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ISSUED TO: A. Vay Shelton
Effects Division - UCRL Livermore

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Standard B&P Blank Books and Loose Leaf Devices

Standard Figuring Book

No. 1602½

2	Columns	to Right,	Units,	Single	Page	Form
3	"	"	"	"	"	"
4	"	"	"	"	"	"
5	"	"	"	"	"	"
6	"	"	"	"	"	"
6	"	Divided,	"	"	"	"
7	"	to Right,	"	"	"	"
8	"	"	"	"	"	"
10	"	"	"	Double	Page	Form
12	"	"	"	"	"	"
14	"	"	"	"	"	"
14	"	Without Name Space	"	"	"	"
16	"	to Right,	"	"	"	"
18	"	"	"	"	"	"
20	"	"	"	"	"	"

Unruled
Quadrille
Faint

In 150 and 300 Pages

Standard B & P Blank Books are Loose Leaf Devices

Standard Figuring Book

No. 1602½

2	Columns	to Right,	Units,	Single	Page	Form
3	"	"	"	"	"	"
4	"	"	"	"	"	"
5	"	"	"	"	"	"
6	"	"	"	"	"	"
6	"	Divided,	"	"	"	"
7	"	to Right,	"	"	"	"
8	"	"	"	"	"	"
10	"	"	"	Double	Page	Form
12	"	"	"	"	"	"
14	"	"	"	"	"	"
14	"	Without Home Space	"	"	"	"
16	"	to Right,	"	"	"	"
18	"	"	"	"	"	"
20	"	"	"	"	"	"

Unruled Quadrille Faint

In 150 and 300 Pages

Made in U. S. A.

A BOORUM & PEASE PRODUCT

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MAY 20 '59 INV.

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Plumbbob

Pilgrim Status as of 26 Sept, 1956

QRQ Meeting

Area 2

Three towers: 20, 25, 40 kT

400', 400', 500', 200 ton capacity.

May 1 – July 1

DELETED

DELETED

Fall:

DELETED

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Area 9

DELETED

≤ 1 kT Balloon? 200' tower? May 1 – July 1

0.2 – 10 kT 300' tower

0.2 – 15 kT " "

DELETED

Fall

DELETED

Area 9

- < 1 kt Balloon? 300' tower? May 1 - July 1
- 0.2 - 10 kt 300' tower
- 0.2 - 15 kt " "
- 80 kt Balloon

Fall: 2-3 small weapons

X Balloon

~ 4000'

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2

Fallout for Pilgrim as of 26 Sept 1956

DELETED

40 kt, 500', 75 tons/foot
25 kt, 400', " " "
20 kt, 900', " " "
0.75 kt, 200', 35 tons/foot
10 kt, 300', " " "
15 kt, " " "
30 kt, 1500'

D	M	Z
745	220	965
575	175	750
410	180	590
4	35	39
257	135	392
451	135	586
0	1	1
2442	881	3323
2443	958	3401
5658	235	5885
881	258	1139

Teapot totals:
U/k totals:
Teapot ECRL totals:

Fallout, dust, $h = 20'$ h_{min} for $F_0 = 0$

R_2	W	F_0	Z_p	P	
217	0.1	18	.600	216	128
284	0.2	38	.633	293	162
367	0.4	79	.658	366	204
449	0.7	139	.662	449	245
513	1	202	.673	R_2	274
556	2	402	.680		348
		842	.702		438
			.709		528

Fallout, mixtels.

$Z_m = \frac{.002\,T}{N}$

$F_m = 0.6\,T\,MC$

T in tons
W in Kt

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Fallout, dust, h = 20'

R_1	W	F_0	Z_0	R_2	km for $F_0 = 0$
217	0.1	18	.600	216	128
284	0.2	38	.633	283	162
367	0.4	79	.650	366	204
449	0.7	139	.662	449	245
513	1	202	.673	R_2	276
656	2	428	.680		348
836	4	842	.702		438
1016	7	1498	.709		528
1148	10	2152	.717		595
1460	20	4338	.723		750
1849	40	8782	.732		944
2235	70	15,500	.738		1139
2522	100	22,230	.741		1280
3185	200	44,800	.747		1615
4030	400	89,960	.750		2035
4860	700	158,700	.756		2452
5480	1000	227,600	.759		2760
6920	2000	457,000	.762		3480
8710	4000	917,500	.765		4385
10,520	7000	1,612,000	.768		5280
11,830	10,000	2,303,000	.768		5950
14,770	20,000	4,623,000	.770		7495
18,810	40,000	9,282,000	.774		9440

Fallout, [redacted]

$Z_m = .002 \frac{T}{W}$

$F_m = 0.6\ T\ Mc$

T in tons

W in Kt

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W	h	R_F	$\times 10^{-3}$ $9R_F$	$\times 10^{-3}$ $5R_2$	$\times 10^{-3}$ Σ	$\times 10^{-3}$ $12R_Fh$	$\times 10^{-3}$ Δ	R_2	h/R_2	$\sqrt{h/R_2}$
								153		
0.1	50	85	65		77	51	26	141	.311	.5
4	↓	292	767	12	779	135	604	737		
7		352	1115	↓	1127	211	916	957	.064	.2
10		396	1411		1423	238	1185	958	.052	
0.1	70	85	65		89	71	18	1077		
0.2	↓	108	105	24	129	94	38	1089	.046	
0.4		136	166	↓	190	114	76	114		
2.0		500	2250		2274	420	1854	134	.522	
0.1	100	85	65		115	102	13	1362	.359	
0.2	↓	108	105	50	155	130	25	195		
0.4		136	166	↓	289	196	93	267	.254	
0.7		184	305		355	221	134	276		
1		629	3564		3611	755	2856	1360	.051	
4		758	5171		5221	910	4311	1362		
7		1084	10,420		10,532	1977	8555	55		
10		1633	24,000		24,312	4899	19,413	114	.877	
0.1	130	85	65	84	189	148	41	122		
0.2	↓	108	105	↓	250	212	38	158	.633	
0.4		136	166		568	362	206	288		
0.7		184	305		6649	1332	5316	305	.321	
1		232	494		278	245	33	352		
2		354	1564		351	293	58	366	.274	
4		758	5171	112	417	331	86	1697		
7		1084	10,420	↓	879	526	353	1690	.059	
10		1633	24,000		10,532	1977	8555	2073		
0.1	150	136	166		439	391	48	2075	.024	
0.2	↓	143	239		684	557	127	64		
0.4		184	305	200	1315	845	470	145	.828	
0.7		292	767	↓	16,750	3254	13496	75		
1		352	1115		569	508	61	195	.196	
4		1356	16,550		16755	1093	5282	120		
7		1633	24,000	264	1079	776	303	1945	.135	
10				↓	24,312	4899	19413	1945		
0.1	200	136	166							
0.2	↓	143	239							
0.4		184	305							
0.7		232	494							
1		292	767							
2		352	1115							
4		1356	16,550							
7		1633	24,000							
10										
0.1	230	184	305							
0.2	↓	232	494							
0.4		292	767							
0.7		352	1115							
1		396	1411							
4		1356	16,550							
7		1633	24,000							
10										
0.1	250	232	494							
0.2	↓	292	767							
0.4		352	1115							
0.7		396	1411							
1		1356	16,550							
4		1633	24,000							
7										
10										
0.1	300	292	767							
0.2	↓	352	1115							
0.4		396	1411							
0.7		1356	16,550							
1		1633	24,000							
4										
7										
10										
0.1	400	352	1115							
0.2	↓	396	1411							
0.4		1356	16,550							
0.7		1633	24,000							
1										
4										
7										
10										
0.1	500	396	1411							
0.2	↓	1356	16,550							
0.4		1633	24,000							
0.7										
1										
4										
7										
10										
0.1	700	1356	16,550							
0.2	↓	1633	24,000							
0.4										
0.7										
1										
4										
7										
10										

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Σ $\times 10^{-3}$	$12Rph$ $\times 10^{-3}$	Δ $\times 10^{-3}$	R_2 $\sqrt{\Delta}$	h/R_2	$\sqrt{h/R_2}$	$.67\times(h/R_2)^{1.5}$	$2\sqrt{h/R_2}$	① $\frac{2.67-\Sigma}{\sqrt{h}}$	② $\frac{399w}{\sqrt{h}}$	FD ② / ①
7	51	26	153							
779	175	604	161	.311	.557	.115	1.114	1.438	7.07	5.64	.8
1127	211	916	775						↘		
1423	238	1185	777	.064	.253	.011	.506	2.150		226	486
89	71	18	957								
129	91	38	958	.052	.228	.008	.456	2.203		395	870
190	114	76	1082								
2274	420	1854	1089	.046	.214	.007	.428	2.232		564	1259
115	102	13	114								
155	130	25	134	.522	.723	.251	1.446	.970	8.36	4.77	5
289	196	93	182						↘		
355	221	134	195	.359	.599	.143	1.198	1.326		9.55	13
3611	755	2856	267								
5221	910	4311	276	.254	.504	.085	1.008	1.574		19.09	30
189	168	21	1360								
250	212	38	1362	.051	.226	.008	.452	2.207		955	2108
568	362	206	55								
6648	1332	5316	114	.877	.936	.548	1.872	.247	10.00	3.99	1
278	245	33	122						↘		
351	293	58	158	.633	.796	.336	1.592	.739		7.98	6
417	331	86	288								
879	526	353	305	.328	.573	.125	1.146	1.396		27.93	39
6,532	1937	8595	352								
439	391	48	366	.273	.523	.095	1.046	1.526		39.9	61
684	557	127	1687								
1315	845	470	1690	.059	.243	.009	.486	2.172		1596	3467
6,750	3254	13,496	2073								
568	508	61	2075	.048	.219	.007	.438	2.222		2793	6206
1675	1093	582	64								
679	876	203	145	.897	.946	.366	1.892	.209	11.40	7	1
4,312	4899	19,413	145						↘		
			195	.667	.816	.363	1.632	.672		14	9
			435								
			454	.286	.535	.102	1.070	1.495		70	105
			2302								
			2306	.056	.237	.009	.474	2.184		3500	7644
			103								
			182	.824	.908	.499	1.816	.352	12.24	13.04	5
			189						↘		
			241	.622	.789	.327	1.578	.762		22.82	17
			252								
			293	.512	.716	.245	1.432	.990		32.6	32
			575								
			594	.252	.502	.085	1.004	1.578		130	205
			2928								
			2932	.051	.226	.008	.452	2.207		6520	14,390
			89								
			219	.913	.955	.582	1.910	.175	14.14	19.75	3
			294						↘		
			356	.562	.750	.281	1.500	.886		56.4	50
			655								
			685	.292	.540	.105	1.080	1.472		198	293
			3670								
			3675	.054	.232	.009	.464	2.194		11,288	24,770
			90								
			247	.931	.965	.599	1.930	.138	15.16	26.32	4
			728						↘		
			763	.301	.548	.110	1.096	1.461		263	384
			374								
			450	.556	.745	.276	1.490	.901	15.80	101	91
			4397						↘		
			4405	.057	.239	.009	.478	2.180		17,675	38,530

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W	h	R_F	$\times 10^{-3}$ $9R_F^2$	$\times 10^{-3}$ $5h^2$	$\times 10^{-3}$ Σ	$\times 10^{-3}$ $12R_F h$	$\times 10^{-3}$ Δ	R_2 $\sqrt{\Delta}$	h/R_2	$\sqrt{h/R_2}$	$.67(h/c$
2	300	232	484	450	934	835	99	93 314	.955	.977	.6
7	↓	352	1115	↓	1565	1267	298	456 546	.549	.741	.7
20		500	2250		2700	1800	900	899 948	.316	.562	.1
1000		1840	30,500		30,950	6624	24,326	4921 4930	.061	.247	.0
4	350	292	767	612	1379	1226	153	174 391	.895	.946	.5
10	↓	396	1411	↓	2023	1663	360	487 600	.583	.764	.2
2000		2320	48,400		49,010	9744	39,270	6260 6270	.056	.236	.0
7	400	352	1115	800	1915	1690	225	254 474	.844	.919	.5
40	↓	629	3561	↓	4361	3019	1342	1088 1159	.345	.588	.1
20	450	500	2250	1012	3262	2700	562	600 750	.600	.775	.3
70	↓	758	5171	↓	6183	4093	2090	1375 1447	.311	.558	.1
4000		2920	76,700		77,710	15,768	61,940	7857 7870	.057	.239	.0
10	500	396	1411	1250	2661.	2376	285	189 534	.936	.967	.6
100	↓	854	6564	↓	7814	5124	2690	1562 1640	.305	.552	.1
7000		3520	111,500		112,800	21,120	91,680	9562 9575	.052	.228	.0
40	550	629	3561	1512	5073	4151	922	778 961	.572	.757	.2
20	600	500	2250	1800	4050	3600	450	301 671	.894	.945	.5
200	↓	1076	10,420	↓	12,220	7747	4473	2028 2115	.284	.533	.1
10,000		3960	141,100		142,900	28,512	114,400	10,653 10,670	.056	.236	.0
70	700	758	5171	2450	7621	6367	1254	873 1119	.626	.791	.3
20,000	↓	5000	225,000	↓	227,400	42,000	185,400	13,592 13,610	.051	.226	.0
40	750	629	3561	2812	6373	5661	712	386 844	.889	.942	.5
100	800	854	6564	3200	9764	8198	1566	962 1251	.639	.799	.3
400	↓	1356	16,550	↓	19,750	13,018	6732	2469 2594	.308	.555	.1
70	900	758	5171	4050	9221	8186	1035	474 1017	.885	.941	.5
40,000	↓	6290	356,100	↓	360,200	67,930	292,300	17,056 17,080	.053	.230	.0
100	1000	854	6564	5000	11,560	10,248	1312	559 1145	.873	.934	.5
200	↓	1076	10,420	↓	15,420	12,912	2508	1227 1523	.632	.795	.3
700		1633	24,000		29,000	19,600	9400	2397 3065	.326	.571	.1

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$\times 10^{-3}$ Σ	$\times 10^{-3}$ $12R_2h$	$\times 10^{-3}$ Δ	R_2 $\sqrt{\Delta}$	h/R_2	$\sqrt{h/R_2}$	$.67\times(h/R_2)^{1.5}$	$2\sqrt{h/R_2}$	① $2.67-\Sigma$	$\sqrt{h}$	② $299w/\sqrt{h}$	F_0 ② π	Z_0
934	835	99	93 314	.955	.977	.622	1.954	.091	17.31	46.10	4	.067
1565	1267	298	456 546	.549	.741	.271	1.482	.914	↓	161	147	.070
2700	1800	900	899 948	.316	.562	.119	1.124	1.424		461	656	.109
30,950	6624	24,326	4921 4930	.061	.247	.010	.494	2.163		23,050	49,860	.166
1379	1226	153	174 391	.895	.946	.565	1.892	.210	18.70	85.4	18	.015
2023	1663	360	487 600	.583	.764	.297	1.528	.842	↓	213	179	.060
49,010	9744	39,270	6260 6270	.056	.236	.009	.472	2.186		42,680	93,298	.155
1915	1690	225	254 474	.844	.919	.518	1.838	.311	20.00	140	44	.021
4361	3019	1342	1088 1159	.345	.588	.135	1.176	1.356	↓	798	1082	.090
3262	2700	562	600 750	.600	.775	.310	1.550	.867	21.20	376	303	.051
6183	4093	2090	1375 1447	.311	.558	.116	1.116	1.435	↓	1317	1890	.090
17,710	15,768	61,940	7857 7870	.057	.239	.009	.478	2.180		75,280	164,100	.137
2661	2376	285	188 534	.936	.967	.604	1.934	.129	22.37	178	23	.008
7814	5124	2690	1562 1640	.305	.552	.112	1.104	1.451	↓	1794	2589	.086
12,800	21,120	91,680	9562 9575	.052	.228	.008	.456	2.203		124,900	275,200	.131
5073	4151	922	788 961	.572	.757	.289	1.514	.864	23.43	681	588	.041
4050	3600	450	301 671	.894	.945	.564	1.890	.213	24.50	326	69	.012
2,225	7747	4473	2028 2115	.284	.533	.101	1.066	1.500	↓	3256	4884	.081
42,900	28,512	114,400	10,653 10,670	.056	.236	.009	.472	2.186		162,800	355,900	.119
7621	6367	1254	873 1119	.626	.791	.330	1.582	.755	26.43	1057	798	.032
27,400	42,000	185,400	13,592 13,610	.051	.226	.008	.452	2.207	↓	302,000	666,500	.111
6373	5661	712	386 744	.889	.942	.558	1.884	.225	27.40	582	131	.011
9764	8198	1566	962 1251	.639	.799	.341	1.598	.728	28.30	1410	1026	.034
19,750	13,018	6732	2468 2594	.308	.555	.114	1.110	1.443	↓	5640	8139	.066
9221	8186	1035	474 1017	.885	.941	.556	1.882	.229	30.00	931	213	.010
366,200	67,930	292,300	17,056 17,080	.053	.230	.008	.460	2.199	↓	532,000	1,170,000	.098
11,560	10,248	1312	559 1145	.873	.934	.544	1.868	.255	31.60	1263	322	.011
15,420	12,912	2508	1227 1583	.632	.795	.335	1.590	.742	↓	2526	1874	.031
29,000	19,600	9400	2897 3065	.326	.571	.124	1.142	1.401		8841	12,390	.059

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							$\times 10^{+4}$				
1000	1100	1840	30,500	6050	36,550	24,290	1226	3323 3500	.314	.560	.117
4,000	↓	7580	517,100	↓	523,200	100,100	42,310	20,520 20550	.054	.232	.008
400	1200	1356	16,550	7200	23,750	19,530	422	1668 20555	.584	.765	.298
200	1300	1076	10,420	8450	18,870	16,790	208	623 1442	.902	.950	.572
4,000	↓	8540	656,400	↓	664,800	133,200	53,160	23,064 23,100	.056	.236	.009
2000	1400	2320	48,400	9800	58,200	38,980	1922	4150 4380	.320	.566	.121
700	1500	1633	24,000	11,250	35,250	29,390	586	1899 2420	.620	.787	.375
400	1600	1356	16,550	12,900	29,350	26,040	331	968 1820	.879	.937	.550
1000	1700	1840	30,500	14,450	44,950	37,540	741	2123 2720	.625	.791	.329
4000	1800	2920	76,700	16,200	92,900	63,070	2983	5154 5460	.330	.575	.127
700	2000	1633	24,000	20,000	44,000	38,190	481	994 2180	.913	.956	.582
2000	2100	2320	48,400	22,050	70,450	58,460	1199	2750 3460	.607	.779	.315
7000	↓	3520	111,500	↓	133,600	88,200	4490	6364 6700	.313	.560	.117
1000	2200	1840	30,500	24,200	54,700	48,580	612	1133 2475	.889	.943	.559
0,000	2400	3960	141,100	28,800	169,900	114,000	5590	7075 7470	.321	.567	.121
4000	2600	2920	76,700	33,800	110,500	91,100	1940	3561 4410	.590	.768	.302
2800	2800	2320	48,400	38,200	87,600	77,950	965	1341 3105	.902	.950	.572
0,000	3000	5000	225,000	45,000	270,000	180,000	9000	8994 9480	.316	.562	.119
7000	3200	3520	111,500	51,200	162,700	135,200	2750	4148 5240	.611	.782	.319
4000	3500	2920	76,700	61,250	138,000	122,600	1540	1764 3990	.893	.945	.563
4,000	3600	3960	141,100	64,800	205,900	171,100	3480	4676 5900	.610	.781	.277
4,000	3800	6290	356,100	72,200	428,300	286,800	14,150	11,255 11,880	.320	.566	.121
7000	4200	3520	111,500	88,200	199,700	177,400	2230	2453 4720	.890	.943	.560
0,000	4500	5000	225,000	101,250	326,200	270,000	5620	6000 7500	.600	.775	.310
0,000	4600	7580	517,100	105,800	622,900	418,400	24,450	13,538 14,300	.322	.567	.122
0,000	4800	3960	141,100	115,200	256,300	228,100	2820	2271 5310	.904	.951	.574
0,000	5000	8540	656,400	125,000	781,400	512,400	26,900	15,618 16,400	.305	.552	.112
0,000	5700	6290	356,100	162,400	518,500	430,200	8830	7477 9400	.606	.778	.314
0,000	6000	5000	225,000	180,000	405,000	360,000	4500	3006 6710	.884	.946	.564
0,000	6800	7580	517,100	231,200	748,300	618,500	12,980	9154 11,400	.596	.772	.307
0,000	7600	6290	356,100	288,800	644,900	573,600	7130	3700 8450	.899	.947	.568
0,000	7700	8540	656,400	296,400	952,200	789,100	16,370	10,195 12,780	.603	.777	.313
0,000	9100	7580	517,100	414,000	931,100	827,700	10,340	4512 10,160	.896	.946	.566
0,000	10,000	8540	656,400	500,000	1,156,000	1,025,000	13,100	5458 11,440	.874	.935	.545

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		$\times 10^{-4}$									
			3323						①	②	
550	25,790	1226	3500	.314	.560	.117	1.120	1.430	33.2	12,020	17.1
3,200	100,100	42,310	20,520 20,550	.054	.232	.008	.464	2.195	↓	841,300	1,841
1,750	19,530	422	1668 2055	.584	.765	.288	1.530	.839	34.6	4613	38
9,870	14,790	207	623 1442	.902	.950	.572	1.900	.195	36.05	2214	43
4,800	33,200	53,160	23,044 23,100	.056	.236	.009	.472	2.186	↓	1,107,000	2,42
8,200	38,980	1922	4150 4380	.320	.566	.121	1.132	1.414	37.4	21,340	30,1
1,250	29,390	586	1899 2420	.620	.777	.325	1.594	.768	38.7	7217	55
1,350	26,040	331	868 1820	.879	.937	.550	1.874	.243	40	3990	9:
1,850	37,540	741	2123 2720	.625	.791	.329	1.572	.756	41.2	9684	73.
2,900	63,070	2983	5154 5460	.330	.575	.127	1.150	1.390	42.4	37,640	52,3
4,000	38,190	481	894 2190	.913	.956	.582	1.912	.173	44.7	6248	10
2,450	58,460	1199	2750 3460	.607	.779	.315	1.558	.794	45.8	17,420	13,8
3,600	88,200	4490	6364 6700	.313	.560	.117	1.120	1.430	↓	60,980	87,2
4,700	48,580	612	1133 2475	.889	.943	.559	1.886	.222	46.9	8507	18
9,900	114,000	5590	7075 7470	.321	.567	.121	1.134	1.412	49.0	87,430	115,6
4,500	91,100	1940	3561 4410	.590	.768	.302	1.536	.729	51	31,290	25,9
7,600	77,950	965	1341 3105	.902	.950	.572	1.900	.195	52.9	15,070	296
10,000	180,000	9000	8994 9480	.316	.562	.119	1.124	1.424	54.8	145,600	207,
7,700	135,200	2750	4149 5240	.611	.782	.319	1.564	.784	56.6	49,350	38,
8,000	122,600	1540	1764 3910	.893	.945	.563	1.890	.214	59.2	26,960	57
15,900	171,100	3480	4676 5900	.610	.781	.277	1.562	.828	60	66,500	55,0
28,300	286,800	14,150	11,255 11,890	.320	.566	.121	1.132	1.414	61.6	259,100	366,
9,700	177,400	2230	2163 4700	.890	.943	.560	1.886	.221	64.8	43,100	95,
16,200	270,000	5620	6000 7500	.600	.775	.310	1.550	.807	67.1	117,900	95,
22,900	418,400	24,450	13,538 14,300	.322	.567	.122	1.134	1.411	67.9	411,800	580,
16,300	228,100	2820	2271 5310	.904	.951	.574	1.902	.191	69.3	57,580	11,
81,400	512,400	24,900	15,619 16,400	.305	.552	.112	1.104	1.451	70.7	564,400	818,
18,500	430,200	8830	7477 9400	.606	.778	.314	1.556	.797	75.5	211,400	168,
15,000	360,000	4500	3006 6710	.894	.946	.564	1.892	.241	77.5	103,000	21,
28,300	618,500	12,980	9154 11,400	.596	.772	.307	1.544	.316	82.4	339,000	276,
24,900	523,600	7130	3700 8450	.899	.947	.568	1.894	.205	87.1	183,200	37,
52,200	789,100	16,370	10,195 12,770	.603	.777	.313	1.554	.200	87.8	454,400	363,
31,100	827,700	10,340	4512 10,460	.896	.946	.566	1.892	.209	95.4	292,800	64,
156,000	1,025,000	13,100	5458 11,440	.894	.935	.545	1.870	.252	100	399,000	100,

6[redacted]

Possibility of Fallout on Wake from a shot on Teengi

From the "time zone" map, Taongi to Wake = 335 statute miles
= 291 nautical miles

Bikini to Wake = 495 statute miles
= 431 nautical miles

Assume, as in Zeni calibration calculation (Flat sd. that intensity falls off as $\frac{1}{R}$ (Hill int.)

$$I_{av} \cdot K_1 R^{-1} = K_2 t^{-1}$$

$$D_{inf} = 5 I_{average} t^{-1.2}$$

$$I_{average} = I_{av} t^{-.2}$$

$$D_{inf} = 5 I_{av} t^{-1.2}$$

$$= 5 K_2 t^{-1.2}$$

$$= 5 K_3 R^{-1.2}$$

$$= K_4 R^{-1.2}$$

$$\frac{D_{inf\ 291mi}}{D_{inf\ 431mi}} = \left(\frac{431}{291}\right)^{1.2} = 1.48^{1.2}$$

$\log(\text{ratio D's}) = 1.2 \log 1.48 = 1.2 \times 0.170226 = 0.204312$

ratio D's = 1.65 = ratio of dose at Wake from Taongi to dose at Wake from Bikini.

which might be the case for fairly radial winds, and doses of the order of 100R at the distance of Wake from Taongi, and 61R at the distance of Wake from Bikini, for 10 MT surface

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$\frac{\text{Dinf 291 mi}}{\text{Dinf 431 mi}} = \left(\frac{431}{291}\right)^{1.2} = 1.48^{1.2}$

$\log(\text{ratio D's}) = 1.2 \log 1.48 = 1.2 \times 0.170026 = 0.204312$

ratio D's = 1.65 = ratio of dose at Wake from Taongi to dose at Wake from Bikini.

which might be the case for fairly radial winds, and doses of the order of 100R at the distance of Wake from Taongi and 61R at the distance of Wake from Bikini, for 10MT surface.

For cases with more shear, and lower doses at 300 miles, ~ 20 R, Lacrosse Verification shows a reduction in dose of 6.5 from 100 to 200 miles. If one takes a factor of 5 per distance change of 2:

Ratio D's = 2.5,

so that dose of 20 R from 10MT at the distance of Wake from Taongi would be 8 R at the distance of Wake from Bikini. This probably is representative of the most common situation which would put Wake in the fallout path.

It is probably reasonable to assume a mean wind of 10 knots in the less severe (and usual) cases, which implies a 29 hour fallout arrival time with large space and time variations normally cutting the dose by at least a factor of 5 to 4R infinite and not over 2R biologically effective.

More often than not space and time variations will prevent the fallout from reaching Wake at all.

LLNL 15

LC035 0540

Areas 1, 4, 3, 7 not available for fall. Need area that is ready.

New K station ready in fall

New Plate station ready in spring, but not urgent.

Spring:

1 or 2 DELETED Area 2. 3 shots < 10 kt in Area 9

DELETED case shot, Area 2 ~ 2 kt

DELETED (Area 9)

Have capability of 3 shots, area 2.

DELETED for 25+35 kt

Fall:

DELETED (not in spring because of primary difficulties)

Sandia will do bomb vulnerability studies, yield > 10 kt

will hang bombs on tower, have probe running up tower center.

Area 2

3 × 400'

4000'

500' × 500'

DELETED

4000'

Site 1 will tolerate 40 kt } Overpressure
2 " " 25 } exist on
3 " " 25 towers

200 ton towers, 100 tons in each

100 tons distributed.

Site 1 to be fired last.

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[redacted]

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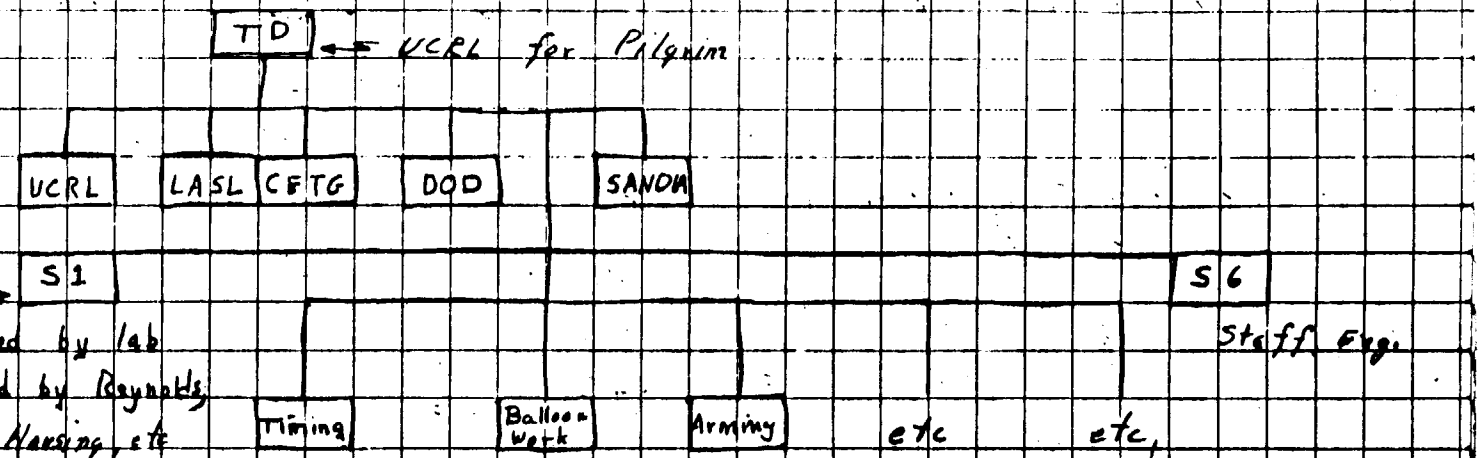
Meeting Monday, Oct 1, 0900.



Areas 1, 4, 3, 7 not available for fall. New area thus needed.

New d station ready in fall
New Plate station ready in spring, but not urgent.

Spring:

1 or 2 DELETED Area 2 . . . . . 3 shots < 10 kt in Area 9

DELETED case shot, Area 2. ~ 2 kt

DELETED (Area 9)

Have capability of 3 shots, area 2.

DELETED 25-35 kt.

Fall:

DELETED (not in spring because of primary difficulties)

LLNL

Sandia will do bomb vulnerability studies, yield > 10 kt

SECRET

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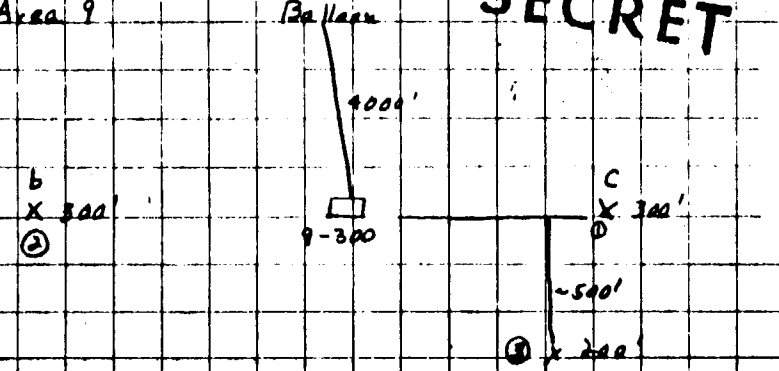

DELETED

0.4 kt
0.3 kt
2-10 kt
2-10 kt
} Priority list not all to be fired

Firing order ①, ②, ③

Might have a shot ready by April 15 - DELETED
" " " large shot ready by April 15 -

Photography can probably be done in daylight
DELETED exp. can probably not be done in daylight

Fallout as of Oct. 1, 1956, Pilgrim

	D	M	T
20 kt, 400' tower at 25 tons/foot	420	180	600
" " " " " " "	420	180	600
30 kt, 500' " " " " "	430	225	655
80 kt, 1500' Balloon	0	1	1
0.4 kt, 300' tower " 35 tons/foot	0	28	28
0.3 kt, 200' tower " " " "	0	26	26
10 kt, 300' " " " "	255	63	318
	1525	704	2229

DELETED

Fall operation

LLNL

Fallout as of Oct. 1, 1956, Pilgrim

	D	M	T
20kt, 400' tower at 75 tons/foot	420	180	600
" " " " " "	420	180	600
30kt, 500' " " " " "	430	225	655
60kt, 1500' Balloon	0	1	1
0.4kt, 300' tower " 35 tons/foot	0	28	28
0.3kt, 200' tower " " " "	0	26	26
14kt, 300' " " " "	255	63	318
	1525	704	2229

Fall Operation

DELETED 40kt, 500' tower at 75 tons/foot	720	225	945
8 small, 5kt, 300' towers at 35 tons/foot	7823	6343	14166
	954	414	1368

Totals for years: 2409 1118 3527

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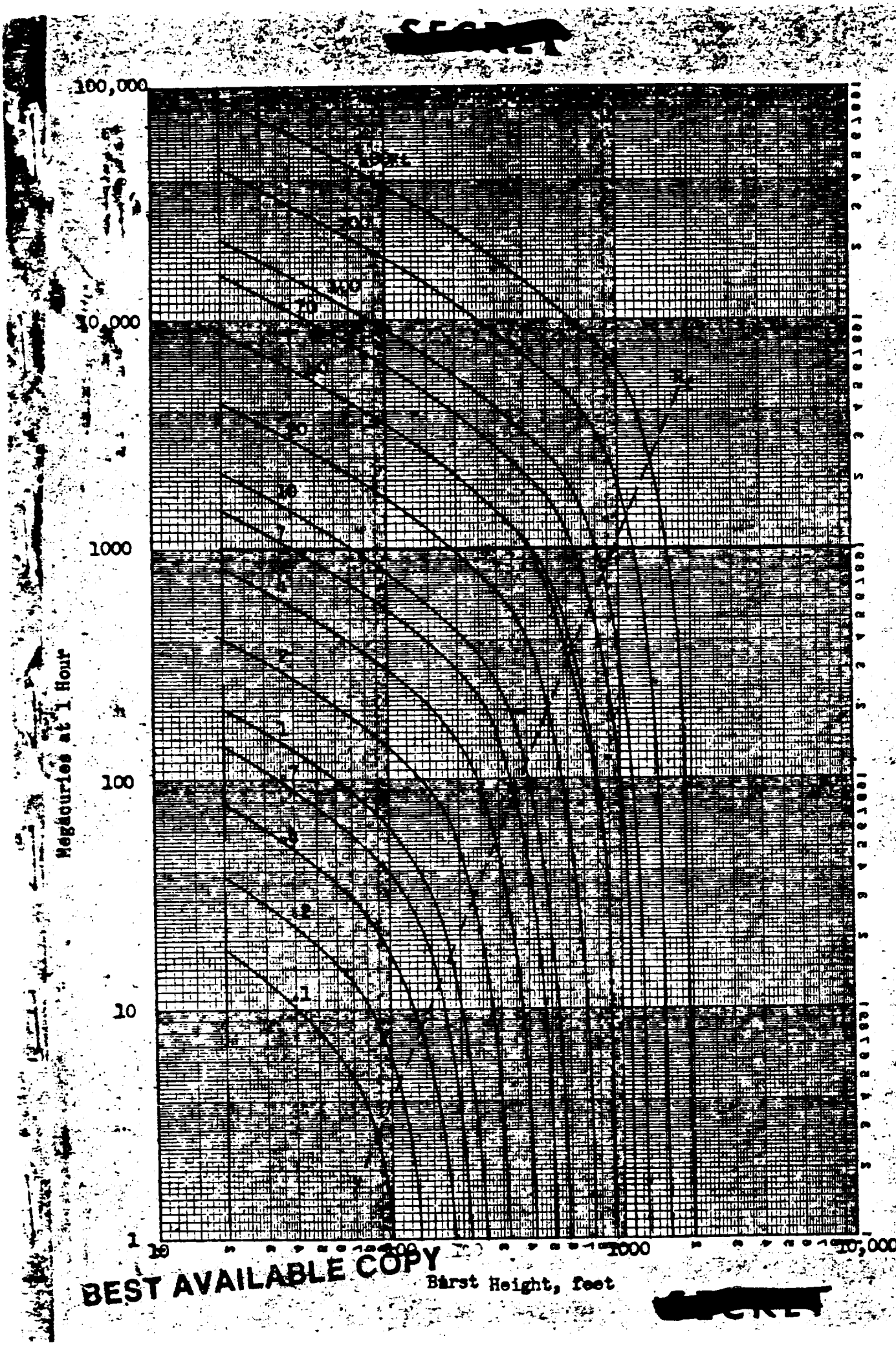

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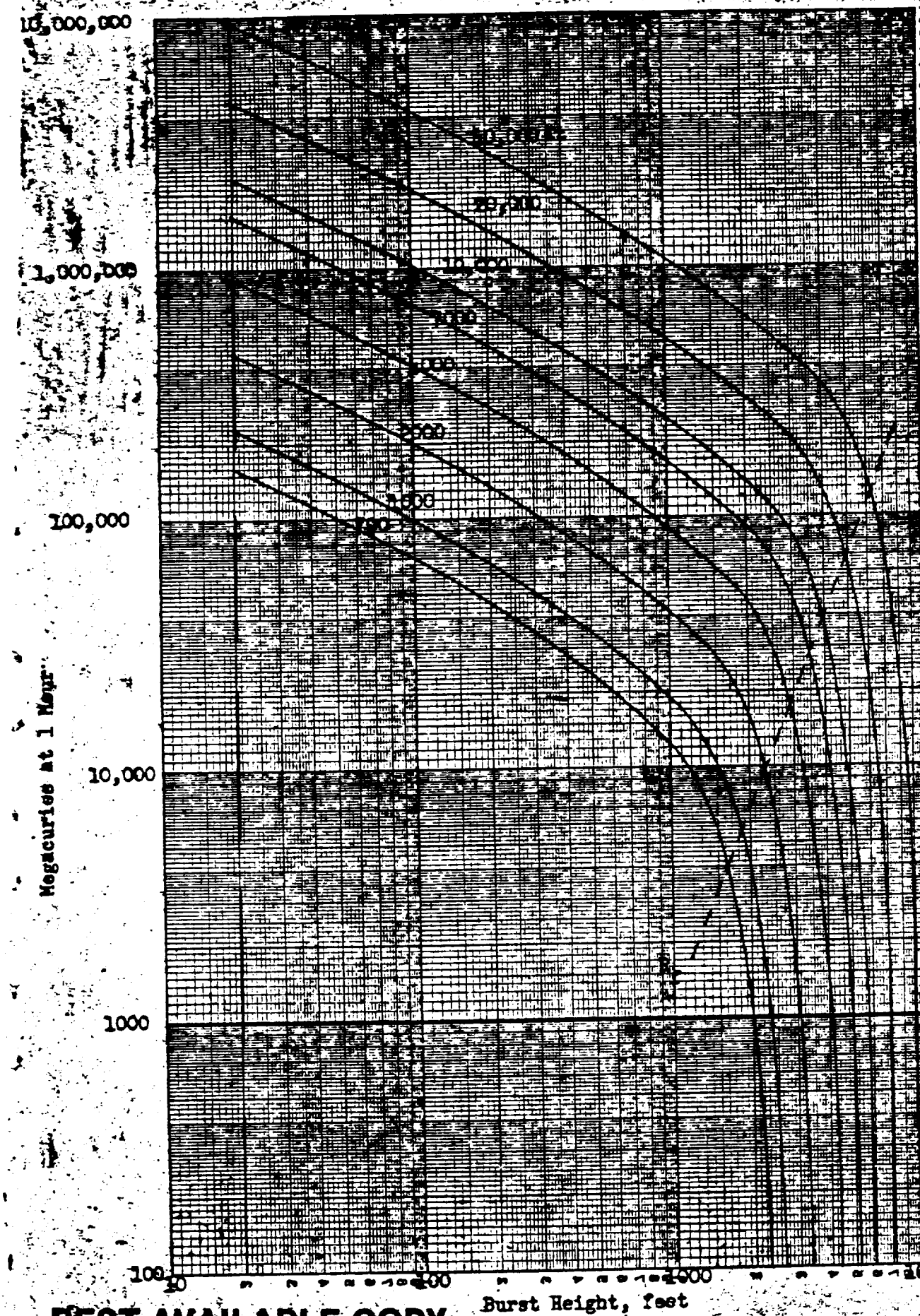

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21

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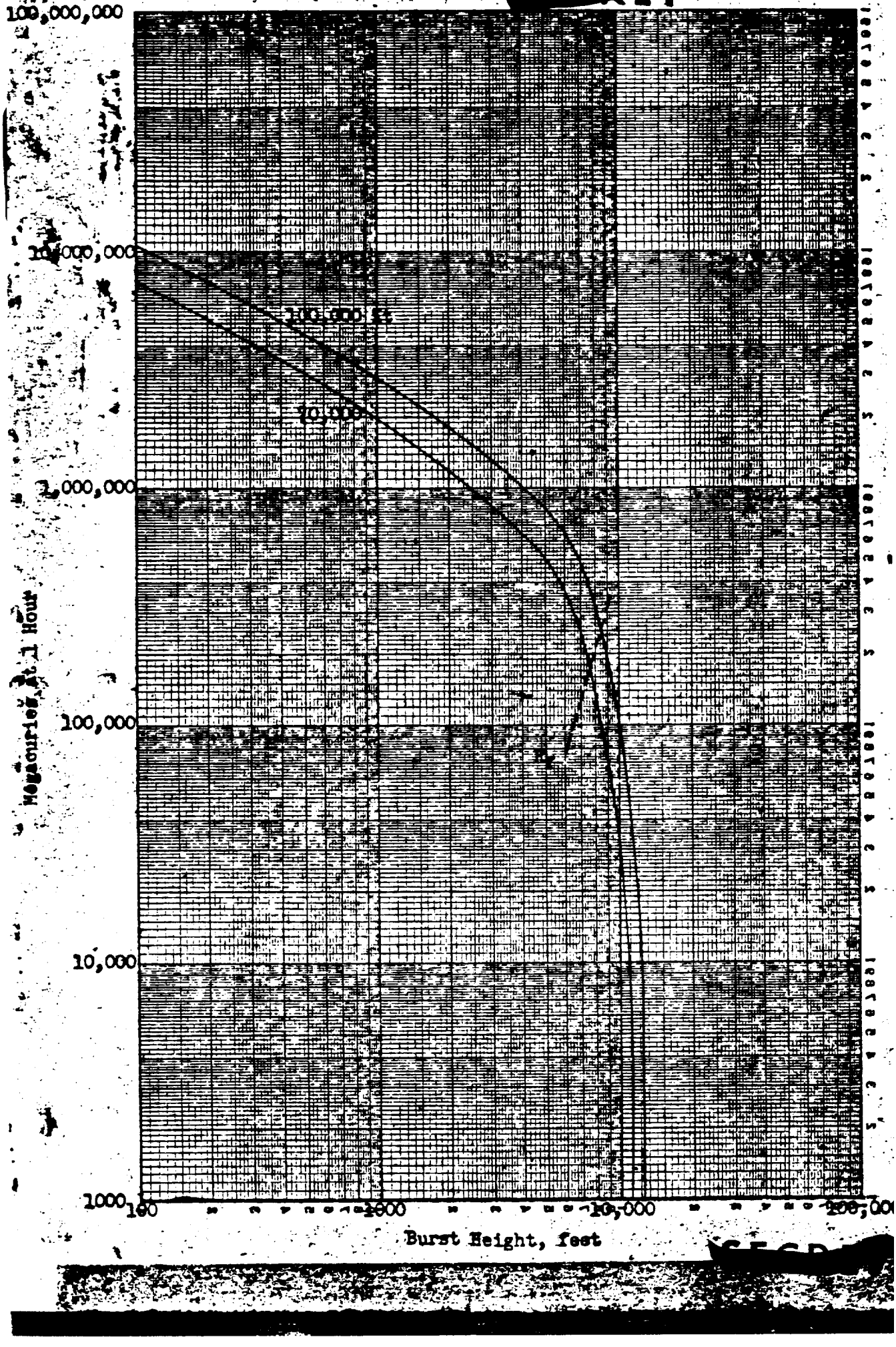
[redacted]


100,000,000
10,000,000
2,000,000
100,000
10,000
1000
Megacuries at 1 Hour
100,000 ft
10,000
100
1000
10,000
Burst Height, feet

10

Pad calculations for a DELETED 20 Kt, 400 tower

$R_2 = (9R_E^2 + 12R_E h + 5h^2)^{1/2}$ --

$9R_E^2 = 2,250,000$

$5h^2 = 200,000$

$12R_E h = 2,400,000$

$(\ ) = 450,000$

$R_2 = 806$

$F_D = [2,130,000 + 16,000 R_1 - 654 (R_1)^{1.5}] / (R_1)^{1.5}$

$F_D = 100$

$Z = 1.33 \left[2\left(\frac{1}{\sqrt{R_1}} - \frac{1}{\sqrt{806}} \right) + 0.67 \times 400 \left(\frac{1}{(R_1)^{1.5}} - \frac{1}{(806)^{1.5}} \right) \right]$

$= 1.33 \left[2\left(\frac{1}{\sqrt{R_1}} - 0.035 \right) + 267 \left(\frac{1}{(R_1)^{1.5}} - .0001 \right) \right]$

$= 1.33 \left[\frac{2}{\sqrt{R_1}} + 0.07 + \frac{267}{(R_1)^{1.5}} - .012 \right]$

$= 1.33 \left(\frac{2}{\sqrt{R_1}} - 0.082 + \frac{267}{(R_1)^{1.5}} \right)$

$= \frac{355}{(R_1)^{1.5}} + \frac{2.66}{\sqrt{R_1}} - 0.109$

P	R_1	$\sqrt{R_1}$	$(R_1)^{1.5}$	$16,000 R_1$	$654 (R_1)^{1.5}$	$2,130,000 + 16,000 R_1 - 654 (R_1)^{1.5}$	$\div (R_1)^{1.5} = F_D$	Z_D
0	400	20	8000	6,400,000	5,232,000	3,298,000	412	.069
300	500	22.4	11,200	8,000,000	7,325,000	2,805,000	250	.042
447	600	24.5	14,700	9,600,000	9,614,000	2,116,000	144	.024
574	700	26.4	18,480	11,200,000	12,096,000	1,244,000	67	.011
693	800	28.3	22,640	12,800,000	14,810,000	120,000	5	.001
806	450	21.2	9540	7,200,000	6,239,000	3,091,000	324	.054
700	806							

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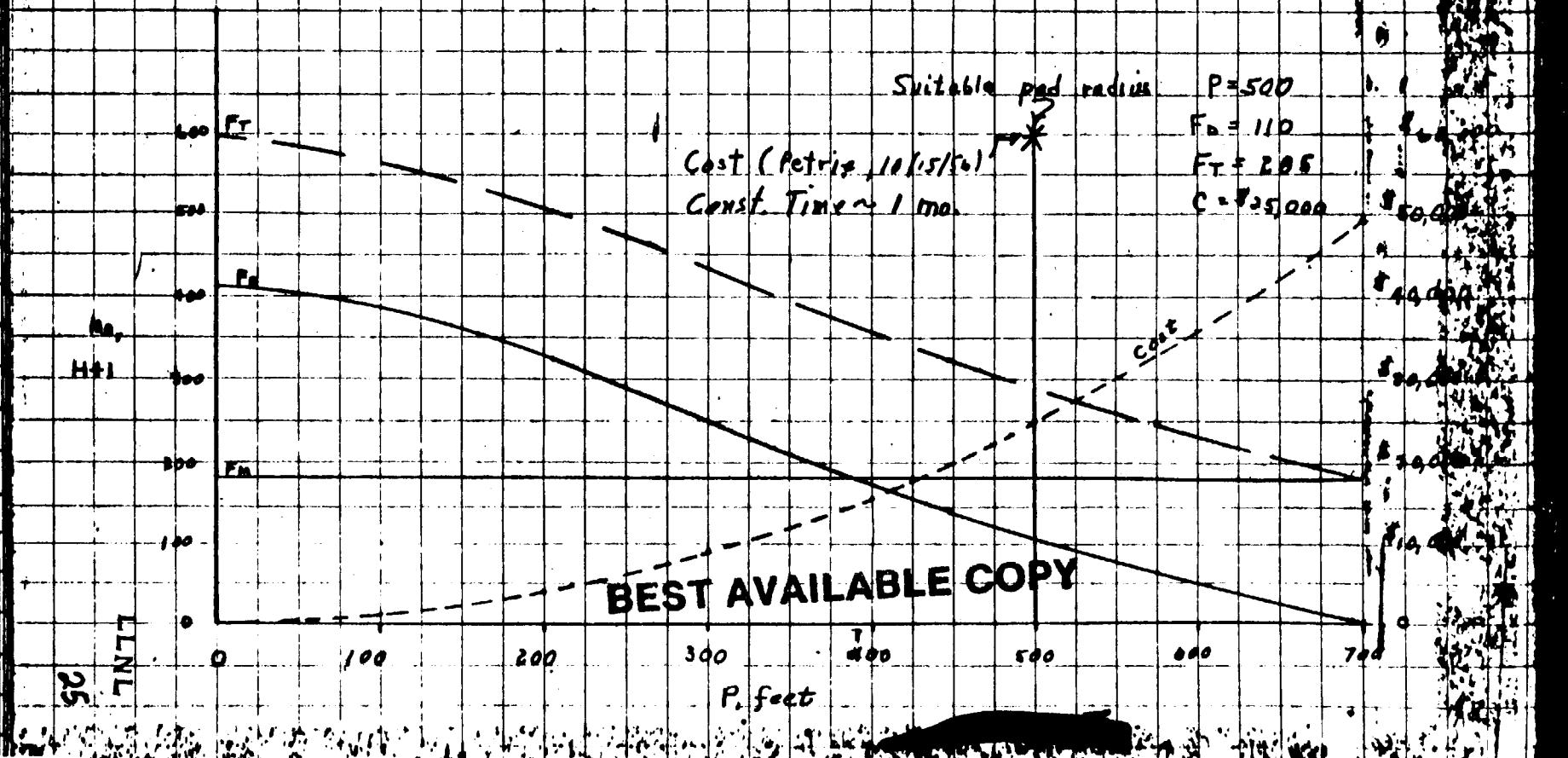
LENGTH

Suitable

$$\frac{3.55}{(R_1)^{1.5}} + \frac{2.64}{\sqrt{R_1}} - 0.109$$

P	R_1	$\sqrt{R_1}$	$(R_1)^{1.5}$	$16{,}000 R_1$	$654 (R_1)^{1.5}$	$2.15 \times 10^6 + 16{,}000 R_1 - 654 (R_1)^{1.5}$	$\div (R_1)^{1.5} = F_D$	Z_D
0	400	20	8000	6,400,000	5,232,000	3,288,000	412	.069
300	500	22.4	11,200	8,000,000	7,325,000	2,805,000	250	.042
447	600	24.5	14,700	9,600,000	8,614,000	2,116,000	144	.024
574	700	26.4	18,480	11,200,000	12,086,000	1,244,000	67	.011
693	800	28.3	22,640	12,800,000	14,810,000	120,000	5	.001
206	450	21.2	9540	7,200,000	6,239,000	3,091,000	324	.054
700	806							



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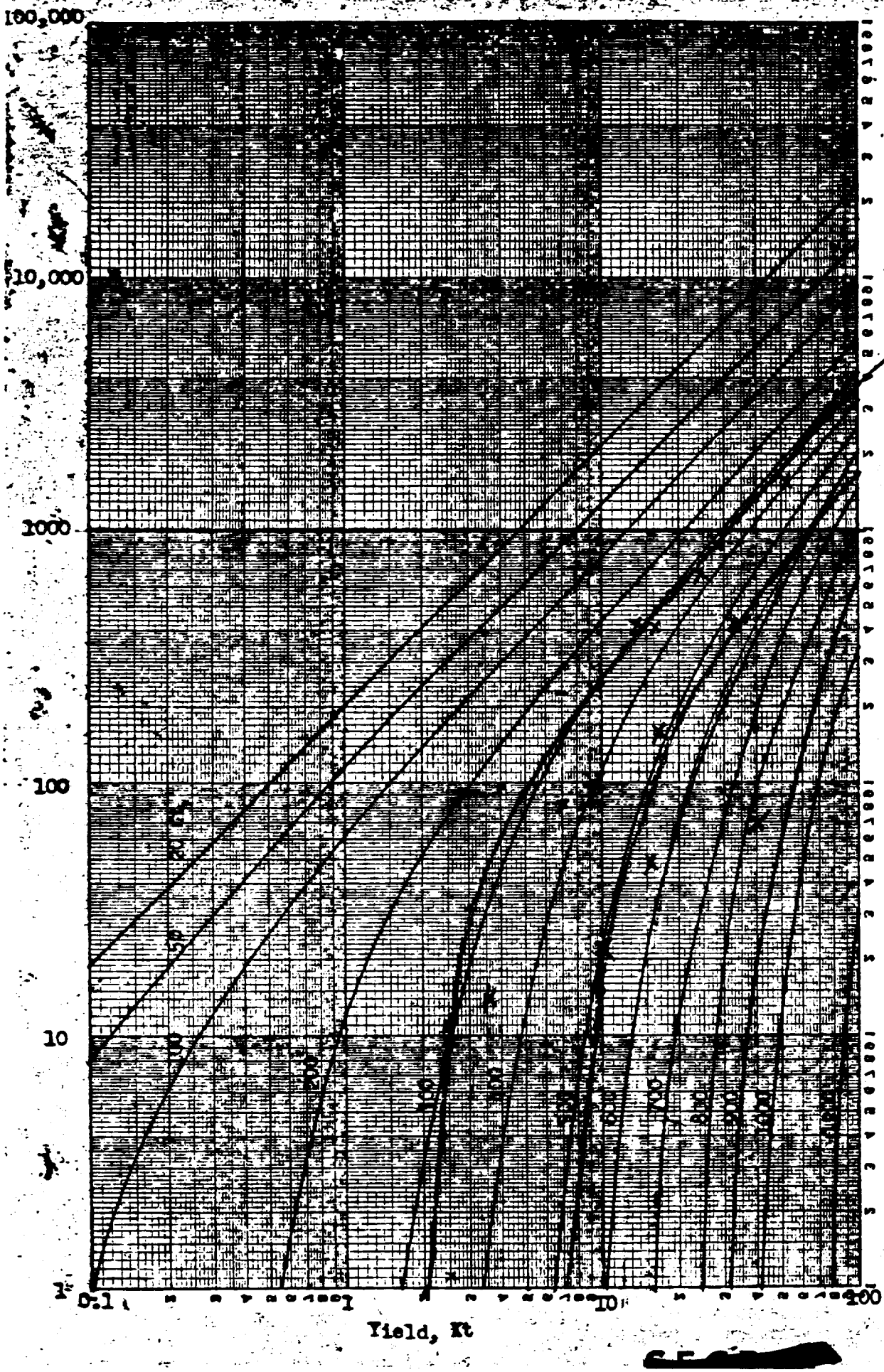

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26

Megacuries at 1 Hour
100
1000
10,000
100,000
Yield, Kt

DELETED

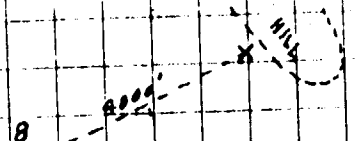
DELETED

Pilgrim Meeting 8 October, 1956

Area 12 is now called area 8.

[redacted]

"Hill and Dale" shot might be possible in area 8. There is a spur near by, to the east.



Lack of funds may prohibit Hill & Dale exp. anyway.

DELETED diagnostics

Looking for secondary ~

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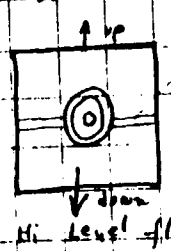
Area 2 - Western



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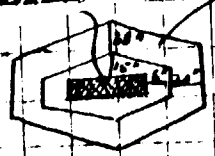

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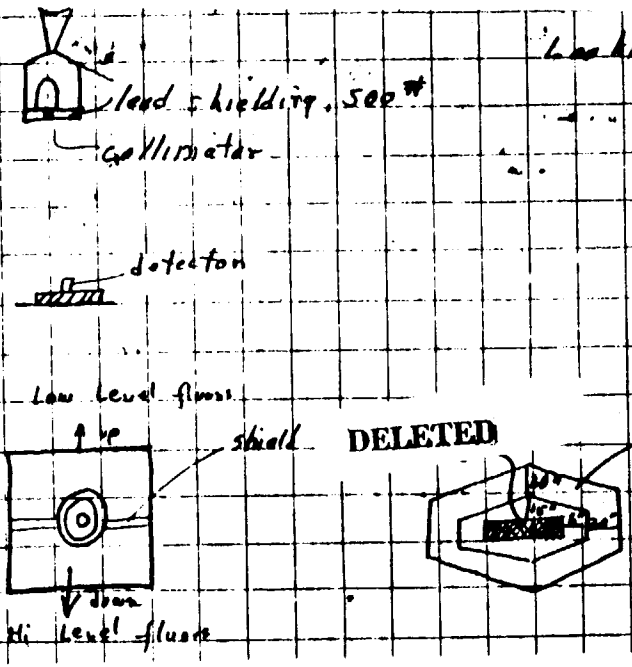

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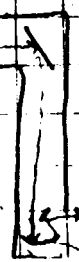
New photo bunker near the K station

Floors will be about 5' apart on towers

Such a bunker may not be operable before 1 July.



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Pad effect curves [redacted]

$$Z = 4.33\left[\Delta\left(1/R_1^{1.5} - 1/R_2^{1.5}\right) + 0.67h\left(1/R_1^{1.5} - 1/R_2^{1.5}\right)\right]$$

$$R_1 = (P^2 + h^2)^{1/2} \qquad R_2 = (P_{max}^2 + h^2)^{1/2}$$

W	h	P/Pm	Pm	P	R_1	R_2	$\sqrt{R_1}$	$\sqrt{R_2}$	$1/\sqrt{R_1}$	$1/\sqrt{R_2}$	2Δ ①
4	20	.25	836	209	210	836	14.5	28.9	.0697	.0346	.0702
↓	350	↓	174	44	353	391	18.8	19.8	.0532	.0505	.0454
40	20		1849	462	462	1849	21.5	43.0	.0465	.0233	.0464
↓	750		386	96	755	844	27.5	29.1	.0364	.0344	.0040
400	20		4030	1008	1008	4030	31.7	63.5	.0315	.0157	.0316
↓	1600		868	217	1614	1820	40.2	42.7	.0249	.0234	.0030
4	20	.50	836	418	418	836	20.4	28.9	.0490	.0346	.0708
↓	350	↓	174	87	360	391	19.0	19.8	.0526	.0505	.0042
40	20		1849	924	924	1849	30.4	43.0	.0329	.0233	.0192
↓	750		386	193	774	844	27.8	29.1	.0360	.0344	.0032
400	20		4030	2015	2015	4030	44.8	63.5	.0223	.0157	.0132
↓	1600		868	434	1658	1820	40.7	42.7	.0246	.0234	.0024
4	20	.75	836	627	627	836	25.0	28.9	.0400	.0346	.0108
↓	350	↓	174	130	373	391	19.3	19.8	.0518	.0505	.0026
40	20		1849	1387	1398	1849	37.2	43.0	.0269	.0233	.0072
↓	750		386	290	804	844	28.4	29.1	.0352	.0344	.0016
400	20		4030	3022	3022	4030	55.0	63.5	.0182	.0157	.0050
↓	1600		868	651	1728	1820	41.6	42.7	.0240	.0234	.0012

	$1/R_1^{1.5}$	$1/R_2^{1.5}$	.67hΔ ②	$1.33Z$ ②	Zm	Z/Z_m	R_1/R_2
4	.000328	.000041	.0038	.0984	.702	.140	.250
↓ 350	.000151	.000129	.0052	.0141	.015	.940	.903
40 20	.000101	.000013	.0014	.0633	.732	.086	.250

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4	20	.50	174	87	360	391	19.0	18.8	.0526	.0505	.0942		
↓	350	↓											
40	20		1849	924	924	1849	30.4	43.0	.0329	.0233	.0192		
↓	750												
400	20		4030	2015	2015	4030	44.8	63.5	.0223	.0157	.0132		
↓	1600		868	434	1658	1820	40.7	42.7	.0246	.0234	.0024		
4	20	.75	836	627	627	836	25.0	28.9	.0400	.0346	.0108		
↓	350	↓	174	130	373	391	19.3	19.8	.0518	.0505	.0026		
40	20		1849	1387	1378	1849	32.2	43.0	.0269	.0233	.0072		
↓	750		386	290	804	844	28.4	29.1	.0352	.0344	.0016		
400	20		4030	3022	3022	4030	55.0	63.5	.0182	.0157	.0050		
↓	1600		868	651	1228	1820	41.4	42.7	.0240	.0234	.0012		
			$1/R_1^{1.5}$	$1/R_2^{1.5}$	② .676Δ	Z ② 1.33Σ@		Z_m		Z_1/Z_m	R_1/R_2		
4	20	.25	.000328	.000041	.0038	.0984		.702		.140	.250		
↓	350	↓	.000151	.000128	.0052	.0141		.015		.940	.903		
40	20		.000101	.000013	.0012	.0633		.732		.086	.250		
↓	750		.000048	.000041	.0035	.0010		.011		.909	.895		
400	20		.000031	.000004	.0004	.0426		.750		.057	.250		
↓	1600		.000015	.000013	.0021	.0068		.008		.850	.887		
4	20	.50	.000117	.000041	.0010	.0396		.702		.056	.500		
↓	350	↓	.000146	.000129	.0040	.0109		.015		.727	.921		
40	20		.000036	.000013	.0003	.0259		.732		.035	.500		
↓	750		.000046	.000041	.0025	.0076		.011		.691	.917		
400	20		.000011	.000004	.0001	.0257		.750		.034	.500		
↓	1600		.000015	.000013	.0021	.0060		.008		.750	.911		

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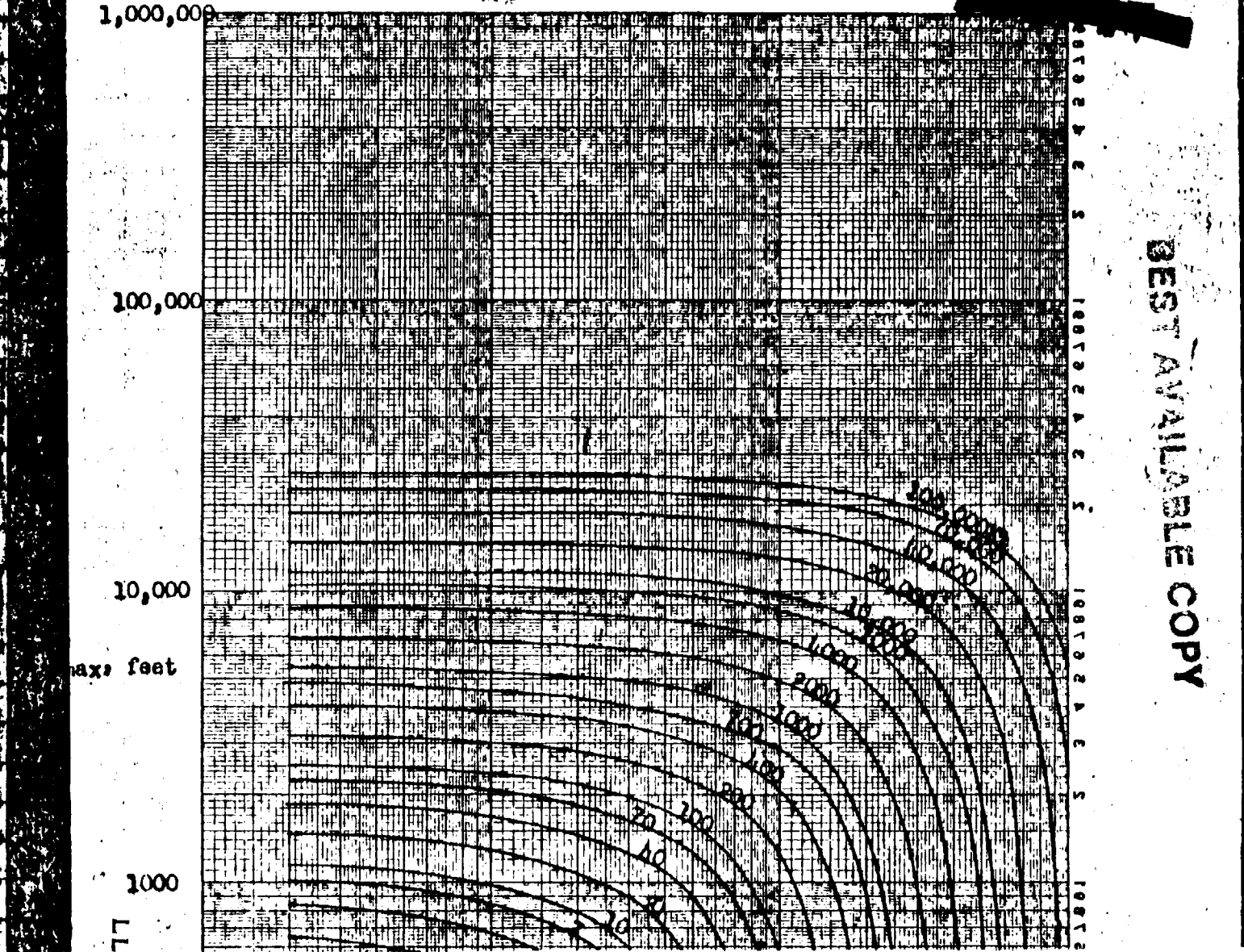
P_{max} ($F_D = 0$) vs h, Parameter Field.



