HAROLD E. EDGERTON

PAPERS

MC 25

Series III

Laboratory Notebooks

Number —

Dated June 11, 1949 to December 31, 1952

meter calibration.

PLACE 20 D 108

DATE June 11 1949

OBSERVER KE Eby.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	66	65	3'	585	2000	101.17			628 Std.	1501 A 115 GR meter
1	67			603					646 Std.	
1	62.5			562					#5.	628 hcp / 200 WS = 3.14
1	62			558					"	
										3.23 hcps / WS
				628 × 101.17 / 100. =		636. hcps			for Std #628.	
						636/9 =		70.7	meter should read this.	646 × 1.017 = 657
	Diffuser on meter changed.									
4	75		3'	675.					628	
4	78		3'	901.					646.	
1	72		9	648	Should be 636.			#	628	1.8% high.
1	74		9	667	"	" 657		#	646	1.5% high.
1	67.5								#5	

$\frac{830,000}{d^2} = F = 145$ for f 4.5 Kodak dense.

$d^2 = \frac{830,000}{145} = 5700$

$d = 75$ ft.

$75 \times 4.5 = 340$

170 / 260 Lens set 11 ft.

18 / 18 / 35000.

$\frac{31,000}{18^2} =$

$\frac{20.30}{40,00}$

Peak light -- FT-214 6 tubes

Data from G. E., November 11, 1946

10 mf. lumens	30 mf. lumens	100 mf. lumens	2000 v.
7.55×10^6	17.1×10^6	$25. \times 10^6$	
7.85	16.7	23.7	
7.55	17.1	25	
8.2	17.4	25.7	
8.2	17.2	26.3	
8.5	17.4	27.	
7.975×10^6	17.15×10^6	25.45×10^6	

March 4, 1953
H. E. Edgerton

PLACE 20 Dunster St MIT

DATE June 25 49

OBSERVER H.E. Edg.

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN SEC'S.~~	E VOLTS	C CAPACITY (MFD)	ENERGY $CE^2/2$ (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
4	120		18'						FT~~201~~	Raytheon STF 2 #9
8	142		18'	370,000					FT224	1 end bank. 30° Ref. 3 banks.
8	80		18'						FT224	FT-503 3 banks
2	90		18'					FT-503		3 banks.
2	40		18'				Std ref.	FT503		Strobotron 1 bank.
2	115		18'				"	"	"	3 banks.
8	120		18'	310,000			~~Spot~~		"	3 banks.
16	120		18'	620,000		not on axis.		FT 617A		30" ref 1200 mf.
16	140		18'			on axis.		old reflector		
8	85	680	36'	880,000						
8	80		36'	830,000		other 30" ref & other				1200 mf.

Output of Equipment read in Raceway Photo for Joe Ostay

PLACE MIT 20D102

DATE June 28 1949

OBSERVER Edgerton

	R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	$CE^2/2$ ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
10,000 1.	8	85	680	36'	880,000	4000	1200 -			FT 623A	30" Ref.
10,000 2.	8	80	640	36'	830,000	"	"			"	" "
Ray.	8	142	1136	18'	350,000	"	350			Raytheon FT ~~624 Flood~~	SPOT.
	2	90	180	18'	56,000	"	350.			"	FT-503 ~~FT-624~~ - FLOOD.
~~Strob~~ - CHROME	8	120	960	18'	310,000	"	350			STROBOCHROME	SPOT
	2	115	230	18'	~~71~~,000	"	350			"	FLOOD.
MIT.					85,000 ?	"	400				FLOOD.
						"	400				

56

120

180

C.A.A. Tests

PLACE M.I.T.
DATE July 13, 49
OBSERVER E. MacR.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	ENERGY (WATT SEC.) $CE^2/2$	L/W EFFICIENCY	LAMP	REMARKS
			36"		2000	5.54			FX2 Helix 10 Cm Xe	5" Eastman Midget Reflector marked to 4'
	40							Center		
	44							2"R		
	35							4R		
	24							6R		
	13							8R		LCL = 1/2"
	40							2L		
	34							4L		
	24							6L		
	15							8L		
								Center		
	72							Center		
	74							2"R		
	48							4R		
	25							6R		
	12							8R		LCL = 5/8"
	74							2L		
	58							4L		
	26							6L		
	14							8L		
	73							Center		
	85							Center		
	78							2"R		
	62							4R		
	24							6R		
	12							8R		LCL = 3/4"
	73							2L		
	65							4L		
	28							6L		
	12							8L		

Shutter type light Meter f 4.7 (922 tube 88 filter (1/50 sec + 1/32" meter 42 Sec

C. A. A. Test

PLACE M.I.T.
DATE July 13 '49
OBSERVER E. Mack.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
	19		36"		2000	3.15	6.3		FX-2 Helix 10 Cm Xe	5" Eastman Midget Reflector masked to 4"
	28				"	5.54	11.08			
	40				"	10.80	21.60			LC 4 = 1"
	17				1000	10.8	5.4			
	25				"	21.52	10.76			
	36				"	40.07	20.03			
	30		36"		2000	5.54	11.08		U-tube	"
	41				"	8.62	17.24			
	45				1000	21.52	10.76			
	73				"	34.82	17.41			
	79		38"		1300	24.5	41.4		FT-220	
	46		36"		1000	21.52	10.76		Utube	
	72		"		1000	34.82	17.41			
	38		36"		500	45.27	5.61			
	55		"		500	85.64	10.7			
	52		"		"	"	10.7			
	82				"	140.6	17.57			

Changed to f 5.6

118 at f 4.7 Shutter type light Meter f 4.7 (922 tube 88 filter) ($\frac{1}{50}$ sec. $+\frac{1}{32}$") nearer 1/25 sec.

C.A.A. Tests

PLACE M.I.T.
DATE July 13, '49
OBSERVER E. Mack, Jr.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	ENERGY CE²/2 (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
			36"		2000	5.54			FX 2 Helix 10 Cm Ke	5" Eastman Midget Reflector masked to 4"
	58							Center		
	58							2" R		
	54							4 R		
	31							6 R		7/8" LCL
	12							8 R		
	57							2 L		
	60							4 L		
	33							6 L		
	19							8 L		
	56							Center		
	28							Center		
	30							2" R		
	37							4 R		
	28							6 R		1" LCL
	17							8 R		
	31							2 L		
	38							4 L		
	28							6 L		
	24							8 L		
	28							Center		

Shutter type light meter f 4.7 (922 tube 88 filter (1/50 sec. + 1/32 never 1/25 sec.)

C.A. Tests

PLACE M.I.T.
DATE July 13, '49
OBSERVER E. MacR.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $\frac{1}{2}CE^2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
	40	58	36"		400	100	8		U-tube	
	45	65			425	"	9	80%		
	50	72			450	"	10.2	90%		All tests with electrolytic Capacitors
	85	122			400	180	14.4	154%		
	94	135			425	"	16.2	171%		
f-5.6	104?	150			450	"	18.6	190%		
	70	101			400	200	16			Rated 100 mfd = Measured 120 mfd Mallory SPQ6337) 235 P47 450V
	78	112			425	"	18			
	88	127			450	"	20.3			
	Off-scale				400	300	24			Rated 180 mfd = Measured 210 Sprague Y-9868 475V
	Lamp failed to fire several times at 400V									
	With added spark band fires O.K. at 325V misses occasionally at 300V									Rated 200 mfd = Measured 250 mfd C-D-FBEX-3816 500V
	58	83			700	50	12.9			Rated 300 mfd = Measured 350 mfd Mallory SPQ 6783 235925 475V
	72	104			800	50	16			Two Mallory 100 mfd. in series

PLACE M.I.T.
DATE July 14 '39
OBSERVER E. Mack

ATTENUATION RATIO R	METER S. R. Prototype	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
			36"							Straight lamp for Microscope
	83		to		500	85.64	10.7			Mounted in
	83		tube		1000	21.52	10.76			bakelite tube
	70				1500	9.64	10.35			as used in
	67				2000	5.54	11.08			exposure tests
					500					
	147				1000	42.46	21.23			
	120				1500	18.44	20.5			
	110				2000	10.8	21.6			
X 2 on attenuator disc										
	40				500	85.64	10.7			
	40				1000	21.52	10.76			
	36				1500	9.64	10.35			
	35				2000	5.54	11.08			
										* These tests made
	98				500	170	21.2			
	76				1000	42.46	21.23			with shutter type
	69				1500	18.44	20.5			light meter
	67				2000	10.8	21.6			
									929	tube 1/100 sec.
										f-11
										Lamp self flashed at no filter
										2000 V a couple of times

Tests of FX-1 tubes for valley.

PLACE MIT 200 102

DATE July 19 1949

OBSERVER Edgerton

R ATTENUATION RATIO	METER #113	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN SEC'S~~	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1	104	104	2'	416	2000	50.7			FX-1	
1	112	112	2'						FX-1	3 flashes on each tube Holdoff > 4000 V
1	107	107	2'						FX-1	
1	105 103 105	105	2'						FX-1	
1	104 108 104	109	21						FX-1	Flashed at 3KV the first time it was on the line.
1	95 95 95	95							FX-1	
1	103 103 103	103							FX-1.	
1	110 106 105	106							FX-1	
1	110 109 109	109							FX-1	
1	105	105	2'	420	2000	50.7	101.4	41.5	FX-1	above sent by air mail to Valley in Colorado.
1	20	20	2'	80	1000	50.7	25.4	31.4		
1	45	45	2'	180	1000	101.2	50.6	35.6		
1	117	117	2'	468	1500	101.2	134.	35.		
2	112	224	~~2'~~	896	~~2000~~	101.2	202.2	44.3		
1	75 9 30		3' 3'	784 270	3000 2000	50.7 50.7				FT-422

600 mf.
7000 V.

$\frac{CE^2}{2}$ =

$\frac{3000}{4}$
1200 watt/sec

300 watt/sec.

V tube 100 W.S. Elec. Co.

PLACE MIT

DATE July 20 49

OBSERVER Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN SEC'S.~~	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	84	84	1'	84	1000	50.7			V	meter 113
	82									
1	80	80	1	80	1000	50.7				meter. 1501-A 0
	82	82	1							
2	94	188	1	188	1000	101.2				"
2	97	194	1	194	"	"				
2	50			150	500	150 e			2	Mallory 300 mf
2	98			196	800	"	48.0			electrolytic in series.
2	128			256	900	"	60.7			Measured 350 to 375 with Bridge.
2	168			376	700	300 e			4	Mallory 300 mf.
4	112	448	1'	448	800	"				
4	148	592	1'	592	900	"				
4	64	256		256	900	150 e	60.7			
4	47				900	150 e	60.7			~~Spiral~~ 1 1/2 turns.
4	44				"	"	"			" "

$$\begin{array}{r} 36 \\ \times\ 72 \\ \hline 4320 \end{array}$$

FT. 422 duplicates Sylvania SA 309

PLACE 20D102

DATE July 23 1949

OBSERVER Elgarten

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC. 36	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC)	EFFICIENCY L/W	LAMP	REMARKS
1	120	120	6'	~~4320~~	2000	600	1200		FT.422 type	#1C 5cm Xenon. via James Jansen.
1	120	120	6'		2000	600	1200		Genus the	21" of 10mm pyrex tube similar to FT-422.
										Aug 1 1949. FT
1	85	85	0		550	.97				SA 309 against Dif disc of meter
	Conditions as used in type setting machine. shown me by Sam Caldwell last week.									
	20 cycles 550 V 1 mf = 2.5 watts power.									
	$RC = \frac{1}{10}$ sec R = 25,000 ohms.									Set up life tests.

33
25
33
75
75
825

$\sqrt{\frac{100}{05}}$ =

25 40
1' 0

100 mt. $Df = \sqrt{KQM}$.

3,5 x 5
15,5 .

25
32
50
75
800

65
25
325
130

f3,5x4
12

G.E. U tube tests WITH REFLECTOR MIT

Alzak Diffuse Reflector G.E.

PLACE 20D 102

DATE Aug 4 1949

OBSERVER Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	33	33	5'	825	850±	190/2 e			U G.E. Co.	alzak ref.. 2 Sprague cards
1	40	40	5	~~880~~ 1000	880					
1	32	32	5	800	?	190/2 e ?	$100 \times \frac{8}{100} \times \frac{100}{2} = 40$ W.S. Red Flash.			2 Sprague cards. Red Flash
1	65	65	5	1625	700	140/2 Sprague 300/2 Mallory	}			
1	98	98	5	2460	850	"	}		U GE	
1	95	95	5	2380	840		}		U GE.	Data sent to G.E. Co. Boor.
1	62	62	5	1550.	880	300/2 Mallory			"	

2. Photos taken with. 890 - 880 volts.
(140/2 Sprague
300/2 Mallory)

GN 16.5
GN 20.

Daylight Kodachrome cc15.
Mary Brennan and yellow card with data.

Both over exposed. ✓

417.

PLACE 20D102 MIT

DATE Aug 9 '49

OBSERVER Edgerton

ATTENUATION RATIO R	METER (115)	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	94		3'	755	2000	101.17	~~202.34~~ 235	32.3 32.1	Std.	646 Std #2 DE 214 32.3 L/W. 32.1 L/W.
	~~69~~		3		2000	101.7	235		417	
1	74		3'	665	2000	101.7	235	28.3		
1	98		"	880	"	130	300	29.3	"	
1	32			287		50.7	117	24.5	"	
	16	-4.		144		24.5	56.6	?. ~~25.4~~	"	
	17			126		24.5	56.6	22.2	617	
	25			225		50.7	117	19.3	"	
	50			450		101.17	235	19.2	"	
	64			575		130.	300	19.2	"	
(M113)	80			718					646 ~~Std~~.	
(113)	81				Power Supply.		G.E. meter M120916.			
					2000 = 2150			$\left(\frac{2150}{2000}\right)^2 = 1.15$		$\frac{718}{646} = 1.10$ 1.15 1.14 .04

Blue flash

PLACE 20 D 102 MIT

DATE Sept. 9 1949

OBSERVER Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	100		4 ft	1600	1000 V	150 mf 2 Mallory in series			G.E. 1 U	115 volts input 120 ?
					actual 175 mf measured at 960 volts.					
		This is about twice the light of the Red flash.								

Sylvania Portable. ANSCO COLOR PRINTON Daum

PLACE Belmont

DATE Sept 12 1949

OBSERVER Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	94	94	5'	2350	2500	32	100 W.S.			Sylvania.
8	45	360	5'	9000	2800	75				Transportable.
4	90	360	5'	9000.	"	"				Transportable.
				Commander Hotel.						
1	45	45	5'	1130					210	Seminar #105
1	180	180	5'	4500			150 W.S.			Seminar Large reflector.
2	85	170	5'	4300						
2	180		42"							Seminar Large Ref 11 also used for fill light
4	86									
1	offscale		~~4~~ 5'					1	FT-210	Seminar #101 101, 0191 model.
2	120	240	5'	6000						Large Reflect
8	180	1440	~~2~~ 4'	~~270~~			230 W.S.			
16	76	1200	~~2~~ 4'							
				Photos at f 8		1/3 size.	head on 8 by 10			printon
									11, 12, 35.	
				3000 to 5400			11 Color Tungsten basic & daylight			
				5400 - 6500			12 Daylight - to strobe.			
							35 Slight adjustment by test.			
		1500 x $(\frac{.35}{8})^2$ =			300	ft candle sec.				

Chas. Le Blanc

H. E. Haywarth.

Seminar

Beverly. Mass

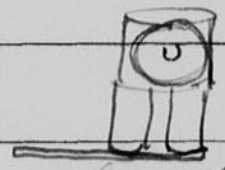
Blue Flash

M.I.T.

PLACE 20D102

DATE ~~Oct~~ 2 1949

OBSERVER Edgerton Mc Roberts

ATTENUATION RATIO R	METER (GR #115)	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	L/W EFFICIENCY	LAMP	REMARKS
1	59	59	5'	1470	900 ±	300/2 e			FT 110 Utube S.A.	mallory cords.
1	60	60	5'	1500	900					
	B-122 A-72									3 lbs with cords
2	120	240	5'	6000	900	600? e			FT 220	600 mf FT 220 square job.
2	new	batteries B-133		put in meter A-78			115	B-		
2	128	256	5'	6400	900	600? e				
2	118									
2	127									
2	185	370	5'	9250	200	2000+				~~Kodatron~~ # 139

10^{-4}

40

R95.

400.

$E = \frac{Q}{4\pi D^2}$

$E = \frac{CP}{D^2}$

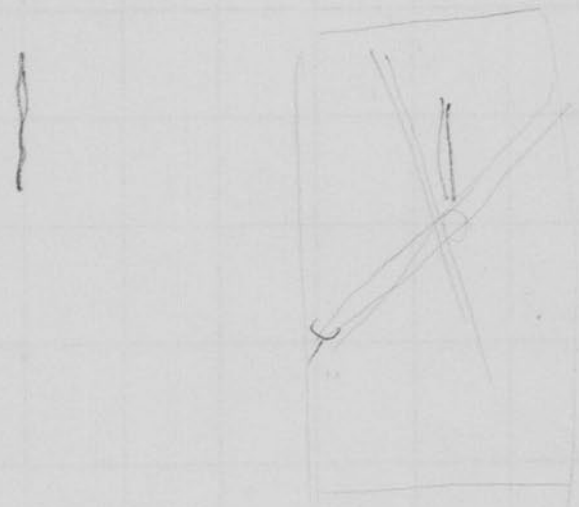
$CP = \frac{Q}{4\pi}$

PLACE 20D102

DATE Dec 2 1949

OBSERVER Edgerton Lyman Mitchel.

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1	156	646 B.C.P.S.	24"		2000	100	200		#2	Sg. Std tube
	152 150	628	24		2000	100	200		#1	" " "
	~~146~~									
	143 143	592			2000 "	100 100	200 200			N.G. Standard E.L.O. Std #1.



M.I.T.

PLACE 20D102

DATE Dec 24 1949

OBSERVER H. Edgerton

R	ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN~~ ~~SEC'S.~~	E VOLTS	C CAPACITY (MFD)	$CE^2/2$ ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
x1		50		18'	16,200	4KV	?			503 F1	Str. narrow beam 18" reflector
				Raytheon Hi Power Supply					STF 2 #9		
				Power supply only.							
		#	4	Racetrack Power supply unit with							12 mf external
				10" specular reflector					FT-224.		
i°		20		16'	5,120	4KV	1?				
				old G.R. Box Steel case					90%	3850	120 V.
1		50		18'		4KV	16 mf external.			FT-224/in	
				Str. concentrated beam reflector.							

Bob. Ever.

Rubber model

10 per sec.

Strobolac & Strobolux.

$\frac{CE^2}{2}$

$\frac{4000^2 C}{2} = 100$

$8C = 100$

$c = \frac{100}{8} = 12.$ mf.

175
36
1050
525
63.

$\frac{100}{2} \times 1000^2 = 50$

81_2

2) 175
87.5

175
87.5
875
1225
1400
153.0

FT-110

PLACE Jan 7 1950

DATE 7 D 10 5

OBSERVER Edgerton

R	ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	ENERGY (WATT SEC.) $CE^2/2$	L/W EFFICIENCY	LAMP $\frac{CE^2}{2}$	REMARKS
1		43		2	172	1000	101 p	50		Light/oz	FT-110 Paper cond.
		14				500	300/2 e				CD electrolytics.
		62			248	900	" e			826	1# 14 oz 30
		48			172	900	300/2 e			8.2	Mallory. 1# 5 21
		87				900+	175 e				series parallel # 175 mf Sprague.
		82				950					1# 13 oz. 29
		84		2	336	900		70.8	47.4*	11.6	
		132		2	528	900	175/87/262 e	106.	49.8		6-Sprague oz. 43.5
		97				800	262 e				6 Sprague
		165			660	1000	" "				
		133				900	262 e				" "
		-				1000	11.8 p				Paper cond.
		18				2000	"				
		33				3000					self flashes.
						3500					
		41				1000	101. p				
		43				1000	"				
		44				1000	"			FT 110	#6.
		87.5		2	350	1800 V	300/4 e			FT-214	4 Mallory capacitors.
		32		2	128	1800	28.2 p			FT-214	
		35			140	1800	28±			"	

FT-110

PLACE 20D 102

DATE Jan 18 50

OBSERVER Edy

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	79		2'	315.	2000	50.74			FT-	#2 Std lamps 214
1	70		2'	280	2000	50.74			FT-110 ×	shows arcing !!
1	42		2'	168	1000	101.			FT-110X	
1	37		2'	148	1000	24.5			FT-110X	
1	174		3'	1570	900±	300 mfd 2			110	Blue flash Bk. type reflector
	180		3'	1620	" ±	"			"	"

Triumph Model 70

PLACE
DATE Jan 50
OBSERVER [illegible] McRob

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	10	10	2'	400	800	200/2 C-D.				Kenlite no Ref Sunflash.
1	22	22	2'	880	1000	"				" "
1	22	22	2'	880	800	300/2 Mallory				" "
1	32	32	2'	1280	900	"				" "
1	16	16	2'	640	800	175/2 Sprague				" "
1	28	28	2'	1120	960	"				" "
1	16	16	2'	640	800	200/2 C.D			FT-110 #2	#2 no Reflector
1	27	27		1080	1000	200/2 C.D.				
1	33	33	2'	1320	800	300/2 Mallory			FT-110	
1	44	44	2'	1760	900	"				
1	36	36	2'	1440	800	175/2 Sprague			FT-110	
1	43	43	2'	1720	950	"			"	

36
300
10,800

D-1 Tests

MIT

PLACE 20D102

DATE ~~Feb~~ 2 1950

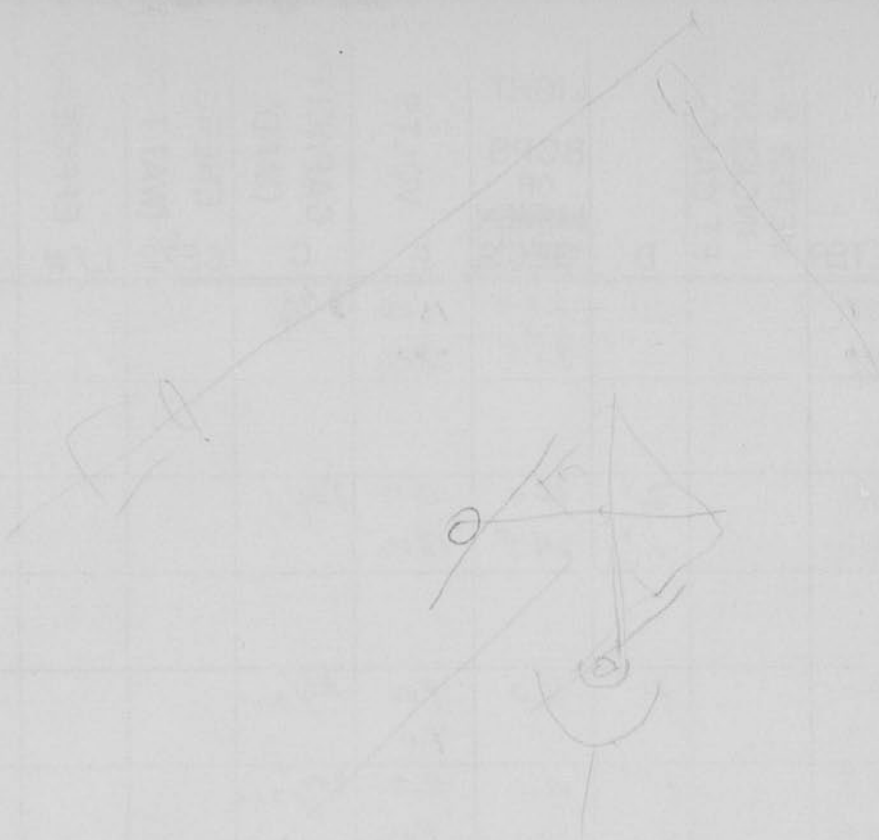
OBSERVER Edgerton Barstow

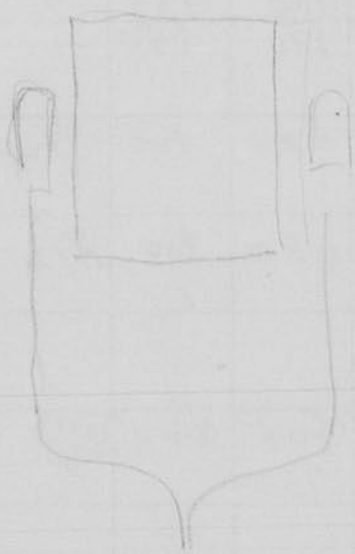
ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN SEC'S.~~	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
4	73	292	6'	10,500	3000	69.	310	34.	FT-224	10" Spec reflector
4	27	108			2500	53	166		FT-220	
2	52	104			"	"	166		"	
2	26	52			"	28			"	
2	34	68			2500	28			FT-220	- new tube.
2	65	130			2500	53			"	" "
1/3 D-1		Calc. 100			2500	Calc. 40.7	127 ref.			1/3 D-1
						$(1.5/4.5)^2 = 1/9$				= ~~1/5~~
						$(2/4.5)^2 = 1/5$				
						$(\frac{500}{300})^2 = 2.8$				
						$2.8 \times \frac{1}{5} = .55$				settle for .5
Use third FT-220 tube with the following loading of 21 mf 2500 V.										
2	67	134			2500	53.				
1	150	150			2500	53				
1	56	56			2500	20.5	64.0			ok. for new (1/2 D-1)
										using 3 FT-220 tubes..
										CE' 200 watts/tube 600 watts total

214 with Electrolytics

PLACE MIT 20
DATE Feb 11 1950
OBSERVER MCR

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN SEC'S.~~	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC)	L/W EFFICIENCY	LAMP	REMARKS
1	61		2'	244	1500	360/4			214	4 Mallory Series
	97			388	1800					condensers
1	40		2'	160	1500	180/4			214	4 Sprague
	62		2'	248	1800					in series.
1	120		1'	120	900	180/2			FT 110	2 Sprague
1	185		1'	185	900	360/2			"	2 Mallory
1	193		1	193	900	"			"	"
1	200+		1	200+	900	360/2			"	2 Mallory (others)
1	140		1	140	900	180/2			"	2 Sprague (others)
1	160		1	160	950	"				"
1	170		1	170	950	"			"	"
1	200		1	200	900	180/2			"	2 Mallory (still others)
1	170		2	680	900	360/2				4 Mallory
	4									Ser. par.
1	56		3	504	850	180×3/2				6 Sprague 3 par
8	80		3	5750				5 par	12 ft.	" 2 ser





132
32

PLACE 20D 102

DATE Jan 28 1958

OBSERVER Edgerton McRobert

ATTENUATION RATIO R	METER (Bird Photo equip)	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	82		2'		900	180 e			FT-110	4 Sprague electrolytics
	107		2'		1000	"			"	
									Quartz	U Tube as used in Infra Red CAA Illum.
1	18		2'		500	180 e				4 Sprague in Ser Par.
	36		2'		700					
	44		2'		800					
	50		2'		900					
	56		2'		1000					
	33		2'		475	360 e				2 Sprague in Parallel.
	53		2'		475	540 e				3 " "
	67		2'		475	720 e				4 " "
										With reflector Webber Brass
8	132		2'	H220	900				FT-110	
	150				950					6 Sprague Capacitors.

