5~~ 171.5 -9.92¢

Chan A = 62/27 (150 sec) 180.7 -9.3¢

Chan D = 86/33 (150 sec) 156.7 -11.45¢

190

38.d Level ∞

VDT #3 = -0.6

VDT #4 = -2.0 (?)

Selsyn #1 = 21.07

Selsyn #2 = 21.0195

4-11-63

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source PuBe + γ

		Channel A	B	C	D	E
Range	F HV = 8	10/1000	opr	X	10/1000	1050
Source Dist.	OK	2'	0	30"	4"	6"
% F.S. Trip		95	OK	100	80	100+

C.A. 7" dia Cyl Expr. _____ Run 39

~~Shot~~ 2 - 3" Date Apr 11 1963 Time 9:00 AM ~~PM~~

Purpose Rossi α Measurement

FUEL AS SHOWN pg 186

~ 1/2" separation

VDT #3 = +3.2 Selsyn #1 = 21.08

VDT #4 = +5.4 Selsyn #2 = 21.009

Log n = .00058 ∞ Period

Servo on channel D @ 10/500 reads ≈ 49.0

Servo signal @ 432 units

NOTE: Shut down @ 1010 (looking for "noise" problems in fission ch)
Went back up to power and added following run data to already collected data above.

New settings: start data @ 1100 hrs.

VDT #3 = +3.6 Selsyn #1 = 21.072

VDT #4 = +6.0 Selsyn #2 = 21.0069

Log N = .00055 ∞ Period

Servo on chan D @ 10/500 @ 59.0

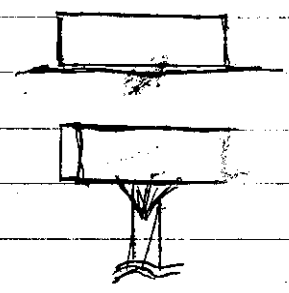
Servo signal @ 531 units stopped @ 1115

Restart taking data again @ 1145 thru 1320 hrs.
— The small fission counter during Rossi & experiment this run is located against the underside of the diaphragm and centered between the 2 - 3" stacks of U. The previous 7" dia. runs had the small counter located on the [redacted] side outer edge of bottom stack.

at end of run:

VDT #3 = +4.3
#4 = +6.9

Selsyn #1 = out
#2 = 21.0075

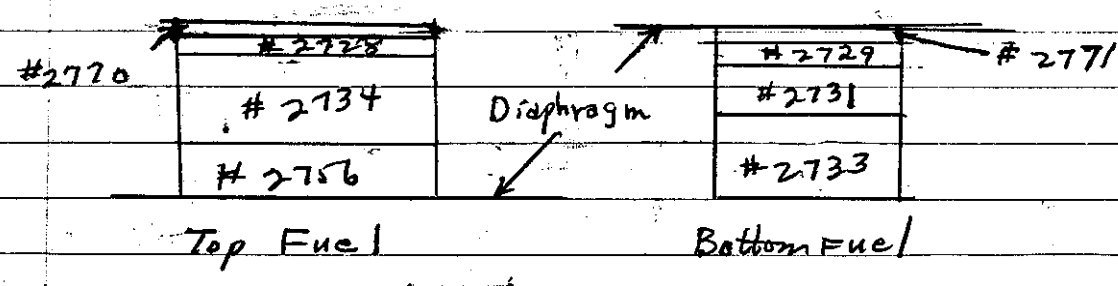


C.A-7" dia Cyl 40

Sheet Date 9 Time 1:45 ~~AM~~ PM

Purp Rossi α 3 1/8" on each half,

3 1/8" Fuel on each half
~ 5/8" Separation



UDT #3 = 20.8
#4 = off

Selsyn #1 = out
#2 = 20.747

Log N = .00056

Servo on @ 530 A = 59 10/500

Measured thickness TOP:

East Vernier: S 3.126 ; E 3.127 ; N 3.128 ; W 3.127
West Vernier: 3.127 3.123 3.125 3.127

avg 3.1263

4-15-63

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source Pu Be + γ

	F	A	B	C	D	E
Range	HV = 8	~~0~~	Opr	X	10/1000	1050V.
Source Dist.	OK	~~X~~	0	30"	3"	6"
% F.S. Trip			OK	100	80	100+

Channel

C.A. 7" dia. cyl. Expr. _____ Run 41

Shoot _____ Date _____ 19 __ Time _____ AM PM

Purpose Critical Separation of 2-3 1/8" thick - 7" dia cylinders.

See diagram Pg 193

41 a Measured Positive Period: #1 = 000.00 #2 = 99.940

VDT #3 = +7.4 SELSYN #1 = 20.83

VDT #4 = -9.8 SELSYN #2 = 20.741

Log N = + +86.9 +11.0¢

Chan A = out of service -

Chan D = 97/22 (100 sec) +67.4 +13.3¢

24.3

VDT #3+4 = 6.5 mil 12.15

$\frac{12.15}{6.5}$ = 1.87 ¢/mil

VT3+4

9.37

6.2

41 b Level ∞

VDT #3 = +1.0 Selsyn #1 = 20.82

VDT #4 = -16.4 Selsyn #2 = 20.7335

Measured thickness: E 3.128; N 3.125; W 3.125; S 3.125:

Avg = 3.1258

41 c Measure Negative Period:

VDT #3 = -5.0 Selsyn #1 = 20.818

VDT #4 = -22.8 Selsyn #2 = 20.727

VT3+4 = 6.2

$\frac{9.37}{6.2}$ = 1.69¢/mil

Log N = −		-187.5	-8.85¢
Chan A = out of service		-	
Chan D = 90/49 (100 sec)		-164.7	9.37¢ { -10.55¢
66/37 (100 sec)		-172.7	-9.88¢

Measured separation (down) = E 21.411; W 21.407; W 21.404; S 21.402;

SE = 21.410 · E 21.4055; N 21.406 Avg = 21.4065

42a Evaluation of support rings & diaphragm: Down → 00000 & #2 = 99.9377 !!!

Positive Period:

VDT #3 = -5.0 Selsyn #1 = 20.818

VDT #4 = -22.2 Selsyn #2 = 20.727

Log N = +		+141.7	+7.42¢
Chan A = out of service		-	
Chan D = 84/39 (100 sec)		+130.3	+7.99¢
80/32 (100 sec)		+109.1	+9.2¢

5.1 1.40 ¢/mil

5.5 | 7.71

7.71¢

+ 9.37

17.08¢

R+D

42b Level ∞

VDT #3 = -10.1 Selsyn #1 = 20.81

VDT #4 = off scale Selsyn #2 = 20.721

41b vs 42b VDT #3 = 11.1 mils

43a Evaluation of support stand:

Positive Period

VDT #3 = -10.1 Selsyn #1 = 20.811

VDT #4 = off scale Selsyn #2 = 20.7225

Log N = + +119.4 + 8.59 ¢

Chan A = out of service –

Chan B = 82/3 y (100 sec) +113.5 + 8.92 ¢

Avg = 8.76 ¢

43b Level ∞

VDT #3 = -11.1 Selsyn #1 = 20.805

VDT #4 = off scale Selsyn #2 = 20.7145

#1 = 6

#2 = 8

$7\overline{)8.70}$ = 1.22 ¢

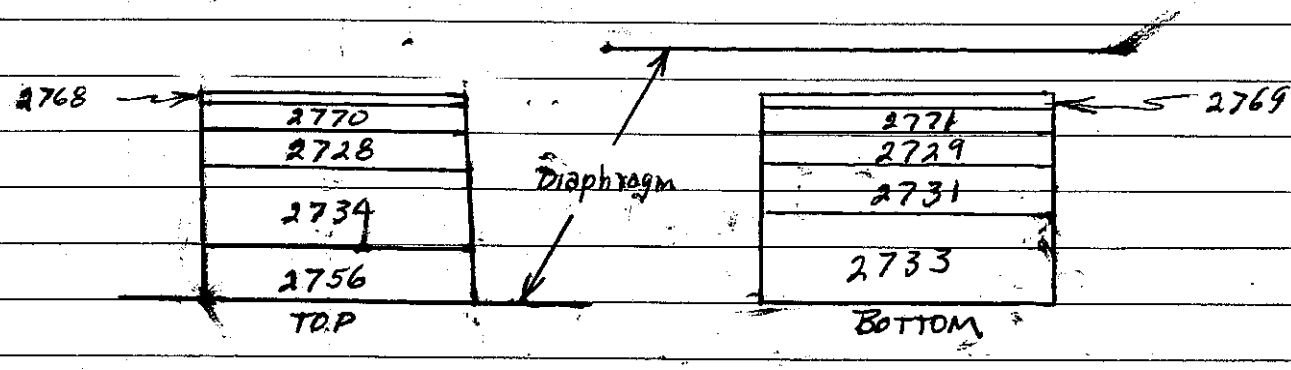
C.A. 7" dia. cyl. Expr. _____ Run 44

Sheet _____ Date Apr 15 19 63 Time 1[illegible] PM

Purpose ~~[illegible]~~ 2 - 3¼"

Rossi ~~[illegible]~~

∝ ~~[illegible]~~ 3¼" separation



~~[illegible]~~ ~~[illegible]~~ Level ∝

VDT # 3 = -8.9 Selsyn # 1 = 20.532

VDT # 4 = -14.8 Selsyn # 2 = 20.4265

Log N = .00055

Servo on channel D 10/500 @ 61

Servo signal @ 549

End run @ 1615 hrs.

Measured thickness TOP:

East Vernier: S 3.252; E 3.254; N 3.254; W 3.253

West Vernier: 3.250 3.251 3.251 3.254

Avg 3.2524

4-16-63

INSTRUMENT CHECK

Time 8:10 AM ~~PM~~ Source Pu Be + γ

		Channel A	B	C	D	E
Range	F		open	X	10/1000	1050
	HV = 8					
Source Dist.	OK	0	0	30"	3"	9"
% FSS. Trip			OK	100	80	100+

69

C.A. 7" dia. cyl. Expr. Run 45

Sheet Date Apr 16 1963 Time 9:00 AM

Purpose Critical Separation of 2-3¼" thick, 7" dia. cylinders of U.

diagram Pg 198

≈ ¾" Separation

45a Measure Positive Period

VDT #3 = -1.1 Selsyn #1 = 20.55

VDT #4 = -3.1 Selsyn #2 = 20.416

Log N =	+86.2	+11.0¢
Chan A = out of service		
Chan D = 75/45 (50 sec)	+98.0	+10.0¢
98/30 (100 sec)	+84.5	+11.2¢
7) 10.7 = 1.53¢/min		Avg 10.7¢

45b Level ∞ Period

VDT #3 = -8.1 Selsyn #1 = 20.533

VDT #4 = -10.1 Selsyn #2 = 20.408

chan D 82/46 (100) -172.4 (-9.894)

45c Measure Negative Period

VDT # 3 = -15.1 Selsyn # 1 = 20.535

VDT # 4 = -17.8 Selsyn # 2 = 20.399 Avg = 9.09¢

7) 9.09 = 1.30¢/mil

*down # 1 = 000.005 ; # 2 = 99.8975

Log (N) -189.5 = (8.72¢) chan D = 70/40 (100) -174.2 → (9.78¢)

also 90/55 (100) -203.2 → (7.98¢)

46 a Evaluation of diaphram and support rings

Positive Period

VDT # 3 = -8.1 Selsyn # 1 = 20.545

VDT # 4 = -10.2 Selsyn # 2 = 20.4055

Log N =	+53.4	+15.6¢
Chan A = out of service		
Chan D = 83/31 (50)	+50.8	+16.1¢
65/26 (50)	+54.6	+15.4¢
		15.7¢

*Measured separation at shutdown: E 21.274"; N 21.275; W 21.273; SW 21.272; S 21.271; SE 21.276 Avg → 21.2735"

Measured thickness of bottom: E 3.252"; N 3.252; W 3.250; S 3.251; SE 3.251 Avg → 3.2512"

10.7) 15.7 = 1.47¢

46 b Level ∞ Period

VDT # 3 = -18.8 Selsyn # 1 = 20.53

VDT # 4 = -21.8 Selsyn # 2 = 20.391

47 a Evaluation of support stand

Positive Period

VDT #3 = -18.8 Selsyn #1 = 20.525

VDT #4 = -21.8 Selsyn #2 = 20.391

Log N =	+121.6	+ 8.45¢
Chan A = out of service		
Chan D = 95/40 (100)	+115.6	+8.80¢
87/55 (50)	+109.2	+9.21¢
64/42 (50)	+118.6	+8.62¢

1.655¢/mil

5.3) 8.77

Avg = 8.77

47 b Level ∞ Period

VDT #3 = -24.1 Selsyn #1 = 20.52

VDT #4 = off scale (-) Selsyn #2 = 20.387

4-17-63

INSTRUMENT CHECK

Time 11:11 AM ~~PM~~ Source ~~Pe~~ Be + γ

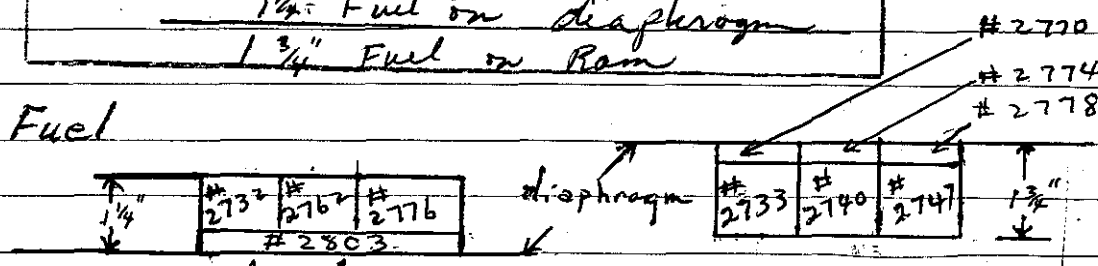
	Channel F	A	B	C	D	E
Range	HV=8	0	ap	X	10/1000	1050V
Source Dist.	OK	~~Σ~~	0	30"	3"	5"
% F.S. Trip	Ctr #2 - OK		OK	100	80	100+

C.A. 11" dia Expr. _____ Run 1

~~Sheet~~ Solid Cyl. 4-17-1963 Time _____ AM PM

Purpose To obtain critical assembly of 11" dia solid cylinder.
1¼" Fuel on diaphragm
1¾" Fuel on Ram

3" Fuel



Sub Critical
Ctr #2 (x256) 1 min
5 +92
4 +137

Run 2 Added ¼" Fuel to top #2771, #2775, #2779

38 +33 (x 64)
39 +46

VT#3 = 5.0 #1 = 23.005
#4 = 1.0 #2 = 22.885

Run #3 Added 1/8" Fuel To Top #2746; 2773; 2769

VDT #3 = 5.2 Selsyn #1 = 23.005

VDT #4 = 1.0 Selsyn #2 = 22.884

Log N = .00021

BF_3 Counter #2 (1 min) 39^{+170} (256)

PHS = 20 41^{+132} (256)

42^{+66} (256)

Run #4 Added 1/8" (9" dia. ONLY) To Top # 2768; 2763

Critical @ ≈ 22.70 and ≈ 100 mil separation

Run #5 Removed the (7-9) 1/8" ring i.e. #2763

TOTAL NOW = 3 3/8" + (1/8" @ 7" dia.)