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Pad Effect Curves (Data page 14)

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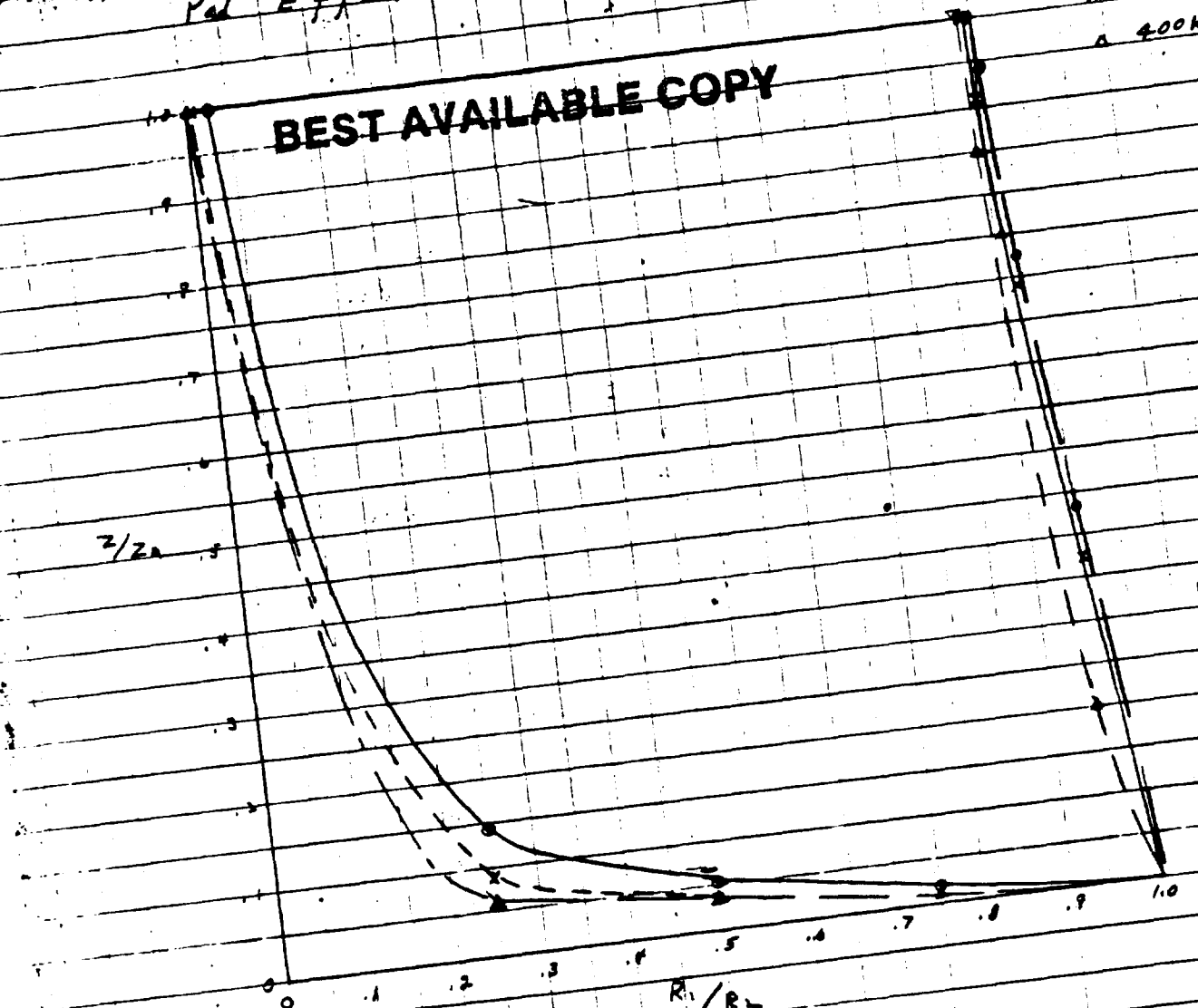

W	h	$\frac{R_1-h}{R_2}$	$\frac{R_1-h}{R_2-h}$	Z/Z_m
4	20	.227	.220	.140
↓	↓	.476		.056
		.726		.021
	350	.00767		.940
	↓	.0256		.727
		.059		.433
40	20	.239		.057
	↓	.499		.035
		.739		.013
	750	.0255		.909
	↓	.028		.691
		.064		.373
	20	.245		.057
				.034

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Pad Effect Curves (Data page 14)

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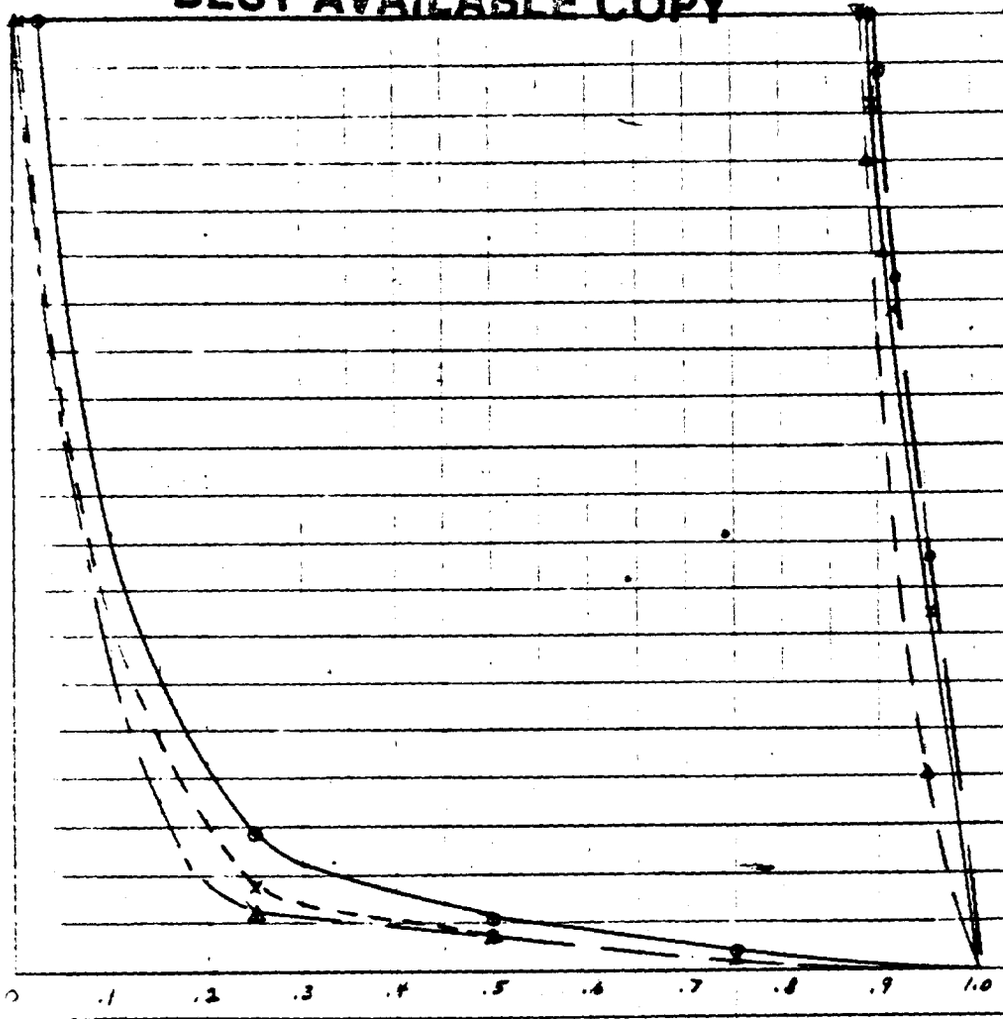
○ 4Kt, 20' Q 3

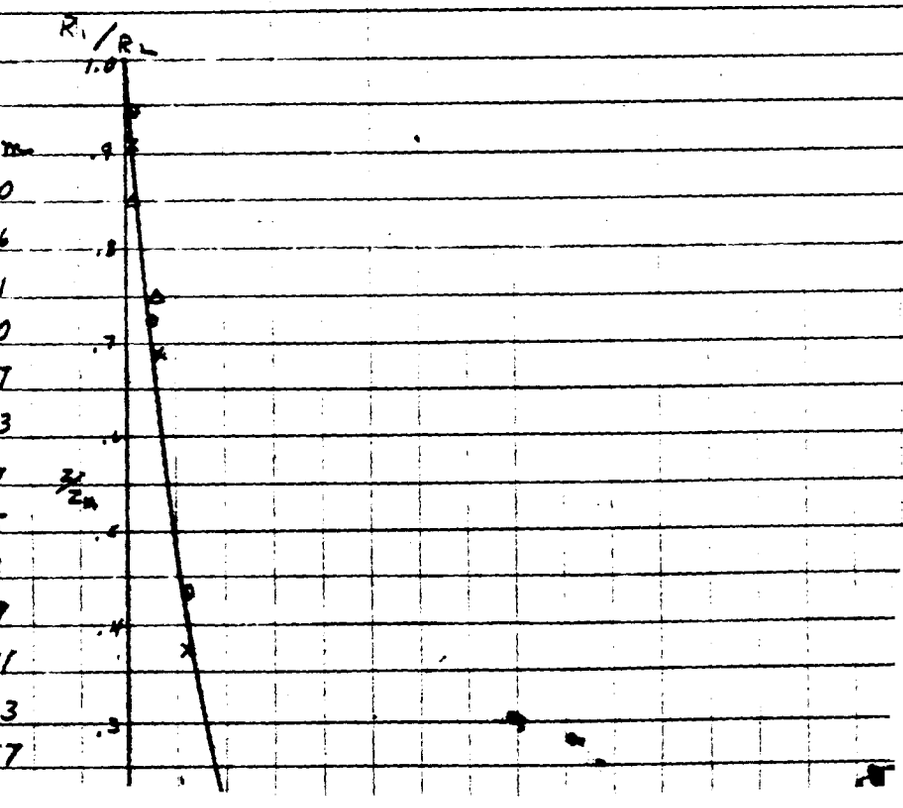
× 40Kt, 20' X 7

△ 400Kt, 20' Δ 1

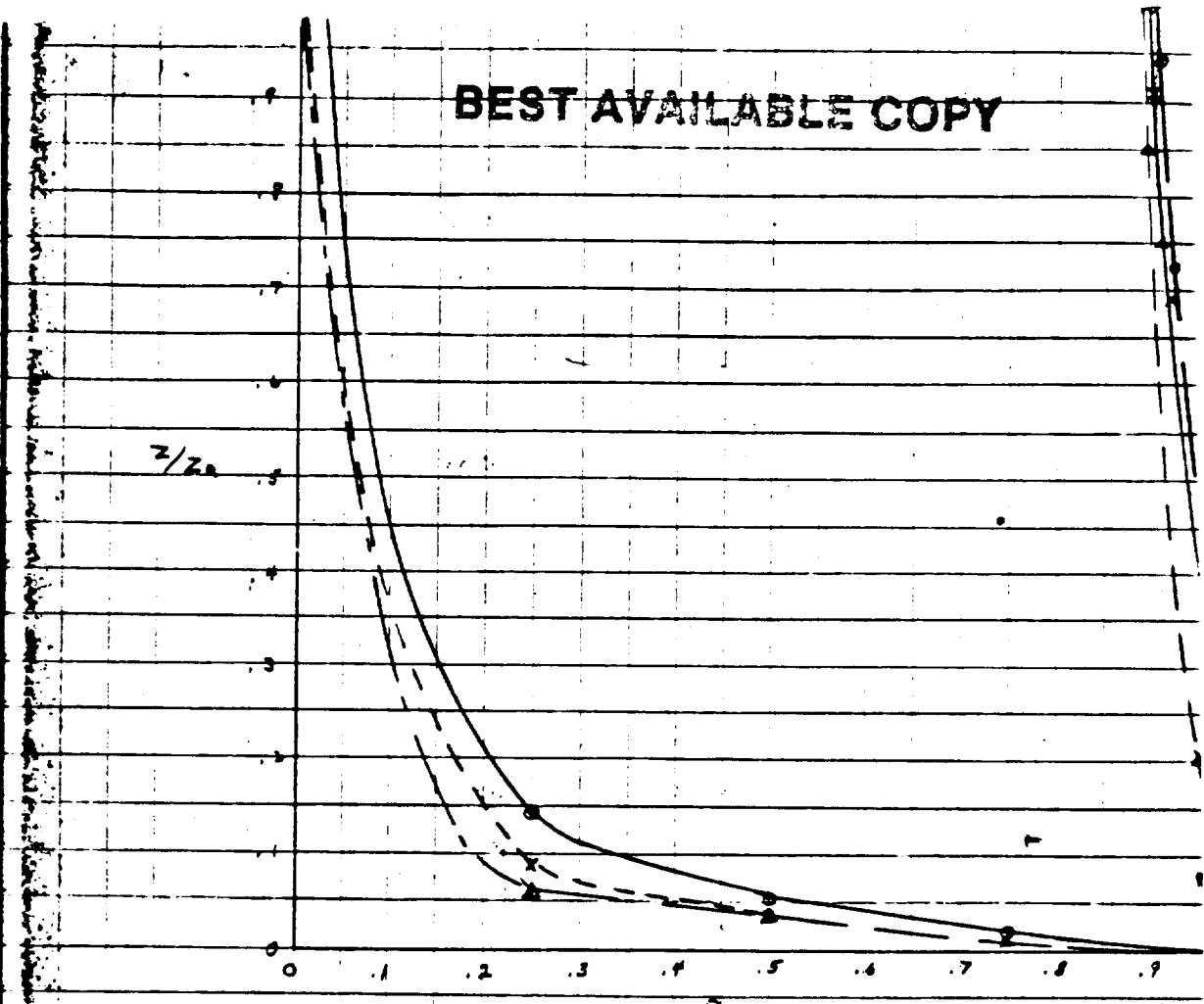


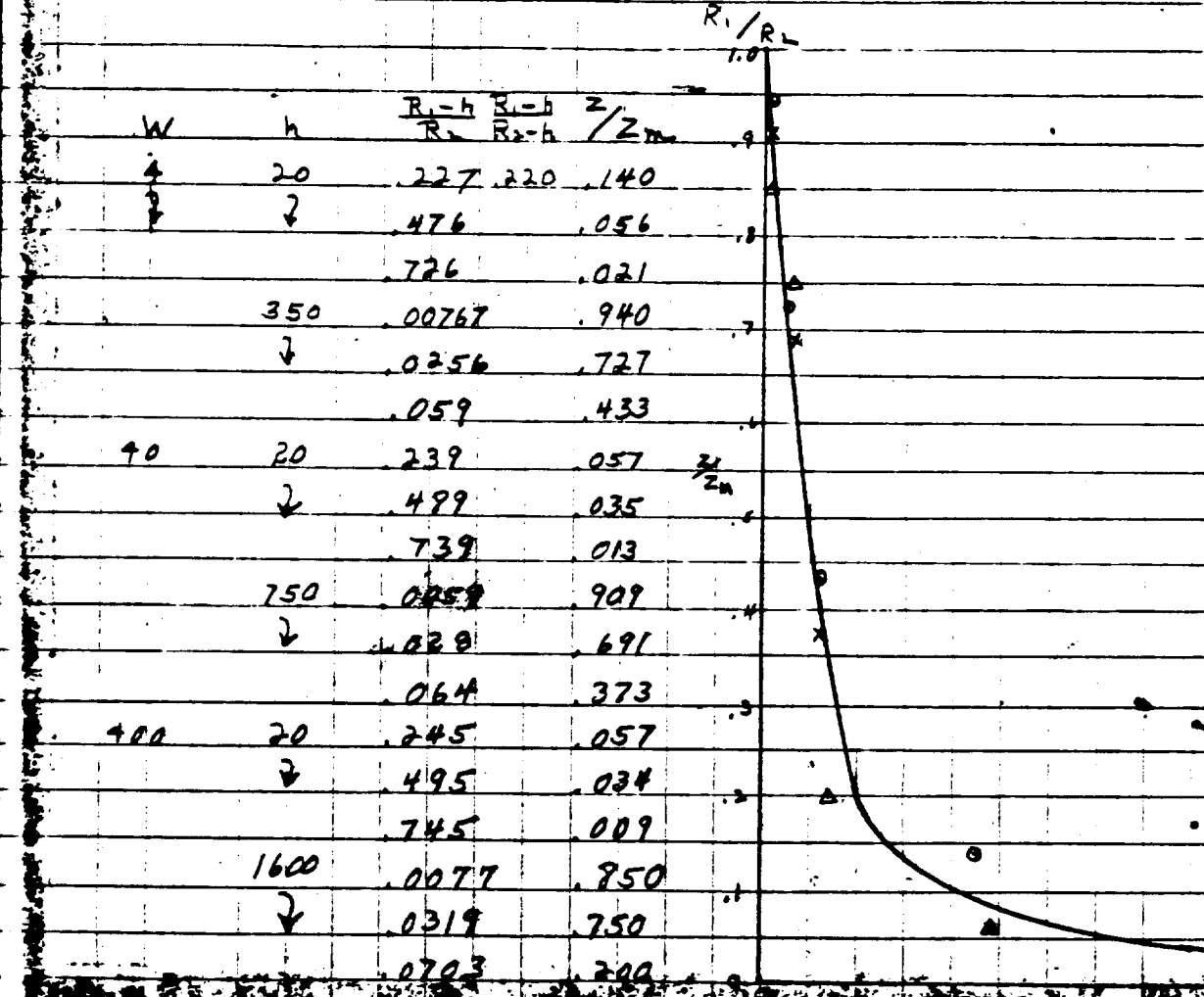
R_1/R_2

$\frac{R_1-h}{R_2-h}$	$\frac{z_1-h}{z_2-h}$	z/z_m
.227	.220	.140
.476		.056
.726		.021
.00767		.940
.0256		.727
.059		.433
.239		.057
.499		.035
.739		.013
.0059		.909
.028		.691
.064		.373
.245		.057



BEST AVAILABLE COPY





W	h	$\frac{R_1-h}{R_2}$	$\frac{R_1-h}{R_2-h}$	z/z_m
4	20	.227	.220	.140
↓	↓	.476		.056
		.726		.021
	350	.00767		.940
	↓	.0256		.727
		.059		.433
40	20	.239		.057
	↓	.499		.035
		.739		.013
	750	.0253		.909
	↓	.028		.691
		.064		.373
400	20	.245		.057
	↓	.495		.034
		.745		.009
	1600	.0077		.850
	↓	.0319		.750
		.0703		.200

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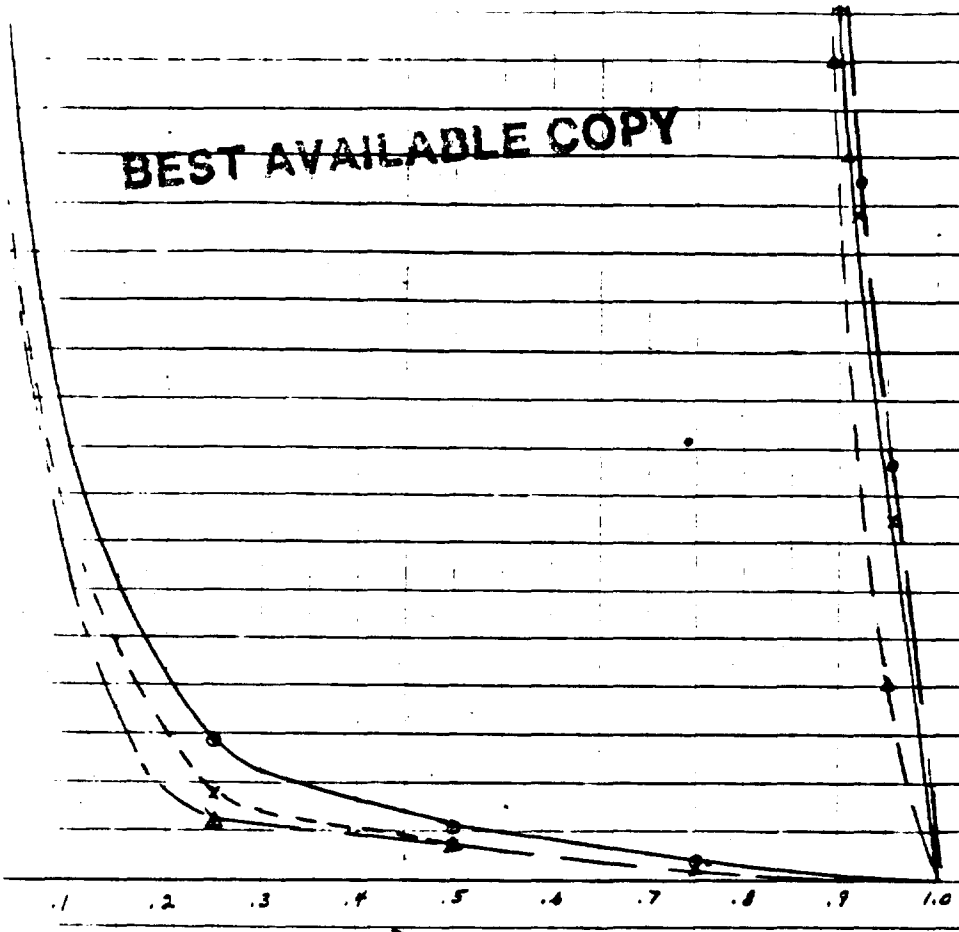

R_1/R_2

$\frac{R_1-h}{R_2-h}$	$\frac{R_1-h}{R_2-h}$	z/z_m
.227	.220	.140
.476		.056
.726		.021
.00767		.940
.0256		.727
.059		.433
.239		.057
.489		.035
.739		.013
.0059		.909
.028		.691
.064		.373
.245		.057
.495		.034
.745		.009
.0077		.850
.0319		.750
.0703		.700

z/z_m

1.0 .9 .8 .7 .6 .5 .4 .3 .2 .1 0 .9

Pad effects, cont.

W	h	$\frac{R_1-h}{R_2-h}$	R_1	R_2	$\sqrt{R_1}$	$\sqrt{R_2}$	$1/\sqrt{R_1}$	$1/\sqrt{R_2}$
4	150	.02	159	594	12.6	24.4	.0794	.0410
↓	↓	.05	172	↓	13.1	↓	.0763	↓
		.10	194		13.9		.0719	
		.20	239		15.5		.0645	
		.50	372		19.3		.0518	
20	400	.02	408	806	20.2	28.4	.0495	.0352
		.05	420	↓	20.5	↓	.0488	↓
		.10	441		21.0		.0476	
		.20	481		21.9		.0457	
		.50	603		24.6		.0406	
40	550	.02	558	961	23.6	31.0	.0424	.0323
		.05	571	↓	23.9	↓	.0418	
		.10	591		24.3		.0412	
		.20	632		25.2		.0397	
		.50	756		27.5		.0364	

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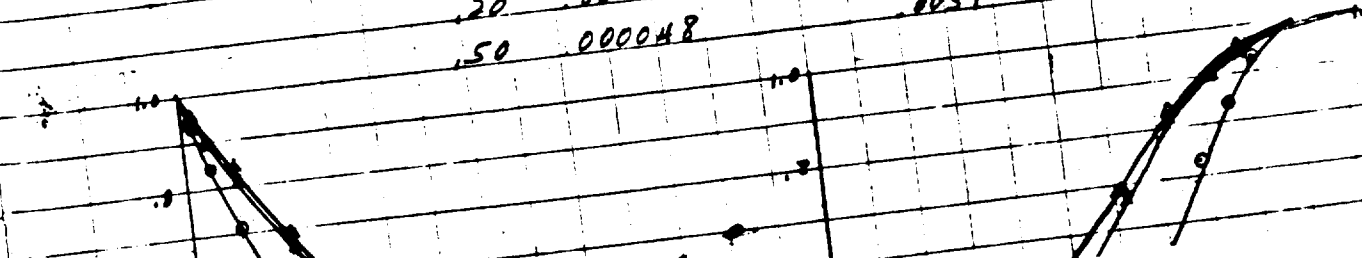
$\frac{P_n-P}{PP_n}$	W	h	$\frac{R-h}{R_2-h}$	$1/R^{1.5}$	$1/R_2^{1.5}$	② .67hΔ	Z 1.33Σ②	Z_n
.0178	4	150	.02	.000499	.000069	.0430	.159	.171
.0102	↓	↓	.05	.000444	↓	.0375	.144	↓
.0064			.10	.000371		.0302	.122	
.00364			.20	.000270		.0201	.099	
.0018			.50	.000139		.0070	.038	
.0110	20	400	.02	.000121	.000044	.0206	.065	.069
.0064	↓	↓	.05	.000116	↓	.0192	.062	↓
.00395			.10	.000102		.0171	.056	
.00232			.20	.000095		.0136	.046	
.00079			.50	.000067		.0061	.022	
	40	550	.02	.000076	.000034	.0154	.047	.043
	↓	↓	.05	.000073	↓	.0143	.044	↓
			.10	.000070		.0132	.041	
			.20	.000063		.0106	.034	
			.50	.000048		.0051	.018	



rad effects, rent. [redacted] 11

h	$\frac{R_1-h}{R_2-h}$	R_1	R_2	$\sqrt{R_1}$	$\sqrt{R_2}$	$1/\sqrt{R_1}$	$1/\sqrt{R_2}$	① 2Δ
150	.02	159	594	12.6	24.4	.0794	.0410	.0768
↓	.05	172	↓	13.1	↓	.0763	↓	.0706
	.10	194		13.9		.0719		.0618
	.20	239		15.5		.0645		.0470
	.50	372		19.3		.0518		.0216
400	.02	408	806	20.2	28.4	.0495	.0352	.0286
	.05	420	↓	20.5	↓	.0488	↓	.0272
	.10	441		21.0		.0476		.0248
	.20	481		21.9		.0457		.0210
	.50	603		24.6		.0406		.0108
550	.02	558	961	23.6	31.0	.0424	.0323	.0202
	.05	571	↓	23.9	↓	.0418		.0190
	.10	591		24.3		.0412		.0178
	.20	632		25.2		.0397		.0148
	.50	756		27.5		.0364		.0082

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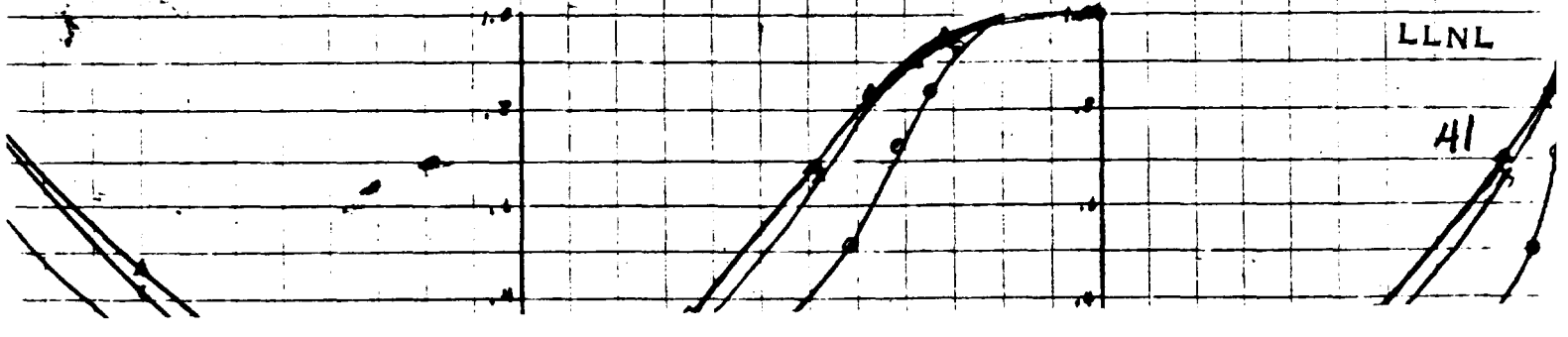
h	$\frac{R_1-h}{R_2-h}$	$1/R_1^{1.5}$	$1/R_2^{1.5}$	② $.67h\Delta$	Z $1.33\Sigma\theta^2$	Z_M	Z/Z_M	$\frac{P_M-P}{P_M}$	$\frac{P_M^2-P^2}{P_M^2}$
150	.02	.000499	.000069	.0430	.159	.171	.930	.908	.992
↓	.05	.000444	↓	.0375	.144	↓	.842	.854	.979
	.10	.000371		.0302	.122		.713	.786	.954
	.20	.000270		.0201	.089		.503	.677	.895
	.50	.000139		.0070	.038		.215	.409	.650
400	.02	.000121	.000044	.0206	.065	.069	.942	.886	.987
↓	.05	.000116	↓	.0192	.062	↓	.899	.817	.967
	.10	.000108		.0171	.056		.812	.734	.929
	.20	.000095		.0136	.046		.667	.619	.854
	.50	.000067		.0061	.022		.319	.356	.585
550	.02	.000076	.000034	.0154	.047	.049	.959	.881	.966
↓	.05	.000073	↓	.0143	.044	↓	.898	.806	.96
	.10	.000070		.0132	.041		.837	.726	.925
	.20	.000063		.0106	.034		.698	.605	.841
	.50	.000048		.0051	.018		.367	.341	.56



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		.10	1.14				.0645		
		.20	239		15.5		.0518		
		.50	372		19.3		.0495	.0352	
20	400	.02	406	806	20.2	28.4	.0488	↓	
		.05	420	↓	20.5	↓	.0476		
		.10	441		21.0		.0457		
		.20	481		21.9		.0406		
		.50	603		24.6		.0424	.0323	
40	550	.02	558	961	23.6	31.0	.0418		
		.05	571	↓	23.9	↓	.0412		
		.10	591		24.3		.0397		
		.20	632		25.2		.0364		
		.50	756		27.5				

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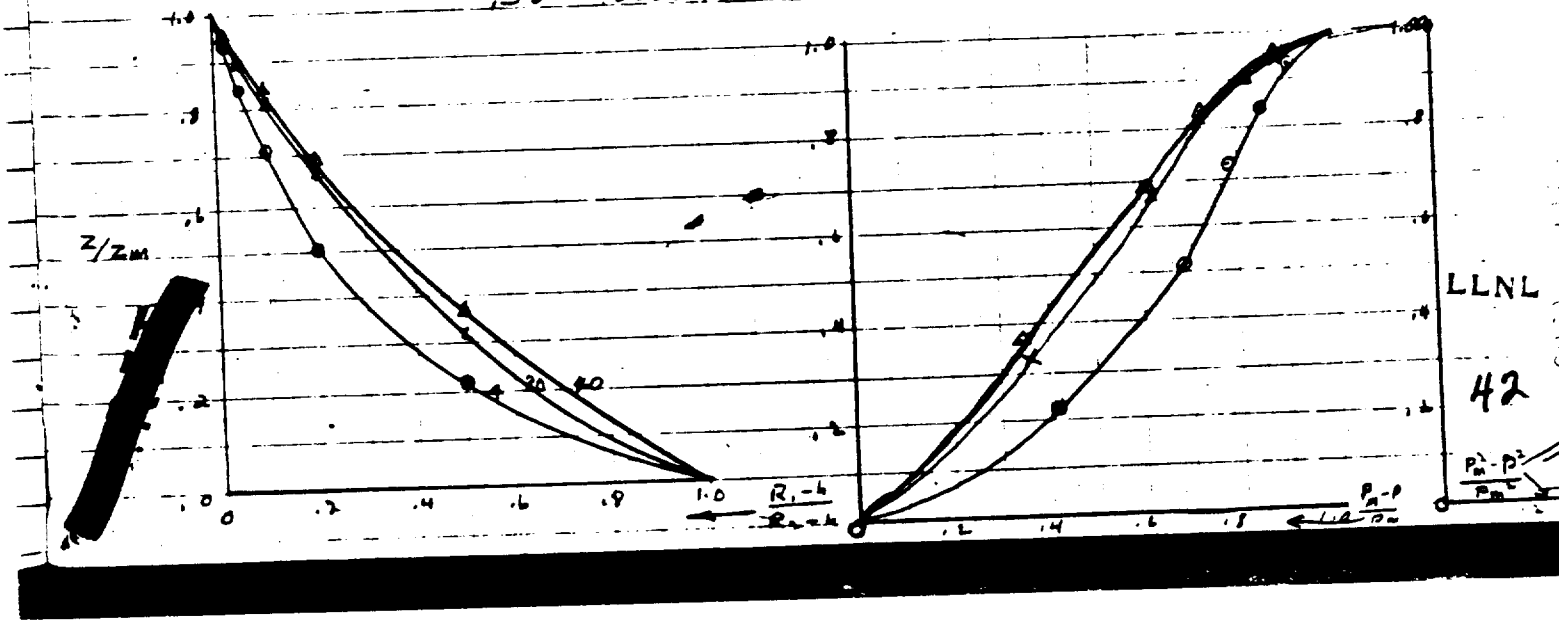
$\frac{P_m - P}{P E_m}$	w	h	$\frac{R_1 - h}{R_2 - h}$	$1/R_1^{1.5}$	$1/R_2^{1.5}$	.67hΔ	1.33 $\Sigma \theta_i$	Z_m	$Z/2$
.0178	4	150	.02	.000499	.000069	.0430	.159	.171	.93
.0102	↓	↓	.05	.000444	↓	.0375	.144	↓	.84
.0064			.10	.000371		.0302	.122		.71
.00364			.20	.000270		.0201	.089		.5
.0018			.50	.000139		.0070	.038		.2
.0110	20	400	.02	.000121	.000044	.0206	.065	.069	.9
.0064	↓	↓	.05	.000116	↓	.0192	.062	↓	.8
.00395			.10	.000108		.0171	.056		.8
.00232			.20	.000095		.0136	.046		.6
.00079			.50	.000067		.0061	.022		.3
	40	550	.02	.000076	.000034	.0154	.047	.049	.9
	↓	↓	.05	.000073	↓	.0143	.044	↓	.8
			.10	.000070		.0132	.041		
			.20	.000063		.0106	.034		
			.50	.000048		.0051	.018		



	.10	1.14		13.9		.0114	.0618
	.20	239		15.5		.0645	.0470
	.50	372		19.3		.0518	.0216
0	.02	408	806	20.2	29.4	.0495	.0352 .0276
	.05	420	↓	20.5	↓	.0488	↓ .0272
	.10	441		21.0		.0476	.0248
	.20	481		21.9		.0457	.0210
	.50	603		24.6		.0406	.0108
0	.02	558	961	23.6	31.0	.0424	.0323 .0202
	.05	571	↓	23.9	↓	.0418	.0190
	.10	591		24.3		.0412	.0178
	.20	632		25.2		.0397	.0148
	.50	756		27.5		.0364	.0082

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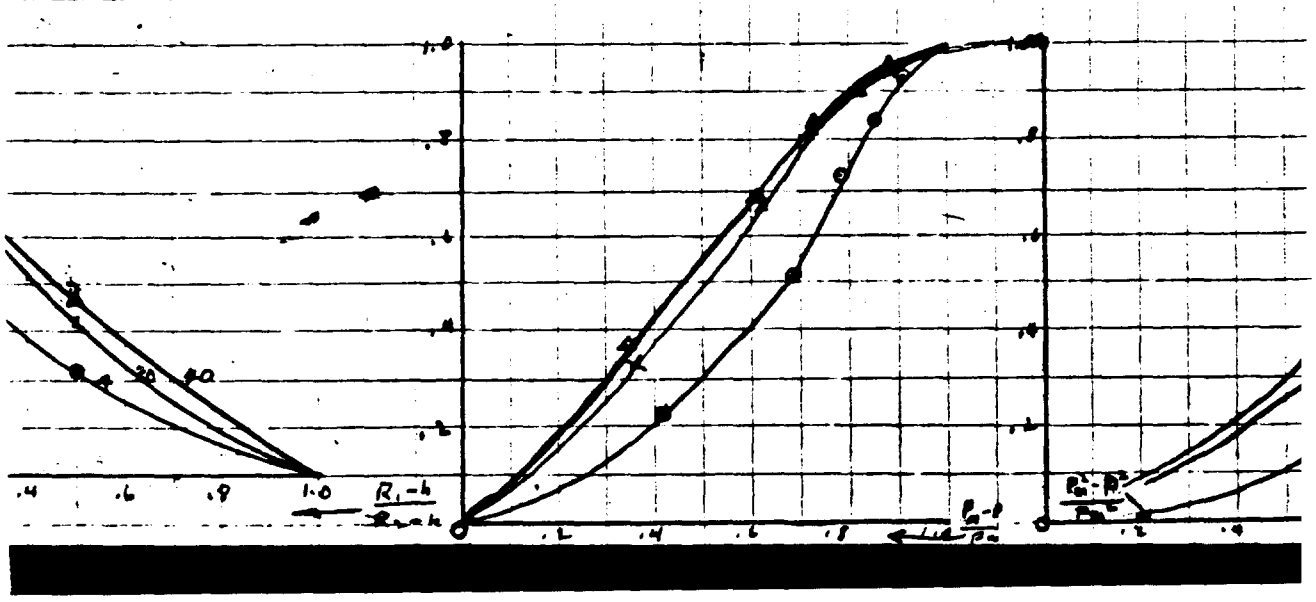
$\frac{R_i-h}{R_o-h}$	$1/R_i^{1.5}$	$1/R_o^{1.5}$	@ .67hΔ	Z 1.33 $\Sigma\Theta$	Z_M	Z/Z_M	P_a
0 .02	.000499	.000069	.0430	.159	.171	.930	9
.05	.000444	↓	.0375	.144	↓	.842	8
.10	.000371		.0302	.122		.713	7
.20	.000270		.0201	.089		.503	
.50	.000189		.0070	.038		.215	4
10 .02	.000121	.000044	.0206	.065	.069	.942	
.05	.000116	↓	.0192	.062	↓	.899	
.10	.000108		.0171	.056		.812	
.20	.000095		.0136	.046		.667	
.50	.000067		.0061	.022		.319	
0 .02	.000076	.000034	.0154	.047	.049	.959	
↓ .05	.000073	↓	.0143	.044	↓	.898	
.10	.000070		.0132	.041		.837	
.20	.000063		.0106	.034		.694	
.50	.000048		.0051	.018		.367	



Pad Effects [redacted]

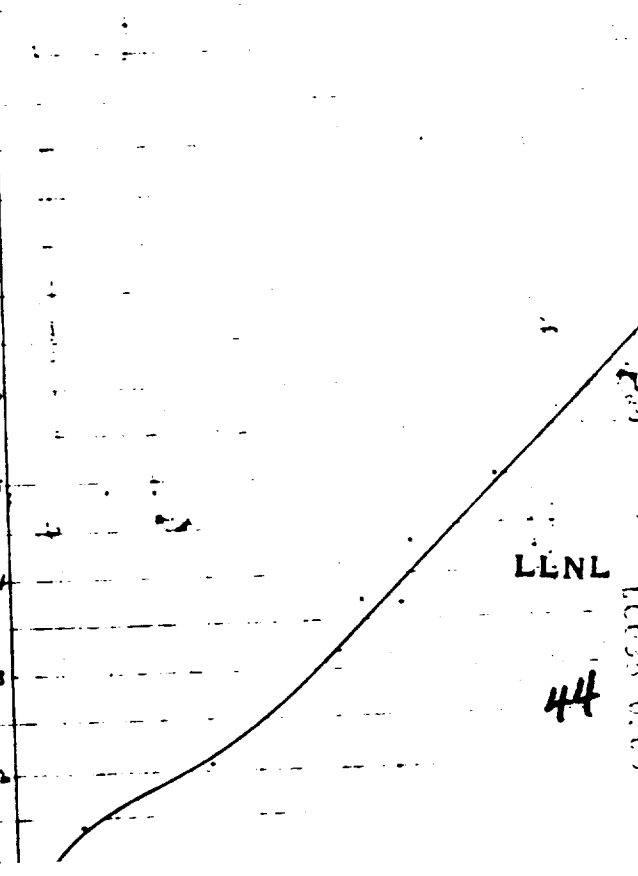
$\beta = \frac{h}{R_2 - h}\left(\frac{R_2 - R_1}{R_1}\right) = \frac{h}{R_1}($

$1/R_1 = \frac{1-\beta}{R_2} + \frac{\beta}{h}$

$R_1 = \frac{h R_2}{h(1-\beta) + \beta R_2}$

Apple II Pad radius.

w	h	$\left(\frac{R_2 - R_1}{R_2 - h}\right) h/R_1$	z/z_M
4	150	.924	.930
↓	↓	.828	.842
		.696	.713
		.502	.503
		.202	.215
20	400	.960	.942
↓	↓	.905	.899
		.816	.812
		.666	.667
	½	.332	.319
40	550	.966	.959
↓	↓	.914	.898
		.838	.837
		.697	.694
		.363	.367
4	20	.273	.140
↓	↓	.010	.056
		.006	.021
4	350	.922	.940
↓	↓	.734	.727
		.410	.433
40	20	.033	.036
↓	↓	.011	.035
		.004	.013
4	750	.942	.909
↓	↓	.721	.671
		.397	.373
4	20	.015	.057
↓	↓	.005	.034
		.002	.009
400	1600	.931	.850
↓	↓	.711	.750
		.387	.200



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Pad Effects [redacted]

h	$\left(\frac{R_2-R_1}{R_2-h}\right) h/R_1$	z/z_M
150	.924	.930
↓	.828	.842
	.696	.713
	.502	.503
	.202	.215
400	.960	.942
↓	.905	.899
	.816	.812
	.666	.667
	.332	.319
500	.966	.959
↓	.914	.898
	.838	.837
	.697	.694
	.383	.367
20	.173	.140
↓	.010	.056
	.005	.021
30	.722	.740
↓	.734	.727
	.410	.433
2	.033	.036
↓	.011	.035
	.004	.013
7	.942	.909
↓	.731	.691
	.397	.373
6	.015	.057
↓	.005	.034
	.002	.009
1600	.931	.850
↓	.714	.750
	.387	.200

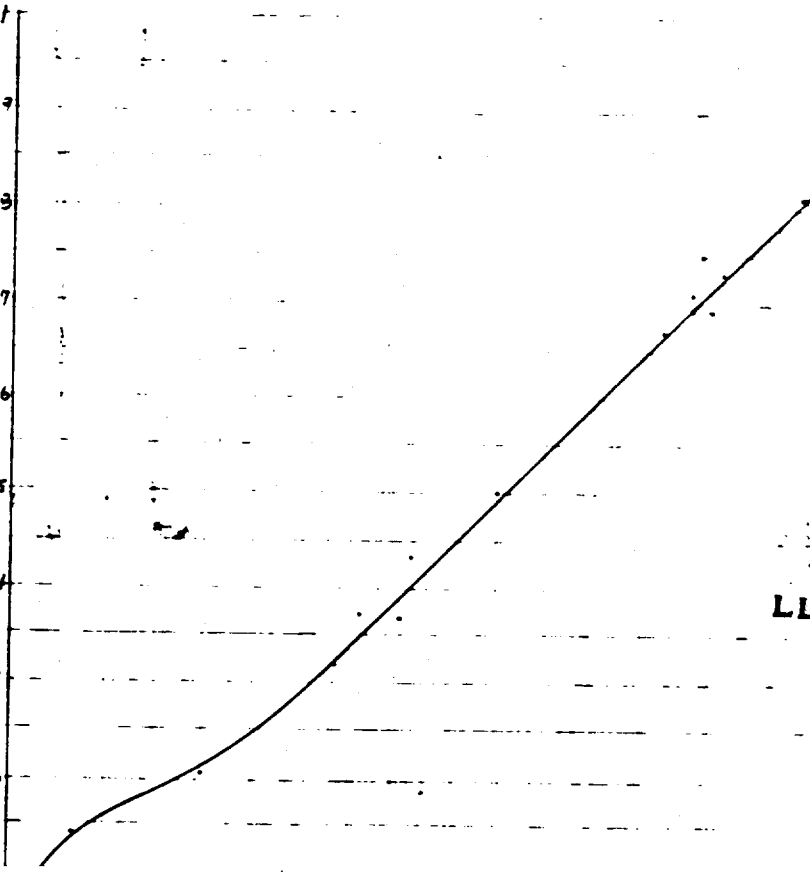
$$\beta = \frac{h}{R_2-h}\left(\frac{R_2-R_1}{R_1}\right) = \frac{h}{R_1}\left(\frac{R_2-R_1}{R_2-h}\right)$$

$$\frac{1}{R_1} = \frac{1-\beta}{R_2} + \frac{\beta}{h}$$

$$R_1 = \frac{h R_2}{h(1-\beta)+\beta R_2}$$

Apple II Pad radius: 600

BEST AVAILABLE COPY

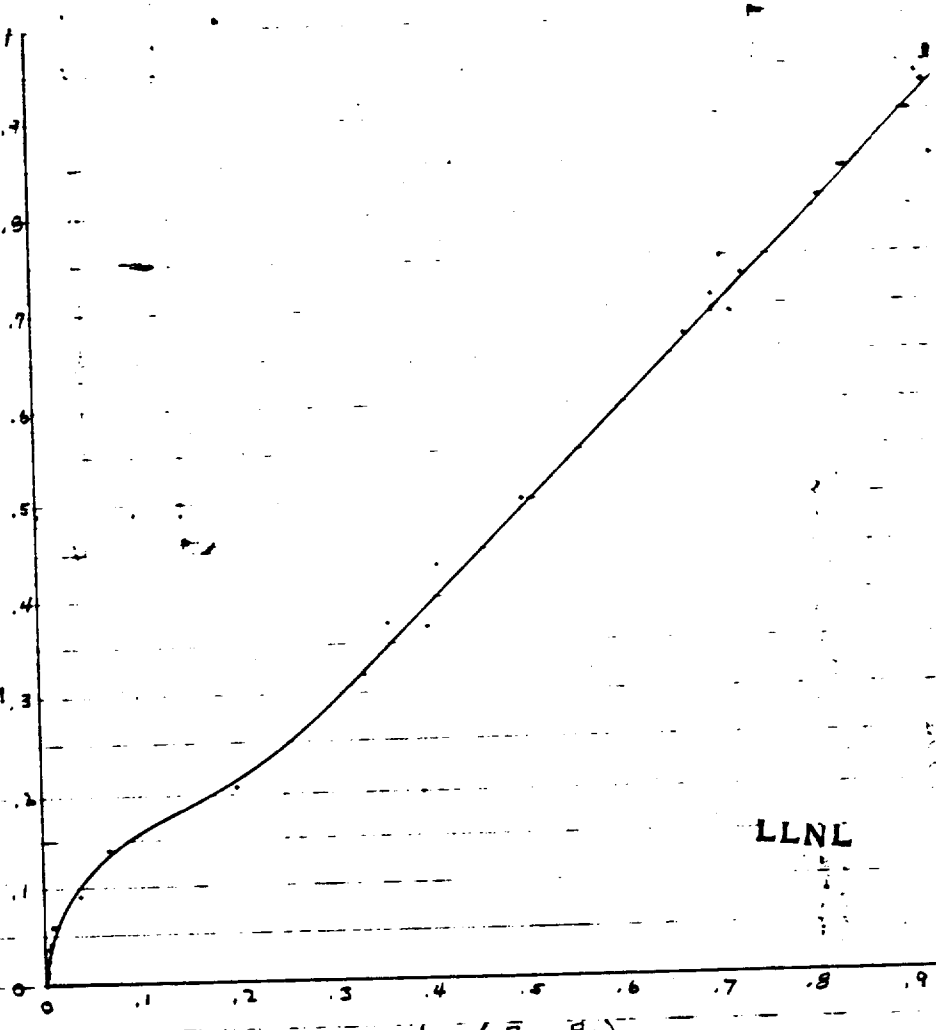


$R_1 = \overline{h(1-\beta)+\beta R_2}$

Apple II Pad radius: 600'

	.502	.503
	.202	.215
400	.960	.942
↓	.905	.899
	.816	.812
	.666	.667
	.332	.319
500	.966	.959
↓	.914	.898
	.838	.837
	.697	.694
	.363	.367
20	.373	.140
↓	.010	.056
	.006	.021
300	.722	.240
↓	.734	.727
	.410	.433
2[illegible]	.033	.036
↓	.011	.035
	.004	.013
750	.942	.909
↓	.721	.691
	.397	.373
2[illegible]	.015	.057
↓	.005	.034
	.002	.009
1600	.931	.850
	.714	.750
	.397	.200

BEST AVAILABLE COPY



LLNL

$\frac{h}{R_2-h}\left(\frac{R_2-R_1}{R_1}\right)=\beta$

46

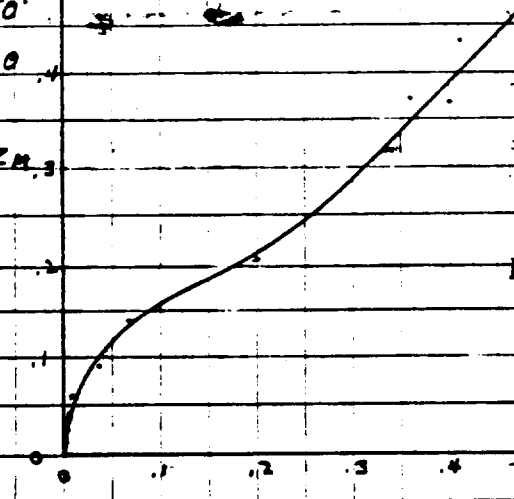
		.696	.713
		.502	.503
		.202	.215
20	400	.960	.942
↓	↓	.905	.899
		.816	.812
		.666	.667
		.332	.319
40	550	.966	.959
↓	↓	.914	.898
		.838	.837
		.697	.694
		.363	.367
4	20	.073	.140
↓	↓	.010	.056
		.008	.021
4	50	.922	.940
↓	↓	.734	.727
		.410	.433
40	20	.033	.086
↓	↓	.011	.035
		.004	.013
40	750	.942	.909
↓	↓	.721	.691
		.397	.373
400	20	.015	.057
↓	↓	.005	.034
		.008	.009
400	1200	.931	.850
↓	↓	.774	.750
		.387	.200

$R_1 = \frac{hR}{hL - pLt}$

Apple II Pc

BEST AVAILABLE C

z/z_m



$\frac{h}{R_2 - h}$

$R = \sqrt{P^2+h^2}$ $P = \sqrt{R^2-h^2}$

BEST AVAILABLE C

h	R	P
100	141	100
↓	510	500
	1010	1000
	224	200
	2000	2000
200	224	100
↓	283	200
	538	500
	1020	1000
	2010	2000
	5000	5000
300	316	100
↓	360	200
	583	500
	1043	1000
	2020	2000
	5010	5000
	10,000	10,000
400	412	100
↓	447	200
	640	500
	1077	1000
	2040	2000
	5010	5000
	10,000	10,000
500	510	100
↓	538	200
	707	500
	1118	1000
	2060	2000
	5020	5000
	10,000	10,000
600	608	100
↓	632	200
	781	500
	1166	1000
	2086	2000

h	R	P
700	707	100
↓	728	200
	860	500
	1240	1000
800	806	
↓	825	
	943	5
	1280	1
	2155	2
	5060	5
	10,030	1
900	905	
↓	922	
	1030	5
	1345	1
	2194	
	5080	
	10,040	
1000	1004	
↓	1020	
	1118	
	1414	
	2235	
	5100	
	10,040	
1200	120	
↓	12	
	5110	5000
	10,062	10,000
1500	1503	100
↓	1513	200

$P = \sqrt{R^2 - h^2}$

P	h	R	P
100	700	707	100
500	↓	728	200
1000		860	500
200		1240	1000
2000			
100			
200			
500	800	806	
1000	↓	825	
2000		943	5
5000		1280	1
100		2155	2
200		5060	5
500		10,030	1
1000	900	905	
2000	↓	922	
5000		1030	5
10,000		1345	1
100		2194	
200		5080	5
500		10,040	1
1000	1000	1004	
2000	↓	1020	
5000		1118	
10,000		1414	
100		2235	
200		5100	
500		10,040	
1000	1200	12	
2000	↓	12	
5000			
10,000			
100			
200			
500		10,060	10,000
1000	1500	1503	100
2000	↓	1513	200
5000		1580	500
10,000		1802	1000

[redacted]

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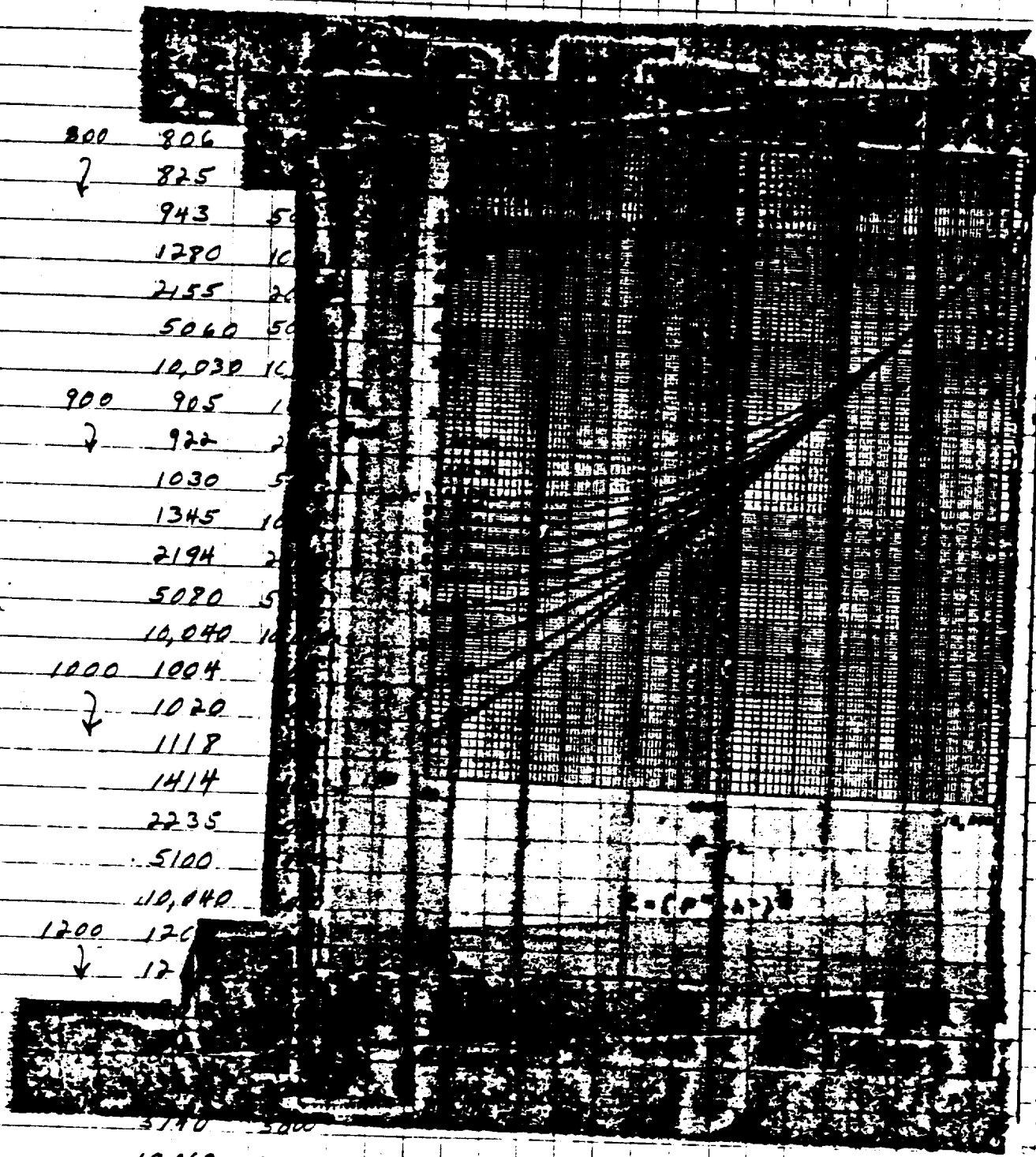

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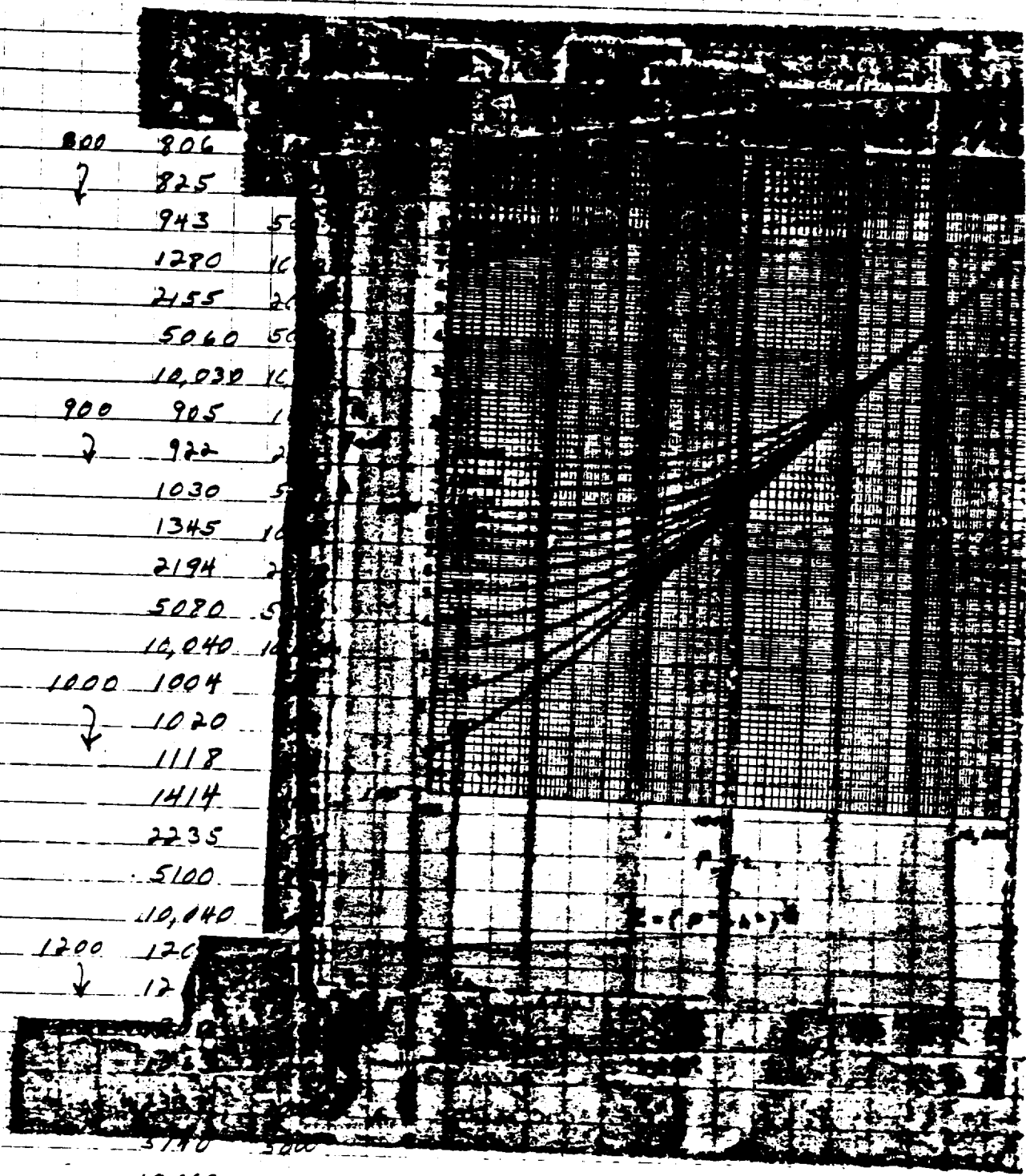
	510	500
	1010	1000
	224	200
	2000	2000
200	224	100
	283	200
	538	500
	1020	1000
	2010	2000
	5000	5000
300	316	100
	360	200
	583	500
	1043	1000
	2020	2000
	5010	5000
	10,000	10,000
400	412	100
	447	200
	640	500
	1077	1000
	2040	2000
	5010	5000
	10,000	10,000
500	510	100
	538	200
	707	500
	1118	1000
	2060	2000
	5020	5000
	10,600	10,000
600	608	100
	632	200
	781	500
	1166	1000
	2086	2000
	5040	5000
	10,020	10,000

	728	200
	860	500
	1240	1000
800	806	
	825	
	943	5
	1280	1
	2455	2
	5060	5
	10,030	1
900	905	1
	922	2
	1030	5
	1345	1
	2194	2
	5080	5
	10,040	1
1000	1004	
	1020	
	1118	
	1414	
	2235	
	5100	
	10,040	
1200	120	
	12	
	3140	500
	10,068	10,000
1500	1503	100
	1513	200
	1580	500
	1802	1000
	2500	2000
	5220	5000
	10,120	10,000

BEST AVAILABLE COPY

10	1000		860 500
24	200		1240 1000
00	2000		
24	100		
83	200		
38	500	800	806
820	1000	↓	825
010	2000		943 5
0004	5000		1280 1
116	100		2455 2
160	200		5060 5
783	500		10,030 1
243	1000	900	905
020	2000	↓	922
5010	5000		1030 5
0,000	10,000		1345 1
412	100		2194
447	200		5080 5
640	500		10,040 1
1077	1000	1000	1004
2040	2000	↓	1020
5010	5000		1118
10,000	10,000		1414
510	100		2235
538	200		5100
707	500		10,040
1118	1000	1200	120
2060	2000	↓	12
5020	5000		
10,000	10,000		
608	100		
632	200		
781	500		10,060 10,000
1166	1000	1500	1503 100
2086	2000	↓	1513 200
5040	5000		1580 500
10,020	10,000		1802 1000
			2500 2000
			5220 5000
			10,120 10,000



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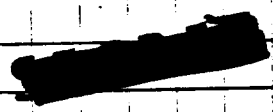

54

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Relation between magnitude + energy of earthquakes

Markus Båth, Trans Am. Geophys. Un. 36 No 5, Oct. 1

Earthquake magnitude depends only upon the to
the seismic waves. (Mag. M as defined by Richter +

$$\log E = (7.2 \pm 0.5) + (2.0 \pm 0.07) M +$$

E = total energy in ergs
M = Richter magnitude.
x = ratio of total energy to energy
x taken as 2 for shallow foci

This is an empirical relationship: depends
wave forms, and may not apply precisely to "sh

If shots cause waves of higher frequency, the ea
in the earth may be considerably higher than th
generated waves. =

$$M = A + \log(w/t) + K(M-7)$$: Gutenber

A = energy parameter, a function of wave type
Values listed by Gutenberg, 1945.

w = observed ground amplitude, microns
t = wave period, seconds.

K = factor to correct for slight depend

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n between magnitude & energy of earthquakes [redacted]

us Båth, Trans Am. Geophys. Un. 36 No 5, Oct. 1955

arthquake magnitude depends only upon the total energy of smic waves. (Mag. M as defined by Richter & Gutenberg)

$$\log E = (7.2 \pm 0.5) + (2.0 \pm 0.07) M + \log \chi/2$$

E = total energy in ergs
M = Richter magnitude.
χ = ratio of total energy to energy of Rayleigh waves.
χ taken as 2 for shallow foci

is is an empercical relationship: depends upon seismic ms, and may not apply precisely to "shot" earthquakes.

ts cause waves of higher frequency, the rate of absorption earth may be considerably higher than that for earthquake ed waves.

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$$M = A + \log (w/t) + K(M-7)$$: Gutenberg, 1945

A = energy parameter, a function of wave type & distance. Values listed by Gutenberg, 1945.

w = observed ground amplitude, microns
t = wave period, seconds

K = factor to correct for slight dependence of A on M.

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57

LC035 0581

Earthquake magnitude depends only upon the the seismic waves. (Mag. M as defined by Richter

$$\log E = (7.2 \pm 0.5) + (2.0 \pm 0.07) M$$

E = total energy in ergs
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If shots cause waves of higher frequency, the
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A = energy parameter, a function of wave
Values listed by Gutenberg, 1945.

w = observed ground amplitude, micrs
t = wave period, seconds

K = factor to correct for slight d

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LLN
SOT

Earthquake magnitude depends only upon the total energy of seismic waves. (Mag. M as defined by Richter + Gutenberg)

$$\log E = (7.2 \pm 0.5) + (2.0 \pm 0.07) M + \log \chi/2$$

E = total energy in ergs
M = Richter magnitude.
χ = ratio of total energy to energy of Rayleigh waves.
χ taken as 2 for shallow foci

This is an empirical relationship: depends upon seismic forms, and may not apply precisely to "shot" earthquakes.

shots cause waves of higher frequency, the rate of absorption the earth may be considerably higher than that for earthquake nerated waves.

$$M = A + \log (w/t) + K(M-7) \quad : \text{Gutenberg, 1945}$$

A = energy parameter, a function of wave type + distance.
" Values listed by Gutenberg, 1945.

w = observed ground amplitude, microns
t = wave period, seconds.