#23 wire
Ω/1000/ft. 21

10/ft. .2 ohms.

#18 6.5 Ω/1000

.06

68 / 9 / 612

180 / 3 / 540 / 270

36 / 2

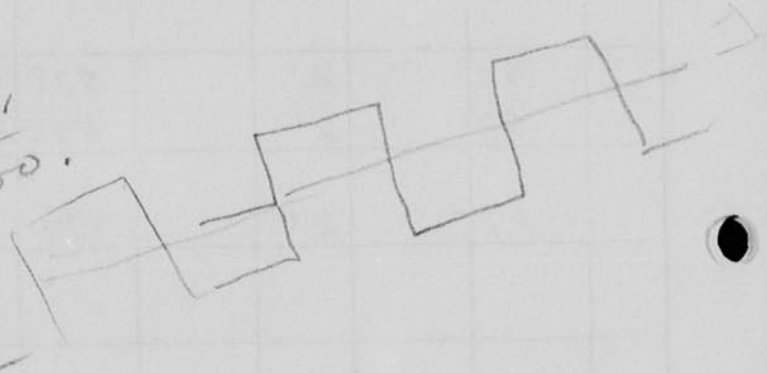
48 / 9 / 4220

18 / 5

260 / 9 / 2340 b.p.s.

135 / 270 / 9 / 2430

300 / 91 / 2700.



130 / 16 / 780 / 130 / 2080 b.p.s.

2700 / 1400 × 28 =

1.7 = 1.3 36.5

260

1

7 / 6.3 / .7 = 5 ohms.

.15 / 5 / .75

FT-110. Bird Limit. MIT

PLACE 20D102

DATE Feb 25 1950

OBSERVER H.E.Edg.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	68 70	68	3'	610	925 " +	270			FT-110 6	Sprague 180 mf Tube Brown base
1	65 68		3'		900 + "				FT-110	New model.
1	48 50		3'	422	950 975	180			FT-110	4 Sprague "

1879
1638

FX-1 Silver bads. M.C.P.S.

PLACE 20D102

DATE March 15 50

OBSERVER Edy

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS ~~OR~~ LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
2	91	182	3'	1638	2000	101			FX-1	Silver half bads
					3500	2 mf				Self flashes
2	44	88	3'		2000	50.7			"	
2	114		3'			129.9			"	
2	117		3'		2000	129.9			"	

PLACE M I T

DATE Mar. 30 '50

OBSERVER HEG FEB VETTE.

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1	47	47	15'		4000	269	2150		FT-423	Straight Glass lamps.
4	167	668	~~15~~ 15'		4000	178	1424		FT-503	G.E. L 83 reflector
4	139		15'		4000	178	1424		FT-623	In Aerial reflector
4	117		20'		4000	178	1424		~~FT-503~~ FT 529	GE Ref. close to light center
4	70	280	20'		4000	178	1424		FT-623	Aerial refl.
4	107		20'		4000	369	3150		FT 623	"
8	58		"		"	"	"		"	"
8	66		"		"	"	"		FT ~~529~~ 529	G E Ref.
4	83		20'		~~4000~~	90.2	~~722~~ 723		FT-411	in GE Ref.
~~8~~ 8	100		~~19~~ 19'		"	"	"		"	" "
			5							
4	105		19'		"	"	"		"	" " 0°
"	98		"		"	"	"		"	" " +2½°
"	78		"		"	"	"		"	" " +5°
"	31		"		"	"	"		"	" " +7½°
"	15		"		"	"	"		"	" " +10°
"	101		"		"	"	"		"	" " -2½°
½	86		"		"	"	"		"	" " -5°
"	43		"		"	"	"		"	" " -7½°
	16									" " -10°
"	27		5'		"	"	"		"	Bare lamp

13 on reflector

Ref factor 50

avg. Ref = 42

87.8
90.2
1786

88

9.5

56-58

65

~~1111~~ ~~111~~

40 x 40

40 x 15

40

5½

PLACE MIT
DATE Mar 31 '50
OBSERVER FEB AEG VEM ©

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
4	22	88	~~10'~~ 5'		4000	90.2	723		FT-17	FT-17 bare
"	28		20'		"	"	"		"	FT-17 in GERB
			Ref. Factor angle to		center = half light		= 20°			
1	33		10'		4000	90.2	723		FT-917	Bare
1	55		10'		"	178	1424		"	"

Projectile photo

65

16.8

PLACE MIT

DATE April 5 '50

OBSERVER VEHo. FGB.

Angle	ATTENUATION RATIO R	METER No. 115	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	ENERGY CE²/2 (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
0°	1	175		16'		2000	74			FT-19	Helix GE Reflector Cross Wise No Bugs. Horizontal
+2½°	"	155									
+5°	"	129									
+7½°	"	55									
+10°	"	22½									
+15½°	"	11									
−5½°	"	151									
−5°	"	107									
−7½°	"	99									
−10°	"	19									
−12½°	"	11									
0°	"	51								"	Pittsburgh With Spread Lens
+5°	"	52									
+10°	"	48									
+15°	"	42									
+20°	"	37									
+25°	"	13									
+30°	"	5									
+25°	"	20									
−5°	"	99									
−10°	"	49									
−15°	"	33									
−20°	"	18									
−25°	"	7									
−30°	"	4									

PLACE MIT

DATE April 5 @ 50 FEB

OBSERVER VEMC

angle	ATTENUATION RATIO R	METER (No. 115)	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
00	1	53		16'		5000V	79			FT-14 Hubb	G E reflector
+5°	"	52									Holz Vertical
+10°	"	48									Spread Lens
+15°	"	41									
+20°	"	26									
+25°	"	10									
+30°	"	5									
0°	"	59									
-5°	"	51									
-10°	"	46									
-15°	"	35									
-20°	"	22									
-25°	"	7									
-30°	"	4									

PLACE M I T

DATE April 5 '50

OBSERVER ~~M E Me.~~ FER

R ATTENUATION RATIO	METER (No. 1-15)	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	ENERGY $CE^2/2$ (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
~~4~~	~~69~~		~~20'~~		~~4000~~	~~178~~	~~1424~~		~~FT-623~~	~~Axial Ref. on axis.~~
2	147	294	20'		4000	178	1424		FT-623	Axial Ref. on axis
1	78	78	5'		"	"	"		" "	Bare end on
2	134	268	5'		"	"	"		" "	Bare sideways
	From above reflectors:									on Beam Centers
	End on				$\frac{294}{4.86} = 60.5$					
	Sideways:				$\frac{294}{16.8} = 17.5$					
	1/2 light at 21° total angle									42° (approx)
0° 2	107		20'		4000	178	1424		FT-623	5 cm Flood Ref on axis
10° "	100		"		"	"	"		"	"
20° "	96									
30° "	16									
0° "	113									
-10° "	98									
-20° "	99									
-30° "	14									
	1/2 light at 38° (approx.)									
2	29		10'		4000	178	1424		FT 923	Straight 5000 v. tube Beam at rt. angles
1	58		10'		"	"	"		"	"

PLACE MIT

DATE April 6, '50

OBSERVER FEB REMc

	R ATTENUATION RATIO	METER No. 115	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
0°	2	120		20'		4000	178	1424		FT-633	Aerial refl. shot blocked out
+5°	"	117									
+10°		118									
+15°		86									
+20°		56									
+25°		28									
+30°		10									
+40°		7									
0°		121									
-5°		131									
-10°		119									
-15°		72									
-20°		50									
-25°		29									
-30°		10									
-90°		7									
0°		129									
0°	2	127		20'		4000	178	1424		FT-633	Aerial refls. shot used.
+5°		130									
+10°		137									
+15°		110									
+20°		75									
+25°		31									
+30°		12									
+40°		8									
0°		128									
-5°		138									
-10°		138									
-15°		98									
-20°		70									
-25°		32									
-30°		11									
-40°		8									
0°		133									
0°		127	after waiting								
	1	55		10'		"	"	"		FT-433	Straight tube

PLACE _____

DATE _____

OBSERVER _____

	ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC. D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
0°	2	109							FT-628 Sun Flas	
+5°		101								
+10°		92								
0°		105								
-5°		106								
-10°		97								
-30°		42								
-30°		14								
+30°		42								
+30°		14								
0°		107								

PLACE
DATE Apr 26 1950
OBSERVER HEE Dick Borden

ATTENUATION RATIO R	METER 115	METER X R INCIDENT FT. CAND. SEC.	16/90 1440 D	LIGHT BCPS OR ~~LUMEN SEC'S~~	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	90	—	4	1440					210	Dorwitzer (Borden)
1	167		4	2670	1000	175			FT-110	Green Flash.
1	160		4	2560	—	—			—	after 1/2 min
4	124	496	4	7950	2800v	75			FT-220	Transportable lamp.
										$14\sqrt{\frac{167}{90}} = 1.34 \times 14$
										$= 19.$
										50 33.4

Light Meter #115 at 5 ft. at stop #1

~~Dream~~ Flash
May 1950

Unit	Volts	Cap.	Read	
✓ #12	940	220	75	
	900		70	
✓ #4	940	210	93	
	900		87	
#0	940	220	85	
	900		79	
#8	940		85	
	900		80	
#3	940		85	
	900		80	
✓ #5	940		68	Double.

PLACE 20D-102

DATE May 24 5[illegible]

OBSERVER E. Ma[illegible]

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X1	#115	64	5ft		950V nom.	180 nom.			G.E. double FT-110	Hummer Unit #5 (new lam
		65								
		66								
		66								
		66								
		57							G.E. double FT-110	Hummer Unit #12 (new lamp)
		57								
		57								
		92							FT-110	Hummer Uni #4 (single lamp
		92								

PLACE May 25, '50

DATE M. L. T.

OBSERVER E. MacR.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X 1	#115	80	3 ft.		950 V nom.	180 mfd. nom.			FT-110 Unit #5	Hummer Units Changed
		79							FT-110 Unit #12	back to single lamps
		83							FT-110 Unit #4	(Standard FT-110)

PLACE MIT

DATE June 17, '50

OBSERVER F.E.B. Mr. Kennedy of Trumpf

R	ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1		62		54"							Trumpf Flood Light Normal 2 turn Kenlite Sun Flash M-5
1		38		29"							Ditto (5 turn) Forlier M-5
1		72		39"							Ditto Exp. Kenlite
1		56		39"							Ditto Kenlite Exp. 60° unit.
1		124		72"							Ditto with reflector on unit Exp. Kenlite #5
1		142		72"							Ditto Sun Flash M-5
1		90		53"			at	30°			"
											Trumpf 79.5 Self Contained
1		65		48"							Standard lamp.
1		18		48"			20°				
1		25		48"			20°	Reverse			

PLACE M.I.T.
DATE Aug. 14, '30
OBSERVER E. MacR.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
		Location from								Lucite
X1	#115	Centerline 4'			930	Nom. 150			FT-120	enclosed
	Read								G.E	Blue Flash
	107	Center							Ref.	Breadboard
	118	2" left								
	151	4" left								
	180	6								
	155	8							Semi-	
	128	10							Precision	
	103	12								
	81	14								
	65	16								
	55	18								
	49	20								
	110	Center								
	111	2" right								
	120	4								
	144	6								
	149	8								
	137	10								
	121	12								
	107	14								
	89	16								
	75	18								
	62	20								
	50	22								
	44	24								
	110	Center								

PLACE M.I.T.

DATE Aug. 14, '30

OBSERVER E. Mack

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X1	# 115	Location formal Ctr.	4'		950	Nom 150			FT-110	Lucite enclosed
									G.E. Ref. Semi-Specular	Blue Flash Breadboard
	111	Center			Simpson Meter	Mixed Cap. 170 mfd				
	108	2" L								
	110	4"								
	111	6"							(B)	
	105	8								
	94	10								
	85	12								
	74	14								
	67	16								
	59	18								
	52	20								
	46	22								
	40	24								
	111	Center								
	106	2" R								
	100	4"								
	91	6								
	85	8								
	75	10								
	67	12								
	61	14								
	55	16								
	49	18								
	43	20								
	111	Center								

PLACE M.I.T.

DATE Aug 14 '50

OBSERVER E. MacRae

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X1	116	Location from C.L.	4'		950	150			FT-110	Lucite Enclosed Blue Flash
	84	Center			Sunpower Meter	Measured Cap. 170 mfd.			G.E. Ref.	Bread board
	86	4"L							Selenium	
	82	8							Specular	
	69	12							with	
	54	16							diffusing plastic in front	
	41	20							(Material Doc obtained from Eastman)	
	85	Center								
	84	4R								
	80	8								
	71	12								
	58	16								
	46	20								
	34	24								
	85	Center								

PLACE M.I.T.

DATE

OBSERVER E. Mack

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X1	# 115	location from e.l.	4'		950	None 150			FT-110 in G.E. Ref. semi-Specular with Diffusing screen of one thickness Dewey Almy saran	Lucite endcap Blue Flash
	90	Center			Simpson Meter	Measured Cap 150 mfd.				Bread board
	110	4"L								
	95	8"L								
	69	12"								
	50	16"								
	38	20"								
	90	Center								
	88	4"R								
	96	8"R								
	88	12								
	69	16								
	51	20								
	36	24								

Light Dist. in a) Hor. plane FT-110 in semi-specular G.E. Reflector 150 mfd nom. 950 V. D. C. (Simpson 260) Meshred Cap 170 mfd. (Tolchnike) Distance lamp to Meter = 48"

Aug. 14, '30
E. Mack.

PLACE M.I.T.
DATE Sept 5 '52
OBSERVER E. Mack

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X1	#115		5ft.		910	180 mfd. nom.			FT 110	(Wisland's Unit
	80			2000			(225 mfd measured			# 2 Green Flash)
X2	40			2000						
X2	62		4ft	1984						
X1	124			1584						
~~X1~~	~~121~~		~~4ft~~	~~1936~~	~~910~~	~~180 mfd.~~				~~aluminum Bird Unit~~
X1	128		4ft	2048	910	120 mfd	(225 mfd measured)			
	151			2416	980					
X1	137		4ft	2192	910	180 nom.				Green Flash # 11

PLACE M.I.T.
DATE Sept. 14, '50
OBSERVER E. Mack.

ATTENUATION RATIO R	METER	~~METER X R INCIDENT FT. CAND. SEC.~~	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) CE²/2	EFFICIENCY L/W	LAMP	REMARKS
1	#115		4ft		900	nom. 150			FT-110 Diffuse	Dormitzer
	62	0°		992		meas 160			G.E. Reflector	Synctron
	63	5R							(oo)	Candid
	62	10R								Serial
	59	15R								#E1793T
	53	20R								
	45	25R								
	35	30R								
	28	35R								
	63	0		1008						
	64	5L								
	61	10L								
	54	15L								
	45	20L								
	36	25L								
	29	30L								
	23	35L								
	63	0								
	62	0							(8)	
	61	5R								
	57	10R								
	49	15R								
	44	20R								
	37	25R								
	31	30R								
	60	5L								
	53	10L								
	48	15L								
	42	20L								
	37	25L								
	31	30L								

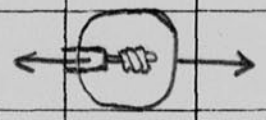
Two Mallory 300 mfd 450V in Series.

PLACE M.I.T.

DATE Sept. 16, '30

OBSERVER E. Mack.

ATTENUATION RATIO R	METER #	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X1	115		3ft		480	nom. 400			Angle	Reliance
										Thriftlite
	93	0°		837						
	92	5°R								
	61	10R								
	41	15R								
	32	20R								
	22	25R								
	13	30R								
	95	0°								
	80	5L								
	52	10L								
	40	15L								
	31	20L								
	18	25L								
	12	30L								
	99	0°								
	86	5R								
	54	10R								
	31	15R								
	20	20R			25° to 30°					
	13	25R			total included angle					
	10	30R								
	96	0°			to half light					
	92	5L								
	61	10L								
	41	15L								
	29	20L								
	20	25L								
	13	30L								
	50		1ft	50				bare lamp.		



PLACE M.I.T.

DATE Sept 15, 30

OBSERVER E. MacR.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
X1	#115		1 ft.			Rated			Ang-Lo 56512	Reliance Thriftlite
	42				450	200 X 2 C.D		Max. 500 mfd		
	50					FB10063			Base Lamp.	
						Original Specif.				
	65				450	300 X 2 Mallory SP0-6220		680		
	57				450	300 X 2 Mallory HC-450033		680		
	45				450	200 X 2 CD		560		
	53				480					
	59				500	FW-10005				
	39				450	180 X 2		450		
	45				480	Sprague D11406				
	58				450	180 X 3		675		
	65				480	Sprague				
	59				450	100 X 6		720		
	70				480	Mallory SP06337				

PLACE _____

DATE _____

OBSERVER _____

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
X1	#115		4ft			180/2 ×2 Sprague		Mean Cap.		Hummer Unit #7
		135		2160	900			220		
		76		1216	900	300/2 Mallory HC-4503		170		
		60			940	200/2 C.D.		135		
		55			900	FW-10015				
		68			1000					
		39			900	200/2 C.D.		120		
		43			940	FEEX3816				
		122			880	300/2 C.D. FAEX-4516		185		

PLACE 202-102

DATE

OBSERVER

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	$CE^2/2$ ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
X1	#115	133	4ft.		900	180				Greenflash #1

PLACE M.I.T.

DATE March

OBSERVER Dept 30 52

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
X1	115	Degrees	4			150	900			Calibrate
	98	0		1570						
	140	5° L		2240						
	160	10° L		2570						
	102	15° L		1640						
	64	20° L		1030						
	47	25° L		753						
	30	30° L		482						
	101	0		1620						
	110	5R		1760						
	131	10R		2100						
	141	15R		2250						
	109	20R		1750						
	77	25R		1230						
	61	30R		975						
	83	0		1330	With		Claim			
	78	15R		1250	Eastman		60° to 1/3 light			
	43	30R		685	Diffuser		3300 lumen sec.			
	107	0			Battery					

PLACE 201 102

DATE 11/20/50

OBSERVER

R	ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	$CE^2/2$ ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1		104	104	2' King	416	900	315 275.	128 111	3.24 3.75		2 Sprague .500 2103 pwm
1		43	43	2'	172	900	165 150	61	2.56 2.82		2 Mallory 300 2103 pwm. paper capacitor.
1		89	89	2'	366	900	275	111	3.20		

8.
$16 \times 10^6 \times 100 \times 10^{-6}$
$= 800$ watt secs

36
64
144
216
2300

Suitcase power unit with Blower

M.I.T. 20D102

PLACE

DATE Oct 20 1950

OBSERVER Edgerton.

ATTENUATION RATIO R	METER 115	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
				multiflash.						
1	77	77	8'-	5000 -	4000	Internal +6			24	
1	2	2		128	4000	Internal	.5 mf	?	24.	0.5 mf ?
1	48	48		3100	4000	Int +4.			24.	
				unit with E & G name plate.						
1	65	65	8'	4150 -	4000	Int +4			24	
1	7	7	8'	450		Int			24	
1	99	99	8'	6350		Int +6			24	

PLACE M I T

DATE 20-D-102 ~~Oct 25, 30~~

OBSERVER E. MacK.

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
X1		185	1'		900	300/2	Mallory	21 oz.	FT-110	Bare lamp
X1		185			900	130	Paper			
X1		126								
X2		61			900	180/2	Sprague	14 oz		
X2		148			900	180/2 X2	Sprague	28 oz.		
X2		117			900	300/2	C.D.	30 oz		

Page 1

Al Webb
John Mills
Hans Clayton
Oct 10 1950
GR Co.

