

BOOK85R

Notes:

"Tinker Toy Experiments Series III" on front

"~10 kgU/unit" on front

"Series III" on spine

"III" on spine

Blank pages: inside front cover sheets, 2, 3, 58, 70-152, inside back cover sheets

-1 (or 2) photos are on each of the following pages: 4, 8, 10, 14, 16, 20(2), 22(2), 26, 27, 30, 32, 34, 36, 38, 40, 44, 48, 50, 54, 56, 60, 62, 64, 66, 68

-pages 7/8 have paper clip at top

-pages 54/55 have 1 half sheet between pages

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RSICC /Oak Ridge National Lab.

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No. 168 BLANK BOOK

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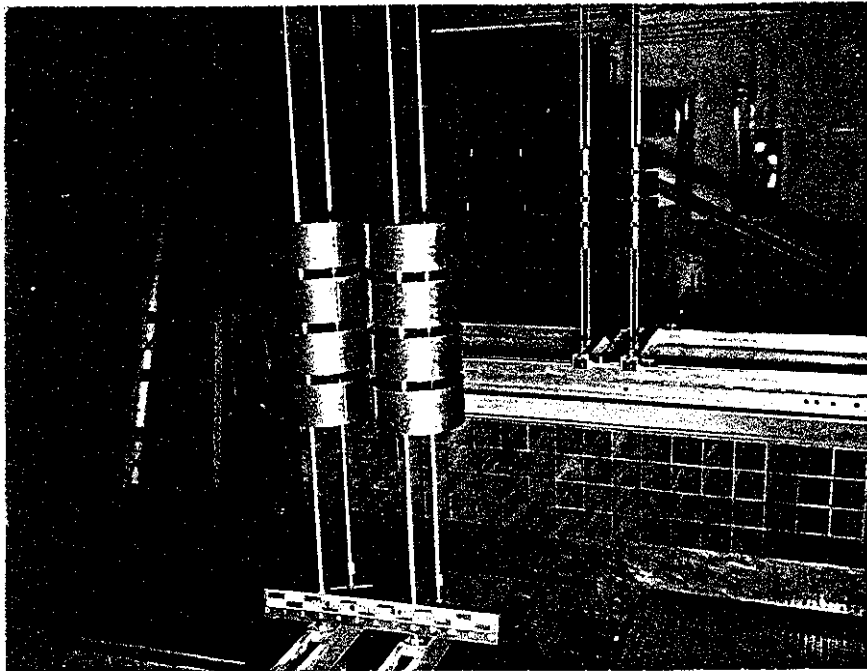
Subassemblies

unit dimensions 4.53" dia x 2.12" ht.

# 1		# 2	
unit	mass	unit	mass
411		412	
2204	10.480 ✓	2168	10.489 ✓
311		312	
2176	10.479 ✓	2193	10.471 ✓
211		212	
2184	10.485 ✓	2195	10.481 ✓
111		112	
2205	10.474 ✓	2196	10.478 ✓

ave. 10.480 kg U(93.2)

# 3		# 4	
unit	mass	unit	mass
421		422	
2170	10.490	2162	10.517
321		322	
2152	10.468	2190	10.443
221		222	
2156	10.498	2172	10.505
121		122	
2200	10.460	2197	10.453



Experiment 1

Instrument Check on 5-29-63 Source 10mc

PM-1	Low Trip	OK	Alarm Trip	OK
PM-2			Alarm Trip	OK
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK	Clock 2433
IC-3		Calibration		M-230
IC-4	Response	Calibration	J11	check list ✓
CRM		Meter Trip		

16 units \cdot kg UL93.2 / unit STS = 579" R < 1
 Reset spacing to $3/16"$: R < 1

Instrument Check on 6-3-63 Source 10mc

PM-1	Low Trip	OK	Alarm Trip	OK
PM-2			Alarm Trip	OK
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK	Clock 2433
IC-3		Calibration		M-230
IC-4	RESPONDS	Calibration	J11	check list ✓
CRM		Meter Trip		

Reset Spacing to 0.500"

8.7×10^7 R > 1 positive period ~ 65 sec at 0.060" (1.50 Revs.)
 R = 1 at 0.091 inches $\frac{\Delta R}{\Delta S} = 4.39 / \text{in}$ (2.05 Revs.)
 Separated tables to $\sim 5"$ and checked spacing between
 units on assemblies 1 and 2. $\sim 4"$ too great; reset to $1/2"$
 R > 1 positive period ~ 36 sec at 0.134 in. (2.80 revs)
 R = 1 at 0.156 in. $\frac{\Delta R}{\Delta S} = 9.19 \text{ 1/in.}$ (3.30 revs)

Summary
 16 - 10.480 Rg/unit, unreflected
 STS = 0.531 + 0.005 in
 1.349 cm
 $V_L = 1.1123 \text{ L} \Rightarrow \rho = 9.422 \text{ g/cc}$

$V_L = 67.902 \text{ cm}^3$
 $F = 0.50319$

Experiment 2 Subassemblies

# 1		# 2		# 3	
311		312		313	
2168	10.489	2170	10490	2178	10492
211		212		213	
2156	10.498	2176	10479	2165	10510
111		112		113	
✓ 2196	10479	✓ 2205	10474	2200	10460

# 4		# 5		# 6	
321		322		323	
✓ 2152	10.468	✓ 2158	10488	✓ 2193	10471
221		222		223	
2162	10.517	2183	10526	2199	10522
121		122		123	
2155	10.462	2154	10454	2197	10453

# 7		# 8		# 9	
331		332		333	
2194	10505	2180	10500	2199	10494
231		232		233	
✓ 2184	10485	✓ 2195	10481	2204	10480
131		132		133	
✓ 2190	10443	2203	10513	2202	10444

ave. 10.484 kg/(93.2)/unit

Experiment 2

Instrument Check on 6-6-63 Source 10 me V

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock	2434
IC-3		Calibration		M-230	
IC-4	Responds	Calibration	OK	check list	✓
CRM		Meter Trip			

27-units 10. kg/unit unreflected.

STS = $27/32$ " $k < 1$

Reset spring to $3/4$ "

$k > 1$ positive period ~ 16.5 sec at 0.306 in (520 Revs)

$k = 1$ at 0.350 in $\Delta s = 0.044$ (584 Revs)

Changed spacing between N-S rows to 0.760"; E-W + Vertical at 0.750"

$k > 1$ positive period ~ 39.8 sec at 0.239" (450 revs)

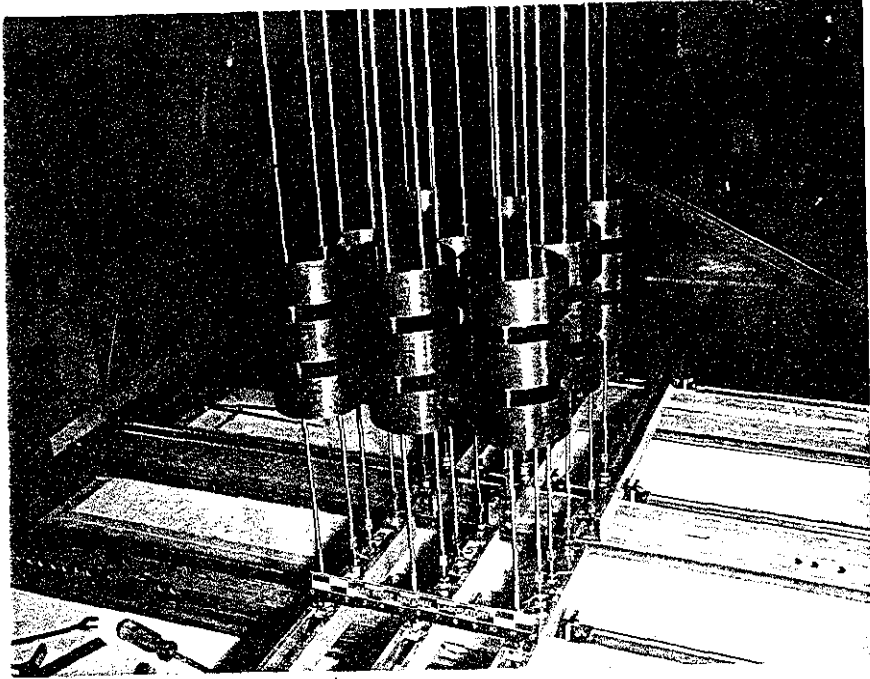
$k = 1$ at 0.306 in $\Delta s = .067$ (520 revs)

Changed spacing between N-S rows to 0.8125"; E-W + Vertical remain at 0.750"

$k > 1$ positive period ~ 73.9 sec 0.146 in (3.00 Revs)

$k = 1$ at 0.176 in $\Delta s = 0.30$ " (3.50 Revs)

8



Experiment 2

Reset spacing to $5/64"$

Instrument Check on 6-6-63 Source 10mc

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IS-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock	2435
IC-3		Calibration			M-230
IC-4	Responds	Calibration	JII		check list ✓
CRM		Meter Trip			

$k < 1$ more than #1 -

Changed spacing between n-5 rows to $0.786"$ from $0.790"$

$k < 1$ more than #1 -

Subassemblies 4 and 6 not properly spaced.

Have reset spacing in entire array to $5/64$ again.

Instrument Check on 6-7-63 Source 10mc

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock	2435
IC-3		Calibration			check list ✓
IC-4	Responds	Calibration	JII		M-230
CRM		Meter Trip			

$k \approx 1$ negative period ~ 121.2 sec. $\rho = 11.1 \times 10^{-4}$ 17.3 f

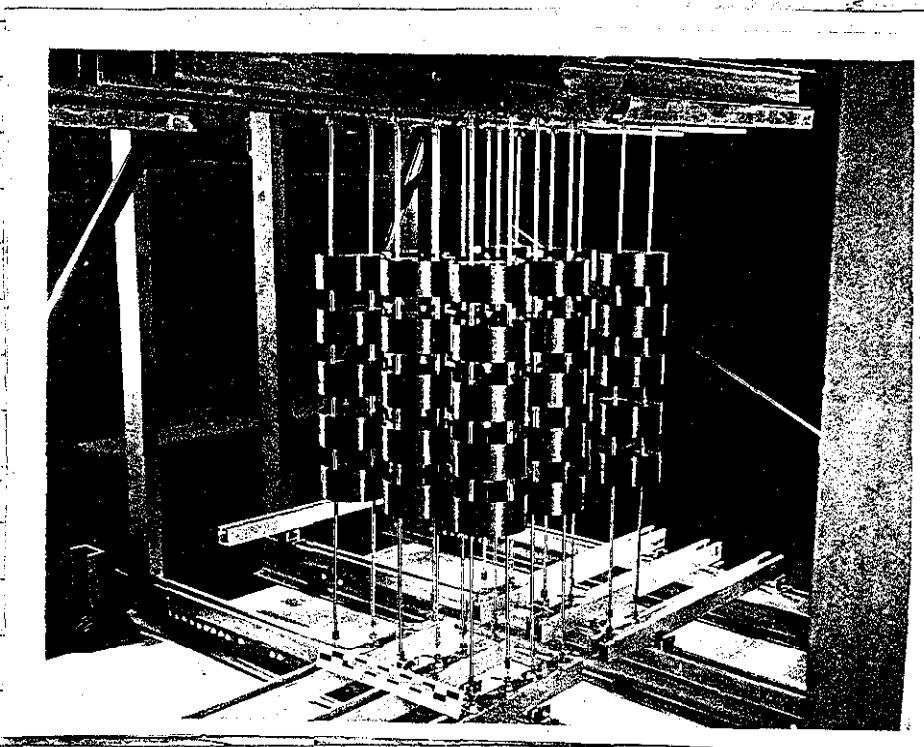
Summary 27 units 10.484 kg U(93.2)/unit
 unreflected
 STS = 0.790 ± 0.005 in