Critical @ ≈ 22.72

Run #6

2746, 2773, 2768	1/8
2742, 2829, 2728	3/8
2743, 2736, 2729	3/8
2767, 2737, 2730	9/16
2803, ~~[illegible]~~	1/4
-diaphragm-	
2778, 2774, 2770	1/4
2747, 2740, 2733	1 1/2

Super Critical @ 22.76 ≈ 40 mil separation

Run #7 Remove from Run #6 configuration #2746

Super critical @ 22.775

Run #8 Remove # 2773 from top.
Super critical @ 22.781

Run #9 Consider conf. of Run #6.
Remove 9/16 disc # 2730
3/8 disc # 2728
1/8 disc # 2768
Now install in their place
1" disc # 2731

Positive Period:

VDT #3 = +5.2 Selsyn #1 = 23.005
#4 = +1.0 #2 = 22.883

Log N =	+ 194.3	+ 194.3	5.71 ¢
Chan D =	77/44 (150 sec)	+ 268	4.6 ¢
	95/53 (100 sec)	+ 172	6.3 ¢

Chan A = out of service

Run #10

2746	2773	2768	1/8"
2742	2829	x	3/8
x	x	2771	1/4
2743	2736	x	3/8
2767	2737	x	9/16
2803	- - -	- - -	1/4
x	x	2732	1"
2778	2774	2770	1/4"
2747	2740	2733	1 1/2"

diaphram

— cont next pg —

VDT #3 = +5.2	Selsyn #1 = 23.005	
#4 = +1	#2 = 22.884	
Log N = − 419.6	−419.6	3.4¢
Chan A = out of service	—	/
Chan D = 58/44 (100 sec)	361	4.05¢

Run # 11 Remove walkways etc. Put up small fission counter & servo shim in place. Fuel situated as in Run # 10.

Slightly sub-critical with servo control "in".

4-18-63

INSTRUMENT CHECK

Source Pu Be & γ

Time 8:25 AM ~~PM~~

	F	A	B	C	D	E
	HV=8	10/1000	off	X	10/1000	1050
Range	OK	10"	0	30"	3"	10"
Source Dist.		80	OK	100	80	100+
% F.S. Trip						

Ch #2

C.A. 11" diacyl. Expr. _____ Run 12

~~Size~~ SOLID CYL. Date Apr. 18 1963 Time 9:00 AM

Purpose: Criticality Mass determination of solid cylinder

Reference Run #10

Run 12 Replaced 2768 & 2771 with 2729
Slightly supercritical

Run 13 Reference Run #10
Replace 2732 with 2731 Therefore: Solid Cyl.

9-11 Ring	7-9 Ring	DISC 7" dia					
2746 ✓	2773 ✓	2768 ✓	1/8"				
2742 ✓	2829 ✓	X		3/8"			
X	X	2771 ✓	1/4"				3 3/8 +
2743 ✓	2736 ✓	X		3/8"	1 5/8	1 11/16"	
2767 ✓	2737 ✓	X	9/16"				
X	X	2731 ✓		1"			
2803	DISC		1/4"				
2778	2774	2770		1/4"			>10mil Diaphragm
2747	2740	2733	1 1/2"		1 3/4"		

cont next pg

Run #13 cont

C.A. 11" dia. Cyl. Expr. _____ Run 13
Sheet Solid Cyl. Date 18 Apr. 1963 Time 9^00 AM
Purpose Rossi α Measurement
Fuel as shown bottom pg
209

VOT #3 = +5.1 (MP)
#4 = 0.0

Selsyn #1 = 23.005
#2 = 22.878

Log N = .00055 ∞ Period
Servo on Chan D 10/500 @ 61.5
Servo signal @ 540 units

4-19-63

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source

	F	A	B	C	D	E
		Channel				
Range	HV=8	10/1000	ok	X	10/1000	1050V
Source Dist.	OK	10"	0	36	4"	10"
% F.S. Trip		95	OK	100	80	100+

Cts #2

G.A. 11" dia cyl. Expr. _____ Run 14a

Sheet Solid Cyl. Date Apr 19 1963 Time 8:30 AM ~~PM~~

Purpose Evaluation of detectors

GA as Bottom Pg 209

14a Evaluation of detectors Clean Critical

Measure negative period

VDT #3 = +5.3 (mp) Selsyn #1 = 23.005

#4 = -0.1 #2 = 22.887

LogN =	— 13.3 (27.7147)		288.8	-5.22#
Chan A =	80/48 (150)	57/35 (150)	295.3 & 307.4	-5.06# & -4.84#
Chan D =	77.5/53 (100)	92/57 (150)	263.2 & 313.2	-5.78# & -4.72#
Counter #1	— 300 sec			-4.98#

all avg → -5.10#

14b Evaluation of support stand
readings (up)
Positive Period

Log N = 1.2(21.7147)	+26.06 ~	+ 24.5¢
Chan A = $\frac{85}{35}$(25)	+28.18	+ 23.0¢
Chan D = $\frac{85}{40}$(25)	+28.90	+ 22.6¢
		all avg + 23.37¢

Run 14a + Run 14b = 28.47¢
Value of support stand

14c Add 10 mil diaphragm

VDT # 3 = +5.2 Selsyn # 1 = 22.005
#4 = −0.2 #2 = 22.885
Positive Period

counter # 1 = +177.2		+177.2	+ 6.17¢
Log N = 7.975(21.7147)		+173.2	+ 6.29¢
Chan A = $\frac{76}{46}$(100)	$\frac{80}{35}$(150)	+199.2 & +181.0	+ 5.6¢ & +6.05¢
Chan D = $\frac{66}{32}$(100)	$\frac{71}{39}$(100)	+143.9 & +167.0	+7.35¢ & +6.5¢
			all avg +6.33¢

Run 14b − 14c = −17.02
value of diaphragm ($10 extra mil sep)

14 d Removed extra support stand and diaphragm.
Put up support rings

Measure Negative Period
Positions up. bottom

counter #1 = $\frac{600}{\ln 5}$	- 373	- 3.82¢
Log N = 21.7147 (17.3)	- 375.6	- 3.85¢
Chan A = 82/49 (200) & 70/37 (250)	- 388.3 & 409.9	-3.7¢ & - 3.5¢
Chan D = 90/48 (200) & 84/61.5 (150)	- 318.2 & 419.4	-4.65¢ & -3.4¢
		- 3.95

5¢
-¢

C.A. 11" dia cyl. Expr. _____ Run 15

Sheet _____ Date Apr 19 1963 Time 11:30 AM

Purpose Critical separation of 2-1¾" 11" dia cylinders

11-9 RING	9-7 RING	7 DISC	
2748	2741	2734	1½"
2803	DISC		¼" → 10 MIL DIAPHRAGM
2778	2774	2770	¼"
2747	2740	2733	1½"

VDT #3 11.5 Selsyn 1 22.678

#4 −4.8 2 22.5535

15a POSITIVE:

Log N = 7.3 (21.7147)

Ch A = 68/20 (150) & 69/37 (100)

Ch D = 60/21 (100) & 61/30 (100) & 80/46 (100)

Counter #1 = +143 sec

6.78¢ +158.5

~~17.2¢~~ ~~46.5~~ ② 6.7¢ & 160.4

~~10.2¢~~ ~~+95.2~~ 7.35¢ & +144.3 6.08¢ & +180.5

7.39¢ +143

15b Level ∞ Period Clean

VDT #3 = +7.0 Selsyn #1 = 22.665

#4 = −9.1 Selsyn #2 = 22.548

15c Measure Negative Period

VTT #3 = +1.9 Selsyn #1 22.655

#4 = -14.5 #2 22.543

Log N 7(21.7147)	-152	-11.8#
Counter #1 -143.3	-143.3	-12.95#
Chan A: 70/28 (150)	-164.7	-10.55#
Chan D: 77/25 (150)	-148.2	-12.35#

Selsyn Reading with Table down

#1 0000 #2 99.900

$$\Delta\rho/\Delta x = \frac{\left[(6.78+11.8) + (6.7+10.55)_A + (6.08+12.35)_D + (7.39+12.95)\right]/4}{(9.6+9.7)/2 \qquad \frac{74.2}{19.3}/2}$$

$\Delta\rho/\Delta x$ = 1.94 #/mil

Measured separation: NE 22.787; S 22.784; N 22.7885; W 22.784; SE 22.782; N 22.789; S 22.779; S 22.781

AVG → 22.7843

11-9 Ring bottom thickness N 1.751; E 1.753; S 1.751; W 1.751

AVG → 1.7515

Δx = Separation at critical

22.7843
22.6430
~~.2313~~
.1413

16 a Added support rings and diaphragm for evaluation

Measure Positive Period

VDT # 3 = +7.0 Selsyn # 1 = 22.667

VDT # 4 = -9.0 Selsyn # 2 = 22.547

Counter # 1 =	+71.7	+71.7	+12.6 ¢
Log N =	76 μa	+76.0	+12.2 ¢
Chan A =	$\frac{85}{44}$ (50 μa)	+76.1	+12.2 ¢
Chan D =	$\left(\frac{80}{22}\right)\left(\frac{99}{23}\right)(50)$	+17.2 ¢ 11.2	(?)

Support + Diaphragm $\rho = \frac{12.2+12.2+12.6}{3} = 12.33$ ¢

16 b Level

VDT # 3 -0.2 Selsyn 1 22.655

4 -16.2 2 22.5385

17 a Added Lower Support stand to top

Measure Positive Period

VDT # 3 -0.2 Selsyn #1 - 22.665

4 -16.2 #2 - 22.540

Positive Period

Log N =	+21.7	+21.7	+27.5 ¢
Chan D =	$\frac{46}{10}(25)$ (?)	+16.4	+30.4 ¢
Chan A =	$\frac{59}{20}(25)$ (?)	+23.1	+26.5 ¢

17b Level

VDT #3 = -13.0 Selsyn #1 = 22.655

#4 = off scale #2 = 22.526

3A 11" dia cyl. Expr. _____ Run 18

Sheet 2-1 3/4 Date Apr 19 1963 Time 2 15 PM

Purpose Rossi α Measurement

Fuel as shown top pg 215

Separ = 0.1413"

VDT #3 Selsyn #1

#4 #2

Log N =

Servo on channel D

Servo signal @ units

Scram @ 2:45 PM caused by trip of low level of "F"

Screws caused the inner ring and disc to compress the shims holding these pieces ~~tog~~ up. Reassembled system and noticed a loss in reactivity. Critical point is now

VDT #3 +4 22.66 Selsyn 1

#4 -12 22.541 Selsyn 2

Fuel on bottom half readjusted

4-22-63

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source Pu Be γ

		Channel A	B	C	D	E
Tables ok	F					
Light ok	ok	10/1000	opr	X	10/1000	1050
Range						
Source Dist.		12"		30"	3"	10"
% F.S. Trip		80		100	60	100

C.A. 11" dia. cyl. Expr. _____ Run 19

Sheet _____ Date Apr 22 1963 Time 8:50 AM ~~PM~~

Purpose Rossi α 1 3/4 on each half

See Pg 215 for fuel arrangment

VDT #3 = +0.2 Selsyn #1 = 22.665

#4 = −16.0 #2 = 22.538

Servo on Chan D 10/500 @ ≈76

Servo signal @ 650 units

Log N = .00062

C.A. 11" dia. cyl Expr. _____ Run 20

Sheet 2 - 1 7/8" Date Apr 22 1963 Time 3:00 ~~AM~~ PM

Purpose Criticality check

11-9 Ring	9-7 Ring	7" Disc		
2746	2773	2769	1/8	
2748	2741	2734		1 1/2
2803	Disc		1/4	
2744	2763	2768	1/8	
2778	2774	2770		1/4
2747	2740	2733	1 1/2	

10 MIL Diaphragm

20a Critical @ 22.093 on Selsyn #2
Readjusted flang ≈ 60 mil.