	Meter No	Lamp	E volts.	C mf	d miles	M L/sq/ft.	F	
Sample 132.		Std #3.	2400 (2300)	54	25.25	101.	1	Lamp dusty.
"		#2 646	2400	54	"	121.	1	
"		#3 628	2400	54	"	118	1	
"		GR #2	2400	54	"	115.	1	
"		GR #3	2400	54	"	116	1	
"		MIT X	2400	54	"	113	1	
"		O	2400	54	"	115	1	
		GR Light Standard 100.22 mf 2000 volt. Test Set. GR X 200						
Sam	132	#2 646	2000	100.2	25 1/4	160	1	Error in Volts reading 17
	132	646	2000	100.2	"	157	1	15
		Meter changed to Horizontal from Vertical.						
	132	#2 646	2000	100.2	25 1/4	155	1	
MIT	115	646	2000	100.2	25 1/4	148	1	
M.I.T.	alum	646	2000	100.2	25 1/4	151	1	
MIT	113	646	2000	100.2	25 1/4	151	1	
	113	#3 628	"	"	"	147	1	
	113.	628	2000	100.2	30"	107	1	
GR	132	628	2000	100.2	30"	111	1	Should read 101.
MIT	113	628	2000	100.46	30"	94	1	X variation due to lamp dipper does not work after but one.
GR	113	628	2000	100.2	30"	109	1	?
MIT	113.	628	2000	100.46	30"	98	1	X disc pushed in. back door closed.
MIT	113	#2 646	2000	100.46	30"	105	1	
GR	113	#2. 646	2000	100.2	30"	111	1	
MIT	ALUM.	628	2000	100.46	30"	103	1	
GR	ALUM	628	2000	100.2	30"	109 1/2	1	
MIT	ALUM	646	2000	100.46	30"	106	1	
GR.	ALUM.	646	2000	100.2	30"	112	1	
GR.	132	628	"	100.2	30"	101		adjusted to read 101 with GR Standard
GR.	132	646.	"	"	"	102 1/2		
GR.	113	628	"	"	"	101		
GR	113.	646	"	"	"	103.		
GR	115.	628	"	"	"	101.		
GR	115.	646	"	"	"	103		
GR	ALUM.	628	"	"	"	101		
GR	ALUM.	646	"	"	"	103		

Test for Polaroid light — no reflector.

PLACE 20D 102 M.I.T.
DATE May 23 1949
OBSERVER H.E. Edgerton

Var	ATTENUATION RATIO R	G.R. #115 METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
39	1	58	58	3.15'	580	900	625 e				Sprague electrolytics. 14 180 mf 475V in series-parallel.
49	1	74		3.15	740	1000 -	625 e				
	1	78		3.15	780	1000	625 e				
	1	58			580	2000	111.8 p				Standard Kodatron
"	1	58		3.15	580	900	600 e				Cornell Dubilier 12 200 mf 500 V in ser parallel.
43.		75		"	750	1000	"				

14 Sprague cap weigh 6# 6.5 oz.
12 Cornell Dub " 7# 2 oz.
8 G.E. 14 mf 2500 v 2# 9 oz × 8 16# 7 oz = 20.5#
4.5

Test for Polaroid light — no reflector

PLACE 20D 102 M.I.T.
DATE May 23 1949
OBSERVER H.E. Edgerton

Vac	ATTENUATION RATIO R	G.R. #115 METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
39	1	58	58	3.15'	580	900	625e				Sprague electrolytics. 14 180 mf 475V in series-parallel.
49	1	74		3.15	740	1000 -	625e				
	1	78		3.15	780	1000	625e				
	1	58			580	2000	111.8p				Standard Kolatron
"	1	58		3.15	580	900	600 e				Cornell Dubilier 12 200 mf 500 V in ser parallel.
43.		75		"	750	1000	"				
14	Sprague cap weigh				6 # 6.5 oz.						
12	Cornell Dub			"	7 # 2 oz.						
8	Gk. 14 mf 2500 v			2 # 9 oz x 8			16 # 7 oz = 20.5 #				

			E	C	d.	M. F.
		lamp	volts	mf.	inches.	%/sq ft.
MIT	ALUM	626	2000	100.46	80	91
"	"	"	2100	"	"	102
"	115	"	"	"	"	102
"	113	"	"	"	"	103
"	132	"	"	"	"	103
"	132	646	"	"	"	108
GR.	115	X	2000	100.2	"	96
"	"	132	"	"	"	88
"	"	{GR#1}	"	"	"	98
"	"	#2	"	"	"	96
"	"	#3	"	"	"	97
"	"	646	"	"	"	

GR MICROFLASH #130

PLACE 20D102

DATE Nov 7 1950

OBSERVER Edg McRoberts Smith

R ATTENUATION RATIO	METER #115	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1	50		30"		7000	1/3				
1	35		42		"	"				

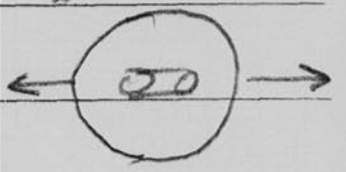
PLACE 20D102

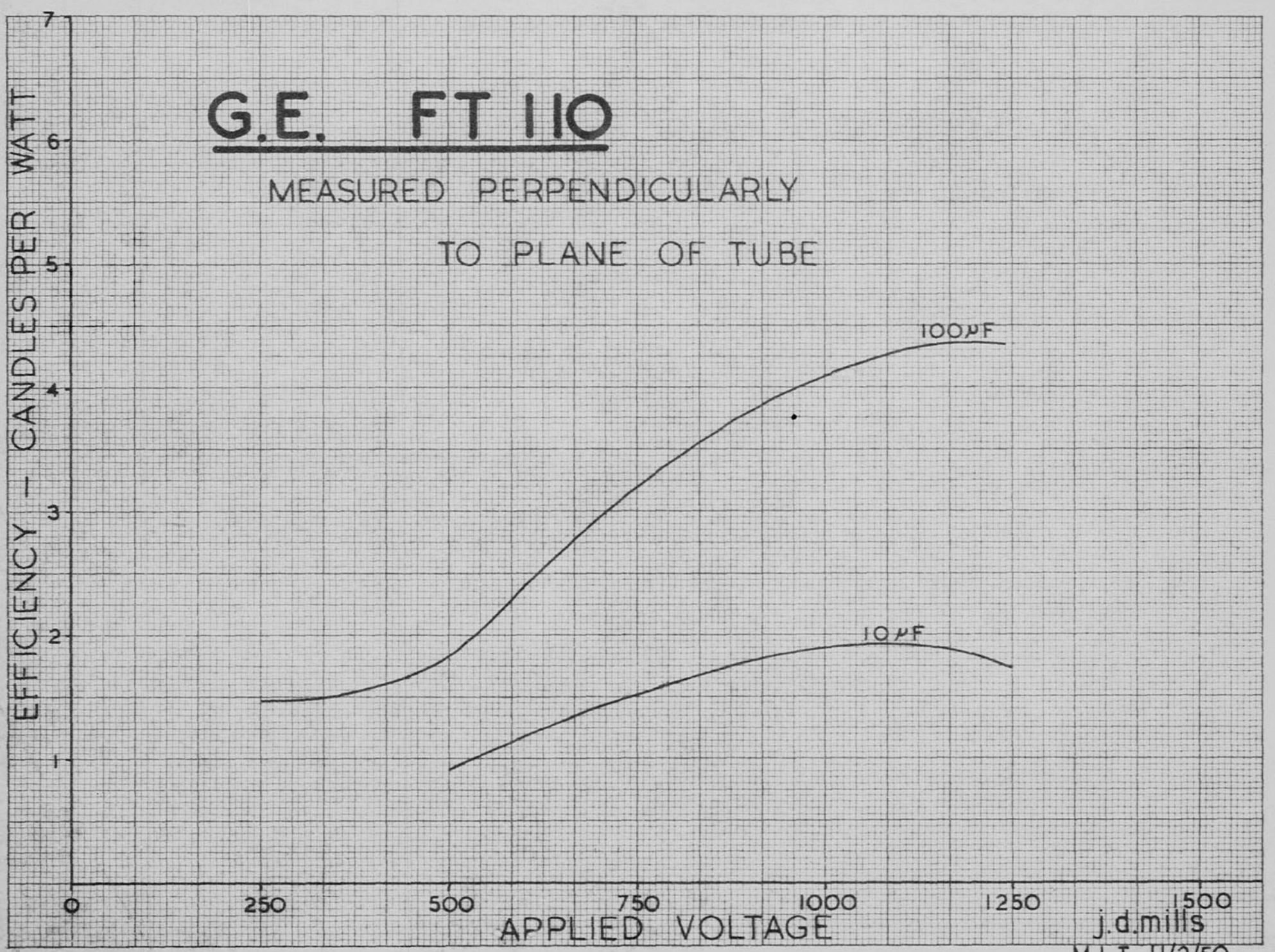
DATE Dec 27 1950

OBSERVER Wm Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
64	70	~~1580~~	15'		Guide No			400		2-transformer Power. 2.600 mf cond boxes. 80
64	60	3840	15'		Guide No			290		1200 box with Fan job for chg. 90 on meter
				Both meter. 75 ft 4 wire lamp cables.						
16	110	1600	15'		Guide No.			236		600 pf + 2 ka power

PLACE M.I.T.
DATE Jan 30, 51
OBSERVER E. Mack

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
					nom.	nom.				Red Flash
X1	113		4'		950	90	40 w.s.			
	0°	67		1072						with FT-110
	10°R	87								tube
	20°R	50								
	25°R	33								
	30°R	22								mounted
	0°	67								with
	10°L	85								electrodes
	20°L	55								just inside
	25°L	38								reflector
	30°L	26								



$$\begin{array}{r} 39\,0 \\ \quad\;\; 6 \\ \hline 23.40 \end{array}$$

18" 1/4 1.2 QUARTZ CLOUD CH. LAMPS.

PLACE 21012

DATE Feb 3 1951

OBSERVER Elgarten

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS ~~OR LUMEN SEC'S.~~	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
					Copper soldered				caps.	2cm argon Pressure. Bottle!
1	113	7	6'		2000	100				
1	113	25	6'		4000	100				2 cm
		Did not start second time.								~~Tube~~ 2
		19			4000	100				1 cm pumped out
1	113	35	6'		4000	100				3 cm
		Did not flash second try.								Pressreduced to 2 MG
1	113	19			4000	100				1 cm
										pumped out
1	113	50			4000	100				5.5 ↓
1	113	32			4000	100				3. → did not fire.
										→ Pumped
1	113	60	6'	2160	4000	100	800			7.5 cm
		53	6						7.5	Several misses
		36							4.5	
										→ pumped
1	113	64	6'	2304.	4000	100				9cm argon.
		58								
		57								
		57.								→ Pumped out
1	113	65								12.5
		62								
		62								
		59.		Min Start 2500.						
										→ pumped
		Instant		Start	1500.					10 cm.
		62			4000	100				
		then start in			3500	300 ± --- volts.				→ pumped
		65. Instant 1500+								14cm
										→ pumped out
				Sealed off.						15 cm
		Start 1800 volts after tip off.								

36 60 / 21 60

Test of Nat carbon Battery Jobs.

PLACE 20D102

DATE 2/22/51

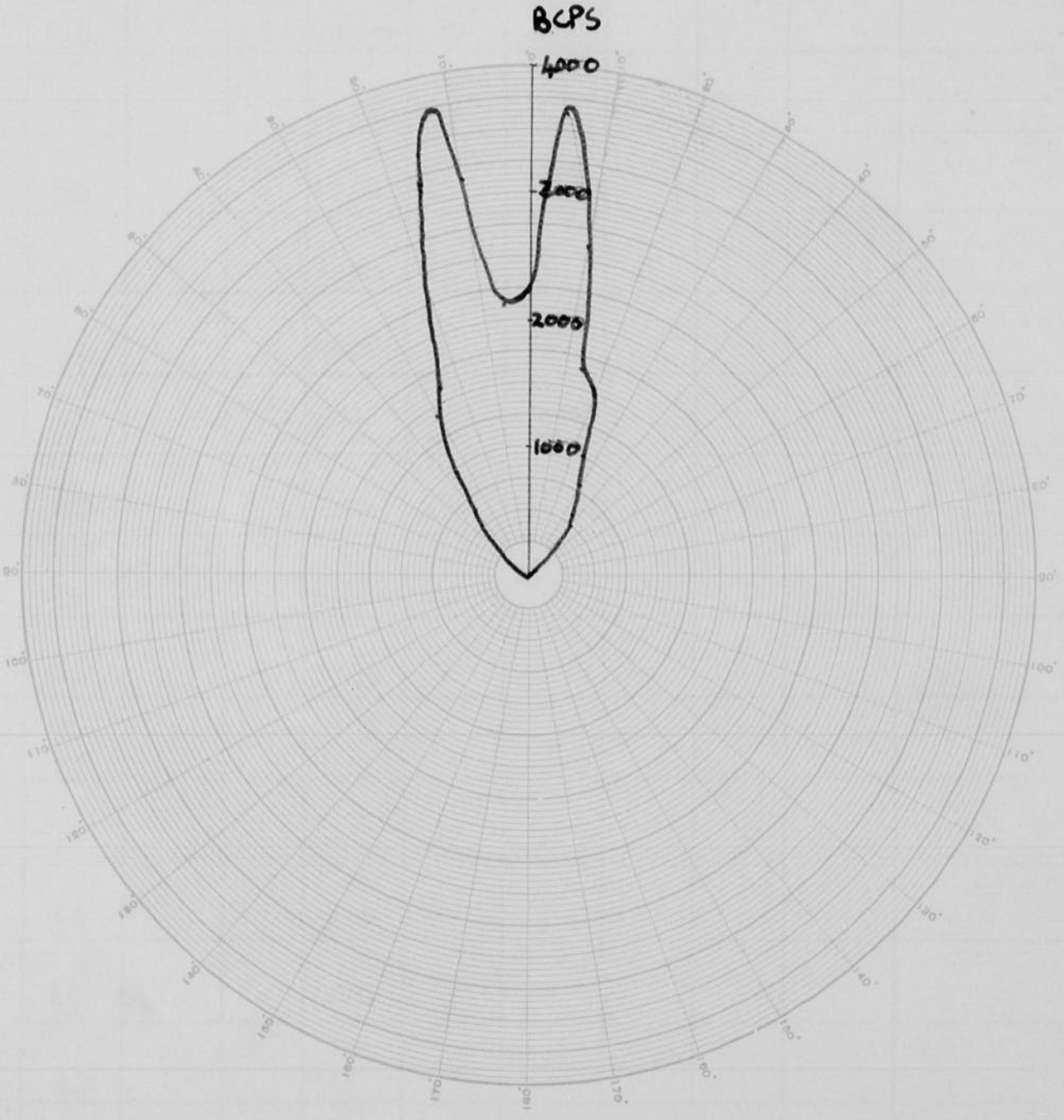
OBSERVER H Edgerton Smiths

ATTENUATION RATIO H	113 METER	D	METER READING INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY C (MFD)	ENERGY $CE^2/2$ (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
1	170	3	170	1530	400	1050				Agen box. 2 Sprague capacity
2	160	3	320	2880	900					green flash.
2	120	3	240	2160						Doubler supply. 2 sprague.
2	104	3	208	1872						Small flash gun
2	45	3	90	810						" 80°.
2	62	3	124	1116						green flash 30°
Present Location Fritz.										

PLACE M.I.T.
DATE Apr. 25, 51
OBSERVER E. Mach & J. Mills

ATTENUATION RATIO B	METER	D	METER X-RAD INCIDENT INT. CAND SEC.	LIGHT BCPS	VOLTS E	CAPACITY C (MFD)	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY CP/W	LAMP	REMARKS
		4ft			None	None			FT-110	Cellux
X1	66		0°	1056	880	150				
	70		5°L	1120						Model 5m
	67		10°L							Ser. No. 432
	53		15°L							
	40		20°L							
	30		25°L	480						aluminum
	22		30°L							painted
	66		0°							Weber Reflector
	68		5°R							
	68		10°R							
	57		15°R							
	45		20°R							
	32		25°R	512						
	23		30°R							
	0		65							

GREEN FLASH. LIGHT DISTRIBUTION



Green Flash Light Distribution

PLACE 20 D 102

DATE May 3 1951

OBSERVER J. MILAS

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	Angle VOLTS E	CAPACITY (MFD) C L or R	ENERGY CE²/2 (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	91		5 ft	2250	0°	R				Reflector Distinctly Specular
1	145		"	3630	5°	R				
1	104		"	2600	10°	R				
1	66		"	1650	15°	R				
1	50		"	1250	20°	R				
1	40		"	1000	25	R				
1	32		"	800	30	R				
1	23		"	575	35	R				
1	20			500	40	R				
1	93			2320	0	L				
1	85			2120	5	L				
1	126			3150	10	L				
1	136			3400	15	L				
1	99			2470	20	L				
1	64			1600	25	L				
1	47			1170	30	L				
1	39			980	35	L				
1	26			625	45	L				

Color Electronic Camera PORTLAND ORE

D 2387 SH

PLACE MIT 20D102

DATE July 12 1951

OBSERVER H. Edgerton John Mile

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT ~~LUMEN~~ BCPS OR SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
									FT-220	Lamps in camera
1	75	75	5	1875						
1	37	37	5	925.						Side light ~~photocell tripped~~

Joe Souza
John Scanzio.
728 Broadway
Somerville.

Photocell

FT 210

Incandescent spot lamps.

Focus

FT 220

5x7 film holder.

f4.5 lens.

6 photos

3650
1800

35mm Kodachrome exposure test. Light Duration

M.I.T.

PLACE 20D102

DATE July 19 1951

OBSERVER H. Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	FT D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	50	50	10	5000	2000	101			FT-220	Photos at f 3.5 G.E. 35 4. 40 5.6 56 8. 80
										note one photo in error on chart. mark on sheet shows f 3.5. actual camera aperture was f 5.6 to 8. 2 was in this photo and was in profile. all others - I was looking at the lamp.
										Capacity now reduced from 101 to 24.5.
1	12	12	10	1200	2000	24.5			FT-220	
1	50	50	5' 1½" 5.125	263×5 = 1310	2000	24.5			"	
1	52	52	5'	1300	2000	24.5				same series as above f 3.5 17.5 4. 20 5.6 28 8. 40
										now changed to electrolytic ac unit. 600 mf at 950 (±) volts. FT-220 is a different tube.
1	50	50	10'	5000	950	600c				Electrolytic caps. f 3.5 35 4 40 5.6 56 8 80.
1	50	50	6'	1800	950	180c				Green flash. 5.6 33.6 8 48.0
1	53	53			"	"				

95
9
855

Quartz Flash tubes for Cloud Chamber

PLACE 20102

DATE Sept 28 1951

OBSERVER Edgerton

ATTENUATION RATIO R	METER (FX1)	METER X R INCIDENT FT. CAND. SEC	FT. D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY CE²/2 (WATT SEC.)	EFFICIENCY C.P. L/W (429)	LAMP	REMARKS
1	95	95	3	855	2000	101	202	4,23	FX1	#3B. - 850 V SY.
1	90	90	3	810	2000	101		4,01	"	2B 2000± SY.
1	96	95	3	855	2000	101			"	1B 700 V SY.
1		70	3'		2000	101			FX1	#2 Sept 25 Dark tube. Surface glow
1		100	3'		2000	101			FX1	#2B. Surface glow.
1		100	3'		2000	101			FX1	? Sept 27 51 Surface glow
1		100	3'		2000	101			"	Sept 27. ok. glow.
1		95	3'		2000	101			"	Sept 25 Surface glow
1		100	3'		2000	101			"	2B. ok.
1		85	3'		2000	101				Sept 21. Has 15cm power instead of 20 cm
1		95	3'		2000	101			FX1	3B.
1		96	3'		2000	101			FX1	1A
1		95	3'		2000	101			FX1	1B
1		97	3'		2000	101			FX1	Oct. 5. 1951 just pumped #2
1		98	3'		2000	101			FX1	"
1		94	3'		2000	101			FX1	"
1		77	3'	694	2000V	101		3.43		S.E. 429 repaired 18cm pressure for Dr. Donaldson.

Photo of 1" quartz tube.
f45 x00 filter.
about 1 to 1 or filter.

1" Quartz tube

PLACE 20D102

DATE Oct 7 1951

OBSERVER Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) CE²/2	EFFICIENCY L/W	5/32 I.D. x cm 20cm LAMP	REMARKS
1		67	1FT	67	360	575e	37.2	1.8	4mm I.D.	
		51		51	300	"	26.1	1.94		
		73		73	360	"	37.2	1.96	1" gap	
		108		108	300	1150e				
		145		145	360	1150e	74.4	1.95		
		63		63	360	525e	37.2	1.69		
		99		99	455	525e				
		160		160	450	1050 1150?				

2 x 3.5 = 7. guide factor.

G.R. Meter 115 Strobolume #408.

PLACE 20D102

DATE Nov 3 1951

OBSERVER W.E. Dyer Lo

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	70	70	2'	280	2800	4 mf	Hi ck		FT-220	center of beam.
	—	—			2800	.1 ?	Low.		"	
f3.5	70	70	2'							
f4.5	70	70	17.5"							

Bird & Michie checks.

PLACE 20D102

DATE Nov 19 '51

OBSERVER EDGERTON

ATTENUATION RATIO R	METER # 115	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	1.097 / corrected LAMP	REMARKS
X1	11		3	99	1400	34.82	34.1	2.9	3.18	3.4-3.
	25		2	100				2.93	3.22	3.4-3
1	18		3	162	2800	14.8	58.	29	3.18	3.4-7
meter-1.3										
1	17		3							
	52		3	467	2000	100	200	2.34	2.57	FT-214 Std. max.
				these measurements				3.18	= .84	
				are lower by				3.8		

$$\frac{V}{\text{Lp.}} \cdot C = \frac{V'}{6''\ 20\text{ cm}} = \frac{V''}{12 \times 10}$$

FX-1 and similar tubes of different Length A

PLACE 20D102

DATE Nov 24. 1951

OBSERVER H. Edgerton Mac R.

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN~~ SEC'S.	E VOLTS	C CAPACITY (MFD)	ENERGY CE²/2 (WATT SEC)	EFFICIENCY cp. L/W	LAMP (Uncorrected)	REMARKS
1	59	59	3'	531.	2000	101	202	2.63	2.88	Standard 214 FT
	60	60	3	540	2000	101.	202		2.93	No. X.
1	77	77	3'	693	2000	101	202		3.76	FX-1 4mm ID
1	~~13~~	13	3'	117	1000	101	~~101~~ 50.5		2.54	6" between
1	38	38	3	342	1500	101	113		3.32	electrodes.
1	76	76	3	684	2000	101	202		3.7	
1	113	113	3	1020	2500	101	315		3.54	
1	132	132	3	1190	3000	101	454		2.87	Soldered ends.
	72			648	2000	101	202		3.52	
	73			657	2000	101	202		3.57	
1	64	64	~~X~~3'	575	2000	101	202	2.84	3.12	FT-214 Standard
1	65	65	~~X~~3'	585	"	"		2.84	3.17	# 628.
1	65	65	~~X~~3'	585					3.17	FT-214 Std # 646.
1	12		3'	108	1000	101	50.5		2.34	10 cm press. 12" FX-1
	72			648	2000	101	202		3.52	yours.
	74			667	2000	101	202		3.62	4 mm I.D.
	122			1100	2500	101	316		3.81	
	122			1100	2500	101	316		3.88	
	172			1550	3000	101	454		3.74	12"
	169			1520	3000	101	454		3.67	
	72			648	2000	101	202		3.52	
2	112	224		2020	2500	101	619		3.58	
	124	248		2230	4000	101	808		3.03	
	115	230		2070	4000	101	808		2.81	
X2	33	66		595	2000	101	202		3.23	Slight end discoloration.
1		66		595	2000	101	202		"	
1										
		646								
		628								
		1274								
		637								
		580								

average standard meter.