$V_L = 82.36 \text{ in}^3$
 $F = 0.4486$

$v = 1.39784$ $\rho = 7.767 \text{ g/cc}$

Subassemblies

Subassembly #	Part #	Quantity	Part #	Quantity	Subassembly #	Part #	Quantity
#1	511		512		#3	513	
	2182	10.391	2184	10.403		2187	10.385
	411		412			413	
	2168	10.489	2170	10.490		2178	10.492
	311		312			313	
#2	2156	10.498	2176	10.479	#4	2165	10.510
	211		212			213	
	2196	10.479	2205	10.474		2200	10.460
	111		112			113	
	2177	10.423	2181	10.420		2185	10.425
#3	521		522		#5	523	
	2153	10.489	2166	10.421		2173	10.428
	421		422			423	
	2152	10.468	2158	10.467		2193	10.471
	321		322			323	
#4	2162	10.517	2183	10.526	#6	2199	10.522
	221		222			223	
	2155	10.462	2154	10.454		2197	10.453
	121		122			123	
	2167	10.438	2172	10.505		2201	10.543
#5	531		532		#7	533	
	2192	10.383	2198	10.394		2159	10.377
	431		432			433	
	2194	10.505	2180	10.500		2179	10.494
	331		332			333	
#6	2189	10.485	2195	10.481	#8	2204	10.480
	231		232			233	
	2190	10.443	2203	10.513		2202	10.444
	131		132			133	
	2157	10.399	2164	10.407		2169	10.403



Rev 10.458
 Rj W(832)
 Unit

Experiment 3

Instrument Check on 6-10-63 Source 10 net

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	53×10^{-4}	Meter Trip	OK	Fast Trip	OK
IC-2	53×10^{-4}	Meter Trip	OK		C10 OK 2436
IC-3		Calibration	-		M-230
IC-4	Responds	Calibration	JIT		check list ✓
CRM		Meter Trip			

45 - (3x3x5) 10.458 kg $(10^{3.2})$ /unit. STS = $1.5/16$ "

Unreflected.

R > 1 positive period $\rho = 12.1 \times 10^{-4}$
40 sec at 0.337 18.94 (5.70 Revs)R = 1 at 0.390 $\Delta S = 0.053 \Rightarrow$ 3.57 #/in (6.45 Revs)Reset spacing in N.S. planes to 1.335" ~~5.00 Revs~~R > 1 positive period $\rho = 11.5 \times 10^{-4}$
43.3 sec at 0.290 17.97 (5.00 Revs)R = 1 at 0.338 in. $\Delta S = 0.048$ 3.74 #/in. (5.75 Revs)

Cf: Experiment 2.

Summary

45 units; 10.458 kg/unit

Unreflected

STS 1.355 ± 0.005 in

3.442 cm

 $V_L = 1.968492$, $\rho = 5.313$

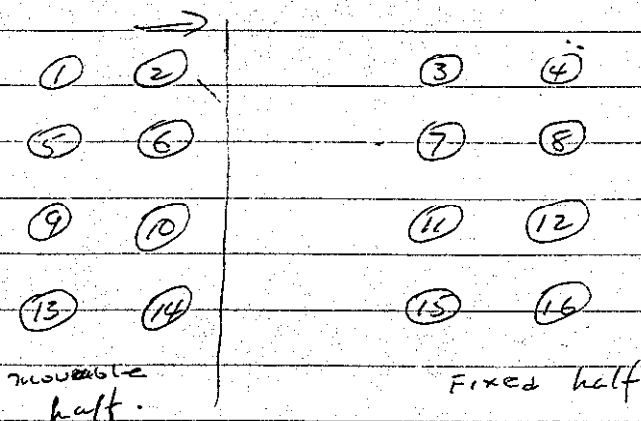
$$V_L = 120.35 \text{ in}^3$$

$$F = 0.28390$$

Experiment 4

①	411 2157 10399 311 2197 10453 211 2190 10443 111 2161 10364	②	412 (2468) 5224 2472 2292 3189 10485 212 2176 10479 112 2163 10352	③	413 2289 5221 2470 5247 313 2195 10481 213 2196 10478 113 2160 10340	④	414 2182 10391 314 2202 10444 214 2167 10438 114 2175 10369
⑤	421 2454 5252 2455 5223 221 2193 10461 221 2180 10505 121 2456 5252 2457 5222	⑥	422 2166 10421 322 2165 10510 222 2201 10533 122 2181 10420	⑦	423 2177 10423 323 2203 10513 223 2183 10526 123 2185 10425	⑧	424 2452 5262 2453 5204 324 2155 10462 224 2156 10498 124 2473 5210 2288 5259
⑨	431 2460 5250 2461 5223 331 2152 10468 231 2148 10489 131 2463 5258 2464 5219	⑩	432 2164 10407 332 2199 10522 232 2172 10505 132 2184 10403	⑪	433 2169 10408 333 2162 10517 233 2194 10505 133 2462 5237 2474 5234	⑫	434 2466 5252 2469 5217 334 2158 10467 234 2170 10490 134 2467 5251 2290 5213
⑬	441 2198 10394 341 2200 10460 241 2173 10428 141 2159 10377	⑭	442 2459 5244 2471 5226 342 2178 10492 242 2204 10480 142 2186 10363	⑮	443 2287 5227 2451 5242 343 2179 10494 243 2205 10474 143 2191 10359	⑯	444 2187 10385 344 2154 10454 244 2153 10418 144 2192 10383

ave of 10.434 kgU(92.2)/unit



Experiment 4

Instrument Check on 6-11-63 Source 10 meV

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock 2436
IC-3		Calibration			
IC-4	Responds	Calibration	JH		
CRM		Meter Trip			

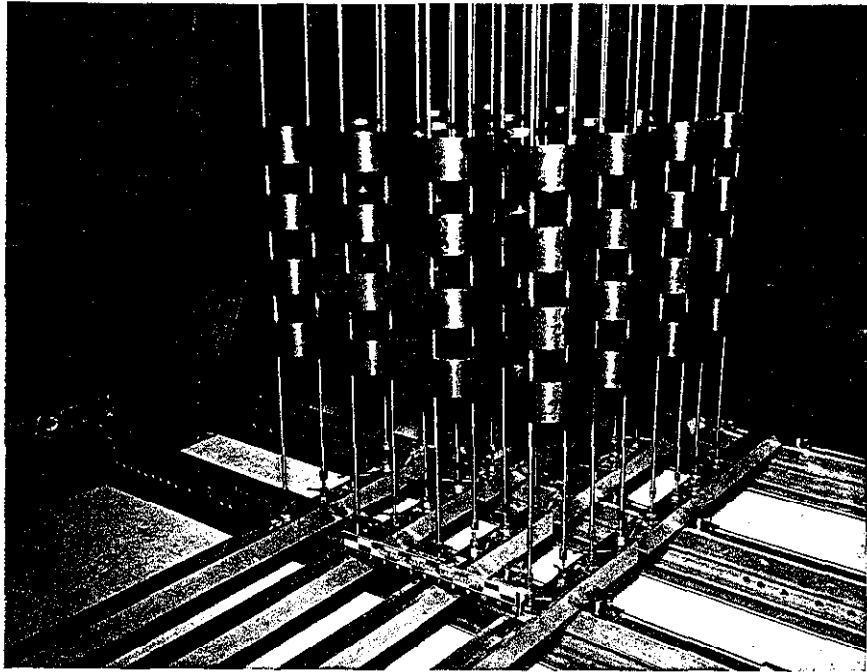
67 units $R_{\text{y}} \approx 0.93 \cdot 2 / \text{unit}$ unreflected $SFS = 1.750''$
 $R < 1$; more than 1-

Instrument Check on 6-12-63 Source 10 meV

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock 2437
IC-3		Calibration			H-250
IC-4	Responds	Calibration	JH		check list ✓
CRM		Meter Trip			

Have moved 715 planes closer by $0.125''$

$R < 1$ by more than 1-



Experiment 4

Instrument Check on 6-13-63 Source 10 mc Y

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	53×10^{-4}	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock - 2438
IC-3		Calibration			H-230
IC-4	Responds	Calibration	JIT		check list ✓
CRM		Meter Trip			

Reset spacing to $1.656''$ $k < 1$ more than $1 -$ Moved N-S planes $.065''$ closer and outer E-W planes $.065''$ closer. $k < 1$ more than $1 -$ Reset spacing to $1 \frac{1}{16}$ Instrument Check on 6-24-63 Source 10 mc Y

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock 2438
IC-3		Calibration			H-230
IC-4	Responds	Calibration	JIT		check list ✓
CRM		Meter Trip			

 $k \leq 1$ req period 12.62 sec. $P = 11.2 \times 10^{-4}$ $17.3 f$ Summary 64 units; $10.434 \text{ Kg U}^{(93.2)}$ /unit

Unreflected

S.T.S. = $1.556 \pm 0.005 \text{ in.}$ 3.952 cm. $V_L = 136.1568 \text{ in}^3$ $F = 0.25094$ $V_L = 2.22315 \text{ L}$ $\rho = 4.693$

Subassemblies

1/ 211
2204 10480

2/ 212
2168 10489

111
2176 10479

21
112
2193 10471

221
3/ 2189 10485

222
2195 10481

121
2205 10474

122
2196 10478

ave 10.480 kg U/unit



Experiment 5

8 units $10.480 \text{ kg} (493.2) / \text{unit}$ in 6-in-thick paraffin refl. $STB = 1.500''$

Instrument Check on 8-2-63 source 10 met

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	2.3×10^{-11}	Meter Trip	OK	Fast Trip	OK
IC-2	2.2×10^{-11}	Meter Trip	OK		(lock 2458)
IC-3	Responds	Calibration	711		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$k \approx 1$ negative period of 99.6 sec at closure. (-17.9%)

Cf series I pp. 56-57

take $k=1$ at $1.455 \pm 0.010 \text{ in.}$ } $V_L = 128.057 \text{ in}^3$
 3.696 cm } $F = 0.26681$
 $V_L = 2.09793 \text{ L}$ } $\rho = 4.9958 \text{ g/cc}$

Experiment 6

Unit arrangement same as Exp 2 p 6.

p 23

Comparison of 6-in. thicknesses of paraffin and plexiglas show that within the ability to locate reflector the two thickness are the same in effectiveness

EXPERIMENT 6

Instrument Check on 8-5-63 Source Co mcs

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2458
IC-3	Responds	Calibration	JT		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

27 units 10.48 kg U(93.2)/unit in Six-in-thick paraffin Reflector. STS = 2.750 in. 3. "

$\rho = 12.3 \times 10^{-4}$
 $k > 1$ positive period 38.84 sec. 3.165 in ($1 \frac{1}{2}$ ft/m, 29.90 Revs)
 $k \approx 1$ at 3.270 in (30.40 Revs)

Reset spacing to 3.750" $k \ll 1$.