K = factor to correct for slight dependence of A on M.

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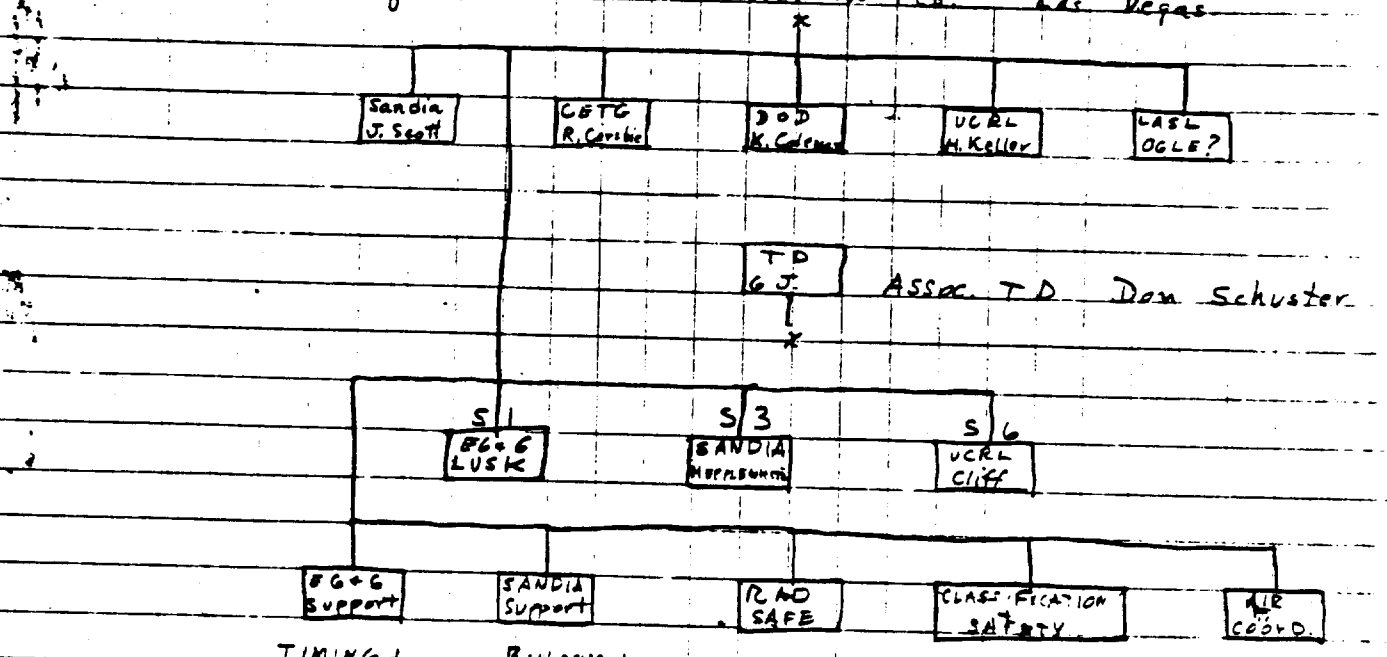
22

Pilgrim meeting 0900 Mon, Oct. 22, 1951

Organization

Highlights here – to Merc. in Feb. – Las Vegas



TIMING + FIRING

BALLOONS + Arming

Operation should start ~ May 1 No socner.

LASL Area 4 500' tower 10-15 KT

1 500' tower 10-15 KT

3 Three + towers, 300', 2-5 KT

7 Balloon system + 1 tower

300' towers out if balloons work.

Total: 7-8 shots.

BEST AVAILABLE COPY

Underground hole existence not classified. Hole

Continuous operation probably out. Starbird o

Pilgrim split between spring + fall – essentia. continuous.

Tower orders 1-500' } LTAN

2-300' }

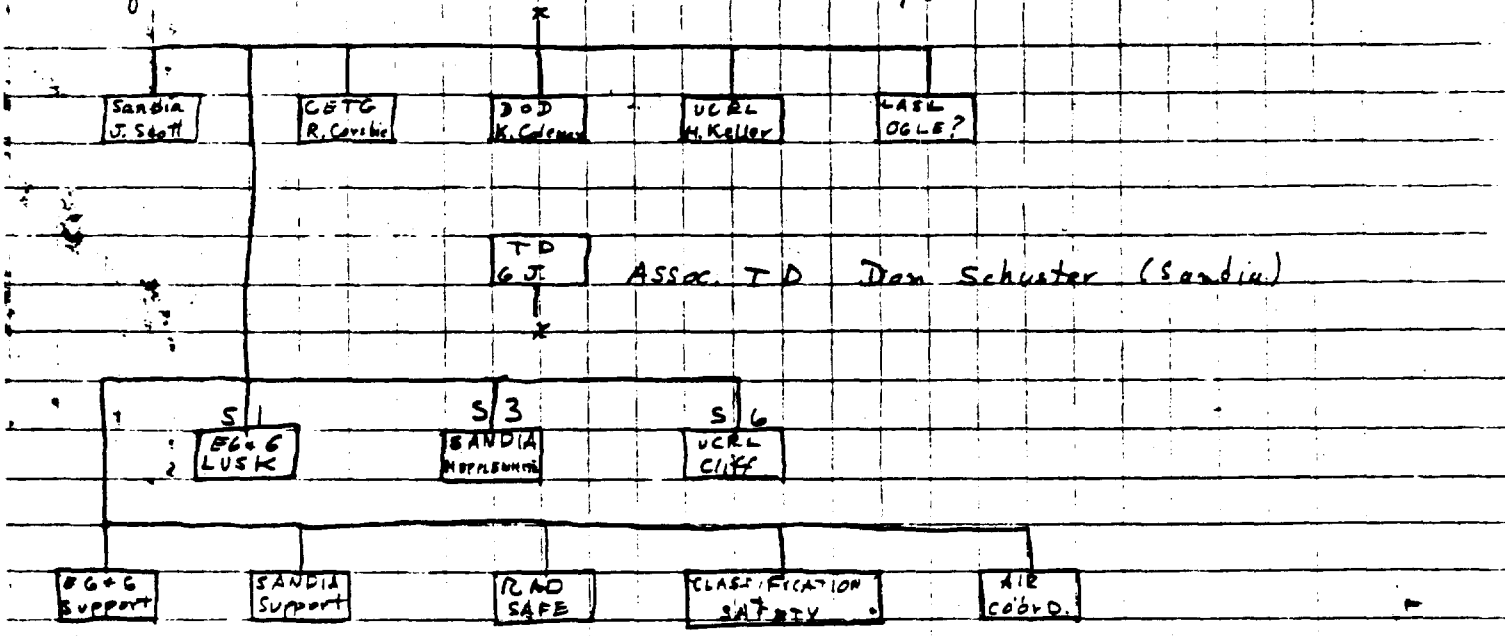
6-500' } a March?

LLNL
60

ion meeting 0900 Mon, Oct. 22, 1951 [redacted]

Organization

Hqtrs here – to Merc. in Feb. – Las Vegas



TIMING + FIRING · BALLONS + Arming

Operation should start ~ May 1 No socner.

ASL · Area 4 500' tower 10-15 kT
1 500' tower 10-15 kT
3 Three+ towers, 300', 2-5 KT
7 Balloon system + 1 tower
300' towers out if Balloons work.

al: 7-8 shots.

BEST AVAILABLE COPY

Underground hole existence not classified. Hole to be in May 1.

Continuous operation probably out. Star bird against.

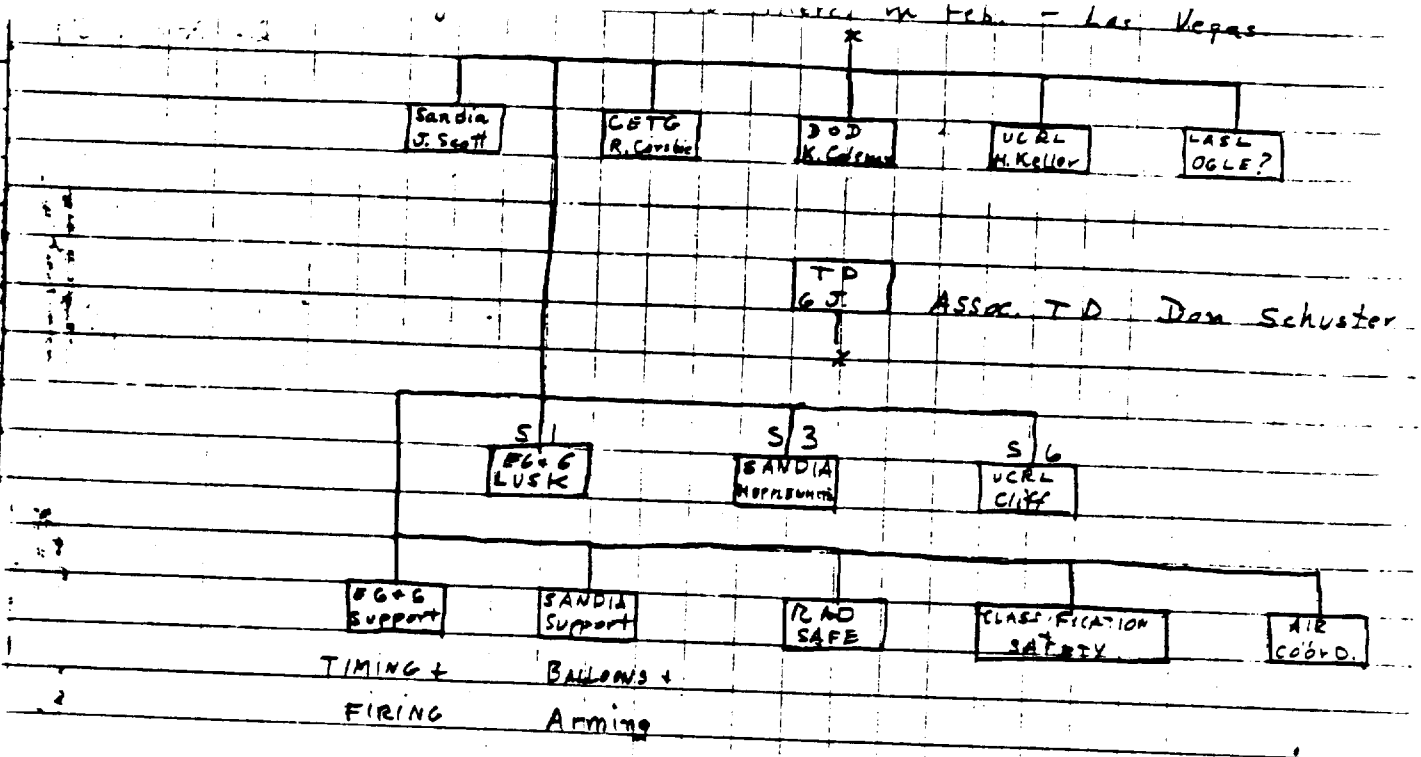
Pilgrim split between spring + fall – essentially could be continuous.

Tower orders 1-500' } 1 JAN
2-300' }

6-500' } a March?
7-?

LLNL

[redacted] 61



Operation should start ~ May 1 No saower.

LASL Area 4 500' tower 10-15 kT
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3 Three t towers, 300', 2-5 KT
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300' towers out if balloons work.

Total: 7-8 shots.

BEST AVAILABLE COPY

Underground hole existence not classified. Hole

Continuous operation probably out. Starbird

Pilgrim split between spring & fall - essentially continuous.

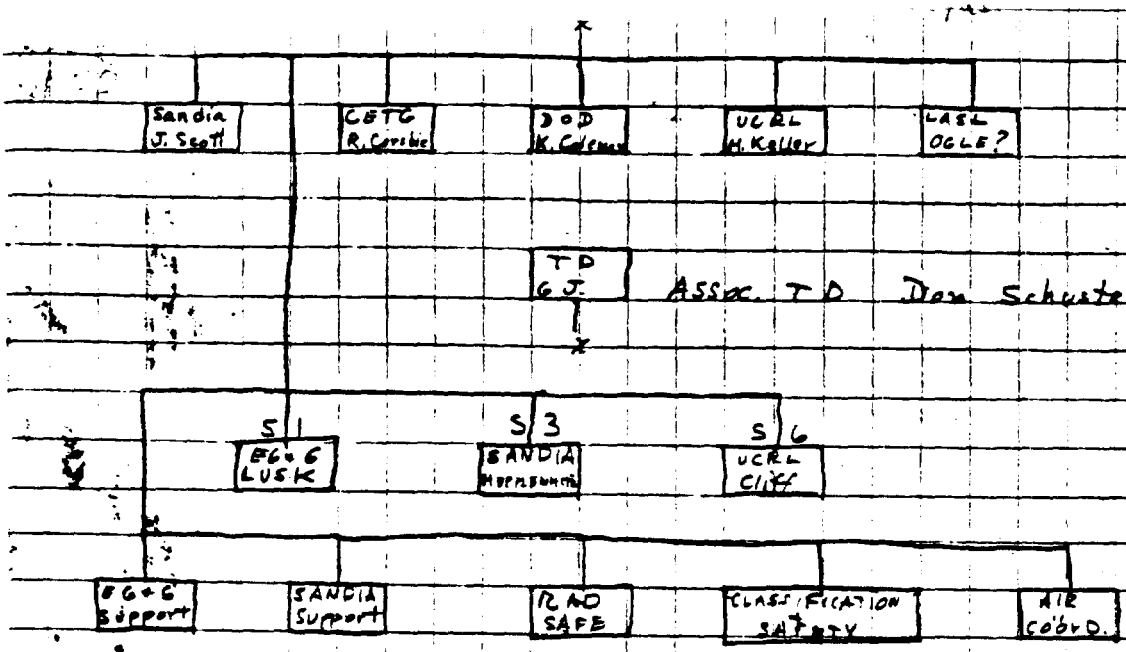
Tower orders 1-500' } LLNL
2-300' }

6-500' } ~ March? LLNL
2-300' }

3-500' ~ March? or Jan?

Duration not less than 45 days.

DOE 35 [illegible]



TIMING + FIRING — BALLONS + Arming

Operation should start ~ May 1 No saower.

LASL Area 4 500' tower 10-15 KT
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3 Three+ towers, 300', 2-5 KT
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BEST AVAILABLE COPY

Underground hole existence not classified. Hole to be in May 1.

Continuous operation probably act. Starbird against.

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Tower orders 1-500' } 1 JAN
2-300' }

6-500' } ~ March?
2-300' }

3-500' ~ March? or Jan.?

Erection not less than 45 days.

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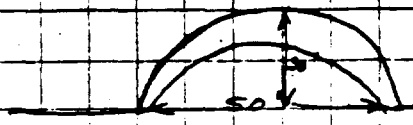
[redacted]

63

CETG

3 Concrete Domes



In 75 – 10 PSI

Thickness 6" to 1 foot (at top)

Family shelters

Underground garage 80x90'
2 Japanese dwellings.
Mostly in Frenchman's Flat – DELETED Another shot 5

DOD

3 Concrete Domes – no thickness variation.

Balls on catenary cable.

1200 pigs. Treating mass casualty experiment.
Uniform.
Around FF ground zero from 10 PSI out.
Complete field hospital. Beds!

Pigs use 30,600 gal/day – ½ peak Mercury
150-200 keepers

BEST AVAILABLE COPY

Pigs 60-80 # Out of season!
In pens 8-20 pigs per pen.

Pigs stored by well 5B in Frenchman's

Sandia

Totem poles – Free standing

8 Balloon rigs ordered. (Permits 8 balloon sh

LLNL
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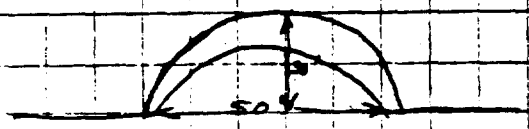
CETG

[redacted]

Concrete Domes



In 7.5 – 10 PSI range.

Thickness 6" to 1 foot (at top)

Family shelters

Underground garage 80×90'

- Japanese dwellings.

Ly in "Frenchman's Flat" - DELETED Another shot 500' tower.

DOD

3 Concrete Domes - no thickness variation.

Balls on catenary cable.

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Uniforms.
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BEST AVAILABLE COPY

Pigs 60-80 # Out of season!
In pens 8-20 pigs per pen.

Pigs stored by well 5B in Frenchman's

Sandia.

LLNL

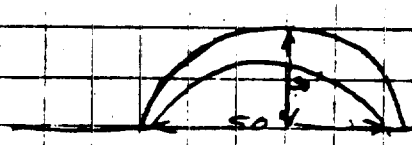
tem poles - Free standing

Balloon rigs ordered. (Permits 8 balloon shots)

065

[redacted]

t. [illegible] completed [illegible] Division



In 75 - 16

thickness 6" + 1 foot (at top)

BEST AVAILABLE COPY

Family shelters

Underground garage 80×90'

2 Japanese dwellings.

Mostly in Frenchman's Flat - DELETED Another she

DOD

3 Concrete Domes - no thickness variatio

Balls on catenary cable.

1200 pigs. Testing mass casualty experimen
Uniform.

Around FF ground zero from 10PSI out.

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150-200 keepers

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In pens 8-20 pigs per pen.

Pigs stored by well 5B in Frenchma

Sandia.

Totem poles - Free standing

8 Balloon rigs ordered. (Permits 8 balloon

LLNL

Area B: hope to have completed before Pilgrim.

Alb

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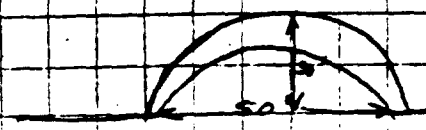
DELETED

Practice lead coffin



In 75 – 10 PSI range.

Thickness 6" + 1 foot (at top)

Family shelters

Underground garage 80×90'

2 Japanese dwellings.

Frenchman's Flat – DELETE. Another shot 500' tower.

DOD

3 Concrete Domes – no thickness variation.

Balls on catenary cable.

1200 pigs. Treating mass casualty experiment

Uniforms

Around FF ground zero from 10 PSI out.

Complete field hospital. Beds!

Pigs use 30,000 gal/day – ½ peak Mercury consumption.

150-200 keepers

BEST AVAILABLE COPY

Pigs 60-80 # Out of season!

In pens 8-20 pigs per pen.

Pigs moved by well 5B in Frenchman's

Sandia.

item poles – Free standing

Balloon rigs ordered. (Permits 8 – balloon shots)

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[redacted]

hope to have completed before Pilgrim.

09

67

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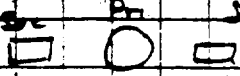
SECRET



4 hot spot pipes (Keller)
2 " " " "
15 pipes for various uses in two tiers for pipe end-signal reception.

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Keller has no gear in cab for

DELETED

Will study time interval + spectral distribution fireball.

Total fallout for Pilgrim as of 22 Oct, 1956.

			D	M
(See pg 8)	Spring	UCRL	1525	704
		LASL:		
		15kt, 500' tower 75T/100'	96	202
		" " " "	96	202
		5kt, 300' " 35T/100'	78	63
		" " " "	78	63
		" " " "	79	63
		" " " "	78	63
			504	656
		DOD:		
		40kt, 500' 40T/'	720	120
	Fall	UCRL	954	414
		Grand totals:	3633	1894

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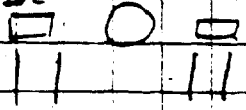

4 hot spot pipes (Keller)
2 " " " "
15 pipes for various uses on DELETED tower has two tiers for pipe and signal reception.

Keller has no gear in cab for DELETED
will study time interval & spectral distributions in early fireball.

Total fallout for Pilgrim as of 22 Oct, 1956.

		D	M	T
Spring	UCRL	1525	704	2229
	LASL:			
	15kt, 500' tower 75T/100'	96	202	298
	" " " "	96	202	298
	5kt, 300' " 35T/100'	78	63	141
	" " " "	78	63	141
	" " " "	79	63	141
	" " " "	78	63	141
		504	656	1160
	DOD:			
	40kt, 500' 40T/'	720	120	840
all	UCRL	954	414	1368
	Grand totals:	3633	1894	5597

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+ not for pipes (Kelley)

2 " " " "

15 pipes for various uses in two tiers for pipe end-signal reception.

DELETED

Keller has no gear in cab for DELETED

Will study time interval & spectral distribution fireball.

Total fallout for Pilgrim as of 22 Oct, 1956.

			D	M
(See pg 8) Spring	UCRL		1525	704
	LASL:			
	15kt, 500' tower, 75T/100'		96	202
	" " " "		96	202
	5kt, 300' " 35T/100'		78	63
	" " " "		78	63
	" " " "		79	63
	" " " "		78	63
	—		504	656
	DOD:			
	40kt, 500' 40T/'		720	120
Fall	UCRL		954	414
	Grand totals:		3633	1894

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SECRET

4 hot spot pipes (Keller)
2 " " " "
15 pipes for various uses on DELETED has
two tiers for pipe end-signal reception.

Keller has no gear in cab for DELETED
I will study time-interval & spectral distributions in early fireball.

Total fallout for Pilgrim as of 22 Oct, 1956.

		D	M	T
Spring	UCRL	1525	704	2229
	LASL:			
	15kt, 500' tower, 75T/100'	96	202	298
	" " " "	96	202	298
	5kt, 300' " 35T/100'	78	63	141
	" " " "	78	63	141
	" " " "	79	63	141
	" " " "	78	63	141
		504	656	1160
	DOD:			
	40kt, 500' 40T/'	720	120	840
Fall	UCRL	954	414	1367
	Grand totals:	3633	1894	5597

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[redacted]

YIELD vs HEIGHT for 200, 600, and 1000 Mc FALLOUT

#454

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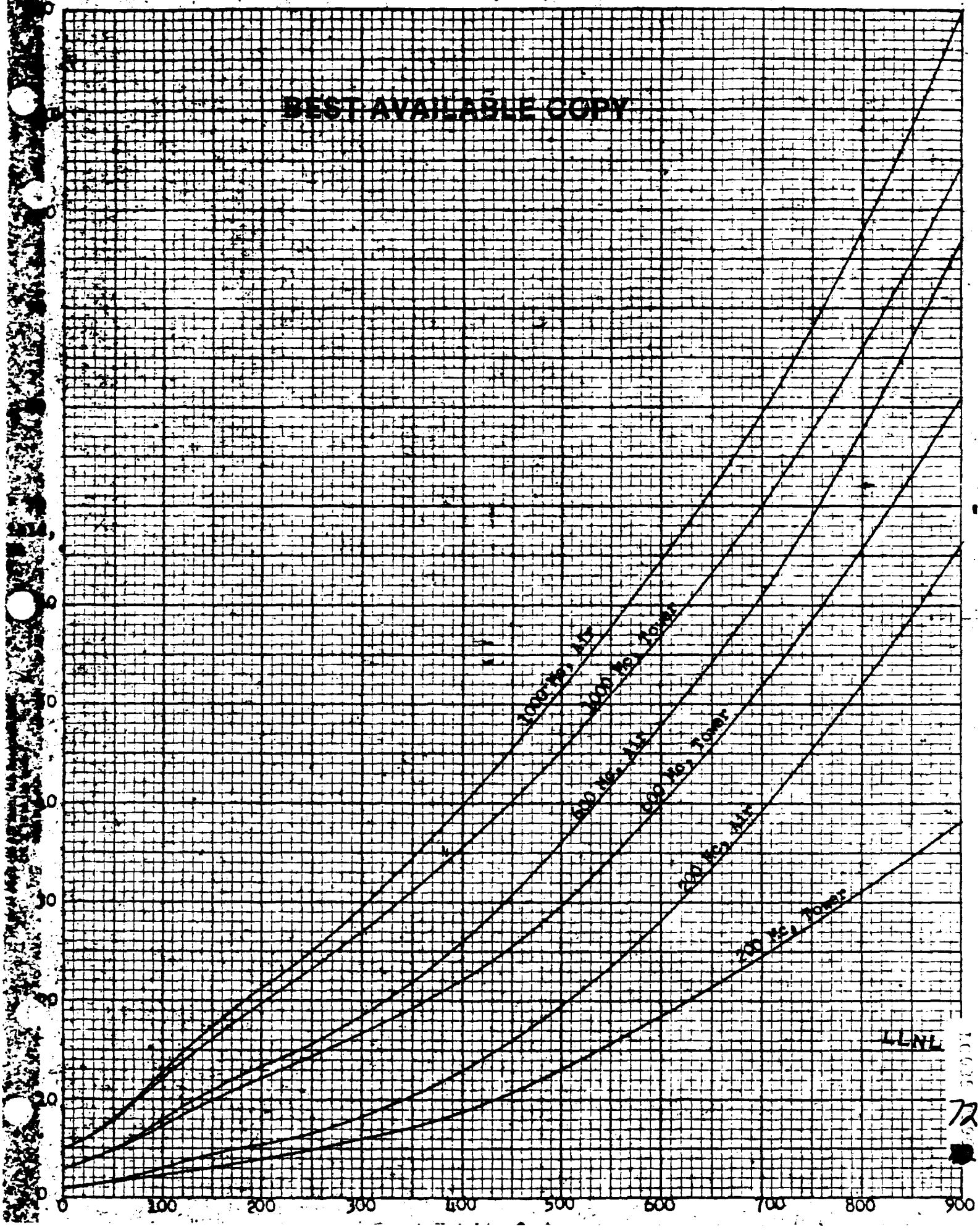

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[redacted]

Burst height vs yield for $E_T = 1000$, with and without Tower at 50 tons/in²

No tower h	W	h	F_{max}	F_D	W	W maximum sec
0	4.8	0	0	1000	4.8	✓
50	8.0	50	75	985	7.7	✓
100	12.8	100	30	970	12.3	✓
200	21.3	200	60	940	19.8	✓
300	29.6	300	90	910	27.0	✓
400	38.0	400	120	880	34.0	✓
500	51.5	500	150	850	45.5	✓
611	65.0	600	180	820	57.0	✓
700	80.0	700	210	790	70.0	✓
800	97.0	800	240	760	86.0	✓
900	121.0	900	~~270~~	~~730~~	~~103.0~~	105.0
1000	140.0	1000	~~300~~	~~700~~	~~122.0~~	
1200	220.0	1200	~~360~~	~~640~~	~~194.0~~	
1500	365.0	1500	~~450~~	~~550~~	~~320.0~~	
2000	700.0	2000	~~600~~	~~400~~	~~600.0~~	

For $E_T = 200$

No Tower h	W	h	F_m	F_D	W
0	1.0	0	0	200	1.0
50	1.7	50	15	185	1.5
100	2.8	100	30	170	2.4
200	5.2	200	60	140	4.0
300	8.5	300	~~80~~	~~110~~	6.0
400	13.1	400	~~120~~	~~80~~	~~8.6~~
500	20.0	500	~~150~~	50	~~12.3~~
600	27.0	600	~~180~~	~~20~~	~~14.8~~
700	41.0	667 ~~700~~	~~200~~	~~0~~	~~14.0~~
800	51.0	~~800~~			
900	67.0	~~900~~			
1000	83.0	~~1000~~			
1200	152.0	1200			
1500	280.0	1500			
2000	520.0	2000			

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[redacted]

Weight vs yield for F_T = 1000, with & without Towers at 50 tons/100'

W per	h	F_{max} (0.6T)	F_D	W	W maximized
4.8	0	0	1000	4.8	✓
8.0	50	75	985	7.7	✓
12.8	100	30	970	12.3	✓
23.3	200	60	940	19.8	✓
29.6	300	90	910	27.0	✓
38.0	400	120	880	34.0	✓
51.5	500	150	850	45.5	✓
65.0	600	180	820	57.0	✓
80.0	700	210	790	70.0	✓
97.0	800	240	760	86.0	✓
121.0	900	~~270~~	~~730~~	~~103.0~~	105.0
140.0	1000	~~300~~	~~700~~	~~122.0~~	
220.0	1200	~~360~~	~~640~~	~~154.0~~	
365.0	1500	~~450~~	~~550~~	~~320.0~~	
700.0	2000	~~600~~	~~400~~	~~600.0~~	

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For F_T = 200

Tower W	h	F_s	F_D	W	W maximized
1.0	0	0	200	1.0	✓
1.7	50	15	185	1.5	✓
2.8	100	30	170	2.4	✓
5.2	200	60	140	4.0	✓
8.5	300	~~80~~	~~110~~	~~6.0~~	
13.1	400	~~120~~	~~80~~	~~8.6~~	8.9
20.0	500	~~150~~	~~50~~	~~12.3~~	13.4
27.0	600	~~180~~	~~20~~	~~14.8~~	18.5
41.0	667	~~200~~	~~0~~	~~14.0~~	25.3
51.0	700				31.0
67.0	800				38.3
83.0	900				47.6
152.0	1000				
280.0	1200				
520.0	1500				
	2000				

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0	4.8	0	0	1000	4.8	✓
50	8.0	50	75	985	7.7	✓
100	12.8	100	30	970	12.3	✓
200	21.3	200	60	940	19.8	✓
300	29.6	300	90	910	27.0	✓
400	38.0	400	120	880	34.0	✓
500	51.5	500	150	850	45.5	✓
611	65.0	600	180	820	57.0	✓
700	80.0	700	210	790	70.0	✓
800	97.0	800	240	760	86.0	✓
900	121.0	900	~~270~~	~~730~~	~~103.0~~	105.0
1000	140.0	1000	~~300~~	~~700~~	~~122.0~~	
1200	220.0	1200	~~360~~	~~640~~	~~174.0~~	
1500	365.0	1500	~~450~~	~~550~~	~~320.0~~	
2000	700.0	2000	~~600~~	~~400~~	~~600.0~~	

For F_T = 200

No Tower		Tower			
h	w	h	F_h	F_D	w
0	1.0	0	0	200	1.0
50	1.7	50	15	185	1.5
100	2.8	100	30	170	2.4
200	5.2	200	60	140	4.0
300	8.5	300	~~80~~	~~114~~	~~6.0~~
400	13.1	400	~~120~~	~~80~~	~~8.6~~
500	20.0	500	~~150~~	~~50~~	~~12.3~~
600	27.0	600	~~180~~	~~20~~	~~14.8~~
700	41.0	667 700	~~200~~	~~0~~	~~14.6~~
800	51.0	~~800~~			
900	67.0	900			
1000	83.0	1000			
1200	152.0	1200			
1500	280.0	1500			
2000	520.0	2000			

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4.8	0	0	1000	4.8	✓	
8.0	50	75	985	7.7	✓	
12.8	100	30	970	12.3	✓	
21.3	200	60	940	19.8	✓	
29.6	300	90	910	27.0	✓	
38.0	400	120	880	34.0	✓	
51.5	500	150	850	45.5	✓	
65.0	600	180	820	57.0	✓	
80.0	700	210	790	70.0	✓	
97.0	800	240	760	86.0	✓	
121.0	900	~~270~~	~~730~~	103.0	105.0	
140.0	1000	~~300~~	~~700~~	~~122.0~~		
220.0	1200	~~360~~	~~640~~	~~194.0~~		
365.0	1500	~~450~~	~~550~~	~~320.0~~		
700.0	2000	~~600~~	~~400~~	~~600.0~~		

For F_T = 200

No Tower — Tower

w	h	F_A	F_D	w	w Maximized
1.0	0	0	200	1.0	✓
1.7	50	15	185	1.5	✓
2.8	100	30	170	2.4	✓
5.2	200	60	140	4.0	✓
8.5	300	~~90~~	~~110~~	~~6.9~~	✓
13.1	400	~~120~~	~~80~~	~~8.6~~	8.9
20.0	500	~~150~~	50	~~12.3~~	13.4
27.0	600	~~180~~	~~20~~	~~14.8~~	18.5
41.0	667 / 700	~~200~~	0	~~14.0~~	25.3
51.0	800				31.0
67.0	900				38.3
83.0	1000				47.6
152.0	1200				
280.0	1500				
520.0	2000				

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NTS Board Meeting, Las Vegas, 26 Oct, 195[redacted]

ectives, Sub-Committee on Fallout:

1. How serious is the predicted fallout for Pilgrim?
2. How can the hazard be reduced?
3. Should the hazard be reduced?
4. What should NTS testing criteria be?
5. Organization, operation, & functions of a FOPU.

mbership: Shelton
Nagler
Machta
Merritt
Cowan
Stopinski
Sherman
Israel
Kennedy
Gocke

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Special assignments:

Pilgrim predictions, total Mc: UCRL
Methods of computing: USWB, SANDIA
Correlation of delay with hazard & total Mc: LASL, LLNL

he sub-committee will meet for two days prior to next board meeting at Albuquerque.

Pilgrim, LASL

Spring:	1.8 kt	20,000'
	11 kt	500'
	11 kt	500'
	2 kt	Balloon
	11-35 kt	500'
	~ 3@5 kt	300' tentative
Fall:	8 kt	
	2 kt	

[redacted]

NTS Board Meeting, Las Vegas, 26 Oct, 1956

Objectives, Sub-Committee on Fallout:

1. How serious is the predicted fallout for Pilgrim?
2. How can the hazard be reduced?
3. Should the hazard be reduced?
4. What should NTS testing criteria be?
5. Organization, operation, & functions of a FOI

Membership: Shelton
Nagler
Machta
Merritt
Cowan
Stopinski
Sherman
Israel
Kennedy
Goeke

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Special assignments:

Pilgrim predictions, total Mc: UCRL
Methods of computing: USWB, SANDIA
Correllation of delay with hazard onset

The sub-committee will meet for two days the next board meeting at Albuquerque.

Pilgrim, LASL

Spring:	1.8 kt	20,000'
	11 kt	500'
	11 kt	500'
	2 kt	Balloon
	11-35 kt	500'
	~ 3@5 kt	300' tentative
Fall:	8 kt	
	2 kt	

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1. How serious is the predicted fallout for Pilgrim?
2. How can the hazard be reduced?
3. Should the hazard be reduced?
4. What should NTS testing criteria be?
5. Organization, operation, & functions of a FO

Membership: Shelton
Nagler
Machta
Merritt
Cowan
Stopinski
Sherman
Israel
Kennedy
Gocke

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Special assignments:

Pilgrim predictions, total Mc: UCRL
Methods of computing: USWB, SANDIA
Correllation of delay with hazard contour

The sub-committee will meet for two days the next board meeting at Albuquerque.

Pilgrim, LASL

Spring:	1.8 kt	20,000'
	11 kt	500'
	11 kt	500'
	2 kt	Balloon
	11-35 kt	500'
	~ 3@5 kt	300' tentative.
Fall:	8 kt	
	2 kt	
	+2 others	
Fall UCRL:	40 kt	-700'
	30 kt	-500'
	~ 3@10 kt	300'

LLNL

[redacted]

1. How serious is the predicted fallout for Pilgrim?
2. How can the hazard be reduced?
3. Should the hazard be reduced?
4. What should NTS testing criteria be?
5. Organization, operation, & functions of a FOPU

mbership: Shelton
Nagler
Machta
Merritt
Cowan
Stopinski
Sherman
Israel
Kennedy
Gocke

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pecial assignments:

Pilgrim predictions, total Mc: UCRL
Methods of computing: USWB, SANDIA
Correllation of delay with hazard on total Mc: LASL, UCE

e sub-committee will meet for two days prior to next board meeting at Albuquerque.

Pilgrim, LASL

Spring; 1.8 kt 20,000'
11 kt 500'
11 kt 500'
2 kt Balloon
11-35 kt 500'
~ 3@5 kt 300' tentative

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Fall; 8 kt
2 kt
+2 others

UCRL: 10 kt -700'
30 kt -500'
~ 3@10 kt 300'

080

[redacted] [redacted]

CUMULATIVE EFFECTIVE BIOLOGICAL DOSE IN MILLIROENTGENS FOR ALL NEVADA TESTS THROUGH OCTOBER 1956

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	Population	E.B.D. mr
Acoma, Nevada	(10)	3000
Alamo, Nevada	400	1300
Alton, Utah	154	800
Anderson Junction, Utah	17	1200
Apex, Nevada	(50)	100
Ash Meadows, Nevada	(10)	50
Ash Springs, Nevada	(5)	600
Austin, Nevada	520	50
Baker, Nevada	60	800
Barclay, Nevada	(10)	2000
Bear Valley Jct., Utah	(10)	400
Beatty, Nevada	345	50
Beaver, Utah	1685	250
Beaver Dam, Arizona	(5)	2000
Beryl, Utah	(15)	500
Beryl Junction, Utah	(25)	1000
Boulder City, Nevada	3903	80
Buckhorn Ranch, Nevada	(5)	900
Bunkerville, Nevada	200	4300
Cactus Spring, Nevada	25	30
Caliente, Nevada	970	700
Caro, Nevada	32	3600
Cedar City, Utah	6106	400
Charleston Lodge, Nevada	(10)	150

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[redacted]

[redacted]

#~7B

[redacted]

Clarks Station, Nevada	(5)	800
Crestline, Nevada	(25)	700
Crystal, Nevada	7	4000
Crystal Springs, Nevada	(0)	1000
Currant, Nevada	(5)	500
Desert Rock, Nevada	--	50
Dry Lake, Nevada	(10)	1000
Duckwater, Nevada	(100)	800
East Ely, Nevada	1200	600
Eden Creek Ranch, Nevada	(5)	700
Elgin, Nevada	(25)	3500
Ely, Nevada	3558	600
Enterprise, Utah	790	700
Eureka, Nevada	575	200
Fallini Ranch, Nevada	(15)	800
Furnance Creek, California	(50)	0
Garrison, Utah	(25)	700
Glendale, Nevada	50	700
Glendale, Utah	226	1200
Goldfield, Nevada	336	0
Grocm, Nevada	(0)	2000
Gunlock, Utah	127	2600
Hamilton Fort, Utah	26	600
Henderson, Nevada	3643	20
Hiko, Nevada	55	1000

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[redacted]

[redacted]

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[redacted]

Hoover, Dam, Nevada	(30)	50
Hurricane, Utah	1271	4200
Indian Springs, Nevada	(500)	50
Johnnie, Nevada	(5)	0
Kanab, Utah	1287	1600
Kanarraville, Utah	263	1200
Kimberley, Nevada	507	500
Kingman, Arizona	(5000)	30
Lake Meade Resort, Nevada	(5)	50
Las Vegas, Nevada	50,000	200
Lathrop Wells, Nevada	9	50
Leeds, Utah	215	3000
Lincoln Mine, Nevada	500	4000
Littlefield, Arizona	(25)	1600
Lockes Ranch, Nevada	(5)	1300
Logandale, Nevada	300	400
Long Valley, Utah	(100)	800
Lund, Nevada	200	800
Lund, Utah	75	500
Mercury, Nevada	—	100
Mesquite, Nevada	580	1800
McGill, Nevada	2297	400
Milford, Utah	1673	100
Minersville, Utah	593	200
Moapa, Nevada	22	800

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[redacted]

[redacted]

Modena, Utah	84	500
Mount Carmel, Utah	125	850
Mount Trumbull, Arizona	(5)	160
Nellis AFB, Nevada	(1000)	50
New Castle, Utah	115	600
New Harmony, Utah	126	1200
North Las Vegas, Nevada	(8000)	200
Nyala, Nevada	(5)	1700
Orderville, Utah	371	1500
Overton, Nevada	527	350
Pahrump, Nevada	(100)	200
Panaca, Nevada	500	650
Panguitch, Utah	1501	200
Paragonah, Utah	404	400
Parowan, Utah	1455	400
Peach Springs, Arizona	(150)	0
Pintura, Utah	219	1200
Pioche, Nevada	~~1302~~/392	700
Preston, Nevada	37	700
Reed, Nevada	(0)	4000
Riverside, Nevada	(15)	7800
Rockville, Utah	266	3000
Round Mt., Nevada	300	50
Rox, Nevada	(10)	3000
Ruth, Nevada	1244	500
Saint George, Utah	4562	3000

[redacted]

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[redacted]

[redacted]

Santa Clara, Utah	319	3500
Sharp's (Adaven), Nevada	25	1200
Shivwits, Utah	95	2800
Short Creek, Arizona	(300)	1600
Shoshone, Nevada	(10)	700
Springdale, Nevada	(5)	20
Springdale, Utah	209	2600
Sunnyside, Nevada	25	1200
Toquerville, Utah	219	2000
Tonopah, Nevada	1375	0
Ursine, Nevada	(25)	600
Veyo, Utah	100	2000
Virgin, Utah	147	1500
Warm Springs, Nevada	(5)	500
Warm Springs Ranch, Nevada	(15)	1000
Washington, Utah	435	3000
Whitney, Nevada	(1000)	0
Wolf Hole, Arizona	(5)	1300
Zahe, Utah	25	300

[redacted]

[redacted]

Dunning's proposed four system: (1951-1961), (1961-1971), ...

[redacted]

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single proposed dyke system: (1951-1961), (1961-1971), xx, not sig. 27

[redacted]

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[redacted]

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Pilgrim Mc as of 29 Oct., 1956 [redacted]

			D	N
UCRL: Spring	20 Kt	400' tower (75T/100')	420	180
	20 Kt	400' tower "	420	180
	80 Kt	1500' Balloon	0	1
	30 Kt	500' tower (75 ton/100')	440	225
	0.4 Kt	300' tower (35T/100')	0	21
	0.3 Kt	200' tower "	0	26
	10 Kt	300' tower "	255	63
			1535	704
Fall	40 Kt	700' tower (50T/100')	250	210
	30 Kt	500' tower (75T/100')	440	225
	3 at ~10 Kt	300' tower (35T/100')	3x255	3x63
			1455	624
		Totals:	2990	1328
LASL: Spring	1.8 Kt	20,000' air	0	1
	11 Kt	500' tower (75 ton/100')	34	184
	11 Kt	500' " "	34	184
	2 Kt	Balloons	0	1
	35 Kt	500' tower (75 ton/100')	560	225
	3 at ~ 5 Kt	300' " (35 ton/100')	3x80	3x63
			868	784
Fall	7 Kt	300' tower (35 ton/100')	190	63
	2 Kt	" " "	3	49
	2 at 5 Kt	" " "	2x80	2x63
			353	238
		Totals:	1221	1022
DOD: (Spring)	40 Kt	500' tower (40 ton/100')	720	17

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		LLNL
Grand totals, Spring:	3123	1608
" " Fall:	1808	862
		88
Grand totals, 1957:	4931	2470

0-200Mc 200-410 400-600 600-800

Pilgrim Mc as of 29 Oct, 1956 [redacted]

			D	M	T
CRL: Spring	20 Kt	400' tower (75T/100')	420	180	600
	20 Kt	400' tower "	420	180	600
	80 Kt	1500' Balloon	0	1	1
	30 Kt	500' tower (75 ton/100')	440	225	665
	0.4 Kt	300' tower (35T/100')	0	29	29
	0.3 Kt	200' tower "	0	26	26
	10 Kt	300' tower "	255	63	318
			1535	704	2239
Fall	40 Kt	700' tower (50T/100')	250	210	460
	30 Kt	500' tower (75T/100')	440	225	665
	3 at ~10 Kt	300' tower (35T/100')	3X255	3X63	3X318
			1455	624	2079
		Totals:	2990	1328	4318
SL:	1.8 Kt	20,000' air	0	1	1
	11 Kt	500' tower (75 ton/100')	34	184	218
ring	11 Kt	500' " "	34	184	218
	2 Kt	Balloon	0	1	1
	35 Kt	500' tower (75 ton/100')	560	225	785
	3 at ~ 5 Kt	300' " (35 ton/100')	3X80	3X63	3X143
			868	784	1652
	7 Kt	300' tower (35 ton/100')	190	63	253
l	2 Kt	" " "	3	49	52
	2 at 5 Kt	" " "	2X80	2X63	2X143
			353	238	591
		Totals:	1221	1022	2243
):	40 Kt	500' tower (40 ton/100')	720	120	840
ng)					

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Grand totals, Spring:	3123	1608	4731
" " Fall:	1808	862	2670
Grand totals, 1957:	4931	2470	7401

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Spring	40 Kt	1500' Balloon	0
	30 Kt	500' tower (75 tons/100')	440
	0.4 Kt	300' tower (35 t/100')	0
	0.3 Kt	200' tower "	0
	10 Kt	300' tower "	255
			1535
Fall	40 Kt	700' tower (50 t/100')	250
	30 Kt	500' tower (75 t/100')	440
	3 at ~10 Kt	300' tower (35 t/100')	3x25
			1455
		Totals:	2990
LASL: Spring	1.8 Kt	20,000' air	0
	11 Kt	500' tower (75 tons/100')	34
	11 Kt	500' " "	34
	2 Kt	Balloons	0
	35 Kt	500' tower (75 tons/100')	560
	3 at ~ 5 Kt	300' " (35 tons/100')	3x80
			868
Fall	7 Kt	300' tower (35 tons/100')	190
	2 Kt	" " "	3
	2 at 5 Kt	" " "	2x80
			353
		Totals:	1221
DOD: (Spring)	40 Kt	500' tower (40 tons/100')	720

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Grand totals, Spring: 3123

" " , Fall: 1808

Grand totals, 1957: 4931

	0-200 Mc	200-400	400-600	600-800	800-1000	1000-120
UK:	6	0	1	0	1	1
T:	8	2	1	2	1	0

		[illegible] tower	420	180	600
Spring	80 Kt	1500' Balloon	0	1	1
	30 Kt	500' tower (75 ton/100')	440	225	665
	0.4 Kt	300' tower (35 t/100')	0	29	29
	0.3 Kt	200' tower "	0	26	26
	10 Kt	300' tower "	255	63	318
			1535	704	2239
Fall	40 Kt	700' tower (50 t/100')	250	210	460
	30 Kt	500' tower (75 t/100')	440	225	665
	3 at ~10 Kt	300' tower (35 t/100')	3x255	3x63	3x318
			1455	624	2079
		Totals:	2990	1328	4318
LASL:					
	1.8 Kt	20,000' air	0	1	1
Spring	11 Kt	500' tower (75 ton/100')	34	184	218
	11 Kt	500' " "	34	184	218
	2 Kt	Balloons	0	1	1
	35 Kt	500' tower (75 ton/100')	560	225	785
	3 at ~ 5 Kt	300' " (35 ton/100')	3x80	3x63	3x143
			868	784	1652
Fall	7 Kt	300' tower (35 ton/100')	190	63	253
	2 Kt	" " "	3	49	52
	2 at 5 Kt	" " "	2x80	2x63	2x143
			353	238	591
		Totals:	1221	1022	2243
?D:	40 Kt	500' tower (40 ton/100')	720	126	846
pring)					

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Grand totals, Spring:	3123	1608	4731
" " , Fall:	1808	862	2670
Grand totals, 1957:	4931	2470	7401

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200Mc	200-400	400-600	600-800	800-1000	1000-1200	1200-1400	200[illegible]
6	0	1	0	1	1	1	1
3	2	1	2	1	0	0	0

[redacted]

1 Shot schedule for Pilgrim, spring, (T) as of 31 Oct, 195

UCRL	2 @ 20 kt, 400'T	Area 2	5-
	1 @ 30 kt, 500'T	2	6-
	1 @ 80 kt, 1500'B	9	
	* 1 @ 2-5 kt, 300'T	9	
	* 1 @ 0.2-0.7 kt, 300'T	9	
	* 1 @ 2-10 kt, 300'T	9	5
	* 1 @ 0.4 kt, 300'T		
LASL	3 @ N kt, 500'T	4, 7, 3	Area 4:
	1 @ 2 kT, 500'B	7	
	1 @ 35 kT, 500'T	1	
	* 1 @ .2-.8 kT, 300'T	3	
	* ~~2 @ 1.5-3 kT, 200', 300'T~~	3	
DOD	1 @ 40 kt 500'T	F	6-1-5
	1 @ 1.8 kt 20,000 R		

		D	M	T
0.7 kt,	300'T	0	34	34
0.9 kt,	300'T	0	36	36
3 kt,	200'T	96	42	138
3 kt	300'T	19	56	75

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600 MCi

No tower

h	W
0	2.9
50	4.9
100	7.9
200	13.3
300	19.2
400	25.6
500	36.3
600	48
700	61
800	78
900	97
1000	116

Tower @ 50 tons/100'

h	F_{max}	F_0	W	W maximized
0	0	600	2.9	✓
50	15	585	4.8	✓
100	30	570	7.4	✓
200	60	540	12.2	✓
300	90	510	17.0	✓
400	120	480	21.8	✓
500	150	450	30.5	✓
600	180	420	39.5	✓
700	~~210~~	~~390~~	~~51.0~~	52
800	~~240~~	~~360~~	~~63~~	65
900	~~270~~	~~330~~	~~78~~	81
1000	~~300~~	~~300~~	~~95~~	LLNL

92

dule for Pilgrim, spring, (T) as of 31 Oct, 1956. [redacted]

2 @ 20 Kt, 400'T	Area 2		5-15-56, 5-25-56
1 @ 30 Kt, 500'T	2		6-15-57
1 @ 80 Kt, 1500'B	9		
1 @ 2-5 Kt, 300'T	9		
1 @ 0.2-0.7 Kt, 300'T	9		
1 @ 2-10 Kt, 300'T	9		5-1-56
1 @ 0.4 Kt, 300'T			
3 @ 11 Kt, 500'T	4, 7, 3		Area 4: 5-1-56
1 @ 2 KT, 500'B	7		
1 @ 35 KT, 500'T	1		
1 @ .2-.8 KT, 300'T	3		
2 @ 1.5-3 KT 200', 300'T	3		
1 @ 40 Kt 500'T	F		6-1-56
1 @ 1.8 Kt 20,000 R			

	D	M	T
300'T	0	34	34
300'T	0	36	36
200'T	96	42	138
300'T	19	56	75

BEST AVAILABLE COPY

600 MGi

Tower @ 50 tons/100'

h	F_{max}	F_D	W	Maximized
0	0	600	2.9	✓
50	15	585	4.8	✓
100	30	570	7.4	✓
200	60	540	12.2	✓
300	90	510	17.0	✓
400	120	480	21.8	✓
500	150	450	30.5	✓
600	180	420	39.5	✓
700	~~210~~	~~390~~	~~54.0~~	52
800	~~240~~	~~360~~	~~63~~	65
900	~~270~~	~~330~~	~~78~~	81
1000	~~300~~	~~300~~	~~95~~	

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LCC35 0117

1

A

Fallout totals. Pilgrim.

		D	m	T
UCRL				
30 kt	500'T @75/	440	225	665
20 kt	400'T "	420	180	600
20 kt	400'T "	420	180	600
5 kt	300'T @35/	80	63	143
10 kt	300'T "	255	63	318
.7 kt	300'T "	0	34	34
		1615	745	2360
ASL				
35 kt	500'T @75/	560	225	785
11 kt	500'T "	34	184	218
11 kt	500'T "	34	184	218
2.8 kt	300'T @35/	0	36	36
3 kt	300'T "	19	56	75
8 kt	200'T "	96	42	138
1 kt	500'T @75/	34	184	218
		777	911	1688
		2392	1656	4048

If starred shots on balloons:

		D	m	T
25 kt	500'	310	225	535
20	500'	200	225	425
20	500'	200	225	425
5	300'			143
10	300'			318
.7	200'	3	34	37
		1048	835	1883
25	500'	310	225	535
		527	911	1438
		1575	1746	3321
UCRL } A		1280	585	1865
LASL }		758	819	1577
		2038	1404	3442
UCRL } B		710	675	1385

B

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15	400'	260	

A

	D	m	T
500'T @75/	440	225	665
400'T "	480	180	600
400'T "	420	180	600
300'T @35/	80	63	143
300'T "	255	63	318
300'T "	0	34	34
	1615	745	2360
500'T @75/	560	225	785
500'T "	34	184	218
500'T "	34	184	218
300'T @35/	0	36	36
300'T "	19	56	75
200'T "	96	42	138
500'T @75/	34	184	218
	777	911	1688
	2392	1656	4048

Fallout totals Pi/m.

25kt	500'	
20	500'	
20	500'	
5	300'	
10	300'	
.7	200'	
25	500'	

B

	D	m	T
	310	225	535
	200	225	425
	200	225	425
			143
			318
	3	34	37
	1048	835	1883
	310	225	535
	527	911	1438
	1575	1746	3321

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		D	m	T
		15	400'	260	180	440

Larred shots on balloons:

		D	m	T
UCRL	A	1280	585	1865
LASL	A	758	819	1577
		2038	1404	3442
UCRL	B	710	675	1385
LASL	B	508	819	1327
		1218	1494	2715

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			435	63	818	10	300'				378		
*0.7 Kt	300'T	"	0	34	34	.7	200'		3	34	37		
			1615	745	2360				1048	835	1883		
LASL													
35 Kt	500'T	@75'	560	225	785	25	500'		310	225	535		
11 Kt	500'T	"	34	184	218								
11 Kt	500'T	"	34	184	218								
*0.8 Kt	300'T	@35'	0	36	36								
*3 Kt	300'T	"	19	56	75								
8 Kt	200'T	"	96	42	138								
11 Kt	500'T	@75'	34	184	218								
			777	911	1688				527	911	1438		
			2392	1656	4048				1575	1746	3321		
If starred shots on balloons:						UCRL / LASL	A		1280 / 758	585 / 819	1865 / 1577		
									2038	1404	3442		
						UCRL / LASL	B		710 / 508	675 / 819	1385 / 1327		
									1218	1494	2715		

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29 Nov., 1956

[redacted]

Teapot; Max Mc (used in predictions) vs actual Mc.

Shot	Yield	Mc		
	Act.	Pred	Act.	Fest, actual w. 35, 59, 75 had
~~Moth~~				
Moth	2.5	143	41	72
Tesla	7	323	260	213
Turk	40	1205	888	985
Hornet	3.6	143	99	97
Apple	15.5	1205	256	~~330~~ 317
Bee	7	323	69	159
Post	1.8	63	51	49
Met	24	1200	619	670
AppleII	31.5	-	737	675
Zucchini	32.5	1205	441	475
		5810	3401	3652

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3401 = ~ 60% of 5810

Pilgrim, 6 mo in advance, appears to be 30% greater
Teapot, 6 mo in advance.

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UCRL 5005 (REV.)

[redacted]
97

[redacted] Max Mc (used in predictions) vs actual Mc. (calculated)

Yield: Act.	Mc Prod	Mc Act.	Fest, actual w. 35, 50, 75 Thod
2.5	143	91	72
7	323	200	213
40	1205	888	985
3.6	143	99	97
15.5	1205	256	317 ~~330~~
7	323	69	159
1.5	63	51	49
24	1200	619	670
31.5	-	737	675
32.5	1265	441	475
	5810	3401	3652

21 = ~ 66% of 5810

6 mo in advance, appears to be 30% greater than 6 mo in advance.

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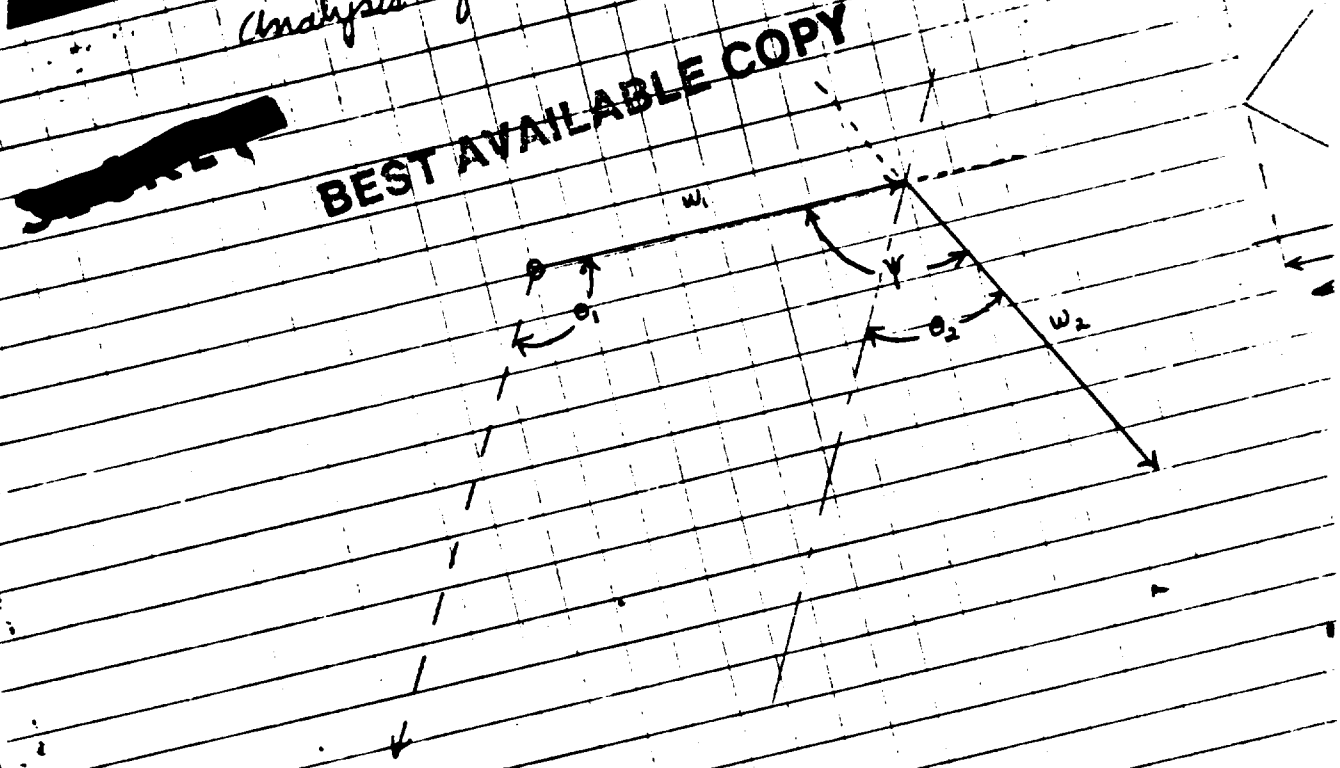
Analysis for Site 300: most critical beam



$c_1 = w_1 \cos\theta_1$

$c_2 = w_2 \cos\theta_2$

$\psi = \theta_2 + \pi - \theta_1$

$\Delta C = c_1 - c_2 = w_1 \cos\theta_1 - w_2 \cos\theta_2$

$= w_1 \cos\theta_1 - w_2 \cos(\psi + \theta_1 -$

$\Delta c = w_1 \cos\theta_1 + w_2 \cos(\psi + \theta_1)$

$\frac{d(\Delta C)}{d\theta_1} = -w_1 \sin\theta_1 + w_2 (-\cos\psi \sin\theta$

Set $\frac{d(\Delta C)}{d\theta_1} = 0 = w \sin\theta_1 + w_2 \cos\psi \sin\theta$

$= w_1 + w_2 \cos\psi + w$

$w_2 \sin\psi \cot\theta_1 = -w_1 - w_2$

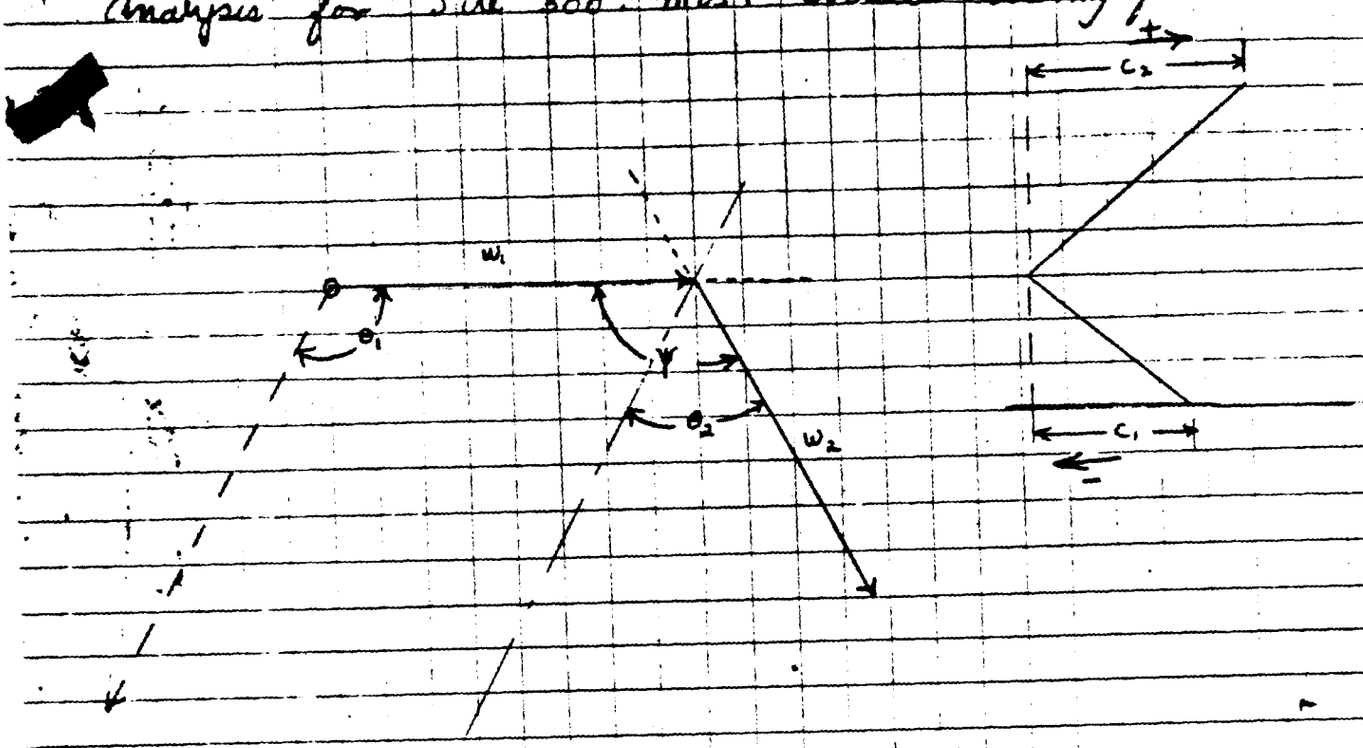
$w_2 \cot\theta_1 = -\frac{w_1}{\sin\psi} - w$

$\cot\theta_1 = -\frac{w_1}{w_2 \sin\psi}$

$\tan\theta_1 = -\frac{w_2 \sin}{w_1 + w_2}$

$\theta_1 = w \sin$

Analysis for Site 300: most critical bearing from wind sounding



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$c_1 = w_1 \cos\theta_1$

$c_2 = w_2 \cos\theta_2$

$= \theta_2 + \pi - \theta_1$

$= c_1 - c_2 = w_1 \cos\theta_1 - w_2 \cos\theta_2$

$= w_1 \cos\theta_1 - w_2 \cos(\psi + \theta_1 - \pi)$

$= w_1 \cos\theta_1 + w_2 \cos(\psi + \theta_1)$

$\Delta c = w_1 \cos\theta_1 + w_2(\cos\psi\cos\theta_1 - \sin\psi\sin\theta_1)$

$$\frac{d(\Delta c)}{d\theta_1} = -w_1 \sin\theta_1 + w_2(-\cos\psi\sin\theta_1 - \sin\psi\cos\theta_1)$$

Set $\frac{d(\Delta c)}{d\theta_1} = 0 = w_1 \sin\theta_1 + w_2\cos\psi\sin\theta_1 + w_2\sin\psi\cos\theta_1$

$= w_1 + w_2\cos\psi + w_2\sin\psi\,\mathrm{ctn}\,\theta_1$

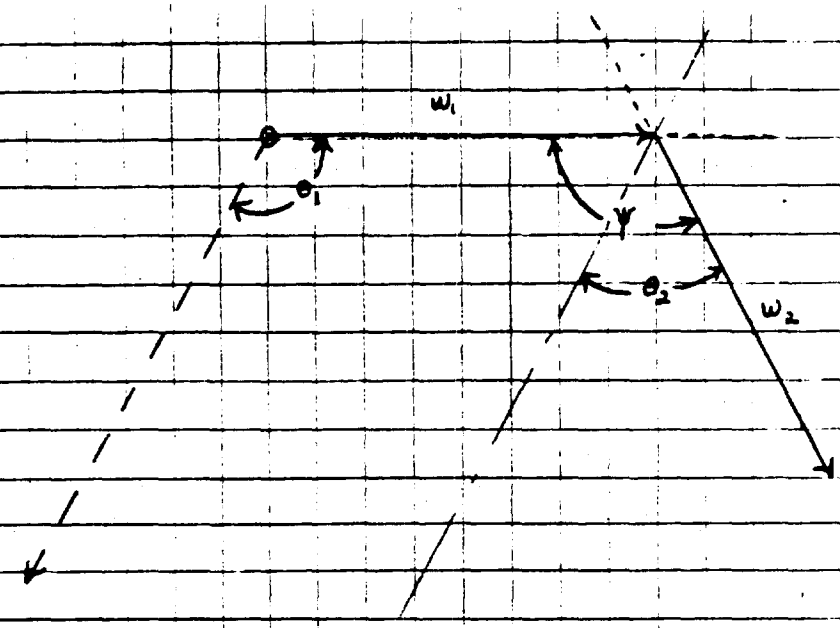
$w_2\sin\psi\,\mathrm{ctn}\,\theta_1 = -w_1 - w_2\cos\psi$

$w_2\,\mathrm{ctn}\,\theta_1 = -\frac{w_1}{\sin\psi} - w_2\,\mathrm{ctn}\,\psi$

$$\mathrm{ctn}\,\theta_1 = -\frac{w_1}{w_2\sin\psi} - \mathrm{ctn}\,\psi \qquad (1)$$

$$\tan\theta_1 = \frac{w_2\sin\psi}{w_1 + w_2\cos\psi} \qquad (2)$$

$w_1 = -.4$, ψ



$C_1 = w_1 \cos\theta_1$

$C_2 = w_2 \cos\theta_2$

$\psi = \theta_2 + \pi - \theta_1$

$\Delta C = C_1 - C_2 = w_1 \cos\theta_1 - w_2 \cos\theta_2$

$= w_1 \cos\theta_1 - w_2 \cos(\psi + \theta_1 - \pi)$

$= w_1 \cos\theta_1 + w_2 \cos(\psi + \theta_1)$

$\Delta C = w_1 \cos\theta_1 + w_2 (\cos\psi \cos\theta_1 - \sin\psi$

$\frac{d(\Delta C)}{d\theta_1} = -w_1 \sin\theta_1 + w_2 (-\cos\psi \sin\theta_1 - \sin\psi$

Set $\frac{d(\Delta C)}{d\theta_1} = 0 = w_1 \sin\theta_1 + w_2 \cos\psi \sin\theta_1 + w_2 \sin$

$= w_1 + w_2 \cos\psi + w_2 \sin\psi \operatorname{ctn}$

$w_2 \sin\psi \operatorname{ctn}\theta_1 = -w_1 - w_2 \cos\psi$

$w_2 \operatorname{ctn}\theta_1 = \frac{-w_1}{\sin\psi} - w_2 \operatorname{ctn}\psi$

$\operatorname{ctn}\theta_1 = \frac{-w_1}{w_2 \sin\psi} - \operatorname{ctn}\psi$

$\operatorname{Tan}\theta_1 = \frac{w_2 \sin\psi}{w_1 + w_2 \cos\psi}$

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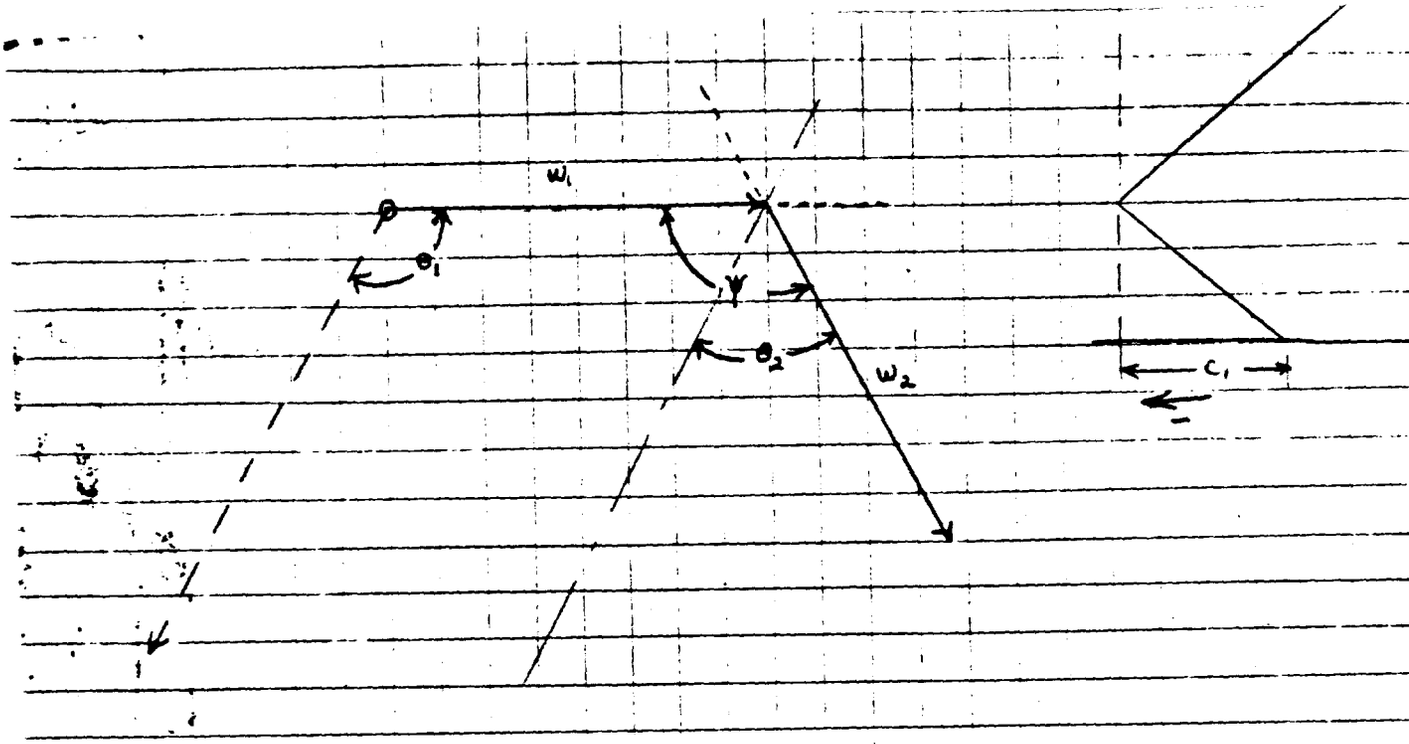
For $C_1 + C_2$ max: $\operatorname{ctn}\theta_1 = \frac{w_1}{w_2 \sin\psi} - \operatorname{ctn}\psi$



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$c_1 = w_1 \cos\theta_1$

$c_2 = w_2 \cos\theta_2$

$\psi = \theta_2 + \pi - \theta_1$

$c = c_1 - c_2 = w_1 \cos\theta_1 - w_2 \cos\theta_2$

$= w_1 \cos\theta_1 - w_2 \cos(\psi + \theta_1 - \pi)$

$= w_1 \cos\theta_1 + w_2 \cos(\psi + \theta_1)$

$\Delta c = w_1 \cos\theta_1 + w_2(\cos\psi\cos\theta_1 - \sin\psi\sin\theta_1)$

$\frac{d(\Delta c)}{d\theta_1} = -w_1 \sin\theta_1 + w_2(-\cos\psi\sin\theta_1 - \sin\psi\cos\theta_1)$

Set $\frac{d(\Delta c)}{d\theta_1} = 0 = w_1 \sin\theta_1 + w_2\cos\psi\sin\theta_1 + w_2\sin\psi\cos\theta_1$

$= w_1 + w_2\cos\psi + w_2\sin\psi\,\mathrm{ctn}\,\theta_1$

$w_2\sin\psi\,\mathrm{ctn}\,\theta_1 = -w_1 - w_2\cos\psi$

$w_2\,\mathrm{ctn}\,\theta_1 = \frac{-w_1}{\sin\psi} - w_2\,\mathrm{ctn}\,\psi$

$\mathrm{ctn}\,\theta_1 = \frac{-w_1}{w_2\sin\psi} - \mathrm{ctn}\,\psi$

$\tan\theta_1 = \frac{w_2\sin\psi}{w_1 + w_2\cos\psi}$

For $c_1 + c_2$ max: $\mathrm{ctn}\,\theta_1 = \frac{w_1}{w_2\sin\psi} - \mathrm{ctn}\,\psi$

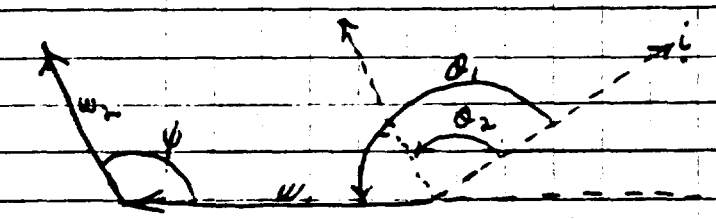
[redacted]

Site 200: Critical Bearing, check against data.