1.097 =

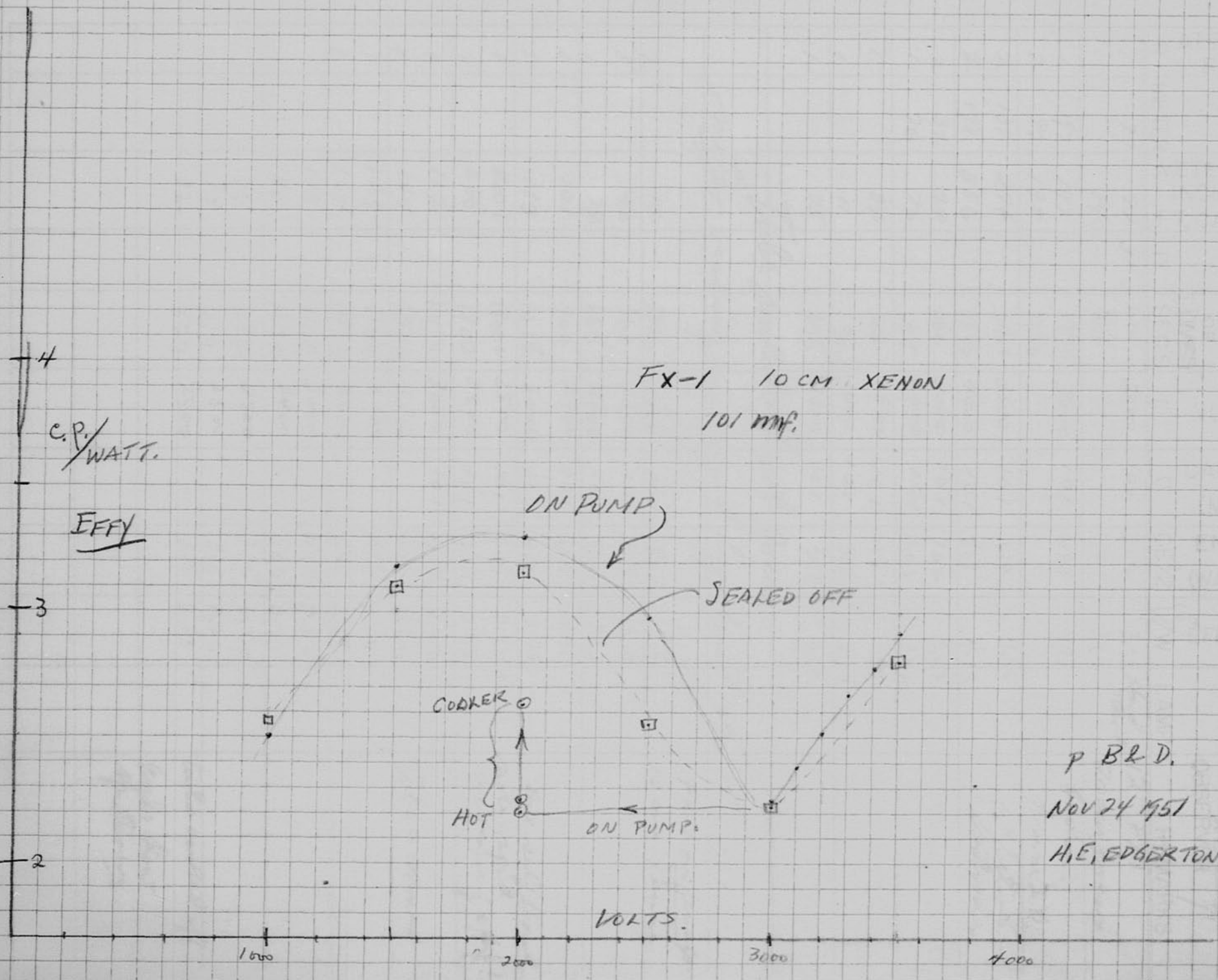
1,095 x 59 / 58 — 647

on long FX1

Graph taken by A Briggs

April 27 1953

$C \times 10^6$ 600 1200 μμf


FX-1 10 CM XENON
101 mm.
4
C.P./WATT.
EFFY
3
2
ON PUMP
SEALED OFF
COOKER
HOT
ON PUMP.
P B & D.
Nov 24 '51
H. E. EDGERTON.
VOLTS.
1600
2000
3000
4000

12" Fx Vicor tube.

PLACE 20D102 B

DATE Nov 24 1951

OBSERVER HE Edg.

ATTENUATION RATIO R	METER	METER X R. INCIDENT FT. CAND. SEC. (1.097 Corrected)	D	LIGHT BCPS OR ~~LUMEN~~ SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) CE²/2	EFFICIENCY c.p. L/W	LAMP	REMARKS
1	77	77	31	694	2000	101	202	3.77	Hard Start.	12" Fx-1
		74		666				3.62		20 cm press.
1	197	197		1770	3000	101	454	4.27		Helium.
2	97	194		1750						4 mm I.D.
2	137	274		2460	3500	101	619	4.35		12" between electrodes
2	178	356		3200	4000	101	808	4.33		
2	37	74		666	2000	101	202	3.62		
1	76	76		685	2000	101	202	3.72		
1		34		306	1500	101	113	2.97		
1		11		99	1000	101	50.5	2.15		
1		75		675	2000	101	50.5	3.68		
		Tube sealed off at 20 cm.								
		meter reading increased by about 1090								✓
										Fx-1 on pump.
1		14		126.	1000	101	50.5	2.5		10 cm x sman.
1		40		360	1500	101	113	3.19		
1		74		665	2000	101	202	3.30		
1		101		909	2500	101	315	2.98		
1		113		1015	3000	101	454	2.24		One self flash.
1		200+		1800+	3500	101	619	2.92+		note rapid increase of effy !!
1		200		1800	3500	101	619	2.92		
1		112		1010	3000	101	454	2.22		
1		145		1300	3200		515	2.52		Tube is warm
1		129		1160	3100		485	2.39		
1		164		1470	3300		550	2.68		
		113		1015	3000		454	2.23		
		180		1620	3400		583	2.77		
		77		692	2500		315	2.20		
		79		710	2500		315	2.26		
		92.		827	2500		315	2.63		Tube cooled off.
										Ends show sputtering.

C

PLACE

DATE Nov 24 1951

OBSERVER NEE MacR.

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1		~~14~~	~~3'+~~		~~1000~~	~~10+~~				~~O.~~ Pump F x 1
		47	3'		1500					20 cm x mm.
		17	3'		1000					
		103	3'		2000					
		160	3'		2500					
2	93	186	3'		3000					
1		174	3'		3000					tube allowed to cool.
1		172			3000.					
2	114	228			3500					
2	158	316			4000					Shows sputtering Black electrode.
2	114	228			3500					
2	73	146			3000					Electrode ends appear to be melted!!
1		147			3000					
1		107			2500					
1		88			2000					
1		47			1500					
1		89			2000					
		45			1500					
		Pumped out gas and refilled to 20 cm x mm.								
1		17			1000					
		49			1500					
		85			2000					
		132			2500					
		157			3000					
		Presume reduced to 10 cm x mm								
		77			2000					
		92			2500					
		127			3000					
		200+			3500					
2	99	198			3500					
		Pressure increased to 20 cm and tube sealed off.								

Fx-1 20 cm pressure std.

PLACE

DATE Nov 24. 1951

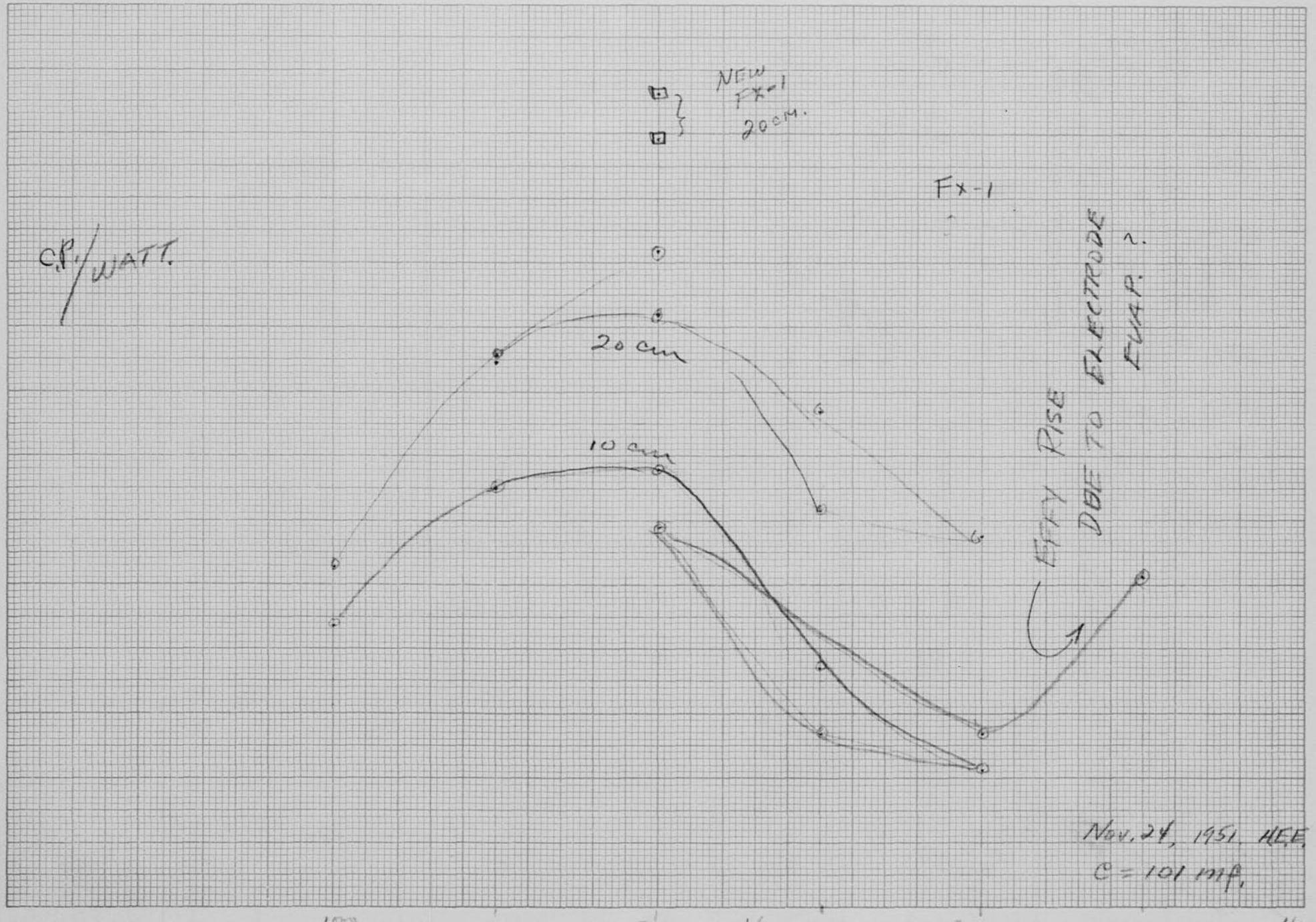
OBSERVER HEE MacR

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY C (MFD)	ENERGY $CE^2/2$ (WATT SEC)	EFFICIENCY L/W	LAMP	REMARKS
1			3'		1000	101	50.5			Same Fx-1 that was tested on panel.
1		44		395.	1500		113	3.49		
		82		737	2000		202	3.64		Electrodes show melting.
		117		1050.	2500		315	3.34		
		149		1340	3000		454	2.95		
		106			2500		315	3.03		20 cm
		86		773	2000		202	3.83		
		44		395	1500		113	3.5		
		16		144	1000		50.5	2.86		
		15		135	1000		50.5	2.67	10 cm	10 cm Fx-1.
		39		350	1500		113	3.1		
		71		638	2000		202.	3.16		
		89		800	2500		315	2.54		
		112		1010	3000		454	2.22		
		82		737	3500 * 2500		315	2.34		Tube is hot.
		67		602	2000		202	2.98		
		118		1060	3000		454	2.34		
		195		1750	3500		619	2.82	*	

The following tube was sealed off at 20 cm at the same time as the tube at the top of this page. This second tube was not operated on the pump. Starts at 600 V.

1		97	877	->	2000	101	202	4.32		Fx-1 Std 20 cm.
		94	845		2000	101	202	4.18		after 1/2 min.
		94	845		2000	101	202	4.18		

* Note the rise in efficiency at 3000 → 3500 volts. We think this is due to electrode evaporation which gives metal vapor in the tube. Note that the efficiency is less when tested at regular loading after the tube has been abused. This reduction in efficiency may be due to evaporated electrode material that deposits on the glass walls.



$$\begin{array}{r} 35 \\ 4\overline{)443} \\ 12 \\ \hline 23 \end{array}$$

Microscope illuminator

PLACE 20D102

DATE Nov 14 1951

OBSERVER [illegible]

ATTENUATION RATIO R	METER 113	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS ~~OR~~ LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
x1	143	143.	6"	35	400±	180 electrolytic				4 mm I.D. 3/4" gap.
	Above taken with old lamp that shows some darkening.									
			6"		"	"				Tube with constricted center. 3/4" gap.
x1	68	68	6"		"	Soldered seals.				
1		72	6"		475 after 79	"				
1	190	190	6"	47.	475	180	20.3	2.31		3/4" gap 4 mm I.D. neon tube.

$$\frac{400}{400}$$
$$\frac{160000000}{2} = 8 \times 10^7$$

Kenlight tubes. FT-105 FT-110

PLACE 20D102

DATE Dec 4 1951

OBSERVER Edgerton.

ATTENUATION RATIO R	# 115 METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) Sprague C	ENERGY CE²/2 (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	39	39	23"		420	575c			Kenlight.	
1	36	36	2'		420?	575c				
1	35	35	2'		440	575				
1	37	37	2'		440	575			FT-110.	
1	35	35	2'		440	575.			FT-105	
		Experiments continued Dec 7 1951 evening.								
1	33		2'		440	575c			FT105	Simpson 280 meter for volts.
1	65		1.5'	146	470	575c			FT105	
1	124		1.5'	279	~~440~~	1150c	~~2220~~ 1110	2.64	FT105	450 V 575 MF Sprague
1	133		1.5'	299.0	~~440~~	1150 c			FT110	
1	133		1.5'	299.	"	"			FT110	90 V. after flash.
1	125		1.5	281	440	1150c			FT105	70 V after flash.
1	124		1.5	279	440	1150			KEMNITE	70 V after flash.
1	123		1.5	277	440	1150			"	
1	78		1.5	176	440	1150c			DOUBLE FT-110.	
1	18		1.5	40.5	440	1150c			QUARTZ GAP 3/4" in 4 mm with 2 mm after center section	(70V.)
		~~ANODE~~ and cathode shows discoloration after one flash. Also some at cathode.								
1	62		1.5	139.5	440	1150c			Quartz tube. 70V.	
		Serious anode melting Globs of melted material stick to quartz after one flash.								
1	137		1.5		880	575/2 c			FT-110	130V after.
	24		1.5		440	"				90V after

400
200
180,000

200
300
2) 60.000
30

35 × √30 = 190.
5.47
guide
no.

Raytheon

2800 watt sec unit

PLACE

DATE 1951

OBSERVER Edgerton Dixon

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN~~ SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
	Two lamps on entire unit.									
	Specular lamps.									
8	120	Beam 960	12' 14	18" Spec 18800						
1	130	10" unit.	12'							
2	160	320	12'	46,00	4000	?	2800			
2	160	320	14'	62,600						

Kemlite MLX 3

PLACE 20D102

DATE Dec 20 1951

OBSERVER Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
			3 turn spiral in Std 4 pin base. metal cylinder in center leg.							
1	129	129	1'		450	575				FT+110
1	50	50	1'		350	575				Kemlite
1	78	78	1'		400	575				"
1	109	109	1'		450	575				
1	108	108	1'		450	575				

At General Radio

Dec 27 1951
At E Edgerton
& Webb.

meter		C	V	LAMP	D.		M			
	115									
#	115		101.8	2000	GR 1	2.5'		85		
	113		101.8	2000	GR 1	2.5		93		
		Webb ~~uses~~ sets meters to read 99 with this set up.								
	113		101	2000	#646.	2.5		100		
	115		101		646			92		
GR	132		101	2000	646			103		
	Standard meter.									
	115		101.8	2000	646			102	after adjustment	
	113		101.8	2000	646			103	after adjustment.	
GR	132		101.8	2000	GR#1			97	625×97 = 605 kcps.	

$100\ 2.5^2 =$
2.5
12.5
50
$625.$

645.

At M.I.T. using adjustable test set 27640 meter.

113	101.17	2000	646	2.5'	108
113	"	"	"	"	109
115	"	"	"	"	112
115	"	"	"	"	108

$14\frac{4}{5.6}$

$\frac{000}{2}$ 50.25 25.3

120

PLACE M.I.T. 20D 102

DATE Jan 19, 1952.

OBSERVER H.E. Edgerton

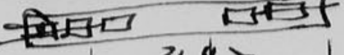
ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY K/W	LAMP	REMARKS
	-		3'		1000	24.54	12.27			8" tube 4 mm I.D.
	19	171.	3'		2000	"	49.2	2.87		FX-1-8 20 cm xenon.
	50	450	3'		3000	"	110.0	4.09		
	7	63.	3'		1000	50.74	25.3	2.49		made today by Bill & Mrs Roberts.
	46	414.	3		2000	50.74	101.5	4.07		
	110	990	3		3000	50.74	228.0	4.34		
	15	135	3		1000	101.	50.5	2.68		
	98	882	3		2000	101	202.0	4.37		
	105	945	3'		2000	101	202.	4.67		FX-1-8 #2
	105	945	31		2000	101	202.	4.67		
	105	945	3'		2000	101	202	4.67		FX-1-8 #3.
	21	189.	31		2000	101	51.5	3.74		FX-1 #1 6"
	108	972	3'		2000	101	202	4.80		"
	55	495	31		1500	101	118.5	4.17		"
	108	972	3'		2000	101	202	4.8		FX-1- #2 6"
	54	486	3'		1500	101	118.5	4.1		
	21	189	3'		1000	101	50.5	3.74		FX-1 27 cm Xenon pressure.
	57	513	3'		1500	101	118.5	4.33		
	- BLEW UP!!				2000	101	202			
	18		2'		450	525 X2				10 atmos xenon 1/4 gap. Cracked tube?

PLACE Jan 26 1952

DATE 10 D 102

OBSERVER H E D
Roy Swanson

ATTENUATION RATIO R	METER (115)	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR ~~LUMEN~~ SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W (C.P.)	LAMP	REMARKS
1	28		2'	112.	450	525c	53.	2.11	MLX3 Kemlite	
	64		2'	256	450	1050c	106	2.36	"	
	72		2'	288	450	1050c	106	2.72	3DLX2 Kemlite	
	30		2'	120	450	525c	53	2.26	"	
	36		2'	144	450	525c	53	2.72	Ft 110	
	85		2'	340	450	1050c	106	3.2	"	

High pressure gap tube #115  2.D. = 0.4 cm 3/4" 1/8" Electrodes

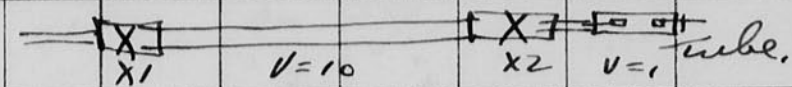
PLACE 20D 102 Back Room

DATE Jan 4 1952

OBSERVER N. Sgrolin, V. MacRoberts.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS

Vac system made with 10 to 1.0 volume of tube in ~~side~~ series with 2 rubber corks.



7.1 cm of xenon into system. then x1 closed and liquid nitrogen applied to tube to condense xenon into tube, then x2 clamped shut and tube allowed to warm up. this should put 71 cm of xenon in small tube.

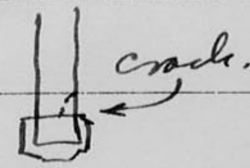
Starts at 800 to 1000V with 1/2" sparks.

R	METER	METER X R	D	LIGHT	E	C	$CE^2/2$	L/W	LAMP	REMARKS
x1 ~~2~~	14	14	2	56	1000	paper. 5 0.74	25.3			
	24			96	1000.	101	50.5			
	32.5				900	575/2 e				
	30.			120	900	575/2 e				Mica paper removed from under tube.

The tube was now pumped out and the pressure was doubled for the next experiment manifold pressure. p = 2 atmos.

R	METER	METER X R	D	LIGHT	E	C	$CE^2/2$	L/W	LAMP	REMARKS
x1	7.		2'	28	500	101 p.				
	25			100	1000	101				
	23			~~100~~	1000	101				
	40		2'	160	~~900~~.	575/2 e				

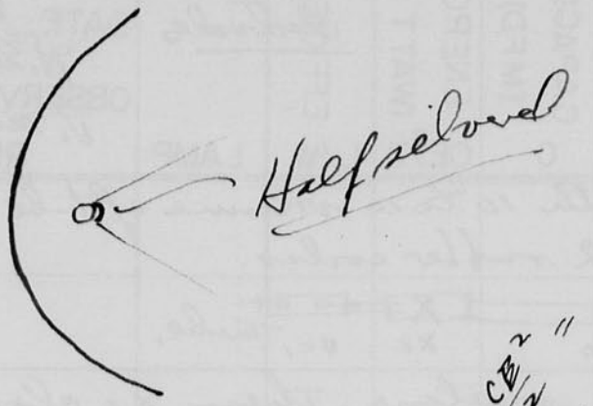
Tube failed ~~to~~ fire on next flash. there was a crack at the seal. titanium hydrid soldered seal on ~~quartz~~ Vicor. I am not sure if pressure or cold caused the crack.??

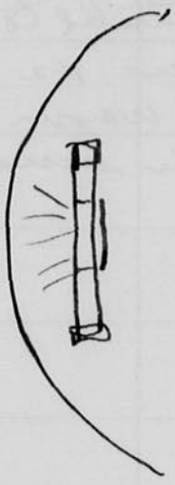


Another tube is being made by Bill Isaac R.

Active volume = $\frac{4^2 \pi}{4}$ 1.5 = 0.19 cubic cm.

The wires on the electrodes were covered with glass capillary to reduce the inactive volume in the tube.





$\frac{10\text{ cm}}{100\text{ cm}}$

50

$\frac{CE^2}{2}$ "

$\frac{9\pi^2}{2}$ $\frac{575}{2}$ "

$\frac{43\frac{1}{4}}{172}$

$\frac{450}{x} \sim \frac{575}{x}$

$\frac{500}{3/4}$

500 v/inch.

500.

$\frac{116}{19} \sim 611$ watts/sec

$500 \cdot \frac{3}{4} \times 14 \times 500 = 5250$ volts.

$\frac{CE^2}{2} = 100$

$\frac{2000\text{ v}}{2000\text{ v}} \sim \frac{100\text{ watts/sec}}{x}$

$C = 200$

$C = \frac{200}{4} = 50 \times 10^{-6}$

PLACE _____

DATE Jan 4 1952

OBSERVER HE Bill MacR.