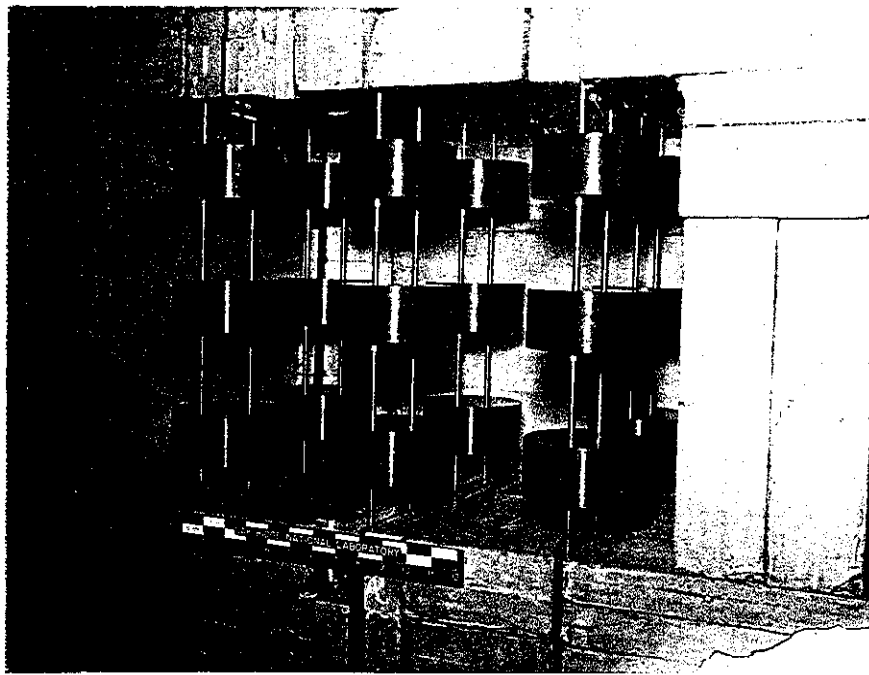
8/7/63

Reset Spacing to 3.500"

Instrument Check on 8-7-63 Source Co mcs

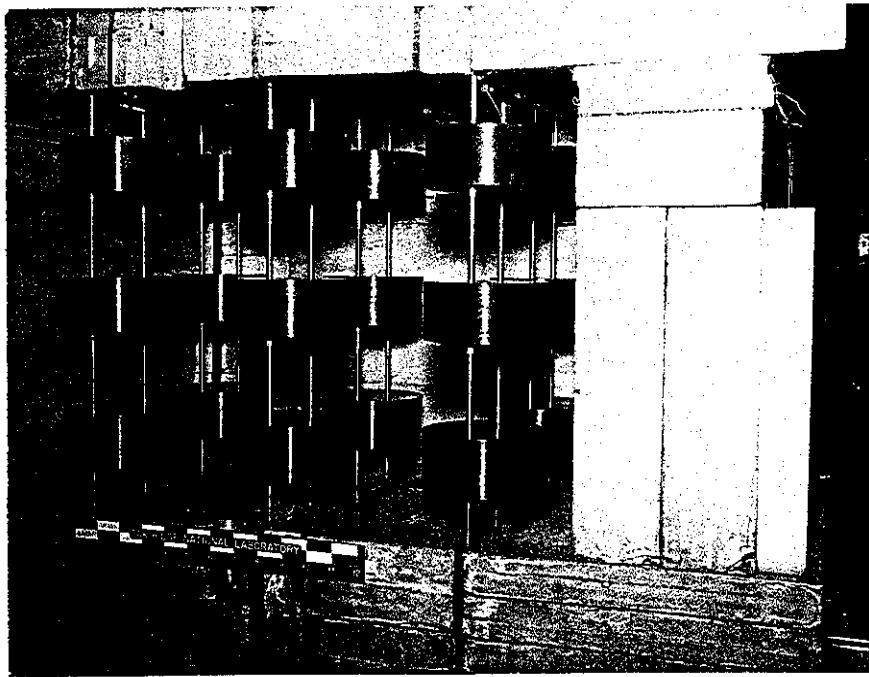
PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2459
IC-3	Responds	Calibration	JT		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$k \ll 1$.



27

A p23



B p23

Experiment 6

Reset spacing to 3.250" 6-in-thick paraffin.

Instrument Check on 8-8-63 Source 10mcY

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2458
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$k > 1$ positive period ~58.93 sec 0.207 (13.80 Revs)
 $k = 1$ 6.090 (14.55 Revs)

Instrument Check on 8-9-63 Source 10mcY

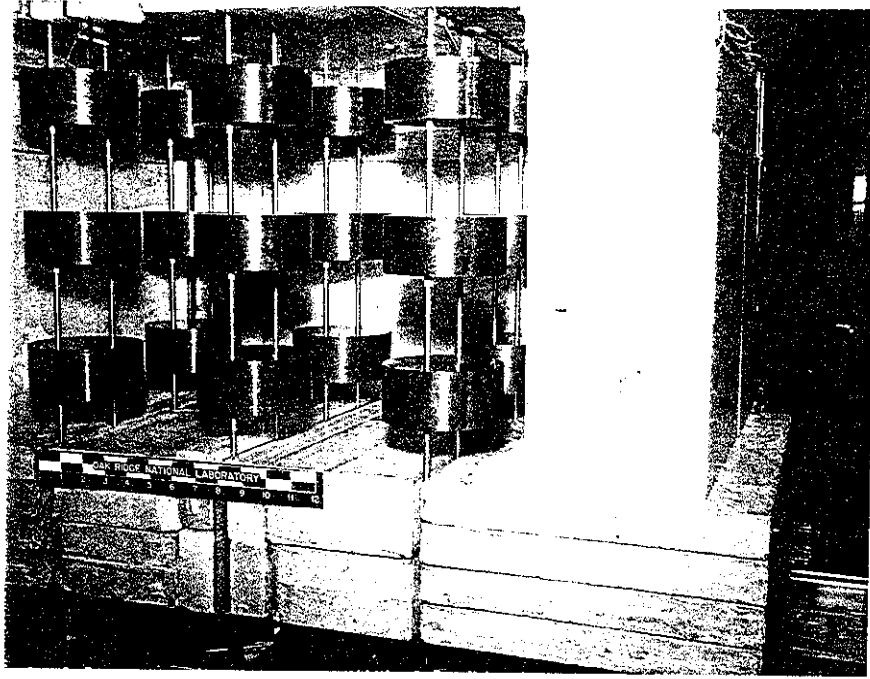
PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2459
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

Reset spacing to 3.375"

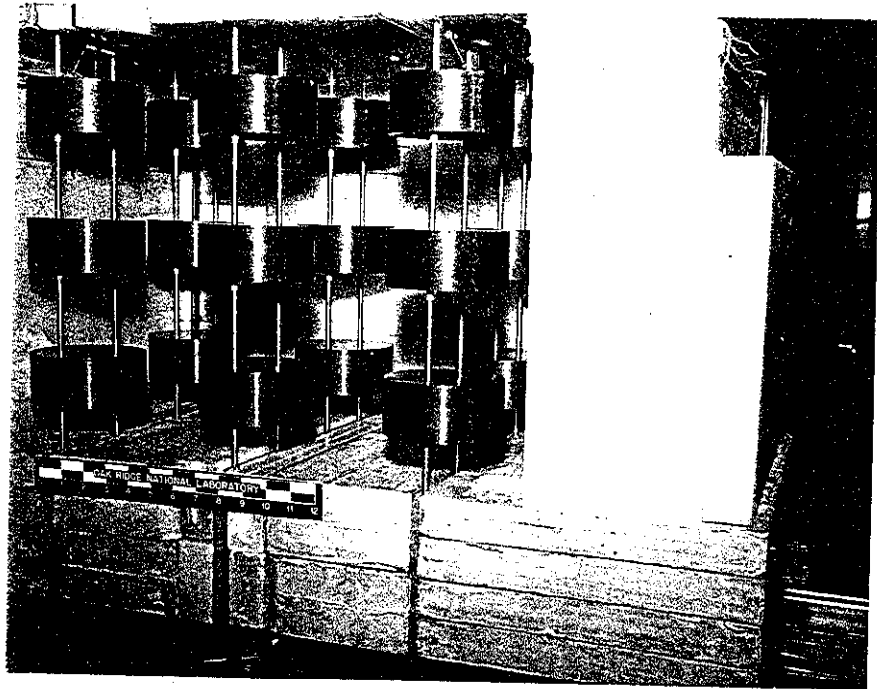
$k > 1$ positive period 67.115 sec 0.207 (4.0 Revs)
 $k = 1$ 0.362 (5.1 Revs)

Have placed a 12x18x1/2-in slab of paraffin on west side of fixed table.

$k > 1$ positive period 58.59 sec $\frac{.43}{.23}$ (4.0 Revs)
 $k = 1$ ~9.1



C p23



D p23

Experiment 6

Have removed paraffin slab

$k > 1$	positive period	21.65 sec	0.207	(4.0 Rev)
---------	-----------------	-----------	-------	-----------

$k = 1$				(7.3 Rev)
---------	--	--	--	-----------

Upper reflector support sagged during experiment. Have added 4 - one inch "C" clamps to hold supporting plexiglas.

Return to original conditions

A	A:	$k > 1$	positive period	143.91 sec	0.207 in.	(4.0 Revs.)
---	----	---------	-----------------	------------	-----------	-------------

		$k = 1$		0.316 in.		(5.29 Revs.)
--	--	---------	--	-----------	--	--------------

Add $12 \times 18 \times \frac{1}{2}$ in slab of paraffin as before.

B:	$k > 1$	positive period	130.54 sec	0.207 in.	(4.0 Revs.)
----	---------	-----------------	------------	-----------	-------------

	$k = 1$		0.320 in.		(5.34 Revs.)
--	---------	--	-----------	--	--------------

Removed slab at $k = 1$ no change in level. \rightarrow (0.320 in.)

Have replaced $6 \times 12 \times 18$ in slab of paraffin on west face of fixed table by $6 \times 12 \times 18$ in slab of polyethylene.

C:	$k > 1$	positive period	156.01 sec	0.207 in.	(4.0 Revs.)
----	---------	-----------------	------------	-----------	-------------

	$k = 1$				(5.30 Revs.)
--	---------	--	--	--	--------------

Have added slab of paraffin to west face of polyethylene.

D:	$k > 1$	positive period	153.45 sec	0.207	(4.0 Revs.)
----	---------	-----------------	------------	-------	-------------

	$k = 1$				(5.30 Revs.)
--	---------	--	--	--	--------------

Removed slab at $k = 1$ no change in level 5.30 Revs.

Summary 27 units 10.484 kg (93.2)/unit

6-in-thick paraffin refl.

STS = 3.421 ± 0.010 in

8.689 cm

 $V_L = 5.74039 \text{ L}$ $R = 1.826 \text{ }^\circ\text{K}^2/\text{cc}$ $V_L = 350.2932 \text{ in}^3$ $F = 0.09754$

Exps. 7

Unit arrangement same as Exps. 2 and 6

Experiment 7

27 $10.480 \text{ R}_g \mu/\text{unit}$; 3-in-thick Paraffin Reflector STS = 3.1875 in.Instrument Check on 8-19-63 Source 10 meV

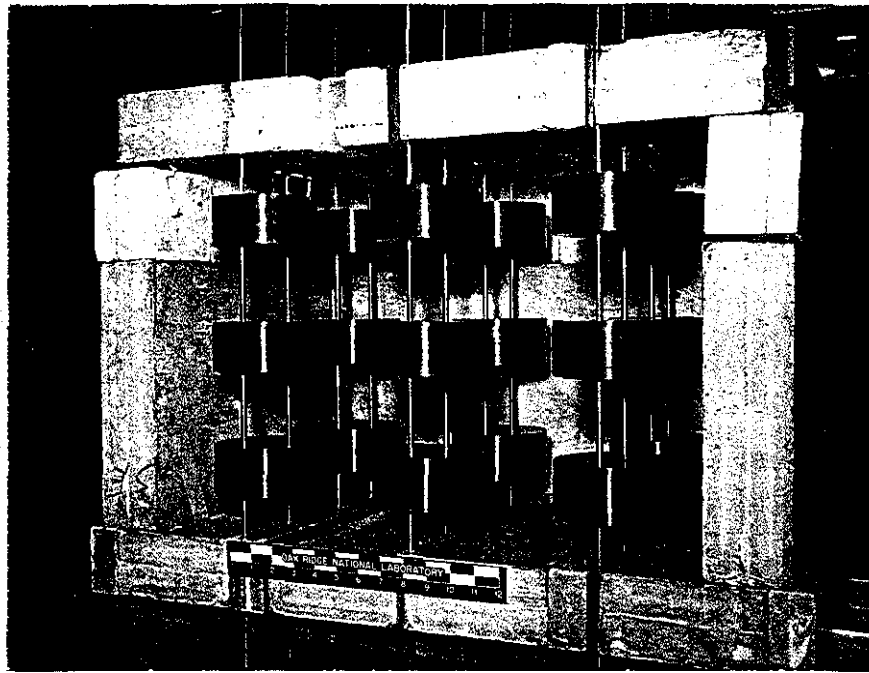
PM-1	Low, Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2461
IC-3	Responds	Calibration	511		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$e = 9.3 \times 10^{-12}$ $k > 1$ positive period of $\sim 59.21 \text{ sec}$ at 40.34 in. (5.78 Revs.)
 $k = 1$ at 40.40 in. (6.60 Revs.)