20b Measure Positive Period

VDT #3 = -6.0 Selsyn #1 = 22.23

#4 = +8.5 (?) #2 = 22.097

Counter #1	= 56.8 sec	+ 56.8	+ 14.95¢
Log N	= 56.75	+ 56.75	+ 14.95¢
Chan A	= 58/26 (50)	+ 62.3	+ 14.0¢
Chan D	= 62/27 (50)	+ 60.3	+ 14.3¢

$$\Delta\rho/\Delta x = \frac{(14.95 + 11.4) + (14.95 + 10.0) + (14.0 + 8.72) + (14.3 + 11.4)}{15 \times 4}$$

* $\Delta\rho/\Delta x = 1.66$ ¢/mil

20c Level Period

VDT #3 = −1.40 Selsyn #1 = 20.215

#4 = +4.5 Selsyn #2 = 22.088

20d Measure Negative Period

VDT #3	−21	Selsyn #1	22.205
#4	−2.8 ?	Selsyn #2	22.077

Counter #1 = $\frac{6 \times 60}{\ln 10}$	−156.3	−11.4¢
Log N = 170.4	−170.4	−10.0¢
Chan A = $\frac{72}{25}(200)$	−189	−8.72¢
Chan D = $\frac{65}{18}(200)$	−156	−11.4¢

$\frac{20d + 20b}{15 \text{ MIL}} = 1.66¢$

Down Selsyns #1 = 0000 #2 99.8945

Measure separation: SE 22.646; E 22.647; N 22.653; NW 22.6475; SW 22.639 & 22.640; W 22.645

Avg → 22.6454

.088

.5574

+.010

.567

* Separation at Critical

22.6454

− 22.1935

.4519

[redacted] UDT #3 moved up. Evaluation of Rings + Diaphragm.

21 a Measured Positive Period

VDT #3 = +6.2 Selsyn #1 = 22.22
#4 = +4.5 OK #2 = 22.088

Chamber #1 = 34.79	+34.79	+20.6¢
Log N = 37.5	+37.5	+19.9¢
Chan. A = 63/32.5(25) ¢ 85/16(75)	+37.9 ¢ +44.9	+19.9¢ ¢ +17.6¢ 18.8
Chan D = 70/40(25) ¢ 75/15(50)	+44.7 ¢ +31.2	+17.6¢ ¢ +22.1¢ 19.8

$$\rho = \frac{20.6 + 19.9 + 18.8 + 19.8}{4} = 19.8$$

* mils = 11.3 = $\frac{6.2 + 5.1 + 4.5 + 6.8}{2}$

21 b Level ∞ Period

VDT #3 = −5.1 Selsyn #1 = 22.200
#4 = −6.8 #2 = 22.072

22 a Evaluation of support stand.

POSITIVE PERIOD:

VDT #3 = −5.0 Selsyn #1 = 22.210
#4 = −6.8 #2 = 22.072

Counter #1 = 23.8	+23.8	+25.5¢
Log N = 24.6	+24.6	+25.3¢
Chan A = 60/25.5(25)	+29.2	+22.6¢
Chan D = 6/21(25)	+22.8	+26.9¢

* $\rho = 25.1$ mills = $\frac{(17.6 - 5) + (19.4 - 6.8)}{2} = 12.6$

Diaphragm.

22b Level ∞ Period

VDT #3 = -17.6 Selsyn #1 = 22.190

#4 = -19.4 #2 = 22.059

+ 18.8

.1 + 19.8

20

72

.6

4-23-63

INSTRUMENT CHECK Pu Be

Time 8:30 AM ~~PM~~ Source γ

Tables OK

	F	Channel A	B	C	D	E
Range	OK	10/1000	or	X	10/1000	1050
Source Dist.	Light	12"	OK	30"	3"	8"
% F.S. Trip	O/C	70		100	60	100

C.A. 11" dia. cyl. Expr. _____ Run 23

Sheet _____ Date Apr 23 19 63 Time 9:00 AM ~~PM~~

Purpose Rossi α 1 7/8" on each half
See Eq 222 for fuel
arrangment.

VDT #3 = +3.5 Selsyn #1 = 22.22
#4 = +1.5 #2 = 22.070

Servo on chan D 10/500 @ 74
Servo signal @ 632 units
Log N = .00056

C.A. 11" dia. cyl. Expr. _____ Run 24

Sheet _____ Date Apr 23 19 63 Time 1:00 ~~AM~~ PM

Purpose Rossi of 2" on each half
See drawing below for
fuel arrangement.

11-9 Ring	9-7 Ring	7" Disc	
2779	2775	2774	1/4
2748	2741	2734	1 1/2
2803	D-15		1/4 — 10 mil diaphragm
2744	2763	2768	1/8
2742	2829	2728	3/8
2747	2740	2733	1 1/2

- No Power @ +15 VDT #3
- Adjust flange

VDT #3 = +6.5
#4 = +2.6

Delayn #1 = 21.76
#2 = 21.607

Servo on Chan D 10/500 @ 72
Servo signal @ 610 units
Log N = .00065

4-24-63

INSTRUMENT CHECK P.B.

Time ____ AM/PM Source γ

Tables OK	* F	Channel A	B	C	D	E
Range	OK	10/1000	opr	X	10/1000	1050
Source Dist.	Light	15"	OK	30"	2"	8"
% F.S. Trip		70		100	80	100

* scram table

Down Selsyns #1: 00.005 #2: 99.872

SEPARATION: E 22.522; NE 22.528; N 22.535; NW 22.532; W 22.527
S 22.518; SE 22.524; E 22.521 AVG 22.526

11-9 RING ONLY BOTTOM: S 2.005; E 2.004; NE 2.002; W 2.004;
SW 2.003; S 2.004 AVG 2.0037

CA 11" dia. cyl. Expr. ____ Run 25

Sheet 2 - 2" Date Apr 24 1963 Time 915 AM/PM

Purpose Criticality measurement of 11" dia. cyl. of 2 - 2" halfs.

25a Level ∞ Period

VDT #3: [redacted] +18.1 — Selsyn #1 = [redacted] 21.76

#4: [redacted] + 7.1 ? — #2 = [redacted] 21.611

25b Measure Negative Period

VDT #3 = + 11.9 — Selsyn #1 = 21.755

#4 = + 5.1 ? — #2 = 21.6045

Counter #1 =	$\frac{742 \times 60}{6N\ 10}$	206	− 7.8°
Log N =		204	− 7.9°
Chan A =	$\frac{85}{40}(150)$ & $\frac{76}{42}(150)$	198.4 & 253	− 8.2° & 6.1°
Chan D =	$\frac{75}{34}(150)$	189.1 ac	− 8.74°

SEPARATION AT CRITICAL

= 22.526 − (21.611 + ~~.1228~~ .128)

* = 0.787 + 10 mils = 0.797

$\Delta\rho/\Delta x = \frac{[7.8 + 7.9 + 8.2 + 8.74]/4}{6.2} = \frac{8.05}{6.2}$ 1.3

26 a Range and diaphram evaluation

Measured + period

VDT #3 – 18.1 Selsyn #1 21.765

#4 – 7.5 (?) #2 21.610

Counter #1	52.1 sec	52.1	+ 15.8¢	
Log N	50 sec	50.0	+ 16.3¢	
Ch A	99/42 (50) 80/33 (50)	58.3¢ 56.6	+ 14.7¢ ¢ +15.0¢	14.85
Ch. D	98/62 (25) 62/35 (25)	54.6¢ 43.8	+ 15.4¢ ¢ 17.7¢	16.55

Av = 15.87

26 b Level

VDT #3 = +6.1 Selsyn #1 = 21.75

#4 = +3.0 (?) #2 = 21.596

27 a Lower Support Stand Evaluation

Measured positive period

VDT #3 +6.1 Selsyn 1 21.75

#4 2 21.596

Counter #1	30.4 sec	30.4	+ 22.4¢	
Log N	33.3 sec	33.3	+ 21.5¢	
27b Chan A	70/20 (50)	39.9	+ 18.9¢	19.8
	60/29 (25)	34.4	+ 20.7¢	
Chan D	95/35 (25)	25.1	+ 25.0¢ (3.96)	20
	-79/45 (25)	56.7	+ 15.0¢	

20.92

276 Level

VOT #3 = −9.1
#4 = −12.0

Delayn #1 = 21.738
#2 = 21.578

85
55

C.A. 11" dia. cyl. Expr. _____ Run 28

Sheet _____ Date Apr 24 19 63 Time 11:20 AM

Purpose Rossi α 2 1/8" on each half.

See below for fuel arrangement.

11-9 Ring	9-7 Ring	7" Disc		
2743	2736	2729	3/8	
2748	2741	2734		1 1/2
2803			1/4	

10 MIL Diaphragm

2778	2774	2770		1/4
2742	2829	2728	3/8	
2747	2740	2733		1 1/2

VDT #3 = -3.1 Delayn #1 = 21.252

#4 = -6.1 #2 = 21.1025

Log N = .00060

Servo on chan D 10/500 @ 70

Servo signal 601 units

Measured 11-9 BOTTOM Ring: W 3.126; N 3.126; E 3.126; S 3.126; SW 3.126; SE 3.126; NE 3.127; NW 3.127

Avg 2.12625

C.A. 11" dia cyl. Expr. _____ Run 29

Sheet _____ Date Apr 25 1963 Time 8^30 AM ~~PM~~

Purpose Critical separation of 2-2 1/8" on ~~#~~ each half.
Fuel as shown top Pg 232

-25-63

INSTRUMENT CHECK

Time 8^10 AM ~~PM~~ Source PuBe γ

	F	A *	B	C	D	E
Range	OK	10/1000	OPR	X	10/1000	1050
Source Dist.	Light	18"	OK	30"	1"	10"
% F.S. Trip		70	-	100	75	100

* Scram table

Down Tables # 1 = 00.005 #2 = 998555

Measured separation: E 22.393; N 22.397; NW 22.400; W 22.398
SW 22.390; S 22.384; SE 22.389

Avg 22.393

126;

29a Measure Positive Period — Servo shim in

VDT #3 = +4.7 — Selsyn #1 = 21.27

VDT #4 = +1.5 — Selsyn #2 = 21.0965

Counter #1 =	54.9	+54.9	+15.3#
Log N =	52.8	+52.8	+15.7#
Chan A =	50/21 (50) & 61/25 (50)	+57.7# +56.1	+14.8# & 15.1# = +14.95#
Chan D =	40/25 (25)	+53.2 ~~& +67.4~~	+15.6#

29b Level ∞ period — ~~Chan~~ — Servo shim in

VDT #3 = -6.5 — Selsyn #1 = 21.255

#4 = -9.8 — #2 = 21.085

$$\Delta e/r_4 = \frac{[(15.3+7.7)+(15.7+7.56)+(14.95+7.13)+(15.6+5.15)]/4}{[(4.7+11.8)+(1.5+15.1)]/2} = 1.346$$

29c Negative Period — Servo shim in

VDT #3 = -11.8 — Selsyn #1 = 21.245

#4 = -15.1 — #2 = 21.0785

Counter #1 = 208.5	-208.5	-7.7#
Log N = 9.8(21.7147)	-212.8	-7.56#
Chan A = 46.5/31 (100) & 47.5/29 (100)	-246.6# -202.8	-6.27# & -7.99# = -7.13#
Chan D = 56/41 (100) & 55/38 (100)	-321.5# -271.7	-4.6# & -5.7# = -5.15#

30a Pull shim out and redo.
Measure Positive period.

VDT #3 = +7.8 Selsyn #1 = 21.27
#4 = +3.8 #2 = 21.096

Counter #1 =	~~[illegible]~~ 75.0	+ 75.0	+12.3¢
Log N =	76	+ 76.0	+12.2¢
Chan A =	$\frac{82}{47}(50) + \frac{99}{54}(50)$	+ 89.8 & 82.6	+10.6¢ & 11.4¢ = +11.0¢
Chan D =	$\frac{68}{34}(50) + \frac{69}{36}(50)$	+ 72.1 & 77.0	+12.6¢ & 12.0 = +12.3¢

+14.95¢

Av = 11.95¢

30 b Level ~ Clean

VDT #3 = −0.2 Selsyn #1 = 21.26
#4 = −3.6 #2 = 21.089

$$\Delta\rho/\Delta x = \frac{(12.3+7.26)+(12.2+6.72)+(10.5+6.73)+(12.3+6.05)}{(7.8+7.1)+(3.8+10.5)} \times \frac{1}{2} = 1.27\ ¢/mil$$

30 c Measure Negative Period

VDT #3 = −7.1 Selsyn #1 = 21.245
#4 = −10.5 #2 = 21.080

Counter #1 = $\frac{8.42 \times 60}{\ln 10}$	−219.0	−7.26¢
Log N = 10.7(21.7147)	−232.3	−6.72¢
Chan A = $\frac{83}{43.5}(150)$ & $\frac{77}{50}(100)$	−231.8 & −231.6	−6.73¢ & 6.73¢ = −6.73¢
Chan D = $\frac{92}{49}(150)$ & $\frac{85}{49}(150)$	−237.9 & 272.2	−6.54 & −5.56 = −6.05¢

Av = 6.69¢

* Separation at Critical

$x = 22.393 - 21.089 - (1 - .8555) + 10$ mills

$= 1.17''$

.13¢
.15¢

31a Evaluation of rings & diaphragms
Measure Positive Period

VDT #3 = -0.2 Selsyn #1 = 21.26
#4 = -3.9 #2 = 21.086

chamber #1 = 43.3 { +43.3 { +17.8¢
Log N = 43.4 { +43.4 { +17.8¢
channel A = 47/20(50) & 68/24(50) & ~~75/25(50)~~ 67.5/39(25) ⇄
channel D = 60/13.5(50) & 74/26(50) { +33.5 & 47.8 { +21.2¢ & 16.7¢ = +18.95
⇐ Chan A → → { +61.7 & 48.0 & 45.6 }
→ +14.2¢ & 16.8¢ & 17.4¢ = +16.13

31b Level ∞
VDT #3 = -13.5 Selsyn #1 = 21.25
#4 = -17.2 #2 = 21.0715

32a Evaluation of support stand:
VDT #3 = 13.5 Selsyn #1 = 21.25
#4 = 17.2 #2 = 21.072

Positive Period

chamber #1 = NONE
? Log N = 21.7 { +21.7 { +27.2¢
Chan A = 55/20(25) { +24.7 { +25.3¢
Chan D = 80/30(4/11 x 50) { +18.5 } +28.3¢
85/30(5/11 x 50) { +21.8 }

STAND TOUCHING top

32b Level 20

VDT #3 = off scale Selsyn #1 = 21.22

#4 = off scale #2 = 21.052

21089
21052
37

+18.95

5

C.A. 11" dia. cyl. Expr. _____ Run 33

Sheet _____ Date Apr 25 19 63 Time 10^50 AM

Purpose Rossi α 2¼" on each half

See fuel arrangement below.