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY cp/W	LAMP	REMARKS
1	43		2'	192	900	$\frac{575}{2}$ c				3/4" gap 0.4 cm
	43		2'	172	900	$575/2$ c	~~505~~ 116	1.48		~~Katmosphere~~ X $\frac{14}{2}$ x 15 cm = 105 cm.
	16		2'	16x4 64	500	"	36.	1.78		
	52				450	575x2c	116.	1.91		
	53			222	450+	575x2c		~~2.14~~		
		Anode shows sputtering.								
	45		2'	180	450	575x2	116			611 W's/cm³.
	12		2'		1000	50.74				
	22		2'		1500	50.74				
	32 4		21	138	2000	50.74	101	1.37		
	33				2500					
		Tube turned blade.!!! apparently from the cathode and anode, after several flashes pitt 575/2 c at ~~1000~~ 900 v the tube cleared up between electrode.								
	37		2'		900	575/2c	116			
	39		2'		900	"	"			
		Tube exhausted - then 20.5 cm x 7 x mm Hg was frozen into the tube						2015/7 = 2.8 atmospheres.		
*	23				500	575/2c		2/3.5		
*	60				~~1000~~ 900	575/2c.				
*	84 4		2'	336	450	575x2	116.	2.9		
*	79		2'		450	575x2				
		Tube pinched off (copper seal in tube)								
		the above in formalin looks very good. We are now going up in pressure.								
		* these tests also had 50.75 ml of paper in parallel with the electrolytic. I was trying to take a photo of the arc in the tube when it blew up upon discharge.								

relay
+
-
20 =
1/4 x 3.7
450 / 2cm =

PLACE _____
DATE Jan 4 1952
OBSERVER _____

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	CP K/W EFFICIENCY	LAMP	REMARKS
										28 cm x 10/76 = glass end.
										280 cm / 76 = 3.7 atmospheres.
										tube 3/4" gap 0.4 cm I.D. Xenon filled.
										Jan 7 1952 Monday
1	105		2'	420	450	575 x 2	116	3.97		280 cm x xenon 3/4" gap 0.4 cm diam
	110			440	450	e	110	4.15		
	97			388				3.66		
	93.			372				350		
	89			356	450	575 x 2.				Hard start anode is broken off. !!
	18		21		500	575/2 e				
	56		2'		900	575/2 e.				
	49		2'		900	575/2 e.				Glass covering of anode wire chips into fragments
				FT-	110	525				
	82		2'		900	525/2 e	21,2		FT-110	tube.
	83		2'	332	900	575/2 e	21,2	3.12		
										Jan 8 1952 Another tube, 3/4 gap.
1	105		2'		450	525 575 x 2 e	106 116	3.8		Tube 1 Black anode.
1	103		2'							3.7 atmos
1	97		2'							Hard start 1 in 6
1	93		2'							
1	109		2'		450	525 575 x 2 e	106 116			Tube 2. 3.7 atmos.
1	130		2'		"	"	"	with		Hard start 4 tries.
								reflector	starter.	
	Does not self start with 4 KV. Blew up when 1 mf at 4 KV was discharged into the tube.									
	The tubes are hard to start.									

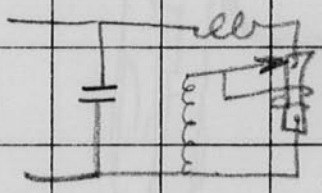
$115\frac{4}{460}$

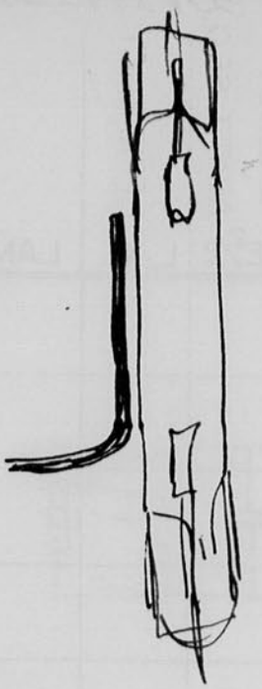
3/4" gap 3 mm 3.8 atmos Xe

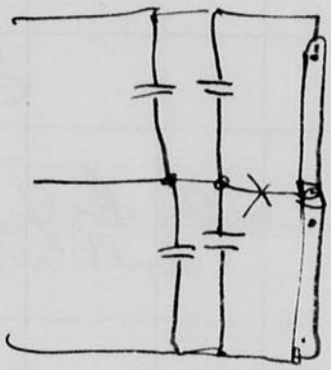
PLACE _____

DATE _____

OBSERVER HEE Mack

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
1	60		2'		450	575 X2				Series inductance helps starting but reduces light
										
Jan 12 1952 cont'd										tube with Pure tungsten anode and thorjated cathode.
1	42		2'		450	575.				
1	41		2'		450	575				
1	98		2'		450	575X2				
1	115		2'	460	450	575X2				with half reflector of dull aluminum.
		another sample								
1	104		2'	416	450	575X2				Hard Starter at 450 V.
	103									
		with inductance in series for triggering								
1	57				~~400~~ 250	575X2				choke has ~~0.73 Ω~~ 0.173 Ω
1	72				460					
1	69				450	"				closed core
1	58				410	"				
1	70				460	"				
1	78				450	" X2	16 turns on a pulse transformer core.			
	49				500	575	4 Ω wire (no choke)			(4 elect. in Ser. par.
	45			Fairchild	500	575				
	47			485	500	575	with 16 turn choke.			
	85			705		575	with 16 turn choke			
	84			700		575	" " " "			
	85			700		575	no choke.			
	94			800		575				Hard start → Shows anode melting! Tungsten





62
28

3/4" gap — tungsten anode — thoriated tungsten cathode.

PLACE

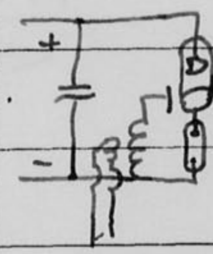
DATE Mark Roberts

OBSERVER H E Edgerton

	ATTENUATION RATIO R	#115 # METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S	VOLTS E Sunfan	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
TUBE 2 (Bent)		18		2'		500	~~575~~/2			gap.	Hard starter. 3
		26		2'		600	" 525.				ok.
		34		2'		700	"				ok.
		44		2'		800	"				ok.
		52		2'		900.	"				
Tube 1		28.				600	"				
		27				600					
		18				500	"				miss.
		35				700	"				
		45				800	"				
		35				900	"				
Tube 2		45				500	525 ~~575~~	c 4 capacitors		575 in series-parallel.	Miss.
		61				600	~~575~~.				
		62		2'	248	600	"				miss.

Jan 14. 1952

Series mercury tube for control.



	R	METER	METER X R	D	LIGHT	E	C	$CE^2/2$	L/W	LAMP	REMARKS
		54		2'		~~54~~ 400	525 ~~575~~x2				
		69		2'		450	"				
		72		2'		450	"				
		39		2'		350	"				
		27		2'		300	"				miss!
		27		2'		300	"	↑			ok.
		17		2'		250					3 misses.

The series mercury tube is one solution to the hard start problem.

	R	METER	METER X R	D	LIGHT	E	C	$CE^2/2$	L/W	LAMP	REMARKS
		47		2'		3~~6~~50	575x2			Special capacitors. 575 mf at 360 v.	
		47 ~~2~~	50	2'		350	"	60 ws			
		79		2'		350	575x3	90 ws.			
		77		2'		350	"	"			
		80		2'		360	"				
		103		2'		360	575x4				
		101		2'		360	"				Light excluded from the mercury tube

7 atmospheres xenon 3/4" gap 0.3 cm I.D.
mercury cooled tubes

PLACE
DATE Jan 15 1952
OBSERVER Roberts, Edgerton

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
			2'		300	525 X 2				Did not start. glowed.
1	65		2' x 4	260	360	525 X 2 (1050)	68.3		3.8 atmosphere lamp.	
1	50		2' 4	200	360	525 X 2	68.3		"	(450 V capacitors).
1	64		2' 4	256	400	"	84.0	3.13	"	
1	83		2' 4	332	450	"	106.	~~3.28~~	"	
1			2' 4		350	525 X 2			7 atmos.	
1	110		2' 4	440	450	525 X 2 (1050)	106 (116)	4.85	"	misses.
		(note FT-110 gives 83 reading).								
1	110		2' 4	440	700	$\frac{525}{2}$ X 2	140	3.14	"	misses.
1	108		2' 4	432	700	"	140	3.09		ok.
1	95		4	380	700	"	140	2.71		ok.
1	98		4	392	700.		140	2.80		ok.
1	103		4	417	700		140	2.94	↓	
					800		Tube exploded!! (184)			→
		FT-110								
1	51		2'	204	700	525/2	64.3	3.17		
1	71		2'	284	800	525/2	83.8	3.39		
1	103		2'	412	900	525/2	106	3.88		
		Stop changed to south side of room so that an oscillograph could be used to measure light							new tube tungsten electrodes 3.8 atmos xenon	
1	94		2'	376	900	525/2	106	3.54	FT110	
1	58		2'	232	900	525/2	106	2.19	1/4 Stop	at 3.5 times.
"	58		"	232	"	"	106	2.19	"	
1	58		2'	232	900	525/2	106	2.19		
1	29		2'	116	300	525 X 2	47.3	2.45	2.45	
1	43		2'	172	350	"	64.3	2.67		
1	61			244	400	"	84.8	2.91		
1	77		2'	308	450		106.5	2.9		
1	89		2'	348	450		106.	3.28		

131 E^2

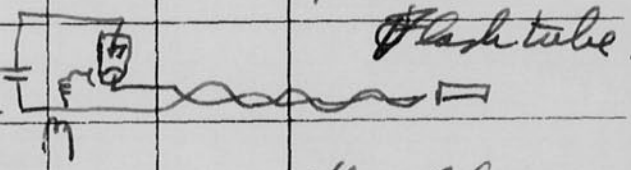
(On Sinclair meter).

3.5 atmos 3/4" gap 0.3cm Xenon

PLACE
DATE Jan 15 1952
OBSERVER

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	CAPACITY C #2 (MFD)	ENERGY CE²/2 (WATT SEC.)	EFFICIENCY C L/W	LAMP	REMARKS
1	12		2'	48	300	525	23.6	2.05		525 / 2700
	17			68	350	"	32.2	2.11		
	23			92	400	"	42.0	2.19		
	30		2'	120	450	"	53.0	2.16		
	45		2'	180	300	525x3	70.7	2.54		
	66			264	350	"	96.5	2.74		
	92			368	400	"	126	2.92		
	117			468	450		159	2.94		
	120			480	450		159	3.01		
	67		2'	268	300	525x4	94.5	2.83		
	96		2'	384	350	525x4	129	2.98		
	128		2'	512	400	"	168	3.04		
	162		2'	648	450		212	3.06		
	39		2'	156	250		65.5	2.38		2 misses
	147		2'	588	450	525x4	212			
	157		2'	628	450		212			without leads.
	87		2'		300	525x4				no leads.
	82		2'		300	"				with wire as above
	—	—	19" to Scope		400	525x4		Oscillogram		1000 μs sweep.
	185		2'	740	450	525x4				with back aluminum on tube.

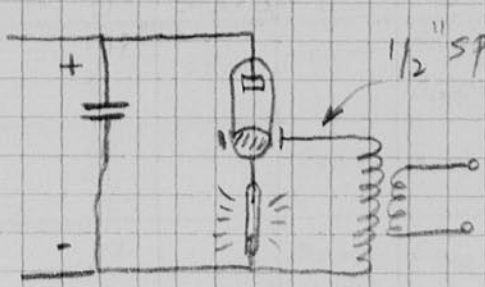
2" of twisted wire between mercury tube and flash tube.



Al foil on backside of tube. to help starting and to increase light in one direction

Starting is 100% now.

MERCURY TUBE



ATMOS GAP.

1050 mf

FT-110
900 V
263 mf

CANDLES/WATT

4

3

2

1

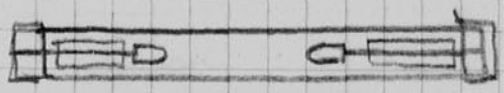
M.

2100

1575

1050

525 mf.



3/4" GAP

0.4 cm I.D.

3.5 ATMOS XENON.

JAN. 15 1952

H.E. EDGERTON

M.I.T.

VOLTAGE

300 350 400 450

24" tube 0.4 cm I.D Xenon ~ 20 cm

Cosmic Ray Lab.

PLACE Jan 25 1952

DATE 20102

OBSERVER Edgerton Mac Roberts Smith Swanson

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY L/W	LAMP	REMARKS
	57		7'	2800.	2000	600 P. + 663(?)	1200	2,33X		Some Misses (The spark was not good).
	64		7'		2000	600 +	1200			
	58		7'		2000	600	12000			
	97		7'		2500	600				
	54		7'		2000	600				
	25		7'		1500	600				
Tube # 2 started at 1400.										
	40				1700					
	68				2000					
	115		7'	5650	2500	600	1880	3.0		
	65				2000					
Tube # 3 started at					1350					
	21				1350					
	30				1550					
	59				2000					
	107				2500					
	62				2000					

Compare FT-422 with FX1-24"

PLACE M.I.T.

DATE Jan 30, '52

OBSERVER E. Mack

R ATTENUATION RATIO	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	E VOLTS	C CAPACITY (MFD)	CE²/2 ENERGY (WATT SEC.)	L/W EFFICIENCY	LAMP	REMARKS
1	47		6ft		1500	600	675		FT-422	Misses
1	91		"		2000	600	1200		No 1	
1	155		"		2500	600	1875			
1	48		"		1500	"	675		FT-422	
1	95				2000	"	1200		No 2	
1	165				2500	"	1875			
1	15				1000	"	300			Does not want to fire at 1000 V.
1	65		6ft		1800	600	972		FX-1-24"	Will not fire at 1500 — misses at 2000
	74		6ft		2000	600	1200			
	135		"		2500	600	1875			
	138		"		2500	600	1875			misses at 2500
	137		"		2500	600	1875			
	183		"		2600	600	2028			
			"							
	40		"		3000	100	450			
	55		"		3500	100	622			
	82		"		4000	100	800			
	74		"		3000	193.5	870			
	115		"		3500	193.5	1210			
	153		"		4000	193.5	1545			

G.E. (100 watt Hg Zigzag tube) See page 16 of note book.

PLACE 2nd D 102

DATE Feb 2 1952

OBSERVER H E Edgerton Mac Robert Ray Swanson.

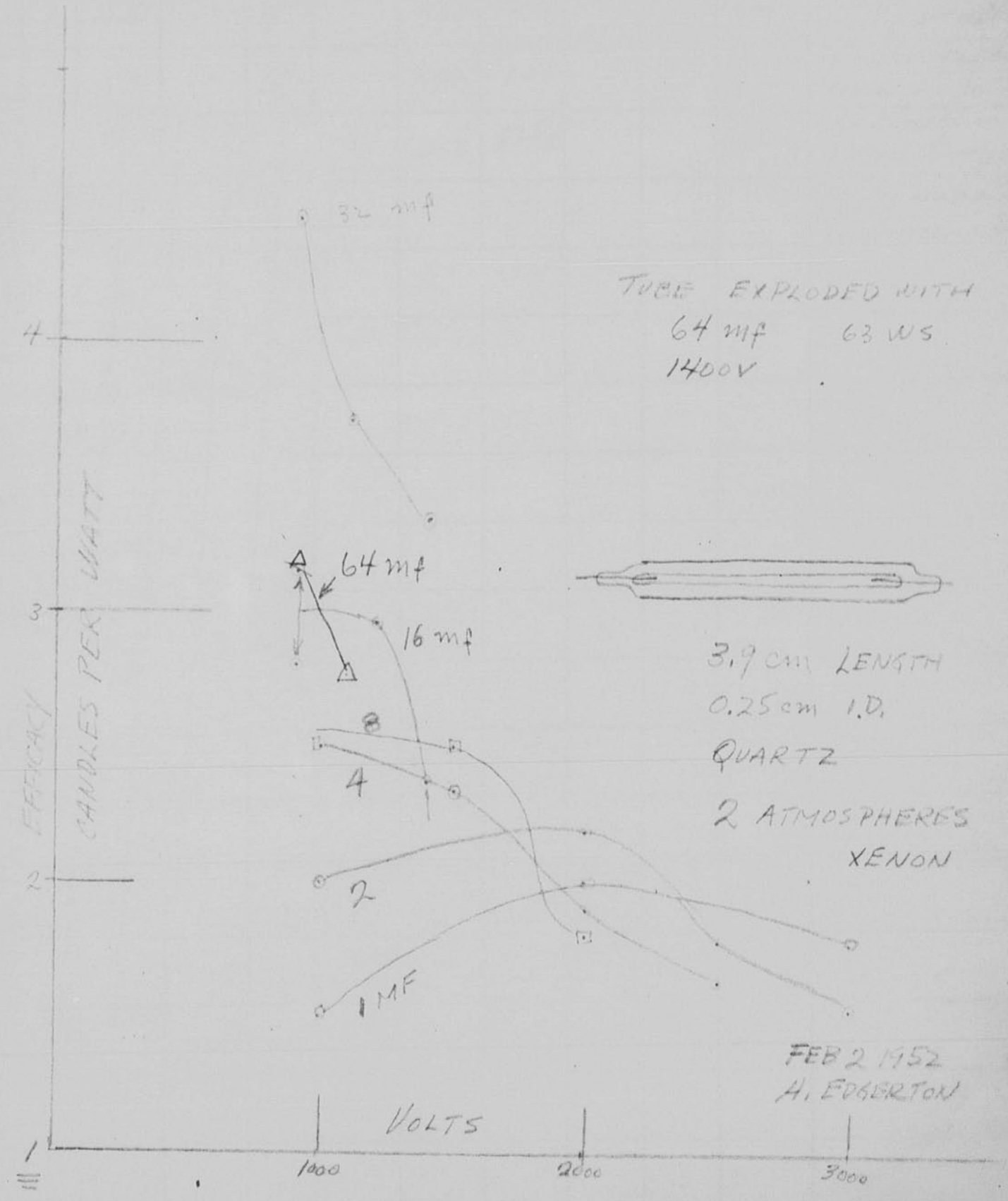
ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/watt L/W	LAMP	REMARKS
1	44		1/2'		1500	4				Prepare about 4 atmosphere xenon.
	62				2000	4				
	77				2500	4			some misses	
	22				1500	2				
	37				2000	2				
	47				2500	2				
	no go 117		0.5'	29.2	1500	8			will not start	very slight anode discoloration.
					2000	8	16	1.8		
				tube	no. 2					starting voltage ~~above~~ 3500 volts.
	3		0.5'	.75	1000	1	.5	1.5		2 atmospheres xenon ~~into~~
	16			4.	2000	1	2.0	2.0		starting voltage 700 volts
	32			8	3000	1	4.5	1.78		
	8			2.	1000	2	1.	2.0		
	35			8.75	2000	2	4.	2.18		
	45			11.2	2500	2	6.25	1.79		
	55			13.7	3000	2	9	1.53		
	20			5.	1000	4	2	2.5		
	42			10.5	1500	4	4.5	2.33		
	61			15.2	2000	4	8	1.90		
	82			20.5	2500	4	12.5	1.64		
	40			10.	1000	8	4	2.5		
	89			22.2	1500	8	9	2.5		
	115			28.7	2000	8	16	1.8		
	82			20.5	900	16	6.48	3.15		
	137			34.2	1200	16	11.5	2.96		
	149			37.2	1400	16	15.7	2.37		
	73			18.2	900	16	6.48	2.8		
	82			20.5	900	16	6.48	3.15		
	95 off scale			23.8	1000	16				
				—	900	32	12.9			
	27		1'	27	1000	16	8	3.5		
	22			22	1000	16	8	2.75		
	48			48	1400	16				
	57			57	900	32	12.9	4.45		

PLACE Dodd 2

DATE Feb 2 1952

OBSERVER Mack - [illegible]

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY C.P. L/W	LAMP	REMARKS
	74		1'	74	1100	32	19.4	3.71		
	105			105	1400	32	31.4	3.35		
	82			82	900	64	26.	3.15		
	107			107	1800	64	38.8	2.76		
					1400	64	~~38.8~~ 63.			Tube explodes
				Tube		80 3				initial starting voltage 6,700 volts
	19		1'		1000	16				
	24		1'		1000	16				
	24		1'		1000	16				
	52		1'		1500	16				
	off scale		1'	200+	600	237.5e	42.6	4.7+		? 16 mf also?
	no go		2'		600	237.5e				
	no go		2'		700	237.5e				
	85		2'	340	800	237.5e	760	4.47		
	80		2'		900	237.5e				anode sputters badly
	65		2'	260	800	237.5e		3.32		G. E Ft - 110
	85		2'		900	237.5e				
	10		1		300	100				Pinched seal type.
	15	?	2'	~~15~~	400	100	8	1.88		
					500	100				Tube explodes



TUBE EXPLODED WITH
64 mf 63 WS
1400 V

3.9 cm LENGTH
0.25 cm I.D.
QUARTZ
2 ATMOSPHERES
XENON

FEB 2 1952
H. EDGERTON

FEB 4 1952

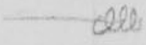
PLACE M.I.T.

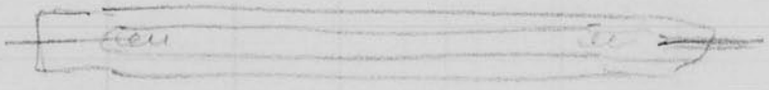
DATE Feb 4, '52

OBSERVER E. Mack

ATTENUATION RATIO R	METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	20		6"		500	50			1/8" Gap	Thoriated tungsten rod for cathode
1	33		6"		500	100			4mm I.D.	5-atmospheres Xenon - tubes
1	85		6"		450	525			~~nylon~~ tubing	cracked on, freqe changing. Tests made immediately.

275 400





3.- Sand Quartz FX-1

PLACE M. I. T.
DATE Edgerton
OBSERVER Del.

ATTENUATION RATIO R	#113 METER	METER X R INCIDENT FT. CAND. SEC.	D	LIGHT BCPS OR LUMEN SEC'S.	VOLTS E	CAPACITY (MFD) C	ENERGY CE²/2 (WATT SEC.)	EFFICIENCY L/W	LAMP	REMARKS
1	13		2ft.		1000	50			FX-1 20cm Xe	Sand Quartz
	47				2000	50				Before flashing
	58				2500	50				tube would
	102				3000	50				start at 400 V.
					500	100			?	won't start
					1000	100				" "
	55				1500	100				
	73				2000	100				now starts
	98				2000	100				
	103				2000	100				OK. at 300 V
		Vycor FX-1								same processing
2	2		2ft		500	100			FX-1 20cm	
"	19				1000	"				
"	51				1500	"				
"	95				2000	"				
"	152				2500	"				
1	198				2000	100				
1	110				2000	100				Sand Quartz.

Sand quartz gives 1/2 as much as fused quartz.

Bill noted red afterglow with 1 sec time constant.

Microscope lamp.

3 Atmospheres ± 3/4 gal

± 4 mm I.D.

PLACE 20D102

DATE Feb 12 1952

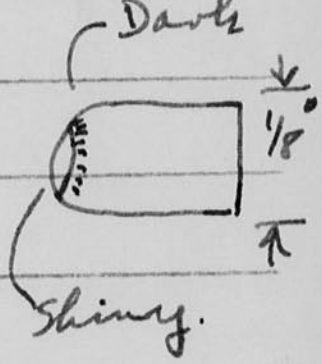
OBSERVER E Boyster

ATTENUATION RATIO H	METER	D	METER X-RAY INCIDENT FT. CAND. SEC.	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT-SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	180	1	130	130	400±	525				Screen as reflector on lamp Series Hg tube.
2	132	1	260	260	400	2×525				
2	57	1	114	1141	400	525				
2	122	1	244	244		1050				
2	127	1	254	254		1050				

anode shows a darkening.

Apparently the pure tungsten anode is melted at the surface.

Cathode shows no discoloration or marking.



PLACE M.I.T.

DATE Feb 14 52

OBSERVER E Mack

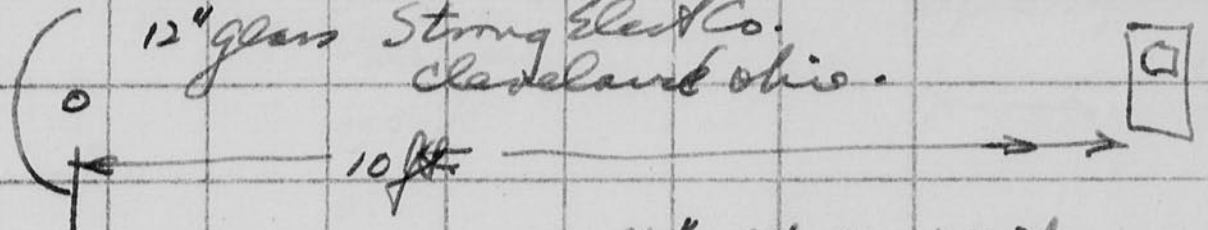
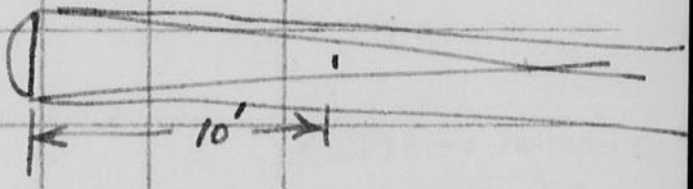
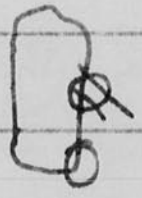
ATTENUATION RATIO X	#113 METER	D	METER READS INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	192	2/4			2000	100			FX-1-10" no 1. 20 cm Xe	firing voltage after flashing 600V.
1	185				2000	100			FX-1-10" no 2 20 cm Xe	
2	100				2000	100			FX-1	no 1 400V
2	95				2000	100			FX-1	no 2 400V
2	95				2000	100			FX-1	no 3 500V
2	96				2000	100			FX-1	no 4 450V
2	94				2000	100			FX-1	no 5 400V
2	89				2000	100			FX-1-4" 23 cm Xe	450V

Spot reflector for H. Bird Photography.