Increased width of bottom reflector by 6-in. i.e. have added two strips $3 \times 6 \times 18 \text{ in.}$ on E+W sides of fixed table.

$e = 9.3 \times 10^{-12}$ $k > 1$ positive period of $\sim 59.21 \text{ sec}$ at 40.34 in. (5.78 Revs.)
 $k = 1$ at 40.40 in. (6.60 Revs.)

$k = 1$ at zero separation, by extrapolation, when STS = $3.250 \pm 0.010 \text{ in.}$



e-

EXPERIMENT 7

Reset spacing to $3\frac{17}{64}$ Instrument Check on 8-22-63 Source 10 mcV

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock-2462
IC-3	Responds	Calibration	JII		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$$r = -806 \times 10^{-4}$$

$$k \approx 1, \text{ negative period of } 146.1 \text{ sec at closure.}$$

Summary:

27 units

10.484 kg U(93.2) per unit

3-in-thick paraffin reflector

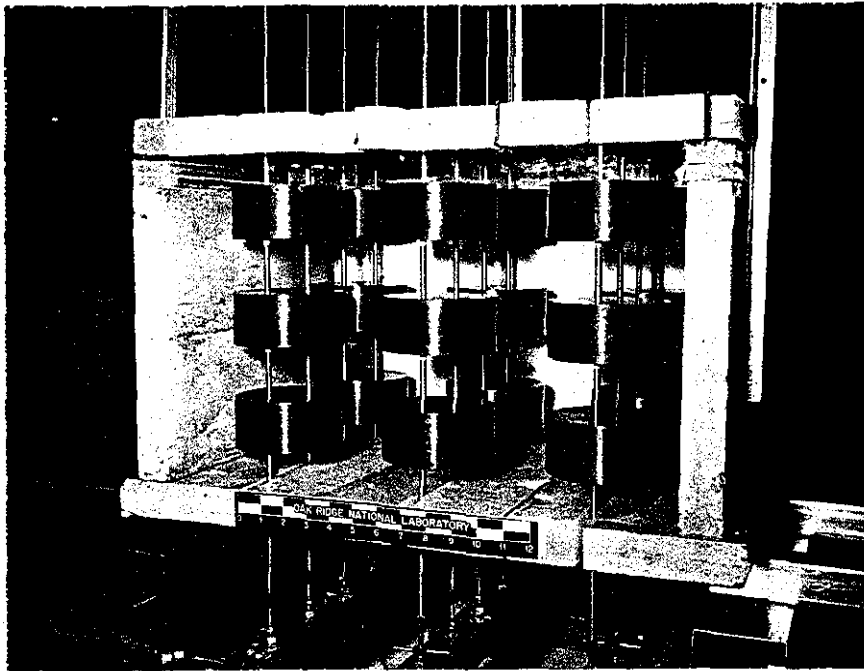
STS = 3.251 ± 0.010 in.

8.258 mm

 $V_L = 5.32962 \text{ L}$ $P = 1.967 \text{ g/cc}$

$$V_L = 325.1816 \text{ in}^3$$

$$F = 0.10507$$



$\rho = 7.75$

1

8

Summary: 27 units 10.484 kg (93.2)/unit
 1/2-in-thick paraffin refl.
 STS = 2.312 \pm 0.010 in.
 5.872 cm

$$V_c = 207.475 \text{ in}^3$$

$$F = 16468$$

$$V_L = 3.39982 \text{ L} \quad \rho = 3.085 \text{ g/cc}$$

$\rho = 7.75$

EXPERIMENT 8

27 - 10.484 kg U/unit in $1\frac{1}{2}$ " - thick - paraffin reflector STS = 2.25"

Instrument Check on 8-26-63 Source 10 mc 8

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock 2463
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

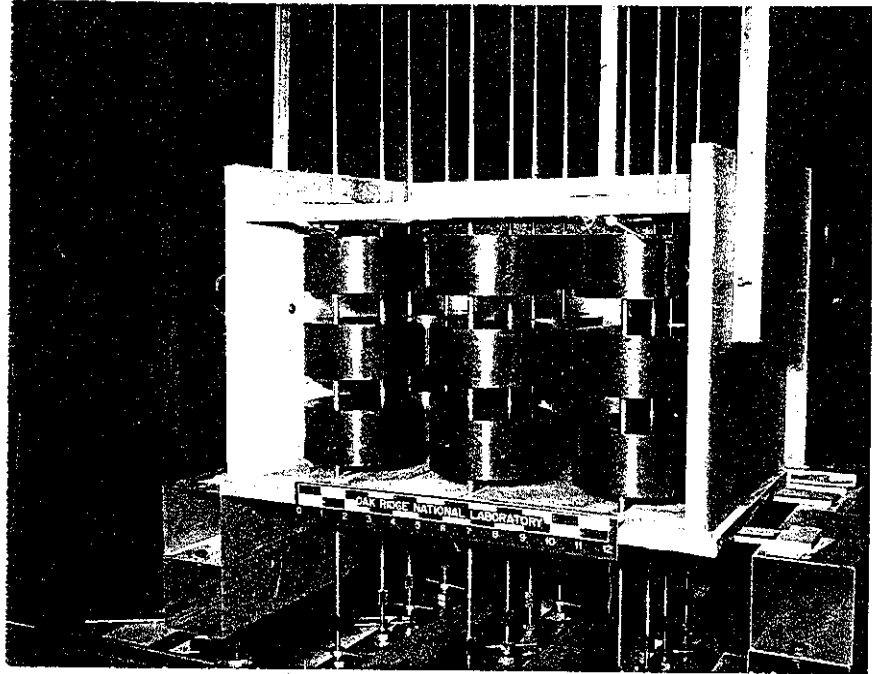
$\rho = 2.85 \times 10^{-12}$ $k > 1$ positive period of 73.87 sec at 0.146 in. (3.00 Revs)
 $k = 1$ at 0.179 in. table separation (3.68 Revs.)
 $\Delta = .043"$ $2.89 \text{ } \mu\text{in}$

8/27/63 Reset spacing to $2\frac{9}{64}$ " = 2.28125"
 Instrument Check on 8-27-63 Source 10 mc 8

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock 2463
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$\rho = 2.7 \times 10^{-12}$ $k > 1$ positive period of 77.05 sec at 0.032 in. (1.00 Revs)
 $k = 1$ at 0.088 in. (2.14 Revs.)
 $\Delta = .056 \text{ in.}$

$k = 1$ at 2.312



Experiment 9

27 - 10.484 kg U(93.2)/unit, $\frac{1}{2}$ -in-thick paraffin reflector STS = 1.1875 in

Instrument Check on 8-28-63 Source 10mcV

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock-2463
IC-3	Responds	Calibration	OK		M-230
IC-4		Calibration			Check list ✓
CRM		Meter Trip			

$k \approx 1$ ≈ 1

have covered cracks in tape reflector by $\frac{1}{16}$ "-thick plexyglas - those (3) remaining in bottom reflector not covered.

$k \approx 1$ negative period of ≈ 130 sec. at closure

$V = 107.45 \text{ in}^3$ take STS₁ = 1.178 in for $k=1$ and $\frac{1}{2}$ -in-thick paraffin reflector.
 $F = 0.31799$

Summary

27 units

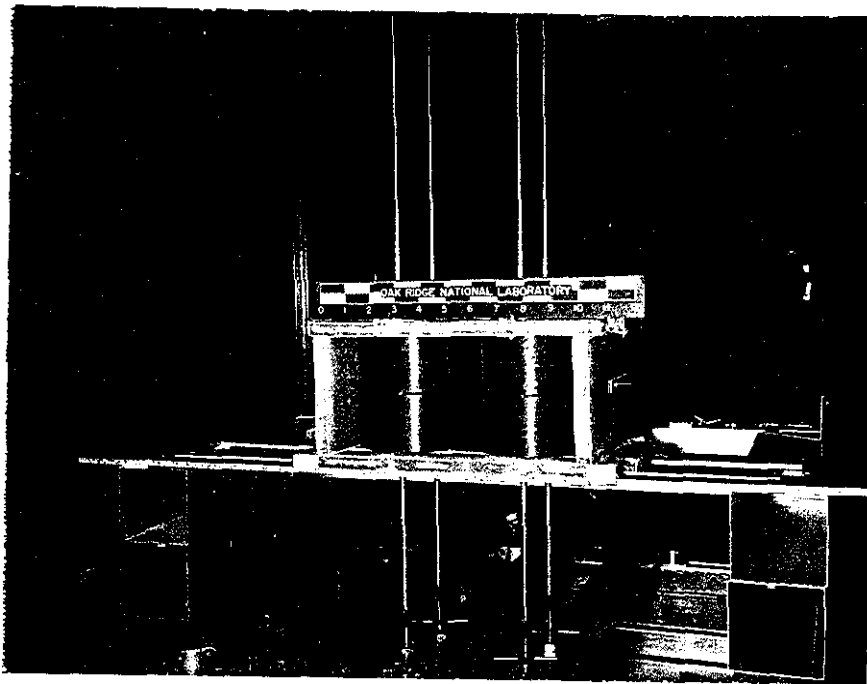
-10.484 kg U(93.2)/unit

$\frac{1}{2}$ -in-thick Paraffin Reflector

STS = 1.178 \pm 0.010 in.

2.992 cm

$V_L = 1.76087 \text{ L. } P = 5954$



EXPERIMENT 10

8 - 10.480 kg U units, $\frac{1}{2}$ -in-thick paraffin reflector STS = $5/32$ "

Instrument Check on 8-29-63 Source 10 meV

N-1	Low Trip	OK	Alarm Trip	OK	
N-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock - 2464
IC-3	Responds	Calibration	JII		H-230
IC-4		Calibration			check list ✓
M		Meter Trip			

$R \ll 1$.

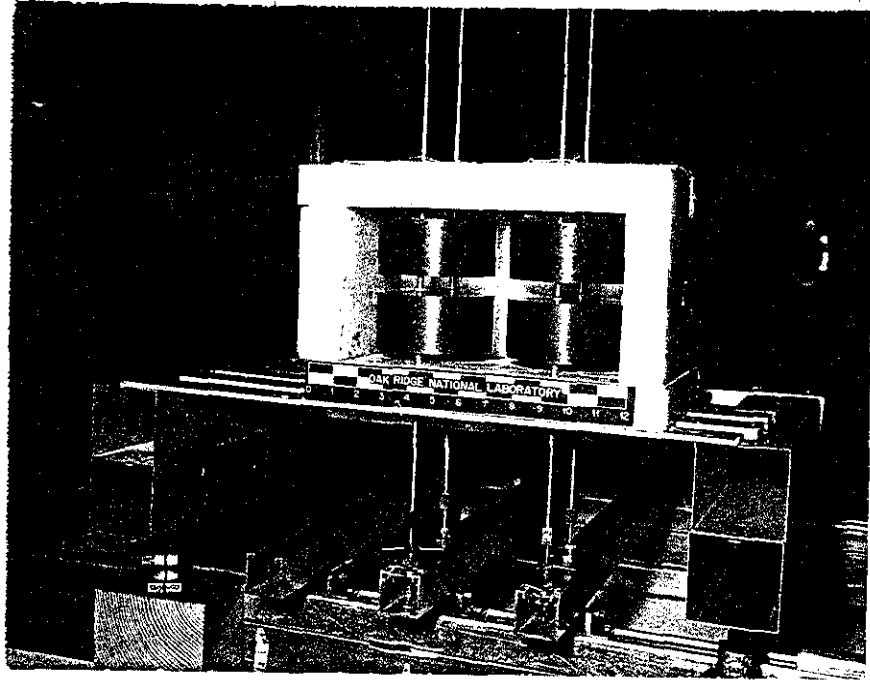
8-30-63 Changed spacing to $3/32$ "

Instrument Check on 8-30-63 Source 10 meV

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2465
IC-3	Responds	Calibration	JII		H-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$R \approx 1$ negative period of 194.8 sec. at closure
bottom reflector has $4/16$ " gap.