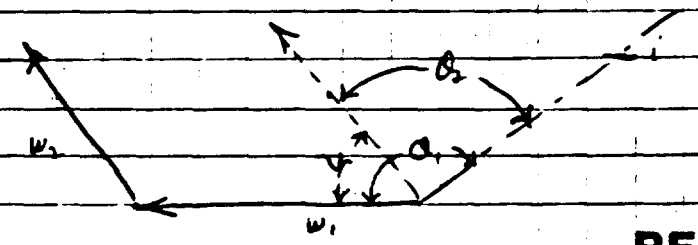
Date	w_1	w_2	Ψ	w_1/w_2	$\frac{w_1}{w_2}\sin\Psi$	ctn Ψ	ctn θ_1
					Eq ①		
11-30-56	30	26	81°	1.15	1.16	.141	−1.301
					Eq ②		
11-30-56	"	"	"	"	"	"	1.019
11-21-56	72	38	44°	1.89	2.72	1.036	1.684
					Eq ③		
11-21-56							3.76 / 3.76

$C_1 + C_2 = 72 + .719 - 38$

$= 72 *$



$\Psi = \pi - \theta_1 + \theta_2$



$\Psi = \theta_1 - \theta_2$

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$C_1 = w_1 \cos\theta_1$

$C_2 = w_2 \cos\theta_2 = w_2 \cos(\theta_1 - \Psi)$

$C_1 \mp C_2 = w_1 \cos\theta_1 \mp w_2 \cos(\theta_1 - \Psi)$

$\Delta C = w_1 \cos\theta_1 - w_2(\cos\theta_1 \cos\Psi + \sin\theta_1 s$

$\frac{d\Delta C}{d\theta_1} = -w_1 \sin\theta_1 - w_2(-\sin\theta_1 \cos\Psi + \cos\theta_1$

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$w_1 \sin\theta_1 = w_2 \sin\theta_1 \cos\Psi - w_2 \cos\theta_1$

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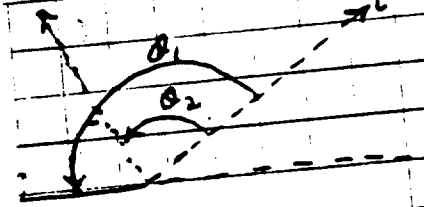
$\frac{w_1 \sin\theta_1}{w_2 \sin\theta_1} = \cos\Psi - \frac{w_2 \cos\theta_1 \sin\Psi}{w_2 \sin\theta_1}$

100: Critical Bearing, check against data.

w_2	ψ	w_1/w_2	$\frac{w_1}{w_2 \sin\psi}$	$\cot\psi$	Eq ① $\cot\theta_1$	Bearing	Actual
26	81°	1.15	1.16	.141	−1.381	130°	130°
"	"	Eq ②	"	"	1.019	~~40°~~ ~~224°~~ 44° 224° → 136° 316°	~~228°~~
38	44°	1.89	2.72	1.036	1.684		
		Eq ①			3.76	~~89°~~	50-70
					3.76	59°	50°-70

$C_1 + C_2 = \sim\sim 72 + 79 - 38 \sim\sim$
$= 72 *$

$\psi = \pi - \theta_1 + \theta_2$



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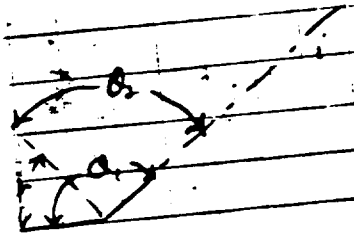

$\psi = \theta_1 - \theta_2$

$= w_1 \cos\theta_1$
$= w_2 \cos\theta_2 = w_2 \cos(\theta_1 - \psi)$

$C_2 = w_1 \cos\theta_1 \mp w_2 \cos(\theta_1 - \psi)$ use −

$C = w_1 \cos\theta_1 - w_2(\cos\theta_1 \cos\psi + \sin\theta_1 \sin\psi)$

$\frac{C}{\theta_1} = -w_1 \sin\theta_1 - w_2(-\sin\theta_1 \cos\psi + \cos\theta_1 \sin\psi) = 0$

$w_1 \sin\theta_1 = w_2 \sin\theta_1 \cos\psi - w_2 \cos\theta_1 \sin\psi$

$\frac{w_1 \sin\theta_1}{w_2 \sin\theta_1} = \cos\psi - \frac{w_2 \cos\theta_1 \sin\psi}{w_2 \sin\theta_1}$

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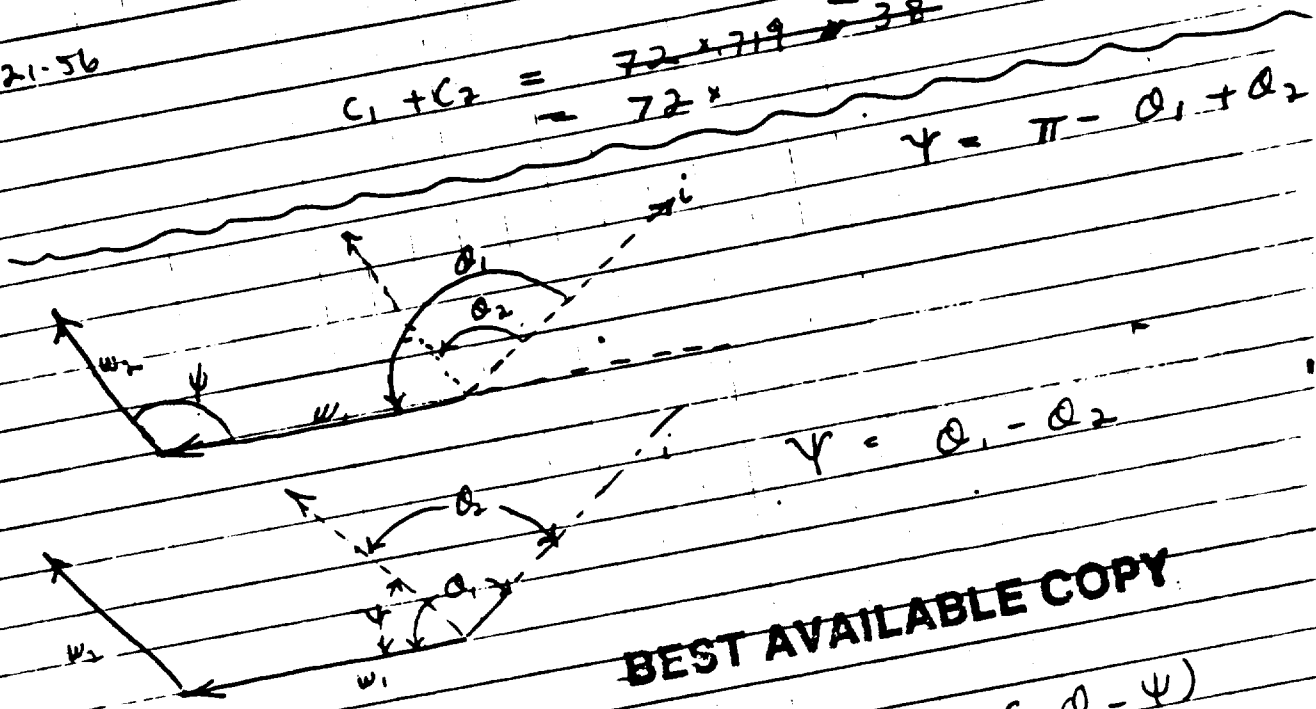
11-30-56	"	"	"	"	Eq ②	"	1.619
11-21-56	72	38	44°	1.89	2.72	1.636	1.624
				Eq ①			3.76
							3.76

11-21-56

$C_1 + C_2 = 72 + 19 - 38$

$= 72 +$



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$C_1 = w_1 \cos \alpha_1$

$C_2 = w_2 \cos \alpha_2 = w_2 \cos (\alpha_1 - \psi)$

$C_1 \mp C_2 = w_1 \cos \alpha_1 \mp w_2 \cos (\alpha_1 -$

$\Delta C = w_1 \cos \alpha_1 - w_2 (\cos \alpha_1 \cos \psi$

$\frac{d \Delta C}{d \alpha_1} = -w_1 \sin \alpha_1 - w_2 (-\sin \alpha_1 \cos$

$w_1 \sin \alpha_1 = w_2 \sin \alpha_1 \cos \psi -$

$\frac{w_1 \sin \alpha_1}{w_2 \sin \alpha_1} = \cos \psi - \frac{w_2 \cos \alpha}{w_2 \sin}$

$w_1/w_2 = \cos \psi - \sin \psi \cot$

$\tan \alpha_1 = -\frac{w_1}{w_2 \sin \psi} + \cot \psi$

Eq ②

" " " 1.019 ~~40°~~ 41°

" " " 1.036 1.684 ~~22°~~ 23° 22° 38°

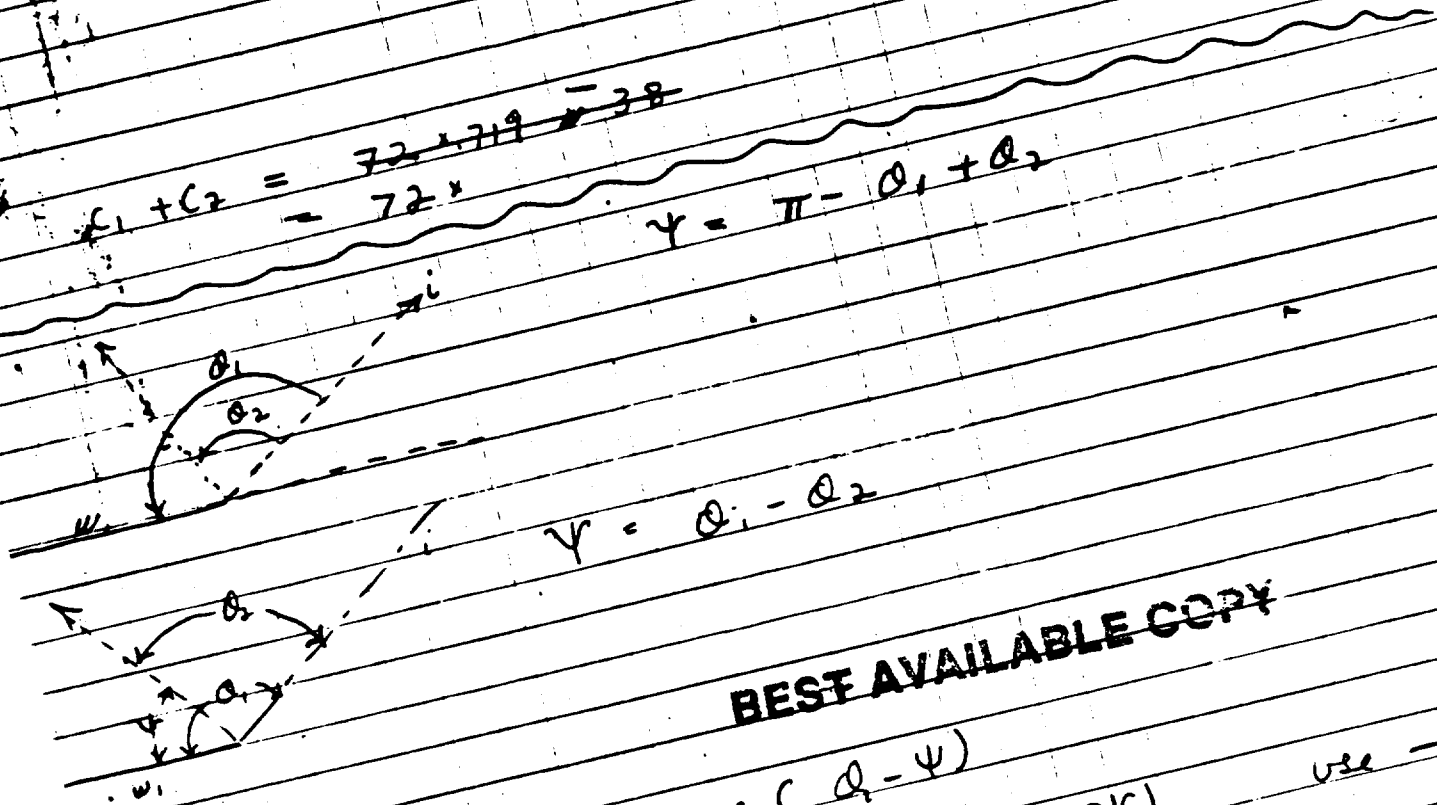
72 38 44° 1.89 2.72 ~~294°~~ 322°

Eq ①

3.76 ~~89°~~ 89° 50-70

3.76 ~~59°~~ 59° 50°-70°

$C_1 + C_2 = 72 + 38 = 72$



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$C_1 = w_1 \cos\theta_1$

$C_2 = w_2 \cos\theta_2 = w_2 \cos(\theta_1 - \psi)$

$+ \; C_2 = w_1 \cos\theta_1 + w_2 \cos(\theta_1 - \psi)$

$\Delta C = w_1 \cos\theta_1 - w_2(\cos\theta_1 \cos\psi + \sin\theta_1 \sin\psi)$

$\frac{d\Delta C}{d\theta_1} = -w_1 \sin\theta_1 - w_2(-\sin\theta_1 \cos\psi + \cos\theta_1 \sin\psi)$

use −

$w_1 \sin\theta_1 = w_2 \sin\theta_1 \cos\psi - w_2 \cos\theta_1 \sin\psi$

$\frac{w_1 \sin\theta_1}{w_2 \sin\theta_1} = \cos\psi - \frac{w_2 \cos\theta_1 \sin\psi}{w_2 \sin\theta_1}$

$w_1/w_2 = \cos\psi - \sin\psi \operatorname{ctn}\theta_1$

$+ \operatorname{ctn}\psi$

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$$\cot\theta_1 = \cot\psi - \frac{w_1}{w_2 \sin\psi}$$

Date	w_1	w_2	ψ	w_1/w_2	$\frac{w_1}{w_2 \sin\psi}$	$\cot\psi$	$\cot$
12-3-56	~~5~~ 17	56	49°	.3035	4.021	.8693	.467
12-3-56	8	8	49°	1	1.325	"	.455
11-28-56	18	5.3	55°	3.396	4.146	.7002	-3.446
11-26-56	11	~~X~~ 7	44°	1.571	2.24	1.035	-1.2c
12-4-56	17	~~25~~	30°	.68	1.36	1.732	.372

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$\cot\theta_1 = \cot\psi - \frac{w_1}{w_2 \sin\psi}$

w_2	ψ	w_1/w_2	$\frac{w_1}{w_2 \sin\psi}$	$\cot\psi$	$\cot\theta_1$	Bearing	Wind Actual
56	49°	.3035	1.021	.8693	.4672	25° ← wrong	
8	49°	1	1.325	"	.4557	270°	
5.3	55°	3.396	4.146	.7002	-3.446	43°	30°
X7	44°	1.571	2.24	1.035	-1.205	104	9°
75	30°	.68	1.36	1.732	.372	40°	70°

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[redacted]

Shot Schedule as of 5 December 1956

Date	Device	Lab	Area - Method
May 15		LASL	7 Tower 500'
May 22		LASL	3 Tower 200'
May 27		LASL	7 Balloon
June 1		LASL	4 Tower 500'
June 1		LASL	9 Balloon
June 4		UCRL	7 Balloon
June 7		LASL	F Tower 600'?
June 16		DOD	9 Balloon
June 12		UCRL	7 Balloon
June 20		LASL	9 Balloon
June 25		UCRL	2 Tower 500'
June 28		UCRL	7 Balloon
June 30	DELETED	LASL	9 Balloon
July 9		UCRL	2 Tower 500'
July 9		UCRL	7 Balloon
August 1		LASL	1 Tower 500'
August 6		LASL	3 Tower
August 6		LASL	2 Tower 500'
August 12		UCRL	9 Balloon
August 15		UCRL	7 Balloon
August 25		LASL	9 Balloon
Sept. 1		UCRL	8 Tower 70
Sept. 4		UCRL	9 Balloon
Sept. 15		UCRL	Underground

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[redacted]

Shot Schedule as of 5 December 1956

Device	Lab	Area - Method	Yield
	LASL	7 Tower 500'	11 Kt
	LASL	3 Tower 200'	20 t
	LASL	7 Balloon	2 kt
	LASL	4 Tower 500'	11 kt
	UCRL	9 Balloon	10 Kt
	LASL	7 Balloon	1.7 K
	DCD	F Tower 600'?	40 k
	UCRL	9 Balloon	0.5 k
	LASL	7 Balloon	40 Kt
	UCRL	9 Balloon	5 kt
	UCRL	2 Tower 500'	15 k
DELETED	LASL	7 Balloon	long
	UCRL	9 Balloon	80 k
	UCRL	2 Tower 500'	15 k
	LASL	7 Balloon	?
	LASL	1 Tower 500'	11 K
	LASL	3 Tower	8 k
	UCRL	2 Tower 500'	25 K
	UCRL	9 Balloon	<10
	LASL	7 Balloon	50 k
	UCRL	9 Balloon	<10
	UCRL	8 Tower 700'	50 k
	UCRL	9 Balloon	<10
	UCRL	Underground	1.8

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Teapot Weather Delay Data

Shot	Ready	Fired	Δ	Yield
Turk	15 Feb	7 Mar	±19	43 ± 2
Tesla	28 Feb	1 Mar	0	6.9 ± 0.2
Apple I	9 Mar	29 Mar	18	15 ± 2
Wasp		18 Feb	0	1.2 ± 0.1
Moth		22 Feb	0	2.4 ± 0.2
HADR		25 Mar	0	—
Met		15 April	7	23 ± 1.5
Post		9 April	1	1.5 ± 0.1
HA		6 April	0	3.2 ± 0.2
Hornet		12 March	3	3.6 ± 0.2
Ess		23 March	1	
Bee		22 March	0	8.1 ± 0.3
Wasp'		29 March	0	3.2 ± 0.2
Apple II		5 May	9	30 ± 3
Zucchini		15 May	7	29 ± 2

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Estimate of Taongi Lagoon Fallout from Bravo

R/hr Htl	$\frac{1}{144}$ in^2	R/hr ave	Mc/mi^2 ave	(nmi)^2 (× .18 nmi)^2 / $\frac{1}{144}$ in^2
72000	6	2500	750	1.11
32000-1500	16	1700	510	2.96
1500-1000	15	1250	375	2.78
1000-500	33	750	225	6.10
500-250	37	375	110	6.84
250-100	14	175	50	2.59
100-80	10	95	30	1.85
				24.23

$\frac{1 \text{ kt}}{10{,}100 \text{ kt}} = .0019$

10 MT: Dose Rate on Southern Islands: Min
Max

Mc in lagoon: min ~ 6000
Max ~ 6000

1 MT Dose Rates 10 R/hr → 100 R/hr.

Mc in lagoon ~ 1,000 or 0.33 pc

Intensities 3' above lagoon at 1 hr

At southern end 500 mr/hr
at Northern end 100 R/hr

Lagoon intensities decay ~ t

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Estimate of Taongi Lagoon Fallout from Bravo Pattern.

$\frac{1}{4}$ mi^2	R/hr ave	mc/mi^2 ave	(nmi)^2 (x .185 for mi^2)	mc
6	2500	750	1.11	832
16	1700	510	2.96	1510
15	1250	375	2.78	1042
33	750	225	6.10	1372
37	375	110	6.84	752
14	175	50	2.59	130
x 10	95	30	1.85	56
			24.23	5694 mc

$$\frac{19\,kt}{10{,}000\,kt} = .0019 = 19\,kt$$

∴ Dose Rate on Sathern Islands: Min 90 R/hr at 1 hr
Max ~ 500 R/hr at 1 hr

Mc in lagoon: min ~ 6000
Max ~ 6000

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1T Dose Rates 10 R/hr → 100 R/hr. South to North

Mc in lagoon ~ 1000 or 0.33 percent.

Intensities 3' above lagoon at 1 hr: (÷ 20)

At southern end 500 mr/hr at 1 hr
at Northern end 100 R/hr at 1 hr

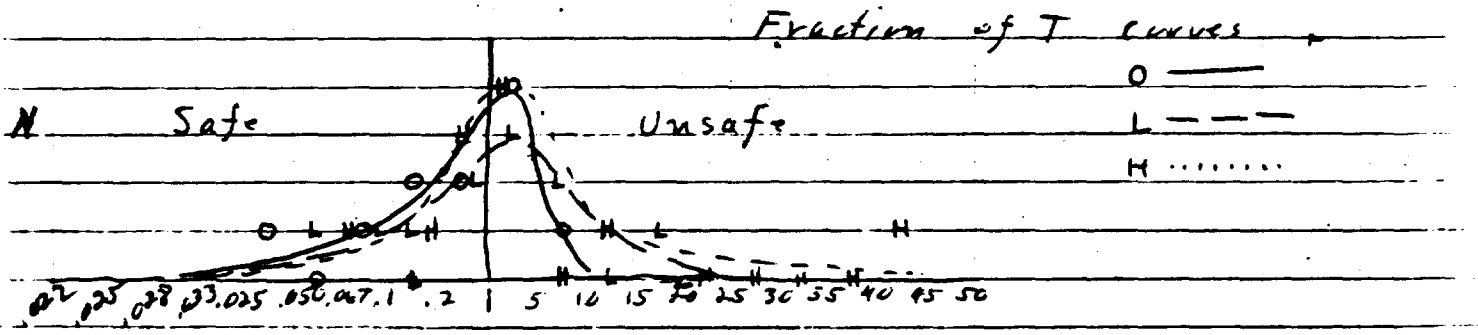
Lagoon intensities decay ~ $t^{-1.2}$

LLN

38 300 Blast Fist Verifications with Tracy rvx.

[redacted] Tests

	Tests H	O	L	T	Deviation, lbs. H	O	L	Fractio H	
1	500	50	90	500	0	-450	-410	1	0
2	1,350	65	45	8	+342	+57	+37	43.8	
3	300	60	500	25	+275	+35	+475	12.0	
4	35	160	330	65	-30	+95	+265	0.54	2
5	500	45	45	500	0	-455	-455	1	0.
6	35	9	360	200	-165	-191	+160	0.18	0
7	70	170	8	140	-70	+30	-132	0.5	1.
8	500	70	110	360	+140	-290	-250	1.4	0
9	6	10	28	17	-11	-7	+11	0.35	
10.	500	360	220	500	0	-140	-280	1	
11	35	500	500	500	-465	0	0	0.07	
Ave	257	136	203	256				Ave 5.62	



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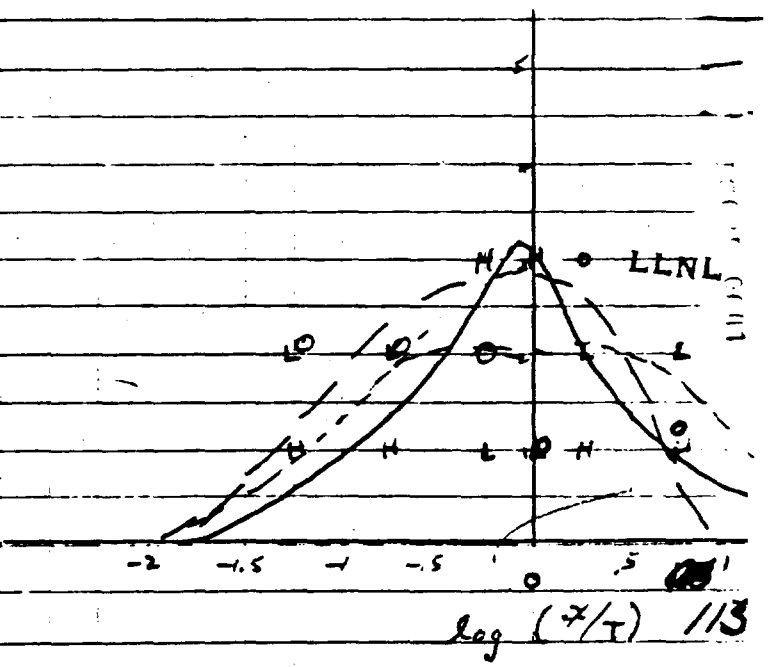
which corresponds to a probable error in # of WP,

	Log (X/T) H	O	L
	0	-1.000	-.745
	1.641	.908	.748
	1.079	.380	1.301
	-.268	.398	.708
	0	-1.046	-1.046
	-.745	-1.398	.255
	-.301	.079	-1.222
	.146	-.721	-.509
	-.456	-.229	.204
	0	-.143	-.357
	-1.155	0	0
ε	-0.059	-2.772	-0.663



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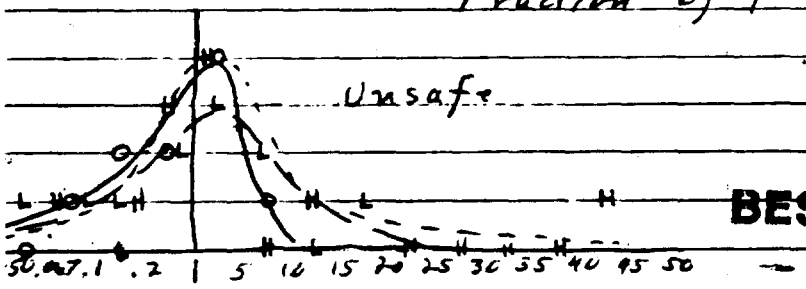
~~Relative~~ H O

300 Blast Fest Verifications with Tracy run

Tests			Deviation, lbs.			Fraction of T ($\frac{x}{T}$)		
O	L	T	H	O	L	H	O	L
50	90	500	0	-450	-410	1	0.1	0.18
65	85	8	+342	+57	+37	43.8	8.1	5.6
60	500	25	+275	+35	+475	12.0	2.4	20.0
160	330	65	-30	+95	+265	0.54	2.5	5.1
45	45	500	0	-455	-455	1	0.09	0.09
9	360	200	-165	-191	+160	0.18	0.04	1.8
170	8	140	-70	+30	-132	0.5	1.2	0.06
70	110	360	+140	-290	-250	1.4	0.19	0.31
10	28	17	-11	-7	+11	0.35	0.59	1.6
360	220	500	0	-140	-280	1	0.72	0.44
500	500	500	-465	0	0	0.07	1	1
136	203	256				Ave 5.62	1.54	3.29

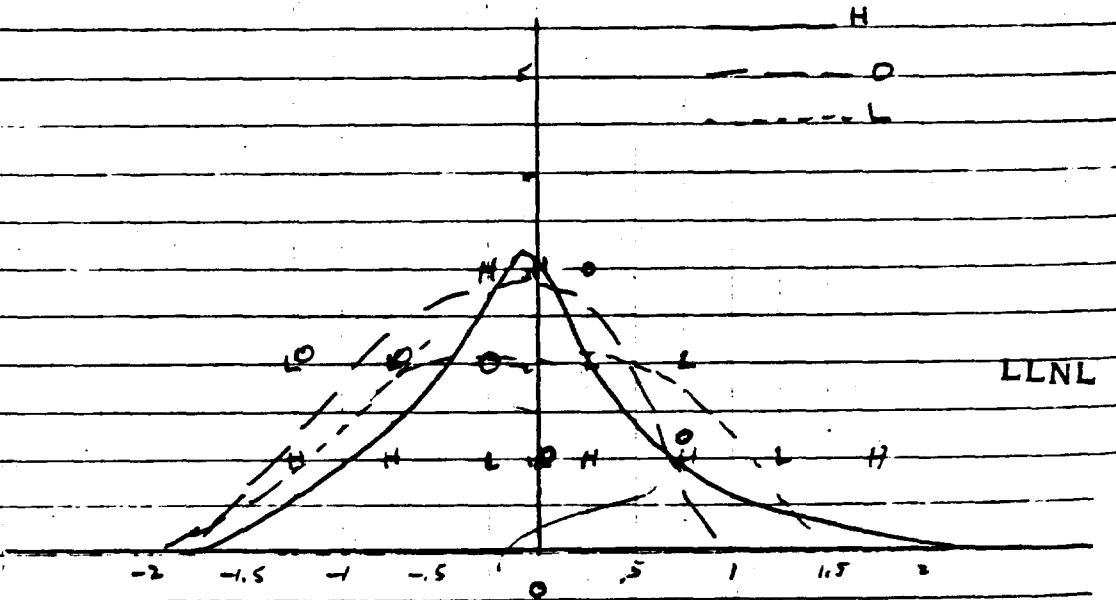
Fraction of T curves



BEST AVAILABLE COPY

responds to a probable error in H of ~48, ub ~42.

Log ($\frac{x}{T}$)	
O	L
-1.000	-.745
.908	.748
.380	1.301
.398	.708
-1.046	-1.046
-1.398	.255
.079	-1.222
-.721	-.509
-.229	.204
-.143	-.357
0	0
-2.777	-0.663



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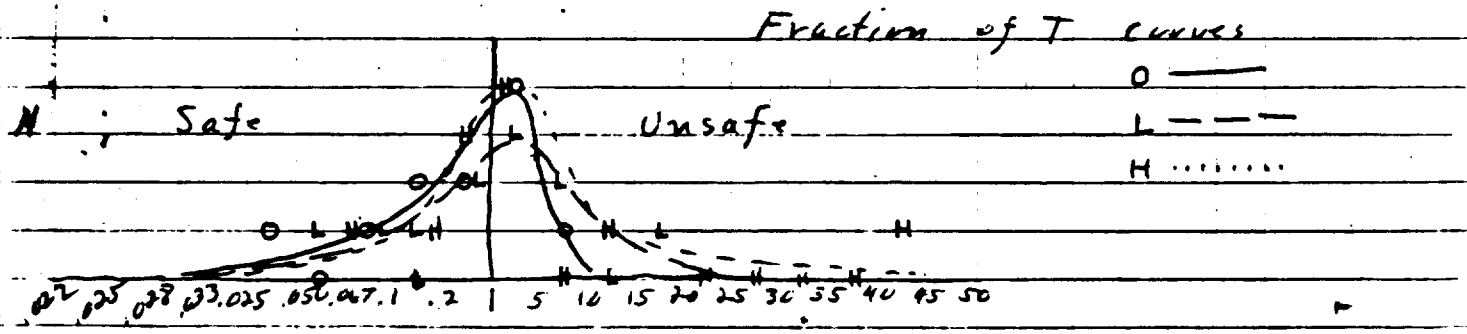
~~Relative~~ H O L

2	350	65	45	8	+342	+57	+37	43.8	8
3	300	60	500	25	+275	+35	+475	12.0	2
4	35	160	330	65	−30	+95	+265	0.54	2.
5	500	45	45	500	0	−455	−455	1	0.0
6	35	9	360	200	−165	−191	+160	0.18	0.
7	70	170	8	140	−70	+30	−132	0.5	1.
8	500	70	110	360	+140	−290	−250	1.4	0.
9	6	10	28	17	−11	−7	+11	0.35	0.
10	500	360	220	500	0	−140	−280	1	0.
11	35	500	500	500	−465	0	0	0.07	
Ave	257	136	203	256				Ave 5.62	1.



which corresponds to a probable error in # of ~48,

	Log (X/T)		
	H	O	L
	0	−1.000	−.745
	1.641	.908	.748
	1.079	.380	1.301
	−.268	.398	.708
	0	−1.046	−1.046
	−.745	−1.398	.255
	−.301	.079	−1.222
	.146	−.721	−.509
	−.456	−.229	.204
	0	−.143	−.357
	−1.155	0	0
Σ	−0.059	−2.772	−0.663

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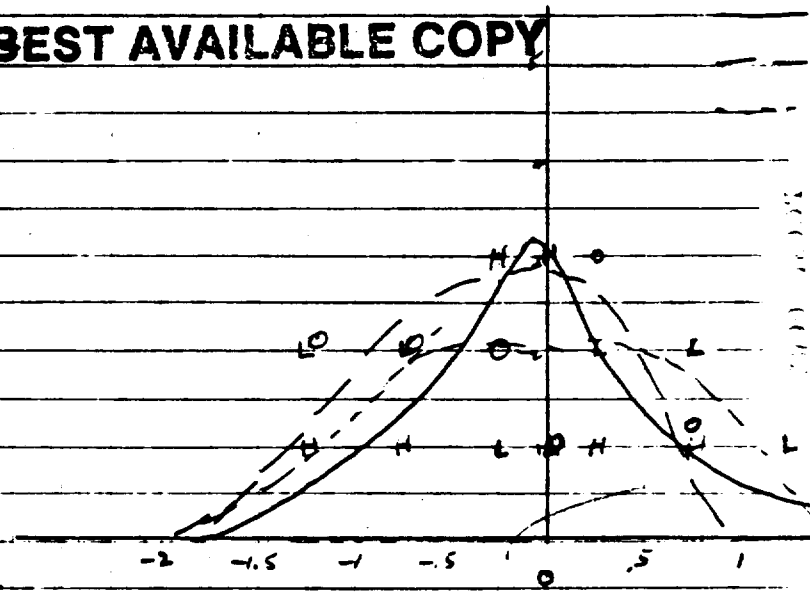

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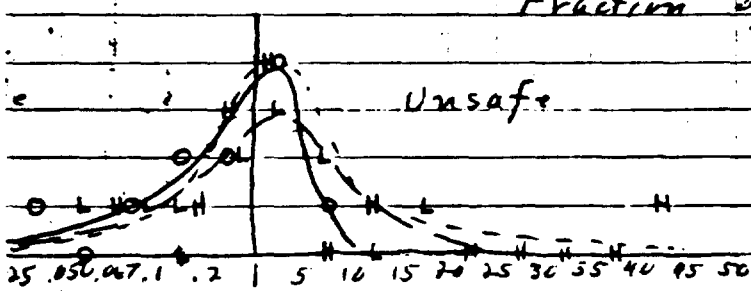
	H	O
~~Rotation spec~~		
Probable max log (X/T)	0.456	.721
X/T	~3	~5

[redacted]

more page 40

30	70	200	0	725	710	1	0.1	0.18
65	45	8	+342	+57	+37	43.8	8.1	5.6
60	500	25	+275	+35	+475	12.0	2.4	20.0
160	330	65	−30	+95	+265	0.54	2.5	5.1
45	45	500	0	−455	−455	1	0.09	0.09
9	360	200	−165	−191	+160	0.18	0.04	1.8
170	8	140	−70	+30	−132	0.5	1.2	0.06
70	110	360	+140	−290	−250	1.4	0.19	0.31
10	28	17	−11	−7	+11	0.35	0.59	1.6
360	220	500	0	−140	−280	1	0.72	0.44
500	500	500	−465	0	0	0.07	1	1
136	203	256				Ave 5.62	1.54	3.29



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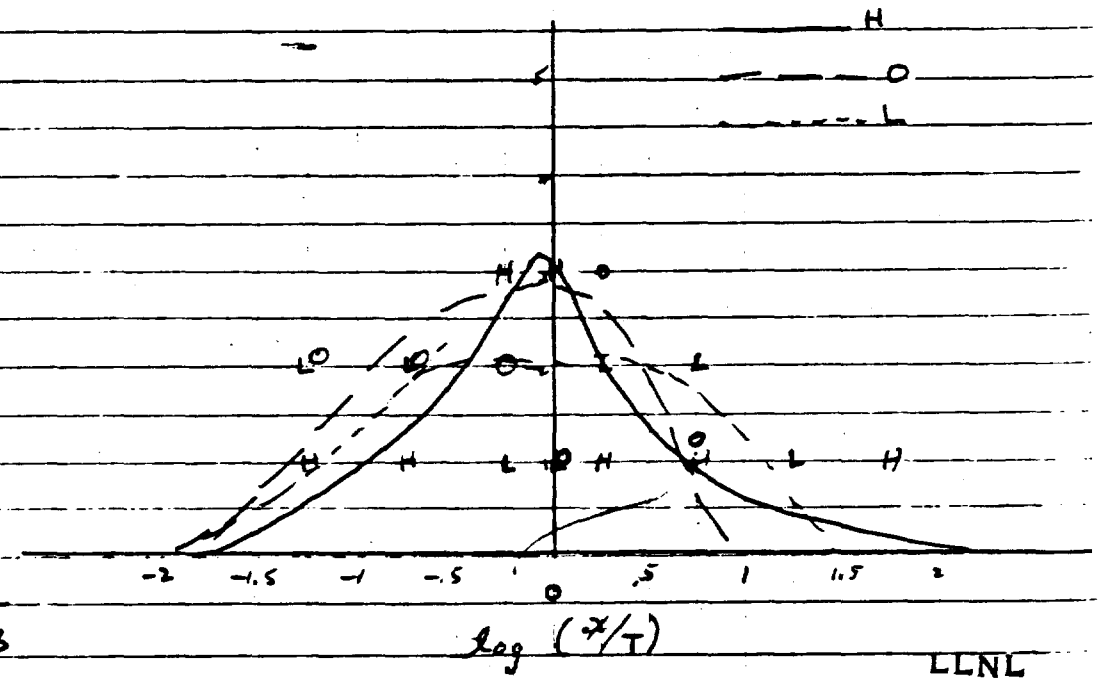
corresponds to a probable error in # of ~x8, μb ~ x2.

	Log (χ/T)	
42	O	L
2	−1.600	−.745
641	.908	.748
079	.380	1.301
268	.398	.708
2	−1.046	−1.046
745	−1.398	.255
301	.079	−1.222
146	−.721	−.509
456	−.279	.204
2	−.143	−.357
155	0	0
59	−2.772	−0.663



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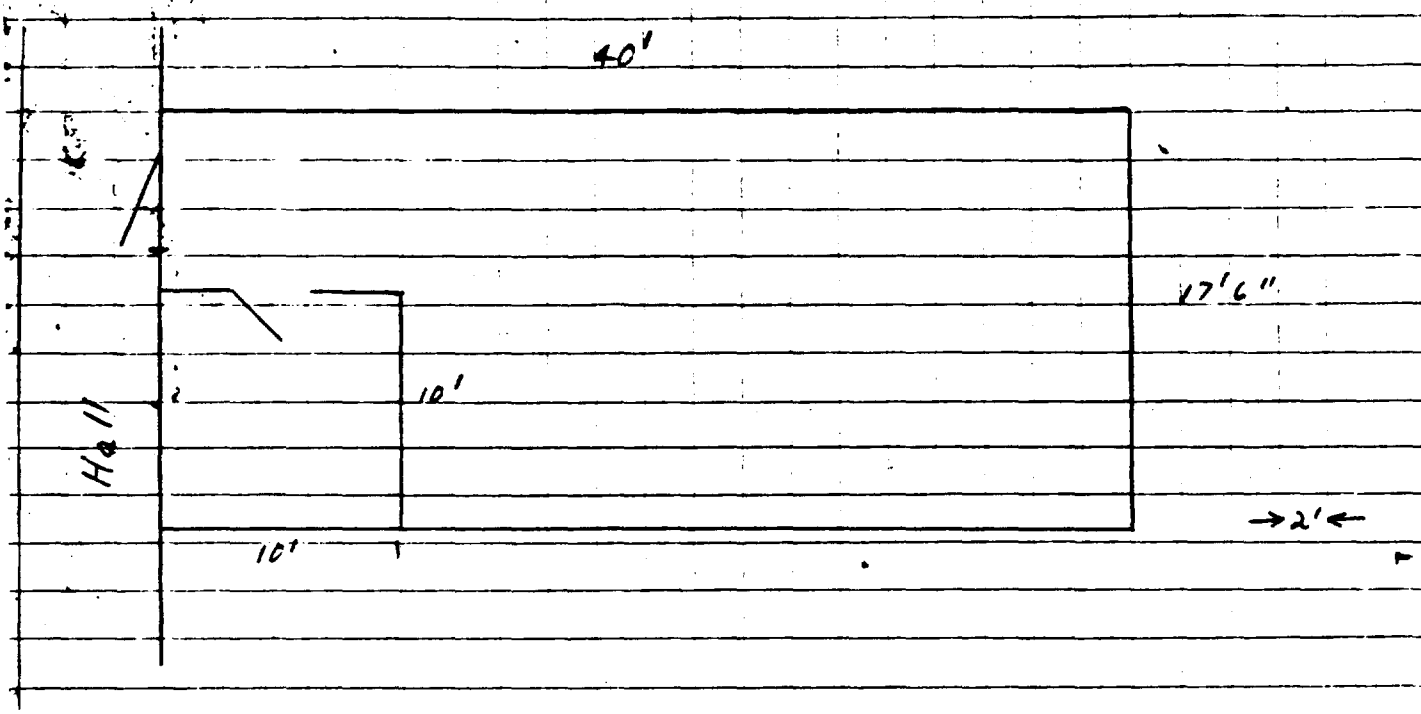
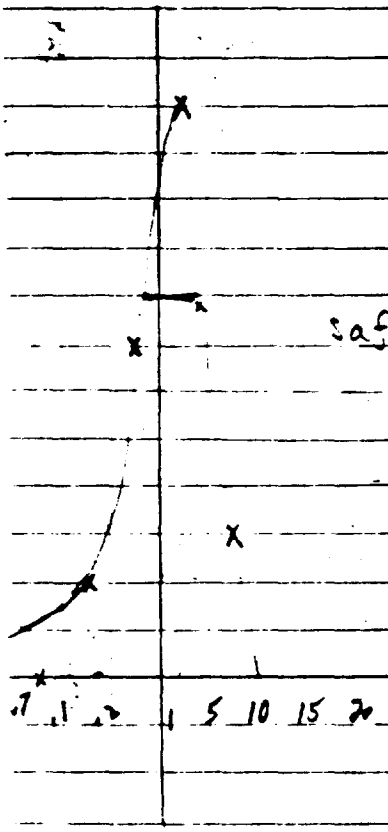
	H	O	L	
~~Relative spin~~				
Probable max Log(χ/T)	0.456	.721	.745	
χ/T	~3	~5	~5	118

more page 40

FOPU Space Bldg 101 Mercury [redacted]



X4 safe.
X2 unsafe.



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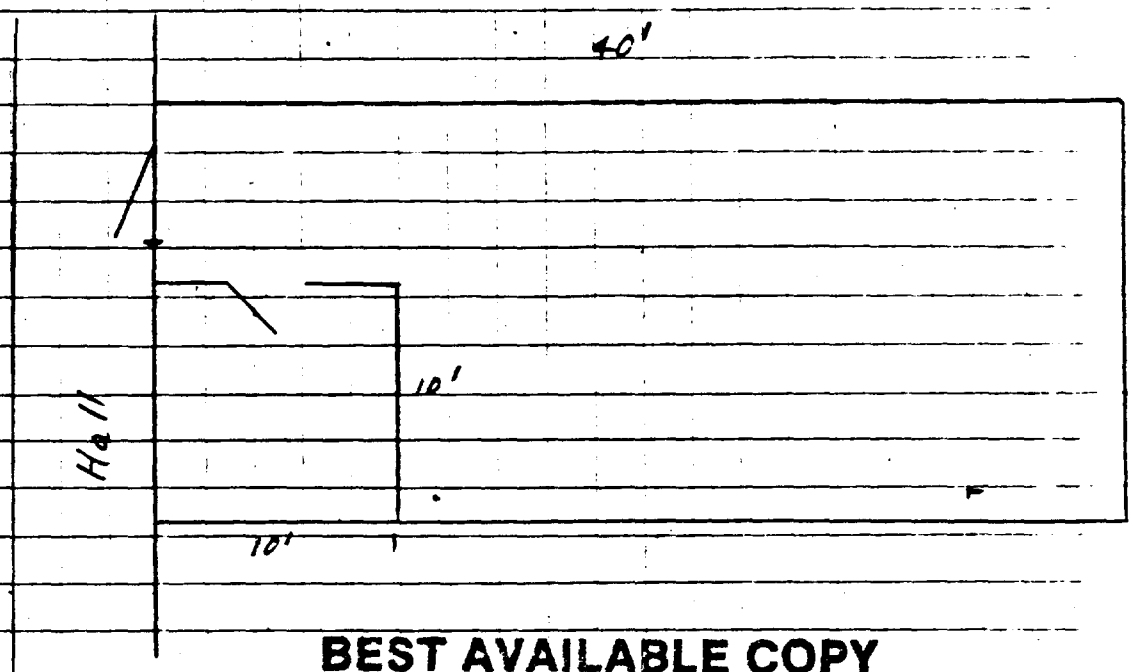
[redacted]

FOPU Space Bldg 101 Mercury [redacted]



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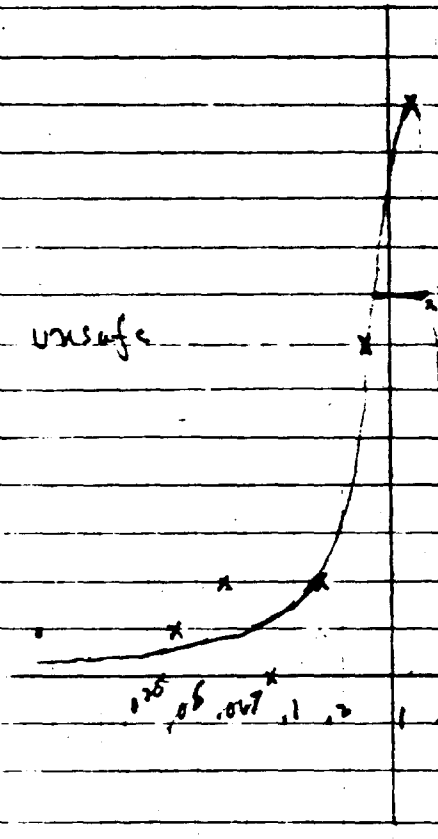
X4 safe.
X2 unsafe.



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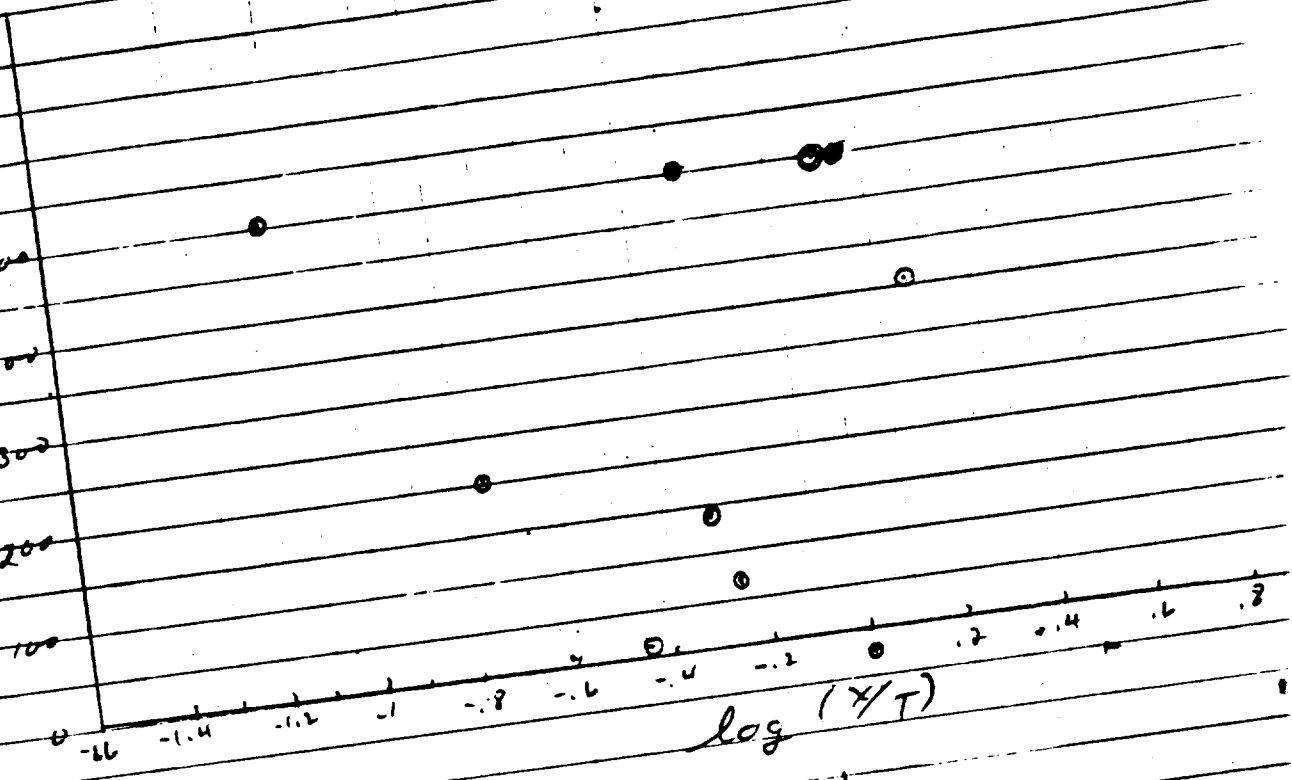
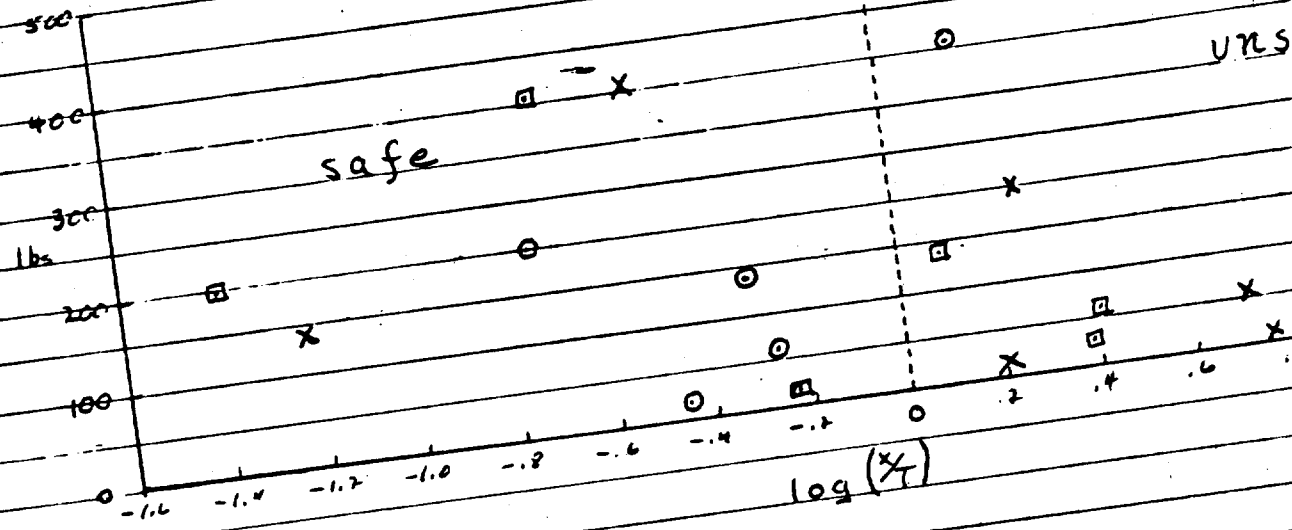
300 Blast Verifications

[redacted]





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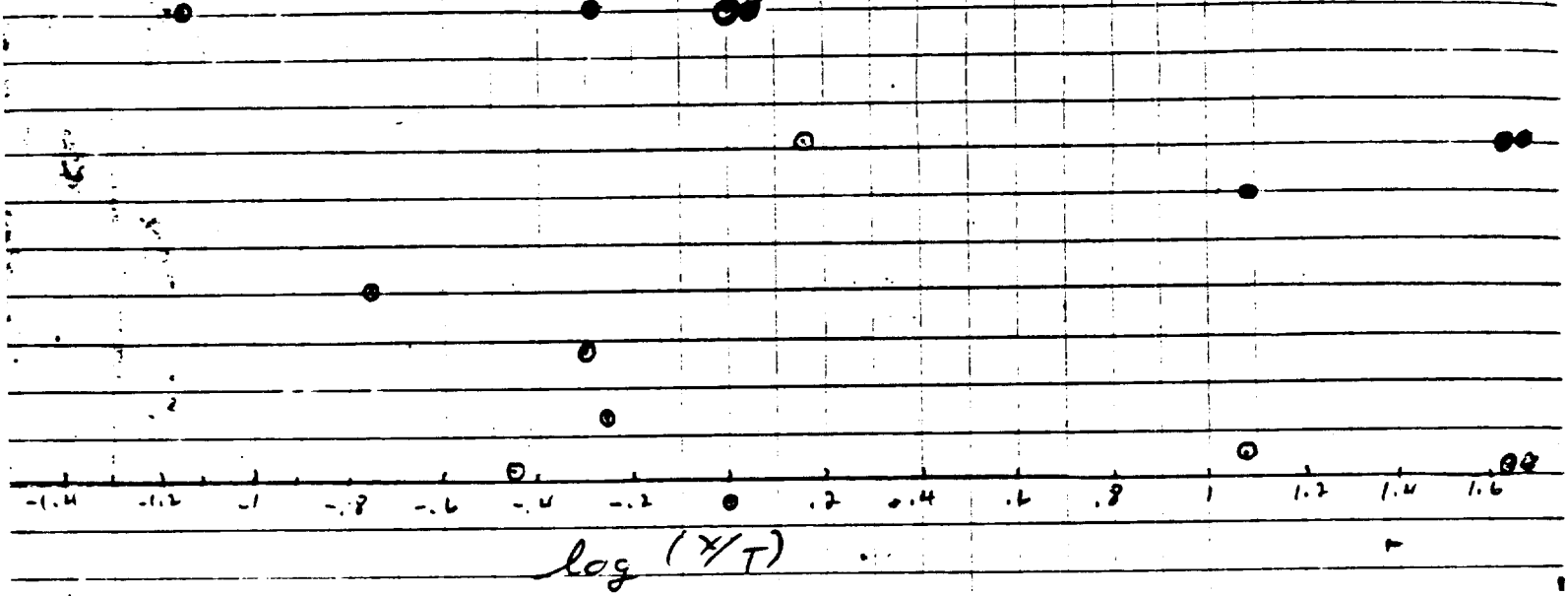
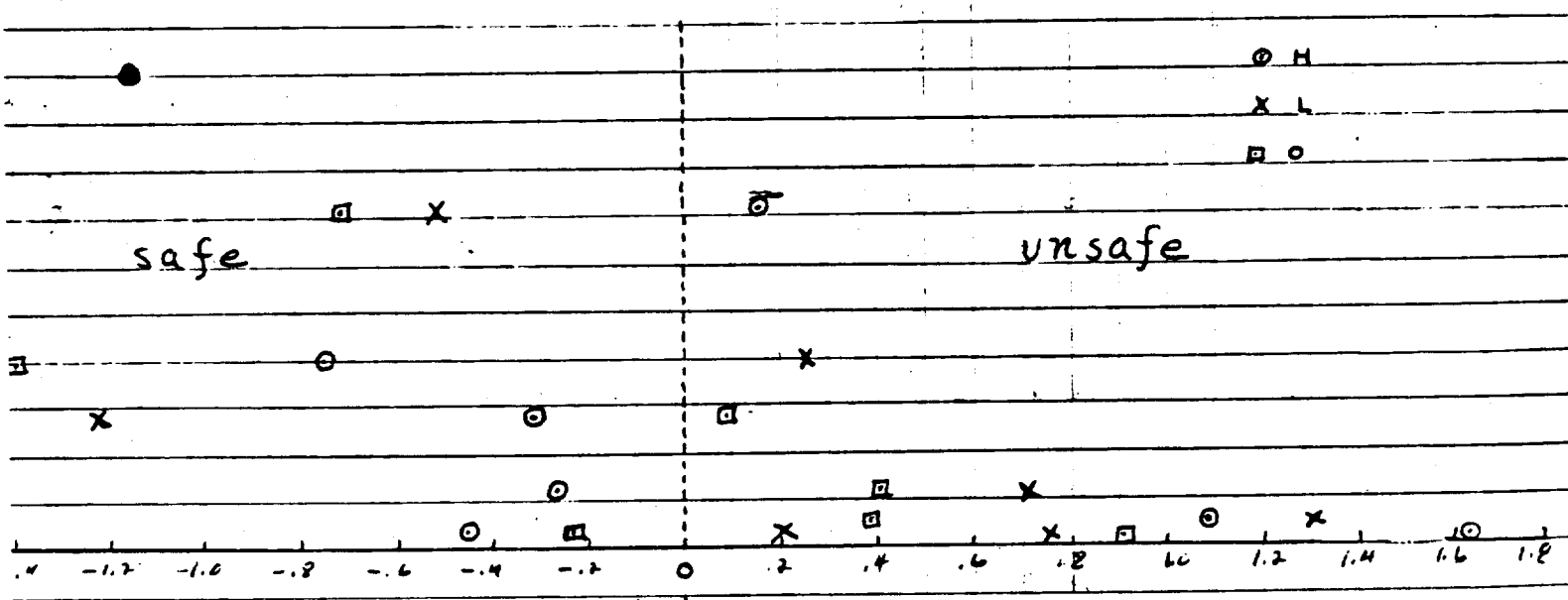
300 Blast Verifications

[redacted]



log (X/T)



log (X/T)

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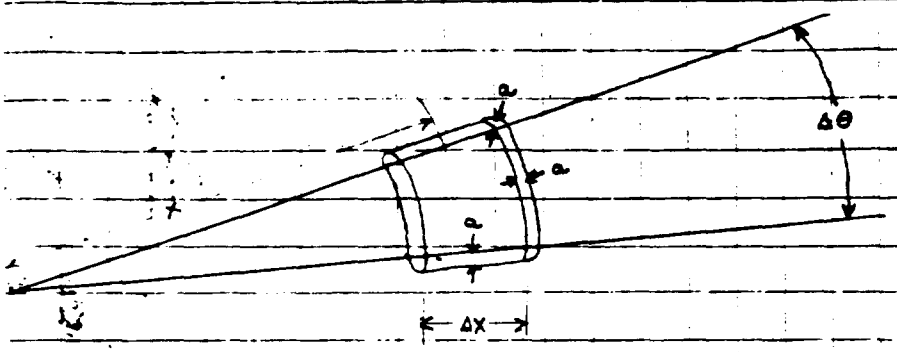
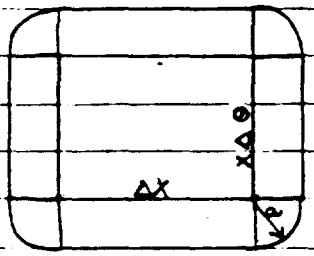


$\Delta\Theta$ is determined by the layer thickness; center level of consideration is, as determined by the weighted space-time hodograph.