11-9 RINGS	9-7 RINGS	7" DISCS		
2746	2773	2769	1/8	
2743	2736	2729		3/8
2748	2741	2734	1½	
2803	DISC			1/4

10 MIL Diaphragm

2744	2763	2768	1/8	
2778	2774	2770		1/4
2742	2829	2728	3/8	
2747	2740	2733		1½

VDT #3 = off scale Selsyn #1 = 20.70 20.70

#4 = -23.0, -24.0 #2 = 20.531 20.527

Log N = .00060

Servo on chan D 10/500 @ 72

Servo signal @ 630 units

4-26-63

Moved VDT #3 + 4 up 3 ~~Turns~~ DIV. 40 mils

4-26-63

INSTRUMENT CHECK PuBe

Time ____ AM ~~PM~~ Source γ

Tables ok Channel *

		A	B	C	D	E
Range	F	10/1000	opr	X	10/1000	1550
Source Dist.	OK Light	12"	Ok	30	1"	10"
% F.S. Trip		70		100	70	100

* scram table

C.A. 11" dia. cyl. Expr. ____ Run 34

Sheet ____ Date Apr 26 1963 Time 8:30 AM

Purpose Critical separation of 2-2¼" halfs 11" dia cyl.

Measured separation: E 22.270; NE 22.269; NW 22.265; SW 22.257; S 22.258; SE 22.260 AVG 22.263

Outer Ring Bottom thickness: S 2.253; W&N&E&SE&NW = 2.254 Avg 2.2538

34a Measure Positive Period

VDT #3 = +19.0 VDT #4 = +10 SICK? Selsyn #1 = 22.721 #2 = 22.547

Counter #1:	55.6 sec & 81 sec	+81	+11.6¢	
Log N =	86.9	+86.9	+10.9¢	
Chan A:	61/36 (50)	+95.2	+10.3¢	> 10.25
	75/43 (50)	+90.1	+10.2¢	
Chan D =	42/21 (50)	+72.1	+12.6¢	> 13.3
	94/42 (50)	+61.9	+14.0¢	

34b Level clean ∞ Period

VDT#1 = +2.7 VDT#2 = +6.2? Selsyn#1 = 20.71 #2 = 20.531

34c Measure Negative Period

VDT#1 = −5.5 VDT#2 = −1.2? Selsyn#1 = 20.71 #2 = 20.523

counter#1 =	187.1	−187.1	−8.9¢
Log N =	184.6	−184.6	−9.0¢
chan A =	72/31 (150)	−177.9	−9.5¢
	73/36 (150)	−212.2	−7.55¢ 8.5
chan D =	98/41 (150)	−172.2	−9.9¢
	~~88/58~~ (100)	−239.2	−6.5¢ 8.2
			10.4

Down Selsyn #1 0000

#2 99.840

Critical Separation

22.263 − (20.531 + 0.16) + 10 mils

$x = 1.582$

$$\Delta\rho/\Delta x = \frac{[(11.6 + 8.9) + (10.9 + 9.0) + (10.25 + 8.5) + (13.3 + 8.2)]}{[24.5 + 20]\ 2}$$

20.5 19.9 18.75 21.5

$\Delta\rho/\Delta x = 0.831$ ¢/mil

35a Evaluate rings & diaphragm

VDT #3 = +2.7 VDT #4 = +7.1 ? Selsyn #1 = 20.715 #2 = 20.5285

Measure Positive Period

Counter #1 = 51.5	+ 51.5	+16.0 ¢
Log N = 51.6	+ 51.6	+16.0 ¢
Chan A = 49/20 (50)	+ 55.8	+ 15.1 ¢
Chan D = 87/26 (50)	+ 41.4	+18.5 ¢ > 17.7
93/32.5 (50)	+46.8	+16.9 ¢

Pav = 16.2

35b Level ∞ period

VDT #3 = -11.0 #4 = -6.8 ? Selsyn #1 = 20.695 #2 = 20.5145

36a remove rings and diaphragm
Now evaluate support stand only.

Measure Positive Period:

VDT #3 = 2.7 #4 = 7.5 Selsyn #1 = 20.715 #2 = 20.5285

counter #1 = 39.3	+39.3	+19.2 ¢
Log N = 37.6	+37.6	+19.6 ¢
Chan A = 45/16 (50)	+48.3	+16.6 ¢ > 17.4
98/30 (50)	+42.2	+18.2 ¢
Chan D = 98/36 (50)	+50.0	+16.3 ¢ 18.8
75/35 (25)	+32.9	+21.4 ¢

36b Level ∞ Period

VDT #3 = -13.8 #4 = -9.5 ? Selsyn #1 = 20.695 #2 = 20.511

C.A. 11" dia. cyl. Expr. _____ Run 37

Sheet 2 - 2 3/8" Date Apr 26 1963 Time 10^45 AM

Purpose Rossi ∝ of 2-2 3/8" halfs 11" dia. cylinders! See fuel arrangement below.

11-9 RINGS	9-7 RINGS	7" DISCS		
2779	2775	2771	1/4	
2743	2736	2729		3/8
2748	2741	2734	1 1/2	
2803	O-S-C			1/4 — 10 MIL Diaphragm
2746	2773	2769	1/8	
2744	2763	2768		1/8
2778	2774	2770	1/4	
2742	2829	2728		3/8
2747	2740	2733	1 1/2	

∝

VDT #3 = +12.0 +11.5 #4 = +2.5 ? +2.6 Selsyn #1 = 20.118 20.11 #2 = 19.9245 19.9205

Log N = .00060

Servo on channel D 10/500 @ ≈ 72 (Signal @ 610 units)

4-29-63

INSTRUMENT CHECK

Time 8 to AM ~~PM~~ Source Pu Be

Tables OK

		Channel A	B	C	D	E
Range	F	10/1000	upr	X	10/1000	1050
Source Dist.	OK Light	12"		3'	4"	10"
% F.S. Trip	OK	70		100	60	100

C.A. 11" dia cyl. Expr. _____ Run 38

Sheet _____ Date Apr 29 19 63 Time 845 AM ~~PM~~

Purpose Critical separation of 2-2 3/8" 11" dia cylinders

See fuel arrangement Pg 243

Selsyn Readings before run

#1 00.01 #2 99.843

SEPARATION: SE 22.145; E 22.131; N 22.139; NW 22.138; W 22.125; S 22.120; ESE 22.131; N 22.136 Avg → 22.1331

THICKNESS BOTT. CUT RING ONLY: S 2.383; ALSO E, N, W, SE, NW Avg → 2.3830

* CRITICAL SEPARATION

22.133 − 19.9325 − (1 − .843) + 10 mills

0.157

20.535

38a Measure Positive period

VDT # 3 = 22.5 #4 = 6.5 ? Selsyn #1 = 20.125 #2 = 19.941

Counter #1 = 182.4	+182.4	+ 6.0 ¢
Log N = 8.3(21714)	+180.2	+ 6.09 ¢
Chan "A" = 71/35 (150)	+213.4	+ 5.27 ¢
72/32 (150)	+185.0	+ 5.92 ¢ > 5.69
Chan "D" = 88/31 (150)	+143.7	+ 7.35 ¢ 145 73
65/29 (150)	+185.9	+ 5.9 ¢ 6.63 73 3

38b Level ∞ Period clear

VDT # 3 = +15.4 #4 = 4.2 ? Selsyn #1 = 20.11 #2 = 19.9325

13

14

38c Measure Negative Period:

VDT # 3 = +2.4 #4 = -5.0 ? Selsyn #1 = 20.10 #2 = 19.9185

counter #1 = $\frac{6.35 \times 60}{\ln 10}$	165.5	-10.5 ¢
Log N = 7.6(21,714)	165.0	-10.5 ¢
chan "A" = 87.2/21 (250)	175.7	- 9.7 ¢ > 9.5
66/38 (100)	180.5	- 9.31 ¢
chan "D" = 80/22 (250)	193.5	- 8.5 ¢ > 8.31
59.5/37 (100)	200.0	- 8.12 ¢

$$* \ \Delta\rho/\Delta x = \frac{(6.0 + 10.5) + (6.09 + 10.5) + (5.69 + 9.5) + (6.63 + 8.31)}{20.1 \times 4}$$

$$= .786 \ \text{¢/mil}$$

39a Evaluate ringp & diaphragm

Measure Positive period

VDT #3 = +15.5 #4 = +4.5 (?) Selsyn #1 = 20.115 #2 = 19.930

Chamber #1 = 48.9	+48.9	+16.6#
Log N = 2.12 (+1.7147)	+47.8	+16.7#
Chan #"A" = 80/47 (25) 87/34 (50)	+47.1	+16.94#
	+53.2	+15.6# } 16.25#
Chan "D" = 67/19 (50)	+42.3	+18.2# } 17.4#
85/30 (50)	+48.1	+16.6

39b Level ∞ Period

VDT #3 = -3.7 #4 = -11.0 (?) Selsyn #1 = 20.09 #2 = 19.910

40a Evaluate support stand (after removing ringp and diaphragm)

Measure Positive Period

VDT #3 = +15.5 #4 = (5) Selsyn #1 = 20.12 #2 = 19.930

Counter #1 = +37.1	+37.1	+19.8#
Log N = +42.6	+42.6	+18.0#
Chan A = + 89/25 (50)	+39.4	+19.0# } 19.15#
65/34 (25)	+38.6	+19.3#
Chan D = + 79/28 (25)	~~+24.1~~	—
70/34 (25)	+34.6	+20.7#

40b Level ∞ Period

VDT #3 = -7.0 #4 = (?) Selsyn #1 = 20.09 #2 = 19.904

	¢	mils
AL Support Value	19.41	22.4
Diaphragm & Ring	16.74	19.1

C.A. 11" dia. cyl. Expr. _____ Run 41

Sheet 2 - 2½" Date Apr. 29 1963 Time 11^45 AM ~~PM~~

Purpose Rossi α of 2 - 2½", 11" dia cylinders. See fuel arrangement below.

2746	2773	2769	1/8	
2779	2775	2771		1/4
2743	2736	2729	3/8	
2748	2741	2734		1½
2803	[illegible]	[illegible]	1/4	

10 MIL Diaphragm

2745	2738	2731		1
2747	2740	2733	1½	

∞ Log N = .0006

VDT # 3 = -12.4 #4 = -3.7 Selsyn #1 = 19.43 #2 = 19.244

end → -11.9 -3.1 19.428 19.241

Servo on Chan "D" @ 10/500 ≈ 82 Signal @ 720

Chan A @ 100/200 @ ≈ 49.5

-30-63

INSTRUMENT CHECK

Time ____ AM ~~PM~~ Source Pu Be + γ

		Channel A	B	C	D	E
	X					
	F					
Range	OK	10/1000	opr	X	10/100	1050
Source Dist.	Light	60"		30"	44"	8"
% F.S. Trip	OK	90		100	60	100

~~SA~~ 11" dia. cyl. Expr. ____ Run 42

~~Sheet~~ 2-2 1/2 Date Apr 30 1963 Time 8:30 AM ~~PM~~

Purpose Criticality measurement of 2-2 1/2" - 11" dia. cylinders

Selsyn Readings #1 00.01 #2 99.8195
Before Run

SEPARATION: SE 22.009; E 22.018; N 22.026; NW 22.018; W 22.009; S 22.002; SE 22.007; E 22.012; NE 22.019 Avg → 22.0133

THICKNESS BOTTOM OUTER RING: E 2.501; N 2.500; W 2.500; S 2.501; SE 2.500; NW 2.500 Avg → 2.5003

250

42a Measure Positive Period 4

VDT #3 = +14.5 #4 = +9.3 Selsyn #1 = 19.455 #2 = 19.2575

Counter #1 = $\frac{3.8 \times 60}{\ln 10}$	+99.0	+10¢
Log N = 4.3(21.7147)	+93.4	+10.4¢
Chan "A" = $\frac{97}{32}(100)$	+90.2	+10.6¢ } 10.35¢
$\frac{93}{33}(100)$	+96.4	+10.1¢
Chan "D" = $\frac{21}{26.5}(100)$	+101.4	+9.8¢ } 10.05¢
$\frac{82}{28.5}(100)$	+94.5	+10.3¢
Counter #3 = $\frac{3.7 \times 60}{\ln 10}$	+96.4	+10.1¢