Summary:	8 units, 10.480 kg (493.2)/unit	$V_L = 47.171 \text{ in}^3$
	$\frac{1}{2}$ -in-thick paraffin reflector	$F = .72434$
	STS = $0.090 \pm 0.005 \text{ in}$	
	0.229 cm	
	$V_L = 0.17269 \text{ L}$	$\rho = 13.563 \text{ g/cc}$



EXPERIMENT 11

Instrument Check on 9-9-63 Source 10mc

M-1	Low Trip	OK	Alarm Trip	OK	
M-2			Alarm Trip	OK	
C-1	$> 5 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
C-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock 2466
C-3	Responds	Calibration	JN		M-230
C-4		Calibration			check list ✓
MEM		Meter Trip			

8 units in a 1.5"-thick paraffin reflector S.T.S. = $47/64$

k=1 positive period 52.22 sec at 0.083 in. (1.90 Revs)

R=1 at 0.105 in. (2.35 Revs)

Summary

8 units

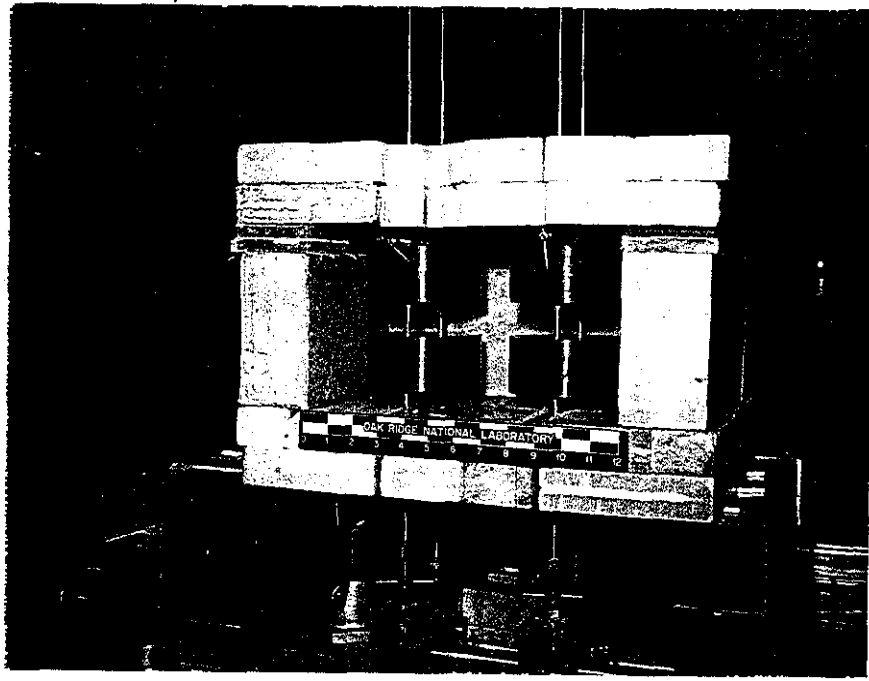
10.780 kg U(93.2)/unit

1 1/2"-thick paraffin reflector

S.T.S. = 0.180 ± 0.010 in.

1.981 cm

 $V_c = 1.7339322$ $\rho = 7.825 \text{ g/cc}$ $V_c = 81.77$ $F = 41785$



EXPERIMENT 12

8 units, 10.480 kg (493.2)/unit 3-in-thick paraffin reflector STS = $1\frac{11}{32}$

Instrument Check on 9-9-63 Source 10 mc ✓

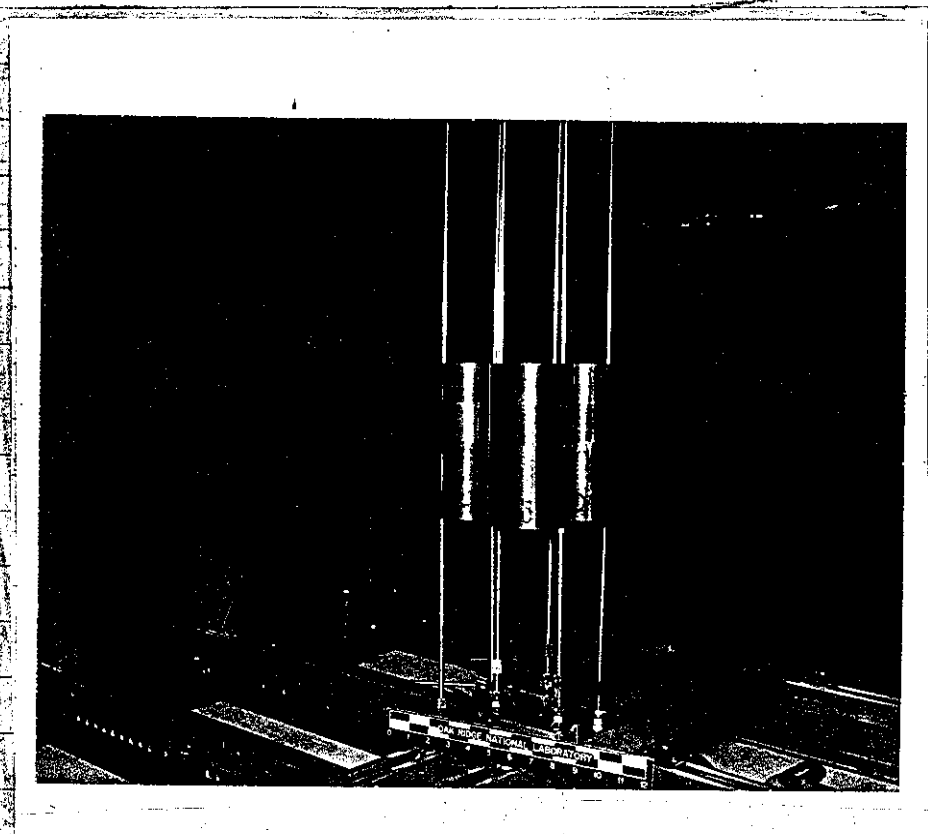
PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2		OK	Alarm Trip	OK	
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		clock 2466
IC-3	responds	Calibration	JH		M-230
IC-4		Calibration			checked ✓
CRM		Meter Trip			

¹⁹⁴
 $k > 1$ positive period 39.48 sec at 0 in. (0.00 Revs)
 top came together before bottom. Reading for $k=2$ not representative
 $k=1$ at .123 in. at table base - Top speed (2.75 Revs)
 take ave. to be ~ 0.040 in.

Summary: 8 units
 10.480 kg (493.2) per unit
 3-in-thick paraffin reflector
 STS = 1.345 ± 0.010 in.
 3.416 cm

$V_L = 119.597$
 $F = .28569$

$V_L = 1.95902 \text{ L}$ $f = 5.350 \text{ 7/16}$



Subcritical in contact : $M \approx 10$

①	211	②	212		
	2326		2384		
	2300		2317		
	111		112	①	②
	2315		2283		
	2313		2281		
			222	③	④
③	221	④	2574		
	2306		2431		
	2312				
	121		122		
	2302		2484		
	2316		2276		

EXPERIMENT 13

8 units 10.507 kg (493.2) per unit unreflected $STS = \frac{5}{89}$

Instrument Check on 9-18-63 Source 10 mcγ

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2470
IC-3	Responds	Calibration	JN		M-23
IC-4		Calibration			check list ✓
CRM		Meter Trip			

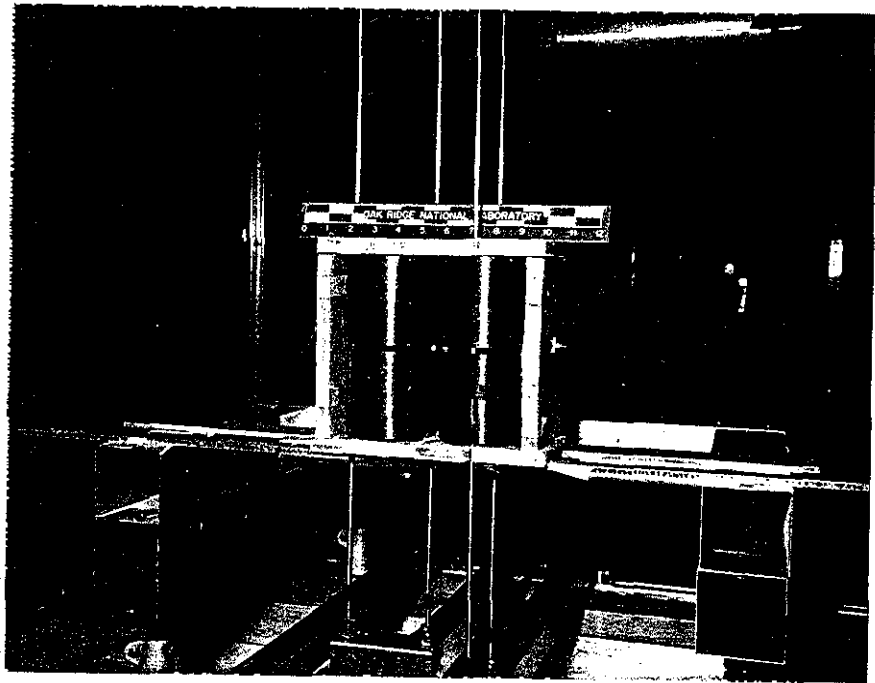
$R < 1$, $M \sim 3$ at closure IC-2: 6.3 on 10×10^{-12} scale

Moved E-W surfaces into contact.

$R < 1$ $M \sim 3$ at closure IC-2: 6.9 on 10×10^{-12} scale

STS = 0

$R < 1$ $M \sim 10$ IC-2: 2.9 on 10×10^{-11} scale



EXPERIMENT 1A

8 units 10.507 kg U(93.2) per unit, 1/2-in-thick paraffin reflector STS 5/32"

Instrument Check on 9-20-63 Source 10 mc 8

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	> 3 x 10 ⁻⁴	Meter Trip	OK	Fast Trip	OK
IC-2	> 3 x 10 ⁻⁴	Meter Trip	OK		clock 2470
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$k \geq 1$ positive period ^{16.54} 47.8 sec at 0.256 in. (4.80 Revs)

$k = 1$ 0.0265 ₁₅₆ (5.09 Revs)

9-23-63 Reset spacing to 7/32 219

Instrument Check on 9-23-63 Source 10 mc 8

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	> 3 x 10 ⁻⁴	Meter Trip	OK	Fast Trip	OK
IC-2	> 3 x 10 ⁻⁴	Meter Trip	OK		clock 2471
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$k > 1$ positive period ^{17.94} of 42.2 sec at 0.032 (1.00 Revs)

$k = 1$ 0.068 ₁₅₆ 4.97 \$/in (1.79 Revs)

Summary 8 units
 10.507 kg U(93.2) per unit
 1/2-in-thick paraffin reflector
 STS = 0.237 ± 0.010 in
 0.602 cm

$V_L = 0.87290 L$
 $\rho = 12.037 \text{ g/cc}$

①	211 2306 5246 -2312 5261 111 2302 5247 2316 5260	②	212 2317 5263 2384 5267 112 2283 5248 2281 5259	③	213 2326 5241 2300 5265 113 2315 5250 2313 5258	④	214 2574 5253 2431 5254 114 2434 5258 2276 5254
---	-----------------------------------------------------------------	---	----------------------------------------------------------------	---	----------------------------------------------------------------	---	----------------------------------------------------------------

ave 10.507

① ②
③ ④

EXPERIMENT 15

8 units, 20.507 kg U(93.2)/unit $1\frac{1}{2}$ -in-thick paraffin refl. STT 1⁵/₃₂Instrument Check on 9-24-63 Source 10 mcd