PLACE 20D102

DATE Feb 15 1952

OBSERVER H.E. Edgerton.

ATTENUATION RATIO R	METER	D	METER X INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
										12" glass String Elect Co. Cleveland Ohio.
										
1	160	10'	160	16,000	400	525			3/4" gas tube	3.5 atmos Xenon
										For this test the image is further than the subject so the beam is narrowing down.
										The beam is almost parallel. 
1	40	2'	40	160	400	525				with half aluminum reflector on back of lamp.
										Focus readjusted on Xenon
4	130	10'	520	52,000						Cut the beam 
										Focus readjusted
16	110	10'	1760 1760,00	176,000						!!!
4	170	~~10'~~ 6'8"	680	68,000						

1/8" gap 4mm I.D. Xenon 5 atmos.

PLACE MIT 20D1032
DATE Feb 18 1952
OBSERVER H E Edgerton

ATTENUATION RATIO R	METER	D	METER XRED INCIDENT FT. CAND SEC.	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATTS) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	39	1'	39	39	350. ~~375.~~	180 mf				Aljak reflector.
	35				375.					micros.
	29				350					
		This lamp can be seen through a D 6 filter.								
										10cm. Xe
1	75	12"			300	180 mf.				~~4atmos~~ 10 mm I.D.
1	28				400	"				3/4" gap.
1	55				300	525				
1	70				450-	"				Screen on back side of tube.
1	90				450	"				
1	40	15" 156		62.5	420	525	46.2	1.35		with Series Hg tube.
1	104	15"		162.	420	2x525.	92.5	1.76		no reflector.
1	180	15"		281.	410	3x525.	138.	2.04		
2	154	1'	308	308	410	3x525	138	2.23		
4	116	1'	464	464	400	4x525	168.	2.76		
	In mirror									
4	100	19'	400		400	3x525				

$\frac{94}{376}$

$\sqrt{\frac{376}{25}} \times 3.5$

$\sqrt{15} =$

$3.88 \times 3.5 = 13.5$

12" mirror 10 mg tube 3/4 gap.

PLACE MIT 20D102

DATE Feb 18 1952

OBSERVER A E Knowlton

ATTENUATION RATIO R	METER	D	METER KRAD INCIDENT FT. CAND SEC.	LIGHT FCPS	STOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
4	94	20/f	376		410	3x525 e				
										meter 2 Birds Signs
					20/f					15 f
	Shop.									Indoor way of office.
4	125	20/f	500		410	3x525				
		No Hg tube. Tube alone — with aluminum back reflector								
1	192	2'	192	768	450	3x525	159 159	4.83		
1	200	2'		800	450	3x525	159			
1	45	2'		180	450	1x525	53.2	3.4		
1	44	2'		196	450.			3.32		
1	127.	2'		508	450	2x525	106.	4.78		
1	130	2'		520	450	2	106	4.91		
		condensor shorted accidently								
1	128	2'		512		2x525	106	4.82		
1	201	21	804	804	450-	3x525	159			
1	205	2'		820	"	"	159			
2	132	2'		1055	440	4x525	212-	4.98		
	130			1040	440	"	212-			
2	51	2'		408			212-			without reflector.
	51			408	440		212	1.93		

12" - 7"

10 mm I.D. 3/4" gap. Xenon Sealed.

PLACE MIT

DATE Feb 19 1952

OBSERVER H E Edgerton

ATTENUATION RATIO N	METER Ref.	D Focus	METER READ INCIDENT FT. CAND. SEC.	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP 186 cm.	REMARKS
4	160	12'	640		450V	4x525				NO Hg tube.
4	180	12'	720		450	4x525				

LIFE TEST 3/4 gap 10 mm 5 at xenon

PLACE MIT

DATE Feb 21 1952

OBSERVER HE Edg.

ATTENUATION RATIO R	METER	D	INCHES PER MICROSEC	LIGHT BOPS	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
1	200	2	200	800	410	2100				Aluminum reflector on lamps
Start		8.45 at 1 per minute								
		9.05 Stops. Very slight darkening								
→1	200	2	200	800	410	2100			Start	9.35 2 min interval
1	185	2								11.00
	200+	2	"		"	"				Reading depends upon aluminum reflector angle.
										2.20 4 hours 430 = 120 flashes
										cathode broke off and welded at side
										Some darkening at cathode end.
	Reflector removed									
1	100	2	100	400	410	2100				
1	110	2	210	440	"	"				
										5.35 off Shows 240 flashes
Start life test again									9	
2	104	2'			420	2100			on	gain with Aluminum Reflector!
									off 10 32	at 1 min Total 90 flashes 330
									Start 1210	
2	94	2'			420	2100			Stop 220	130 Total 460

with Reflector in tube!

Tube is a hard starter below 400 volts!!

Darkening appears at the ends.

Looks mighty good!

1/8" gaps 4 mm I.D. 4 atmospheres Xenon

microscope illuminator

PLACE M.I.T. 20D102

DATE Feb 23 1952

OBSERVER Eggerton

ATTENUATION RATIO H	METER	D	METER READ INCIDENT FT CAND SEC	LIGHT BCPS	VOLTAGE E	CAPACITANCE (MFD) C	ENERGY IJOULES $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	18	1	18	18	400 ~~400~~	180				
1	28	1	28	28	400	180				with aluminum starting band.
			after about 800 flashes							
1	22	1	22	22	400+	180				with fuse clip starter.
			The lamp shows a white deposit Electrodes show melting especially the cathode. The area between the electrodes is clear.							

Kodak Duxpress Dual

$$DA = \sqrt{\frac{10}{15} \cdot 360{,}000} = \sqrt{240{,}000}$$

$$= 500$$

$D = 50$

$A = \frac{500}{50} = f10$ for Kodak mic. Daylight.

$= f16$

225
1600
135000
225
360000

Circuit Unit (Two Raytheon Trans.)

PLACE M.I.T.
DATE Feb 26, '52
OBSERVER E. MacR.

ATTENUATION RATIO N	#113 METER	D	METER XRAD INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	168	15'			4000	1200			FT. 17 A	40° bare
	175									
	177									
	84				4000	600				
	83				4000	600				
	~~88~~	reading meter			4000	600	other bank			
	~~77~~	wrong			4000	600				
	~~80~~				4000	600				
	84				4000	600				
	85				4000	600				
	160				4000	1200			FT-17-50° lens	
	165				4000	1200				
	165									Inspection by Dolph Hawley.
16	100	15'	1600	360,000	4000	600 ~~1200~~				Tube H 3 in FT-17-50 Spencer Reflex
	for use in Swimming Pool. Feb 27 1952.									
16	200+	15'			4000	1200				
32	110	15'			4000	1200				

Sand quarry tabl

PLACE
DATE Feb 28 1952
OBSERVER Edgerton
Edgerton Prof.

R	METER	D	METER READING INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
1	37	3'			2000	100			#1	Sand quarry.
1	40	3'								FX-1
1	34 31	3'			"	"			#2	" "
1	41									FX-1
FX-1		3'			"	"				
1	84									Hand Starter.
1	88									

Beam tube

5 atmos 106 cm/μsec

1 cm diam

2100 mf.

PLACE M.I.T.

DATE Feb 28 1952

OBSERVER H Edgerton

Elmendorf.

ATTENUATION RATIO N	METER	D	METER KRYPTON INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	
1	138	7.5' 20'								Def for 6 ft circle at
1	128	17 ft 3"	128		450	2100.				25'.
4	200	11 3'	800	232,800	..	..				Small spot at meter.

Electrical to spread spot by throwing the rings out of focus.

≥0 12" minimum 7" focal length.

1 Aluminum reflector of small size on the flash unit.

20D102

106 cm prem. Xenon.

10 mm I.D.

3/4" Bafo.

PLACE Mar. 1, 1952

DATE

OBSERVER Edgerton

R	METER	D	METER READING INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTAGE E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY * CP/W	LAMP	REMARKS
1	62	1	62	62	500	100	12.5	4.95		* with al Starter.
1	18	1	18	18	300	100	4.5	4.0		
1	103	1	103	103	700	100	24.5	4.2		Slightly milky tube
1	139	1	139	139	800	100	32.	4.33		
2	115	~~2301~~	230	230	1000	100	50	4.60		Sides bent in!
1	58	1	58	58	500	100	12.5	4.64		
			Another tube looks about the same!							
1	58	2	58	232	400	525 #1 c +100 p	~~25~~ 50	4.65		cap #1
1	47	2	~~188~~	188	400	525	42	4.48		
1	58	2	58	232	450	525	53.2	4.37.		
1	103	2	103	412	400	525x2	84.	4.9		cap #1 & #2.
1	152	2		608	450	"	106.4	5.7		
1	182	2	182	728	400	525x3	126.	5.77		
2	125	2	250	1000	450	"	159.6	6.27.		
2	53	2	106	424	300	"	71.	5.98.		
	78		Old tube #1 with welded cathode.	624				4.95		
2	~~88~~	2		~~424~~	400	525x3	126.	~~2.77~~		
2	103	2		824	450	"	159.6	5.17		

1/8" Microscope lamp 215 atmos. Xenon MIT
4 mm I.D.

PLACE 20)102
DATE Mar 4 1952
OBSERVER H. Edgerton
Assistants.

ATTENUATION RATIO R	METER D	METER YPKD INCIDENT FT CAND S	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	
		1/2		450	180				new tube.
1	59	1/2	59	14.7	430	180			
	54	1/2	54		440	"			
	66		66		440	"			
	62		62		440	180			
	54				440	180			old tube after 1500 flashes. ±
	50				440	180			
	56				440	180			
	53				440	180			
	51				440	180			
	29				400	100			Sprague cond. new gap tube.
	33				420	100			
	32				430	100			
	½ minute intervals		Life test counter			29373			9 a.m. Start.
	33				450	100	30027		2.30 pm. 654
					380	100	Limit of operation.		
	25				390	100			
							30392		530 Stop.
		31161					30422		830 am
		29373					31161		330 missing 1788
		1788				80 missing	31681		830 pm, off. 2308.
	Test in Built-in unit				1821		31-33-75 type.		982 after run.
1	30	6"			450?	100			No cable.
1	25	6"			"	100			with 6/4 cab 6 #18
1	55	6"			450	180			" " " " #18.

PLACE M.I.T.

DATE Mar. 6, '52

OBSERVER E. Mack

ATTENUATION RATIO H	METERS D	METER READING INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
								Gap	
				Initial firing voltage				110cm Xe	→ 3/4 ←
				Occasionally fires at			320		10 mm D.
		"		misses at			360		1/8" D. Thoriated
				always fires at			400		tungsten electrodes

3/4" gap 1 cm I.D. Xenon 105 cm pressure

MIT
PLACE 20D102
DATE Mar 6 1952
OBSERVER Edgerton.

R	ATTENUATION RATIO	D	METER X-RAY INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	115. METER 85	2'	~~370~~	340	900	$\frac{525}{2}$			FT-110	
					800	$\frac{525}{2}$			*	Gap tube Blew up.
		another tube								
1	60	2'		240	450	2x525	110?	218		Gap tube with no reflector.
1	185	2'			450	"				with small reflector.

PLACE M.I.T.

DATE Mar 17 52

OBSERVER E Mack

ATTENUATION RATIO E	METER	D	METER READING INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY CP/W	LAMP	REMARKS
1	170	15'			4000	nom. 1200			FT 17A	
			Ceramic unit to be shipped							
			to New York.							

Cosmic Ray Dept CALIB.

Light Meter 1P39 PC.

PLACE

DATE Mar 19 1952

OBSERVER Edgerton de Staffan

ATTENUATION RATIO H	METER	D	METER READING INCIDENT FT CAND	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SECS) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
										#
1	72x9	3		648						Tube 646
	72			648						
1	69	3'								
	72									
	70		70	630						
1	68	3'								
	67		67	603						
	67									
				COSMIC RAY METER.						
1	43	3'		630	2000	100				HOLE NO. 1.
					$WD^2K = 630 = 4$ cps.					
					$K = \frac{630}{43 \times 9} = \frac{70}{43} =$					
	12									NO 1
	25									" 2
	57									" 3
	61									" 3.
	off scale.									" 4
	28									" 2
	12									" 1
	Diffuser Installed on 1P39 Photo-tube.									
1	67			630	2000	100				# 4 HOLE
1	35			"	"	"				# 3
1	17			"	"	"				# 2
1	8.25			"	"	"				# 1

12" Reflector
17.8 feet from Reflem lamps

MacRoberts & Edgerton
Mar 21 1952

Distance inches		Joins.	1/4 in	1/2 in	3/4 in	3/4 out
	24				2 X 17	
	18			2 X 16	2 X 80	2 X 6
	12		8 X 10	2 X 119	2 X 68	2 X 112
	6	8 X 68	8 X 60	2 X 109	2 X 52	
L	0	8 X 118 8 X 94	8 X 54	2 X 90 2 X 103	2 X 47 2 X 48	2 X 68
R	6	8 X 22.	8 X 46	2 X 108	2 X 53	
	12		8 X 10	2 X 114	2 X 66	2 X 96
	18			2 X 18	2 X 76	2 X 24
	24				2 X 8	

10" Reflector.

	Distance in miles	Lumens/sq ft at 30/150 feet from Reflector		
		X4	X4 17.8	X2
	24			17
	18		5	72
	12	20	44	63
L	6	93	58	54
24	0 ←	110 98 95	55 53	57 59
R	6	92	73	65
	12	49	57	98
	18		28	55
	24	0	2	8 3
		1 1/8"	1/4"	3/8" from focus

10" reflector B2L.

H. E. Q.

Mar. 20, 1952

12" Reflector.
18.5 feet from meter.

2 Lamps Side by Side

3/4" inside of Jodes

3/4 gap Distance.

24	—
18	100 x 4
12	200 x 4
6	175 x 4
	150 x 4
	163 x 4
6"	120 x 4
12"	109 x 4
18	10 x 4

9" MIRROR

PLACE 20D102

DATE

OBSERVER Edgerton.

ATTENUATION RATIO H	METER	D	METER READING INCIDENT LT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
4	94	20'			450	525x4			3/4" gaps. after life test.	
4	105	20								Reflector mounted
4	85	20								
4	180	20'			"	"			new tube.	
			(Field about 1 foot in width at focus.							
			Lamp moved towards reflector by 1/8"							

Sylvania Tubes 500V tubes

PLACE M.I.T.
DATE Apr. 3 52
OBSERVER E. MacR. H. Metter Bates Smith

H	MATER	D	METER YEAD INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENTROY ($CE^2/2$) (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
1	92	2 1/4			450	1050			GE. FT-110 (Sylvania)	
	91									
	92 3/4								KENLITE	
	93								USW	
									Sylvania C7	Would not flash 450V. Flashed at 550 V
	101									
	102								Sylvania C5	
	107								Sylvania B9	
	108									
	93								G.E. FT-110 (M.I.T.)	
	93									

$$\frac{810.}{200} = 4.05$$

21 - FX - 1° 20 cm Xe

PLACE M.I.T.

DATE 4/2/52

OBSERVER E. Mack

ATTENUATION RATIO N	# METER	D	METER READ INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	Min Trigger voltage for firing with mirror	REMARKS
1	85	3/4			2000	100	200		900	Each reading a different tube
	88								600	and the
	92								500	average of three readings.
	92								600	
	94								500	Tubes made in the
	93								700	week of Apr. 1 '52
	94								600	some with quite
	92								600	noticeable darkening
	87								700	from soldering.
	94								800	
	89								600	
	97								700	
	91								800	
	88								700	
	93								600	
	94								700	
	90								600	
	90								800	
	87								1000	
	87								900	
	92								600	

FT-218 FT-110.

PLACE
DATE April 1952
OBSERVER H. E. Edgerton

ATTENUATION RATIO N	METER	D	METER READ INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
1	108 4	2'	432 ~~431~~	413	450	525x2	106	3.9	FT-110	
1	109	2'	~~436~~	418			106	3.95	FT-218	
~~1~~	~~168~~	~~2'~~			450	525x3 1575	159		"	
1	161 4	2'	644		450	"	159	4.05	"	Black Background.
2	105	2'	~~840~~ 840		450 101	525x4	222	3.78	"	
2	105 8	2'	840		450	525x4	222	3.78		
2	21 8	2'	168		450 101	525	(4 cap ser par) 218. 53.2	3.16		
2	47.5 8	2'0	378.0		600 180	"	" 93.6	4.05		
2	69 8	2'	562.		700 245	"	128.	4.38		
2	88 8	2' 6"	714		800 32	"	168	4.25		
2	120 8	2'	960		900 405	"	213	4.51		

66
8
56

FT-218.

M.I.T.

PLACE 20D102

DATE Apr 12 1952

OBSERVER Edgerton

ATTENUATION RATIO R	METER	D	METER X FOOT INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENTROY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	73	2'		584	~~400~~ ~~450~~	4X 525.			FT-215	
2	64	2'								
2	80	2'								
2	95	2'			450					70 volts end voltage.
2	93	2'			450	4X525			3/4" gap.	

FT-210 FT-218

Light tests.

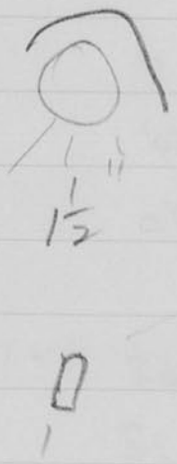
M.I.T. 20D102
April 1952
HE Edgerton

Lamp.	V	C	WS	H.C.P.S.	C.P./WATT.
FT-110	450	1050*	106	413	3.9
FT-218	450	1050	106	418	3.95
FT-218	450	1575	159	644	4.05
FT-218	450	2100	222	840	3.78
FT-218	450	525**	53.2	168	3.16
	600	"	93.6	378	4.05
	700	"	128	562	4.38
	800	"	168	714	4.25
	900	"	213	960	4.51

* 2 Electrolytic Capacitors 525 mf 450 V Sprague
** 4 Elect. Cap in series parallel. Ditto.

Panatomic X. film

al.



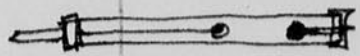
Double enlargement

Photo of electrodes of tube that blew up Apr 18 1932
200 watt sec 2 atmospheres
3/4" gap 450 volts.

f35 & f22. all over exposed.

Sea Lamps.   1" gap. 140 cm Xenon

PLACE 20D 102
DATE Apr 19 1952
OBSERVER H. Edgerton

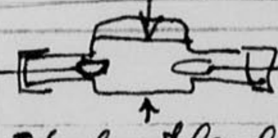
ATTENUATION RATIO H	METER	D	METER [illegible] INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	122 4	2'	~~488~~	488	450	550 600 1150				
	92			368	400	1150				1/4" tube Tungsten electrodes 1" gap
	64			256	350	1150				
	54				325 300					Some misses. ~~Does~~ not fire.

A ~~two~~ single turn starter wire was used on this tube at the center of the gap. Positioning was important. If not centered starting was more difficult

cathode on short end. life test started 4.15 1 f.p.m. 30 flashes 4.45

ATTENUATION RATIO H	METER	D	METER [illegible] INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	120	2'		480	450	1150	116.	4.13		
1	43	2'		172	450	650	65.7	2.62		✓ 118 x 4 = 472 c.p.s. end ok.
1	146	2'		584	~~450~~ 400	1800	~~1820~~ 1440	4.03 ~~3.05~~		
1	173	2'		702	450	1800	182.0	3.86		

1 cm ±.



3/4" gap tube

ATTENUATION RATIO H	METER	D	METER [illegible] INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	83	2'			450	1150	116			Spark at lead.
	90			360	460	1150	116	3.1		misses
	75			300	450	1150	116.			Changed starter to line between
	75				"	"	"	2.58		electrodes
	135			540	450	1800	182	2.98		ok at 300 volts.
	190			760	450	2350	238	3.19		

6 new #490 Eveready Batteries
average new open circuit 93 V.

1st time on 475 V.
2nd " 470 V.
5 sec to 440 V
after about 8 flashes 460 V peak (counter ~~3221~~)
+ 5 flashes. (counter 32711)

Battery Life on Stand by

$I = \frac{V_{drop}}{Res.}$ $I = \frac{V}{530}$

near Friday April 1952

On	Cyl Volts.	Bat. Volts	Res. Drop.	
7.52				
9.53	450+	465	15	20+ mil
10.12	445	450+	5	7 mils
10.47	440-	445	Measured 7.5.	9.6 1/2 a
11.45	430+	440-	6.9	9 mil
1.38	425	430	6.4	8.5 mil
3.07	420	425-	6.0	8 mil
4.42	420	425	5.6	

off 530

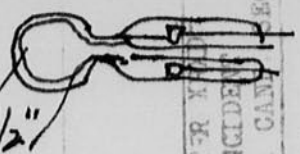
Saturday

9.20	440	455	11.5	
10.45	430	435.	5.3.	
1.00 P.M.	420	425	4.5	
8.50 AM April 1952	440	455	14.v.	
9.45	430	435		
5.00 P.M.	420-	420+	3.35	
11 am. April 5	440.	435		
520. off.	420	420	2.7	
8.45 am April 6	435	430	6.5	
	410	410	2.	
5.00 P.M. off 6				4 days ±

$$52 \times \left(\frac{1}{6}\right)^2 =$$

$$\frac{52}{36} =$$

Microsecond lamps. 1mm I.D. QUARTZ.



1/2" hole.

MIT
PLACE 20D-102
DATE Apr 26 1952
OBSERVER Edgerton

ATTENUATION RATIO R	METER	D	METER X INCIDENT FT. CANDLES	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
no diffuser										200 volts starting
x8	62	1'			1000	2				10.3 cm.
x8	8	1'			500	2				
x8	165	1'			1500	2				
x8	197	1'			1500	2				
x8	65	1'			1000	2				
x8	9	1'			500					
x1	52	2"	~~1.45~~	1.45	1000	2	1 W.S.	1.45		

PLACE Apr. 26 52

DATE M. I. T.

OBSERVER E. Mack

ATTENUATION RATIO R	METER	D	METER READING INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ACCELERATION (CM/SEC) EDGE $CE^2/2$	EFFICIENCE CP/W	LAMP	REMARKS
1	#113	2/+	175		450	2100			10 mm x 3/4" gap	106 cm xe
"	"	"	133		"	"			10 mm x 5/8 gap	76 cm xe
"	"	"	113		"	"			"	"
										after darkening

Underwater unit.

Dry Bat in a 3" I.D. Pyrex Pipe.

FT-218

4 525 mf capacitors in Parallel

12 batteries in series #455 Eveready.

MIT

PLACE 20D102

DATE Apr 29 1952

OBSERVER Edgerton

ATTENUATION RATIO K	METER	D	METER READ INCIDENT	FT. CAND. SEC.	LIGHT BCPS	VOLTS E	CAPACITY C	ENERGY $CE^2/2$	EFFICIENCY P/W	LAMP	REMARKS
1	107	4'				440	525x4				without glass end. Small reflector.
	108	4'									
	110	4'				450	"				
Glass cover installed over flashtube.											1/3
1	98	4'				450	525x4.				with glass cover 3" I.D. corning
1											
1	144	4'				"	"				Ditto with External reflector.

meter reads low?.