Approximate the area of interest:



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Total area $A = \Delta X \cdot X\Delta\Theta + 2a X\Delta\Theta + 2a\Delta X + \pi a^2$

$= X\Delta\Theta(\Delta X + 2a) + 2a\Delta X + \pi a^2$

M = total number of megacuries, at one hour, in the layer Δh, contained on particles which fall between x and $x+\Delta X$.

Activity on ground in the total area $= M t^{-1.2}$

where t = the time of fall from level i to the surface at distance x

Intensity on ground at time of fall I_t:

$$I_t = \frac{3.34\, M t^{-1.2}}{X\Delta\Theta(\Delta X + 2a) + 2a\Delta X + \pi a^2} \qquad \frac{\text{R}\cancel{\text{ons}}^2}{\text{hr}} \quad \frac{\text{Mc}}{\text{n}\cancel{\text{o}}\text{mi}^2}$$

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$$D_{inf} = 5 I_t t = \frac{16.7\, M t^{-.2}}{X\Delta\Theta(\Delta X + 2a) + 2a\Delta X + \pi a^2}$$

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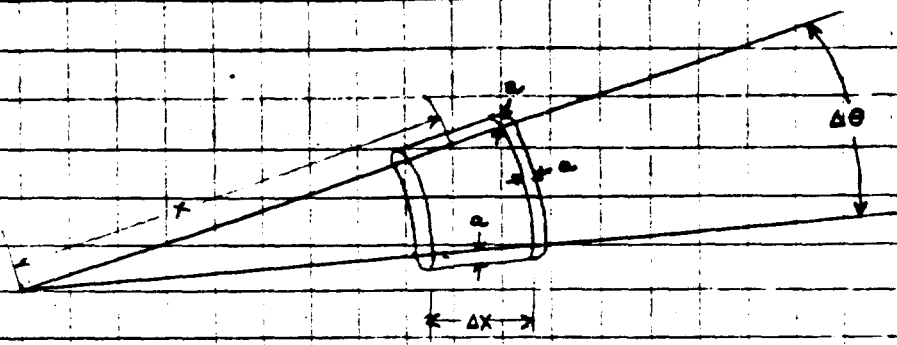
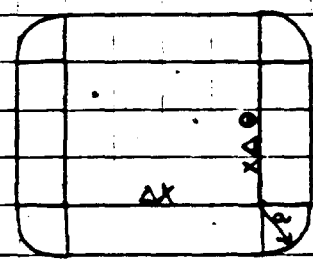
Fallout Forecasting

[redacted]



Δθ is determined by the layer thickness; center level a
as determined by the weighted space-time hodograf

Approximate the area of interest:



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Total area $A = \Delta X \cdot X\Delta\theta + 2aX\Delta\theta + 2a\Delta X$

$= X\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2$

M = total number of megacuries, at one hour, in
contained on particles which fall between X and

Activity on ground in the total area = Mt^{-1}
where t = the time of fall from level i to
distance X

Intensity on ground at time of fall I_t:

$$I_t = \frac{3.34\ M t^{-1.2}}{X\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2} \quad \frac{R}{hr\ Mc}$$

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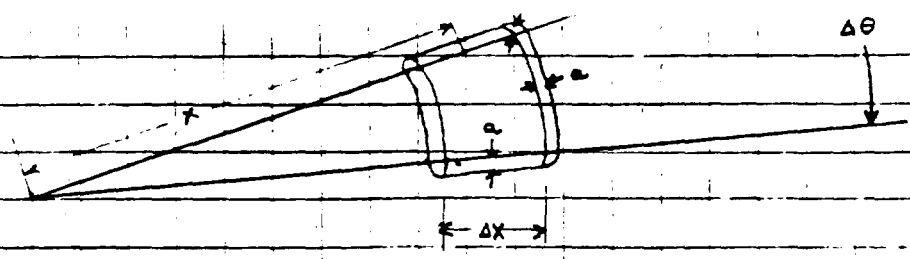
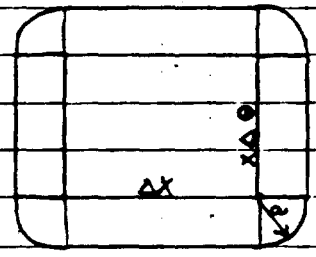
$$Dinf = 5 I_t t = \frac{16.7\ M t^{-.2}}{X\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2}$$



Δθ is determined by the layer thickness; center level a
as determined by the weighted space-time hodogra

Approximate the area of interest:



Total area $A = \Delta X \cdot X\Delta\theta + 2aX\Delta\theta + \pi 2a\Delta X$
$= X\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2$

M = total number of megacuries, at one hour, ...
contained on particles which fall between X an

Activity on ground in the total area = Mt^{-}
where t = the time of fall from level i to
distance X

Intensity on ground at time of fall I_t:

$$I_t = \frac{3.34\, M t^{-1.2}}{X\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2} \quad \frac{R}{hr\ M}$$

$$D_{inf} = 5 I_t t = \frac{16.7\, M t^{-.2}}{X\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2}$$

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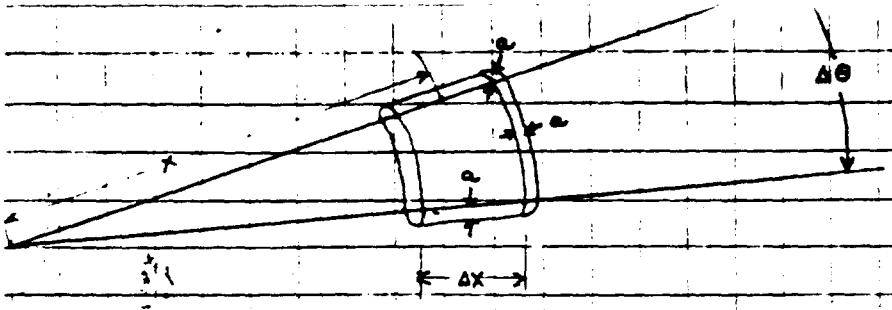
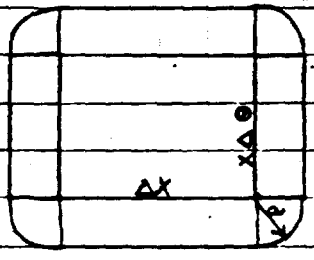


$\Delta\Theta$ is determined by the layer thickness; center level of consideration is, as determined by the weighted space-time hodograph.

Approximate the area of interest:



Total area $A = \Delta X \cdot X\Delta\Theta + 2aX\Delta\Theta + 2a\Delta X + \pi a^2$

$= X\Delta\Theta(\Delta X + 2a) + 2a\Delta X + \pi a^2$

M = total number of megacuries, at one hour, in the layer Δh, contained on particles which fall between X and $X+\Delta X$.

Activity on ground in the total area $= M t^{-1.2}$
where t = the time of fall from level i to the surface at distance X.

Intensity on ground at time of fall I_t:

$$I_t = \frac{3.3\,M t^{-1.2}}{X\Delta\Theta(\Delta X + 2a) + 2a\Delta X + \pi a^2}$$

$\frac{R}{hr}$ ~~$\frac{mi^2}{Mc}$~~ $\frac{Mc}{mi^2}$

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$$D_{inf} = 5 I_t t = \frac{16.7\,M t^{-.2}}{X\Delta\Theta(\Delta X + 2a) + 2a\Delta X + \pi a^2}$$

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LCC35 0055

42 Blast Forecast Verifications.

	T	# Fcst. H	O	L	*	log X/T H	O	L
1	500	500	50	90	out	0	-1	-.745
2	8	350	65	45		1.641	.908	.748
3	25	300	60	(500)		1.079	.380	1.301
4	65	35	160	330		-.268	.398	.708
5	500	500	45	45	out	0	-1.046	-1.046
6	200	35	9	360		-.745	-1.398	.255
7	140	70	170	8		-.301	.079	-1.222
8	360	(500)	70	110		.146	-.721	-.509
9	17	(6)	10	28		-.456	-.229	.204
10	500	500	360	220	out	0	-.143	-.357
11	500	35	500	500	out	-1.155	0	0
12	53	(6)	32	(6)		-.947	-.219	-.947
13	6	6	-	17	out	0	-	.452
14	70	18	(6)	9		-.590	-1.067	-.889
15	14	17	(6)	(6)		.083	-.368	-.368
16	14	90	(6)	40		.808	-.368	.456

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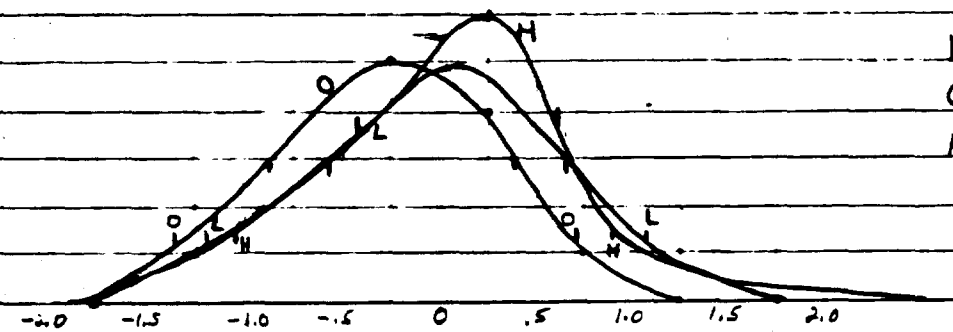

log X/T

Probable erro

L +0.65, -0.
O +0.40, -0.
H +0.60, -0.

L +45, -
O +2.5, -
H +4.0, -.

L +1.9, -
O +1.5, -
H +1.8, -1.

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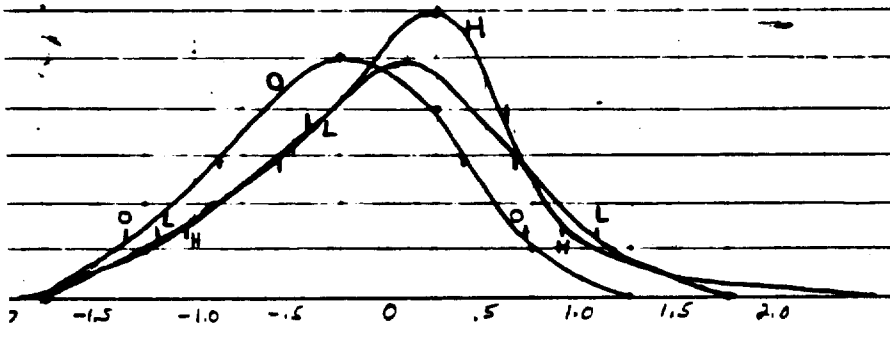
Blast Forecast Verifications.

[redacted]

# Fest.	O	L	X	H	O	L
					log X/T	
0	50	90	out	0	-1	-.745
0	65	45		1.641	.908	.748
0	60	(500)		1.079	.380	1.301
5	160	330		-.268	.388	.708
0	45	45	out	0	-1.086	-1.046
-	9	360		-.745	-1.398	.255
0	170	8		-.301	.079	-1.222
20	70	110		.146	-.721	-.509
2	10	28		-.456	-.229	.204
0	360	220	out	0	-.143	-.357
-	500	500	out	-1.155	0	0
2	32	(6)		-.947	-.219	-.947
	-	17	out	0	-	.452
P	(6)	9		-.590	-1.067	-.889
7	(6)	(6)		.083	-.368	-.368
0	(6)	40		.808	-.368	.456



log X/T

Probable errors

L	+0.65,	-0.60
O	+0.40,	-0.95
H	+0.60,	-0.40

log X/T

L	+4.5,	-4.0
O	+2.5,	-7.0
H	+4.0,	-2.5

X/T

L	+1.9,	-1.8
O	+1.5,	-2.4
H	+1.8,	-1.5

P_x/P_T

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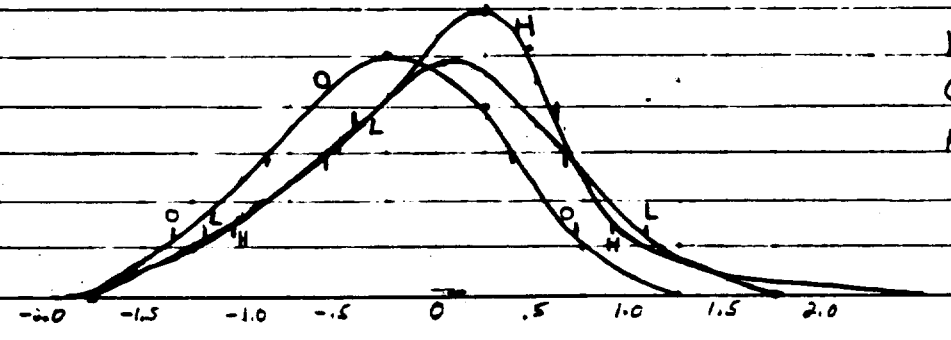
3	25	300	60	(500)		1.079	.380	1.301
4	65	35	160	330		-.268	.398	.708
5	500	500	45	45	out	0	-1.046	-1.046
6	200	35	9	360		-.745	-1.398	.255
7	140	70	170	8		-.301	.079	-1.222
8	360	(500)	70	110		.146	-.721	-.509
9	17	(6)	10	28		-.456	-.229	.204
10	500	500	360	220	out	0	-.143	-.357
11	500	35	500	500	out	-1.155	0	0
12	53	(6)	32	(6)		-.947	-.219	-.947
13*	6	6	-	17	out	0	-	.452
14	70	18	(6)	9		-.590	-1.067	-.889
15	14	17	(6)	(6)		.083	-.368	-.368
16	14	90	(6)	40		.808	-.368	.456

Probable erro

L +0.65, -0.6
O +0.40, -0.8
H +0.60, -0.4



L +4.5, -
O +2.5, -
H +4.0, -2

L +1.9, -1.
O +1.5, -2.
H +1.8, -1.

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[redacted]

* indicates 6 or 500 # tests

$t = x/\bar{v}$ $\qquad x = \bar{v}t$

$$D_{inf} = \frac{16.7\,M\,t^{-1.2}}{x\Delta\theta(\Delta x + 2a) + 2a\Delta x + \pi a^2}$$

$$= \frac{16.7\,M\,t^{-1.2}}{\bar{v}t\Delta\theta(\Delta x + 2a) + 2a\Delta x + \pi a^2} \qquad \Delta\theta \text{ in}$$

$$= \frac{957\,M\,t^{-1.2}}{\bar{v}t\Delta\theta(\Delta x + 2a) + 2a\Delta x + \pi a^2} \qquad \Delta\theta$$

$$= \frac{957\,M}{\bar{v}t^{1.2}\Delta\theta(\Delta x + 2a) + t^{0.2}[2a\Delta x + \pi a^2]}$$

For $\Delta\theta$ small, $\to 0$: (how small depends

$$D_{inf} = \frac{957\,M}{t^{0.2}[2a\Delta x + \pi a^2]}$$

For $\Delta\theta$ large: ($x\Delta\theta >> a$)

$$D_{inf} = \frac{957\,M}{\bar{v}t^{1.2}\Delta\theta(\Delta x + 2a)}$$

a & Δx in sec
$\bar{v}$ in knots,
t in hours
$\Delta\theta$ in degrees

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Express ① in terms of t and Δt:

$$D_{inf} = \frac{957\,M}{\bar{v}t^{1.2}\Delta\theta(\bar{v}\Delta t + 2a) + t^{0.2}[2a\bar{v}\Delta t + \pi a^2]}$$

Continue on page 73

$= X/\bar{v}$ $\qquad X = \bar{v}t$

$$D_{inf} = \frac{16.7\,M\,t^{-.2}}{X\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2}$$

$$= \frac{16.7\,M\,t^{-.2}}{\bar{v}t\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2} \qquad \Delta\theta \text{ in radians}$$

$$= \frac{957\,M\,t^{-.2}}{\bar{v}t\Delta\theta(\Delta X + 2a) + 2a\Delta X + \pi a^2} \qquad \Delta\theta \text{ in degrees}$$

$$= \frac{957\,M}{\bar{v}t^{.8}\Delta\theta(\Delta X + 2a) + t^{0.2}[2a\Delta X + \pi a^2]} \qquad (1)$$

or $\Delta\theta$ small, $\to 0$: (how small depends upon a and X)

$$D_{inf} = \frac{957\,M}{t^{0.2}[2a\Delta X + \pi a^2]}$$

or $\Delta\theta$ large: $(X\Delta\theta >> a)$

$$D_{inf} = \frac{957\,M}{\bar{v}t^{.8}\Delta\theta(\Delta X + 2a)}$$

a & ΔX in sea miles
$\bar{v}$ in knots, mean speed to layer i
t in hours
$\Delta\theta$ in degrees

(1) in terms of t and Δt:

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$$_{inf} = \frac{957\,M}{\bar{v}t^{.8}\Delta\theta(\bar{v}\Delta t + 2a) + t^{0.2}[2a\bar{v}\Delta t + \pi a^2]}$$

Continue on page 73

LCC35 0661

[redacted]

Cab weight : 36 tons

300' tower + guys (no cab) = 48 tons

500' tower + guys (no cab) = 300 tons

700' tower + guys (no cab) = 465 tons

Balloon pay + cab : 1 ton

Take uniform 10 tons for device + shields etc in tower c

Balloon cables : ½ #/ft. Four each balloon

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[redacted]

cab weight: 36 tons

300' tower + guys (no cab) = 48 tons

500' tower + guys (no cab) = 300 tons

200' tower + guys (no cab) = 465 tons

pay + cab : 1 ton

also uniform 10 tons for device + shields etc in tower cable.

cables : ½ #/ft. Four each balloon

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[redacted]

* 25 January Schedule

Fallout for Plumbbob Data sent to Reeves wk of Jan.

	Shot	Yield	Height	Weight of Metals in Fireball	Metal Fallout	Dust Fallout
June						
1	Boltzmann 15 May		500' tower	.292 tons	175 Mc	33 M
2	Wilson 8 June		500' balloon	1	1	23
8	Lassen 2 July		300' balloon	1	1	0
			~~300' tower~~			
15	Franklin 15 May		500' balloon	1	1	0
20	Priscilla 15 June		700' balloon	2	1	190
			~~750 balloon~~			
24	La Place July		300' tower	81	49	1
25	Diablo		500' tower	319	191	96
28	Hood 27 June		1500' balloon	2	1	0
July						
4	Owens 5 July		400' balloon	1	1	12
9	Shasta		500' tower	319	191	96
15	Kepler		500' tower	292	175	33
19	Huygens 1 Aug		surface	2	1	4
			20,000			
19	John		18,000' rocket	0	0	0
22	Doppler Aug		700' balloon	1	1	0
Aug						
1	Newton 25 July 70		1500' balloon	2	1	0
8	Whitney		500' tower	319	191	96
19	Smokey		700' tower	497	298	134 3
			500' balloon			
26	Everest		300' balloon	1	1	7
Sept						

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Fallout for Plumbbob Data sent to Reeves wk of Jan. 21, 1957

Yield	Height	weight of Nichols Metal in Fireball	Metal Fallout	Dust Fallout	Total Fallout
	500' tower	292 tons	175 Mc	33 Mc	208 Mc
	500' balloon	1	1	23	24
	300' balloon	1	1	0	1
	~~300' tower~~ 500' balloon	1	1	0	1
	700' balloon	2	1	190	191
	~~750 balloon~~ 300' tower	81	49	1	50
	500' tower	319	191	96	287
	1500' balloon	2	1	0	1
	400' balloon	1	1	12	13
	500' tower	319	191	96	287
	500' tower	292	175	33	208
	surface	2	1	4	5
	~~20,000~~ 18,000' rocket	0	0	0	0
	700' balloon	1	1	0	1
	1500' balloon	2	1	0	1
	500' tower	319	191	96	287
	700' tower	497	298	370	668
	500' balloon 00' balloon	1	1	78	79
1st	400' tower	292	175	33	208

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			Yield	Height	in Fireball	Fallout	
June							
1	Baltzmann	15 May	500' tower	.292	tons	175 Mc	3
2	Wilson	8 June	500' balloon	1		1	2
8	Lassen	2 June	300' balloon	1		1	
15	Franklin	15 May	~~300' tower~~ 500' balloon	1		1	
20	Priscilla	15 June	700' balloon	2		1	1
24	La Place	July 1	~~750 balloon~~ 300' tower	81		49	
25	Diablo		500' tower	319		191	9
28	Hood	27 June	1500' balloon	2		1	
July							
4	Owens	5 July	400' balloon	1		1	
9	Shasta		500' tower	319		191	
15	Kepler		500' tower	292		175	3
19	Huygens	1 Aug	sfc	2		1	
			20,000				
19	John		18,000' rocket	0		0	
22	Doppler	Aut	200' balloon	1		1	
Aug							
1	Newton	25 July 70	1500' balloon	2		1	
8	Whitney		500' tower	319		191	9
19	Smokey		700' tower	497		298	
			500' balloon				
26	Everest		00' balloon	1		1	
Sept							
1	Galileo	1	500' tower	292		175	3
8	Fizeau		500' tower	268		161	
10	Morgan		500' balloon	1		1	

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May	500' tower	292 tone	175 Mc	33 Mc	208 Mc
ne	500' balloon	1	1	23	24
ne	300' balloon	1	1	0	1
May	300' ~~tower~~ balloon 500' balloon	1	1	0	1
ne	700' balloon	2	1	190	191
ly 1	750 balloon 300' tower	81	49	1	50
	500' tower	319	191	96	287
ne	500' balloon	2	1	0	1
ly	00' balloon	1	1	12	13
	00' tower	319	191	96	287
	500' tower	292	175	33	208
ng	s fc	2	1	4	5
	20,100 18,000' rocket	0	0	0	0
t	700' balloon	1	1	0	1
July	1500' balloon	2	1	0	1
	500' tower	319	191	96	287
	700' tower	497	298	370	668
	500' balloon 300' balloon	1	1	78	79
	500' tower	292	175	33	208
	500' tower	268	161	7	168
	500' balloon	1	1	0	1

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1/8/89

Reeve's Curves 22 Jan, 1957 [redacted]

W: 50 Kt Standard Towers & Cabs: Device + Shelter

h	Weight of metals in fireball	Metal Fallout	Dust Fallout	Total Fallout
300	94 tons 110 (built up 300') 286 (cut down 500')	56 Mc 66 172	1860 Mc	1916 1486 1592
400			1420	
500	346	208	960	1168
600	396	238	650	888
700	497	298	370	668
800	↓	↓	190	488
900			60	358
1000			13	311
1100			0	298

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Reeve's Curves 27 Jan, 1957 [redacted]

t Standard Towers + Cabs: Device + Shielding, etc, 10 tons.

Weight of metals in fireball	Metal Fallout	Dust Fallout	Total Fallout
94 tons	56 Mc	1860 Mc	1916
110 (built up 300')	66		1486
286 (cut down 500')	172	1420	1592
346	208	960	1168
396	238	650	888
497	298	370	668
↓	↓	190	488
		60	358
		13	311
		0	298

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-T

Pop. vs EBD [redacted]

-½	½-1	1-1½	1½-2	2-2½	2½-3	3-3½	3½-4	4-4½
	590							
	55							
	505							
	5							
	266	435	25					
	25	0	500					
	0	0	0	0	0	0	7	
	0	580	0	0	0	0	0	200
	864	342	2298	570	5960	32		
	0	400						
	25	0	0	0	25			
	10							

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Rap. vs. [redacted]

Shot	¼-½	½-1	1-1½	1½-2	2-2½	2½-3	3-3½
Jungle Sfc	0						
" U	500						
TS-5	357	500					
-6	1917	55					
-7	105	505					
-8	0	5					
UK-1	5938	266	435	25			
-2	95	25	0	500			
-3	0						
-5	0						
-6	0	0	0	0	0	0	0
-7	15	0	580	0	0	0	0
-9	7816	864	342	2298	570	5960	32
-10	0						
-11	0						
T -Moth	0						
-Tesla	0						
-Turk	50						
-Hornet	10						
-Bee	0						
-Ess	0						
-Apple	5	0	400				
-Post	0						
-Met	1900	25	0	0	0	25	
-Apple II	362	10					
-Zucchini	397						

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Site 300 Containment Test [redacted] μb

31 Jan 50# Completely covered Barrel (Coil drum)

Earth Overburden, ft	Pressure at Saddle, μb
0	240
1	180 $P_o = 222$
3	60 $P_o = 185$
0	180

1 Feb 10# Completely covered Barrel.

Overburden	μb
0	80
2	20 $P_o = 84$
3	30 $P_o = 90$
0	90

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W	Overburden ft	P_{ft}/P_{0ft}
50#	1 c	0.81
↓	3 c	0.32
10#	2 c	0.24
↓	3 c	0.33
25#	2 c	0.47
75#	2 c	0.25
25#	1 090°	0.87
↓	2 090°	0.83
	3 090°	0.48
	1 090°	0.67
10#	2 090°	0.50
↓	2 00°	1.00

5 Feb 25# Overburden

0	[illegible]
2	80 P_o
75# 2	LLNL EO P
25# 0	140
± 6 inches	142

Site 300 Containment [redacted] cross, overburden ± ½ μb -0+10%

Item 50# Completely covered barrel (coil drum)

Earth Overburden, ft	Pressure at Saddle, μb	Δt
0	240	
		30 min
1	180 $P_0 = 222$	
		60 min
3	60 $P_0 = 185$	
		8 min
0	180	

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Completely covered barrel.

Overburden	μb	Δt
0	80	
		23 min
2	20 $P_0 = 84$	
		30 min
3	30 $P_0 = 90$	
		4 min.
0	90	

Overburden ft.	$P_\theta / P_{0°}$
1 C	0.81
3 C	0.32
2 C	0.24
3 C	0.33
2 C	0.47
2 C	0.25
1 090°	0.87
2 090°	0.83
3 090°	0.48
1 090°	0.67
2 090°	0.50
2 00°	1.00

5 Feb. 25# closed barrel

25# Overburden	μb	Δt
0	200	
		30 min
2	80 $P_0 = 169$	
		18 min
7.5# 2	60 $P_0 = 247$ (exp .43)	
		9 min
25# 0	140	
± 6 inches		

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Meeting Jan 4-17 Albuquerque

[redacted]

Assigned space: Barracks Y

WX	45
FOPU	5
BPU	4
	54
Max capacity	63

Q

WX	1 Mac
FOPU	1 S
BPU	1 Reed

What will be done on cloud dimension measuring? long

Sherman will: write up techniques for space-time calcula

Program 37.2A

Max of 7 arcs, routinely to 300 miles.
special to Miss. river.

1 Team	25 stations at 1 mi intervals,	R ~ 30
1	25	50
2	30	80-100
2	40	120
2	40	150
2	40	200
3	65	275-300

BEST AVAILABLE COPY

Communications phone + radio (aircraft relay)

Need to know:

LLNL

D-2	2100 hrs	Est HOT (line	144
D-1	0930	" "	people 57
H-6½	plane goes up with Kerm		
	Set up	30, 50, 20 mi	
H-4	" "	120, 150	"
H-0	" "	200, 300	"

ting Jan 4-17 Albuquerque [redacted]

space: Barracks Y WX 45
FOPU 5
BPU 4
54
Max capacity 63

Q WX 1 Mac
FOPU 1 5
BPU 1 Reed

ill be done on cloud dimension measuring? long range trajectories?

will: write up techniques for space-time calculation.

m 37.2A

BEST AVAILABLE COPY

Max of 7 arcs, routinely to 300 miles.
special to Miss. river.

am

25 stations at 1 mi intervals, R ~ 20		ave length 25 mi
25	50	50
30	80-100	80
40	120	80
40	150	120
40	200	120
65	275-300	195

Communications phone + radio (aircraft relay)

ed to know:

LLNL

D-2	2100 hrs	Est hot line	
D-1	0930	" " people start to move	145
H-6½	plane goes up with Kermit		
	Set up 30, 50, 80 mi R arcs.		
H-4	" " 120, 150 " " "		
H-0	" " 200, 300 " " "		

FOPU 5
BPU 4
5#

Max capacity 63

Q Wx 1 Max
FOPU 1 3
BPU 1 Red

What will be done on cloud dimension measuring

Sherman will: write up techniques for space-time

Program 37.2A

Max of 7 ares, routinely to 300 mi
special to Miss. river

1 Team	25 stations	at 1 mi intervals
1	25	
2	30	
2	40	
2	40	
2	40	
3	65	

BEST AVAILABLE COPY

Communications phone + radio (aircraft relay)

Need to know:

D-2	2100 hrs	Est HOT time
D-1	0930	"
	H-6½	plane goes up with Sc
		Set up 20 50 20
	H-4	" " 120 150
	H-0	" " 200, 3
	H+4	Pattern as known for LLNL
D-0	Evening	" "
	Aircraft Survey	D+1 morning

Sp. t. Mexico D 0 Mx Mx I 1

FCPU 5
BPU 4
54
Max capacity 63

Q Wx 1 Mac
FUPU 1 5
BPU 1 Reed

will be done on cloud dimension measuring? long range trajectory
man will: write up techniques for space-time calculations.

gram 37.2A

Max of 7 arcs, routinely to 300 miles.
special to Miss. river.

Team	25	stations at 1 mi intervals, R ~ 20	arc length 31
	25	50	31
	30	80-100	1
	40	120	
	40	150	
	40	200	
	65	275-300	

BEST AVAILABLE COPY

Communications phone + radio (aircraft relay)

Need to know:

D-2	2100 hrs	Est hot line	LLNL
D-1	0930	" " people start to move
	H-6½	plane goes up with Kermit	
		Set up 20, 50, 80 mi R arcs	
	H-4	" " 120, 150 " " "	
	H-0	" " 200, 300 " " "	
	H+4	Pattern as known + fast (shot time and
D-0	Evening	" " " " to 7200 m
	Aircraft Survey D+1 morning		

Santa Monica: Del Mar Motel

37.2A (cont) [redacted]

Plan to cover 8 tower shots + high yield balloon
10-12 total

MAPS

Scales			
	1:500,000	1000 ea	long 119° to 112.5°
	1:1,000,000	5000 "	Long " "
	1:3,000,000	1500 with contours	" 125° to 90°
		4000 without "	

2000' contours
<4000' white
4-8000' light shading
7 8000' less light shading

Lambert Conformal, Yucca long N-S

½° grid on 1:500,000
1:1,000,000
"internal" 1:3,000,000

BEST AVAILABLE COPY

LLNL

37.2A (cont) [redacted]

on to cover 8 tower shots + high yield bellows
10-12 total

MAPS

scales 1:500,000 1000 ea long 119° to 117.5° Lat 35°-40°
1:1,000,000 500 " long " " " "
1:3,000,000 1500 with contours " 125° to 96° 49°-31°
4000 without "

2000' contours
<4000' white
4-8000' light shading
7-8000' less light shading

Lambert conformal, Yucca long N-S straight.

½° grid on 1:500,000
" interval 1:1,000,000
1:3,000,000

BEST AVAILABLE COPY

Peaceful Uses of Atomic Explosives. [redacted]

"Contamination Problems"

Fallout from 100 Kt/surf. many sectioned linear sour

100Kt DELETED ~~23 sec~~

Width	500 R/hr	Ht 1 hr.	~~2.3~~ 1.6 miles
Length	"	"	~~+5.8~~ 3.5 miles
			- ~~0.4~~ 0.3 miles
	250 R/hr		
Width			~~4.3~~ 2.9 miles
Length			+ ~~8.3~~ 5.6 miles
			- ~~1.6~~ 0.7 miles
	100 R/hr		
Width			~~7.3~~ 5.6 miles
Length			+ ~~20~~ 13.6 miles
			- ~~2.5~~ 1.5 miles
	50 R/hr		
Width			~~17~~ 9.2 miles at ~~7~~ 4
Length			- ~~5~~ 3 miles
	10 R/hr	Width	~~25~~ 17 miles at
		Length	- ~~4~~ 3.7 miles
	1 R/hr	w. Ith	~~35~~ 24 miles
		Length	- ~~4~~ 4 miles

BEST AVAILABLE COPY

Scaling from Tewa:

LLNL

10 R/hr Ht 1 to 100 miles.

50 R/hr. to 50 miles.

1 R/hr to ~~200~~ 150 miles.

Peaceful Uses of Atomic Explosives. [redacted]

tomination Problems"

from 100 Kt/sub. many sectioned linear series 100m spacing.

DELETED

Width 500 R/hr HI 1 hr. 1.6 miles
Length " " " 5.8 miles
0.3 miles

250 R/hr
Width 2.9 miles
Length + 0.3 miles
0.1 miles.

100 R/hr.
Width 5.6 miles
Length + 1.3.6 miles
1.5 miles

50 R/hr.
Width 9.2 miles at 14 miles.
Length 5 miles.

10 R/hr. width 17 miles at 14 miles
length 3.7 miles.

1 R/hr. width 24 miles at 14 miles
length 4 miles.

BEST AVAILABLE COPY

Scaling from Texas:

LLNL

10 R/hr HI to 100 miles.

50 R/hr. to 50 miles.

1 R/hr to 200 miles.

LCC35 0187

Item 21 Open barrel end 90° to recorder
25 #

Overburden	μb	Δt
Trial 2 1		
(0) 0	(180) 144.	(4) 5 min
(1) 1	$p_0 = 18'$ (120) 126 $p_0 = 145$	5 min
2	120 $p_0 = 147$	5 min
3	72 $p_0 = 149$	5 min
0	150	

Open and a

Overburden	
0	1
2	6
2	opening a
0	

BEST AVAILABLE COPY

Week of March 18

Open	25 #	90 μb	3:10 PM
Bare Core with 2 Sand bags on top	75 #	100 μb	3:25
Covered (3') bomb	75 #	90 μb	4:40
Open	25 #	80 μb	4:50

Bare bag

If: 75# covered gives 90 μb
and 75# bare gives 270 μb
and 25# bare gives 81 μb

then: $P = KW^{\alpha}$

$81 = K25^{\alpha}$

$270 = K75^{\alpha}$

$\frac{81}{270} = \left(\frac{25}{75}\right)^{\alpha}$

$0.300 = 0.333^{\alpha}$

$9.477-10 = \alpha(9.522-10)$

$0.523 = 0.478\,\alpha$

$\alpha = 1.094$

and 75# bare

$81/180 = (25/75)$

$0.45 = 0.333$

$9.653-10 = -0.47$

$\alpha = 0.726$

and $\alpha = 0.43$;

LLNL

$81/x = 0.333$

$x =$ 81/

$= 130$

$\frac{75}{x} = \frac{(90/130)^{.43}}{} = 0.692^{.43}$

300 Containment Tests [redacted]

21 Open barrel end 90° to recorder
25 #

enbundle		μb	Δt	Open end at 90°		10 #	
0		(180) 144.		Onbundle		μb	Δt
			(4) 5 min	0		120	
1	p_0=18	(120) 126 p_0=145					8 min
			5 min	2		60 p_0=120	
2		120 p_0=147					11 min
			5 min	2	opened at 0	120 p_0=120	
3		72 p_0=149					13 min
			5 min	0		~~150~~ 120	
0		150					

BEST AVAILABLE COPY

of March 18

on	25 #	90 μb	3:10 PM		
e with					
bags on top	75 #	100 μb	3:25	Bare background	88 μb
l barrels	75 #	90 μb	4:40	" "	81 μb
	25 #	80 μb	4:50		

75# covered gives 90 μb
nd 75# bare gives 270 μb
nd 75# bare gives 81 μb

$P = KW^{\alpha}$
$81 = K25^{\alpha}$
$270 = K75^{\alpha}$
$81/270 = (25/75)^{\alpha}$
$0.300 = 0.333^{\alpha}$
$477-10 = \alpha(9,522-10)$
$0.523 = 0.478\alpha$
$\alpha = 1.094$

$r5/\chi = (90/130)^{1.43} = 0.682^{1.43}$
~~= 8 SH~~

and 75# bare gives 180 μb

$81/180 = (25/75)^{\alpha}$
$0.45 = 0.333^{\alpha}$
$9.653-10 = -0.478\alpha = 0.347$
$\alpha = 0.726$

LLNL

and $\alpha = 0.43$:

$81/\chi = 0.333^{0.43}$ 153

$\chi = 81/0.333^{.443} = 81/.623$

= 130.1

Overburden		μb	Δt	Overburden
Trial 2 1				
(0) 0		(180) 144.		0
			(4) 5 min	
(1) 1		p₀=18 (120) 126 p₀=145		2
			5 min	
2		120 p₀=147		2
			5 min	
3		72 p₀=149		0
			5 min	
0		150		

Open and ax

Overburden

0 12

2 6c

2 opening at 12

0 12

Week of March 18

BEST AVAILABLE COPY

Open	25 #	90 μb	3:10 PM
Bare Core with 2 Sand bags on top	75 #	100 μb	3:25
Covered (3') Small	75 #	90 μb	4:40
Open	25 #	80 μb	4:50

Bare location

"

If: 75# covered gives 90 μb
and 75# bare gives 270 μb
and 75# bare gives 81 μb
then:

$P = KW^{\alpha}$

$81 = K25^{\alpha}$

$270 = K75^{\alpha}$

$81/270 = (25/75)^{\alpha}$

$0.300 = 0.333^{\alpha}$

$9.477-10 = \alpha(9.522-10)$

$0.523 = 0.478\alpha$

$\alpha = 1.094$

and 75# bare gives:

$81/180 = (25/75)^{\alpha}$

$0.45 = 0.333^{\alpha}$

$9.653-10 = -0.478\alpha =$

$\alpha = 0.726$

and $\alpha = 0.43$:

$81/x = 0.333^{0.43}$

$x = 81/0.333^{0.43}$

LLNL

$= 130$ μb

~~$75/x = (90/130)^{.43} = 0.692^{.43}$~~

~~$= 0.854$~~

~~$x = 75/0.854 = 88$~~

$90/130 = (75/x)^{.43}$

$-.1599 = 0.43[1.8751 - \log x]$

$\log x = 2.2465 \quad x = 176$ #

154

$180/90 = 1.44$

$176/75 = 2.34$

Run	μb	#
1		
2	(180) 144.	
	(4) 5 min.	
	p=18 (120) 126 p=145	
	5 min	
	120 p=147	
	5 min	
	72 p=149	
	5 min	
	150	

Open end at 90°

Run	μb	#
0	120	
	8 min	
2	60 p=120	
	11 min	
2	120 p=120	
	13 min	
0	120	

BEST AVAILABLE COPY

March 18

25 # 90 μb 3:10 PM

with

on top	75 #	100 μb	3:25	Bare background	89 μb
with	75 #	90 μb	4:40	" "	81 μb
	25 #	80 μb	4:50		

75# covered gives 90 μb
75# bare gives 270 μb
25# bare gives 81 μb

$P = KW^{\alpha}$

$81 = K25^{\alpha}$

$270 = K75^{\alpha}$

$81/270 = (25/75)^{\alpha}$

$0.300 = 0.333^{\alpha}$

$-10 = \alpha(9.522-10)$

$.523 = 0.478\alpha$

$\alpha = 1.094$

$= (90/130)^{.43} = 0.692^{.43}$

$= 0.854$

$75/0.854 = 88$

$(75/X)^{.43}$

$9_{6K} = 0.43[1.8751 - \log X]$ $X = 174\#$

and 75# bare gives 180 μb

$81/180 = (25/75)^{\alpha}$

$0.45 = 0.333^{\alpha}$

$9.653-10 = -0.478\alpha = 0.347$

$\alpha = 0.726$

and $\alpha = 0.43$:

$81/X = 0.333^{0.43}$

$X = 81/0.333^{.443} = 81/.623$

$= 130$ μb

$130/90 = 1.44$

$174/75 = 2.34$

[redacted]

LLNL
155

TD's effects Curves

[redacted]

Yield	Height	W
11	500'	.02
15	500'	0.6
2	300'	1.7
1.7	750'	2
0.6	300'	3.5
3.5	400' 600'	3.5
50	700'	8
70	1500'	11
8	500'	15
40	700'	40
.02	20	50
		70

Peak Overpressures 1, 5, 10, 30, 50, 100 psi $\frac{h_w}{W^{1/3}}$ d_{HE}

ΔP, psi	ΔP = 1 psi:	W	h	h (kft)	
1		.02	20	74	1500 yds
↓		0.6	300	356	1625 yds
	—	1.7	750	627	1730 yds
		2.0	300	238	1580
		3.5	400	263	1600
		3.5	500	329	1620
		8	500	250	1590
		11	500	226	1580
		15	500	203	1575
		40	700	204	1575
		50	700	190	1570
		70	1500	364	1630

BEST AVAILABLE COPY

s effects Curves [redacted]

Height	W	h
500'	.02	20
500'	0.6	300
300'	1.7	750
750'	2	300
300'	3.5	400
400' 600'	3.5	500
700'	8	500
1500'	11	500
500'	15	500
200'	40	700
20	50	700
	70	1500

eak Overpressures 1, 5, 10, 30, 50, 100 psi distances

>=1 psi:	W	h	$\frac{h}{W^{1/3}}$ h(1kt)	d1kt	$d_1 \times W^{1/3} = d_W$
	.02	20	74	1500 yds	405 yds
	0.6	300	356	1625 yds	1370 yds
	1.7	750	627	1730 yds	2070 yds *
	2.0	300	238	1580	1990
	3.5	400	263	1600	2430
	3.5	500	329	1620	2460
	8	500	250	1590	3180
	11	500	226	1580	3510
	15	500	203	1575	3880
	40	700	204	1575	5380
	50	700	190	1570	5790
	70	1500	364	1630	6720

BEST AVAILABLE COPY

15	500'	0.6
2	300'	1.7
1.7	750'	2
0.6	300'	3.5
3.5	400' 600'	3.5
50	700'	8
70	1500'	11
8	500'	15
40	700'	40
.02	20	50
		70

Peak Overpressures 1, 5, 10, 30, 50, 100 psi d...

ΔP, psi	$\Delta P = 1$ psi:	W	h	$\frac{h}{W^{1/3}}$ h(1kt)	d_{1kt} c...
1		.02	20	74	1500 yds
2		0.6	300	356	1625 yds
		1.7	750	627	1730 yds
		2.0	300	238	1580
		3.5	400	263	1600
		3.5	500	329	1620
		8	500	250	1590
		11	500	226	1580
		15	500	203	1575
		40	700	204	1575
		50	700	190	1570
		70	1500	364	1630

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[redacted]

* Off 23-200 curves

[redacted]

LLNL

Tentative Shots, Yarger, Hardtack

[redacted]

DELETED

LLNL

ive Shots, Large, Hardstuck. [redacted]

DELETED

LLNL

LCC3: 0700

[redacted]

LLNL

[redacted]

LASL SHOT HUYGENS:

AREA

DELETED

Paul Tompkins request for Carsbie's program.

Needs shot which puts ≥ 1 R/hr @ 1 hr at ~ region.

Shot	Extent 1 R/hr line	width at 1psi dis-
43 Kt Smoky, 250 & 278m = 528 Mc T	> 7000 yds	~ 1000 yds.
Bee 8 Kt 500' T	2500 yds	
Apple 15 Kt 500' T	> 6000 yds 10 R/hr to 4000 yds	2000 yds
DELETED 10 Kt 500' T	~ 4500 yds	< 1000 yds
Zucchini 28 Kt 500'	10 R/hr to > 5000 yds.	

Marginal:

Area		
>	Boltzmann	11 Kt at 500' T
2	Diablo	12 " " " "
2	Shasta	" " " " "
4	Kepler	11 " " " "
2	Whitney	12 " " " "
1	Galileo	11 " " " "

BEST AVAILABLE COPY

LLNL

LASL SHOT HUYGENS; AREA 3 sfc

[redacted] DELETED

Tompkins request for Carsbie's program.

Needs shot which puts ≥ 1R/hr @ 1hr at or beyond 1psi in.

	Extent 1 R/hr line	width at 1psi distance	
78m Met	> 7000 yds.	~ 1000 yds.	1psi to 5000yds
500' T	2500 yds	0	
500' T	> 6000 yds 10R/hr to 4000 yds	2000 yds	1psi to 3300 yds.
500' T	~4500 yds	< 1000 yds with Apple winds	1psi to 3000 yds.
1000' T	10 R/hr to > 5000 yds.		1psi to ~ 4000 yds

1;

Boltzmann	11 KT at 500' T
Diablo	12 " " " "
Shasta	" " " " "
Spider	11 " " " "
Whitney	12 " " " "
Lilo	11 " " " "

BEST AVAILABLE COPY

LLNL

LCC35 0703

[redacted] Frequency of shooting Days fr. B [redacted]

#581

May – July 1955

[redacted]

May — total days (4) (one 2½ day period)

1500Z-2100Z 4 May } ¼ day

2100Z 19 May } 2½ days Cherokee fired 1751 20 May
thru 0300Z 22 May }

2100Z 26 May } ½ day
thru 0600Z 27 May }

1600Z 27 May } ¾ day Zuni fired 1756 27 May.
thru 0900Z 28 May }

June — total days (5) (no period longer than 1 day)

0900Z 3 June } 1 day
thru 0900Z 4 June }

2100Z 5 June } ¾ day
thru 1500Z 6 June }

1400Z 11 June } ¼ day Flathead fired 1826 11 June
thru 2000Z 11 June } 165

2100Z 16 June } 1 day
thru 1900Z 17 June } [redacted]

BEST AVAILABLE COPY

LLNL

LCC35 0706

June (Cont'd)

#58

[redacted]

0600Z 21 June } ½ day
thru 1800Z 21 June }

1000Z 25 June } 1 day — Dakota fired 1906Z 25 June
thru 1200Z 26 June }

0900Z 30 June } 2½ days — 3½ day in June / 2 days in July
thru 2100Z 2 July }

July – total days (9¼) — one 3¼ day period; one 2 day period; two 1½ day periods

1600Z 3 July } 3¼ days
thru 2100Z 6 July }

1200Z 7 July } 1½ days
thru 2100Z 8 July }

BEST AVAILABLE COPY

1800Z 9 July } 1 day — Navajo fired 1856Z 9 July
thru 1600Z 10 July }

1200Z 19 July } 1½ days
thru 0300Z 21 July }

LLNL

[redacted]

CCS 55 0707

74 Redwing Model S[redacted]

Level	f_o	$h = 44{,}000'$ MSL, $b = 4000'$ MSL d, μ
1	12.6	~~704~~
2	11.3	~~744~~
3	10.0	~~624~~
4	8.9	~~550~~
5	7.7	~~547~~
6	6.7	~~389~~
7	5.7	
8	4.9	
9	4.1	
10	3.43	
11	2.87	
12	2.38	
13	1.96	
14	1.63	
15	1.30	
16	1.05	
17	0.83	
18	0.65	
19	0.51	
20	0.39	

Level	f_o	$h = 44{,}000$ MSL, $b = 4000$ MSL d, μ	MSL h, kf+	σ
1	12.2	688	6	1.00
2	9.4	620	10	1.07
3	7.3	478	14	1.14
4	5.3	324	18	1.22
5	3.75	246	22	1.31
6	2.62	175	26	1.40
7	1.80	134	30	1.50
8	1.17	98	34	1.60
9	0.75	73	38	1.72
10	0.45	55	42	1.84

calc. for aerodynamic fall time correlated to Redwing f_o's

From page 73:

$$I_{inj} = \frac{1}{1.89 \times 10^{4}} [25(4.7\text{[illegible]})^{1.2} \times 5 (0.204 \times 25 + 6) + 4.72^{6.}$$

$$= \text{"} \quad [25 \times 5 \times 6.53 * 11.1 + 1.37 \times 59]$$

$$= \text{"} \quad \times 9141 \text{ [illegible]}$$

$$D_{inj} = \frac{18.9 \times 10^{3}}{9.14 \times 10^{3}} = 2.07 \times 10^{0} = 2$$

BEST AVAILABLE COPY

Model [redacted]

h = 44,000' MSL
b = 4000' MSL
d, μ

f_0 →

h = 44,000 MSL
b = 4000 MSL MSL

Level	f_0	d, μ	h, kf+	σ	C fraction
~~704~~	1	12.2	688	6	1.00	0.032
~~944~~	2	9.4	620	10	1.07	0.032
~~624~~	3	7.3	478	14	1.14	0.032
~~650~~	4	5.3	324	18	1.22	0.032
~~547~~	5	3.75	246	22	1.31	0.032
~~389~~	6	2.62	175	26	1.40	0.093
	7	1.80	134	30	1.50	0.195
	8	1.17	98	34	1.60	0.258
	9	0.75	73	38	1.72	0.199
	10	0.45	55	42	1.84	0.095

f_1 =
f_2 =

↑

calc. for aerodynamic fall times correlated to Reducing f_0's

From page 75:

$$I_{inj} = \frac{1}{1.89\times10^4}\left[25(4.7^{1.2})\times5(0.204\times25+6)+4.72^{0.2}(150\times.204+11)\right]$$

$$= \text{"} \quad [25\times5\times6.53\times11.1+1.37\times59]$$

$$= \text{"} \times 9141$$

$$D_{inj} = \frac{18.9\times10^3}{9.14\times10^3} = 2.07\times10^0 = 2.07\ R$$

BEST AVAILABLE COPY

Determination of M_{ij} vs f_{ij}

Take layer 8

$f_o = 1.17$; $\sigma = 1.60$; $M_i = 0.258\ YZ$

Set $\Delta f_{ij} = 0.05$ $\quad \log f_o = 0.06819$

$f_1 = f_o - 0.025 = 1.145$ $\quad \log f_1 = 0.05881$

$f_2 = f_o + 0.025 = 1.195$ $\quad \log f_2 = 0.07737$

area 1 = 0.0147

area 2 = 0.0193

$\Sigma = 0.0340$

$M_{ij} = \frac{0.034}{1} \times 0.258\ YZ$

$= 0.00877\ YZ$

Test: set $\Delta\theta = 5°$, $\bar{v} = 25$ knots $\quad h =$

$h_i = 34{,}000' = 5.59$ n mi

$f_{ij} = 1.17$ $\quad f_{ij}^2 = 1.369$

$\Delta f_{ij} = 0.05$

$M_{ij} = 0.00877\ YZ$ $\quad Y = 50$

Then $D_{inj}^{-1} = \frac{1}{957 \times 0.00877 \times 50 \times 15}\left[25\left(29{,}060\right)^{1.2} \times 5\left[\left(1242 \right.\right.\right.$

$\left.\left.\left. 2 \times 3 \times 25 \times 1242 + 9\pi \right.\right.\right.$

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$= \frac{1}{6300}\left\{227{,}000 \times 125\left(31{,}056\right) + 7.81\left(18\right.\right.$

LLNL

$= \frac{1}{6300}\left(881{,}214{,}000{,}000 + 1{,}455{,}7\right.$

$= \frac{881{,}214{,}000}{6.300} = 140{,}000$

204

$D_{inj} = 7 \times 10^{-9} R \times 3 \times 10^{2} = 2.1$

Determination of M_{ij} vs f_{ij} [redacted]

layer 8

$f_o = 1.17$; $\sigma = 1.60$; $M_i = 0.258\ YZ$

$f_{ij} = 0.05$ $\quad \log f_o = 0.06819$

025 = 1.145 $\quad -\log f_1 = 0.05801 \quad t_1 = 0.03676$

025 = 1.195 $\quad \log f_2 = 0.07737 \quad t_2 = 0.04836$

0.0147
0.0193
0.0340

$M_{81} = \frac{0.034}{1} \times 0.258\ YZ$

$= 0.00877\ YZ$

set $\Delta\theta = 5°$, $\bar{v} = 25$ knots $\quad h = 44{,}000'$ MSL
$= 40{,}000'$ AG

$h_i = 34{,}000' = 5.59$ n mi

$f_{ij} = 1.17 \quad f_{ij}^2 = 1.369 \quad a = 3$

$\Delta f_{ij} = 0.05$

$M_{ij} = 0.00877\ YZ \quad Y = 50 \quad Z = 0.15$

$$D_{inf}^{-1} = \frac{1}{957 \times 0.00877 \times 50 \times 15}\left\{25\left(29{,}060\right)^{1.2} \times 5\left[\left(1242 \times 25 + 6\right)\right] + 29{,}060^{0.2}\left[\left[2 \times 3 \times 25 \times 1242 + 9\pi\right]\right]\right\}$$

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$$= \frac{1}{6300}\left\{227{,}800 \times 125\left(31{,}056\right) + 7.81\left(186{,}328\right)\right\}$$

LLNL

$$= \frac{1}{6300}\left(881{,}214{,}000{,}000 + 1{,}455{,}721\right)$$

$$= \frac{881{,}214{,}000{,}000}{6{,}300} = 140{,}000{,}000 = 1.4 \times 10^{8}$$

$D_{inf} = 7 \times 10^{-9} R \times 3 \times 10^{2} = 2.1 \times 10^{-1}$

205

Error : h_i must be in nautical miles

UCC 25 0750

$\Delta f_{ij} = 0.05$ $\quad t = \frac{\log f}{\alpha}$ $\quad \frac{M}{VZ} = M'$

f_{ij}	f_j	f_{j+1}	$\log f_j$	$\log f_{j+1}$	t_j	t_{j+1}	Area f_j to f_{j+1}	Area cumulative	A_{j+1}
1.17	1.145	1.195	.05881	.07737	.03676	.04836	.034	.00877	.0193
1.22	1.195	1.245	.07737	.09547	.04836	.05948	.0044		.0237

f_{ij}	f_j	f_{j+1}	$\log f_j$	$\log f_{j+1}$

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$\Delta f_{ij} = 0.05$ $\quad t = \frac{\log f}{\alpha}$ $\quad \frac{M}{VZ} = M'$

Layer	f_{ij}	f_j	f_{j+1}	$\log f_j$	$\log f_{j+1}$	t_j	t_{j+1}	Aver Δ_{j+1}	Ax Grad	A_{j+1}
8	1.17	1.145	1.195	.05881	.07737	.03676	.04836	.034	.00877	.019
↓	1.22	1.195	1.245	.07737	.09517	.04836	.05948	.0044		.023

Layer	f_{ij}	f_j	f_{j+1}	$\log f_j$	$\log f_{j+1}$

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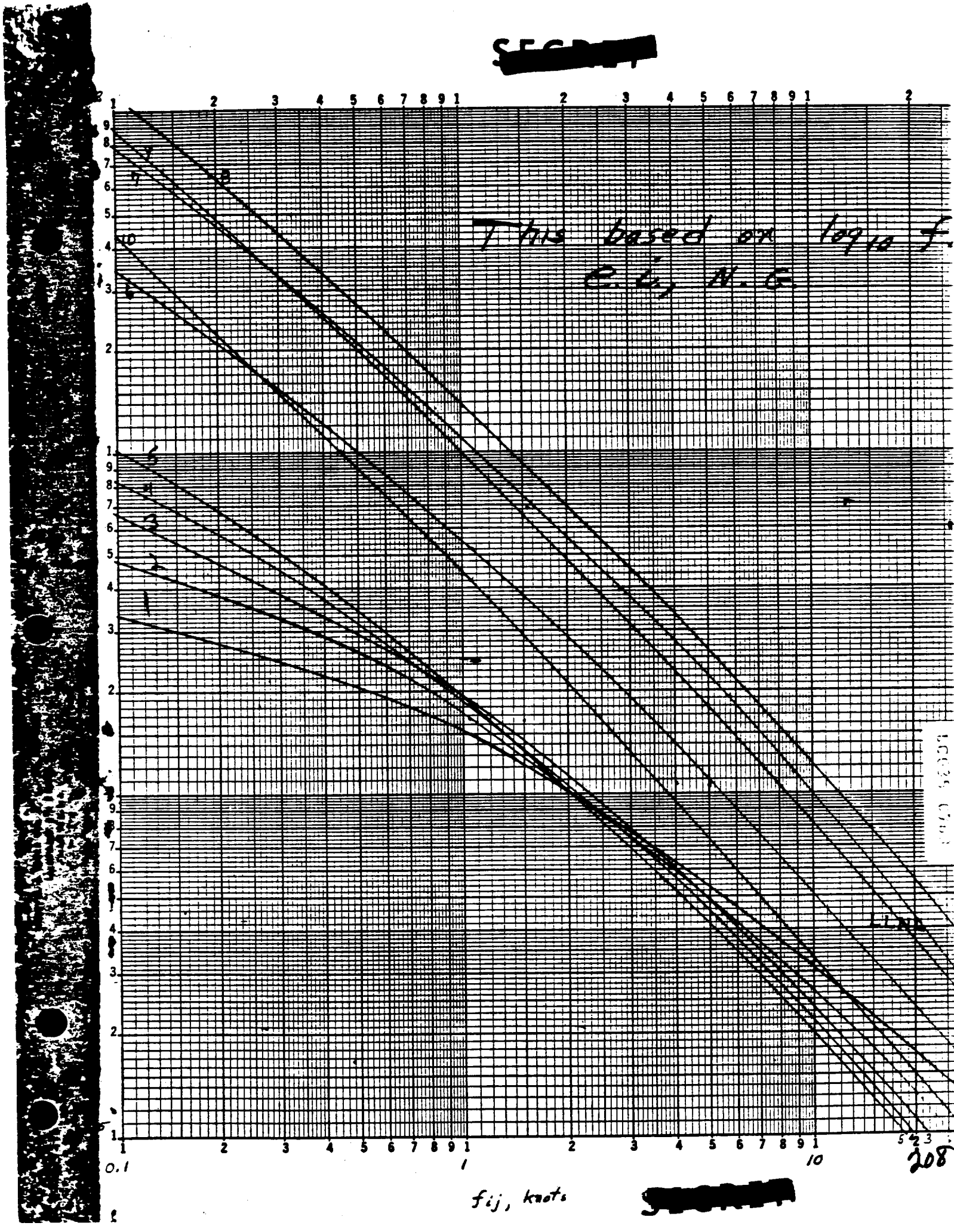
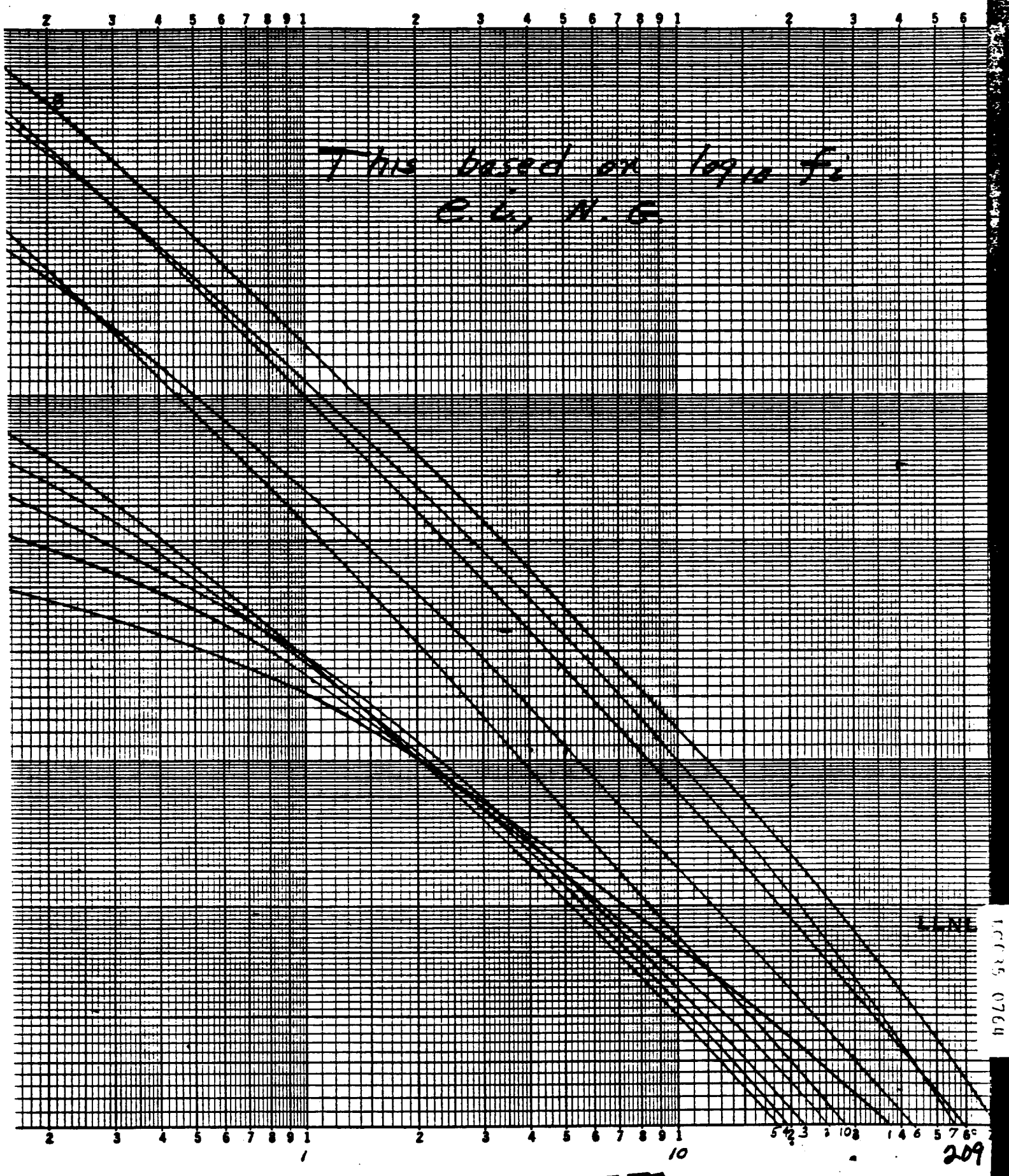

This based on log10 f.
E. L. M. C.
fij, knots
208

[redacted]

#77A



[redacted]

#77B

[redacted]

$M' = 1.365 \times 10^{-3} / f_{sj}$

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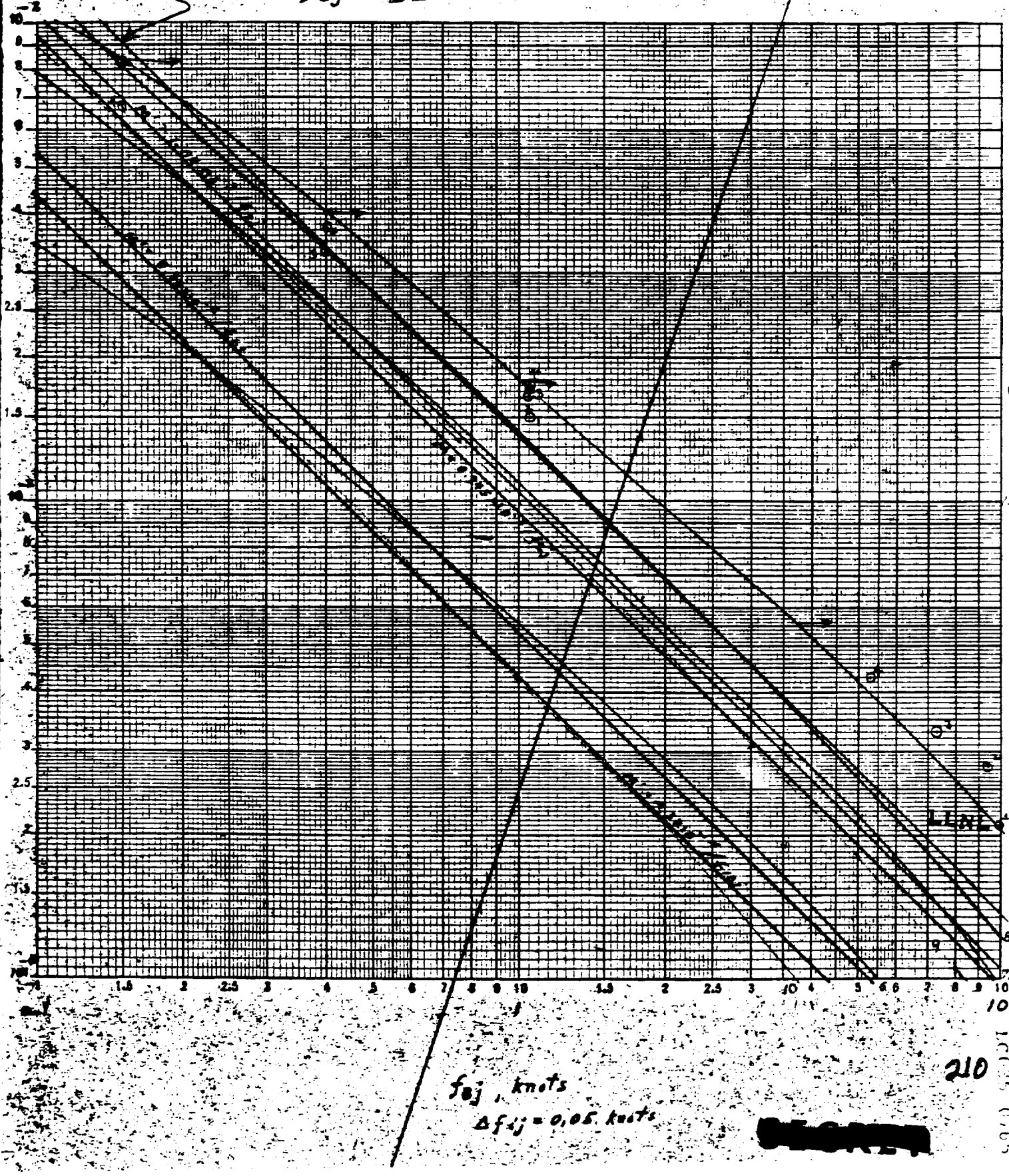