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2471
IC-3	Responds	Calibration	OK		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

 $k < 1$

(0.00 Rms)

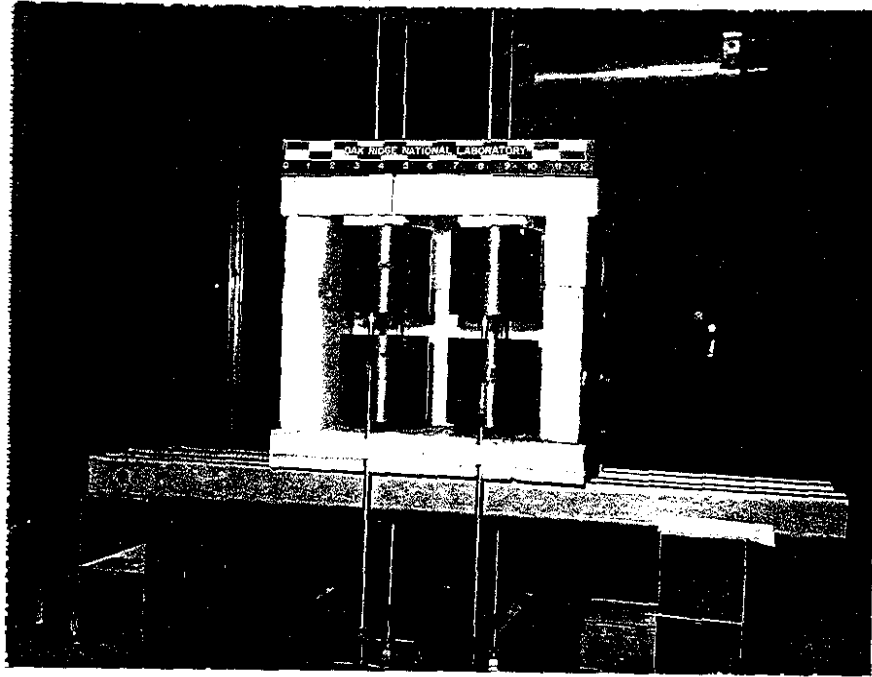
Reset spacing to 1.00"

Instrument Check on 9-25-63 Source 10 mcd

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2472
IC-3	Responds	Calibration	OK		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

 $k < 1$

(0.00 Rms)



EXPERIMENT 15.

9/28/03

Reset spacing to $29/32$ "

$R=1$ positive period 43.94 sec at 0.127 in. 17.464 (2.69 Revs)
 $R=2$ at 0.155 in. 624 #/in. (3.15 Revs)

Summary

8 units

10.507 kg (43.2) per unit

 $1\frac{1}{2}$ -in-thick Reflector, paraffinSTS = $0.930 \pm 0.010 \text{ in}$

2.362 cm

$$V_L = 88.46533 \text{ in}^3$$

$$F = 38903$$

$$V_L = 1.449.58 \text{ L} \quad \rho = 7.248 \text{ g/cc}$$

Unit arrangement same as experiment 15.

Experiment 16

8 units 10.507 kg U(C23.2) / unit 3 3 in-thick paraffin reflecta STS = 1 1/2

Instrument Check on 8-26-63 Source 10mcX

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock	2473
IC-3	Responds	Calibration	JT	Source	M-230
IC-4		Calibration		check list	✓
CRM		Meter Trip			

$R > 1$ positive period 61.1 sec at 0.370 in. (6.10 Revs) ^{13.93}

$R = 1$ at 0.390 in. 6.97 f/in. (6.50 Revs)

Changed spacing to 1.516"

$R > 1$ positive period 62.9 sec at 0.260 (4.90 Revs) ^{15.44}

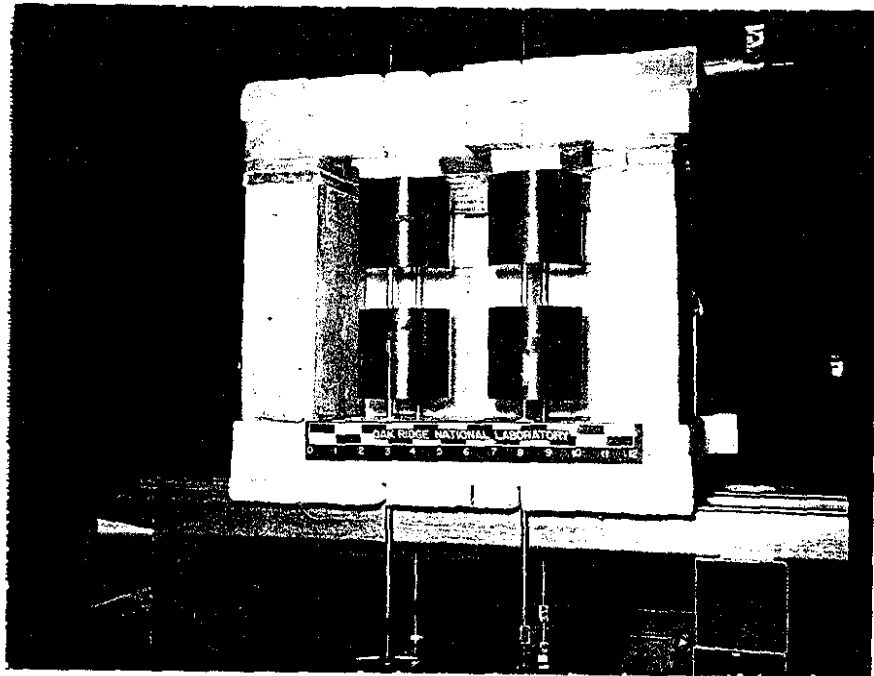
$R = 1$ 0.302 3.67 f/in. (5.45 Revs)

Instrument Check on 9-27-63 Source 10mcX

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock	2473
IC-3	Responds	Calibration	JT	Source	M-23
IC-4		Calibration		check list	✓
CRM		Meter Trip			

Reset spacing to 1 1/16"

$R < 1$ (0.00 Revs)



EXPERIMENT 16

$\rho = 10.507 \text{ kg (1193.2) per unit}$, 3-in-thick paraffin reflector $STS = 1.563$

Instrument Check on 9-30-63 Source 10mcT

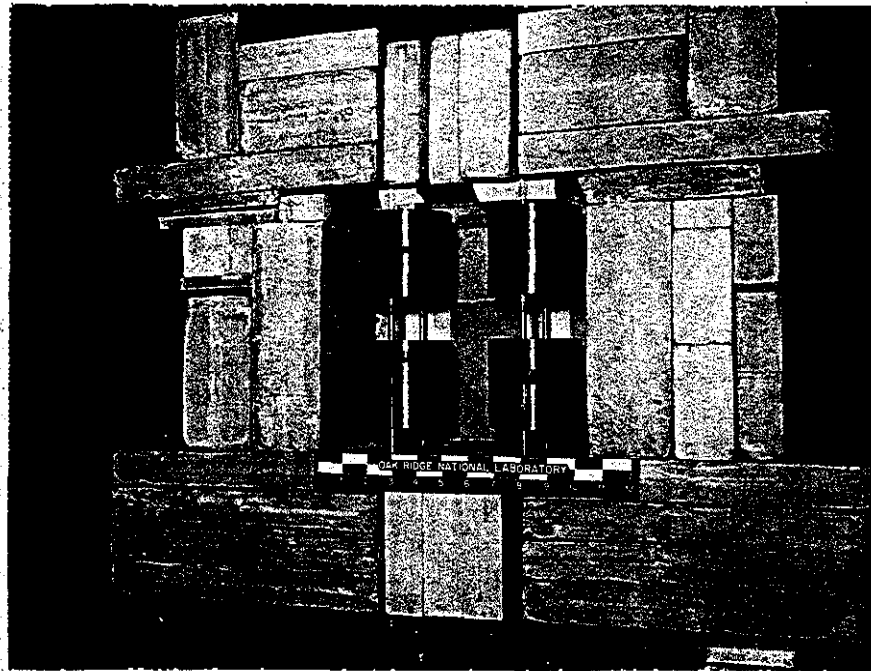
PM-1	Low Trip	OK	Alarm Trip	OK
PH-2			Alarm Trip	OK
IC-1	$> 3 \times 10^{-4}$	Meter Trip	OK	Fast Trip
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK	clock 2974
IC-3	Respond	Calibration	JIT	H-230
IC-4		Calibration		check list ✓
CRM		Meter Trip		

$k > 1$ positive period 2.574 at closure (0.00 Revs)
 $k = 1$ ≈ 0.025 reflector closed on top and sides (0.86 Revs)

Summary
8 units
10.507 kg (1193.2) per unit
3-in-thick paraffin reflector
$STS = 1.563 \pm 0.010$

$V_L = 131.78649$
 $F = .26115$
 $\rho = .0808 \text{ g/cc}$

3.970 mm
 $V_L = 2.15955 \text{ l.}$ $\rho = 4.865 \text{ g/cc}$



Experiment 17

8 units 10.507 kg U(93.2)/unit 6-in-thick paraffin reflector STS = 1.66

Instrument Check on 9-30-63 Source 10 mcd

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-21}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-4}$	Meter Trip	OK		Clock 2474
IC-3	Responds	Calibration	JIT		M-230
IC-4		Calibration			Check list ✓
CRM		Meter Trip			

$k > 1$ positive period 102.5 ^{9.479} sec at closure (0.00 Revs)
 $k = 1$ 0.063 in. refl. closed at top. (170 Revs)

$$1.700 \pm 0.010$$

Summary	
8 units	$V_L = 142.39336$
10.507 kg U(93.2) per unit	$F = .24170$
6-in-thick paraffin reflector	$\rho = .074 \text{ g/cm}^3$
STS = 1.696 \pm 0.010 in	

4.308 cm

$V_L = 2.33746 \text{ l.}$ $\rho = 7.5038 \text{ g/cc}$

① 311
 2282 5.220
 2298 5.276
 211
 2571 5.231
 2277 5.270
 111
 2301 5.189
 2307 5.268

② 312
 2328 5.227
 2322 5.271
 312
 2280 5.234
 2278 5.266
 112
 2279 5.219
 2327 5.277

③ 313
 2320 5.189
 2286 5.286
 213
 2432 5.232
 2304 5.268
 113
 2284 5.195
 2285 5.247

④ 321
 2302 5.227
 2316 5.260
 221
 2384 5.244
 2317 5.263
 121
 2306 5.246
 2312 5.261

⑤ 322
 2325 5.251
 2423 5.258
 221
 2310 5.244
 2305 5.265
 122
 2315 5.250
 2313 5.258

⑥ 323
 2283 5.248
 2281 5.257
 222
 2574 5.253
 2431 5.254
 2434 5.253
 2276 5.254

⑦ 331
 2293 5.104
 2324 5.302
 231
 2323 5.214
 2572 5.286
 2294 5.130
 2309 5.292

⑧ 332
 2383 5.238
 2308 5.266
 231
 2326 5.241
 2300 5.265
 131
 2299 5.236
 2314 5.247

⑨ 333
 2297 5.131
 2318 5.290
 233
 2303 5.221
 2275 5.280
 133
 2311 5.160
 2319 5.290

Ave. 10.4894 k/d
 Unit

EXPERIMENT 18

28-units 10.4894 kg U(93.2) per unit Unreflected S.T.S = 1 31/32"

Instrument Check on 10/14/63 Source 10mc

PM-1	Low Trip	OK	Alarm Trip	OK
PM-2			Alarm Trip	OK
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock 2481
IC-3	Responds	Calibration	JH	M-230
IC-4		Calibration		check list ✓
CRM		Meter Trip		

Rec 1 - Estimate based on 21 kg units!!