8.18

9.03

64

30

2220

35 $\sqrt{\frac{21.7}{2.5}}$ =

Underwater lamp 200 Watt sec

PLACE MIT

DATE Apr 30 1952

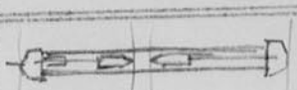
OBSERVER H Edgerton

ATTENUATION RATIO R	METER	D	METER READING INCIDENT FT. CANDLES	LIGHT BCPS	VOLTS E	CAPACITY C (MFD)	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	170	8'	340	21700	450	2500				FT-218 in underwater tube
1	39	8'		2500	900 450	180				FT-110 Green flash.

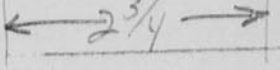
1/8" gap 4 mm. I.D.
4 1/2 atmos.
pointed electrodes 1/8 Dia x 1/4 L.

PLACE M.I.T.
DATE E. Mac R.
OBSERVER May 1 52

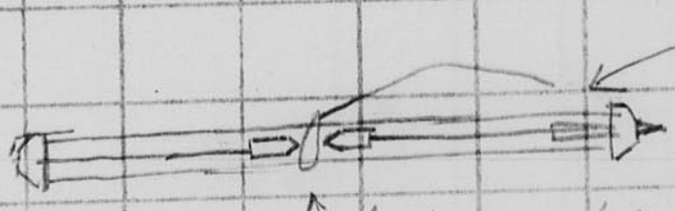
ATTENUATION RATIO R	METER	D	METER READING INCIDENT LIGHT	METER READING CAMERA SET. LIGHT BCPS.	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1		1"	20	20	450	180c	18	1.1		



This tube is marginal starting at 550 V with a single loop spark band.



By bending one end of spark band so that spark jumps to one end terminal starting voltage is reduced to 325-350 V. Adjustment of the starting band loop and the spark jumping distance is quite critical



Foot tube 5/8" gap.
1 cm I.D. Quartz.

PLACE 20D102
DATE May 2 1952
OBSERVER

ATTENUATION RATIO R	METER	D	METER XPSD INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	70	3'		630	450.	2350 e	237	2.64	#1 Apr 29	106 cm. Xenon.
					400	"			#2 Apr 29	106 Xe blew up first flash
1	89	3'		801	450	"	237	3.38		106 cm Xe 3/4" gap Made at an earlier date
same tube 1	32	3'			450	2350	237		#3 Apr. 29.	Blew up at first flash
1	67	2'		288	450	1050	106	2.72	Old 106 cm	3/4" gap
1	67	2'		288	450	1050	106	2.72		136 cm Xe Apr. 29.
1	45	2'		180	450	1050	106	1.7		76 cm Xe also dirty
1	65	2'		280	450	1050	106	2.64	#1 Apr 29	106 cm Xe

Rosenbloom
K17-8930

Friday. May 18. 5.15

Roder. 7.30 pm

"Harvey" underwater light on "Hazel III" 50 ft. fishing boat.

PLACE Boston Harbor
DATE May 21 1952
OBSERVER Edgerton

ATTENUATION RATIO H	METER	D	METER READ INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	145	12'		20,880	450	250±			FT 218	new Pyrex unit.
1	110	3'		990	2000	500/4 ?			FT-214	Harvey.

Compare Sprague 525 mfd } Capacitors M.I.T.
Mallory 525 mfd }

DATE May 7 '32
OBSERVER E. MacR.

ATTENUATION RATIO R	METER	D	METER READING INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATTS/SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	66	2ft.	264		450	Nom. 1050 Measured 1070		184	3/4 gap x 8 turn 106 cm Xe	2-Mallory Capacitors
							10^9 actual	242		
1	66	"	264		"	Nom. 1050 Measured 1075			"	2-Sprague Capacitors
						Leakage of above two pairs seems very similar as indicated by voltage adjustment of the power supply variac.				
1	97	2ft	388		450	Nom. 1050 Measured 1400	(142 actual)	273		2-Mallory Capacitors

100 w.s. Dry Battery 8000 flash

Underwater Unit

PLACE M.I.T.

DATE May 52

OBSERVER Edgerton Mott

ATTENUATION RATIO R	METER	D	METER READING INCIDENT FT. CANDLES	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) CE²/2	EFFICIENCY CP/W	LAMP	REMARKS
			after 2800 flashes							
1	127	4/4		2040	442	1050 mfd 1200 act.	117		FT-110	Cap Volts after 1 min charging. May actually have been charging longer resulting in increased voltage
			FT-110 darkened around cathode							

100 w.s. Dry Battery 8000 flash
Underwater Unit

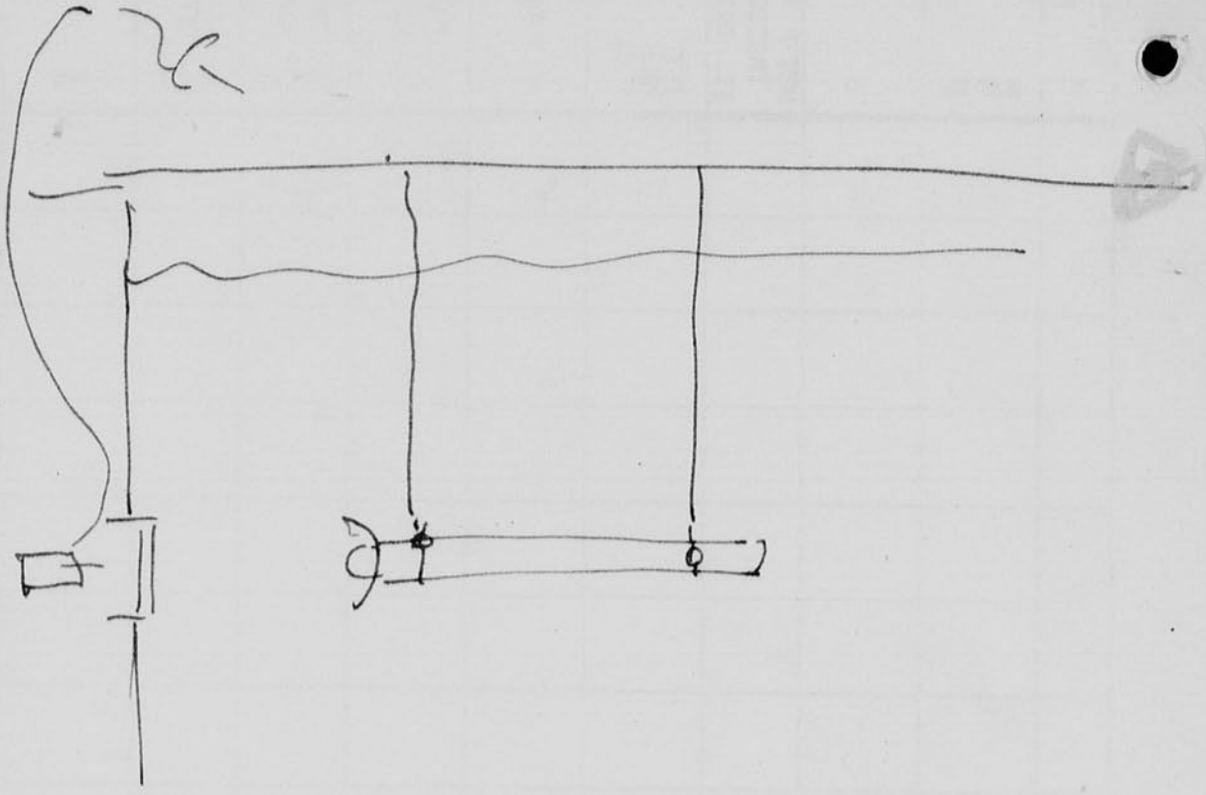
PLACE M.I.T.
DATE May 16 52
OBSERVER P. Mack

ATTENUATION RATIO H	METER	D	MET'R RDG INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	72	4		1140	358	Nom. 1050 Act. 1200	Act. 77		FT-110	Has had 8050 flashes
										Voltage at 1 min
1	86	4		1380	383	11	87			
										Voltage with 1/2 ~~min~~ charge.
										Flash tube is darkened for about 1/2" near cathode. Balance quite clean.
										Energy is down to 66% Light is down to 50% } Compared to values at 2000 flashes

1000 w. 2 Dry Battery 800 flash
Underwater Unit

PLACE M.I.T.
DATE May 7 52
OBSERVER E. Mack

ATTENUATION RATIO H	METER	D	METER READ INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) CE²/2	EFFICIENCY CP/W	LAMP	REMARKS
1	50	4'		800	308	act 1200			FF-10	1 min charge
1	60	4"			341	act. 1200				1½ min charge



Kodademme CC15 on daylight film

Underwater

MIT Pool

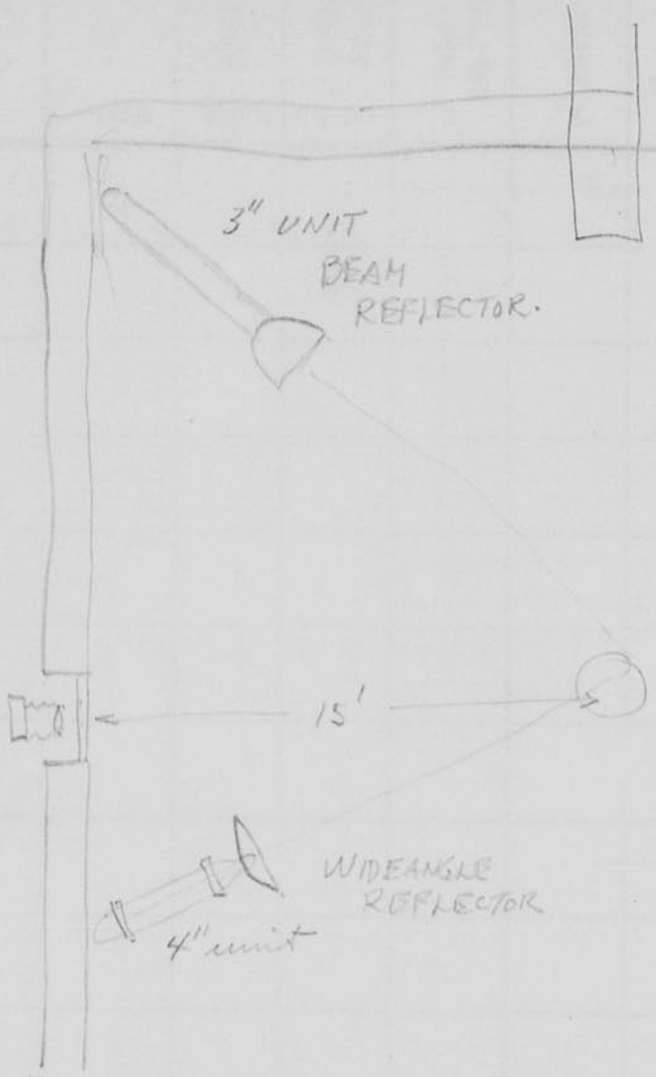
See opposite for lamp layout.

PLACE

DATE June 14 1952

OBSERVER H Elgerton Bobby + Bill.

#	METER	D	METER XPXD INCIDENT FT CAND SEC	LIGHT BCPS	SETUP E	CAPACITY (LEM) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
				Focus Scale.						
1	Bill	f 3.5		10 ft scale			15 ft actual.			CC15 filter.
2	Bill									↓
3	"									
4	Bob.									
5	Bob									
6	Bob	Side Stroke.								
7	Bill	f 5.6								
8	"	f 5.6								
9	"	f 5.6.		Dive towards camera			20 ft ±			
10	"	f 5.6		Dive side						
11	Bob	f 5.6		Dive.						
12	B & B	f 5.6		Bubbles.						
13	"	3.5		"						
14	"	f 8								
15	Bill	f 8								
16	Bob	f 8.								
17	Blanks.									
18	Bob	f 4		View of lamps.			10° off axis of spot.			
19	Bill	f 8		"			" "			


3" UNIT
BEAM
REFLECTOR.
15'
WIDEANGLE
REFLECTOR
4" unit

3 inch Underwater unit. Pool

PLACE 20D102

DATE June 14 1952

OBSERVER H.E. Edgerton Bob & Bill

ATTENUATION RATIO B	METER	D	METER KROD INCIDENT LT. CAND SEC	LIGHT BCPS	STROBE E	CAPACITY (MFD) C	EFFICIENCY (WATTS/CM) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	70	15'			450±	2100±			FT-218.	In air
										Pool.
2	40	10' water +		1½ air						3" tube in Pool.
1	73	10' water +		1½ air.	off axis					
1	158	10' water.		on axis						
1	100	10' water								
1	54	15'	water.							
1	55	15'								
				4" Diam						This unit has a very wide angle reflector.
1	23	9'								
1	34	6 or 7								
1	37	6 or 7								
1	180	3'								
1	170	3'								

$$\begin{array}{r} 180 \\ 4 \overline{)720.} \end{array}$$

$$\begin{array}{r} 164 \\ 4 \overline{)656} \end{array}$$

Gap tubes:

PLACE 20-D-108
DATE June 16, 1952
OBSERVER Edgerton Mc Robert

ATTENUATION RATIO N	METER	D	METER READING INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	90	2'	180	920	2000	100.			Fx-1	~~Cracked~~ Bent end.
										Al. Reflector
✓ 2	42	2'			350	1400c				~~3~~ 8" gap 105cm
1	123	2'			400	1400.				
1	138	2'			425	1400				"
1	158	2'			450	1400				"
1	164	2'	164	656	450	1400				
										Tube #2.
1	112	2'			350	1400c				
1	158	2'			425	1400				
1	165	2'			450	1400				
										Tube #3
1	100	2'			350	1400				
1	158	2'			425	1400				
1	168	2'			450	1400				
		Series Inductance used to stop crack.								9 turns 4" diam
1	87	2'			350	1400	Inductance			
1	133	2'			425.	"	"			
~~1~~	~~138~~	~~2'~~			~~450~~					
1	142	2'			425.	"	"			
1	165	2'			450		"			
1	165	2'			450	no inductance.				
1	173	2'			450	"	"			
1	165	2'			45	Inductance.				

4½" length 1 mm I.D. QUARTZ 10cm.

For Julian Webb.

M.I.T.

PLACE 20D102.

DATE July 4 1952

OBSERVER Edgerton

ATTENUATION RATIO H	METER	D	METER X-RAY INCIDENT FT CAND	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	67	3-	603	603				FT214A	#638.	meter calib.
	70			628	2000+	100				113.
1	72	3	647	647	2000	100		"	"	
1	71	3	639	639	2000	100		"	"	calib ok.
										Spark at center easily.
1	10	1'	10	10	2000	3	6	1.67		4½" tube.
1	17	1'	17	17	2500	3	9.38	1.82		Starts easily at
1	24	1'	24	24	3000	3	13.5	1.78		500 volts.
1	4	1'	4	4	1000	6				
1	22	1'	22	22	2000	6	12	1.83.		
1	32	1'	32	32	2500	6.				
1	41	1'	41	41	3000	6				
1	54	1'	54	54	3500	6				
1	83	1'	83	83	4000	6	48	1.73		
1	6	1'	6	6	1000	12	6	1.0		
1	34	1'	34	34	2000	12	24	1.41		
1	67	1'	67	67	3000	12	54.2	1.23		
1	180	1'	180	180	4000	12	96.	1.87		2 flashes same
1	122	1'	122	122	3500	12				no visual defects in tube.
	no start				1000	24				
	"	"			2000	24				
1	155	1'	155	155	3000	24	108.	1.43		

Suggest use at 4000 V 5 mf. 40 watt sec.
3 sec charging time.

1	65	1'	65	65	4000	5mf	40	1.45		V

after 10 flashes at 3 sec interval

1	64	1								

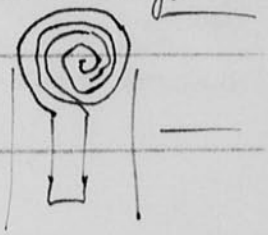
after 20± flashes show white deposit on tube due to evaporated quartz.

now decide to use at 2.5 mf at 4000 volts.

German "Multi Blitz" unit #2784:
Mannesmann
Westhoven Bei Koln

PLACE July 8 1952.
DATE 20102
OBSERVER Edgerton Babcock MacRobert

ATTENUATION RATIO H	METER	D	METER KRYPTON INCIDENT MT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
										Wide Reflector.
1	161	4'		2580						
1	158	4'		2530.						
1	39	4'		628.						4 ft out 2 ft from axis.
1	45	2'		180		Reflector factor $\frac{2530}{180} = 14.1$				Bare lamp.



Lamp Physikalische Technische Werkstatten Wiesbaden Dotheim B4SR80.

2 capacitors measure 2 1/8 "diam x 3 1/4" high

260 and 300 mfd. in parallel. (250) (275) marked

4 volt Battery — vibrator synchronous?

voltage =

Weight 6 3/4 lbs.

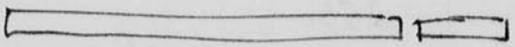
$\frac{CE^2}{2} = \frac{560 \times 470^2}{2} = 61.7$ watt sec.

$\frac{180}{61.7} = 2.92$ c.p./watt.

Starts at 160 volts.

1	12	2'		48	300	525 (650)			Tube at slight angle.
	19				350				
	27				400				
	38				450				
	39				450				
	48				450	" (650)			FT-110 Lamp.

$\frac{CE}{2} = \frac{10}{2} \cdot \frac{.4}{2} = .16$ .08



$P_1 \times 12 \qquad P_2 \times 1$

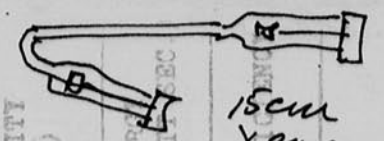
$P_1 \times 13 = P_2 \times 1$

$P_1 = P_2 \times \frac{1}{13.}$ $\quad 4 \times 76$

$\frac{304}{13} = 24.\text{cm}$

Bell Telephone Co.

J. Kernahan



15cm Xenon 1 mm I.D.

PLACE 20D102

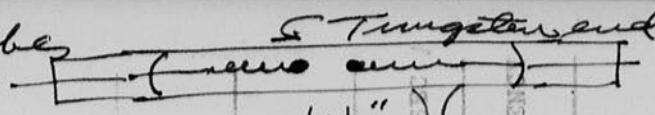
DATE July 8 1952

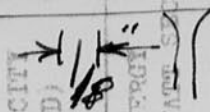
OBSERVER H Edgerton

ATTENUATION RATIO E	METER	D	METER READING INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	CP/W	LAMP	REMARKS
	without diffuser in meter.									
1	47	1'			600	2			T 309 Sylvania.	
	above are standard conditions.								tube above.	
1	65	1'			600	2.				
1	14	1'			400	2				
1	108	1'			400	10				
1	128	1'			400	10	.8 watt sec.			
1	124	1'			420	10	.8			
1	146	1"			420	10		}	Sylvania 309 with diffuser end on.	
1	42	1"			600	2		}		
	Another tube was made with 20 cm of Xenon.									
1	100	1'			400	10				
	130				400	10.				

Of Santa Fe. Open. office.
Carnal ~~Tylond~~. Tylor. Albergue.
Remote. night
Sept 25. leaving date.

P.E. Dop tube — 5 Tungstens end

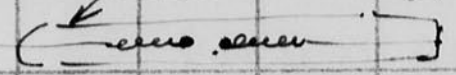




ATTENUATION RATIO X	METER	D	METR XRAY INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) CE²/2	EFFICIENCY CP/W	LAMP

PLACE
DATE
OBSERVER
REMARKS

tube #1 filled with 4 atmospheres.
Starting voltage about 600 volts.
The arc seems to go to the seal end of the cathode terminal.) and by passes the cathode.?!!



Self flashing voltage is above 3000 volts.

The 2 atmos tube exploded when 180 mf at 450 volts was used.

The 4 atmos tube also exploded when 180 mf at 450 volts was used.

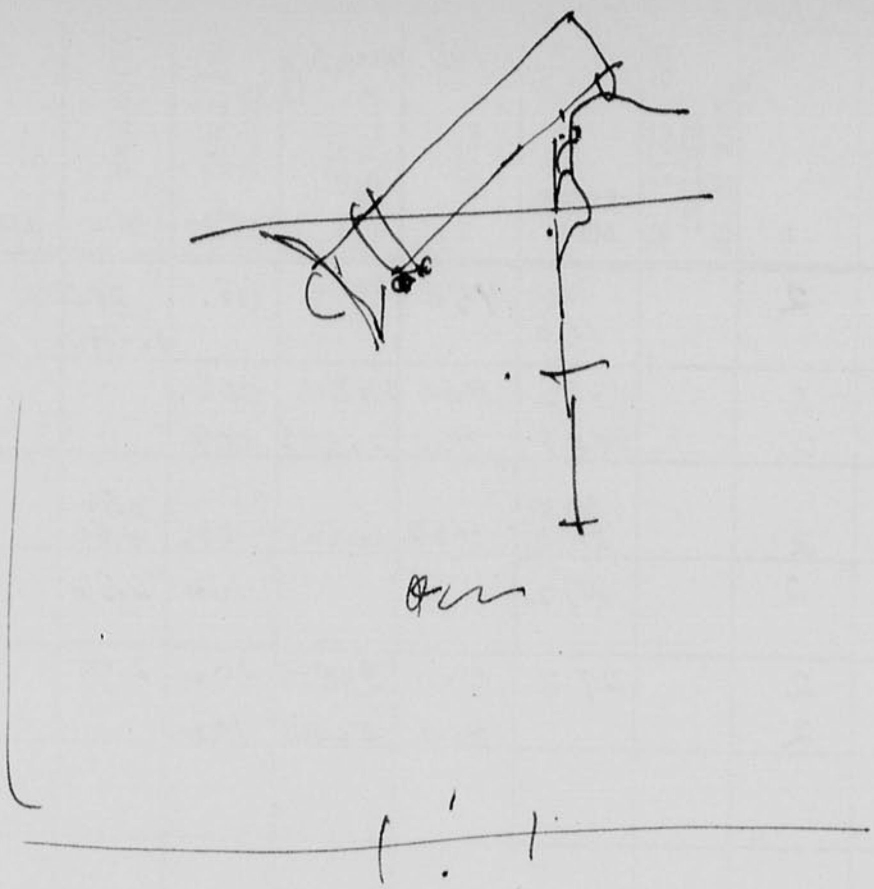
Another tube was sealed off at 3.5 atmos,
This flashed once with
100 mf 450 V with
choke 5 turns 2" diam.
Blew one seal on second flash,
the good seal showed
melting and heat and
cracks in the quartz,

Moly ribbon seals are
no good for the service
here.

Spot (Bird) 5/8 gap. 1 cm diam
105 mm Hg.

PLACE 20D102
DATE July 8 1952
OBSERVER H. Edgerton

ATTENUATION RATIO H	METER	D	METER XPXD INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
4	10	2		~~40~~ 160	950	525/2	118.	~~294~~ 4x.294		Series Inductance. 15 turns 2" diam.
~~4~~ 1	~~18~~									
4	18	2		4x72	450	2x525	106.			no inductance.
4	16	2		4x64	450	2x525	106.			
1	76	2		~~304~~ ~~764~~	450	2x525	106.	2.86 ~~+.55~~		no inductance
1	68	2		272			106	2.56		with inductance. 15 turns 2" diam
1	78	2		292	450	2x525	106	2.75		with ind 5 turns #12 wire 2" diam
1	78	2			450	2x525	106.			



Wadleigh.