[redacted]

$\Delta f_{ij} = 0.05$ [redacted] $t = \frac{\log f_0 - \log f}{\alpha}$

	f_{ij}	f_i	f_{i+1}	$\log f_0$	$\log f_i$	$\log f_{i+1}$	t_i	t_{i+1}	A_{i+1}	A_i
	1.17	1.145	1.195	.06819	.05881	.07737	.00586	.00574	.00230	.0
	1.22	1.195	1.245	↓	.07737	.09517	.00574	.01686	.00674	.0
	1.27	1.245	1.295		.09517	.11227	.01686	.02755	.01102	.0
	1.32	1.295	1.345		.11227	.12872	.02755	.03783	.01513	.00
	1.37	1.345	1.395		.12872	.14457	.03783	.04774	.01902	.00
	1.42		1.445			.15987		.05730	.02282	.00
	1.47		1.495			.17464		.06653	.02651	.00
	1.52		1.545			.18893		.07546	.03008	.00
	1.57		1.595			.20276		.08411	.03354	.00
	1.62		1.645			.21617		.09249	.03687	.00
	1.67		1.695			.22917		.10061	.04008	.00
	1.72		1.745			.24180		.10851	.04320	.00
	1.77		1.795			.25406		.11617	.04627	.00
	1.82		1.845			.26600		.12363	.04922	.00
	1.87		1.895			.27761		.13089	.05206	.00
	1.92		1.945			.28892		.13796	.05498	.00
	1.97		1.995			.29994		.14484	.05759	.00
	2.02		2.045			.31069		.15156	.06022	.00
	2.07		2.095			.32118		.15812	.06285	.00
	2.12		2.145			.33143		.16452	.06536	.00
	2.17		2.195			.34143		.17078	.06780	.00
	2.22		2.245			.35122		.17689	.07019	.00
	2.27		2.295			.36078		.18287	.07255	.00
	2.32		2.345			.37014		.18872	.07488	.00
	2.37		2.395			.37931		.19445	.07714	.00
	2.42		2.445			.38828		.20006	.07932	.00
	2.47		2.495			.39707		.20555	.08146	.00
	2.52		2.545			.40569		.21094	.08357	.00
	2.57		2.595			.41414		.21622	.08563	.00
	2.62		2.645			.42243		.22140	.08765	.00
	2.67		2.695			.43056	LLNL	.22648	.08963	.00
	2.72		2.745			.43854		.23147	.09156	.00
	2.77		2.795			.44638		.23637	.09342	.00
	2.82		2.845			.45408		.24118	.09526	.00
	2.87		2.895			.46165		.24591	.09710	.00
	2.92		2.945			.46909		.25056	.09892	.00
	2.97		2.995			.47640		.25513	.10070	.00
	3.02		3.045			.48359		.25962	.10245	.00
	3.07		3.095			.49066		.26404	.10413	.00
	3.12		3.145			.49762		.26839	.10579	.00

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$\Delta f_{ij} = 0.05$ [redacted] $t = \frac{\log f_0 - \log f_i}{}$ ΔA $M'_{yz} \cdot \Delta C_c$ 77

f_{i+1}	log f_0	log f_i	log f_{i+1}	t_j	t_{j+1}	A_{j+1}	$A_j - A_{j+1}$	
1.195	.06819	.05781	.07737	.00586	.00574	.00230	.00464	.00120
1.245	↓	.07737	.09517	.00574	.01686	.00674	.00444	.00115
1.295		.09517	.11227	.01686	.02755	.01102	.00428	.00110
1.345		.11227	.12872	.02755	.03783	.01513	.00411	.00106
1.395		.12872	.14457	.03783	.04774	.01902	.00389	.00100
1.445			.15987		.05730	.02282	.00380	.00098
1.495			.17464		.06653	.02651	.00369	.00095
1.545			.18893		.07546	.03008	.00357	.00092
1.595			.20276		.08411	.03354	.00346	.00089
1.645			.21617		.09249	.03687	.00333	.00086
1.695			.22917		.10061	.04004	.00317	.00082
1.745			.24180		.10851	.04320	.00316	.00082
1.795			.25406		.11617	.04627	.00307	.00079
1.845			.26600		.12363	.04922	.00295	.00076
1.895			.27761		.13089	.05206	.00284	.00073
1.945			.28892		.13796	.05488	.00282	.00073
1.995			.29994		.14484	.05759	.00271	.00070
2.045			.31069		.15156	.06022	.00263	.00068
2.095			.32118		.15812	.06285	.00263	.00068
2.145			.33143		.16452	.06536	.00251	.00065
2.195			.34143		.17078	.06780	.00244	.00063
2.245			.35122		.17689	.07019	.00239	.00062
2.295			.36078		.18287	.07255	.00236	.00061
2.345			.37014		.18872	.07488	.00233	.00060
2.395			.37931		.19445	.07714	.00226	.00058
2.445			.38828		.20006	.07932	.00218	.00056
2.495			.39707		.20555	.08146	.00214	.00055
2.545			.40569		.21094	.08357	.00211	.00054
2.595			.41414		.21622	.08563	.00206	.00053
2.645			.42243		.22140	.08765	.00202	.00052
2.695			.43056		.22648	.08963	.00198	.00051
2.745			.43854		.23147	.09156	.00193	.00050
2.795			.44638		.23637	.09342	.00186	.00048
2.845			.45408		.24118	.09526	.00184	.00047
2.895			.46165		.24591	.09710	.00184	.00047
2.945			.46909		.25056	.09892	.00182	.00047
2.995			.47640		.25513	.10070	.00178	.00046
3.045			.48359		.25962	.10245	.00175	.00045
3.095			.49066		.26404	.10413	.00168	.00043
3.145			.49762		.26839	.10579	.00166	.00043

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1.32	1.295	1.345		.11727	.12872	.02255	.03783	.01513	.00411
1.37	1.345	1.395		.12872	.14457	.03783	.04774	.01902	.00538
1.42		1.445			.15987		.05730	.02282	.00386
1.47		1.495			.17464		.06653	.02651	.00367
1.52		1.545			.18893		.07546	.03008	.00357
1.57		1.595			.20276		.08411	.03354	.00346
1.62		1.645			.21617		.09249	.03687	.00333
1.67		1.695			.22917		.10061	.04004	.00317
1.72		1.745			.24180		.10851	.04320	.00316
1.77		1.795			.25406		.11617	.04627	.00307
1.82		1.845			.26600		.12363	.04922	.00295
1.87		1.895			.27761		.13089	.05206	.00284
1.92		1.945			.28892		.13796	.05478	.00272
1.97		1.995			.29994		.14484	.05759	.00277
2.02		2.045			.31069		.15156	.06022	.00263
2.07		2.095			.32118		.15812	.06285	.00263
2.12		2.145			.33143		.16452	.06536	.00251
2.17		2.195			.34143		.17078	.06980	.00244
2.22		2.245			.35122		.17689	.07019	.00233
2.27		2.295			.36078		.18287	.07255	.00236
2.32		2.345			.37014		.18872	.07488	.00233
2.37		2.395			.37931		.19445	.07714	.00226
2.42		2.445			.38828		.20006	.07932	.00218
2.47		2.495			.39707		.20555	.08146	.00214
2.52		2.545			.40569		.21094	.08357	.00211
2.57		2.595			.41414		.21622	.08563	.00206
2.62		2.645			.42243		.22140	.08765	.00202
2.67		2.695			.43056		.22648	.08963	.00198
2.72		2.745			.43854		.23147	.09156	.00193
2.77		2.795			.44638		.23637	.09342	.00186
2.82		2.845			.45408		.24118	.09526	.00184
2.87		2.895			.46165		.24591	.09710	.00184
2.92		2.945			.46909	LLNL	.25056	.09892	.00182
2.97		2.995			.47640		.25513	.10070	.00178
3.02		3.045			.48359		.25962	.10245	.00175
3.07		3.095			.49066		.26404	.10413	.00168
3.12		3.145			.49762		.26839	.10579	.00166
3.17		3.195			.50447		.27268	.10745	.00166
3.22		3.245			.51121		.27689	.10909	.00164
3.27		3.295			.51786		.28104	.11070	.00161
3.32		3.345			.52440		.28513	.11225	.00155
3.37		3.395			.53084		.28916	.11378	.00153

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1.245		.09511	.11227	.01686	.02755	.01104	.00406	.00116	
1.345		.11727	.12872	.02755	.03783	.01563	.00411	.00106	
1.395		.12872	.14457	.03783	.04774	.01902	.00389	.00100	
1.445			.15987		.05730	.02282	.00380	.00098	
1.495			.17464		.06653	.02651	.00369	.00095	
1.545			.18893		.07546	.03008	.00357	.00092	
1.595			.20276		.08411	.03354	.00346	.00089	
1.645			.21617		.09249	.03687	.00333	.00086	
1.695			.22917		.10061	.04004	.00317	.00082	
1.745			.24180		.10851	.04320	.00316	.00082	
1.795			.25406		.11617	.04627	.00307	.00079	
1.845			.26600		.12363	.04922	.00295	.00076	
1.895			.27761		.13089	.05206	.00284	.00073	
1.945			.28892		.13796	.05488	.00282	.00073	
1.995			.29994		.14484	.05759	.00271	.00070	
2.045			.31069		.15156	.06022	.00263	.00068	
2.095			.32118		.15812	.06285	.00263	.00068	
2.145			.33143		.16452	.06536	.00251	.00065	
2.195			.34143		.17078	.06780	.00244	.00063	
2.245			.35122		.17689	.07019	.00239	.00062	
2.295			.36078		.18287	.07255	.00236	.00061	
2.345			.37014		.18872	.07488	.00233	.00060	
2.395			.37931		.19445	.07714	.00226	.00058	
2.445			.38828		.20006	.07932	.00218	.00056	
2.495			.39707		.20555	.08146	.00214	.00055	
2.545			.40569		.21094	.08357	.00211	.00054	
2.595			.41414		.21622	.08563	.00206	.00053	
2.645			.42243		.22140	.08765	.00202	.00052	
2.695			.43056		.22648	.08963	.00198	.00051	
2.745			.43854		.23147	.09156	.00193	.00050	
2.795			.44638		.23637	.09342	.00186	.00048	
2.845			.45408		.24118	.09526	.00184	.00047	
2.895			.46165		.24591	.09710	.00184	.00047	
2.945			.46909		.25056	.09892	.00182	.00047	
2.995			.47640		.25513	.10070	.00178	.00046	
3.045			.48359		.25962	.10245	.00175	.00045	
3.095			.49066		.26404	.10413	.00168	.00043	
3.145			.49762		.26839	.10579	.00166	.00043	
3.195			.50447		.27268	.10745	.00166	.00043	
3.245			.51121		.27689	.10909	.00164	.00042	
3.295			.51786		.28104	.11070	.00161	.00042	
3.345			.52440		.28513	.11225	.00155	.00040	
3.395			.53084		.28916	.11378	.00153	.00039	.02994

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	f_{j+1}	log f_0	log f_j	log f_{j+1}	t_j	t_{j+1}	A_{j+1}	ΔA	M'
95	3.445	.06819	.53084	.53719	.28916	.29312	.11529	.00151	.00039
	3.495			.54345		.29704	.11677	.00148	.00038
	3.545			.54962		.30089	.11824	.00147	.00038
	3.595			.55570		.30469	.11968	.00144	.00037
	3.645			.56170		.30844	.12111	.00143	.00037
	3.695			.56761		.31214	.12251	.00140	.00036
	3.745			.57345		.31579	.12390	.00139	.00036
	3.795			.57921		.31939	.12527	.00137	.00035
	3.845			.58490		.32294	.12662	.00135	.00035
	3.895			.59051		.32645	.12795	.00133	.00034
	3.945			.59605		.32991	.12927	.00132	.00034
	3.995			.60152		.33333	.13057	.00130	.00034
	4.045			.60692		.33671	.13185	.00128	.00033
	4.095			.61225		.34004	.13311	.00126	.00033
	4.145			.61752		.34333	.13433	.00122	.00031
	4.195			.62273		.34659	.13554	.00121	.00031
	4.245			.62788		.34981	.13673	.00119	.00031
	4.295			.63296		.35298	.13793	.00120	.00031
	4.345			.63799		.35612	.13913	.00120	.00031
	4.395			.64296		.35923	.14031	.00118	.00030
	4.445			.64787		.36230	.14145	.00114	.00029
	4.495			.65273		.36534	.14258	.00113	.00029
5	5.495		.73600	.73997	.41738	.41986	.16275	.00092	.00024
15	7.495		.87186	.87477	.50229	.50411	.19294	.00064	.00017
95	9.495		.97520	.97749	.56688	.56831	.21513	.00049	.00013
95	1.145		.03941	.05881	.01799	.00586	.00720	.00486	.00125
95	1.095		.01912	.03941	.03067	.01799	.01227	.00507	.00131
95	1.045		-.00218	.01912	.04398	.03067	.01755	.00528	.00136
45	.995		-.02457	-.00218	.05798	.04398	.02309	.00554	.00143
95	.945		-.04818	-.02457	.07273	.05798	.02899	.00590	.00152
95	.895		-.09863	-.07289	.10489	.08818	.04176	.00659	.00170
5	.845		-.15802	-.12784	.14138	.12252	.05624	.00746	.00192
95	.795		-.22548	-.19044	.18354	.16164	.07282	.00858	.00221
95	.745		-.30539	-.26360	.23349	.20737	.09236	.01026	.00265
95	.695		-.40340	-.35164	.29474	.26239	.11595	.01244	.00321
5	.645		-.53018	-.46218	.37398	.33148	.14577	.01591	.00410
5	.595		-.70997	-.61083	.48635	.42439	.18662	.02224	.00574
5	.545		-1.02228	-.83863	.68154	.56676	.25228	.03768	.00972
5	9.425	.97313	.97197	.97428	.00108	.00107	A_j .00043	A_{j+1} .00043	ΔA .00086 .00022

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DRAFT

Level	f_{i-}	f_i	f_{i+}	log f_0	log f_i	log f_{i+1}	t_i	t_{i+1}	A_{i+}	
8	3.42	3.395	3.445	.06819	.53084	.53719	.28916	.29312	.11529	.0
↓	3.47		3.495	↓		.54345		.29704	.11677	.0
	3.52		3.545			.54962		.30089	.11824	.0
	3.57		3.595			.55570		.30469	.11968	.0
	3.62		3.645			.56170		.30844	.12111	.0
	3.67		3.695			.56761		.31214	.12251	.0
	3.72		3.745			.57345		.31579	.12390	.0
	3.77		3.795			.57921		.31939	.12527	.0
	3.82		3.845			.58490		.32294	.12662	.0
	3.87		3.895			.59051		.32645	.12795	.0
	3.92		3.945			.59605		.32991	.12927	.0
	3.97		3.995			.60152		.33333	.13057	.0
	4.02		4.045			.60692		.33671	.13185	.0
	4.07		4.095			.61225		.34004	.13311	.0
	4.12		4.145			.61752		.34333	.13433	.0
	4.17		4.195			.62273		.34659	.13554	.0
	4.22		4.245			.62788		.34981	.13673	.0
	4.27		4.295			.63296		.35298	.13793	.0
	4.32		4.345			.63799		.35612	.13913	.0
	4.37		4.395			.64296		.35923	.14031	.0
	4.42		4.445			.64787	LLNL	.36230	.14145	.0
	4.47		4.495			.65273		.36534	.14258	.0
	5.47	5.445	5.495		.73600	.73997	.41738	.41986	.16775	.0
	7.47	7.445	7.495		.87186	.87477	.50229	.50411	.19294	.0
	9.47	9.445	9.495		.97520	.97749	.56688	.56831	.21513	.0
	1.12	1.095	1.145		.03941	.05881	.01799	.00586	.00720	.0
	1.07	1.045	1.095		.01912	.03941	.03067	.01799	.01227	.0
	1.02	.995	1.045		-.00218	.01912	.04398	.03067	.01755	.0
	.97	.945	.995		-.02457	-.00218	.05798	.04398	.02309	.0
	.92	.895	.945		-.04818	-.02457	.07273	.05798	.02899	.0
	.82	.795	.845		-.09863	-.07299	.10489	.08818	.04176	.0
	.77	.695	.745		-.15802	-.12784	.14138	.12252	.05624	.0
	.62	.595	.645		-.22548	-.19044	.18354	.16164	.07282	.0
	.52	.495	.545		-.30539	-.26360	.23349	.20737	.09236	.0
	.42	.395	.445		-.40340	-.35164	.29474	.26239	.11595	.0
	.32	.295	.345		-.53018	-.46248	.37398	.33148	.14577	.0
	.22	.195	.245		-.70997	-.61083	.48635	.42439	.18662	.0
	.12	.095	.145		-1.02228	-.83863	.68154	.56676	.25228	.0
2	9.40	9.375	9.425	.97313	.97197	.97428	.00108	.00107	.00043	.0
↓	30.00				1.47676	1.47748				

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UCRL 52703

25 day Teongi vs Bikini analysis

Bikini

Δt Teongi 7 days –
Δt Bikini 5 days
— shot --- time lapse

[redacted]CRET

Zunks

Zunks

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IC035 0710

Rex's 45 day Taongi vs Bikini analysis

	Taongi	Bikini	
	-	-	
	-	-	
	-	-	
	-	-	
	-	-	
	o	-	
April	+ -	+	
	+	+ -	
	+	-	
	+	-	
	+	-	
	o	-	
	o	-	
	-	-	
	o	-	Jurks
	+ -	-	
	o	+ -	
	-	-	
	-	-	
	o	-	
	+	-	
June	+	-	
	o	-	
	+ -	-	
	+	-	
	+	-	
	o	-	
	+	-	
	-	+	
	+ -	+ -	Jurks
	+ -	-	
	+	-	
	+	+	
	+	+	
	+	+ -	
	+	-	
July	o	-	
	+ -	-	
	-	-	
	+	-	

At Taongi 7d
At Bikini 5d
— shot -

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[redacted] — shot

	−	−
	−	−
	−	−
	o	−
April	+ −	+
	+	+ −
	+	−
	+	−
	+	−
	o	−
	o	−
	−	−
	o	−
	+ −	−
	o	+ −
	−	−
	−	−
	o	−
	+	−
June	+	−
	o	−
	+ −	−
	+	−
	+	−
	o	−
	+	−
	−	+
	+ −	+ −
	+ −	−
	+	−
	+	+
	+	+
	+	+ −
	+	−
July	o	−
	+ −	−
	−	−
	+	−
	+	+
	+	+ −
	+	−
	−	

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[redacted]

LLCC 35 (7-11)

W	# P	d, 1 kt	$\overset{x}{=} w^{1/3}$ d, w kt, yds
5	1	1500 yds	2560
	4	560 yds.	958
20	1	etc	4070
	4	etc	1520
10	1	↓	3230
10	4		1205
15	1		3700
	4		1380
30	1		4660
	4		1740
40	1		5130
	4		1916
70	1		6180
	4		2310
100	1		6970
	4		2600
150	1		7970
	4		2970
200	1		8780
	4		3270
250	1		9440
	4		3530
300	1		10,030
	4		3750

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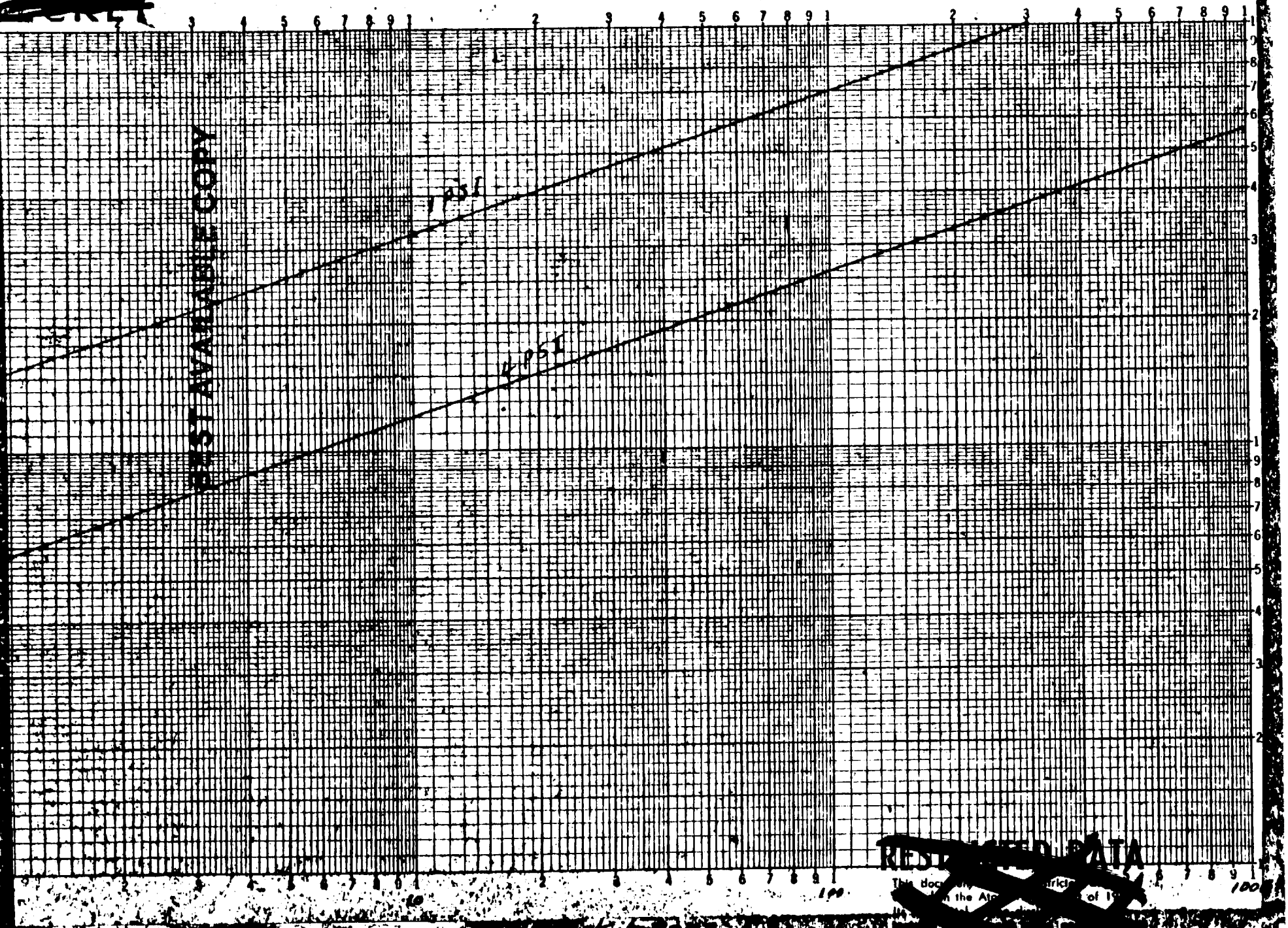

RESTRICTED DATA

Distances Tarc Complex [redacted]

Site	Location	Yield	Distance	To
1	300' tower - Rogov	5	9050'	OBOE camp
	↓	2	1650	2200 sta
			4550	2300 "
			3625	Site #3 300's
2	300' tower Bugs	5	12,200	OBOE
	↓	2	2000	2200
			8200	2300
			3625	Site #1
3	Barge on ground	20	16800	OBOE
	↓	2	4250	Site #2
		40	16,800	OBOE
			4250	site #2
4		300	28,000	OBOE
5	Barge off dog	2M	62,000	"
		7M	↓	"
6	" " Baker	500K	85,000	"
		17M		

BEST AVAILABLE COPY

Site	W	h, kt	d, yds	d, kt	ΔP psi	Location	
1	5	175	3017	1762	0.86	Oboe	
			550	322	12	sta 2200	
			1517	887	2.2	sta 2300	
			1225	717	3.0	site #2	
2			4233	2472	0.53	Oboe	
			667	390	8.2	sta 2200	
			27339 8200 yds	1595	0.98	sta 2300	
					3.0	site #1	
3	20	0	5620	2062	0.68	Oboe	
			1417	522	4.6	site #2	
	40		5600	1636	0.94	Oboe	
			1417	415	6.6	site #2	LLNL
4	300	0	9333	1391	1.2	Oboe	
5	5000	0	26,667	1208	1.4	Oboe	
	7000	0	"	1080	1.7	Oboe	
6	500	0	28,833	3570	0.32	Oboe	
	12,000	0	"	1295	1.4	Oboe	

ces Tare Complex

[redacted]

ocation	Yield	Distance	To	ΔP
tower - Rigov	5	9050'	OBOE camp	
	2	1650	2200 sta	
		4550	2300 "	
		3625	Site #1 300'	
tower Sugar	5	12,200	OBOE	
	2	2000	2200	
		2300	2300	
		3625	Site #1	
on ground	20	16900	OBOE	
	2	4250	Site #2	
	40	16,800	OBOE	
		4250	site #2	
	300	28,000	OBOE	
off dcy	2M	62,000	"	
	7M	"	"	
" Baker	500K	85,000	"	
	17M			

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d, yds	d, kt	ΔP psi	Location
3017	1762	0.86	Obae
550	322	12	sta 2200
1517	887	2.2	sta 2300
1225	717	3.0	site #2
4233	2472	0.53	Obae
667	390	8.2	sta 2200
2733 9 8200 yds	1595	0.98	sta 2300
		3.0	site #1
5600	2062	0.68	Obae
1417	522	4.6	site #2
5600	1636	0.94	Obae
1417	415	6.6	site #2
9333	1391	1.2	Obae
26,667	1208	1.4	Obae
"	1080	1.7	Obae
26,333	3570	0.32	Obae
"	1295	1.4	Obae

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[redacted]

Close in fallout intensities. Dose rates for H+
Reduce a factor of 10 t

Extents

W	h	10 R/hr	1 R/hr	0.1 R/hr	0.01 R/hr
20 ~~X~~	300'	350 yds	600 yds	850 yds	1100 yds
5 ~~0~~	"	200	400	600	800
			1100	1500	1900
40	"	700	~~1000~~	~~1300~~	~~1600~~
150		~~7000~~	~~7,000~~		
		~~10,000~~	~~10,000~~	~~13,000~~	
		~~7000~~ 700			
		~~4000~~			
		~~1,000~~	~~2,000~~	~~15,000~~	~~22,000~~ yds.
		1500	3300	5000	~~5000~~ yds (7000)
300		~~1000~~ 2000	~~2500~~ ~~2500~~ 4300		~~5000~~ yds.
				6500	(9000)

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TCC 07230

e in fallout intensities. Dose rates for H+24 hours.
Reduce a factor of 10 to Ht 8 days

	Extents		
10 R/hr	1 R/hr	0.1 R/hr	0.01 R/hr
350 yds	600 yds	850 yds	1100 yds
200	400	600	800
	1100	1500	1900
700	~~1000~~	~~1300~~	~~1600~~
~~7000~~	~~7,000~~		
~~10,000~~	~~12,000~~	~~13,000~~	
~~7000 200~~			
~~1000~~			
~~1,000~~	~~2,000~~	~~15,000~~	~~22,000 yds~~
→ 1500	3300	5000	~~5000~~ yds. (7000) 10:20 Wed
~~1000~~	~~2500~~ ~~7500~~		~~5000~~ yds.
2000	4300		
		6500	(9000)

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Pressure Predictions, Plumbbob Page 65 con

Scaling from UK-10:

ΔP	15 MKT d, yds	d, 11 kT, yds	12 kT	10 kT	14 kT
1	3433	3066	3371	2975	3327
6	1167	1042	3150	1011	1131
7.58	1917	1712	1958	1660	1858
8	1283	1146	1179	1111	1243
5	2700	2411	2476	2338	2616
8	900	804	825	779	872
9					
10	650	580	596	563	630
10	583	521	535	505	565
15	517	462	474	448	501
20	477	426	437	413	462
30	420	375	385	364	407
50	353	315	324	306	342
100	267	238	245	231	259
200	190	170	P(10kT)	165	184

Diablo, Flask, Whitney, Hoya, Wilson → 700'

$\frac{d_1}{d_2} = \left(\frac{W_1}{W_2}\right)^{1/3} =$

Assume h_i

$(W_1/W_2)^{1/3} = (15.$

$d_2 = d_1/1.1$

B': Smokey: 45 kt, 700' to

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Scale from Priscilla: Assume same scaled heig

$$\frac{d_1}{d_2} = \left(\frac{W_1}{W_2}\right)^{1/3} = \left(\frac{39.5}{45}\right)^{1/3} = 0.878^{1/3} = 0.958$$

$d_{prisc} = 0.958\, d_{B'}$

$d_{B'} = 1.044\, d_{prisc}$

Newton: 70 kt at 1500
Scale from Smokey: ~~add scaled height~~. Add x% for higher scaled height.

ΔP, psi	$d_{B'}$, yds
1	4872
2	3306
3	2561
5	~~1900~~ 1851
6	1653
8	1368
9	~~999~~
8.5	1034
8.3	1078 → 1287
10	950
15	793
20	707
30	~~633~~ 598
40	629

ΔP	1.16 $D_{B'} = D_m^*$	$X D_m^* = D_m$
1	5652	5833
2	3835	4027
3	2971	3182
5	2147	2319
6	1917	2070
8	1587	1657
9	1159	1217
8.5	1199	1259
8.3	1250 → 1493	1312 → 1568
10	1402	1165
15	920	950
20	820	853
2.	1.94	

LLNL

Pressure Predictions, Plumbbob Page 65 continuation

ing from UK-10:

MKT →	d, yds	d, 11 KT, yds	12 Kt	10 kt	MKT	$d_1 = \left(\frac{w_1}{w_2}\right)^{1/3} = \frac{h_1}{h_2}$
	3453	3066	1097	2973	12327	
	1167	1042	3150	1011	1131	d_2
	1917	1712	1758	1660	1858	
	1283	1146	1199	1111	1243	
	2700	2411	2476	2338	2616	
	900	804	825	779	872	Assume $h_1 = h_2$
	650	580	596	563	630	
	583	521	535	505	565	$(w_1/w_2)^{1/3} = (15.4/11)^{1/3} = 1.4^{1/3}$
	517	462	474	448	501	$= 1.12$
	477	426	437	413	462	$d_2 = d_1/1.12 = 0.893\, d_1$
	420	375	385	364	407	
	353	315	324	306	342	
	267	238	245	231	259	
	190	170	P(10kT	165	184	

B': Smokey: 45 kt, 700' tower

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from Priscilla: Assume same scaled height.

$$\frac{d_1}{d_2} = \left(\frac{w_1}{w_2}\right)^{1/3} = \left(\frac{39.5}{45}\right)^{1/3} = 0.878^{1/3} = 0.958$$

$d_{prisc} = 0.958\, d_{B'}$

$d_{B'} = 1.044\, d_{prisc}$

Newton: ~~X~~ 70 Kt at 1500'

~~Scale from Smokey: add 10% for higher scaled height~~. Add X% from TH+3 for higher scaled height. (to d Newton)

Hood: 60 Kt 1500'

ssi	$d_{B'}$ yds	ΔP	$1.16\, D_{B'} = D_n^*$	$X D_n^* = D_x$	LLNL
	4872				
	3306	1	5652	5833	5544
	2561	2	3835	4027	3826
	~~1760~~ 1851	3	2971	3182	3023
	1653	5	2147	2319	2203
	1368	6	1917	2070	1967
	~~999~~ 999	8	1587	1657	1574
	1034	9	1159	1217	1156
	1078 → 1287	8.5	1199	1259	1196
	950	8.3	1250 → 1483	1312 → 1568	1246 → 1490
	793	10	1402	1165	1107
	707	15	920	950	902
	~~599~~ 598	20	820	853	810
	629	30	694	694	659
	438				

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7.5	1283	1146	1199	1111	1243
8	2700	2411	2476	2338	2616
9	900	804	825	779	872
10	650	580	596	563	630
15	593	521	535	505	565
20	517	462	474	448	501
30	477	426	437	413	462
50	420	375	385	364	407
100	353	315	324	306	342
200	267	238	245	231	259
300	190	170	175	165	184

PLOT

Assume $(W_1/W_2)^{1/3} =$

$d_2 =$ d_1

B': Smokey: 45 Kt, 700'

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Scale from Priscilla: Assume same scaled he

$$\frac{d_1}{d_2} = \left(\frac{W_1}{W_2}\right)^{1/3} = \left(\frac{39.5}{45}\right)^{1/3} = 0.878^{1/3} = 0.95$$

$d_{prisc} = 0.958\, d_{B'}$

$d_{B'} = 1.044\, d_{prisc}$

Newton: X 70 Kt at 150'
Scale from Smokey: ~~scaled height~~. Add X% for higher scaled height.

ΔP_{psi}	$d_{B'}$ yds
1	4872
2	3306
3	2561
5	~~1851~~
6	1653
8	1368
9	~~899~~
8.5	1034
8.3	1078 → 1287
10	950
15	793
20	707
30	~~633~~ 598
40	629
60	438
100	362
200	300
300	268

PLOT

ΔP	$1.16\, D_{B'} = D_n^*$	$X D_n^* = D_n$
1	5652	5833
2	3835	4027
3	2971	3182
5	2147	2319
6	1917	2070
8	1587	1657
9	1159	1217
8.5	1199	1259
8.3	1250 → 1483	1312 → 1568
10	1402	1165
15	920	950
20	820	LLNL 853
30	694	694
40	614	614
60	508	457 RD
100	420	357
200	348	296
300	311	264

PL

1283	1146	1179	1111	1243
2700	2411	2476	2338	2616
960	804	825	779	872
650	580	596	563	630
583	521	535	505	565
517	462	474	448	501
477	426	437	413	462
420	375	385	364	407
353	315	324	306	342
267	238	245	231	259
180	170	P/10FT	165	184

Assume $h_1 = h_2$

$(W_1/W_2)^{1/3} = (15.4/11)^{1/3} = 1.4^{1/3}$

$= 1.12$

$d_2 = d_1/1.12 = 0.893\, d_1$

B': Smokey: 45 kt, 700' tower

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from Priscilla: Assume same scaled height

$\frac{1}{2} = \left(\frac{W_1}{W_2}\right)^{1/3} = \left(\frac{39.5}{45}\right)^{1/3} = 0.878^{1/3} = 0.958$

$d_{prisc} = 0.958\, d_{B'}$

$d_{B'} = 1.044\, d_{prisc}$

Newton: 70 kt at 1500'

Scale from Smokey: ~~add 10% for higher scaled height~~. Add X% from TN 43-200 for higher scaled height. (to d Newton)

Hood: 60 kt 1500'

$d_{B'}$ yds	ΔP	$1.16\, \bar{D}_{B'} = D_N^*$	$X D_N^* = D_N$	
4872				
3306	1	5652	5833	5544
2561	2	3835	4027	3826
~~1851~~ 1860	3	2971	3182	3023
1653	5	2147	2319	2203
1368	6	1917	2070	1967
~~899~~ 899	8	1587	1657	1574
1034	9	1159	1217	1156
1078 → 1287	8.5	1199	1259	1196
950	8.3	1250 → 1483	1312 → 1568	1246 → 1490
793	10	1402	1165	1107
707	15	920	950	902
~~599~~ 598	20	820	853	LLNL 810
529	30	694	694	659
438	40	614	614	583
362	60	508	457	434 181
300	100	420	357	339
268 PLOT	~~200~~	348	296	~~281~~
	300	311	264 PLOT	251

Pressure Predictions, Plumbbob [redacted]

Device: DELETED Yield: DELETED Height: 500' (Tow

d: ground range

1-8 PSI: Ideal Curves, overpressure, TM-23-200 d = h

Scaled height 1 Kt = 225' with altitude correc

ΔP, psi	d, 1 Kt, yds	d, 11 Kt, yds	Pressure factor: .86 ΔP	d, 1 Kt, yds	d, 11
1	1585	3519	0.86 1	1632	36
3	730	1621	2.58 3	752	16
6 (455) 5	515	1010	5.16 6	469	1.0
8	390	866	6.88 8	402	89

Working ΔP=1 back according to TM 23-200 method

d, 1 Kt = $\frac{3623}{1.03(11)^{1/3}}$ = 1584

P, 1 kt = 1 psi P, 4000' = 0.86

UK-10: Yield = 15.4 kt h = 524'

ΔP	13.6 PSI	10 PSI
d	533 yds	587 yds

From 23-200 curves for poor sfc conditions:

Scaled 1 kt h = 210'

d, 1 kt = $\frac{533}{1.03 \times 2.49}$ = 208 yds

p, 1 kt = 14.2 × 0.86 = 12.2 } curve hard to read.
to 15.0 × 0.86 = 12.9 }

d, 1 kt = $\frac{587}{1.03 \times 2.49}$ = 229 yds

p, 1 kt = 12 × 0.86 = 10.3 PSI

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ΔPc	ΔPi	d, 1 kt, yds	d, 11 kt, yds
10.3	12	932	737
14.6	17	285	633
19.8	23	240	533
24.9	29	210	466
30.1	35	190	422

This data does not show proper

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DELETED

Yield : DELETED Height : 500' (Tower)

d : ground range

Ideal Curves, overpressure, TM-23-200 d = horizontal range

1 height 1 Kt = 225' with altitude correction:

Pressure factor .86 Distance factor 1.03

1 Kt, yds	d, 11 Kt, yds	ΔP	d, 1 Kt, yds	d, 11 Kt, yds
585	3519	0.86 1	1632	3623
730	1621	2.58 3	752	1669
955 → 915	1010	5.16 6	469	1041
990	866	6.88 8	402	892

P=1 back according to TM 23-200 method:

$\frac{3623}{1.03(11)^{1/3}} = 1584$

1 psi P, 4000' = 0.86

Yield = 15.4 Kt h = 524'

13.6 PSI 10 PSI

533 yds 587 yds

23-200 curves for poor sfc conditions:

d 1 Kt h = 210'

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1 Kt = $\frac{533}{1.03\,\sqrt[3]{2.49}}$ = 208 yds

1 Kt = 14.2 × 0.86 = 12.2 } curve hard to read.

to 15.0 × 0.86 = 12.9 }

1 Kt = $\frac{587}{1.03\,\sqrt[3]{2.49}}$ = 229 yds

1 Kt = 12 × 0.86 = 10.3 PSI

LLNL

d, 11 Kt, yds
737
633
533
466
422

This data does not show proper 'precursor' shape

183

ICO35 0727

DELETED

1 - 8 PSI : Ideal Curves, overpressure, TM-23-200 d =

Scaled height 1kt = 225' with altitude corre

ΔP, psi	d, 1 kt, yds	d, 11 Kt, yds
1	1565	3519
3	730	1621
6 / 5	455 → 515	1010
8	390	866

Pressure factor: .86 Distance

ΔP	d, 1 kt, yds	d,
0.86	1	1632	3
2.58	3	752	1
5.16	6	469	1
6.88	8	402	1

Working ΔP=1 back according to TM 23-200 method:

d, 1 kt = $\frac{3623}{1.03(11)^{1/3}}$ = 1584

p, 1 kt = 1 psi P, 4000' = 0.86

UK-10 : Yield = 15.4 kt h = 524' r

ΔP	13.6 PSI	10 PSI
d	533 yds	587 yds

From 23-200 curves for poor sfc conditions:

00'

Scaled 1 kt h = 210'

d, 1 kt = $\frac{533}{1.03(2.37)}$ = 208 yds

p, 1 kt = 14.2 × 0.86 = 12.2 } curve hard to read.
to 15.0 × 0.86 = 12.9 }

d, 1 kt = $\frac{587}{1.03(2.37)}$ = 229 yds

p, 1 kt = 12 × 0.86 = 10.3 PSI

ΔPc	ΔPi	d, 1 kt, yds	d, 11 kt, yds
10.3	12	932	737
14.6	17	285	633
19.8	23	240	533
24.9	29	210	466
30.1	35	190	422
39.6	46	170	377
49.9	58	147	326
99.8	116		
149.6	174		

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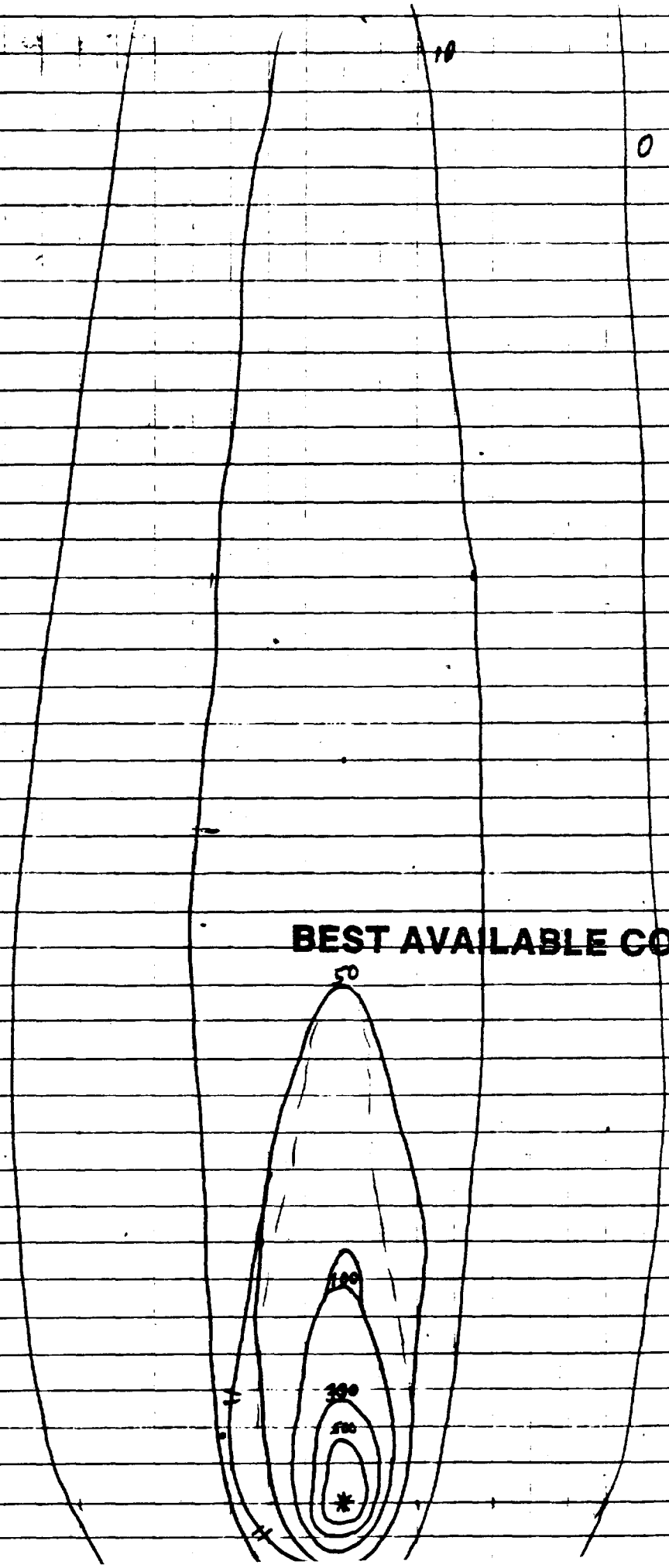
LLNL

This data does not show proper

[redacted]



100

Dose R
at

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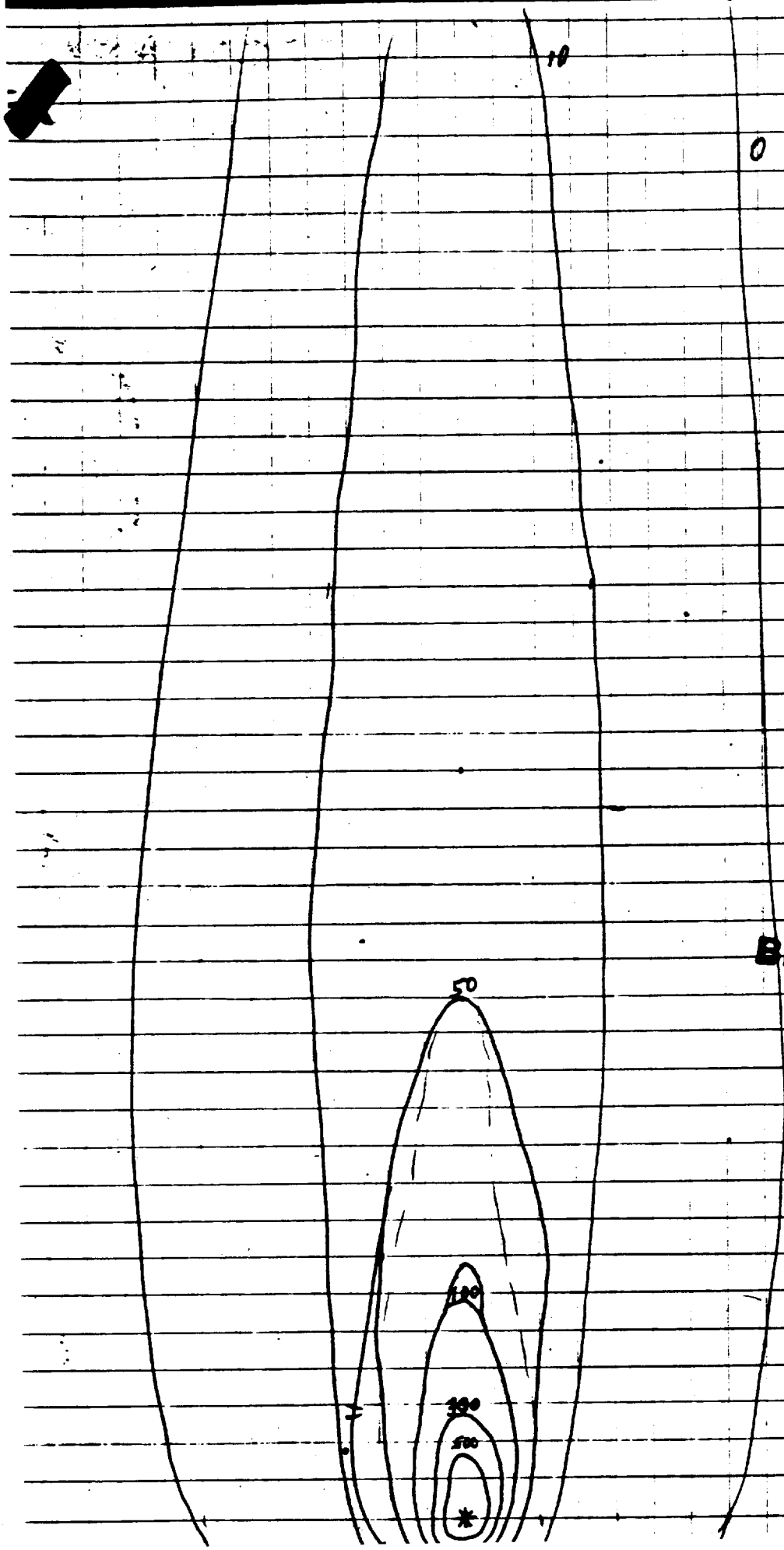
LLNL

185

LLNL (730)



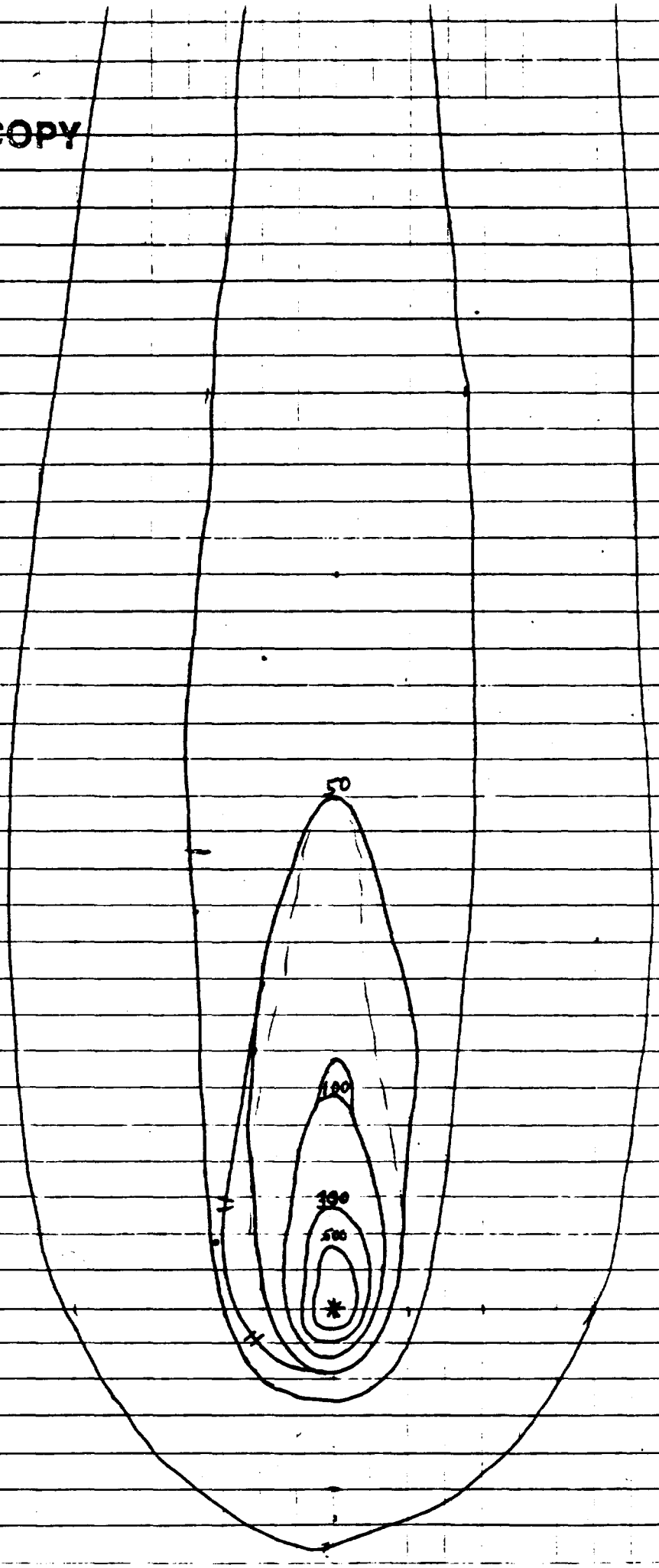
BEST AVAILABLE COPY

LLNL

LCC35 0731

186

BEST AVAILABLE COPY



100

Dose

at

LLNL

182

[redacted]

Development of DELETED Fallout Pattern.

Yield 0.02 kt
Puff radius: 0.22 miles = 1162' or 387 yds
Stem radius: 0.055 miles = 290' or 97 yds
Cloud heights: 3000' sfc burst
6000' tower burst
Stem to puff thickness ratio: 1 [redacted] : 1 to 1

Jangle surface: 1.2 kt

distance:	R/hr @ 1 hr	width
600 yds	500	300 yds at 300 yds
2200 "	300	500 yds at 500 yds; 200
	100	500 yds at 2000 yds
	50	1000 yds at 3000 yds
	10	1500 yds at 3000 yds
	1	2000 yds at 3000 yds.

Jangle surface from TM-23-300 predictions: (15 kt at win

1000 yds	500 R/hr
1500 yds	300 ~~1000~~
3300 yds	100
7000 yds	50

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DELETED prediction from TM-23-200

~~85~~ yds	500 R/hr	(cross wind extent ~ 350 yds.
130 yds	300	
340	100	
700	50	
2400	10	

LLNL

Scaling; widths as $w^{1/3}$ (cube root of 60):

500 R/hr.	~~150~~ 75 yds
300	125 yds
~~100~~	
1	325 yds at zero 500 yds at 1000 yds.

188

DELETED

[redacted]

levelopment of DELETED Fallout Patterns.

2 Kt

: 0.22 miles = 1162' or 387 yds

rs: 0.055 miles = 290' or 97 yds

kts 3000' sfc burst

6000' tower burst

uff thickness ratio: 1 [redacted] : 1 to 1

ace: 1.2 kt

R/hr @ 1 hr	width
500	300 yds at 300 yds
300	500 yds at 500 yds; 2000 yds at 1000 yds
100	500 yds at 2000 yds
50	1000 yds at 2000 yds
10	1500 yds at 3000 yds
1	2000 yds at 3000 yds.

ce from TM-23-200 predictions: (15 kt + wind)

500 R/hr

~~300~~

100

50

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redictions from TM-23-200

500 R/hr (crossing extent ~ 350 yds.

300

100

50

10

LLNL

widths as $w^{1/3}$ (factor of 60):

500 R/hr ~~75~~ ~~150~~ yds

300 175 yds

~~100~~

1 325 yds at zero
500 yds at 1000 yds.

189

LCO35 0735

[illegible] radius. Dirt mines = 1162' or 387 yds
Stem radius: 0.055 miles = 290' or 97 yds
Cloud heights: 3000' sfc burst
6000' tower burst
Stem to puff thickness ratio: 1 [redacted] : 1 to 1

Jungle surface: 1.2 kt

distance:	R/hr @ 1 hr	width
600 yds	500	300 yds at 300 yds
2200 "	300	500 yds at 500 yds; 200
	100	500 yds at 2000 yds
	50	1000 yds at 2000 yds
	10	1500 yds at 3000 yds
	1	2000 yds at 3000 yds

Jungle surface from TM-23-200 predictions: (15 hr t+w

1000 yds	500 R/hr
1500 yds	300 ~~1000~~
3300 yds	100
7000 yds	50

DELETED prediction from TM-23-200

~~100~~ 85 yds	500 R/hr	crossing extent ~ 350 yds.
130 yds	300	
340	100	
700	50	
2400	10	

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Scaling; widths ~~at~~ as $w^{1/3}$ (factor of 60):

500 R/hr.	~~750~~ 75 yds	LLNL
300	125 yds	
~~100~~		
1	325 yds at zero 500 yds at 1000 yds.	
100	225 yds at 125 yds	
50	250 yds at 325 yds	190
10	375 yds at 1000 yds	

Max width in radial winds: 400 yds

68 Bee Overpressures W = 8.1 ± 0.2 kt

[redacted] h = 500'

Desert Line

From UK-10 report

Ground Range, yds	ΔP, psi		
433	14.4	0 level	422
550	10.85	0 level	462
667	11.7	0 level	449
433	21.8	10' level	
550	13.8	10' level	
667	12.4	10' level	
433	28.5	dynamic	
550	—	dynamic	
667	3.25	dynamic	

$$\frac{d_1}{d_Y} = \left(\frac{8.1}{15.4}\right)^{1/3} = 0.526^{1/3} = 0.807$$

$d_1 = 0.807\, d_2$

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Shot Fizeau : 8 kt at 500'

Scaling from Boltzmann:

$\frac{d_B}{d_F} = \left(\frac{11}{8}\right)^{1/3} =$

$d_F = 0.9\, d_B$

ΔP psi	d_B yds	d_B ave ΔP	ave d_F	For @ wea
1	2759		2759	2814
2.56	1541		1541	1572
1.5	2170		2170	2213
5	1031		1031	1054
6	938		938	959
8	724		800	823
9	522		700	720
10	469	550 10.85 433 14.4	540	LLNL 555
15	416	667 11.7	430	430
20	383		383	383
30	337		338	338 191
50	284		284	284
100	214		214	214
200	153		153	153

PIOT PIOT

Bee Overpressures W = 8.1 ± 0.2 kt
h = 500'

[redacted]

t line

From UK-10, neglecting scaled h differences

d Range, yds	ΔP, psi		
433	14.4	0 level	422
550	10.85		462
667	11.7		449
433	21.8	10' level	
550	13.8		
667	12.4		
433	28.5	dynamic	
550	—		
667	8.25		

$\left(\frac{8.1}{15.4}\right)^{1/3} = 0.526^{1/3} = 0.807$

0.807 d_2

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Fizeau : 8 kt at 500'

ng from Boltzmann: $\frac{d_B}{d_F} = \left(\frac{11}{8}\right)^{1/3} = 1.375^{1/3} = 1.112$

$d_F = 0.9\, d_B$

psi	d_F yds	d_{sc} ΔP	d_F or d_F	For Owens: 8 kt at 400':
2759			2759	2814
1541			1541	1572
2170			2170	2213
1031			1031	1054
938			938	959
724			800	823
522			700	720
469	550	10.85	540	555
416	433	14.4	430	430
383	667	11.7	383	383
338			338	338
284			284	284
214			214	214
153			153	153

LLNL

192

DIAT DIAT

[redacted]

Overpressures: Franklin: 2 Kt at 300'

Alt. corrections: Distance: 1.04; ΔP: 0

Directly from TM-23-200: "average" surface conditions.

ΔP	$\Delta P_{5000'}$	dist × $\frac{1}{1.04}$ × 1.26 = $d_{FRANKLIN}$, yds	Franklin x 0.66 Lassen
1	0.85	1920	1283
1.18	1.00	1736	1160
2	1.70	1192	796
3	2.55	886	592
5	4.25	623	416
10	8.50	399	267
15	12.75	302	202
20	17.00	254	170
30	25.50	206	138
50	42.50	157	105
70	59.50		
100	85.00	115	
200	170.0		

PLOT

Laplace: 1.7 Kt at 750'

Altitude corrections: Distance 1.04; ΔP:

Scaled height: 628' Data as of Fra

20':

ΔP	$\Delta P_{5000'}$	dist × $\frac{1}{1.04}$ × 1.193 = d_{LLNL}, yds
1	0.83	1984
2	1.66	1357
3	2.49	1052
5	4.15	759
10	8.3	477
15	12.45	288
20	16.6	190
30	24.9	115
50	41.5	-
70	58.1	-
100	83	-

BEST AVAILABLE COPY

LLNL

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Overpressures: Franklin: 2 Kt at 300' scaled h = 238'

Alt. corrections: Distance: 1.04; ΔP: 0.85

from TM-23-200: "average" surface conditions. (Checks UK-3 to 4 psi.)

ΔP_{scaled}	dist × $\frac{1}{1.04}$ × 1.26 = dist Franklin, yds	Franklin × 0.668 Lassen	W = 0.6 at 300' Corrected for scaled h
0.85	1920	1283	1311
1.00	1736	1160	1185
1.70	1192	796	819
2.55	886	592	607
4.25	623	416	426
8.50	398	267	275
12.75	302	202	202
17.00	254	170	163
25.50	206	138	115
42.50	157	105	95
59.50			PLOT
85.00	115		
170.0	PLOT		

BEST AVAILABLE COPY

Laplace: 1.7 Kt at 750'

Altitude corrections: Distance 1.04; ΔP: 0.83

Scaled height: 628' Data as of Franklin above.

ΔP_{scaled}	dist × $\frac{1}{1.04}$ × 1.193 = dist, yds
0.83	1984
1.66	1357
2.49	1052
4.15	759
8.3	477
12.45	288
16.6	190
24.9	115
41.5	-
58.1	-
83	-

LC03E 0740

70

[redacted]

Overpressures: Huygens: 0.02 kt, sfc.