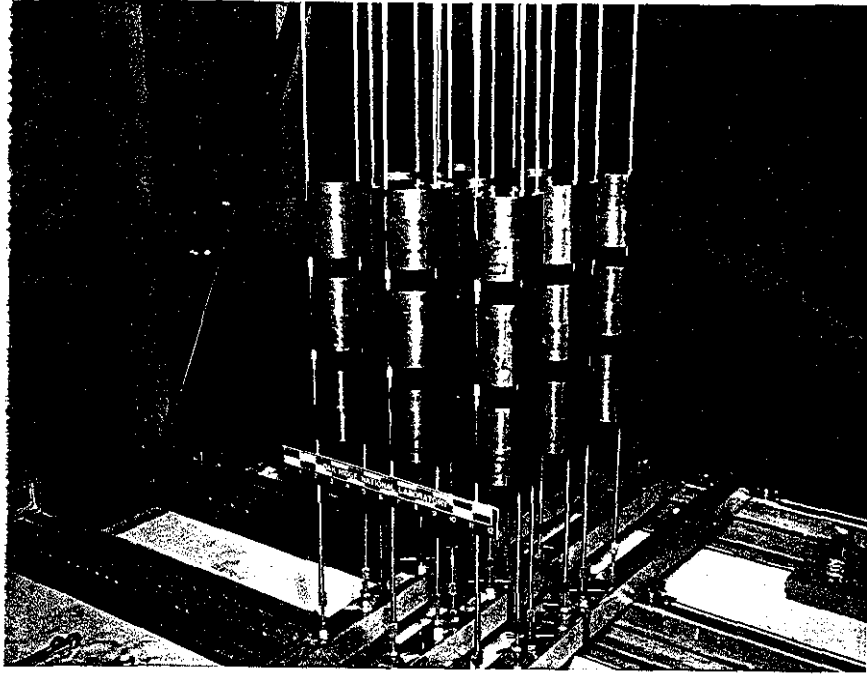
Instrument Check on 10/15/63 Source 10mc

94 kg/unit

PM-1	Low Trip	OK	Alarm Trip	OK
PM-2			Alarm Trip	OK
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock 2481
IC-3	Responds	Calibration	JH	M-230
IC-4		Calibration		check list
CRM		Meter Trip		

Reset spacing to 53/64 in.

k > 1 positive period 16.664 47.1 sec at 1.016 in. (13.80 Revs)
 k = 1 1.060 in. 3.79 1/2 in (14.25 Revs)



[Lined page with horizontal ruling lines]

VI -18

①

2282 220
2298 276

2571 231
2277 270

2301 188
2307 188

②

2328 227
2322 271

2280 234
2278 266

2272
2279 219
2327 277

③

2320 199
2286 286

2432 232
2304 268

2284 195
2285 287

④

2302 227
2316 280

2384 244
2317 263

2306 246
2312 261

⑤

2325 251
2433 258

2310 244
2305 265

2315 250
2313 258

⑥

2283 278
2281 259

2574 253
2431 254

2434 253
2276 254

⑦

2293 104
2324 302

2323 214
2572 286

2294 130
2309 292

⑧

2383 238
2308 266

2326 241
2300 265

2299 236
2314 267

⑨

2297 131
2318 290

2303 221
2275 280

2311 160
2319 280

Ave 10.4894 kg/unit

Experiment 18

27 - 10.489 kg U(93.2) per unit unreflected

STS = $6\frac{1}{64}$ "Instrument Check on 10-15-63 Source 10mcY

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2481
IC-3	Responds	Calibration	✓		U-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$R > 1$ positive period 75.8 sec \Rightarrow 11.9 $\frac{1}{s}$ at 0.032 in (1.00 Revs)

$R = 1$ 0.066 in. $\sim 35^\circ \frac{1}{in}$ (1.75 Revs)

Summary 27 units

10.489 kg U(93.2) per unit

unreflected

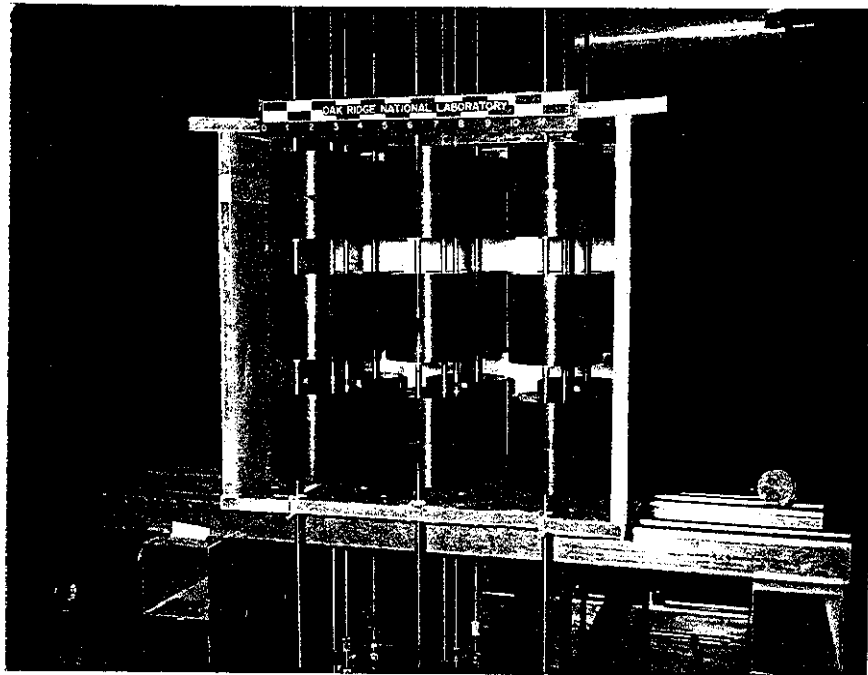
STS = 0.959 in \pm 0.005 in.

2.136 cm

$V_L = 1.47821 \text{ l.}$

$P_{20} = 7.096 \frac{20}{cc}$

$\Rightarrow F = 3.37925$



Experiment 19

27 units 10.489 kgU(93.2) per unit. 1/2-in-thick paraffin refl. STS = 1.23/24

Instrument Check on 10-17-63 Source 10mc

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2482
IC-3	Responds	Calibration	III		M-230
IC-4		Calibration			check list
CRM		Meter Trip			

$R \leq 1$ negative period 143.3 sec $\Rightarrow -12.9 f$ (0.00 Rms)

$-12.9 f \Leftrightarrow \sim 0.010$ in. in STS.

Summary
 27 units
 10.489 kgU(93.2) per unit
 1/2-in-thick paraffin reflector
 STS = 1.349 \pm 0.010 in.
 3.426 cm.

$V_c = 1.8982 L_v$

$P = 5.52586 \frac{eV}{cc}$

$F = 7.29456$

EXPERIMENT 20

27 units 10.489 Kg U(93.2) per unit 1 1/2 in thick paraffin refl. SIS = 1 63/64

Instrument Check on 10/21/63 Source 10 met

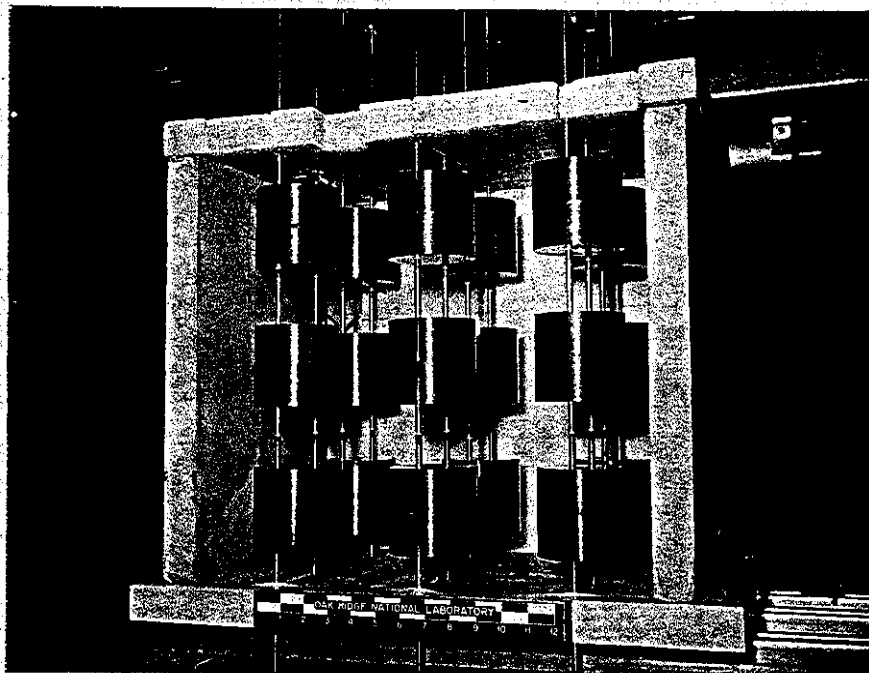
PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK	Clock	2483
IC-3	Responds	Calibration	JIT	M-230	
IC-4		Calibration		checklist	✓
CRM		Meter Trip			

$k > 1$ positive period 129.9 seconds 7.31 ft 8.750" (52.20 Revs)
 $k = 1$ 8.921" (52.58 Revs)
 $D = .141" \Rightarrow 4.557/in$

Two thirds of array very "chirpy" during reflector assembly.

Preliminary Check on 10-25-63

- Room 115 Pressure Differential _____
- Red Light On and Personnel Check _____
- Scrams and Bldg, Alarm Reset _____
- Source Inserted _____ *OK*
- Safety Withdrawn _____
- Controls Set _____
- Reflector Water _____
- Moderator Water _____



Summary

32 units

10.488 kg U(93.2) per unit

1½-in-thick paraffin reflector

STS = 2.590 ± 0.010 in

6.579 cm

$V_c = 3.7492 \text{ l.}$

$\rho_{av} = 2.798 \text{ g/l} \quad F = 0.14914$

Experiment 20
Reset spacing to $2\frac{3}{64}$ - $1\frac{1}{2}$ in - thick paraffin refl.

Instrument Check on 10-23-63 Source 10mc

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2483
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			Check list ✓
CRM		Meter Trip			

positive period $R \geq 1$ 63.9 sec (5.58 Revs)

Box appears closed at top and about $\frac{1}{2}$ distance down sides

$R \geq 1$ 0.358 in (6.15 Revs)

Instrument Check on 10-24-63 Source 10mc

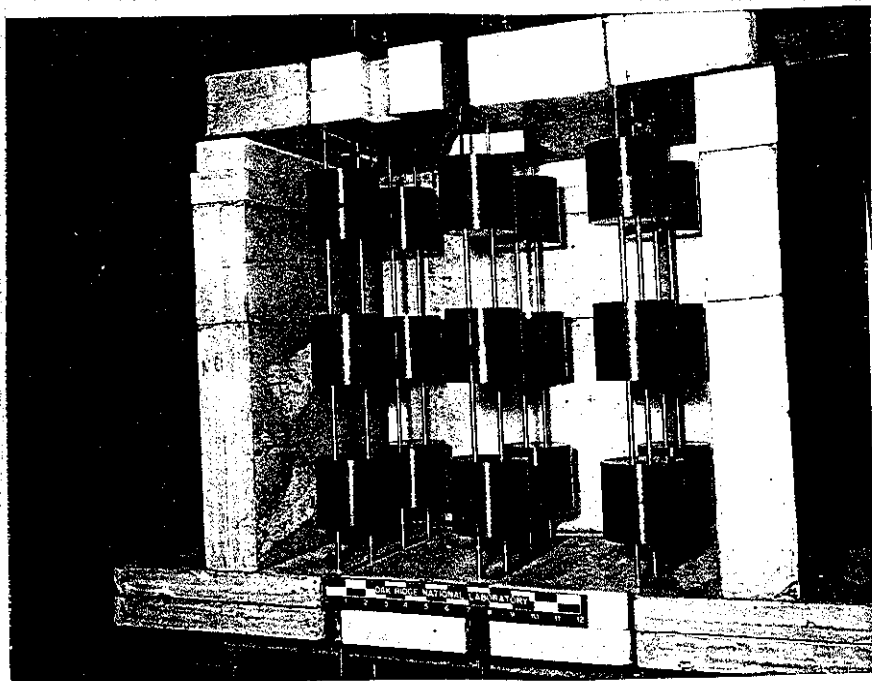
PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2484
IC-3	Responds	Calibration	JH		M-230
IC-4		Calibration			Check list ✓
CRM		Meter Trip			

Reset spacing to $2\frac{3}{64}$

$R \geq 1$ positive period 103.8 at closure. (0.00 Revs)

$R = 1$ Box essentially closed on top and sides. 0.063 in. (1.88 Revs)

$R = 1$ at STS = 2.590



Summary

27 units

10.489 kg U(93.2) per unit

3-in-thick paraffin reflector

STS = 3.550 ± 0.010 in.