42b Level

VDT #3 = -2.7 #4 = +3.9 Selsyn #1 = 19.44 #2 = 19.239

21.45
24.5

42c Measure negative Period 4

VDT #3 = -12.9 / 13.1 = 13.0 #4 = -3.8 Selsyn #1 = 19.428 #2 = 19.2275

counter #1 = $\frac{8.7 \times 60}{\ln 10}$	-226.7	-6.95¢
counter #3 = $\frac{8.8 \times 60}{\ln 10}$	-229.3	-6.85¢
Log N = 10.5(21.7147)	-228.0	-6.9¢
Chan "A" = $\frac{45.5}{23}(150)$	-219.6	-7.23¢ } 6.61¢
$\frac{90}{34}(250)$	-256.5	-5.98¢
Chan "D" = $\frac{77.5}{33.5}(200)$	-238.9	-6.5¢ } 7.35¢
$\frac{65}{30.5}(150)$	-198.4	-8.2¢

Critical separation = 22.0133 − 19.239 − .1805 + 10 mils

= 2.6038

$$\Delta\rho/\Delta x = \frac{(10.+6.95)+(10.1+6.85)+(10.4+6.9)+(10.35+6.61)+(10.05+7.35)}{25 \times 5} = 0.60$$

43a Evaluate rings and diaphragm

Measure Positive Period

VDT #3 = -2.7 #4 = +4.0 Selsyn #1 = 19.445 #2 = 19.238

Counter #1 = $\frac{1.92 \times 60}{\ln 10}$	+50.0	+16.3¢
Counter #3 = $\frac{1.92 \times 60}{\ln 10}$	+50.0	+16.3¢
Log N = 2.3(21.7147)	+49.9	+16.3¢
Chan "A" = 80/24(75)	+62.3	+14.0¢ > 14.7¢
65/26(50)	+54.6	+15.4¢
Chan "D" = 87/19.5(100)	+67.0	+13.3¢ > 15.2¢
62/25(50)	+48.2	+16.7¢

43b Level

VDT #3 off #4 = -16.8 Selsyn #1 = 19.42 #2 = 19.2145

24.5 mils

19.239
2145
245

44a (Remove rings & diaphragm)

Evaluate support stand

Measure Positive Period

VDT #3 = -2.5 #4 = +4.1 Selsyn #1 = #2 = 19.237

counter #1 = $\frac{1.6 \times 60}{\ln 10}$	+41.7	+18.3¢	
" #3 = $\frac{1.7 \times 60}{\ln 10}$	+44.3	+17.6¢	
Log N = 1.75(21.7147)	+38.0	+19.5¢	18.5
Chan "A" = ~~70/38.5(50)~~	~~+83.5~~	~~+10.4¢~~	
90/58(20)	+46.3	+17.1¢	
Chan "D" = ~~75/41(50)~~	~~+82.7~~	~~+11.4¢~~	
74/18.5(50)	+36.1	+20.1¢	

Level

VDT #3 = off #4 = -21.8 Selsyn #1 = 19.415 #2 = 19.210

29 mils

C.A. 11" dia cyl Expr. _____ Run 45
Sheet 2-2 5/8" Date Apr 30 1963 Time 10 45 AM ~~PM~~
Purpose Rossi α measurement of 2-2 5/8", 11" dia discs. See fuel arrangement below

11-9 Ring	9-7 Ring	7" Disc		
2778	2774	2770	1/4	
2779	2775	2771		1/4
2743	2736	2729	3/8	
2748	2741	2734		1 1/2
2803			1/4	

10 MIL SS Diaphragm

2746	2773	2769		1/8
2745	2738	2731	1	
2747	2740	2733		1 1/2

∞ Log N = .00068
VDT #3 = +8.2 #4 = 10 (?) Selsyn #1 = 18.64 #2 = 18.4354
at end → 7.1 (?) — .4325

Servo on Chan D @ 10/500 ≈ 77 Signal @ 661
Chan A @ 100/200 ≈ 48

Separation: E 21.874; N 21.893; W 21.882; S 21.874; SE 21.8; E 21.876 Avg 21.8798

Thickness of bottom outer ring: E 2.629; N 2.629; S 2.628; W 2.628; SW 2.629; NE 2.629 Avg 2.6287

46 a Measure clean critical.
Positive period
VDT #3 = +24.0 #4 = ? Selsyn #1 = 18.654 #2 = 18.465

Counter #1 = $\frac{5.1 \times 48}{\ln 10}$	+106.3	+9.41¢
— #3 = out of service this run		
Log N = 4.8(21.5147)	+104.2	+9.58¢
Chan "A": 64/21(100)	+89.7	+10.7¢ } 9.85¢
53.5/63.5(50)	+112.4	+8.96¢
Chan "D": 89/58.5(50)	+119.4	+8.6¢ } 9.45¢
95/57(50)	94.2	+10.3¢
Av 9.5675		

$\sigma/\Delta x$ = .3178

46 b Level ∞ Period
VDT #3 = -6.1 #4 = ? Selsyn #1 = 18.633 #2 = 18.4355

Down Selsyna #1 = 00000 #2 = 99.8135

CRITICAL SEPARATION
21.8798 − 18.4355 − 0.1865 + 10 mils
3.2678

47a Measure Positive Evaluate rings & diaphragm
VDT #3 = -6.2 #4 = +4.6 (?) Selsyn #1 = 18.645 #2 = 18.436

Counter #1 = ~~26.6~~ 52.9	+ 52.9	+ 15.6 ¢	
Log N = 2.317 (21.7147)	+ 50.3	+ 16.2 ¢	
Chan "A" = 98/41 (50)	+ 57.4	+ 14.8 ¢	> 14.35 ¢
52/35 (25)	+ 62.7	+ 13.9 ¢	
Chan "D" = 90/31 (50)	+ 46.9	+ 16.9 ¢	> 16.05 ¢
55/35 (25)	+ 55.4	+ 15.2 ¢	

47b Level ~ Period
VDT #3 = out #4 = -22.1 Selsyn #1 = 18.605 #2 = 18.406

48a Remove rings & diaphragm
Evaluate support stand.
Positive Period
VDT #3 = -6.2 VDT #4 = +4.6 Selsyn #1 = 18.645 #2 = 18.436

counter #1 = 42.9	+ 42.9	+ 18.0 ¢	
Log N = 1.966 (21.7147)	+ 42.7	+ 18.0 ¢	
Chan "A" = 90/21.5 (75)	+ 52.3	+ 15.7 ¢	> 16.3 ¢
90/31 (50)	+ 47.0	+ 16.9 ¢	
Chan "D" = 88/30 (50)	+ 46.5	+ 17.0 ¢	> 17.3 ¢
67/38 (25)	+ 44.2	+ 17.6 ¢	

48b Level ~ Period
VDT #3 = off VDT #4 = off Selsyn #1 = 18.605 #2 = 18.4045

5-1-63

INSTRUMENT CHECK

Time 810 AM ~~PM~~ Source Ra B. γ

Tables OK F

		Channel A	B	C	D	E
Range	ok	10/1000	opr	X	10/1000	1050
Source Dist.	Light	15	OK	30"	4"	
% F.S. Trip	ok	80		100	70	100

C.A. 11" dia. cyl. Expr. _____ Run 49

~~Sheet~~ 2-2 3/4 Date May 1 1963 Time 9:00 AM ~~PM~~

Purpose Rossi α of 2-2 3/4" - 11" dia cylinders. See fuel arrangement below.

11-9 Ring	9-7 Ring	7" Disc		
2776	2762	2732	1	
2748	2741	2734		1 1/2
2803			1/4	
2778	2774	2770		1/4
2745	2738	2731	1	
2747	2740	2733		1 1/2

10 MIL SS

∞ Log N = .00058

VDT #3 = off #4 = off Selsyn #1 = 17.67 #2 = 17.4585

Servo on Chan D @ 10/500 ≈ 79 17.67 Signal = 790 units

Chan A @ 100/200 ≈ 46

= 17.454

50a Measured Positive Period - Chan Critical

VDT off Selsyn #1 = 17.735
#2 = 17.512

Counter #1 = + 48.7 sec			+ 16.6 ¢	
Log N = + 49.2			+ 16.5	
Chan "A"	68/2.9 (50)	+ 59.1	+ 14.5	15.1 ¢
	48/35 (50)	+ 52.9	+ 15.7	
Chan "D"	99/14 (25)	+ 38.3	+ 19.4	18.45 ¢
	66/22 (50)	+ 45.5	+ 17.5	

Avg = 16.66 ¢

50b Level

VDT off Selsyn #1 17.685
#2 17.473

24.88 / 60 = 4.146 ¢/min

50c Measured Negative Period

#1 17.675
#2 17.452

Counter #1	- 194		- 8.5	
Log N	- 193.2		- 8.5	
~~Selsyn~~				
Chan A	63.5/39.5 (100)	- 212	- 7.55	8.22 ¢
	74/53 (100)	- 304	~~- 4.9~~	
Chan D	70/32.5 (150)	- 196	- 8.35	"
	80/45 (150)	- 258	~~- 5.91~~	

Avg

Selsyn Reading when Down #1 9995
#2 998015

Measured Separation

NE	21.747	N	21.760	NW	21.759	W	21.758
SW	21.745	S	21.751	SE	21.746	Av	21.752

SEPARATION AT CRITICAL

$x = 21.752 - 17.473 - .1985 + .010$
$= 4.0905$

51a Diaphragm + Ring evaluation
Measured + pinned
VDT off

Selsyn #1 = 17.683
#2 = 17.464

Counter #1	= 82.3 sec pd	11.45
Log N	= 79.2	11.6
A $\frac{92}{18.5}(150)$	= + 93.7	10.4 > 11.05
$\frac{63}{35.5}(50)$	= + 79.9	11.7
D $\frac{72}{12}(100)$	= + 56.0	~~15.1~~
$\frac{58}{30}(50)$	= + 76.0	+12.2

Avg = 11.44 ¢
11.57

51b Level ∞
VDTs off

Selsyn #1 = 17.653
#2 = 17.436

$$29\overline{)11.44} \quad .3945 \text{ ¢/mil}$$

-52a

Evaluation of Lower Fuel Support
Positive Period.

VDTs off

Selsyn #1 = 17.685
#2 = 17.465

Counter #1	= 66.7 sec	13.4 ¢
Logger	= 69.5	12.95
Chan "A"	= $\frac{74}{23.5}(100) = +87.4$	10.9 > 11.75
	$\frac{60}{30}(50) = +72.1$	12.6
"D"	= $\frac{83}{42}(75) = +110.6$	~~9.05~~
	$\frac{82}{25.5}(100) = +85.8$	+11.1

Avg = 12.19 ¢
Av. 12.30

¢

Level

Selsyn #1 = 17.655
17.4335

.3964 ¢/mil
30.75) 12.19

5/2/63

INSTRUMENT CHECK

Pu Be

Time 8-05 AM PM Source γ

Tables OK Channel X

	F	A	B	C	D	E
Range	OK	10/1000	opr	X	10/1000	1050
Source Dist.	Light	8"	OK	24"	2"	12"
% F.S. Trip	OK	80		100	70	100

E.A. 11" dia Cyl Expr. _____ Run 53

Sheet 2 - 2 7/8" Date _____ 19 ___ Time _____ AM PM

Purpose Rossi α 2 7/8" each half.

Fuel Arrangement Below.