Altitude corrections: Distances 1.04; ΔP

Using TM 23-200:

ΔP	ΔP 5000'	dist x 1/1.04 * 0.272 = d Huygens	Scali
0.1	0.086	*4300 ÷ 1.04 = 4134	(÷
0.4	0.344	= 962	
0.5	0.43	*830 ÷ 1.04 = 798	
1	0.86	391	
3	2.58	180	
5	4.30	130	
10	8.60	85 62	
20	17.20	[illegible]	
30	25.80	49	
50	43.00	42	

PLOT

* Taken from COL 4340

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LLNL

[redacted]

Overpressures: Huygens: 0.02 kt, sfc

Altitude corrections: Distance 1.04; ΔP 0.86

Using TM 23-200:

P	ΔP sea'	d/kt × $\frac{1}{1.04}$ = d Huygens	Scaling from HE: (÷ 1.04, W = 20,000 #)
1	0.086	*4300 ÷ 1.04 = 4134	
4	0.344	= 962	
5	0.43	*830 ÷ 1.04 = 798	
	0.86	391	375
	2.58	180	153
	4.30	130	108
2	8.60	85 62	73
0	17.20	[redacted]	52
0	25.80	49	44
0	43.00	42	34

PLOT

* Taken from COL 4340

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[redacted]

Prompt Gamma Interactions : Plumbbob . (Corsbie's curves)

Relative air density = R = $0.27\,P/T$

$= 0.27 \times 860/286$

$= 0.81$

Plot γ-yield scaling factor vs yield for R = 0.81
" γ dose vs slant range for 1 kt

1/4 PSI distance

Newton	70 kt	1500'	: 21,700 yds	area 7
Hood	60 kt	1500'	: 20,200 yds	" 9
Franklin	2 kt	300'	: 6400 yds	" 3

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LLNL

mpt Gamma Interstitics : Plumbbob - (Carsbie's curves)

lative air density = R = 0.27 P/T

= 0.27 × 860/286

= 0.81

ot γ-yield scaling factor vs yield for R = 0.81 } From
" γ dose vs slant range for 1 kt } TM 23-200

PSI distance

Newton 70kt 1500' : 21,700 yds area 7
Hood 60kt 1500' : 20,700 yds area 9
Franklin 2-kT 300' : 6400 yds " 3

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72

[redacted]

Corstie's request for Project 39.5

Shot	Shape	Boosted	Stages
Franklin	DELETED	Yes?	1
Wilson		Yes	1
Hood -		Yes	2
Laplace -		No?	1
Newton:		Yes	2
Smoky:		Yes	2
Galileo		Yes	1
Fizeau		Yes?	1

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LLNL

cont. from page 43

[redacted]

$$D_{inf} = \frac{957M}{\bar{v}\, t^{1.2} \Delta\theta\, (\bar{v}\Delta t + 2a) + t^{0.2}(2a\bar{v}\Delta t + \pi a^2)}$$

where

M = mc at 1 hour in layer Δh ("width c

$\bar{v}$ = mean wind speed to height h, knots

t = fall time from height h, hours

Δt = " " interval from Δh interval, h

a = cloud radius at height h, nautical r

$\Delta\theta$ in degrees

$$D_{inf} = \frac{957 M_{ij}}{\bar{v}\left(h_i/f_{ij}\right)^{1.2} \Delta\theta \left[\frac{h_i \Delta f_{ij}}{f_j f_{j-1}} \bar{v} + 2a\right] + \left(h_i/f_{ij}\right)^{0.2} \left(2a\bar{v} \frac{h_i \Delta f_{ij}}{f_j}\right.}$$

Set $f_j f_{j-1} \approx f_{ij}^2$

Then $D_{inf}^{-1} = \frac{1}{957 M_{ij}} \left[\bar{v} \left(\frac{h_i}{f_{ij}}\right)^{1.2} \Delta\theta \left(\left[\frac{h_i \Delta f_{ij}}{f_{ij}^2}\right] \bar{v} + 2a \right) + \left(f_{\cdot}\right.\right.$

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cont. from page 43

$$f = \frac{957M}{\bar{v}\, t^{1.2}\, \Delta\theta\, (\bar{v}\Delta t + 2a) + t^{0.2}(2a\bar{v}\,\Delta t + \pi a^2)}$$

here

M = mc at 1 hour in layer Δh ("width" $\Delta\theta$)
$\bar{v}$ = mean wind speed to height h, knots
t = fall time from height h, hours.
Δt = " " interval from Δh interval, hours
a = cloud radius at height h, nautical miles.
$\Delta\theta$ in degrees

$$inf = \frac{957 M_{ij}}{\bar{v}\left(h_i/f_{ij}\right)^{1.2} \Delta\theta \left[\frac{h_i \Delta f_{ij}}{f_j f_{j-1}}\bar{v} + 2a\right] + \left(h_i/f_{ij}\right)^{0.2}\left(2a\bar{v}\frac{h_i \Delta f_{ij}}{f_j f_{j-1}} + \pi a^2\right)}$$

$$+ \quad f_j f_{j-1} \approx f_{ij}^2$$

$$\therefore \bar{inf}^{-1} = \frac{1}{957 M_{ij}}\left[\bar{v}\left(\frac{h_i}{f_{ij}}\right)^{1.2}\Delta\theta\left(\left[\frac{h_i \Delta f_{ij}}{f_{ij}^2}\right]\bar{v} + 2a\right) + \left(\frac{h_i}{f_{ij}}\right)^{0.2}\left[\frac{2a\bar{v}\, h_i \Delta f_{ij}}{f_{ij}^2} + \pi a^2\right]\right]$$

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	3.52		3.545			.54962		.30089	.11824	.00
	3.57		3.595			.55570		.30469	.11968	.00
	3.62		3.645			.56170		.30844	.12111	.00
	3.67		3.695			.56761		.31214	.12251	.00
	3.72		3.745			.57345		.31579	.12390	.00
	3.77		3.795			.57921		.31939	.12527	.00
	3.82		3.845			.58490		.32294	.12662	.00
	3.87		3.895			.59051		.32645	.12795	.00
	3.92		3.945			.59605		.32991	.12927	.00
	3.97		3.995			.60152		.33333	.13057	.00
	4.02		4.045			.60692		.33671	.13185	.00
	4.07		4.095			.61225		.34004	.13311	.00
	4.12		4.145			.61752		.34333	.13433	.00
	4.17		4.195			.62273		.34659	.13554	.00
	4.22		4.245			.62788		.34981	.13673	.00
	4.27		4.295			.63296		.35298	.13793	.00
	4.32		4.345			.63799		.35612	.13913	.00
	4.37		4.395			.64296	LLNL	.35923	.14031	.00
	4.42		4.445			.64787		.36230	.14145	.00
	4.47		4.495			.65273		.36534	.14258	.00
	5.47	5.445	5.495		.73600	.73997	.41738	.41986	.16275	.00
	7.47	7.445	7.495		.87186	.87477	.50229	.50411	.19294	.00
	9.47	9.445	9.495		.97520	.97749	.56688	.56831	.21513	.0004
	1.12	1.095	1.145		.03941	.05881	.01799	.00586	.00720	.00
	1.07	1.045	1.095		.01912	.03941	.03067	.01799	.01227	.005
	1.02	.995	1.045		-.00218	.01912	.04398	.03067	.01755	.0052
	.97	.945	.995		-.02457	-.00218	.05798	.04398	.02309	.0055
	.92	.895	.945		-.04818	-.02457	.07273	.05798	.02899	.0057
	.82	.795	.845		-.09863	-.07289	.10489	.08818	.04176	.0063
	.72	.695	.745		-.15802	-.12784	.14138	.12252	.05624	.0074
	.62	.595	.645		-.22548	-.19044	.18354	.16164	.07282	.00
	.52	.495	.545		-.30539	-.26360	.23349	.20737	.09236	.01
	.42	.395	.445		-.40340	-.35164	.29474	.26239	.11595	.01
	.32	.295	.345		-.53018	-.46248	.37398	.33148	.14577	.01
	.22	.195	.245		-.70997	-.61083	.48635	.42439	.18662	.02
	.12	.095	.145		-1.02228	-.83863	.68154	.56676	.25228	.037
2	9.40	9.375	9.425	.97313	.97197	.97428	.00108	.00107	Aj .00043	Aj+1 .0004
↓	30.00			↓	1.47676	1.47748	.47068	.47136	.18104	.181
	0.15				-.90309	-.75696	1.25348	1.16691	.46021	.447
	1.05				.01072	.03141	.89945	.88011	.31576	.316
										217
1	12.20	12.175	12.225	1.08636	1.08547	1.08745	.00089	.00109	.00036	.000
↓	30.00			↓	1.47676	1.47748	.39040	.39112	.15185	.152
	0.15				-.90309	-.75696	1.98945	1.84332	.47667	.467
	1.05				.01072	.03141	1.07564	1.05495	.35894	.352
8	40.02	39.995	40.045							

	3.545			.54962		.30089	.11824	.00147	.00038	
	3.595			.55570		.30469	.11968	.00144	.00037	
	3.645			.56170		.30844	.12111	.00143	.00037	
	3.695			.56761		.31214	.12251	.00140	.00036	
	3.745			.57345		.31579	.12390	.00139	.00036	
	3.795			.57921		.31939	.12527	.00137	.00035	
	3.845			.58490		.32294	.12662	.00135	.00035	
	3.895			.59051		.32645	.12795	.00133	.00034	
	3.945			.59605		.32991	.12927	.00132	.00034	
	3.995			.60152		.33333	.13057	.00130	.00034	
	4.045			.60692		.33671	.13185	.00128	.00033	
	4.095			.61225		.34004	.13311	.00126	.00033	
	4.145			.61752		.34333	.13433	.00122	.00031	
	4.195			.62273		.34659	.13554	.00121	.00031	
	4.245			.62788		.34981	.13673	.00119	.00031	
	4.295			.63296		.35298	.13793	.00120	.00031	
	4.345			.63799		.35612	.13913	.00120	.00031	
	4.395			.64296		.35923	.14031	.00118	.00030	
	4.445			.64787		.36230	.14145	.00114	.00029	
	4.495			.65273		.36534	.14258	.00113	.00029	
.445	5.495		.73600	.73997	.41738	.41986	.16275	.00092	.00024	
.445	7.495		.87186	.87477	.50229	.50411	.19294	.00064	.00017	
.445	9.495		.97520	.97749	.56688	.56831	.21513	.00049	.00013	
1.095	1.145		.03941	.05881	.01799	.00586	.00720	.00486	.00125	
1.045	1.095		.01912	.03941	.03067	.01799	.01227	.00507	.00131	
.995	1.045		-.00218	.01912	.04398	.03067	.01755	.00528	.00136	
.945	.995		-.02457	-.00218	.05798	.04398	.02309	.00554	.00143	
.895	.945		-.04818	-.02457	.07273	.05798	.02899	.00590	.00152	
.795	.845		-.09863	-.07289	.10489	.08818	.04176	.00659	.00170	
.695	.745		-.15802	-.12784	.14138	.12252	.05624	.00746	.00192	
.595	.645		-.22548	-.19044	.18354	.16164	.07282	.00858	.00221	LLNL
.495	.545		-.30539	-.26360	.23349	.20737	.09236	.01026	.00265	
.395	.445		-.40340	-.35164	.29474	.26239	.11595	.01244	.00321	
.295	.345		-.53018	-.46218	.37398	.33148	.14577	.01591	.00410	216
.195	.245		-.70997	-.61083	.48635	.42439	.18662	.02224	.00574	216
.095	.145		-1.02228	-.83863	.68154	.56676	.25228	.03768	.00972	
9.375	9.425	.97313	.97197	.97428	.00108	.00107	Aj .00043	Aj+1 .00043	DA .00084	.00020
		↓	1.47676	1.47748	.47068	.47136	.18104	.18129	.00025	.00609
			-.90309	-.75696	1.35348	1.61681	.46021	.44706	.01315	.01115
			.01072	.03141	.89945	.88011	.31576	.31063	.00513	.00494
2.175	12.225	1.08636	1.08547	1.08745	.00089	.00109	.00036	.00044	.00080	.00019
		↓	1.47676	1.47748	.39040	.39112	.15185	.15211	.00036	.00019
			-.90309	-.75696	1.98945	1.84333	.47667	.46733	.00934	.00469
			.01072	.03141	1.07564	1.05495	.35894	.35425	.00469	
9.995	40.045	.06819	1.60209	1.60254	.95063	.95897	.33118	.33123	.00005	

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f_{j+1}	$\log f_0$	$\log f_j$	[redacted]	t_j	t_{j+1}	A_j	A_{j+1}	ΔA	m'
1.825	0.25527	.24920	.26126	.00405	.00399	.00162	.00160	.00322	.00063
2.825	↓	.44326	.45102	.12533	.13050	.04988	.05190	.00202	.00039
3.825		.57692	.58263	.21443	.21824	.08493	.08641	.00148	.00029
5.825		.76155	.76530	.33752	.34002	.13216	.13311	.00095	.00019
8.825		.94325	.94571	.45865	.46029	.17671	.17730	.00059	.00015
0.825		-.11070	-.08355	.24398	.22588	.09635	.08939	.00696	.00136
0.525		-.32331	-.27984	.38572	.35674	.15017	.13936	.01076	.00210
0.325		-.56067	-.48812	.54396	.49559	.20675	.18991	.01684	.00328
0.175		1.47676 -.90309	1.47748 -.75696	.81433 .77224	.81481 .67482	.29226 .28005	.29239 .25014	.00013 .02991	.00003 .00583
0.775	-.12494	-.13966	-.11070	.00856	.00828	.00342	.00331	.00673	.00134
1.525	↓	.16879	.18327	.17077	.17919	.06780	.07108	.00328	.00065
3.025		.47349	.48073	.34792	.35213	.13603	.13761	.00158	.00031
5.025		.69679	.70114	.47775	.48028	.18359	.18450	.00091	.00018
2.625		.29557	.30643	.24448	.25080	.09655	.09901	.00246	.00049
.075		.48073	.48785	.35213	.35627	.13761	.13918	.00157	.00031
8.025		.90173	.90445	.59690	.59848	.22475	.22528	.00053	.00010
2.425		-.42597	-.37161	.17502	.14341	.06946	.05703	.01243	.00247
2.175		-.90309	-.75696	.45241	.36745	.17447	.14336	.03111	.00619
2.475	-.34679	-.37161	-.32331	.01349	.01276	.00540	.00510	.01050	.00100
1.075	↓	.01072	.03141	.19430	.20554	.07708	.08146	.00438	.00042
2.025		.29557	.30643	.34911	.35501	.13647	.13870	.00223	.00021
3.025		.47349	.48073	.44580	.44974	.17209	.17351	.00142	.00013
0.225		-.75696 1.47676	-.64782 1.47748	.22292 .99106	.16360 .99145	.08824 .33915	.06500 .33923	.02324 .00010	.00221 .00000
0.125		-1.12494	-.90309	.42291	.30234	.16385	.11879	.04506	.00428
2.645	.41830	.41414	.42243	.00297	.00295	.00119	.00118	.00237	.00022
5.045	↓	.69854	.70286	.20017	.20326	.07937	.08057	.00120	.00011
1.095		.01912	.03941	.28513	.27064	.11225	.10665	.00560	.00052
0.445		-.40340	-.35164	.58693	.54996	.22136	.20879	.01257	.00117
0.145		1.47676 -1.02228	1.47748 -.83863	.75604 1.02899	.75656 .89781	.37521 .34826	.37537 .31533	.00016 .03293	.00015 .00306
2.775	.57403	.57113	.57692	.00221	.00221	.00088	.00088	.00176	.00056
0.025	↓	.99891	1.00108	.32434	.32599	.12715	.12778	.00063	.00020
1.075		.01072	.03141	.43001	.41421	.16640	.16066	.00574	.00018
20.025		1.30049	1.30147	.55855	.55530	.21039	.21066	.00027	.00009
425		-.42597	-.37161	.76336	.72186	.27741	.26478	.01263	.00404
0.175		-.90309	-.75696	1.12757	1.01602	.37027	.34518	.02509	.00803
5.325	.72428	.72222	.72632	.00169	.00167	.00068	.00067	.00135	.00043
1.075	↓	.01072	.03141	.58488	.56793	.22066	.21500	.00566	.00181
8.975		.99673	.99891	.22332	.22511	.08839	.08909	.00070	.00022
425		-.42597	-.37161	.94283	.89827	.32711	.31545	.01166	.00373
20.025		1.47676	1.47748	.61679	.61738	.23134	.23154	.00020	.00006
2.175		-.90309	-.75696	1.33391	1.21413	.40886	.38768	.02118	.00678
7.225	.96232	.96102	.96401	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Level	$f_{i,i}$	f_i	$f_{i,i+1}$	$\log f_0$	$\log f_{i,i}$	$\log f_{i,i+1}$	t_i	$t_{i,i+1}$	A_i	$A_{i,i+1}$
9	1.80	1.775	1.825	0.25527	.24920	.26126	.00405	.00389	.00162	.0
↓	2.80	2.775	2.825	↓	.44326	.45102	.12533	.13050	.04988	.05
↓	3.80	3.775	3.825		.57692	.58263	.24443	.21824	.08493	.0
	5.80	5.775	5.825		.76155	.76530	.33752	.34002	.13216	.13
	8.80	8.775	8.825		.94325	.94571	.45865	.46029	.17671	.17
	0.80	0.775	0.825		-.11070	-.08355	.24398	.22588	.09635	.08
	0.50	0.475	0.525		-.32331	-.27984	.38572	.35674	.15017	.13
	0.30	0.275	0.325		-.56067	-.48812	.54396	.49559	.20675	.19
	30.00				1.47676	1.47748	.81433	.81481	.39226	.39
	0.15	0.125	0.175		-.90309	-.75696	.77224	.67482	.28005	.25
9	0.75	0.725	0.775	-.12494	-.13966	-.11070	.00856	.00828	.00342	.00
↓	1.50	1.475	1.525	↓	.16879	.18327	.17077	.17919	.06780	.07
↓	3.00	2.975	3.025		.47349	.48073	.34792	.35213	.13603	.13
	5.00	4.975	5.025		.69679	.70114	.47775	.48028	.18359	.19
	2.00	1.975	2.025		.29557	.30643	.24448	.25080	.09655	.09
	3.05	3.025	3.075		.48073	.48785	.35213	.35627	.13761	.13
	8.00	7.975	8.025		.90173	.90445	.59690	.59848	.22475	.22
	0.40	0.375	0.425		-.42597	-.37161	.17502	.14341	.06946	.05
	0.15	0.125	0.175		-.90309	-.75696	.45241	.36745	.17447	.14
10	0.45	0.425	0.475	-.34679	-.37161	-.32331	.01349	.01276	.00540	.00
↓	1.05	1.025	1.075	↓	.01072	.03141	.19430	.20554	.07708	.08
	2.00	1.975	2.025		.29557	.30643	.34911	.35501	.13647	.13
	3.00	2.975	3.025		.47349	.48073	.44580	.44974	.17209	.17
	0.20	0.175	0.225		-.75696	-.64782	.22292	.16360	.08824	.06
	30.00				1.47676	1.47748	.99106	.99145	.39915	.39
	0.10	0.075	0.125		-1.12494	-.90309	.42291	.30234	.16385	.11
6	2.62	2.595	2.645	.41830	.41414	.42243	.00297	.00295	.00119	.00
↓	5.02	4.995	5.045	↓	.69854	.70286	.20017	.20326	.07937	.08
	1.07	1.045	1.095		.01912	.03941	.28513	.27064	.11225	.10
	0.42	0.395	0.445		-.40340	-.35164	.58693	.54996	.22136	.20
	20.00				1.47676	1.47748	.75604	.75656	.27521	.27
	0.12	0.095	0.145		-1.02228	-.83863	1.02899	.89781	.34826	.31
5	3.75	3.725	3.775	.57403	.57113	.57692	.00221	.00221	.00078	.00
↓	10.00	9.975	10.025	↓	.99891	1.00108	.32434	.32599	.12715	.12
	1.05	1.025	1.075		.01072	.03141	.43001	.41421	.16640	.16
	20.00	19.975	20.025	LLNL	1.30049	1.30147	.55855	.55530	.21039	.21
	0.40	.375	.425		-.42597	-.37161	.26336	.22186	.07741	.06
	0.15	0.125	0.175		-.90309	-.75696	1.12257	1.01602	.37027	.34
4	5.30	5.275	5.325	.72428	.72222	.72632	.00169	.00167	.00068	.00
↓	1.05	1.025	1.075	↓	.01072	.03141	.58488	.56793	.22066	.21
	9.95	9.925	9.975		.99673	.99891	.22332	.22511	.08839	.08
	0.40	.375	.425		-.42597	-.37161	.94283	.89827	.32711	.31
	30.00	29.975	30.025		1.47676	1.47748	.61679	.61738	.23134	.23
	0.15	0.125	0.175		-.90309	-.75696	1.33391	1.21413	.40886	.38

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	8.80	8.775	8.825		.94325	.94571	.45865	.46029	.17671	.177
	0.80	0.775	0.825		-.11070	-.08355	.24398	.22588	.09635	.089
	0.50	0.475	0.525		-.32331	-.27984	.38572	.35674	.15012	.139
	0.30	0.275	0.325		-.58067	-.47812	.54396	.49559	.20675	.19
	35.00				1.47676	1.47748	.81433	.81481	.39226	.392
	0.15	0.125	0.175		-.90309	-.75696	.77224	.67482	.28005	.250
9	0.75	0.725	0.775	-.12494	-.13966	-.11070	.00856	.00828	.00342	.003
↓	1.50	1.475	1.525	↓	.16879	.18327	.17077	.17919	.06780	.071
	3.00	2.975	3.025		.47349	.48073	.34792	.35213	.13603	.137
	5.00	4.975	5.025		.69679	.70114	.47775	.48028	.18359	.184
	2.00	1.975	2.025		.29557	.30643	.24448	.25080	.09655	.099
	3.05	3.025	3.075		.48073	.48785	.35213	.35627	.13761	.139
	8.00	7.975	8.025		.90173	.90445	.59690	.59848	.22475	.225
	0.40	0.375	0.425		-.42597	-.37161	.17502	.14341	.06946	.057
	0.15	0.125	0.175		-.90309	-.75696	.45241	.36745	.17447	.143
10	0.45	0.425	0.475	-.34679	-.37161	-.32331	.01349	.01276	.00540	.005
↓	1.05	1.025	1.075	↓	.01072	.03141	.19430	.20554	.07708	.081
	2.00	1.975	2.025		.29557	.30643	.34911	.35501	.13647	.138
	3.00	2.975	3.025		.47349	.48073	.44580	.44974	.17209	.173
	0.20	0.175	0.225		-.75696	-.64782	.22292	.16360	.08824	.065
	30.00				1.47676	1.47748	.99106	.99145	.35915	.337
	0.10	0.075	0.125		-1.12494	-.90309	.42291	.30234	.16385	.112
6	2.62	2.595	2.645	.41830	.41414	.42243	.06297	.00295	.00119	.001
↓	5.02	4.995	5.045	↓	.69854	.70286	.20017	.20326	.07937	.080
	1.07	1.045	1.095		-.01912	.03941	.28513	.27064	.11225	.106
	0.42	0.395	0.445		-.40340	-.35164	.58693	.54996	.22136	.207
	30.00				1.47676	1.47748	.75604	.75654	.37516	.375
	0.12	0.095	0.145		-1.02228	-.83863	1.02899	.89781	.34826	.315
5	3.75	3.725	3.775	.57403	.57113	.57692	.00221	.00221	.00088	.000
↓	10.00	9.975	10.025	↓	.99891	1.00108	.32434	.32599	.12715	.127
	1.05	1.025	1.075		.01072	.03141	.43001	.41421	.16640	.160
	20.00	19.975	20.025		1.30049	1.30147	.55855	.55530	.21039	.210
	0.40	.375	.425		-.42597	-.37161	.76336	.72186	.27741	.264
	0.15	0.125	0.175		-.90309	-.75696	1.12757	1.01602	.37027	.345
4	5.30	5.275	5.325	.72428	.72222	.72632	.00169	.00167	.00068	.000
↓	1.05	1.025	1.075	↓	.01072	.03141	.58488	.56793	.22066	.215
	9.95	9.925	9.975		.99673	.99891	.22332	.22511	.08839	.087
	0.40	.375	.425		-.42597	-.37161	.94283	.89827	.32711	.315
	30.00	29.975	30.025	LLNL	1.47676	1.47748	.61679	.61738	.23134	.23
	0.15	0.125	0.175		-.90309	-.75696	1.33391	1.21413	.40886	.38
3	7.30	7.275	7.325	.86332	.86183	.86481	.00131	.00131	.00052	.00
↓	0.15			↓	-.90309	-.75696	1.54148	1.42130	.43934	.4
	1.05				.01072	.03141	.74789	.72974	.27269	.2
	30.00				1.47676	1.47748	.53811	.53874	.20474	.2
	0.40				-.42597	-.37161	1.13096	1.08327	.37100	.3
9	40.00	39.975	40.025	-.12494	1.60178	1.60233	1.00391	1.00423	.34227	.34

8.825		.94325	.94571	.45865	.46029	.17671	.17730	.00059	.000115
0.825		-.11070	-.08355	.24398	.22588	.09635	.08939	.00696	.00136
0.525		-.32331	-.27984	.38572	.35674	.15017	.13936	.01076	.00210
0.325		-.56067	-.48812	.54396	.49559	.20675	.18991	.01684	.00328
		1.47676	1.47748	.81433	.71481	.39226	.29239	.00012	.000025
0.175		-.90309	-.75696	.77224	.67482	.28005	.25014	.02991	.00583
0.775	-.12494	-.13966	-.11070	.00856	.00828	.00342	.00331	.00673	.00134
1.525	↓	.16879	.18327	.17077	.17919	.06780	.07108	.00328	.00065
3.025		.47349	.48073	.34792	.35213	.13603	.13761	.00158	.00031
5.025		.69679	.70114	.47775	.48028	.18359	.18450	.00091	.00018
2.025		.29557	.30643	.24448	.25080	.09655	.09901	.00246	.00049
3.075		.48073	.48785	.35213	.35627	.13761	.13918	.00157	.00031
8.025		.90173	.90445	.59690	.59848	.22475	.22529	.00053	.00010
0.425		-.42597	-.37161	.17502	.14341	.06946	.05703	.01243	.00247
0.175		-.90309	-.75696	.45241	.36745	.17447	.14336	.03111	.00619
0.475	-.34679	-.37161	-.32331	.01349	.01276	.00540	.00510	.01050	.00100
1.075	↓	.01072	.03141	.18430	.20554	.07708	.08146	.00438	.00042
2.025		.29557	.30643	.34911	.35501	.13647	.13870	.00223	.00021
3.025		.47349	.48073	.44580	.44974	.17209	.17351	.00142	.00018
0.225		-.75696	-.64782	.22292	.16360	.08824	.06500	.02324	.00221
		1.47676	1.47748	.99106	.99145	.33915	.33925	.00010	.0000095
0.125		-1.12494	-.90309	.42291	.30234	.16385	.11279	.04506	.00428
2.645	.41830	.41414	.42243	.00297	.00295	.00119	.00118	.00237	.00022
5.045	↓	.69854	.70286	.20017	.20326	.07937	.08057	.00120	.00011
1.095		.01912	.03941	.28513	.27064	.11225	.10665	.00560	.00052
0.445		-.40340	-.35164	.58693	.54996	.22134	.20279	.01257	.00117
		1.47676	1.47748	.75604	.75656	.27521	.27537	.00016	.000015
0.145		-1.02228	-.83863	1.02899	.89781	.34826	.31533	.03293	.00306
2.775	.57403	.57113	.57692	.00221	.00221	.00088	.00088	.00176	.00056
10.025	↓	.99891	1.00108	.32434	.32599	.12715	.12778	.00063	.000020
1.075		.01072	.03141	.43001	.41421	.16640	.16066	.00574	.00018
20.025		1.30049	1.30147	.55455	.55530	.21039	.21066	.00027	.000009
.425		-.42597	-.37161	.76336	.72186	.27741	.26428	.01263	.000404
0.175		-.90309	-.75696	1.12757	1.01602	.37027	.34518	.02509	.000803
5.325	.72428	.72222	.72632	.00169	.00167	.00068	.00067	.00135	.000043
1.075	↓	.01072	.03141	.58488	.56793	.22066	.21500	.80566	.000181
9.975		.99673	.99891	.22332	.22511	.08839	.08909	.00070	.000022
.425		-.42597	-.37161	.94283	.89827	.32711	.31545	.01166	.000373
30.025		1.47676	1.47748	.61679	.61738	.23134	.23154	.00020	.000006
0.175		-.90309	-.75696	1.33391	1.21413	.40886	.38768	.02118	.000678
7.325	.86332	.86183	.86481	.00131	.00131	.00052	.00052	.00104	.000033
	↓	-.90309	-.75696	1.54148	1.42130	.43934	.42238	.01696	.000534
		.01072	.03141	.74789	.72974	.27269	.26722	.00547	.000175
		1.47676	1.47748	.53811	.53874	.20474	.20496	.00022	.000007
		-.42597	-.37161	1.13096	1.08327	.37100	.36062	.01038	.000332
40.025	-.12494	1.60178	1.60233	1.00391	1.00423	.34228	.34236	.00008	.000016

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Test calculation (from FOPEN manual)

[redacted]

$h_r = 40$ $h_0 = 4.44$ $\frac{h_0}{f_{0j}} = 1.59$ $f_{0j} = 2.79$ $\Delta\theta_0 =$

$d = 50$ miles $\bar{v}_0 = 31.4$ $C_{0j} = .000490$ $f_{0j}^2 = 7.78$ $^{4}/_{f_{0j}^2}$

$$D_{inf} = \frac{2940}{4.76}\{31.4 \times 4.2 \times 1.59^{1.2}[31.4 \times .57 + 40] + 1.59^{0.2}[2 \times 31.4 \times 0.57 + 63]\}^{-1}$$

$$= \frac{2940}{4.76}\{230 \times 57.9 + 1.097[98.8]\}^{-1}$$

$$= \frac{2940}{4.76}(13317 + 108)^{-1} = \frac{2940}{4.76} \times 13425^{-1} = 9.54 \times 10^{-4} \quad 0.15$$

$h_7 = 3.85$ $\frac{h_7}{f_{7j}} = 1.69$ $f_{7j} = 2.28$ $f_{7j}^2 = 5.20$ $^{4}/_{f_{7j}^2} = 0.71$

$\bar{v}_7 = 29.5$ $C_{7j} = .000494$

$$D_{inf} = 6 \times 10^{6} \times 4.94 \times 10^{-4}(29.5 \times 5.4 \times 1.87[29.5 \times .74 + 40] + 1.01[2 \times 29.5 \times .74 +$$

$$= 2.96 \times 10^{3}(298 \times 62 + 1.111 \times 107)^{-1} = 2.96 \times 10^{3} \div 1.86 \times 1$$

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Met: using WBP MODEL

$h_r = 38{,}000$ AG $h_7 = 24{,}760' = 4.06$ n. mi. $\frac{h_7}{f_{7j}} = 2.12$ f_7

$d = 50$ miles $\bar{v}_7 = 23.6$ $C_{7j} = .00201$ $f_{7j}^2 = 3.69$

$^{4}/_{f_{7j}^2} = 1.10$ $w = 3$ $a = 2.2$ $\Delta\theta_7 = 1.1$

$$D_{inf} = 6 \times 10^{6} \times 3 \times 2.01 \times 10^{-3}\{23.6 \times 1.1 \times 2.46[23.6 \times 1.1 + 40 \times 2.2] + 1.16[2 \times$$

$$= 3.62 \times 10^{4}\{63.9[114] + 1.16[417]\}^{-1}$$

$$= 3.62 \times 10^{4}(7285 + 484)^{-1} = \frac{3.62 \times 10^{4}}{7.77 \times 10^{3}} = 0.4$$

LLNL

$h_0 = 4.69$ $^{h_2}/_{f_{8j}} = 1.48$ $f_{8j} = 3.17$ $C_{2_0} = .00125$

$\bar{v}_8 = 33.8$

$$D_{inf} = 6 \times 10^{6} \times 3 \times 1.25 \times 10^{-3}\{33.8 \times 2.6 \times 1.6[33.6 \times 0.4 + 88] + 1.1[4.4 +$$

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$$= 2.25 \times 10^{4}[32.4(161.5) + 1.1 \times 361]^{-1}$$

$$= 2.25 \times 10^{4}(2.481 \times 10^{3})^{-1}$$

Test calculation (from FOPEN manual) [redacted]

$h_8 = 4.44$ $\frac{h_8}{f_{8j}} = 1.59$ $f_{8j} = 2.79$ $\Delta\theta_8 = 4.2$ $a_{ij} = 1$

$\bar{v}_8 = 31.4$ $C_{8j} = .000340$ $f_{8j}^2 = 7.78$ $w/f_{8j}^2 = 0.57$ $w = 1$

$31.4 \times 4.2 \times 1.59^{1.2}[31.4 \times .57 + 40] + 1.59^{0.2}[2 \times 31.4 \times 0.57 + 63]\}^{-1}$

$\{230 \times 57.9 + 1.097[98.8]\}^{-1}$

$(13317 + 108)^{-1} = 4.76 \times 13425^{-1} = 3.54 \times 10^{-4}$ ~~0.1572~~ 0.219

5 $\frac{h_7}{f_{7j}} = 1.69$ $f_{7j} = 2.28$ $f_{7j}^2 = 5.20$ $w/f_{7j}^2 = 0.74$ $\Delta\theta = 5.4$

$C_{7j} = .000494$

$4.94 \times 10^{-4}(29.5 \times 5.4 \times 1.87[29.5 \times .74 + 40] + 1.11[2 \times 29.5 \times .74 + 63])^{-1}$

$\times 10^3(298 \times 62 + 1.11 \times 107)^{-1} = 2.96 \times 10^3 \div 1.86 \times 10^4 = 0.159$

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xg WBP MCDGL

8,000 AG $h_7 = 24,760' = 4.06$ n.mi. $\frac{h_7}{f_{7j}} = 2.12$ $f_{7j} = 1.92$

miles $\bar{v}_7 = 23.6$ $C_{7j} = .00201$ $f_{7j}^2 = 3.69$

$= 1.10$ $w = 3$ $a = 2.2$ $\Delta\theta_7 = 1.1$

$\times 10^6 \times 3 \times 2.01 \times 10^{-3}\{23.6 \times 1.1 \times 2.46[23.6 \times 1.1 + 40 \times 2.7] + 1.16[2 \times 2.2 \times 23.6 \times 1.1 + 63 \times 4.6]$

$3.62 \times 10^4\{63.9[114] + 1.16[417]\}^{-1}$

$3.62 \times 10^4(7285 + 484)^{-1} = \frac{3.62 \times 10^4}{7.77 \times 10^3} = 0.47 \times 10^1 = 4.7$

LLNL

9 $w/f_{8j} = 1.48$ $f_{8j} = 3.17$ $C_{8j} = .00125$ $\Delta\theta = 0.6$

$6 \times 10^6 \times 3 \times 1.75 \times 10^{-3}\{33.8 \times 0.6 \times 1.6[33.6 \times 0.4 + 88] + 1.1[4.4 + 33.8 \times 0.4 + 302]\}^{-1}$

$2.25 \times 10^4[32.4(101.5) + 1.1 \times 361]^{-1}$

$2.25 \times 10^4(3.686 \times 10^3)^{-1}$

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$D_{inf} = \frac{2940}{4.76}\{31.4 \times 4.2 \times 1.59^{1.2}[31.4 \times .57 + 40] + 1.59^{0.2}[2 \times 31.4 \times 0.57 + 63]\}^{-1}$

$= \frac{2940}{4.76}\{230 \times 57.9 + 1.097[98.8]\}^{-1}$

$= \frac{2940}{4.76}(13317 + 108)^{-1} = \frac{2940}{4.76} \times 13425^{-1} = 5.54 \times 10^{-4}$ 0.16

$h_7 = 3.85$ $\frac{h_7}{f_{7j}} = 1.69$ $f_{7j} = 2.28$ $f_{7j}^2 = 5.20$ $h_7/f_{7j}^2 = 0.7$

$\bar{v}_7 = 29.5$ $C_{7j} = .000494$

$D_{inf} = 6 \times 10^6 \times 4.94 \times 10^{-4}(29.5 \times 5.4 \times 1.87[29.5 \times .74 + 40] + 1.11[2 \times 29.5 \times .74 +$

$= 2.96 \times 10^3(298 \times 62 + 1.11 \times 107)^{-1} = 2.96 \times 10^3 \div 1.86 \times 1$

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Met: using WBP MCDGL

$h_T = 38,000$ AG $h_7 = 24,760' = 4.06$ n.mi. $\frac{h_7}{f_{7j}} = 2.12$ f

$d = 56$ miles $\bar{v}_7 = 23.6$ $C_{7j} = .00201$ $f_{7j}^2 = 3.6$

$h_7/f_{7j}^2 = 1.10$ $w = 3$ $a = 2.2$ $\Delta\theta_7 = 1.1$

$D_{inf} = 6 \times 10^6 \times 3 \times 2.01 \times 10^{-3}\{23.6 \times 1.1 \times 2.46[23.6 \times 1.1 + 40 \times 2.2] + 1.16[2 \times$

$= 3.62 \times 10^4\{63.9[114] + 1.16[417]\}^{-1}$

$= 3.62 \times 10^4(7285 + 484)^{-1} = \frac{3.62 \times 10^4}{7.77 \times 10^3} = 0.4$

$h_8 = 4.69$ $h_8/f_{8j} = 1.48$ $f_{8j} = 3.17$ $C_{8j} = .00125$

$\bar{v}_8 = 33.8$

$D_{inf} = 6 \times 10^6 \times 3 \times 1.25 \times 10^{-3}\{33.8 \times 0.6 \times 1.6[33.6 \times 0.4 + 88] + 1.1[0.4 +$

$= 2.25 \times 10^4[32.4(161.5) + 1.1 \times 361]^{-1}$

$= 2.25 \times 10^4(3.686 \times 10^3)^{-1}$

$= 6.1$

Σ 7 and 8 = 10.8 R

LLNL

[redacted] 225

Cont. from page 73

[redacted]

$$D_{inf} = 957\, M_{ij}\left\{\bar{v}\left(\frac{h_i}{f_{ij}}\right)^{1.2}\Delta\theta\left[\left(\frac{h_i\Delta f_{ij}}{f_{ij}^2}\right)\bar{v}+2a_i\right]+\left(\frac{h_i}{f_{ij}}\right)^{0.2}\left[\left(\frac{h_i\Delta f_{ij}}{f_{ij}^2}\right)2a_i\right.\right.$$

M_i = mc at 1 hour in layer Δh, center
$\bar{v}_i$ = mean wind speed to height h_i, knots
f_{ij} = fall rate, knots, mean, interval Δf_{ij}
a_i = cloud radius at h_i, nautical miles
h_i = height of level i, nautical miles
$\Delta\theta_i$ = sector width, degrees, covered by

Set $\Delta f_{ij} = 0.05$ knots
$M_{ij} = 300\, w' C_f$, w' in Kt, fallout yield

Then:

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$$D_{inf} = 3\times10^{5} w' C_f\left\{\bar{v}_i\Delta\theta\left(\frac{h_i}{f_{ij}}\right)^{1.2}\left[0.05\,\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+2a_i\right]+\left(\frac{h_i}{f_{ij}}\right)^{0.2}\left[0.05\times2\,a_i\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)\right.\right.$$

$$= \frac{6\times10^{6}}{2\times10} w' C_f\left\{\bar{v}_i\Delta\theta_i\left(\frac{h_i}{f_{ij}}\right)^{1.2}\left[\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+40a_i\right]+\left(\frac{h_i}{f_{ij}}\right)^{0.2}\left[2a_i\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)\right.\right.$$

$$6\times10^{6} w' C_f\left(\frac{h_i}{f_{ij}}\right)^{1.2}\left\{\bar{v}_i\Delta\theta_i\left(\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+40a_i\right)+\left(\frac{h_i}{f_{ij}}\right)^{1}\left(2a_i\bar{v}_i\right.\right.$$

$$6\times10^{6} w' C_f\left(\frac{h_i}{f_{ij}}\right)^{1.2}\left\{\frac{\bar{v}_i^2 h_i\Delta\theta_i}{f_{ij}^2}+40\bar{v}_i\Delta\theta_i a_i+2a_i\bar{v}_i\right.$$

$$h_i/f_{ij} = R/\bar{v}_i \qquad f = \frac{h\bar{v}}{R}$$

$$\bar{v}_i = \frac{R f_{ij}}{h_i}$$

$$6\times10^{6} w' C_f\left(\frac{h}{f_{ij}}\right)^{1.2}\left\{\frac{R^2 f_{ij}^2}{h^2}\frac{h\Delta\theta}{f^2}+\frac{40Rf\Delta\theta a}{h}\right.$$

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$$6\times10^{6} w' C_f\left(\frac{h}{f_{ij}}\right)^{1.2}\left\{\frac{R^2\Delta\theta}{h}+\frac{4\pi Rf\Delta\theta a}{h}\right.$$

$$\frac{6\times10^{6} w' C_f\left(\frac{h}{f}\right)^{1.2}}{h^{-1}}\left[R^2\Delta\theta^{(\Delta f)}+40Rf\Delta\theta a+63a^2f+\right.$$

Cont. from page 72

[redacted]

$$\left\{\bar{v}\left(\frac{h_i}{f_{ij}}\right)^{1.2}\Delta\theta\left[\left(\frac{h_i\Delta f_{ij}}{f_{ij}^2}\right)\bar{v}+2a_i\right]+\left(\frac{h_i}{f_{ij}}\right)^{0.2}\left[\left(\frac{h_i\Delta f_{ij}}{f_{ij}^2}\right)2a_i\bar{v}+\pi a_i^2\right]\right\}^{-1}$$

M_i = mc at 1 hour in layer Δh, center h_i
$\bar{v}_i$ = mean wind speed to height h_i, knots
f_{ij} = fall rate, knots, mean, interval Δf_{ij}
a_i = cloud radius at h_i, nautical miles.
h_i = height of level i, nautical miles.
$\Delta\theta_i$ = sector width, degrees, covered by Δh_i

= 0.05 knots
$300\,w'C_f$, w' in Kt, fallout yield

$$\left\{\bar{v}_i\Delta\theta\left(\frac{h_i}{f_{ij}}\right)^{1.2}\left[0.05\,\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+2a_i\right]+\left(\frac{h_i}{f_{ij}}\right)^{0.2}\left[0.05\times2\,a_i\,\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+\pi a_i^2\right]\right\}^{-1}$$

$$\chi_f\left\{\bar{v}_i\Delta\theta_i\left(\frac{h_i}{f_{ij}}\right)^{1.2}\left[\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+40a_i\right]+\left(\frac{h_i}{f_{ij}}\right)^{0.2}\left[2a_i\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+63a_i^2\right]\right\}^{-1}$$

$$w'C_f\left(\frac{h_i}{f_{ij}}\right)^{1.2}\left\{\bar{v}_i\,\Delta\theta_i\left(\bar{v}_i\left(\frac{h_i}{f_{ij}^2}\right)+40a_i\right)+\left(\frac{h_i}{f_{ij}}\right)^{-1}\left(2a_i\bar{v}_i\,\frac{h_i}{f_{ij}^2}+63a_i^2\right)\right\}^{-1}+$$

$$w'C_f\left(\frac{h_i}{f_{ij}}\right)^{-1.2}\left\{\frac{\bar{v}_i^2\,h_i\,\Delta\theta_i}{f_{ij}^2}+40\,\bar{v}_i\,\Delta\theta_i\,a_i+2a_i\bar{v}_i/f_{ij}+\frac{63a_i^2f_{ij}}{h_i}\right\}$$

$$h_i/f_{ij}=R/\bar{v}_i \qquad f=\frac{h\bar{v}}{R}$$

$$\bar{v}_i=\frac{Rf_{ij}}{h_i}$$

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$$w'C_f\left(\frac{h}{f_{ij}}\right)^{-1.2}\left\{\frac{R^2f^2}{h^2}\frac{h\Delta\theta}{f^2}+\frac{40Rf\Delta\theta a}{h}+\text{—}+\text{—}\right\}$$

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$$w'C_f\left(\frac{h}{f_{ij}}\right)^{-1.2}\left\{\frac{R^2\Delta\theta}{h}+\frac{4aRf\Delta\theta a}{h}+\frac{63a^2f}{h}+\frac{2aR}{h}\right\}$$

$$w'C_f\left(\frac{h}{f}\right)^{1.2}\left[R^2\Delta\theta^{(\Delta f)}+40Rf\Delta\theta a+63a^2f+2aR^{(\Delta f)}\right]^{-1}$$

LLNL 0783

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W.B. Plumbbob Model

[redacted]

	Layer	C_f	f_o	α
Base	1	0.032	12.4	1.89
	2	0.034	9.8	1.82
	3	0.042	7.7	1.68
	4	0.052	5.9	1.42
	5	0.075	4.4	1.23
	6	0.121	3.2	1.10
	7	0.174	2.3	1.03
	8	0.226	1.8	0.98
	9	0.161	1.4	0.94
Top	10	0.083	1.3	0.92

Level	f_{ij}	f_j	f_{j+1}	$\log f_o$	$\log f_j$	$\log f_{j+1}$	t_j	t_{j+1}	A_j	
7	.125			.89791			3.04457	2.65040	.49885	.49
↓	.425			↓			1.69797	1.58438	.45522	.44
	1.025						.80765	.76128	.29061	.27
	4.025						.53726	.54933	.20372	.20
	10.025						1.42687	1.43171	.42316	.42
	40.025						2.77279	2.77398	.49723	.49
8	.125			.58779			2.94979	2.53550	.49845	.49
↓	.425			↓			1.53448	1.41509	.43754	.42
	1.025						.59979	.55000	.22573	.20
	4.025						.81480	.82748	.29239	.29
	10.025						1.74980	1.75488	.45988	.45
	40.025						3.16438	3.16563	.49926	.49
9	.125			.33647			2.80795	2.37603	.49748	.49
↓	.425			↓			1.33241	1.20795	.40860	.38
	1.025						.35795	.30604	.13982	.12
	4.025						1.11683	1.13005	.36793	.37
	10.025						2.09162	2.09691	.48176	.48
10	.125			.26236			2.78843	2.34713	.49738	.49
↓	.425			↓			1.28083	1.15365	.39985	.38
	1.025						.28517	.23214	.11226	.09
	4.025						1.22166	1.23517	.39928	.38
	10.025						2.21764	2.22305	.48673	.48

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W.B. Plumbbob Model

[redacted]

C_f	f_o	σ
0.032	12.4	1.89
0.034	9.8	1.82
0.042	7.7	1.68
0.052	5.8	1.42
0.075	4.4	1.23
0.121	3.2	1.10
0.174	2.3	1.03
0.226	1.8	0.98
0.161	1.4	0.94
0.083	1.3	0.92

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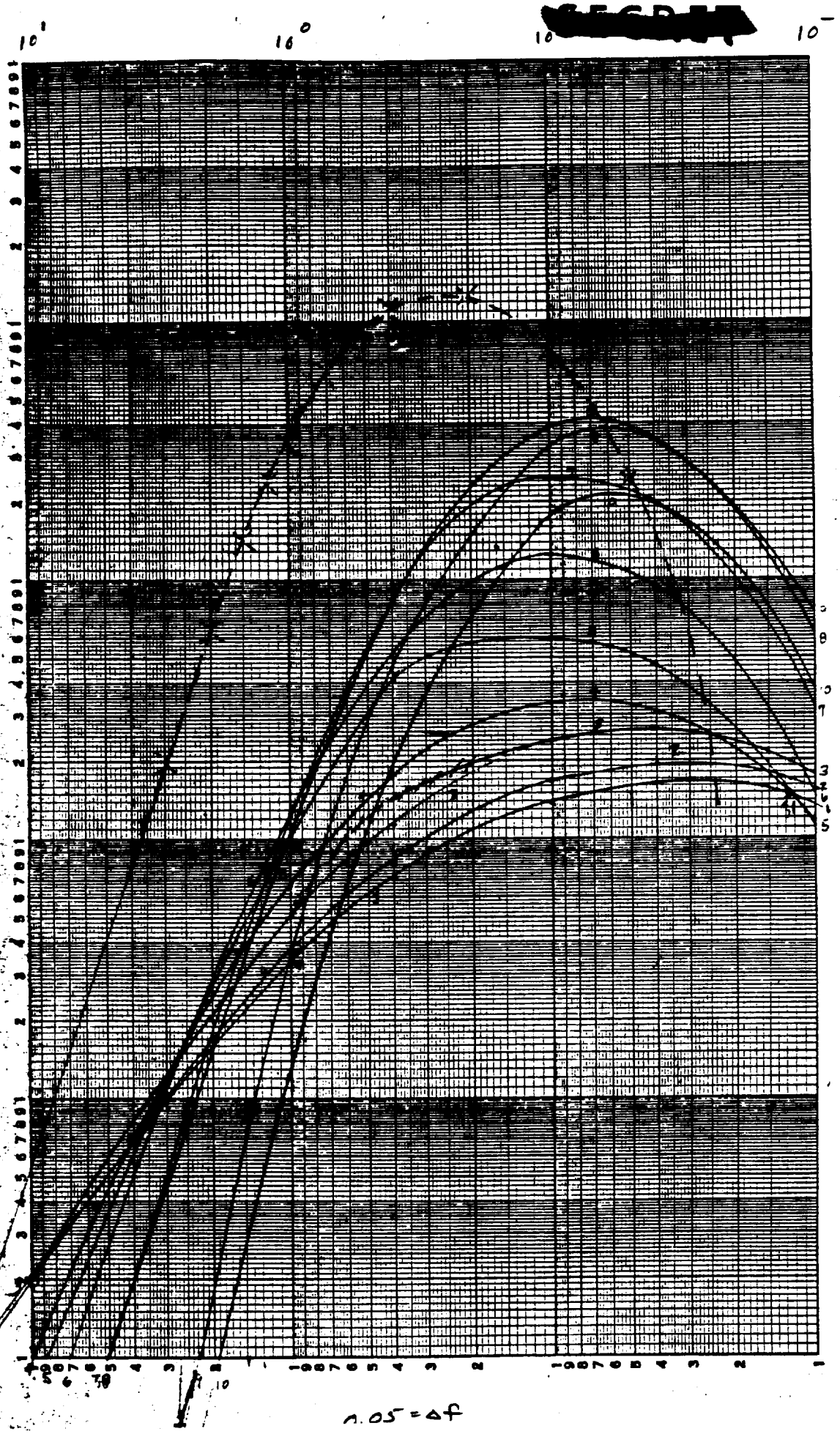
f_j	f_{j+1}	$\log f_o$	$\log f_j$	$\log f_{j+1}$	t_j	t_{j+1}	A_j	A_{j+1}	ΔA	M'
	.89791				3.04457	2.65040	.49885	.49600	.00285	.000496
	↓				1.69797	1.50438	.45522	.44348	.01174	.020443
					.80765	.76128	.29061	.27678	.01383	.002406
					.53726	.54933	.20372	.20857	.00485	.000844
					1.42687	1.43171	.42316	.42386	.00070	.000122
					2.77729	2.77398	.49723	.49724	.00001	.000002
	.58779				2.94979	2.53550	.49845	.49441	.00404	.000913
	↓				1.53448	1.41509	.43754	.42146	.01608	.003634
					.59979	.55000	.22573	.20880	.01693	.003826
					.81480	.82748	.29239	.29599	.00360	.000814
					1.74980	1.75488	.46988	.46034	.00046	.000104
					3.16438	3.16563	.49926	<.49927	<.00001	.000002
	.33647				2.80795	2.37603	.49748	.49122	.00626	.001088
	↓				1.33241	1.20795	.40860	.38649	.02211	.013560
					.35795	.30604	.13982	.12020	.01962	.003159
					1.11683	1.13005	.36793	.37081	.00288	.000464
					2.09162	2.09691	.48176	.48198	.00022	.000035
	.26236				2.78843	2.34713	.49738	.49054	.00684	.000568
	↓				1.28083	1.15365	.39985	.37567	.02418	.002007
					.28517	.23214	.11226	.09181	.02045	.001697
					1.22166	1.23517	.38928	.39161	.00233	.000193
					2.21764	2.22305	.48673	.48689	.00016	.000013

ΔA vs S_{ij} 0.01 = Δf

#83A



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PLUMBBOB MODEL (PAGE 83)

	f_j	f_{j+1}	$\log f_0$	$\log f_j$	$\log f_{j+1}$	t_j		A_{j+1}
.125	0.1	0.15	2.51770	-2.303	-1.897	2.55063	2.33582	.49461 .4902
.425	0.4	0.45		-.8916	-0.799	1.81677	1.75486	.46544 .4603
1.025	1.0	1.05		0	.04879	1.33212	1.30630	.40856 .4042
4.025	4.0	4.05		1.38629	1.39772	.59863	.59205	.22533 .2231
10.025	10.0	10.05		2.302592	2.30757	.11381	.11118	.04532 .0442
40.025	40.0	40.05		3.688883	3.69011	.61967	.62032	.23279 .2325
100.025	100.0	100.05		4.60517	4.60567	1.10448	1.10475	.36529 .3653
.125			2.28238			2.51944	2.29636	.49409 .4891
.425						1.75735	1.69307	.46056 .4547
1.025						1.25405	1.22725	.39513 .3901
4.025						.49236	.48553	.18875 .1863
10.025						.01110	.01378	.00444 .0055
40.025						.77280	.77348	.28021 .2804
100.025						1.27626	1.27653	.39906 .3991
.125			2.04122			2.58584	2.34418	.49516 .4904
.425						1.76025	1.69061	.46082 .4545
1.025						1.21501	1.18597	.38785 .3871
4.025						.38984	.38244	.15164 .1489
10.025						.15558	.15854	.06183 .0630
40.025						.98075	.98148	.33668 .3368
100.025						1.52616	1.52646	.43650 .4365
.125			1.77495			2.87179	2.58588	.49801 .4951
.425						1.89504	1.81264	.47095 .4650
1.025						1.24996	1.21561	.39439 .3879
4.025						.27370	.26495	.10784 .1044
10.025						.37158	.37508	.14488 .1461
40.025						1.34784	1.34870	.41115 .4112
100.025						1.99311	1.99346	.47699 .4769
.125			1.48160			3.07691	2.74683	.49897 .4969
.425						1.94927	1.85415	.47436 .4681
1.025						1.20455	1.16489	.38581 .3779
4.025						.08107	.06738	.03233 .0266
10.025						.66747	.67152	.24779 .2496
40.025						1.79454	1.79554	.46366 .4637
100.025						2.53949	2.53989	.49449 .4945
.125			1.16315			3.15105	2.78195	.49921 .49
.425						1.89014	1.78377	.47061 .46
1.025						1.05741	1.01305	.35480 .34
4.025						.20285	.21415	.08041 .08
10.025						1.03585	1.04038	.34985 .352

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		10.025	10.0	10.05	2.30259	2.30757	.11381	.1118	.04532	.0442
		40.025	40.0	40.05	3.68888	3.69011	.61967	.62032	.23229	.2325
		100.025	100.0	100.05	4.60517	4.60567	1.10448	1.10475	.36529	.3653
2	2/π	.125			2.28238		2.51944	2.29636	.49409	.4891
		.425					1.75735	1.69307	.46056	.4547
		1.025					1.25405	1.22725	.39513	.3961
		4.025					.49236	.48553	.18875	.1863
		10.025					.01110	.01378	.00444	.0055
		40.025					.77280	.77348	.28071	.2804
		100.025					1.27626	1.27653	.39906	.3991
	3	.125			2.04122		2.58584	2.34418	.49516	.4904
96		.425					1.76025	1.69061	.46082	.4545
43		1.025					1.21501	1.18597	.38785	.3871
06		4.025					.38984	.38244	.15164	.1489
44		10.025					.15558	.15854	.06183	.0630
22		40.025					.98075	.98148	.33668	.3368
22		100.025					1.52616	1.52646	.43650	.4365
63	4	.125			1.77495		2.87179	2.58508	.48801	.4951
34		.425					1.89504	1.81264	.47095	.4652
26		1.025					1.24996	1.21561	.39439	.3879
14		4.025					.27370	.26495	.10784	.1044
04		10.025					.37158	.37508	.14498	.1461
02		40.025					1.34784	1.34870	.41115	.4112
08		100.025					1.99311	1.99346	.47699	.4769
60	5	.125			1.48160		3.07691	2.74683	.49897	.4969
59		.425					1.94927	1.85415	.47436	.4681
44		1.025					1.20455	1.16489	.39581	.3779
35		4.025					.08107	.06738	.03233	.0266
568		10.025					.66747	.67152	.24779	.2490
07		40.025					1.79454	1.79554	.46366	.4637
97		100.025					2.53949	2.53989	.49449	.4945
93	6	.125			1.16315		3.15105	2.78195	.49921	.4973
13		.425					1.89014	1.78377	.47061	.4627
		1.025					1.05741	1.01305	.35480	.3445
		4.025					.20285	.21415	.08041	.0846
		10.025					1.03585	1.04038	.34995	.3506
		40.025					2.29612	2.29724	.48918	.4897
		100.025					3.17911	3.12956	.49915	.4996

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BEST AVAILABLE COPY

Cont. page 82

[redacted]

4.05	1.37647	1.39772	.59863	.61093	.00333	.00511	.000011
10.05	2.30259	2.30757	.11381	.11418	.04532	.04427	.00105	.000034
40.05	3.68888	3.69011	.61967	.62082	.23229	.23251	.00022	.000007
100.05	4.60517	4.60567	1.10448	1.10475	.36529	.36534	.00005	.000002
2.28238 ↓			2.51944	2.29636	.49409	.48919	.00490	.000167
			1.75735	1.69307	.46056	.45478	.00578	.000197
			1.25405	1.22725	.39513	.39018	.00495	.000168
			.49236	.48553	.18875	.18634	.00241	.000082
			.01110	.01384	.00444	.00554	.00110	.000037
			.77280	.77348	.28071	.28041	.00020	.000007
			1.27626	1.27655	.39906	.39911	.00005	.000002
2.04122 ↓			2.58584	2.34418	.49516	.49048	.00468	.000197
			1.76025	1.69061	.46082	.45455	.00627	.000263
			1.21501	1.18597	.38785	.38219	.00566	.000238
			.38994	.38744	.15164	.14990	.00274	.000115
			.15558	.15854	.06183	.06302	.00119	.000050
			.98075	.98148	.33668	.33686	.00018	.000008
			1.52616	1.52646	.43650	.43654	.00004	.000002
1.77495 ↓			2.87179	2.58588	.49801	.49516	.00285	.000148
			1.89504	1.81264	.47095	.46508	.00587	.000305
			1.24996	1.21561	.39439	.38797	.00642	.000334
			.27370	.26495	.10704	.10448	.00336	.000175
			.37158	.37508	.14488	.14618	.00130	.000068
			1.34784	1.34870	.41115	.41129	.00014	.000007
			1.99311	1.99346	.47699	.47691	.00002	.000001
1.48160 ↓			2.07691	2.74683	.49897	.49697	.00200	.000150
			1.94927	1.85415	.47436	.46813	.00623	.000469
			1.20455	1.16489	.38581	.37798	.00783	.000587
			.08107	.06738	.03233	.02685	.00548	.000411
			.66747	.67152	.24779	.24909	.00130	.000098
			1.79454	1.79554	.46366	.46374	.00008	.000006
			2.53949	2.53989	.49449	.49450	.00001	.000001
1.16315 ↓			3.15105	2.78195	.49921	.49732	.00189	.000229
			1.89014	1.78377	.47061	.46280	.00781	.000985
			1.05741	1.01305	.35480	.34450	.01030	.001246
			.20285	.21415	.08041	.08482	.00441	.000534
			1.03585	1.04038	.34985	.35089	.00104	.000126
			2.29612	2.29724	.48918	.48922	.00004	.000005
			3.12911	3.12956	.49915	.49915	<.00000	<.000000

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Cont. page 82

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4.05	1.38629	1.39772	.59863	.59205	.22533	.22310	.00223	.000071
10.05	2.30259	2.30757	.11381	.11118	.04532	.04427	.00105	.000034
40.05	3.68888	3.69011	.01967	.02022	.23229	.23251	.00022	.000007
100.05	4.60517	4.60567	1.10448	1.10475	.36529	.36534	.00005	.000002
2.28238			2.51984	2.29636	.49409	.48919	.00490	.000167
↓			1.75735	1.69307	.46056	.45478	.00578	.000197
			1.25405	1.22725	.39513	.39018	.00495	.000168
			.49236	.48553	.18875	.18634	.00241	.000082
			.01110	.01378	.00444	.00554	.00110	.000037
			.77280	.77348	.28021	.28041	.00020	.000007
			1.27626	1.27653	.39906	.39911	.00005	.000002
2.04122			2.58508	2.34418	.49516	.49048	.00468	.000197
↓			1.76025	1.69061	.46082	.45455	.00627	.000263
			1.21501	1.18597	.38785	.38719	.00566	.000238
			.38994	.38244	.15164	.14990	.00274	.000115
			.15558	.15854	.06183	.06302	.00119	.000050
			.98075	.98148	.33668	.33686	.00018	.000008
			1.52616	1.52646	.43650	.43654	.00004	.000002
1.77495			2.97129	2.58508	.49801	.49516	.00285	.000148
↓			1.89504	1.81264	.47095	.46508	.00587	.000305
			1.24996	1.21561	.39439	.38797	.00642	.000334
			.27370	.26495	.10784	.10448	.00336	.000175
			.37158	.37508	.14498	.14618	.00130	.000068
			1.34784	1.34670	.44115	.44129	.00014	.000007
			1.99311	1.99346	.47699	.47691	.00002	.000001
1.48160			3.07691	2.74683	.49897	.49697	.00200	.000150
↓			1.94927	1.85415	.47436	.46813	.00623	.000467
			1.20455	1.16489	.39521	.37798	.00783	.000587
			.08107	.06738	.03233	.02685	.00548	.000411
			.66747	.67152	.24779	.24909	.00130	.000098
			1.79454	1.79554	.46366	.46374	.00008	.000006
			2.53949	2.53989	.49449	.49450	.00001	.000001
1.16315			3.15105	2.78195	.49921	.49732	.00189	.000229
↓			1.89014	1.78377	.47061	.46280	.00781	.000985
			1.05741	1.01305	.35480	.34450	.01030	.001246
			.20285	.21415	.08041	.07482	.00559	.000534
			1.03585	1.04038	.34995	.35089	.00104	.000126
			2.29612	2.29774	.48918	.48922	.00004	.000005
			3.17911	3.12956	.49915	.49915	<.00000	<.000000

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Cont. page 82

[redacted]

Change Δf to 1.00

Eliminate terms relating to radi
of cloud radius and pattern c

Then:

$$D_{inf} = 6\times10^{6} w' C_f h \left(\frac{R}{\bar{r}}\right)^{-1.2} [20R^2\Delta\theta + 40a$$

$$= 1.2\times10^{7} w C_f h \left(\frac{R}{\bar{r}}\right)^{-1.2} (R^2\Delta\theta + 2$$

WB Balloon (air Burst) Model

$f_0 = 0.51$, all layers.
$\sigma = 0.863$, " "

	i	C_f
Top	10	0.086
	9	0.225
	8	0.291
	7	0.247
	6	0.128
	5	0.023
	4	0
	3	0
	2	0
Bottom	1	0

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Change of to load

Eliminate terms relating to radial addition of cloud radius and pattern corner (πa^2)

Then:

$$D_{inf} = 6\times10^{6} w' C_f h \left(\frac{R}{\bar{v}}\right)^{-1.2} [20R^2\Delta\theta + 40aR]$$

$$= 1.2\times10^{7} w C_f h \left(\frac{R}{\bar{v}}\right)^{-1.2} (R^2\Delta\theta + 2\pi a$$

WB Balloon (air burst) Model.

f_o = 0.51, all layers.
σ = 0.863, " "

	i	C_f
Top	10	0.086
	9	0.225
	8	0.291
	7	0.247
	6	0.128
	5	0.023
	4	0
	3	0
	2	0
Bottom	1	0

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of wave radius and pattern c

Then:

$$D_{inf} = 6\times10^{6} w' C_f h \left(\frac{R}{\bar{U}}\right)^{-1.2} \left[20R^2\Delta\theta + 40a\right.$$

$$= 1.2\times10^{7} w C_f h \left(\frac{R}{\bar{U}}\right)^{-1.2} \left(R^2\Delta\theta + 2\right.$$

WB Balloon (air Burst) Model.

f_o = 0.51, all layers.
σ = 0.863, " "

	i	C_f
Top	10	0.086
	9	0.225
	8	0.291
	7	0.247
	6	0.128
	5	0.023
	4	0
	3	0
	2	0
Bottom	1	0

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LLNL

[redacted]

Shot Baltzmann : DELETED

Ready 16 MAY 1957

Design yield DELETED
Aircraft yield 12.5 kT
Fallout yield 12.5 kT

Tower weights:

			Cumulative
Cumulative	Top	0 → 50'	88,900 #
		50 - 100'	115,280
		100 - 300'	226,110
		300 - 500'	356,740

Cab: 12 t
Sand: 9 t
Paraffin: 15 t

Metals weight in fireball as 437/500 × 178 t²

Fallout Mc:

Tower materials:
Dust:
Total

WB estimate: 340 MC

Fired 0455 PDT, 28 May, 1957

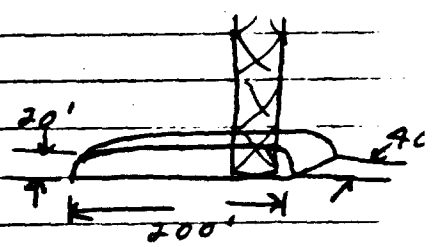
Yield 12 Kt ~

Cloud height 33,000' MSL
Radius, visual estimate, crude, 1 mi
Yucca winds 0500 PDT 28 May
Sfc → 7,000' calm

8	20/10
9	19/11
10	15/13
12	14/16
14	13/18
16	14/27
18	14/27
20	15/24
23	17/20
25	17/18
30	17/21
35	19/23

BEST AVAILABLE COPY

Fine earth cover tower:



LLNL

Calc. fallout parameters for 12 kT:

a = 1.8
a' = .44

Dust Mc: 48
Metals Mc: 97
Total : 145

~~SECRET~~

tg mass : DELETED — Design yield — DELETED

AY 1957 — Aircraft yield — 12.5 KT

Fallout yield — 12.5 KT

hts:

	Cumulative
0 → 50'	88,900 #
50 - 100'	115,280
100 - 300'	226,110
300 - 500'	356,740

Cab: 12 tons
Sand: 9 tons } in cab
Paraffin: 15 tons

ls weight in fireball as ~~427~~ 477/500 × ~~178~~ 178 × ~~1.2~~ 1.2 = ~~214~~ 164 tons

Fallout Mc: Tower materials: ~~263~~ ~~98~~ 98

Dust: 55

Total ~~312~~ ~~153~~ 153

WB estimate: 340 MC

455 PDT, 28 May, 1957

BEST AVAILABLE COPY

eld 12 KT

loud height 33,000' MSL

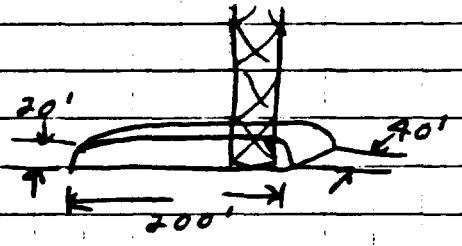
adius, visual estimate, crude, 1 mi

inds 0500 PDT 28 May

7,000' calm

20/10
19/11
15/13
14/16
13/18
14/27
14/27
15/24
17/20
17/18
17/21
19/23

Fine earth cover at base of tower:



LLNL

Calc. fallout parameters for 12kT:

$a = 1.8$ — Dust Mc: 48

$a' = .44$ — Metals Mc: 97

Total: 145

238

declassified 01/00

Tower weights:

		Cumulative	
Cumulative: Top	0 → 50'	88,900 #	Cab: 12
	50-100'	115,280	Sand: 9
	100-300'	226,110	Paraffin: 15
	300-500'	356,740	

Metals weight in fireball as ~~497/500 × 178/180 × 12/13 = 137~~

Fallout Mc:

Tower materials:

Dust:

Total

WB estimate: 340 MC

Fired 0455 PDT, 28 May, 1957

Yield 12 Kt

Cloud height 33,000' MSL

Radius, visual estimate, crude, 1 mi

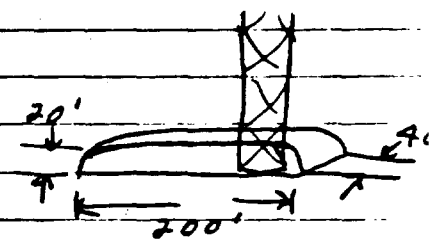
Yucca winds 0600 PDT 28 May

Sfc → 7,000' calm

8	20/10
9	19/11
10	15/13
12	14/16
14	13/18
16	14/27
18	14/27
20	15/24
23	17/20
25	17/18
30	17/21
35	19/23
40	22/47
45	23/45
50	23/25

BEST AVAILABLE COPY

Fine earth cover tower:



Calc. fallout parameters for 12 kT:

$a = 1.8$

$a' = .44$

LLNL

Dust Mc: 48

Metals Mc: 97

Total: 145

Amount used in predictions

[redacted]

239

hts:

	Cumulative
0 → 50'	88,900 #
50-100'	115,280
100-300'	226,110
300-500'	356,740

Cab: 12 tons
Sand: 9 tons } in cab
Paraffin: 15 tons

ds weight in fireball as $^{437}/_{500} \times \frac{178}{\cancel{200}} \times \cancel{\text{[illegible]}} = \cancel{\text{[illegible]}}$ 164 tons

Fallout Mc: Tower materials: ~~263~~ ~~88~~ 98
Dust: 55
Total ~~351~~ ~~137~~ 153

WB estimate: 340 MC

1455 PDT, 28 MAY, 1957

ield 12 KT

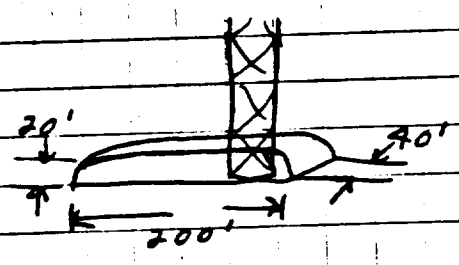
BEST AVAILABLE COPY

loud height 33,000' MSL
adius, visual estimate, crude, 1 mi
inds 0500 PDT 28 MAY

7,000' calm

20/10
19/11
15/13
14/16
13/18
14/27
14/27
15/24
17/20
17/18
17/21
19/23
22/47
23/45
23/25

Fire earth cover at base of tower:



Calc. fallout parameters for 12kT:

$a = 1.8$ Dust Mc: 48
$a' = .44$ Metals Mc: 97
Total: 145

LLNL

Amount used in predictions: 300, based on Apple, and 12.5KT

240

[redacted]

LCC35, 0102

86 $\sigma = 0.963$ [redacted] WB Balloon Model Pg 0.01 Kn+

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Level	f_{j-1}	f_j	f_{j+1}	Δf_0	Δf_0	Δf_{j+1}	t_j	t_{j+1}	A_j
10	0.02	.015	.025	-0.1673	-4.2585	-3.7095	4.1546	3.5185	-
	0.05	.045	.055		-3.1075	-2.9045	2.8210	2.5857	.49
	0.1	.095	.105		-2.3555	-2.2550	1.9496	1.8331	.474
	0.2	.195	.205		-1.6350	-1.5850	1.1147	1.0568	.369
	0.4	.395	.405		-0.9290	-0.9040	0.2966	0.2677	.116
	0.7	.695	.705		-0.3640	-0.3495	0.3580	0.3742	.13
	1.0	.995	1.005		-0.0050	+.00497	0.7740	0.7854	.28
	1.2	1.195	1.205		0.17813	0.18647	0.9862	0.9959	.337
	1.5	1.495	1.505		0.40212	0.40879	1.2458	1.2535	.39
	2.0	1.995	2.005		0.69064	0.69564	1.5801	1.5859	.442
	3.0	2.995	3.005		1.09698	1.10027	2.0509	2.0548	.473

Table of Φ_{ij}

f_{ij} i =	10	9	8	7	6	5
.03	.00005	.00014	.00017	.00014	.00007	.00001
.04	.00013	.00034	.00044	.00037	.00019	.00003
.05	.00022	.00057	.00074	.00063	.00033	.00006
.06	.00032	.00083	.00108	.00092	.00048	.00009
.07	.00041	.00107	.00139	.00118	.00061	.00011
.08	.00050	.00131	.00169	.00144	.00074	.00013
.09	.00058	.00152	.00196	.00166	.00086	.00015
.10	.00066	.00173	.00223	.00189	.00098	.00018
.20	.00110	.00288	.00372	.00316	.00164	.00029
.30	.00107	.00280	.00362	.00307	.00159	.00028
.40	.00096	.00252	.00325	.00276	.00143	.00026
.50	.00083	.00217	.00281	.00238	.00124	.00022
.60	.00067	.00176	.00227	.00192	.00100	.00017
.70	.00054	.00141	.00183	.00155	.00080	.00014
.80	.00045	.00118	.00152	.00129	.00067	.00012
.90	.00037	.00097	.00125	.00106	.00055	.00010
1.00	.00029	.00076	.00098	.00083	.00043	.00008
1.10	.00025	.00066	.00085	.00072	.00037	.00007
1.20	.00020	.00052	.00068	.00057	.00030	.00005
1.30	.00018	.00047	.00061	.00052	.00027	.00005
1.40	.00015	.00039	.00051	.00043	.00022	.0000
1.50	.00012	.00031	.00041	.00034	.00018	.0000
1.60	.00011	.00029	.00037	.00032	.00016	.0000
1.80	.00008	.00021	.00027	.00023	.00012	.0000
2.00	.00006	.00016	.00020	.00017	.00009	.0000
2.20	.00004	.00010	.00014	.00011	.00006	.00001

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.913 WB Balloon Model Per 0.01 Knot interval

[redacted]

f_j	f_{j+1}	$h f_0$	$h f_j$	$h f_{j+1}$	t_j	t_{j+1}	A_j	A_{j+1}	ΔA
.015	.025	-0.1673	-4.2585	-3.7185	4.1546	3.5165	—	—	—
.045	.055	↓	-3.1075	-2.9045	2.8210	2.5857	.49761	.49516	.00245
.095	.105		-2.3555	-2.2550	1.9496	1.8331	.47438	.46662	.00776
.195	.205		-1.6350	-1.5850	1.3147	1.0568	.36749	.35466	.01283
.395	.405		-0.9290	-0.9040	0.7966	0.2677	.11661	.10553	.01108
.695	.705		-0.3640	-0.3495	0.8580	0.3748	.13984	.14608	.00624
.995	1.005		-0.0050	+.00497	0.7740	0.9856	.28056	.28392	.00336
1.195	1.205		0.17813	0.18647	0.9862	0.9959	.33799	.34038	.00239
1.495	1.505		0.40212	0.40879	1.2458	1.2535	.39360	.39503	.00143
1.995	2.005		0.69064	0.69564	1.5801	1.5859	.44301	.44365	.00064
2.995	3.005		1.09694	1.10027	2.0509	2.0548	.47934	.48004	.00070

10	9	8	7	6	5 ← last
.00005	.00014	.00017	.00014	.00007	.00001
.00013	.00034	.00044	.00037	.00019	.00003
.00022	.00057	.00074	.00063	.00033	.00006
.00032	.00083	.00108	.00092	.00048	.00009
.00041	.00107	.00139	.00118	.00061	.00011
.00050	.00131	.00169	.00144	.00074	.00013
.00058	.00152	.00196	.00166	.00086	.00015
.00066	.00173	.00223	.00189	.00098	.00018
.00110	.00288	.00372	.00316	.00164	.00029
.00107	.00280	.00362	.00307	.00159	.00028
.00096	.00252	.00325	.00276	.00143	.00026
.00083	.00217	.00281	.00238	.00124	.00022
.00067	.00176	.00227	.00192	.00100	.00018
.00054	.00141	.00183	.00155	.00080	.00014
.00045	.00118	.00152	.00129	.00067	.00012
.00037	.00097	.00125	.00106	.00055	.00010
.00029	.00076	.00098	.00083	.00043	.00008
.00025	.00066	.00085	.00072	.00037	.00007
.00020	.00052	.00068	.00057	.00030	.00005
.00018	.00047	.00061	.00052	.00027	.00005
.00015	.00039	.00051	.00043	.00022	.00004
.00012	.00031	.00041	.00034	.00018	.00003
.00011	.00029	.00037	.00032	.00016	.00003
.0008	.00021	.00027	.00023	.00012	.00002
.0006	.00016	.00020	.00017	.00009	.00002
.0004	.00010	.00014	.00011	.00006	.00001
.0003	.00008	.00010	.00009	.00004	.00001

BEST AVAILABLE COPY

LLNL

Table of G df: 3 d.f.