= 9.017 cm

$V_L = 5.20605$ l.

$\rho_A = 1.80656$ g/cc

$F = .89630$

EXPERIMENT 21

27 Units; 10.489 kg (43.2) unit 3-in-thick paraffin refl. STS = $3\frac{19}{32}$

Instrument Check on 10-25-63 Source 10 mCi

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2484
IC-3	Responds	Calibration	JII		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

$$k < 1 \text{ by } \sim 1$$

(0.00 Rws)

Instrument Check on 10-28-63 Source 10 mCi

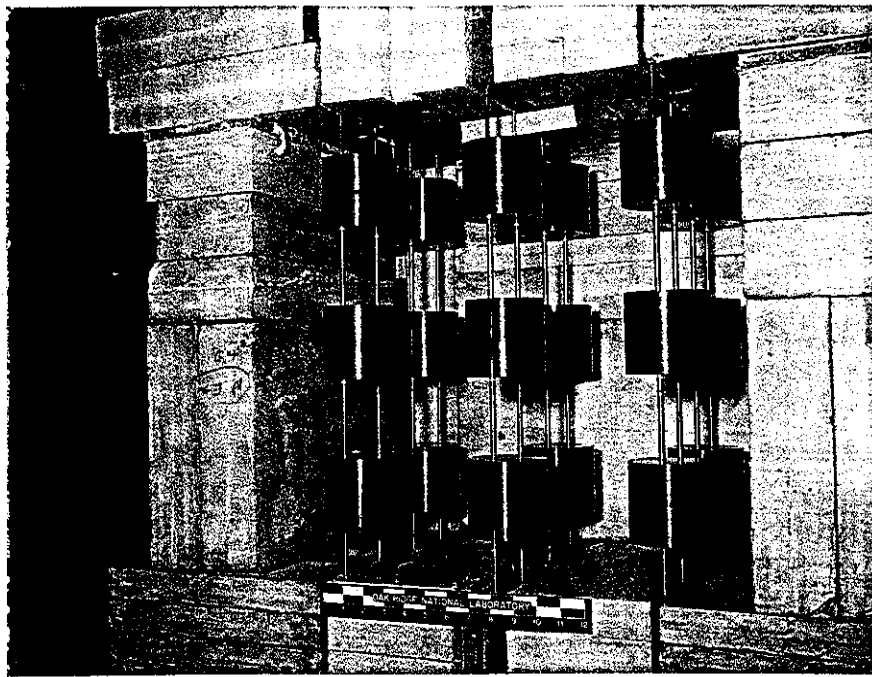
PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		clock 2484
IC-3	Responds	Calibration	JII		M-230
IC-4		Calibration			check list ✓
CRM		Meter Trip			

Reset spacing to $3\frac{9}{16}$ "

$k \approx 1$ negative period of 102.5 sec at closure (0.00 Rws).

$$p = -25.254$$

take $k=1$ for STS = 3.550 ± 0.010 in.



EXPERIMENT 22

27 units; 10.489 kg U(93.2) per unit; 6-in-thick paraffin reflector. STS = 3.714

Instrument Check on 10/29/63 Source 10me8

PM-1	<u> </u>	Low Trip	<u>OK</u>	Alarm Trip	<u>OK</u>
PM-2	<u> </u>			Alarm Trip	<u>OK</u>
IC-1	<u>$> 3 \times 10^{-4}$</u>	Meter Trip	<u>OK</u>	Fast Trip	<u>OK</u>
IC-2	<u>$> 3 \times 10^{-4}$</u>	Meter Trip	<u>OK</u>		<u>Clock 2484</u>
IC-3	<u>Responds</u>	Calibration	<u>JT</u>		<u>M-230</u>
IC-4	<u> </u>	Calibration	<u> </u>		<u>check list ✓</u>
CRM	<u> </u>	Meter Trip	<u> </u>		<u> </u>

$k \geq 1$ negative period 96.1 sec at closure. (0.00 Revs)

$f \sim 2.84$

Extrapolates to $k=1$ at STS = 3.714 ± 0.010 in.

Summary

27 UNITS

10.489 kg U(93.2) per UNIT

6-in-thick paraffin Reflector

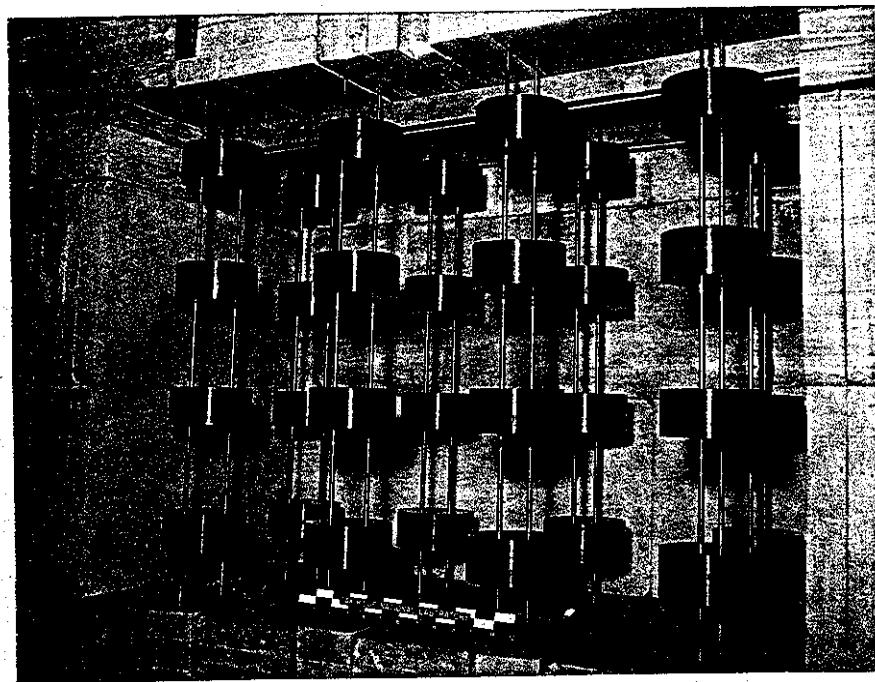
STS = 3.714 ± 0.010 in.

9.434 cm

$V_c = 6.2197$ l

$P_c = 1.6864$ g/cc $F = .08987$

See page 12 for unit arrangement



Summary

64 units

10.434 kg U(93.2) per unit

6-in-thick Paraffin reflector

STS = 4.866 ± 0.010 cm

12.360 cm

$$V_1 = 10.0844 \text{ l}$$

$$P_0 = 11035 \text{ g/cc}$$

$$F = 0.05515$$

EXPERIMENT 23

64 units $10.434 \text{ kg U}(93.2)/\text{unit} - 6\text{-in-thick Paraffin reflector. STS} = 4.906''$

Instrument Check on 12-3-63 Source 10 mcd

M-1	Low Trip	OK	Alarm Trip	OK	
M-2			Alarm Trip	OK	
C-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
C-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2495
C-3	Responds	Calibration	JII		M-230
IC-4		Calibration			checklist ✓
CRM		Meter Trip			

$k < 1$ by ~ 50 to 75% .

Instrument Check on 12-5-63 Source 10 mcd

PM-1	Low Trip	OK	Alarm Trip	OK	
PM-2			Alarm Trip	OK	
IC-1	$> 3 \times 10^{-11}$	Meter Trip	OK	Fast Trip	OK
IC-2	$> 3 \times 10^{-11}$	Meter Trip	OK		Clock 2497
IC-3	Responds	Calibration	JII		M-230
IC-4		Calibration			checklist ✓
CRM		Meter Trip			

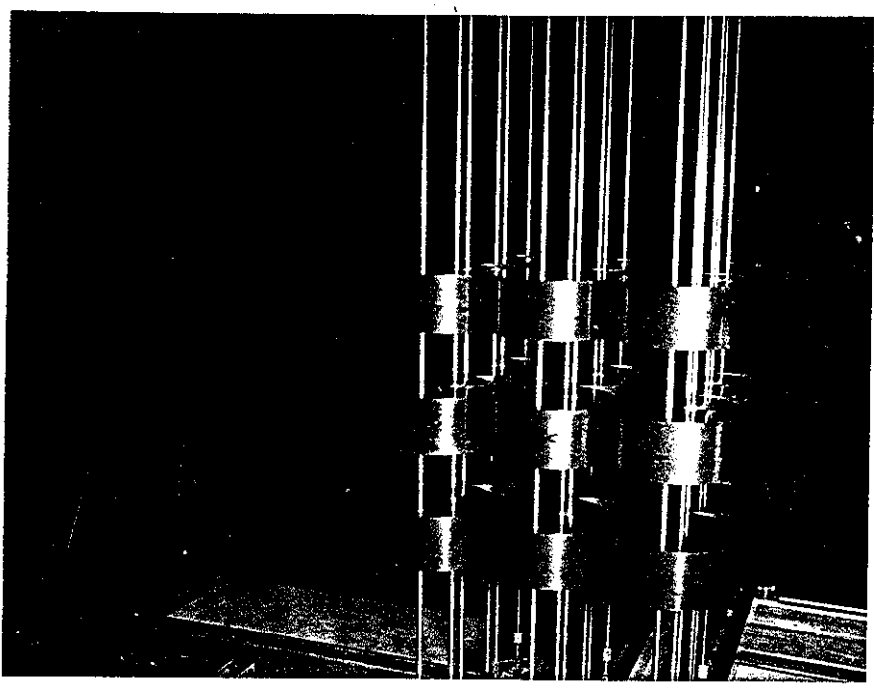
Reset spacing to $4 \frac{27}{32}'' = 4.844$

$k > 1$ positive period at closure. 82.14 sec ($P = 11.224$) (0.00 Revs)

$k = 1$ Reflector remains almost closed. ($9.182''$) (3.70 Revs)

Re: expt. II-6 Extrapolation to $k=1$ requires $STS = 4.866 \text{ in.}$
12.340 cm

Unit Arrangement same as for experiment 2.



RCL

EXPERIMENT 24

27 units - unreflected - 10.484 kg(93.2)/unit STS Horiz. 0" Vertical 2 1/2"

Instrument Check on 2-11-64 Source 10 mcd

PM-1	Low Trip	OK	Alarm Trip	OK
PM-2			Alarm Trip	OK
IC-1	> 3x10 ⁻⁴	Meter Trip	OK	Fast Trip OK
IC-2	> 3x10 ⁻⁴	Meter Trip	OK	Check 2524
IC-3	Responds	Calibration	JII	M-270
IC-4	Responds	Calibration	JII	check list ✓
CRM	Meter Trip			

k < 1 more than 1 (0.00 Revs)

Beginning IC-2 1.05 on 10x10⁻² scale } ⇒ M-270
2.46 on 3x10⁻⁴ scale.

Summary:

k < 1 for
27 units
10.484 kg(93.2)/unit
Unreflected
ETC spacing 11.509 cm.

exp: V_L = 1.5225
P_a = 6.886
F = .36705
r = .999