Spot-Bird tube. 5/8 gap 1 cm
105 cm

PLACE 20D102
DATE July 9 1952
OBSERVER H E Edg.

ATTENUATION RATIO N	METER	D	METER XPOSD INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY MICFD C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	120	1'	120	120	950±	525/2	106		Gap.	Series Ind 9 turns #12 2" core.
~~1~~	~~38~~									
1	38	2'	142	142	950	525/2	106	1.34		another tube Same Ind,
1	39	2			"	"	"			
			2 atmosphere gap.							
1	57	2	228	228	950	525/2	106	2.14		
1	No start				~~950~~	2X525/2			2 at once.	
1	110	2			~~750~~	525			140 cm.	
1	135	2			900	525				
1	144	2	576	576	900	525	~~216~~ 212	2.66		
									105 cm	
1	113	2			900	525c	~~216~~ 212			
1	68	2			500	525c				
1	~~180~~	2			750	525.			FT-218	
2	157	2		1250	900	525	212 ~~216~~	6.18	Flash tube.	
2	71	2		568	900	525/2	106	5.37		
				Exposure is long.						
										300 ms
			Exp with Spot tubes.							
2	—	2	—	—	900	525	212		Spot.	10 turns 2" diam Blow up on second flash.
					900	525/2			Spot.	Duration.
					900	525/2			Spot.	Duration with 5 turns 2" Inductance.

162

16 82
32
164
240
2624

Underwater unit in 4" tube

PLACE
DATE
OBSERVER

ATTENUATION RATIO R	METER	D	METER READING INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY CE²/2 (WATT SEC)	EFFICIENCY CP/W	LAMP	REMARKS
2	100	4		1600 / 3200	500	4 × 5.25			FT-218	Underwater model.
2	82	4		2624						Green flash.

Underwater Camp.

PLACE
DATE
OBSERVER

ATTENUATION RATIO N	METER M	D	METER KEY INCIDENT FT CAND S	LIGHT BCPS	VOLTAGE E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	170	8'	340		450	2500+				FT-218 in
2	163	8'								
1	39	8'			900	880				Green Flash.

Under Water Lamps — 3" Hole size

FT-110

100 watt 1/4 sec

PLACE July 27 1951

DATE 20D102

OBSERVER Elgert

ATTENUATION RATIO R	METER	D	METER-KILOCANDLES	CANDLE-METERS	LIGHT BOPS	VOLTAGE E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	105	4'				450	X2 525			FT 110	Self flash unit 45 sec.

Bird-Spot allen model

PLACE 20D102
DATE July 28 1952
OBSERVER Edgerton

ATTENUATION RATIO H	METER	D	METER READ INCIDENT FT. CAND SEC.	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY CP/W	LAMP	REMARKS
										2 atmosphere.
1	75	20'								
1	95	20'		30,000	900	2X 525/2				2 spot tubes in 10" reflect

Double Beam unit for Dr AA Allen

10" B&L Reflector.

2 5/8" Icndiam 105 mm pressure x-ray tubes.

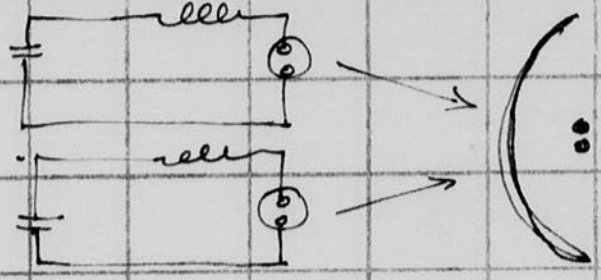
Capacity 1200 mf each Mallory 450 V.

Series inductance in each lamp.

PLACE 20D102

DATE June 16 1952

OBSERVER H E Edgerton



ATTENUATION RATIO	METER	D				REMARKS
2	95	20'±			450	2x1200
2	125	20'±			460	

.125 16KV.

$\frac{CE^2}{2} =$

16
16
96
16
256
128

15 watt sec.

$\frac{1}{3}$

Allen Bird Spot — 2 Gap lamps. 900 volt. 2 Mallory Capacitors in series.

2055 School St
Belmont

PLACE

DATE July 20 1952

OBSERVER Edgerton

ATTENUATION RATIO R	METER D	METER READING INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	86	17'		900	(525/2)	X2		Gap lamps	Two lamps in No. 10 "Reflector 9 turns 1/2" diam Inductance.
2	95	17'	190	900	(525/2)	X2			
2	75	20'	150						
2	125	15	250						
2	160	12	320						
2	162	9	324						
2	200+	6							
4	123	6	492						
4	94	3	376						
4	76	3							
4	120	3	480						
4	112	6	448						
4	127	9	508						
4	93	9	372						
4	33	20	132						
4	125	20	125						

170
10
1020
170
2720

115
16
690
115
1840

146
25
730
292
3650

Deep Sea U.W. unit #1 100 watt sec
45 sec interval

PLACE 20D102
DATE Sept 8 1952
OBSERVER H P Edgerton

ATTENUATION RATIO R	METER	D	METER READING INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	85	4'		2720	450+	1050			FT 110	8½" aluminum Reflector.
		This is about twice as much light as was obtained with the old reflector on the prior trip on the "Bear."								
A 1	115	4'		1840		camera unit on Scion with Reflector at slight angle				
B 1	110	4'				Diffuse miner surface of glass end of 3" tube.				
C 1	170	4'		A.						
				B.		camera				
				C.						
				20,000		Same light 200 watt sec in 10" reflector.				
2	73	146	51	3650		Same light after reflector was moved back by 1 inch.				

Underwater unit

PLACE 20D102
DATE Sept 9 1952
OBSERVER H E Edgerton

ATTENUATION RATIO R	METER	D	METER READ INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
2	85	4'		2720		45 sec unit 100 watt sec.				Underwater unit for 200 ft.

Chas Bulter.
61 Sumner St.
East B 38

Uni Hawaii
Uni cal Coconut
Bob Hyatt -

Dir of Ter. Fish
Honolulu
Forestry.

Vernon Brooks.
Pauli - Cocoanut.

Oscar ~~S, Sette~~
Sette
Dir. of Research.
Donald McKernan.
Uni of Hawaii
Dole St.
3 Boats,

100 watt see Cork under water
unit

3 ft.^{2} 40 x 9

360 c.p.s. $\frac{3600}{100} = 36$ lumens/watt.

3.6 c.p./watt. no reflection.

with reflection. 3 ft 200+ lum/sq ft. 9

1800 b.c.p.s.

Diffuse now installed.

3 ft 2200 110 x 2 9

1980. b.c.p.s.

3 ft 117 x 2 x 9 / 18

936

117

2106 b.c.p.s.

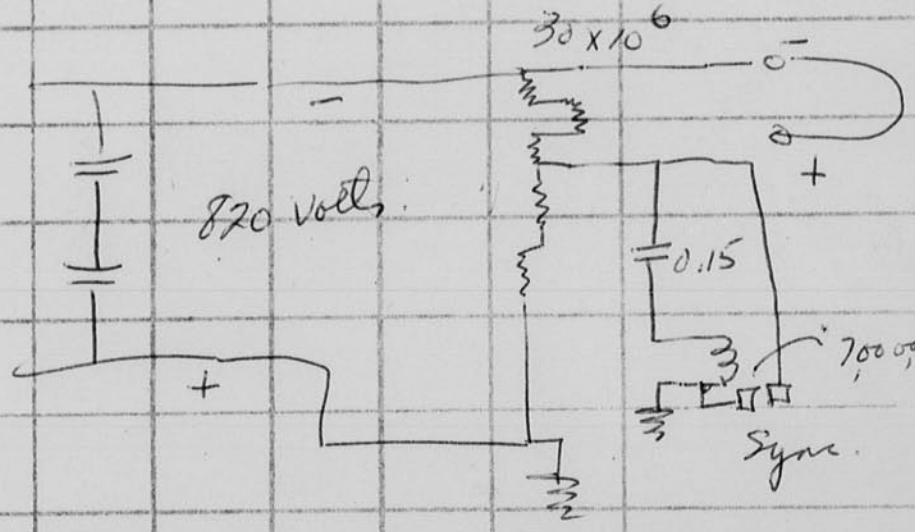
at 30° - 60 is reading

Dornitzer 213 model
Ser 1595 NN
Jos Ward

PLACE 20 Dio2
DATE Sept 10 1932
OBSERVER BE

ATTENUATION RATIO H	METER	D	METER XPRD INCIDENT FT. CAND. SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
i	110	4'								

C.D. vibrator
Type W3306
4 volts
115 A.
229



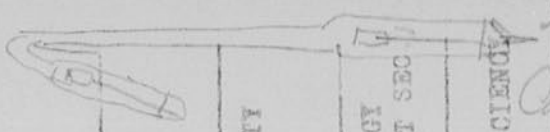
17½" Long FX-1 Special.

PLACE M.I.T.
DATE Oct. 14, '52
OBSERVER E Mack

ATTENUATION RATIO R	METER	D	METER READING INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
									FX-1-	17½ 20 cm Xe
1	64	3	576		2000	100	200			Max Firing Volts. 7000.

Bell Lab-Sketch
#G-50646
Diffuser removed

3-Bell Lab Tubes



Calc. L = 2¼

PLACE M.I.T.
DATE E. Mark L.
OBSERVER Oct 15 '52

ATTENUATION RATIO H	METER	D	METER READ INCIDENT FT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	Ser# 113	12"			450	10				20 cm Xe,
	150	"			"	"			#1	Min fire volts about 400
	150				"	"			#2	min fire more at. 300 V (sparkless)
	155								#3	

Strobolux Test Lamps (Germeshausen)

PLACE M.I.T.
DATE Oct 22 52
OBSERVER E. Mack R.

Scale	METER	D	INCIDENT LIGHT METER READING	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	CP/W EFFICIENCY	LAMP	REMARKS
.01	$\frac{1}{200}$ f4.5	2ft	43		800	0.75	.24		1"x2mm. I.D. 10 cm Xe	
0.1	"	"	17		800	2.0	.64			
"	"	"	24		"	3.0	.96			
"	"	"	43		"	4.0	1.28			
"	"	"	54		"	5.0	1.6			
.01	"	"	47		"	0.75			2" x 2 mm ID. 10 cm Xe	
0.1	"	"	20		"	2.0				First reading was 53 afterwards settled at 47 av.
"	"	"	35		"	3.0				
"	"	"	51		"	4.0				
"	"	"	66		"	5.0				min. starting voltage 300-400V
.01	"	"	4		"	0.75			—	Old Strobolux Lamps
"	"	"	20		"	2.0				
"	"	"	41			3.0				
"	"	"	62			4.0				
"	"	"	83			5.0				
0.1	"	"	8			5.0				

Strobolux Lamps

PLACE M.I.T.
DATE Oct 22 '52
OBSERVER E. MacR.

ATTENUATION H	METER	D	METER READING (MILLIMICROMHOS)	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$	CP/W	LAMP	REMARKS
0.1	1/200	2'	19		810	2.0		—	2 mm × 2 in. 10 cm × 2.	
0.1			1.4			2.0			1 mm × 1 in. 10 × 2	
0.1			24			3.0				
0.1			33			4.0				Starts at 250 V
0.01			50			0.75				
0.01			48			0.75			1 mm × 2 in	
0.1			22			2.0			10 cm × 2	
0.1			37			3.0				
0.1			55			4.0				
0.1			72			5.0				Starts at 250 V

Graphic Arts Lamp

PLACE M.I.T.
DATE Oct 22 '52
OBSERVER E. Mack.

ATTENUATION RATIO H	METER	D	METER READING INTENSITY FT. CANDLES SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
.01	$\frac{1}{200}$ f4.5	2'	45		800	1.0	.32		5cm Xe	starts at 150 V
"			102			2.0	.64		"	
0.1			17			4.0	1.28		"	
.01			46			1.0			11cm Xe	starts at 250 V
0.1			13			2.0				
0.1			26			4.0				
.01			51			1.0			18cm Xe	"
0.1			14			2.0				
0.1			33			4.0				
0.1			35			4.0			22cm Xe	"
.01			62			1.0			28cm Xe	"
0.1			16			2.0				
0.1			39			4.0				
0.1			50			6.0			←	first readings were 60
	Change Xe									
0.1			48			6.0			28cm Xe ←	one 56
0.1			14			2.0				
	another tube									
.01			54-56			1.0			28cm Xe	
0.1			18			2.0				
0.1			42			4.0				
0.1			70			6.0	1.94			started at 70
0.1			60			6.0				dropped to 60
	Wait 5 min.									
0.1			50			6.0				
	Pumped out and recharged to 25cm Xe and sealed off two tubes.									
	Light output measured off system.									
0.1			14-15		800	2.0			Tube #1	start at
0.1			12		800	2.0			Tube #2	250 V

Graphic arts lamps.

PLACE M.I.T.
DATE Oct 23 52
OBSERVER E. MacR.

ATTENUATION R. RATIO	METER	D	MET. READING INCIDENT FT CANDLES SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
.01	1/200 f45	2ft	11		500	1.0				SA-309 #1
			15		550	1.0				cover glass removed
			13		1000	0.25				"
			10		1000	0.25				SA-309 #2
			5		570	1.0				cover glass off.
			15		1000	0.25				6 mm x 1 mm ID. Special lamp. #1
			11		500	1.00				"
			15		500	1.00				6 mm x 1 mm ID.
			17		1000	0.25				Special #2
		1ft.	70		1000	0.25				Reads 60 to 80
			55		500	1.0				"
			44		500	1.0				SA-309 #1
			53		1000	0.25				"

PLACE M.I.T.
DATE Oct 23 52
OBSERVER J. MacR.

ATTENUATION RATIO B	METER	D	METER READING INCIDENT INT. CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SECS)	CP/W	LAMP	REMARKS
	sensitive									
	± 4.5									
	1/100									
.01	31	2ft			800	2.0				New Strobolux lamp.
.01	68				800	3.0				Type 64 f-P1
0.1	12				800	4.0				Sylvania
0.1	17				800	5.0				"
.01	5				800	0.75				"
.01	5				1400	0.25				"
.01	5				400	2.75				"
.01	16	1ft			400	2.75				"
.01	19	1ft			800	0.75				"
.01	100+	1ft.			800	0.75			exp. lamp.	2"×1 mm 2" × 10 cm xe
.1	—	1ft			800	0.75				lamp punctured near tabulation by spark
0.1	14	1ft			800	0.75			exp lamp.	2" × 2 mm. 10 cm xe
0.1	12	1ft			400	2.75				"
0.1	17	"			1400	0.25				self flashes at 1810-2400 v depending on amount of spark lead
0.1	35	"			800	2.0				
0.1	54	1ft			800	2.0	← checks previous data			1" × 1 mm. 10 cm xe.
0.1	16	"			1400	0.25	←			
0.1	15				800	0.75	←			self flashes.
0.1	11				400	2.75				self flashes.

PLACE M.I.T.

DATE Oct 23 '52

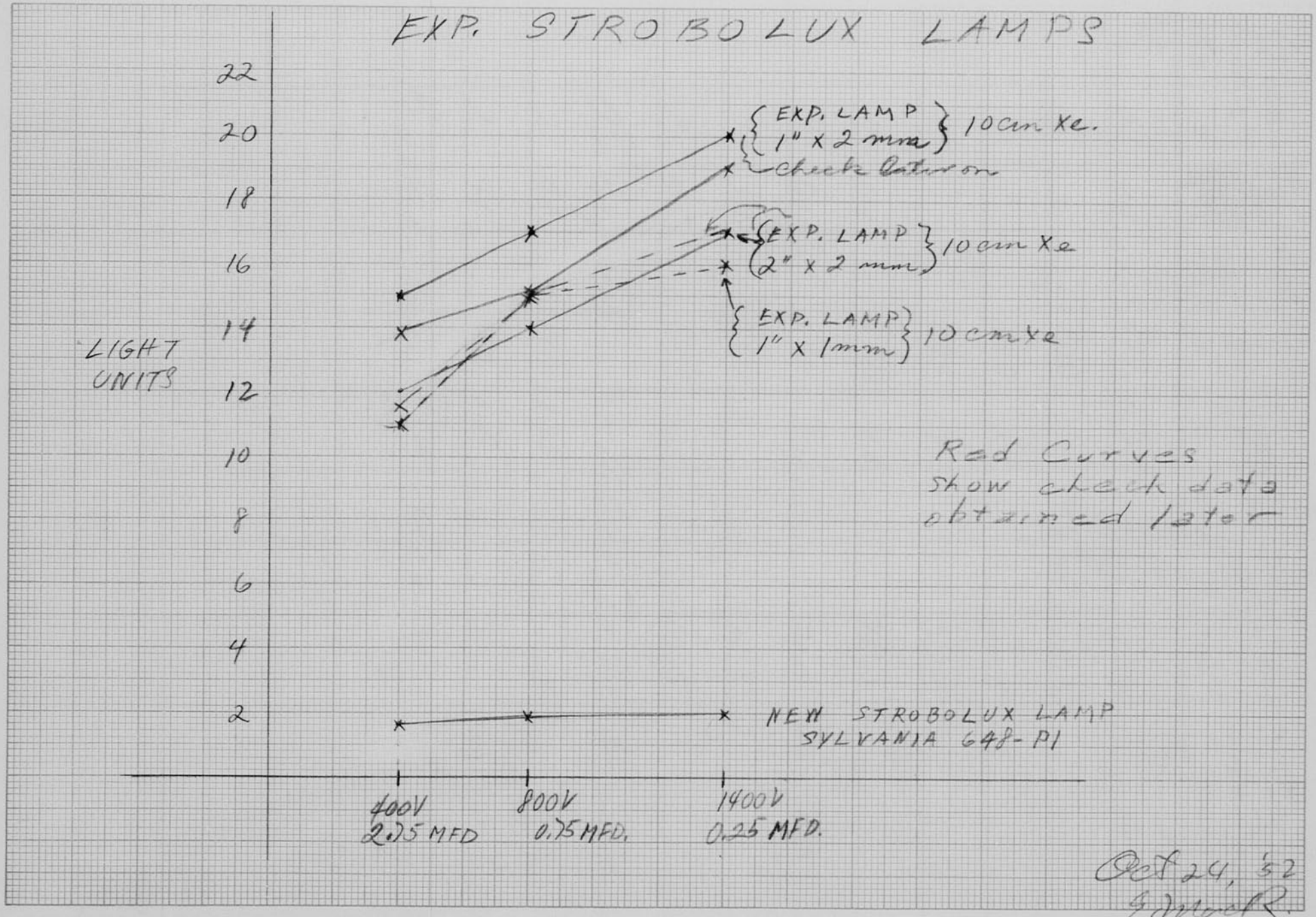
OBSERVER E. MacR.

ATTENUATION RATIO N	METER	D	METER READING INCIDENT FT. CAND SEC.	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
	Sensitivie									
	8-4.5									
	1/100 sec.									
0.1	15	1'			400	2.25				1" x 2 mm I.D.
										10 K2
01	17				800	0.75				"
										"
0.1	20				1400	0.25				
										Self Flashes
										at 1000 V.

Graphic Arts.

1 mfd 500 V

$\frac{1}{4}$ mfd 1000 V



Strobolux Lamps.

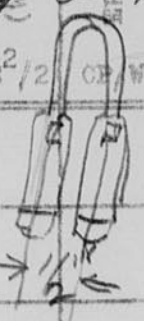
Pure solder seal

PLACE M I T.

DATE Nov 10, '52

OBSERVER G. MacR.

ATTENUATION RATIO H	METER	D	METER READING SECONDS	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	$CE^2/2$	CP W	LAMP	REMARKS
0.01	Sensitive $\frac{1}{100}$	2'	44		800	0.25			11 cm.	min start volts 290
"		"	"		800	"			15.3 cm.	
"		"	"		800	"			20.5	
"		"	"		800	"			28.0	300
0.1		"	64		800	4.0			28.0 cm.	
"		"	62		800	"			20.0 cm.	250
"		"	57		800	"			14.5	
"		"	55		800	"			10.5	
"	Pumped 3-tubes to 20 cm ke									
0.01		2'	48		800	0.75				
0.01		2'	41		800	0.75				slightly smaller tube
	Broke one tube cleaning it.									



Solder Seal Flash Tubes

PLACE M.I.T.
DATE Nov 13, '52
OBSERVER E. Mack

ATTENUATION RATIO H	Relative Reading D	METER XPED INCIDENT FT. CAND. SEC.	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY $CE^2/2$ (WATT SEC.)	EFFICIENCY CP/W	LAMP	REMARKS
	49	3			2000	100		FX-1 #1	min firing voltage 550-600 V.
	49				"	"		FX-1 #2	
	49				"	"		FX-1 #3	
	49				"	"		FX-1	from previous lot.
	50				"	"		FX-1	
	49				"	"		FX-1-9"	Spec. for E.K. Co. 15 cm X2 Min start 800 V
	49				"	"		FX-1-9"	
	32				"	"		24" x 9 cm.	Spec. for Herb Bridge
	34				4000	25			One FX-24 One Tungsten Electrodes

24" flash tube for H. Bridge

PLACE M.I.T.
DATE Dec 52
OBSERVER S. Mask

ATTENUATION RATIO R	METER	D	METER READING INCIDENT CAND SEC FT	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	57	3/ft			2000	200			20cm Xe	tube with Vycor & Pyrex graded seals, 22" arc length
1	108	"			2500	200				
										Starts at 1400 V.
										Holder leaks 24" arc length
1	53	3/ft		477	2000	200			20cm Xe	#1
	97				2500	200				
1	52	3			2000	200				#2
	96				2000	200				

Navy #2 Underwater unit
cords type 1 E684.

PLACE 20D102
DATE Dec 12 1952
OBSERVER Edgerton Roberts

ATTENUATION RATIO R	113 METER	D	MET-R XROD INCIDENT FT CAND SEC	LIGET BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1	170	4'			450	1050			FT-110	in Reflector
	180	4'			"	"				with Diffuser.

This unit was sent to
Naval Photo center
Dec 21 1952

HE Edg

PLACE M.I.T.
DATE Dec 15 '52
OBSERVER E. MacR

ATTENUATION RATIO X	METER #113	D	METER READING INCIDENT FT. CAND SEC.	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY ($CE^2/2$) (WATT SEC.)	EFFICIENCY CP/W	LAMP	REMARKS
X1		3 ft			2000	100	200			
	88 to 95									6 Special FX-1 tubes .f" arc length 20 cm x 2 for Prof. Williams synchroscope
										Min. starting at about 600 V full starting load.

Jr. FT-118 tube.

M.I.T.
PLACE 20D102
DATE Dec. 24, 1952
OBSERVER H. Edgerton
Bob Edgerton

ATTENUATION RATIO H	METER	D	METER XPXD INCIDENT FT CAND SEC	LIGHT BCPS	VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC.) $CE^2/2$	EFFICIENCY CP/W	LAMP	REMARKS
1		2 ft	57		350 v	1050+ mfd.	1050 mf. elect.		FT-118	
1		2'	106		450	1050+			FT-118	
1		2'	121		450	1050.			FT-110	
1		2'			450	1050			FT-218	Does not flash.

Strobolix experimental lamps.

PLACE 20D102

DATE Dec 31 1952

OBSERVER Edgerton MacRoberts.

ATTENUATION RATIO B	METER	D	METER X READING INCIDENT FT. CAND SEC	LIGHT BCPS	SUPPLY VOLTS E	CAPACITY (MFD) C	ENERGY (WATT SEC) IPE^2/2	EFFICIENCY CP/W	LAMP	REMARKS
	2 secs. 0.1 mf. 1/100 sec.									
1	53	1'			1000	1 mf				1" gap in Xenon 2 atmospheres. 6 mm I.D.
1	53	1'			1000	1 mf.				U tube. 20 cm press Xenon. Capilliary.
1	12	1'			1000	1 mf.				1/8" gap tube. Xenon 2 atm.