4

11-9 Ring	9-7 Ring	7" Disc	
2746	2773	2769	1/8
2776	2762	2732	1
2748	2741	2734	1 1/2
2803	—	—	1/4

10 mil SS

2744	2763	2768	1/8
2778	2774	2770	1/4
2745	2738	2731	1
2747	2740	2733	1 1/2

40

∞ Log N = .00058

VDTs off Selsyn #1 = 16.44 16.430

Servo Signal = 720 #2 = 16.215 16.206

Chan "D" ≈ 82 @ 10/500

"4" ≈ 48 @ 100

54a Measured Separation

E - 21.618 NW - 21.628 S - 21.609 Av = 21.619

N - 21.628 W - 21.615 SE - 21.618

Selsyn reading when down #1 = 0.005

#2 = 99.7825

NOTE: Subtract 25 mils from each thickness outside ring

Thickness - outside Ring Bolt

E - 2.904 NE - 2.902 W - 2.904 S - 2.903 SW - 2.903 SE - 2.903

54a Measured Positive Period - Chan Critical

VDTs off Selsyn #1 = 16.512

#2 = 16.282

Ctr #1 = 83.4	+83.4	+11.4¢	= 11.55¢	
Log N = 79.6	+79.6	+11.7¢		
41 mils Chan "A" = $\frac{26}{41}$ (50)	+93.2	+10.4¢	+9.7¢	
$\frac{92}{37.5}$ (100)	+111.6	+9.0¢		
"D" = $\frac{82}{74}$ (50)	+56.8	+14.9¢	+13.25¢	
$\frac{77}{41.5}$ (50)	+80.9	+11.6¢		

54b Level VDT off Selsyn #1 = 16.47

#2 = 16.2425

54c Measured Negative Period

VDT off Selsyn #1 = 16.43 #2 = 16.202

Ctr #1 155 Sec	-155	-11.5¢	11.1¢	
40 mils Log N 7.5(21.7142)	-162.9	-10.7¢		
A $\frac{26}{31}$ (100) =	-169.5	-10.1¢	-10.2¢	
$\frac{20}{38.5}$ (100) =	-167.2	-10.3¢		
D $\frac{80}{46}$ (100) =	-180.5	-9.3¢	-8.34¢	
$\frac{82.0}{41}$ (100) =	-216.3	-7.38¢		

CRITICAL SEPARATION

$x = 21.619 - 16.2425 - 0.2175 + .010$

$5159 + .010$

55a Diaphragm and Ring Evaluation

Positive Period

VDTs off

Selsyn #1 = 16.47

#2 = 16.2485

Ctr #1 =	~~[illegible]~~	—	
Log N =	~~[illegible]~~ 72	—	12.7 ¢
Chan "A" = $\frac{70}{30}(75)$ =		+88.7	+10.75¢
$\frac{74}{24.5}(100)$ =		+91.0	+10.6¢
34 mins "D" = $\frac{62}{25.5}(50)$ =		+56.3	+15.1¢

+10.68

55b Level ∞

Selsyn #1 = 16.418

#2 = 16.208

56a Lower Fuel Support Evaluation

Positive Period

Selsyn #1 = 16.47

#2 = 16.250

Ctr #1 =		—	
Log N =	56.5	+56.5	+15.0¢
42 mins Chan "A" = $\frac{87}{59}(25)$ =		+64.9	+13.5¢
$\frac{96}{25.5}(100)$ =		+75.5	+12.2¢
"D" = $\frac{78}{29}(75)$ =		+75.8	+12.2¢

+12.85¢

Selsyn #1 = 16.408

56b ∞

NE; SW; SW; NE

THICKNESS	TOP	11-9						9-7
2 7/8 Run #53		N2.877	E.878	S.879	W.880	NE.8795	SW.878	N2.875 E
2 3/4	49	2.750	.749	.750	.749	.749	.749	2.7485
2 5/8	45	2.626	.6255	.626	.627	.626	.626	2.624
2 1/2	41	2.503	.504	.505	.505	.504	.505	2.501
2 3/8	37	2.375	.375	.376	.376	.375	.375	2.374
2 1/4	33	2.253	.253	.254	.255	.253	.253	2.251
2 1/8	28	2.123	.124	.125	.124	.124	.124	2.125
2	24	2.0015	.000	.000	.001	.000	.000	1.998
1 7/8	20	1.877	.878	.878	.8775	.878	.878	1.874
1 3/4	15	1.748	.749	.749	.7485	.748	.748	1.750
SOLID	13	1.691	.693	.693	.693	.693	.6925	1.6905

THICKNESS	BOTTOM	11-9						9-7
2 7/8 Run 53		N.	E.	S	W	NE	SW. OK	N2.877 E
2 3/4	49	2.751	.752	.751	.751	.752	.751	2.753
2 5/8	45						OK	2.628
2 1/2	41						OK	2.502
2 3/8	37						OK	2.378
2 1/4	33						OK	2.252
2 1/8	28						OK	2.127
2	24						OK	3.000
1 7/8	20	1.878	.878	.878	.878	.878	.878	1.877
1 3/4	15						OK	1.752
SOLID	13						OK	1.752

7 DISC

E .875	S .874	W .875	NE .874	SW .875	N 2.876	E .877	S .877	W .878	NE .878	SW .877
.749	.749	.750	.750	.748	2.750	.750	.7505	.7505	.750	.750
.625	.625	.626	.627	.626	2.623	.622	.625	.624	.625	.624
.501	.500	.499	.500	.500	2.498	.500	.501	.500	.499	.499
.374	.374	.375	.374	.375	2.372	.372	.373	.374	.373	.374
.251	.2505	.250	.250	.250	2.252	.253	.252	.252	.251	.251
.125	.124	.125	.125	.125	2.124	.125	.125	.126	.125	.125
.998	.998	.998	.9975	.998	1.997	.997	.997	.997	.996	.998
.874	.875	.875	.874	.875	1.877	.877	.877	.876	.877	.876
.750	.7485	.748	.749	.749	1.749	.749	.7485	.7485	.749	.749
.691	.6915	.691	.690	.690	1.625	.626	.626	.624	.625	.626

7" DISC

77	E .877	S .877	W .877	NE .878	SW .87[illegible]	N 2.879	E .879	S .880	W .879	NE .878	SW .880
53	.753	.752	.753	.753	.753	2.754	.753	.754	.754	.753	.753
28	.629	.628	.628	.6285	.627	2.503*	.503*	.5025*	.503*	.503*	.503*
02	.502	.502	.502	.502	.502	2.502	.503	.503	.5035	.504	.503
78	.379	.380	.379	.379	.378	2.379	.379	.381	.381	.380	.380
52	.252	.253	.252	.252	.253	2.251	.252	.253	.254	.253	.253
27	.127	.128	.127	.128	.128	2.125	.126	.126	.126	.126	.126
00	.001	.001	.001	.001	.001	2.002	.001	.002	.002	.002	.003
77	.877	.876	.876	.877	.876	1.879	.879	.878	.877	.8775	.8775
52	.752	.752	.7515	.751	.751	1.753	.752	.751	.751	.751	.752
52	.752	.752	.7515	.751	.751	1.753	.752	.751	.751	.751	.752

* ADD 0.125

5-14-63

MIHALCZO
LYNN
TAYLOR

INSTRUMENT CHECK

Source Pu Be + γ

Time 1:15 ~~AM~~ PM

	Channel A	B	C	D	E
F	10/1000	opr	X	0	1050
Range HV = 8	12"	0	30"	4	10"
Source Dist. OK	80	OK	100	T	100+
% F.S. Trip					

~~Ctrs~~ #1 + 3 OK

OD ID

C.A. 15"-9" Expr. _____ Run 1

~~Sheet~~ Bare Date MAY 14 19 63 Time 1 45 PM

Purpose Criticality measurement

See annular ring fuel arrangement below. 9" dia. HOLE IN CENTER

Recheck of Pg 131

TOP 11-9 = 3 7/8"
TOP 13-11 = 3 15/16"
TOP 15-13 = 3 15/16"

		15-13 RING	13-11 RING	11-9 RING		
3 15/16	3 7/8	X	2780	X	1/8	
		2786	X	X		1/2
		X	2782	X	1/4	
		2784	X	2743		3/8
		X	X	2745	1	
		2885	2783	X		1/4
		X	2750	X	3/8	
		X	2749	X		3/8
		2886	X	X	1/4	
		2766	2755	X		9/16
		X	X	2747	1 1/2	
		2787	2753	X		1/2
		2760	2752	X	1/2	
		2739	2757	2776		1

10 MIL Diaphragm

2"		2761	X	X	1/8	
		2785	X	2742		3/8
		X	2751	X	1/2	
		2848	2754	X		1/2
		X	X	2746	1/8	
		2735	2756	X		1
		X	X	2748	1 1/2	

Run #1 (con't)

VDT #3 = +7.1 Selsyn #1 = 22.60

#4 = -7.5 #2 = 22.370

Both segments "together" and light on.

Measure negative period

Log N	-129.2	-129.2	-15.4¢ ✓
Clan A	71/25 (150)	-143.7	-12.8¢
	71/42 (100)	-190.6	-8.68¢
Counter #1	Not Used	—	
Counter #3	$\frac{10.2 \times 60}{\text{len } 10}$	-132.9	-14.6¢ ✓

AW = 12.87¢

THICKNESS OF BOTTOM OUTER RING ONLY:

S 2.0075; SE 70; E 78; NE 70; N 72; NW 61; W 70; SW 52

AVG → 2.0069

INSTRUMENT CHECK

Time 11⁰⁰ AM ~~PM~~ Source PoBe & h

	F	Channel A	B	C	D	EX
Range	H&L	10/1000	OPR	X		1060
Source Dist.		12"	0	30"		10"
% F.S. Trip	OK	80	OK	100		100+

C.A. 15" dia. cyl Expr. _____ Run 1

Sheet _____ Date May 15 1963 Time 1¹⁰ ~~37~~ PM

Purpose Critical measurement of 2 - 1½" 15" dia cylinders

15-13 RING	13-11 RING	11-9 RING	9-7 RING	7" DISC		
2785	2750	2743	2829	2729	3/8	
2739	2757	2776	2762	2732		1
21	D-15-C				1/8	10 Mil Diaphragm
2784	2749	2742	2736	2728		3/8
20	D-15-C				1/8	
2735	2756	2745	2738	2731		1

VDT #3 = +5.6 ; #4 = -1.8 Sikayn #1 = 23.09 ; #2 = 22.8715

Subcritical

17 May 63
JT Mihalczo
JJ Lynn
JR Taylor

INSTRUMENT CHECK

Time 8:20 AM ~~PM~~ Source PoBe & N

	X F	Channel A	B	C	D	E
Range	H&L	10/1000	OPR	X		1050
Source Dist.		8"	0	30"		10"
% F.S. Trip	OK	90	OK	100		100+

Top Run # 5

S.A. 15" drawer Dep. _____ Run 5

Sheet _____ Date May 17 1963 Time 8:40 AM ~~PM~~

Purpose Critical measurement

Same as run #1 except ~~Rings~~: Disc. Top: & 11-9 Ring

	7" Disc		11-9 Ring	
3/8	2729		2743	3/8
1/4	2771		2779	1/4
1/4	2770		2778	1/4
9/16	2730		2767	9/16
1/8	21---		21---	1/8

VDT's #3 = ~~[illegible]~~ #4 = ~~[illegible]~~

Selsyn #1 = 23.09

#2 = 22.872

Supercritical ≈ 17¢ excess reactivity.

Down Selsyn #1 = 000.025

Run #6 Same as Run #1 except 13-11 Top Ring & Disc Top:

13-11		7" DISC	
3/8	2760	2729	3/8
1/2	2754	2771	1/4
9/16	2755	2770	1/4
1/8	21---	2730	9/16
			1/8

Move counter away some

Still too much excess at up position

Run #7 Same as configuration #1 but the 15-13 Top Ring & 7" Top Disc:

15-13		7" DISC	
3/8	2785	2729	3/8
1/2	2848	2771	1/4
9/16	2766	2770	1/4
1/8	21---	2730	9/16
		21---	1/8

VDT #3 = +4.1 #4 = +9.2

Selsyn #1 = 23.09 #2 = 22.8705

Too little reactivity at up position

Move the counter closer for next attempt.

Down Selsyn #1 = 000.025

Run #8 Moved counter closer.
With table up is still too little reactivity.

Run #9 Changed to: Top ↓ Bottom Same as original Run #1

15-13 = 1 9/16" height
13-11 = 1 9/16
11-9 = 1 9/16 Still sub-critical
9-7 = 1 9/16
7" Disc = 1 1/2

Run #10 Same as run #9 but add 2 [1/32" x 2 1/2" x 2 1/2"] pieces, one on the other in center of 7" disc.
wt of the 2 = 120.6 grams.

Too much excess reactivity.

Run #11 Same as run #9 but add 1 piece [2 1/2 x 2 1/2 x 1/32]
wt of one piece (in center of disc) = 60.3 grams.

Several attempts made by shuffling the 2 (2 1/2 x 2 1/2 x 1/32) to obtain desired reactivity rate.

20 MAY 63
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INSTRUMENT CHECK

Time 8:15 AM PM Source PuBe γ

Tables ok F X Channel

		A	B	C	D	E
Range	ok	10/1000	opr	X	0	1050
Source Dist.	Light	1'	ok	30"	4	8"
% F.S. Trip	ok	80		100		100

C.A. 15" dia. cyl. Expr. _____ Run 12

Sheet 2-1½" Date May 20 1963 Time 9:05 AM

Purpose Rossi α 15" OD DISC

"Solid"

See fuel arrangement top pg 275

No SEPARATION

∞ Log N = .00055

VDT #3 = +4.1 #4 = +9.0

Selsyn #1 = 23.09 #2 = 22.874

Servo on channel A @ 10/1000 = 70

Servo signal @ 67

SEPARATION DOWN: W 22.924; N .917; E .916; S .925; NE .926; SW .929

AVG → 22.9228

BOTTOM OUTER RING: E 1.497; N .496; W .498; S .495; SW .498; NE .496

AVG → 1.4967

[redacted]

3" +

(1 ONE EACH SIDE
1/32 x 2½ x 2½) ℄

15-13 RING	13-11 RING	11-9 RING	9-7 RING	7" DISC		
2785	2750	2743	2829	2724	3/8	
X	X	2779	2775	X		1/4
X	X	2778	2774	X	1/4	
2848	2754	X	X	X		1/2
X	X	X	X	2732	1	
2766	2755	2767	2737	X		9/16
21 - - - DISC					1/8	
2784	2749	2742	2736	2728		3/8 ~~10 MIL DIAP.~~
20 - - - DISC					1/8	
2735	2756	2745	2738	2731		1

1 9/16" ; 1½" ; 1½"

(WEIGHT OF THE 2(1/32 x 2½ x 2½) PIECES: 120.6 grams
(ONE PIECE ON NORTH SIDE & ONE PIECE ON SOUTH SIDE AS IN SKETCH.

WT. OF #20 (15" DISC) = 6471 grams.

WT. OF #21 (15" DISC): 6518 grams.

E.A. 15" dia af. Expr. ______ Run 13 a

Sheet ______ Date May 20 19 63 Time 2 45 PM

Purpose Critical Separation of 2 - 1 5/8" stacks. See fuel arrangement below.

[redacted] SEPARATION: SEE Pg 279

2848	2754	X	X	X	1/2	
2739	2757	X	X	X		1
X	X	2748	2741	2734	1½	
21 - - -						1/8 ~~10 MIL DIAPH.~~
2758	2780	2744	2763	2768	1/8	
2784	2749	2742	2736	2728		3/8
20 - - -					1/8	
2735	2756	2745	2738	2731		1
15-13	13-11	11-9	9-7	7" Disc		

1 5/8" ; 1 5/8"

28

96

7

13a (cont) Measure Positive Period clean critical

VDT's = not on

Selsyn #1 = 22.375 #2 = 22.1465

~~59/19(50)~~

"A" chan = 50/19(50)	+ 51.7	+15.9¢	+16.83¢
Log N = 2.03 (21.7147)	+43.42	+17.7¢	
Counter #2 = ~~81.2 sec~~	+46.9	+16.9¢	

13b Level ∞ Period

VDTs = not on

Selsyn #1 = 22.35 #2 = 22.133

13c Measure negative period.

VDTs = not on

Selsyn #1 = 22.34 Selsyn #2 = 22.125

Log N = 6.9 x 21.7147	-149.8	-12.1¢	-13.2¢
Ch #2 = -126	-126	-16.2¢	
Chan "A" = 75/21 (200)	-157.2	-11.3¢	
59/41 (100)	-274.2	—	

Selsyn readings at shutdown

#1 — 0.025 #2 — 99816

Separation: NE 21.802; E.802; S.806; W.797; N.806; SW.797
AVG → 21.8017

BOTTOM OUTER RINGS S 1.620; E.623; N.624; W.623; SE.622; NW.624
AVG → 1.6227

SEPARATION AT CRITICAL

~~22.133 + 0.184 − 21.8017 = 0.5153 + 10 mils~~

22.8017 − 22.133 − 0.184 = .4847 + 10 = 0.4947

Run # 14a Table ~~scrammed~~ dropped magnet?

Recheck of critical position ∞

VDT #3 = 13.1 #4 = −6.9

Selsyn # 1 = 22.39 #2 = 22.161

Down Positions

#1 − 0.025 #2 = 99817

35
.09

278

21 MAY 63
MIHALCZO
LYNN
TAYLOR

INSTRUMENT CHECK

Time 8:15 AM ~~PM~~ Source PoBe & h

		Channel A	B	C	D	E
Tables	F					
O/C						
Range	O/C	10/100	OPR	X		1050
Source Dist.	light	1'	O/C	30"		8"
% F.S. Trip	O/C	90		100		100

Run 15a

C.A. 15" dia. cyl Expr. _____ Run 15a

Sheet _____ Date _____ 19 __ Time _____ AM PM

Purpose Recheck critical separation of 2 - 1 5/8" stacks. Same as #13a Pg 225 Recheck of 13b

Down #1 = 00.0 30 #2 = 99.82 9

Separation: E 22.823; N.833; W.819; SW.820; S.817; SW.818

Avg → 21.8217 ✓

Level ∞ period

VDT #3 = +1.3 #4 : −9.5

Selsyn #1 22.387 #2 22.1695

138

31

Critical Separation

~~22.1695 + 0.171 − 21.8217 = 0.518~~ + 10 m.A

0.528

0.4912

15b Evaluation of diaphragm & ringer & support stand.

Measure level ∞

Selsyn #1 = 22.355 #2 = 22.138

Run # 16

C.A. 15" DIA. CYL. Expr. _____ Run 16

~~Sh~~ 2-1 5/8" Date MAY 21 1963 Time 9^45 AM

Purpose Rossi & measurement of 2-1 5/8" 15" DIA. CYLINDERS. FUEL ARRANGEMENT SAME AS RUN 13a. Pg 275

SEPARATION = [redacted] 0.4947"

LOG N ∞ PERIOD = .00051

VDT #3 = -1.6 / -2.9 VDT #4 = -11.2 / -11.1

SELSYN #1 = 22.38 / 22.38 SELSYN #2 = 22.160 / 22.156

SERVO ON CHANNEL A 10/1000 @ 70 SIGNAL = 67

160

Run # 17a

C.A. 15" DIA. CYL. Expr. _____ Run 17a

~~Sheet~~ 2 - 1 3/4 Date May 21 1963 Time 2:30 ~~AM~~ PM

Purpose Critical separation of 2 - 1 3/4" th. 15" DIA. cylinders. Fuel arrangment as shown below.

SEPARATION = 1.018"

	15-13	13-11	11-9	9-7	7 DISC	∡	
1 3/4	2758	2780	2744	2763	2768	1/8	
	2848	2754	X	X	X		1/2
	2739	2757	X	X	X	1	
	X	X	2748	2741	2734		1 1/2
	21					1/8	
1 1/4	2885	2782	2778	2774	2770		1/4
	2784	2749	2742	2736	2728	3/8	
	20						1/8
	2735	2756	2745	2738	2731	1	

Measure Positive period (clean)

VDT #3 = 5.0 VDT #4 = 6.5

Selsyn #1 = 21.732 Selsyn #2 = 21.503

ctr #2 = $\frac{1.9 \times 60}{\ln 10}$ = 49.5	+49.5	+16.4 ∡	
Log N = 48.9	+48.9	+16.5 ∡	
Chan A = 69/32 (50)	+64.9	+13.6 ∡	> 14.5
68/43 (25)	+54.7	+15.4 ∡	

Av = 15.8 ∡

17b Level ∞

VDT #3 = -7.0 #4 = -7.1 (?)

Selsyn #1 = 21.712 #2 = 21.4925

CRITICAL SEPARATION 22.687 - 21.4925 - .1865 + .010

1.018 in

17c Measure negative period

VDT #3 = -15.0 #4 = -15.0 (?)

Selsyn #1 = 21.705 #2 = 21.483

ctr #2 = $\frac{5.8 \times 60}{\ln 10}$	-151.1	-11.9°
Log N = 21.7147(6.8)	-147.7	-12.0°
Chan A = 72/43 (100)	-194.9	-8.42° > 8.36
73/44 (100)	-197.3	-8.3°

Av = 10.75°

Down Selsyn #1 = 00.025 #2 = 99.8135

18a Evaluate Rings & Diaphragms

Bottom thickness Outer ring: S 1.750; E.752; N.750; W.751; NW.749

Avg → 1.7504

SEPARATION Down MEAS.: N 22.693; W.684; S.678; SE.683; E.693

Avg → 22.687

Measure Positive Period

VDT #3 = -6.9 VDT #4 = -6.5 (?)

Selsyn #1 = 21.72 Selsyn #2 = 21.4915

ctr #2 = $\frac{2.5 \times 60}{\ln 10}$	+65.1	+13.5°
Log N = 21.7147(3.1)	+67.3	+13.3°
Chan A = 85/26 (100)	+84.4	+11.2° > 12.95
71/30 (50)	+58.0	+14.7°

Av = 13.25°

18b Level —

VDT #3 = -16.6 VDT #4 = -16.0 (?)

Selsyn #1 = 21.71 #2 = 21.4815

282

19a Evaluate support stand (after removing rings & diaphragm)
Measure Positive Axial
VDT #3 = -7.0 VDT #4 = -6.4
Selsyn #1 = 21.72 Selsyn #2 = 21.4925

Ctr #2 = Not	—	
Log N = 21.7 sec	+21.7	+27.2#
Chan A = 49/21 (25)	+29.6	+22.4#

Av = 24.8#

19b Level ∞
VDT's not on.
Selsyn #1 = 21.70 #2 = 21.4695

725
712
13

700
492
0

22 MAY 63
MIHALCZO
LYNN
TAYLOR

INSTRUMENT CHECK

Time 8:05 AM ~~PM~~ Source PBE # 1

		Channel A	B	C	D	E
Tables ok	F					
Range	OK	10/1000	ORR	X		1050
Source Dist.	light	9"	OK	30"		8"
% F.S. Trip	OK	80		100		

S.A. 15" DIA CYL. Expr. _____ Run 20
Sheet 2-1 3/4" Date May 22 1963 Time 8:30 AM ~~PM~~
Purpose Rossi α
See fuel arrangement Run 17A
TOP Pg 280

LOG N ∞ Period = .00053
VDT #3 = -6.0 VDT #4 = -5.0 (?)
-7.2 -8.8
SELSYN #1 = 21.725 SELSYN #2 = 21.700
21.719 21.6945
SERVO ON CHANNEL A @ 10/1000 @ 70 ; SIGNAL = 67

Run 21a

C.A. 15" DIA. CYL. Expr. _____ Run 21a

Sheet 2 - 1 7/8 Date MAY 22 1963 Time _____ AM PM

Purpose Criticality measurement of 2 - 1 7/8" th., 15" dia. cyl. See fuel arrangement below.

SEPARATION: 1.5971"

	15-13	13-11	11-9	9-7	7 DISC	℄	
1 7/8"	2885	2782	2778	2774	2770	1/4	
	2848	2754	X	X	X		1/2
	2739	2757	X	X	X	1	
	X	X	2748	2741	2734		1 1/2
	21 - -	- - -	- - - -	- - - -	- - - -	1/8	~~10 MIL DIA PH.~~
1 7/8"	2785	2750	2743	2829	2729		3/8
	2784	2749	2742	2736	2728	3/8	
	20 - -	- - -	- - - -	- - - -	- - - -		1/8
	2735	2756	2745	2738	2731	1	

Measure Positive Period

VDT #3 = 4.2 VDT #4 = - 8.5

Selsyn #1 = 21.028 Selsyn #2 = 21.0015

CTR #2 = $\frac{2.375 \times 60}{2.30259}$	+ 61.9	+ 14.1¢
Log N = 59.3 sec	+ 59.3	+ 14.5¢
Chan A = $\frac{87}{25.5}$ (100)	+ 81.5	+ 11.5¢
$\frac{87.5}{41}$ (50)	+ 66.1	+ 13.45¢

→ 12.48¢ / 13.69¢

21b Level ∞

VDT #3 = - 9.1 VDT #4 = - 20.0

Selsyn #1 = 21.005 Selsyn #2 = 20.987

21c Measure Negative Period

VDT #3 = -18.6 VDT #4 off

Selsyn #1 = 20.995 Selsyn #2 = 20.9765

ch #2	$\frac{5.975 \times 60}{2.30259}$	− 154.1	-11.6¢	10.69¢
Log N	21.7147(7.1)	− 154.2	-11.6¢	
Chan A	$\frac{90}{28.5}$(200)	− 173.9	-9.8¢	8.88¢
	$\frac{71}{34}$(150)	− 203.6	-7.95¢	

"Down" Selsyns #1 = 00.025 #2 = 00.0148

PH. Measure Separation: N22.573; NW.562; W.548; SW.550; SE.559; E; 564

Avg → 22.5593

Outer Bottom Ring: S1.870; E.868; N.875; W.8745; SE.870; NW.875

Avg → 1.8722

* CRITICAL SEPARATION: 22.5593 − [20.9870 − .0148] = 1.5871

+ 10

1.5971"

22a Measure "Worth" of Rings & Diaphragm Positive Period

VDT #3 = -9.1 VDT #4 = -20

1.5" mile

Selsyn #1 = 21.008 Selsyn #2 = 20.9895

13.6¢

ch #2 =	$\frac{2.475 \times 60}{2.30259}$	+ 64.5	+13.6¢	13.17¢
Log N =	21.7147(3)	+ 65.1	+13.6¢	
Chan A =	76/20 (100)	+ 74.9	+12.3¢	
	89/60.5(50)	~~+129.8~~	—	

22b Level ∞

VDT's = off on #4 VDT #3 = -21.9

Selsyn #1 = 20.998 Selsyn #2 = 20.9725

286

23a Evaluate support stand only. 26 mils

Measure Positive Period

VDT #3 = -9.1 VDT #4 = -19.8

Selsyn #1 = 21.017 Selsyn #2 = 20.989

ctr #2 = 1.725 X 30 / 2.30259	+ 22.5	+26.6°	
Log N = 21.7147 (1.05)	+ 22.8	+26.5°	
Chan A = 49/23 (25)	+ 33.1	+21.4°	> 22.4°
80/39 (20)	+ 27.9	+23.4°	

26.55° 25.2

23b Level

VDT 3 & 4 = off scale

Selsyn #1 = 20.989 Selsyn #2 = 20.9609

23 MAY 63

MOHALCZO

LYNN

TAYLOR

INSTRUMENT CHECK

Time 820 AM PM Source RBe & n

	F	X A	B	C	E
Table O/C	O/C				
Range		10/1000	OPR	X	1050
Source Dist.	light	8"	O/C	30"	8"
% F.S. Trip	O/C	85		100	100

C.A. _____ Expr. _____ Run _____ AM PM
Sheet _____ Date _____ 19 _____ Time _____
Purpose OOPS!

C.A. 15" DIA. CYL. Expr. _____ Run 24
Sheet 2 - 1 7/8 Date MAY 23 1963 Time 8 45 AM ~~PM~~
Purpose Rossi α
See fuel arrangment Pg 284

LOG N ∞ Period = .00054
VDT #3 = -12.2 (-12.1) VDT #4 = NOT ON
Selsyn #1 = 21.005 (21.005) Selsyn #2 = 20.968 (.9645)
SERVO ON CHANNEL A @ 10/1000 @ 70 ; SIGNAL = 67

987
968
19

C.A. 15" DIA. CYL. Expr. _____ Run 25a

~~Sheet~~ 2 - 2" Date MAY 23 19 63 Time 3:15 ~~AM~~ PM

Purpose CRITICALITY MEASUREMENT OF 2-2" thy 15" DIA. CYLINDERS. SEE FUEL ARRANGEMENT BELOW.

SEPARATION: 2.246"

	15-13	13-11	11-9	9-7	7 DISC	℄	
* 2"	2761	2781	2746	2773	2769	1/8	
	2885	2782	2778	2774	2770	1/4	
	2848	2754	X	X	X	1/2	
	2739	2757	X	X	X	1	
	X	X	2748	2741	2734	1 1/2	
	21					1/8	10 MIL DIAPHRAGM
2"	2758	2780	2744	2763	2768	1/8	
	2785	2750	2743	2829	2729		3/8
	2884	2749	2742	2736	2728	7/8	
	20						1/8
	2735	2756	2745	2738	2731	1	

* NOTE: Was too much sag toward center (as above) so the top only fuel arrangement was changed to: ↓ See sag measurements (of above) Pg 290 **

	15-13	13-11	11-9	9-7	7 DISC	℄	
2"	2761	2781	2746	2773	2769	1/8	
	2885	2782	X	X	X		1/4
	2848	2754	X	X	X	1/2	
	2739	2757	X	X	X		1
	X	X	2748	2741	2734	1 1/2	
	X	X	2803	2745			1/4
	21	D-15				1/8	

BOTTOM SAME AS ABOVE

25a (con't) Measure ~~[illegible]~~ Clean Level Period

VDT #3 = +6.2 #4 = +5.1 (?)
Selsyn #1 = 20.235 Selsyn #2 = 20.0985

ctr #2 = —
Log N = ≈.007
Chan A = 1000/200 ≈ 45

25b Measure Negative Period clean

VDT #3 = −6.8 VDT #4 = −6.8 (?)
Selsyn #1 = 20.225 Selsyn #2 = 20.0855

ctr #2 = $\frac{5.475 \times 60}{\ln 10}$	−142.7	−13.0¢		
Log N = 6.8 x (21.7147)	−147.7	−12.4¢		11.59¢
Chan A = $\frac{85}{36}(150)$	−174.7	−9.36¢		
80/46.5(100)	−184.4			

26A Measure Level (Evaluate Rings, Diaphragm & support stand)
VDT #3 = off (not on)
#4 = not on

Selsyn #1 = 20.190
#2 = 20.055

26b Measure Negative Period

VDT's not on
Selsyn #1 = Selsyn #2 =

ctr #2 =
Log N =
Chan A =

* CRITICAL SEPARATION: 22.4283 −
[20.0985 + .0935] = 2.2363
+ 10 mils = 2.246"
2.246

i.e. @ OUTSIDE RING →

Not enough time to do desired runs of #25 or #26.

** SAG MEASUREMENTS. 13-11 Ring 9 MIL BELOW 15-13; 11-9 RING 13 MIL BELOW THE 13-11; 9-7 is 9 MILS BELOW 11-9; 7" DISC IS 7 MILS BELOW 9-7

Dover Selsyns → # = .03 #2 = 99.9065

Measured separation = E 22.433; N .437; W .424; S .416; SW 430; NW .430 Avg 22.4283
@ center of disc = 22.392

---

24 MAY 63
MIHALCZO
LYNN
TAYLOR

INSTRUMENT CHECK

Time 8:20 AM Source PoBe & r

		Channel A	B	C	D	X E
Tables OK	F					
Range	OK	10/1000	OPR	X		1050
Source Dist.	light	8"	OK	30"		8"
% F.S. Trip	OK	90		100		100

C.A. 15" DIA. CYL. Expr. _____ Run 27
Sheet 2-2" Date May 24 1963 Time 8 45 AM ~~PM~~
Purpose Rossi α
See fuel arrangement page 288
(Bottom)

63

VDT #3 = +2.7 +1.1 VDT #4 = 0.0 ? ?
Log N = .00052
Selsyn #1 = 20.1947 .1950 Selsyn #2 = 20.1912 .1810
Servo on chan A 10/1000 @ 69 Signal = 67

"Sag" of top half.

	13-11 below 15-13	11-9 below 13-11	9-7 below 11-9 on
SE	13 MILS	18 MILS	7 MILS
N	10	13	5
W	15	15	8
	13 mils	15 mils	7 mil

.4283

1947
190
4.7

1912
055
36

235
195
40 mil

191
098
73

C.A. 1.5" DIA. CYL. Expr. _____ Run 28a

Sheet 2-2 1/8 Date May 24 1963 Time 3:10 AM/PM

Purpose Critical measurements of 2-2 1/8"th; 1.5" dia cylinders.
See fuel arrangment below.

SEPARATION: 2.9771"

2 1/8	2886	2783	2779	2775	2771	1/4	
	2885	2782	X	X	X		1/4
	2848	2754	X	X	X	1/2	
	2739	2757	X	X	X		1
	X	X	2748	2741	2734	1 1/2	
	X	X	2803				1/4
	21					1/8	

10 MIL DIAPH.

2 1/8	2786	2752	X	X	X		1/2
	2760	2751	X	X	X	1/2	
	X	X	2776	2762	2732		1
	20					1/8	
	2735	2756	2745	2738	2731		1

28a Level ∞ period clean

336
335

VDT #3 = +18.6 #4 = bad (?)

Selsyn #1 = 19.335 #2 = 19.326

326
308

28b Measure Negative

VDT #3 = +2.1 #4 = +5.0 (?)

Sel #1 = 19.323 Sel #2 = 19.3090

ctr #2 = $\frac{6.39 \times 60}{\ln 10}$	-166.5	-10.4	
Log N = 7.95(21.7147)	-172.6	-9.88	9.82
Chan A = $\frac{60.5}{34}(100)$	-173.3	-9.82	
$\frac{61}{28}(150)$	-192.6	-8.55	9.185

Down Selsyns #1 = 99.9930 #2 = 99.9909

measured separation at outer edge: E 22.302; N .295
NW .298; SW .288; SE .299 Avg 22.2964
center sep. meas = 22.268

* CRITICAL SEPARATION (OUTER EDGE) : 22.2964 − [19.326 + .009] =
2.9614 + .010 = 2.971"

29a Evaluate Rings, Diaphragm and Support stand.
Measure Positive Period
VDT #3 = −13.1 #4 = −8.5 (?)
Selsyn #1 = 19.310 #2 = 19.294

ctr #2 = $\frac{1.66 \times 60}{\ln 10}$	+ 43.3	+17.8¢	
Log N = 1.92 (21.7147)	+ 41.6	+18.3¢	17.98
Chan A = 74.2/42 (25)	+ 43.8	+17.7¢	17.85
74.2/23 (50)	+ 42.7	+18.0¢	

29b Level ∞ period
VDTs = not on
Sel. #1 = 19.285 Sel #2 = 19.2715

5-27-63

INSTRUMENT CHECK

Source Pu Be + γ

Time 8:25 AM ~~PM~~

		Channel A	B	C	D	E
Range	F	10/1000	opr	X	0	1050
Source Dist.	HV=8	12"	0	30"	4	8"
% F.S. Trip	OK	80	OK	100	1	700+
Ctr #2	OK					

C.A. 15" DIA. CYL. Expr. _____ Run 30

~~Sheet~~ 2-2 1/8 Date May 27 19 63 Time 9:00 AM ~~PM~~

Purpose Rossi α

See fuel arrangment Pg 292

LOG N = .00052

VDT #3: +8.2 +7.1 VDT #4: +16 (?) +17.2 ?

Selsyn #1: 19.336 Selsyn #2: 19.3085

Servo on Chan A 10/1000 @ 69 (19.336) ; Signal @ 67 (19.299)

OUTSIDE BOTTOM RING: S 2.125; E.126; N.127; W.128; SE.124; NW.127

AVG → 2.126

	Ring 15/13	13/11	11/9
E	6	7	16
	8	19	3
	7	11	6
	7 mils	9 mil	8 mil

28
MIT
LYN
TAY

INTE
FOR

28 MAY 63
MIHALCZO
LYNN
TAYLOR

INSTRUMENT CHECK

Time 8:05 AM PM Source Pu Be γ

Tables OK

Light OK

		Channel A	B	C	D	E
Range	F	10/1000	opr	X	0	1050
Source Dist.	OK	6"		30"	u	8"
% F.S. Trip		100	OK	100	T	100

C.A. 15" DIA. CYL. Expr. _____ Run 31

~~Sheet~~ 2-2¼ Date May 28 1963 Time 8:30 AM ~~PM~~

Purpose Rossi α

See fuel arrangement below

Top Fuel
3/8 Disc
~1/16" ~~SS~~
center

INTERCHANGED FOR CLEAN CRITICAL

	15-13	13-11	11-9	9-7	7 DISC	℄	
	2784	2749	2743	2829	2729	3/8	
	2885	2782	x	x	x		1/4
	2848	2754	x	x	x	1/2	
2¼	2739	2757	x	x	x		1
	x	x	2748	2741	2734	1½	
	x	x	2803	D-15 C			1/4
	21	D-15 C				1/8	

10 MIL. DIAPH.

	2758	2780	2744	2763	2768		1/8
	2786	2752	x	x	x	1/2	
	2760	2751	x	x	x		1/2
2¼	x	x	2776	2762	2732	1	
	20	D-15 C					1/8
	2735	2756	2745	2738	2731	1	

VDT #3 = +24.5 VDT #4 = +10 no good

Selsyn #1 = 18.326 Selsyn #2 = 18.2665

Log N = .00062

Servo on chan A @ 10/1000 @ 82 ; Signal @ 81

C.A. _____ Expr. _____ Run 32

Sheet 2 - 2 1/4 Date _____ 19 ___ Time _____ AM PM

Purpose Clean Critical + ΔP/Δx

Measured Separation at shutdown

E - 21.170 N - 21.178 W 21.162 SW - 21.156

S 21.160 SE 21.168 Av. 22.1657

Selsyn Readings at shutdown

#1 99.99 #2 99.930

32 A Measure Positive Period

VDT #3 +24 #4 +9

Selsyn #1 18.34 #2 18.271

Log N = 206.3 sec } + 5.84¢

A $\frac{80}{32.5}$(200) = 222.2 } + 5.17¢ } 5.60¢

Counter 2 = 208.5 sec } + 5.78¢

32 B Level

VDT #3 9.5 #4 0 ≈ 66

Sl #1 18.33 #2 18.256 ✓

326

4 mils

CRITICAL SEPARATION

22.1657 - .07 - 18.256 + 10 = 3.8497

32c Measured Negative period.

VDT #3 = -13 #4 = -22.0

#1 = 18.305 #2 = 18.234

Log N : 141 sec — 13.3#

A'' $\frac{66}{26.5}$ (150) = 164.5 sec — 10.6# } 12.5#

156 Ctr #γ = 138 sec. — 13.6#

33a (Evaluate Rings, Diaphragm and Support Stand.)

Level ∞ period

VDTs - Not on

Selsyn #1 = 18.26 # 2 = 18.190

Thickness of Outer ring 15-13 - on Bottom

2.252, 2.253, 2.252, 2.251, 2.252, 2.251

Av. 2.2518"

Depression

15-13	at 13 in	7 mils	5	4	avg 5	
13-11	at 11 in	21	18	21	- 20	
11-9	at 9	0	0	0	—	

C.A. _____ Expr. _____ Run 34

Sheet 2-2 3/8 Date _____ 19 ___ Time 8:30 AM ~~PM~~

Purpose Elem Critical 2 3/8 15" OD

See fuel arrangment pg 299

Thickness of Fuel 15-13 on Bottom

2.378, 2.378, 2.378, 2.378, 2.377 = 2.3778

Depression

13 in	4	5	6 mils	= 5
11	20	17	18	= 18
9	0	4	5	= 3

34b

Measured Separation when down

22.047 22.031 22.020 22.020 22.040

22.044 Av = 22.033

34c

Selsyn Readings when down

#1 99.995 #2 99.931

Fuel change (see Pg 299)

1/8 Fuel on bottom placed on top

1/4 Added to bottom. 2886 2783

2774 2775 2771

CRITICAL SEPARATION

22.033 + 0.069 − 17.0595 + .010 = 4.9145

	2758	2780	2744	2763	2768	1/8
	2885	X	X	X	X	1/4
	2784	2749	2743	2829	2729	3/8
	X	2782	X	X	X	1/4
2 7/8	2848	2754	X	X	X	1/2
	2739	2757	X	X	X	1
	X	X	2748	2741	2734	1 1/2
	X	X	2803			1/4
	21					1/8

10 MIL DIAPH.

	2886	2783	2779	2775	2771	1/4
	2786	2752	X	X	X	1/2
	2760	2751	X	X	X	1/2
2 3/8	X	X	2776	2762	2732	1
	20					1/8
	2735	2756	2745	2738	2731	1

℄

3778 34a Measured positive period

VDT #3 #4

Selsyn #1 = 17.168 #2 = 17.0897

Log N = 64.6 sec } + 13.6¢

A $\frac{86}{21}(100) = 70.9$ } + 12.6¢ } 13.3¢

5 Counter #2 + 64.5 sec } + 13.6¢

18

3

34b Level

Selsyn #1 17.137 #2 17.0595

2040

34c Measured Negative Period

Selsyn #1 17.112 #2 ~~17.112~~ 17.0435

Log N = 226 sec } − 7.0¢

"A" = $\frac{85}{38}(200) = 248$ } − 6.59¢ } 6.90¢

$\frac{47.5}{24.5}(150) = 276$

2771 Ctr #2 = 224 sec } − 7.12¢

300

Run 35 Support structure evaluation

Level ∞ T

Selsyn #1 = 17.045 #2 = 16.9725