0.1	.095	.105	-2.3555	-2.2550	1.9496	1.8331	.47
0.2	.195	.205	-1.6350	-1.5850	1.1147	1.0568	.3
0.4	.395	.405	-0.9290	-0.9040	0.2966	0.2677	.11
0.7	.695	.705	-0.3640	-0.3495	0.3580	0.3745	.1
1.0	.995	1.005	-0.0050	+.00497	0.7740	0.7556	.2
1.2	1.195	1.205	0.17813	0.18647	0.9862	0.9959	.3
1.5	1.495	1.505	0.40212	0.40879	1.2458	1.2535	.3
2.0	1.995	2.005	0.69064	0.69564	1.5801	1.5859	.4
3.0	2.995	3.005	1.09698	1.10027	2.0509	2.0542	.4

f ; i =	10	9	8	7	6	5	
.03	.00005	.00014	.00017	.00014	.00007	.00001	
.04	.00013	.00034	.00044	.00037	.00019	.00003	
.05	.00022	.00057	.00074	.00063	.00033	.00006	
.06	.00032	.00083	.00108	.00092	.00048	.00009	
.07	.00041	.00107	.00139	.00118	.00061	.00011	
.08	.00050	.00131	.00169	.00144	.00074	.00013	
.09	.00058	.00152	.00196	.00166	.00086	.00015	
.10	.00066	.00173	.00223	.00189	.00098	.00018	
.20	.00110	.00288	.00372	.00316	.00164	.00029	
.30	.00107	.00280	.00362	.00307	.00159	.00028	
.40	.00096	.00252	.00325	.00276	.00143	.00025	
.50	.00083	.00217	.00281	.00238	.00124	.00022	
.60	.00067	.00176	.00227	.00192	.00100	.00017	
.70	.00054	.00141	.00183	.00155	.00080	.00014	
.80	.00045	.00118	.00152	.00129	.00067	.00012	
.90	.00037	.00097	.00125	.00106	.00055	.00010	
1.00	.00029	.00076	.00098	.00083	.00043	.00008	
1.10	.00025	.00066	.00085	.00072	.00037	.00007	
1.20	.00020	.00052	.00068	.00057	.00030	.00005	
1.30	.00018	.00047	.00061	.00052	.00027	.00005	
1.40	.00015	.00039	.00051	.00043	.00022	.00004	
1.50	.00012	.00031	.00041	.00034	.00018	.00003	
1.60	.00011	.00029	.00037	.00032	.00016	.00003	
1.80	.00008	.00021	.00027	.00023	.00012	.00002	
2.00	.00006	.00016	.00020	.00017	.00009	.00002	
2.20	.00004	.00010	.00014	.00011	.00006	.00001	
2.40	.00003	.00008	.00010	.00009	.00004	.00001	
2.70	.00002	.00006	.00007	.00006	.00003	.0000	
3.00	.00002	.00005	.00005	.00005	.00003	0	
3.30	.00001	.00003	.00003	.00003	.00002		
3.60	.00001	.00003	.00003	.00003	.00001		
4.00	.00001	.00003	.00003	.00003	.00001		

BEST AVAILABLE COPY

LLNL

[redacted] DELETED 4kT Aircraft + fallout.

00' WT 125 Tons (12 tons cab included)

Mc = ~~75 x 500~~ = $(113 \frac{Rf}{300} + 17) 46 = 73$

Mc = 46

at Mc, 4kt = 119 = 0.40 KT

Mc = 112 x 0.6 = 67

Mc = 20

Mc, 3kt = 87 = 0.29 kT

Mc = 99 x 0.6 = 59

not Mc = 4

total Mc, 2kT = 63 = 0.21 KT

1455 PDT 2 June 1957

height 15.5 kft MSL

d 0.15 KT

BEST AVAILABLE COPY

dius, visual estimate, 0.5 mi.

Cloud showed no stem, considerable amount of hc from tower.

LLNL

[redacted]

Franklin DELETED 4kT Airdrop + fo

Tower 300' WT 125 Tons (12 tons cab mi

4kT Tower Mc = ~~75 × $\frac{Rf}{300}$~~ = $(113 \frac{Rf}{300} + 12)96$ =
Dust Mc = 96

Total Mc, 4kT = 119 = 0.40 KT

3kT Tower Mc = 112 × 0.6 = 67
Dust Mc = 20

Total Mc, 3kT = 87 = 0.29 KT

2kT Tower Mc = 99 × 0.6 = 59
Dust Mc = 4

Total Mc, 2kT = 63 = 0.21 KT

Fired 0455 PDT 2 June 1957

Cloud height 15.5 kft MSL

Yield 0.15 KT

Radius, visual estimate, 0.5 mi.

Cloud showed no stem, considerable amount sparks from tower.

BEST AVAILABLE COPY

LLNL

Area Elevations

[redacted]

T 1	4235' MSL
T 2	4486
T 2a	4382
T 2b	4469
T 2c	4479
T 3	4025
T 3b	3997
T 4	4307
T 7c	4243
B 7b	4186
B 9a	4214
B fa	3076

BEST AVAILABLE COPY

Wilson DELETED 500' balloon, area

15 kt used for fallout.

Assumed Mt : 90
" Cloud height : 36
" Radius 1½ miles
Cloud model: balloon

Fired 0445 PDT 18 June
First yield 10 kT
Cloud height 35,000'
Radius 1 n mi.

Puff clean of dirt - NO_2 color.
Stem dark & thick.

BEST AVAILABLE COPY

LLNL

90 Priscilla DELETED 700' ba F

Fallout Pred: max yield [redacted]

[redacted]

Fallout yield 0.8 KT = 240 mc

Cloud height fest trop + 2000'

Radius fest 2 1/2 miles

Fired 0630 PDT 24 June

Prelim. yield 39 KT

Rim. ~~Radius~~ 2-2.5 miles at 4 minutes
~ 10 miles at 1 hour

Height 40,000'

BEST AVAILABLE COPY

LLNL

Priscilla

DELETED

700' balloon
FF

Fallout Pred: max yield [redacted]

[redacted]

Fallout yield 0.8 KT ≈ 240 mc

Cloud height fest trop. + 2000'

Radius fest 2½ miles

Fired 0630 PDT 24 June

Prelim. yield 39kT

m. ~~Radius~~ 2-2.5 miles at 4 minutes
~ 10 miles at 1 hour

Height 40,000'

BEST AVAILABLE COPY

LLNL

[redacted]

Diablo 500' Tower Design yield: DELETED
Area 26
Yield for fallout calc.: 15 kT

Cloud height feet 36,000'

Metal etc weights:

Total steel:	755,920# =	378 tons
Tower 200' steel:	227,160# =	114 tons
On cab:		
Al:	14,270# =	7 tons
Lead-paraffin:	136,000#: =	58 tons P
		10 tons Pa
Paraffin:	40,000# =	20 tons.

In tower above 200':

Cu:	1116# =	0.5+ tons
Paraffin:	16,280# =	8 tons
Lead:	55,440# =	28 tons.

at 15kT, amount of tower not in fireball:

Total steel in fb:	350 tons
" Lead " " :	86 tons
" Al " " :	7 tons.
Total metal:	443 tons

BEST AVAILABLE COPY

Mc calculation:

Total Boltzmann:	560 mc
Fraction less than 40μ:	214 mc
Difference:	346 mc

LLNL

Assume the 214 mc brought down by rain. (or dust
assume dust contribution fits theory: Witness Priscilla

Dust on Boltzmann: (at 108kT) :	45 mc
Metal on Boltzmann:	301 mc
Metal calc on " :	100 mc

Error in 0.6T theory a factor of 3. 250

Using 1.8T on Diablo: Metals = 1.8 x 443 =

DELETED

500' Tower Design yield:
Area 6
Yield for fallout calc: 15 kT

Cloud height fcst 36,000'

[redacted]

cte weights:

Total steel:	755,920 #	=	378 tons
Lower 200' steel:	227,160 #	=	114 tons
On cab:			
Al:	14,270 #	=	7 tons
Lead-paraffin:	136,000 #:	=	58 tons Pb
			10 tons paraffin
Paraffin:	40,000 #	=	20 tons "
Tower above 200':			
Cu:	1116 #	=	0.5 tons
Paraffin:	16,280 #	=	8 tons
Lead:	55,440 #	=	28 tons

kT, amount of tower not in fireball: 28 tons

Total steel in fb:	350	tons
" Lead " " :	86	tons
" Al " " :	7	tons
Total metal:	443	tons

BEST AVAILABLE COPY

n:
Total Boltzmann: 560 mc
ction less than 40μ: 214 mc
Difference: 346 mc

LLNL

214 mc brought down by rain. (or dust under tower)
least contribution fits theory: Witness Priscilla.
Boltzmann: (at 108kT): 45 mc
n Boltzmann: 301 mc
le or " : 100 mc
in 0.6T theory a factor of 3.

951

P.T on Diablo: Metals = 1.8 x 443 = 797 mc

LCC35 0117

Tube weight steel = 8,000

Metal etc weights:

Total steel:	755,920 #	=	378 tons
Tower 200' steel:	227,160 #	=	114 tons
On cab:			
Al:	14,270 #	=	7 tons
Lead-paraffin:	136,000 #;	=	58 tons
			10 tons
Paraffin:	40,000 #	=	20 tons

In tower above 200':

Cu:	1116 #	=	0.5 tons
Paraffin:	16,280 #	=	8 tons
Lead:	55,440 #	=	28 tons.

At 15kT, amount of tower not in fireball:

Total steel in fb:	350	tons
" Lead " " :	86	tons
" Al " " :	7	tons.
Total metal:	443	tons

Mc calculations:

Total Boltzmann:	560 mc
Fraction less than 40μ:	214 mc
Difference:	346 mc

BEST AVAILABLE COPY

Assume the 214 mc brought down by rain. (or dust
assume dust contribution fits theory: Witness Prisci

Dust on Boltzmann: (at 108kT): 45 MC
Metal on Boltzmann: 301 mc
Metal calc on " : 100 mc LLNL
Error in 0.6T theory a factor of 3.

Using 1.8T on Diablo: Metals = 1.8 x 443 =
Dust =
Total = 252

[redacted]

Cloud height ~ 50,000

[redacted]

ete weights:

Total steel: 755,920 # = 378 tons
Lower 200' steel: 227,160 # = 114 tons
On cab:
Al: 14,270 # = 7 tons
Lead-paraffin: 136,000 #: = 58 tons Pb
10 tons paraffin
Paraffin: 40,000 # : 20 tons "

Towers above 200':
Cu: 1116 # = 0.5 tons
Paraffin: 16,280 # = 8 tons
Lead: 55,440 # = 28 tons

5kT, amount of towers not in fireball: 28 tons

Total steel in fb: 350 tons
" Lead " " : 86 tons
" Al " " : 7 tons

Total metal: 443 tons

tion:

BEST AVAILABLE COPY

Total Boltzmann: 560 mc
-action less than 40μ: 214 mc
Difference: 346 mc

the 214 mc brought down by rain. (or dust under towers)
dust contribution fits theory: Witness Priscilla.
on Boltzmann: (at 108kT): 45 mc
on Boltzmann: 301 mc
ale on " : 100 mc
in 0.6T theory a factor of 3.

1.8T on Diablo: Metals = 1.8 x 443 = 797 mc
Dust = 100 mc
Total = 897 mc

LLNL

LCO37 0819

253

[redacted]

Mc on apple: 250 total.
Dust cont: 105
Metals: 145

Metals wt. in fireball: 223 tons.

α in $\alpha T = mc$: 0.65

Calc ~~Boltzmann~~ Diablo:

$0.65T = 0.65 \times 443 =$ 288 mc
Dust = 100 mc
Total = 388 mc

Average between Boltzmann + apple calibrations

642 mc

= 14%

= 2.1 KT

Diablo initial measurements:

High 900 mc
Low 1700 mc (60% within 5 mils)

Calculated using 1.8T and measured yield

951 mc

LLNL

BEST AVAILABLE COPY

Mc on apple: 250 total.
Dust cont: 105
Metals: 145

wt. in fireball: 223 tons.

α in $\Delta T = mc$: 0.65

~~Boltzmann~~ Diablo:

$0.65T = 0.65 \times 443 = 288$ mc
Dust = 100 mc
Total = 388 mc

between Boltzmann + apple calibrations for Diablo:

642 mc

= 1490

= 2.1 KT

initial measurements: BEST AVAILABLE COPY

High 900 mc
Low 1700mc (60% within 5 miles)

Calculated using 1.8T and measured yield:

951 mc

LLNL

255

Calculations for surface bursts of small "clean"

Total Yield	Fission Yield	Extent of: 400 R	25 R
5		1 mi	4 mi
		½ mi	2 mi
		2.5 mi	12 mi
50			
		1.5 mi	5 mi
		5 mi	21 mi
150			
		2 mi	9 mi

DELETED

For dirty bombs, sfc bursts

Yield	10KT		20		50		150	
Stat. miles Distance	5 hour Dose	D_i	D_o	D_i	D_o	D_i	D_o
5	440	5	730	5	1700	5	5000
10	90	10	180	10	430	10	1400
15	40	15	72	15	155	15	535
30	8.3	30	17	30	33	30	80
60	2.4	60	3	60	7	60	17

Zuni: 91 R/hr, ht hrs, 13.6 stat miles
150 R/hr, ht hrs, ~70 stat miles

Lacrosse: 180 - 900 R/hr at Ht hrs, 14.5 stat miles

LLNL

BEST AVAILABLE COPY

lations for surface bursts of small "clean" bombs.

Fission Yield	Extent of: (t = 5 hrs exp) 400 R	25 R	1 R
DELETED	1 mi	4 mi	17 mi
	½ mi	2 mi	10 mi
	2.5 mi	12 mi	45 mi
	1.5 mi	5 mi	25 mi
	5 mi	21 mi	70 mi
	2 mi	9 mi	40 mi.

For dirty bombs, sfc bursts. 15 knot wind.

20		50		150		1500	
Di	Do	Di	Do	Di	Do	Di	Do
5	730	5	1700	5	5000	5	70000
10	180	10	430	10	1400	10	5200
15	72	15	155	15	535	15	3600
30	17	30	33	30	80	30	1300
60	3	60	7	60	17	60	210

91 R/hr, hrl hrs, 13.6 stat miles.
50 R/hr, hrl hrs, ~70 stat miles

80 - 400 R/hr at Hrl hrs, 14.5 stat miles.

LLNL

BEST AVAILABLE COPY

94 [redacted]	Dust	Metal + Tot		Total		Meas	
TS-7	406	114	91	520	497	513	4
Uk-1	509	115	92	624	601	511	5
Uk-2	836	258	206	1094	1042	859	2
Uk-5	12	8	6	20	18	~10	
Uk-6	980	150	120	1130	1100	1010	1
Uk-7	2061	368	294	2429	2355	1830	2
Uk-9	1179	123	98	1302	1277	3205	1
Uk-10	73	.6	.5	74	74	~100	

BEST AVAILABLE COPY

Wasp	0	.65	.5	.65	.5	~1
Moth	12	38	30	50	42	67
Tesla	147	116	93	263	240	198
Turk	732	822	658	1554	1390	~1000
Hornet	38	97	78	135	116	106
Apple	111	477	382	588	493 (400)	153?
Bee	1	162	130	163	131	~100
Post	2	55	44	57	46	~20
Met	535	343	274	878	809	933
Apple II	0	1089	871	1089	871	898
Zucchini	361	379	303	~~710~~ 664		~700
Boltzmann	48	269	215	317	263	346

	5000 × ε_8 ① Dust Meas	P 109	Dust	Dust New System	⑧ 1/3 w 1/2 T	Totals	Meas.	Err.
TS-7	437	330	406	470	76	482	513	−.06
Uk-1	434	390	509	560	77	586	511	+.15
Uk-2	687	575	836	850	172	1008	859	+.17
Uk-6	910	660	980	970	100	1080	1010	±.07
Uk-7	1585	1250	2061	1900	245	2306	1830	+.26
Moth	42	53	12	66	25	37	67	−.45
Tesla	121	160	147	223	77	224	198	+.13
Turk	452	575	732	1010	548	1280	~1000	~+.2
Hornet	41	79	38	103	65	103	106	−.03
Apple	82	200	111	340	318	429	~400	~+.07
Met			535	700	229	764	933	−.18
Apple II			70		726	> 726	898	<−.19
Boltz.			48	222	179	227	346?	~−.34
Diable 15KT			100	510	586	686	~~258~~	LLNL
Bee	0	93	1	120	108	109	~100	~±.09
Post			2	43	37	39	~20	~±.95
Zucchini			361	770	253	614	<~700	<−.12

Dust	Metal Plate	Total	Mean	Old Calc	New-Old
406	114 91	520 497	513	443	+.014 -.14
509	115 92	624 601	511	543	+.22 +.03
836	258 206	1094 1042	859	897	+.27 +.044
12	8 6	20 18	~10	30	+1.0 +2.0
980	150 120	1130 1100	1010	1014	+.19 +.004
2061	368 294	2429 2355	1830	2122	+.39 +.16
1179	123 98	1302 1277	3205	1205	
73	6 5	74 74	~100	74	
0	.65 .5	.65 .5	~1	.7	
12	38 30	50 42	67	41	-.25 -.39
147	116 93	263 240	198	200	+.01 +.01
732	822 658	1554 1390	~1000	888	+.39 -.11
38	97 78	135 116	106	99	+.07 -.06
111	477 382	588 493 (400)	153?	251	+.47 -.31
1	162 130	163 131	~100	69	
2	55 44	57 46	~20	51	
535	343 274	878 809	933	619	-.059 -.34
0	1089 871	1089 871	898	737	+.21 -.17
361	379 303	~~340~~ 664	~700	441	
48	269 215	317 263	346	145	

BEST AVAILABLE COPY

Avg +.206 -.11

Dust new system (A)	1/3 w 1/2 T	Totals	Mean	Error	Error on Dust if Totals correct	
406	470 76	482	513	-.06	-.071	.094
509	560 77	586	511	+.15	+.17	
836	850 172	1008	859	+.17	+.22	
980	970 100	1080	1010	+.07	+.08	
2061	1900 245	2306	1830	+.26	+.30	
12	66 25	37	67	-.45	-.71	
147	223 77	224	198	+.13	+.21	
732	1010 548	1280	~1000	~+.28		
38	103 65	103	106	-.03	-.07	
111	340 318	429	~400	~+.07		LLNL
535	700 229	764	933	-.18	-.24	
70	726	> 726	898	< -.19	+1 ?	Prevatte
48	222 179	227	346?	~ -.34 ?	+1 ?	Wilson
100	510 586	686				
1	120 108	109	~100	~+.09		259
2	43 37	39	~20	~+.95		
361	770 253	614	< ~700	< -.12		

	10	0	6	20	18	~10
Uk-6	980	150	120	1130	1100	1010
Uk-7	2061	368	294	2429	2355	1830
Uk-9	1179	123	98	1302	1277	3205
UK-10	73	.6	.5	74	74	~100
Warp	0	.65	.5	.65	.5	~1
Moth	12	38	30	50	42	67
Tesla	147.	116	93	263	240	198
Turk	732	822	658	1554	1390	~1000
Hornet	38	97	78	135	116	106
Apple	111	477	382	588	493 (400)	153?
Bee	1	162	130	163	131	~100
Post	2	55	44	57	46	~20
Met	535	343	274	878	809	933
Apple II	0	1089	871	1089	871	898
Zucchini	361	379	303	~~550~~	664	~700
Boltzmann	48	269	215	317	263	346

	5000 x E_8 ① K/W Runt Mean	P 109	Dust	Dust new system (A)	1/3 W 1/2 T	Totals	Meas.	6
TS-7	437	330	406	470	76	482	513	−
Uk-1	434	390	509	560	77	586	511	+
Uk-2	687	575	836	850	172	1008	859	+
Uk-6	910	660	980	970	100	1080	1010	+
Uk-7	1585	1250	2061	1900	245	2306	1830	+
Moth	42	53	12	66	25	37	67	−
Tesla	121	160	147	223	77	224	198	+
Turk	452	575	732	1010	548	1280	~1000	~+
Hornet	41	79	38	103	65	103	106	−
Apple	82	200	111	340	318	429	~400	~+
Met			535	700	229	764	933	−
Apple II			70		726	> 726	898	<−
Boltz.			48	222	179	227	346?	~−
Diablo	15KT		100	510	586	686	—	
Bee	0	93	1	120	108	109	~100	~+,
Post			2	43	37	39	~20	~+,
Zucchini			361	770	253	614	<~700	<−
Uk-5			12	17	5	17	~10	~+

LLNL

Ave +0.0

260

Hood 0 140 4.4 4.4 1.7

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12	8 6	20 18	~10	30	+1.0	+2.0	
980	150 120	1130 1100	1010	1014	±.89	±.99	±.044
2061	368 294	2429 2355	1830	2122	±.33		+.16
1179	123 98	1302 1277	3205	1205			
73	.6 .5	74 74	~100	74			
0	.65 .5	.65 .5	~1	.7			
12	38 30	50 42	67	41	-.25	-.37	-.39
147	116 93	263 240	198	200	±.33	±.39	+.01
732	822 658	1554 1390	~1000	888	±.94		-.11
38	97 78	135 116	106	99	±.27		-.16
111	477 382	588 493	(400) 153?	252	±.47		-.32
1	162 130	163 131	~100	69			
2	55 44	57 46	~20	51			
535	343 274	878 809	833	619	-.059		-.34
0	1089 871	1089 871	898	737	±.23		-.18
361	379 303	~~340~~ 664	~700	441			
48	269 215	317 263	346	145			

Ave +.206 -.11

EXE 8 ①/② P 109	Dust	Dust new system (A)	1/3 W 1/2 T	Totals	Meas.	Error	Error on ratio if metals cancel	
								.094
330	406	470	76	482	513	-.06	-.071	
4 390	509	560	77	586	511	+.15	+.17	
7 575	836	850	172	1008	859	+.17	+.22	
0 660	980	970	100	1080	1010	+.07	+.08	
35 1250	2061	1900	245	2306	1830	+.26	+.30	
2 53	12	66	25	37	67	-.45	-.71	
1 160	147	223	77	224	198	+.13	+.21	
2 575	732	1010	548	1280	~1000	~+.28		
1 79	38	103	65	103	106	-.03	-.07	
2 200	111	340	318	429	~400	~+.07		
	535	700	229	764	933	-.18	-.24	
	70		726	> 726	898	<-.19	+1 ?	Pravatta
	48	222	179	227	346?	~-.34?	+1 ?	Wilson
	100	510	586	686				
93	1	120	108	109	~100	~+.09		
	2	43	37	39	~20	~+.95		LLNL
	361	770	253	614	<~700	<-.12		
	17	17	5	17	~10	~+.7		

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Ave +0.02

261

0 140 4.4 4.4 17

[redacted]

New metals scaling

$M_{c\,met} = KTW^{\frac{1}{2}}$

for $W = 24$, $T = 140$, $M_c = 398$

Met $K = \frac{398}{140 \times 4.9} = 0.58$

Zucch. $K_z = \frac{339}{133 \times 5.7} = 0.45$

With Pad Apple II $K = \frac{898}{388 \times 5.61} = 0.41$

Tesla $K = \frac{51}{88 \times 2.64} = 0.22$

$M_c = 400$

Apple $K = \frac{289}{242 \times 3.93} = 0.30$

Moth $K = \frac{55}{48 \times 1.57} = 0.73$

Bolt $K = \frac{505}{164 \times 3.32} = 0.93$

Or, figuring wings or whatever!

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$K = \frac{291}{164 \times 3.32} = 0.53$

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Average: $\sim 1/2$

New metals scaling [redacted]

$\sigma_t = KTW^{1/2}$

$= 24, T = 140., M_c = 398$

$= \frac{398}{140 \times 4.9} = 0.58$

$= \frac{339}{133 \times 5.7} = 0.45$

$=$

$K = \frac{898}{388 \times 5.61} = 0.41$

$= \frac{51}{88 \times 2.64} = 0.22$

$= \frac{289}{242 \times 3.93} = 0.30$

$= \frac{55}{48 \times 1.57} = 0.73$

$= \frac{505}{164 \times 3.32} = 0.93$

Or, figuring using an alternate!

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$= \frac{291}{164 \times 3.32} = 0.53$

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$\sim 1/2$

263 [redacted]

$1/2$

for $W = 24$, $T = 140$., $Mc = 398$

Met $K = \frac{398}{140 \times 4.9} = 0.58$

Zoach. $K_z = \frac{339}{133 \times 5.7} = 0.45$

With
Pad Apple II $K = \frac{898}{388 \times 5.61} = 0.41$

Tesla $K = \frac{51}{88 \times 2.64} = 0.22$

$Mc = 400$
Apple $K = \frac{289}{242 \times 3.93} = 0.30$

Moth $K = \frac{55}{48 \times 1.57} = 0.73$

Boltz. $K = \frac{505}{164 \times 3.32} = 0.93$

Or, figuring mega or whatever!

$K = \frac{291}{164 \times 3.32} = 0.53$

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Average: $\sim 1/2$

then $Mc_{metals} = \frac{1}{2} W^{\frac{1}{2}} T$

Diabla calculates: $857 Mc_{metal} + 100$

$= -754 + total\ Mc$ $\quad 264$ $= 957\ Mc$

$= \frac{398}{140 \times 4.9} = 0.58$

$= \frac{339}{133 \times 5.7} = 0.45$

$K = \frac{898}{388 \times 5.61} = 0.41$

$= \frac{51}{88 \times 2.64} = 0.22$

$K = \frac{289}{242 \times 3.93} = 0.30$

$K = \frac{55}{48 \times 1.57} = 0.73$

$K = \frac{505}{164 \times 3.32} = 0.93$

Or, figuring mixed or whatever!

$K = \frac{291}{164 \times 3.32} = 0.53$

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$\sim 1/2$

$M_{c\ metals} = 1/2\ W^{1/2}\ T$

265

Bla calculates: 857 mc metal + 100 dust = 957 mc at 15 kT

total for 10 kT

h	w	R_f	$8R_f$	3h	R_2	$1/R_2$	$(1/R_2)^2$	$(1/R_2)^{1\frac{1}{2}}$	$2(1/R_2)^{\frac{1}{2}}$	$.67(1/R_2)^{1\frac{1}{2}}$	$\frac{2\pi}{\Delta} = \frac{2.67}{M} = \frac{30}{Tn}$
20	0.1	85	680	60	620	.0323	.179	.0058	.36		2.31 6.5
↓	1	184	1472	↓	1412	.0142	.119	.0017	.24		2.43 67.
	10	397	3176		3116	.0064	.080	.0005	.16		2.51 67
	100	854	6832		6772	.0030	.055	.0002	.11		2.56 671
	1000	1840	14,720		14,660	.0014	.037	.00016	.07		2.60 671,1
	10,000	8965	31,720		31,660	.0006	.024	.0000	.05		2.62 671,1
50	0.1		680	150	530	.094	.306	.029	.61	.02	2.04 4,2
↓	0.3	123	984	↓	834	.060	.245	.015	.49	.01	2.17 12.7
	1		1472		1322	.038	.195	.007	.39		2.28 42.1
	10		3176		3026	.017	130	—	.26		2.41 42
	100		6832		6682	.0075	.086	—	.17		2.50 424
	1000		14,720		14,570	.0034	.058	—	.12		2.55 424,3
	10,000		31,720		31,570	.0016	.040	—	.08		2.59 424,3
100	0.1		680	300	380	.263	.512	.135	1.02	.09	1.56 3.
↓	0.2	108	864	↓	564	.177	.420	.074	.84	.05	1.78 6
	0.4	136	1088		788	.127	.356	.045	.71	.03	1.93 12
	1		1472		1172	.085	.292	.025	.58	.02	2.07 30
	10		3176		2876	.035	.187	.007	.37		2.30 300
	100		6832		6532	.015	.122	.002	.24		2.43 300
	1000		14,720		14,420	.007	.084	—	.17		2.50 300
	10,000		31,720		31,420	.003	.055	—	.11		2.56 300
200	.2		864	600	264	.758	.870	.659	1.74	.44	.49 4.2
	.5	146	1168		568	.352	.594	.209	1.19	.14	1.34 10.4
	1		1472		872	.229	.478	.109	.96	.07	1.64 21.4
	10		3176		2576	.078	.279	.022	.56	.01	2.10 212
	100		6832		6232	.032	.179	.006	.36	—	2.31 212
	1000		14,720		14,120	.014	.118	.002	.24	—	2.43 21,28
	10,000		31,720		31,120	.006	.078	+	.16	—	2.51 212,3
300	1		1472	900	572	.524	.724	.379	1.45	.25	.97 17.3

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R_f	$8R_f$	$3h$	$\Delta = R_2$	$\frac{1}{R_2}$	$\left(\frac{1}{R_2}\right)^2$	$\left(\frac{1}{R_2}\right)^{1\frac{1}{2}}$	$2\left(\frac{1}{R_2}\right)^{\frac{1}{2}}$	$.67\left(\frac{1}{R_2}\right)^{1\frac{1}{2}}$	$2.67 \frac{300}{M}$	$\frac{300}{Tn}$	$\frac{267}{T}$
85	680	60	620	.0323	.129	.0058	.36		2.31	6.71	15.5
184	1472	↓	1412	.0142	.119	.0017	.24		2.43	67.1	103
397	3176		3116	.0064	.080	.0005	.16		2.51	671	1684
854	6832		6772	.0030	.055	.0002	.11		2.56	6711	17,180
1840	14,720		14,660	.0014	.037	.00016	.07		2.60	67,110	174,500
3965	31,720		31,660	.0006	.024	.0000	.05		2.62	671,110	1,758,000
	680	150	530	.094	.306	.029	.61	.02	2.04	4.24	8.6
123	984	↓	834	.060	.245	.015	.49	.01	2.17	12.7	27.6
	1472		1322	.038	.195	.007	.39		2.28	42.4	97
	3176		3026	.017	130	-	.26		2.41	424	1022
	6832		6682	.0075	.086	-	.17		2.50	4243	10,610
	14,720		14,570	.0034	.058	-	.12		2.55	42,430	108,200
	31,720		31,570	.0016	.040	-	.08		2.59	424,300	1,099,000
	680	300	380	.263	.512	.135	1.02	.09	1.56	3.	4.7
108	864	↓	564	.177	.420	.074	.84	.05	1.78	6	10.7
136	1088		788	.127	.356	.045	.71	.03	1.93	12	23.2
	1472		1172	.085	.292	.025	.58	.02	2.07	30	62
	3176		2876	.035	.187	.007	.37		2.30	300	690
	6832		6532	.015	.122	.002	.24		2.43	3000	7290
	14,720		14,420	.007	.084	—	.17		2.50	30,000	75,000
	31,720		31,420	.003	.055	—	.11		2.56	300,000	768,000
	864	600	264	.758	.870	.659	1.74	.44	.49	4.25	2.08
146	1168		568	.352	.594	.209	1.19	.14	1.34	10.6	14.2
	1472		872	.229	.478	.109	.96	.07	1.64	21.2	34.8
	3176		2576	.078	.279	.022	.56	.01	2.10	212	445
	6832		6232	.032	.179	.006	.34	—	2.31	2123	4904
	14,720		14,120	.014	.118	.002	.24	—	2.43	21,230	51,590
	31,720		31,120	.006	.078	+	.16	—	2.51	212,300	532,900
	1472	900	572	.524	.724	.379	1.45	.25	.97	17.3	16.8

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	10,000	8965	31,720		31,660	.0004	.024	.0000	.05					2.62	671,1
50	0.1		680	150	530	.094	.306	.029	.61		.02			2.04	4.2
↓	0.3	123	984	↓	834	.060	.245	.015	.49		.01			2.17	12.
	1		1472		1322	.038	.195	.007	.39		—			2.28	42.
	10		3176		3026	.017	.130	—	.26		—			2.41	42.
	100		6832		6682	.0075	.086	—	.17		—			2.50	424
	1000		14,720		14,570	.0034	.058	—	.12		—			2.55	424
	10,000		31,720		31,570	.0016	.040	—	.08		—			2.59	424,3
100	0.1		680	300	380	.263	.512	.135	1.02		.09			1.56	3.
↓	0.2	108	864	↓	564	.177	.420	.074	.84		.05			1.78	4
	0.4	136	1088		788	.127	.356	.045	.71		.03			1.93	12
	1		1472		1172	.085	.292	.025	.58		.02			2.07	30
	10		3176		2876	.035	.187	.007	.37		—			2.30	300
	100		6832		6532	.015	.122	.002	.24		—			2.43	300
	1000		14,720		14,420	.007	.084	—	.17		—			2.50	30,0
	10,000		31,720		31,420	.003	.055	—	.11		—			2.56	30,0
200	.2		864	600	264	.758	.870	.659	1.74		.44			.49	4.2
	.5	146	1168		568	.352	.594	.209	1.19		.14			1.34	10.
	1		1472		872	.229	.478	.109	.96		.07			1.64	21.
	10		3176		2576	.078	.279	.022	.56		.01			2.10	212
	100		6832		6232	.032	.179	.006	.36		—			2.31	212
	1000		14,720		14,120	.014	.118	.002	.24		—			2.43	21,2
	10,000		31,720		31,120	.006	.078	—	.16		—			2.51	212,3
300	1		1472	900	572	.524	.724	.379	1.45		.25			.97	17.3
	2	232	1856		956	.314	.560	.176	1.12		.12			1.43	34.
	4	292	2336		1436	.209	.457	.096	.91		.06			1.70	69.
	10		3176		2276	.132	.363	.048	.73		.03			1.91	173
	100		6832		5932	.051	.226	.012	.45		.01			2.21	173
	1000		14,720		13,820	.022	.148	.003	.30		—			2.37	173
	10,000		31,720		30,820	.010	.100	—	.20		—			2.47	173,9
	.6	155	1240		340	.188	.339	.1826	1.88		.55			1.24	10.4

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000	3965	31,720		31,660	.0004	.024	.0000	.05		+			2.62	671,100	1,758,000				
1		680	150	530	.094	.306	.029	.61		.02			2.04	4.24	8.6				
.3	123	984	↓	834	.060	.245	.015	.49		.01			2.17	12.7	27.1				
1		1472		1322	.038	.195	.007	.39		—			2.28	42.4	97				
0		3176		3026	.017	.130	—	.26		—			2.41	424	1022				
00		6832		4682	.0075	.086	—	.17		—			2.50	4243	10,610				
00		14,720		14,570	.0034	.058	—	.12		—			2.55	42,430	103,200				
000		31,720		31,570	.0016	.040	—	.08		—			2.59	424,300	1,049,000				
1		680	300	380	.263	.512	.135	1.02		.09			1.56	3.	4.7				
.2	108	864	↓	564	.177	.420	.074	.84		.05			1.78	6	10.7				
.4	136	1088		788	.127	.356	.045	.71		.03			1.93	12	23.2				
		1472		1172	.085	.292	.025	.58		.02			2.07	30	62				
0		3176		2876	.035	.187	.007	.37		—			2.30	300	690				
0		6832		6532	.015	.122	.002	.24		—			2.43	3000	7290				
10		14,720		14,420	.007	.084	—	.17		—			2.50	30,000	75,000				
000		31,720		31,420	.003	.055	+	.11		—			2.56	300,000	768,000				
2		864	600	264	.758	.870	.659	1.74		.44			.49	4.25	2.08				
5	146	1168		568	.352	.594	.209	1.19		.14			1.34	10.6	14.2				
1		1472		872	.229	.478	.109	.96		.07			1.64	21.2	34.8				
0		3176		2576	.078	.279	.022	.56		.01			2.10	212	445				
10		6832		6232	.032	.179	.006	.36		—			2.31	2123	4904				
10		14,720		14,120	.014	.118	.002	.24		—			2.43	21,230	51,570				
0		31,720		31,120	.006	.078	+	.16		—			2.51	212,300	532,900				
		1472	900	572	.524	.724	.379	1.45		.25			.97	17.3	16.8				
	232	1856		956	.314	.560	.176	1.12		.12			1.43	34.6	49.5				
	292	2336		1436	.209	.457	.096	.91		.06			1.70	69.2	118				
		3176		2276	.132	.363	.048	.73		.03			1.91	173	330				
		6832		5932	.051	.226	.012	.45		.01			2.21	1730	3823				
0		14,720		13,820	.022	.148	.003	.30		—			2.37	17,300	41,000				
0		31,720		30,820	.010	.100	+	.20		—			2.47	173,000	427,300				
	155	1240		340	.082	.239	.0876	1.88		.55			1.24	10.14	21.5				

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Scaling theory modifications

Apparent errors are in: underestimate of dust effect, scaled burst heights, overestimate of low scaled burst

Correction: Increase speed of dust rise to cloud; decrease overall dust effect by lowering content.

UCRL-4660, page 6, assumption (3): change to:

① .... enters the fireball at three times the

② .... if it enters after the center of the fireb... more than four radii above the surface

Calculation of R_2:

$$t_f = \frac{4R_f - h}{v_f}$$

$$\max t_D = \frac{R_2 + 4R_f}{3v_f}$$

For ①

$R_2 = 6R$

$W_D = 0$ at

for $t_f = t_D$

$$\frac{4R_f - h}{v_f} = \frac{R_2 + 4R_f}{3v_f}$$

$$3(4R_f - h) = R_2 + 4R_f$$

$$12R_f - 3h = R_2 + 4R_f$$

$$R_2 = 12R_f - 3h - 4R_f$$

$$R_2 = 8R_f - 3h$$

For

$R_2 = 4R$
$= 2($

$W_D = 0$ at $h = 2R_f$ $(h = R_2)$

Try:

$$W_D(mc) = \frac{300W}{\sqrt{h}}\left[2.67 - 2\left(\frac{h}{R_2}\right)^{1/2} - 0.67\left(\frac{h}{R_2}\right)\right.$$

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ling theory modifications [redacted]

errors are is: underestimate of dust effect for high t heights, overestimate of low scaled burst heights.

: Increase speed of dust rise to cloud; possibly overall dust effect by lowering constant.

60; page 6, assumption (3): change to:

... enters the fireball at three times the speed ...

... if it enters after the center of the fireball is more than four radii above the surface.

tion of R_2:

$t_f = (4R_f - h)/v_f$

max $t_D = (R_2 + 4R_f)/3v_f$

$= t_D$ $\quad \frac{4R_f - h}{v_f} = \frac{R_2 + 4R_f}{3v_f}$

$3(4R_f - h) = R_2 + 4R_f$

$12R_f - 3h = R_2 + 4R_f$

$R_2 = 12R_f - 3h - 4R_f$

$R_2 = 8R_f - 3h$

$W_D = 0$ at $h = 2R_f$ $\quad (h = R_2)$

For ① only:

$R_2 = 6R_f - h$

$W_D = 0$ at $h = 3R_f$

For ② only, not ①:

$R_2 = 4R_f - 2h$
$= 2(2R_f - h)$

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$$(mc) = \frac{3CCW}{\sqrt{h}}\left[2.67 - 2\left(\frac{h}{R_2}\right)^{1/2} - 0.67\left(\frac{h}{R_2}\right)^{1\frac{1}{2}}\right]$$

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h	w	Rf	BRf	Bh	R_2 =	$1/R_2$	$(1/R_2)^{1/4}$	$(1/R_2)^{1/2}$	$2(1/R_2)^{1/2}$	$.67(1/R_2)^{1/4}$	$2.67\frac{L}{h}$	$300\frac{h}{w}$
400	1.5	211	1688	1200	488	.820	.905	.742	1.81	.50	.36	225
	3	265	2120	↓	920	.435	.659	.287	1.32	.19	1.14	45
	7	352	2816		1614	.248	.499	.124	1.08	.08	1.59	105
	10		3176		1976	.202	.449	.091	.90	.06	1.77	150
	20	500	4000		2800	.143	.378	.054	.76	.04	1.91	300
	100		6832		5632	.071	.266	.019	.53	.01	2.13	1500
	1000		14,720		13,520	.030	.173	.005	.35	—	2.32	15,000
	10,000		31,720		30,520	.013	.114	—	.23	—	2.44	150,000
500	3		2120	1500	620	.806	.896	.722	1.79	.48	.40	40.2
	5	315	2520	↓	1020	.490	.700	.343	1.40	.23	1.04	67.0
	7		2816		1316	.380	.616	.234	1.23	.16	1.28	93.7
	10		3176		1676	.298	.546	.163	1.09	.11	1.47	134
	100		6832		5332	.094	.306	.029	.61	.02	2.04	1339
	1000		14,720		13,220	.038	.195	.007	.39	—	2.28	13,390
	10,000		31,720		30,220	.017	.130	.002	.26	—	2.41	133,900
600	4.5	304	2432	1800	632	.949	.973	.923	1.95	.62	.10	55.1
	7		2816	↓	1016	.591	.769	.454	1.54	.30	.83	85.7
	10		3176		1376	.436	.660	.288	1.32	.19	1.16	122
	20		4000		2200	.273	.522	.143	1.04	.10	1.53	245
	100		6832		5032	.149	.345	.041	.69	.03	1.95	1224
	1000		14,720		12,920	.046	.214	.010	.43	.01	2.23	12,240
	10,000		31,720		29,920	.020	.141	.103	.28	—	2.39	122,400
700	7		2816	2100	716	.978	.989	.967	1.98	.65	.04	79.5
	10		3176	↓	1076	.651	.807	.525	1.61	.35	.71	114
	30	571	4568		2468	.284	.533	.151	1.07	.10	1.50	341
	60	720	5760		3660	.191	.437	.083	.87	.06	1.74	682
	100		6832		4732	.148	.384	.057	.77	.04	1.86	1136
	1000		14,720		12,620	.055	.234	.013	.47	.01	2.19	11,360
	10,000		31,720		29,620	.024	.155	.004	.31	—	2.36	113,600
800	11	459	3672	2400	872	.917	.957	.925	1.91	.59	.17	102

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LC035 0845

R_f	BR_f	B_h	$\frac{R_2}{R_1}$	$\sqrt{R_2}$	$(\frac{1}{R_2})^{1/4}$	$(\frac{1}{R_2})^{1/2}$	$2(\frac{1}{R_2})^{1/2}$	$.67(\frac{1}{R_2})^{1/2}$	$2.67\frac{L}{h}$	$\frac{300}{h}W$	$\frac{\pi}{4}\frac{273}{86}$
211	1688	1200	488	.820	.905	.742	1.81	.50	.36	225	8.1
265	2120	↓	920	.435	.659	.287	1.32	.19	1.14	45	52.2
352	2816		1616	.248	.499	.124	1.00	.08	1.59	105	147
	3176		1976	.202	.449	.091	.90	.06	1.77	150	266
500	4000		2800	.143	.378	.054	.76	.04	1.91	300	573
	6832		5632	.071	.266	.019	.53	.01	2.13	1500	3195
	14,720		13,520	.030	.173	.005	.35	—	2.32	15,000	34,800
	31,720		30,520	.013	.114	—	.23	—	2.44	150,000	366,000
	2120	1500	620	.806	.896	.722	1.79	.48	.40	40.2	16.1
315	2520	↓	1020	.490	.700	.343	1.40	.23	1.04	67.0	70
	2816		1316	.380	.616	.234	1.23	.16	1.28	93.7	120
	3176		1676	.298	.546	.163	1.09	.11	1.47	134	197
	6832		5332	.094	.306	.029	.61	.02	2.04	1339	2732
	14,720		13,220	.038	.195	.007	1.39	—	2.28	13,390	30,530
	31,720		30,220	.017	.130	.002	.26	—	2.41	133,900	322,700
304	2432	1800	632	.949	.923	.923	1.85	.62	.10	55.1	5.5
	2816	↓	1016	.591	.769	.454	1.54	.30	.83	85.7	71.1
	3176		1376	.436	.660	.288	1.32	.19	1.16	122	142
	4000		2200	.273	.522	.143	1.04	.10	1.53	245	375
	6832		5032	.119	.345	.041	.69	.03	1.95	1224	2387
	14,720		12,920	.046	.214	.010	.43	.01	2.23	12,240	27,300
	31,720		29,920	.020	.141	.003	.28	—	2.39	122,400	292,500
	2816	2100	716	.978	.989	.967	1.98	.65	.04	79.5	3.2
	3176	↓	1076	.651	.807	.525	1.61	.35	.71	114	81
571	4568		2468	.284	.533	.151	1.07	.10	1.50	341	512
720	5760		3660	.191	.437	.083	.87	.06	1.74	682	1187
	6832		4732	.148	.384	.057	.77	.04	1.86	1136	2113
	14,720		12,620	.055	.234	.013	.47	.01	2.19	11,360	24,880
	31,720		29,620	.024	.155	.004	.31	—	2.36	113,600	268,100
169	3272	2400	872	.917	.957	.877	1.91				

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	6832		5632	.071	.266	.017	.09				2.32	15,000	34,800	275
	14,720		13,520	.030	.173	.005	.35				2.44	150,000	346,000	
0	31,720		30,520	.013	.114	—	.23				.40	40.2	16.1	
	2120	1500	620	.806	.896	.722	1.79	.48			1.04	67.9	70	
315	2520	2	1020	.490	.700	.343	1.40	.23			1.28	93.7	120	
	2816		1316	.380	.616	.234	1.23	.16			1.47	134	197	
	3176		1676	.298	.546	.163	1.09	.11			2.04	1339	2732	
	6832		5332	.094	.306	.029	.61	.02			2.28	13,390	30,530	
	14,720		13,220	.038	.195	.007	.39	—			2.41	133,900	322,700	
	31,720		30,220	.017	.130	.002	.26	—			.10	55.1	5.5	
304	2432	1800	632	.949	.923	.923	1.95	.62			.83	85.7	71.1	
	2816	2	1016	.591	.769	.454	1.54	.30			1.16	122	142	
	3176		1376	.436	.660	.288	1.32	.19			1.53	245	375	
	4000		2200	.273	.522	.143	1.04	.10			1.95	1224	2387	
	6832		5032	.119	.345	.041	.69	.03			2.23	12,240	27,300	
	14,720		12,920	.046	.214	.010	.43	.01			2.39	122,400	293,500	
	31,720		29,920	.020	.141	.003	.28	—			.04	79.5	3.2	
	2816	2400	716	.978	.989	.967	1.98	.65			.71	114	81	
	3176	2	1076	.651	.807	.525	1.61	.35			1.50	341	512	
571	4568		2468	.284	.533	.151	1.07	.10			1.74	682	1187	
720	5760		3660	.191	.437	.083	.87	.06			1.86	1136	2113	
	6832		4732	.148	.384	.057	.77	.04			2.19	11,360	24,880	
	14,720		12,620	.055	.234	.013	.47	.01			2.36	113,600	268,100	
	31,720		29,620	.024	.155	.004	.31	—			.17	117	19.9	
409	3272	2400	872	.917	.957	.878	1.91	.59			.71	159	113	
554	3632	2	1232	.649	.805	.522	1.61	.35			1.02	212	216	
	4000		1600	.500	.706	.353	1.41	.24			1.31	318	417	
	4568		2168	.369	.607	.224	1.21	.15			1.61	636	1024	
	5760		3360	.238	.488	.116	.98	.08			1.77	1060	1876	
	6832		4432	.181	.425	.077	.85	.05			2.15	10,600	22,790	
	14,720		12,320	.065	.255	.017	.51	.01			2.34	106,000	248,000	
	31,720		29,320	.027	.164	.004	.33	—						

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h	w	R_f	$8R_s$	3h	R_2	h/R_2	$(h/R_2)^{1/2}$	$(h/R_2)^{1/4}$	$2(h/R_2)^{1/4}$	$.67(h/R_2)^{1/2}$	E	$\frac{300}{h}w$
4000	1400	2060	16,480	12,000	4480	.893	.945	.844	1.89	.57	.21	6450
↓	3000	2660	21,280	↓	9280	.431	.656	.283	1.31	.19	1.17	14,250
	5000	3140	25,120		13,120	.305	.552	.168	1.10	.11	1.46	23,750
	10,000		31,720		19,720	.203	.450	.091	.90	.06	1.71	47,500
	20,000	5000	40,000		28,000	.143	.378	.054	.76	.05	1.86	95,000
	100,000		68,320		56,320	.071	.266	.019	.53	.01	2.13	475,000
5000	2600	2530	20,240	15,000	5240	.954	.976	.931	1.95	.62	.10	11,050
	3000		21,280	↓	6280	.796	.892	.710	1.78	.48	.41	12,750
	5000		25,120		10,120	.494	.703	.347	1.44	.23	1.03	21,250
	10,000		31,720		16,720	.299	.547	.164	1.09	.11	1.47	42,500
	20,000		40,000		25,000	.200	.447	.089	.89	.06	1.72	85,000
	100,000		68,320		53,320	.094	.306	.029	.61	.02	2.04	425,000
6000	4400	3010	24,080	18,000	6080	.987	.993	.980	1.99	.66	.02	17,072
	5000		25,120	↓	7120	.843	.918	.774	1.84	.52	.31	19,400
	7000	3520	28,160		10,160	.591	.769	.454	1.54	.30	.83	27,160
	10,000		31,720		13,720	.437	.661	.289	1.32	.19	1.14	38,800
	20,000		40,000		22,000	.273	.522	.143	1.04	.10	1.53	77,600
	50,000	6780	54,240		36,240	.166	.407	.068	.81	.05	1.81	194,000
	100,000		68,320		50,320	.119	.345	.041	.69	.03	1.95	388,000
7000	7000		28,160	21,000	7160	.978	.988	.966	1.98	.65	.04	25,130
	10,000		31,720	↓	10,720	.653	.808	.528	1.62	.35	.70	35,900
	20,000		40,000		19,000	.368	.606	.223	1.21	.15	1.31	71,800
	50,000		54,240		33,240	.211	.458	.097	.92	.09	1.66	179,500
	100,000		68,320		47,320	.148	.384	.057	.77	.04	1.86	358,000
8000	12,300	4010	32,080	24,000	8080	.990	.995	.985	1.99	.66	.02	34,610
	20,000		40,000	↓	16,000	.500	.707	.354	1.41	.24	1.02	67,200
	50,000		54,240		30,240	.265	.514	.136	1.03	.09	1.55	168,000
	70,000	7580	60,640		36,640	.218	.467	.102	.93	.07	1.67	235,200
	100,000		68,320		44,320	.181	.425	.077	.85	.05	1.77	336,000
9000	15,000	4530	36,240	27,000	9240	.974	.987	.961	1.97	.64	.06	47,400
	[illegible]	5710	45,680	↓	18,680	.482	.694	.335	1.37	.22	[illegible]	[illegible]

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R_1	$8R_s$	3L	$R = R_2$	$1/R_2$	$(1/R_2)^{1/2}$	$(1/R_2)^{1/4}$	$2(1/R_2)^{1/4}$	$.67(1/R_2)^{1/2}$	$\frac{2.67}{E}$	$\frac{300}{k}$ W	T
2060	16,480	12,000	4480	.893	.945	.844	1.89	.57	.21	6450	1396
2460	21,280	↓	9280	.431	.656	.283	1.31	.19	1.17	14,250	16,700
3140	25,120		13,120	.305	.552	.168	1.10	.11	1.46	23,750	34,700
	31,720		19,720	.203	.450	.091	.90	.06	1.71	47,500	81,200
5000	40,000		28,000	.143	.378	.054	.76	.05	1.86	95,000	176,700
	68,320		56,320	.071	.266	.019	.53	.01	2.13	475,000	1,012,000
2530	20,240	15,000	5240	.954	.976	.931	1.95	.62	.10	14,050	1405
	21,280	↓	6280	.796	.892	.710	1.78	.48	.41	12,750	5230
	25,120		10,120	.494	.703	.347	1.41	.23	1.03	21,250	21,900
	31,720		16,720	.299	.547	.164	1.09	.11	1.47	42,500	62,500
	40,000		25,000	.200	.447	.089	.89	.06	1.72	85,000	146,200
	68,320		53,320	.094	.306	.029	.61	.02	2.04	425,000	867,000
3010	24,080	18,000	6080	.987	.993	.980	1.99	.66	.02	17,172	344
	25,120	↓	7120	.843	.918	.774	1.84	.52	.31	19,444	6014
3520	28,160		10,160	.591	.769	.454	1.54	.30	.83	27,160	22,500
	31,720		13,720	.437	.661	.289	1.32	.19	1.16	38,800	45,000
	40,000		22,000	.273	.522	.143	1.04	.10	1.53	72,600	119,000
6780	54,240		36,240	.166	.407	.068	.81	.05	1.81	194,000	351,000
	68,320		50,320	.119	.345	.041	.69	.03	1.95	388,000	757,000
	28,160	21,000	7160	.978	.988	.966	1.98	.65	.04	25,130	1005
	31,720	↓	10,720	.653	.808	.528	1.62	.35	.70	35,900	25,130
	40,000		19,000	.368	.606	.223	1.21	.15	1.31	71,800	94,460
	54,240		33,240	.211	.458	.097	.92	.09	1.66	179,500	298,000
	68,320		47,320	.148	.384	.057	.77	.04	1.86	358,000	668,000
4010	32,080	24,000	8080	.990	.995	.985	1.99	.66	.02	34,610	692
	40,000	↓	16,000	.500	.707	.354	1.41	.24	1.02	67,200	68,500
	54,240		30,240	.265	.514	.136	1.03	.09	1.55	168,000	260,400
7580	60,640		36,640	.218	.467	.102	.93	.07	1.67	235,200	393,000
	68,320		44,320	.181	.425	.077	.85	.05	1.77	336,000	595,000
4530	76,240	22,000	9240	.974	.987	.961	1.97	.64	.06	47,400	2844
4710	45,680	↓	12,760	.482	.694	.334	1.39	.22	1.00	[illegible]	[illegible]

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[redacted]

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	100,000		60,320		50,320	.011	.246	.011	.53	.07				415,000			
5000	2600	2530	29,240	15,000	5240	.954	.976	.93	1.95	.62		.10		14,050		1	
	3000		21,280	↓	6280	.796	.892	.710	1.78	.48		.41		12,750		5	
	5000		25,120		10,120	.494	.703	.347	1.44	.23	LLNL	1.03		21,250		2	
	10,000		31,720		16,720	.299	.547	.164	1.09	.11		1.47		42,500		6	
	20,000		41,000		25,000	.200	.447	.089	.89	.06		1.72		85,000		12	
	100,000		68,320		53,320	.094	.306	.029	.61	.02		2.04		425,000		8	
6000	4400	3010	24,080	18,000	6080	.987	.993	.980	1.99	.66		.02		12,072			
	5000		25,120	↓	7120	.843	.918	.774	1.84	.52		.31		19,440			
	9000	3520	28,160		10,160	.581	.769	.454	1.54	.30		.83		27,160			
	10,000		31,720		13,720	.437	.661	.289	1.32	.19		1.16		38,800		4	
	20,000		40,000		22,000	.273	.522	.143	1.04	.14		1.53		77,600		1	
	50,000	6780	54,240		36,240	.166	.407	.068	.81	.07		1.81		194,000		3	
	100,000		68,320		50,320	.119	.345	.041	.69	.03		1.95		388,000		7	
1000	9000		28,160	21,000	7160	.978	.988	.966	1.98	.6		.04		25,130		1	
	10,000		31,720	↓	10,720	.653	.808	.528	1.62	.3		.70		35,900		2	
	20,000		40,000		19,000	.368	.606	.223	1.21	.15		1.31		71,800		8	
	50,000		54,240		33,240	.211	.458	.097	.92	.09		1.66		179,500		29	
	100,000		68,320		47,320	.148	.384	.057	.77	.04		1.86		359,000		66	
3000	12,300	4010	32,080	24,000	8080	.990	.995	.985	1.99	.66		.02		34,610			
	20,000		40,000	↓	16,000	.500	.707	.354	1.41	.24		1.02		67,200		68	
	50,000		54,240		30,240	.265	.514	.136	1.03	.09		1.55		168,000		26	
	70,000	7580	60,640		36,640	.218	.467	.102	.93	.07		1.27		235,200		39	
	100,000		68,320		44,320	.181	.425	.077	.85	.05		1.77		336,000		57	
5000	15,000	4530	36,240	28,000	9240	.974	.987	.961	1.97	.64		.06		47,400		2	
	30,000	5710	45,680	↓	18,680	.482	.694	.335	1.39	.22		1.04		94,800		10	
	50,000		54,240		27,240	.330	.574	.189	1.15	.13		1.39		158,000		22	
	70,000		60,640		33,640	.268	.517	.139	1.03	.09		1.55		221,200		34	
	100,000		68,320		41,320	.218	.467	.102	.93	.07		1.67		316,000		52	
10,000	20,500	5040	40,820	34,000	10,320	.969	.983	.953	1.97	.64		.06		61,500		34	
	30,000		45,680	↓	15,680	.638	.799	.510	1.60	.34		.93		90,000		65	
	50,000		54,240		24,240	.413	.642	.265	1.28	.18		1.41		150,000		181	

2530	20,240	15,000	5240	.954	.976	.93	1.95	.62	.10	11,050	1105				
	21,280	↓	6280	.796	.892	.710	1.78	.48	.41	12,750	5230				
	25,120		10,120	.494	.703	.347	1.44	.23	1.03	21,250	21,900				
	31,720		16,720	.299	.547	.164	1.09	.11	1.47	42,500	63,500				
	40,000		25,000	.200	.447	.089	.89	.06	1.72	85,000	146,200				
	68,320		53,320	.094	.306	.029	.61	.02	2.04	425,000	867,000				
3010	24,080	18,000	6080	.987	.993	.980	1.99	.66	.02	12,072	344				
	25,120	↓	7120	.843	.918	.774	1.84	.52	.31	19,400	6014				
3520	28,160		10,160	.591	.769	.454	1.54	.30	.83	27,160	22,500				
	31,720		13,720	.437	.661	.289	1.32	.19	1.16	38,800	45,000				
	40,000		22,000	.273	.522	.143	1.04	.10	1.53	72,600	119,000				
6780	54,240		36,240	.166	.407	.068	.81	.05	1.81	194,000	351,000				
	68,320		50,320	.119	.345	.041	.69	.03	1.95	388,000	757,000				
	28,160	21,000	7160	.978	.988	.966	1.98	.65	.04	25,130	1005				
	31,720	↓	10,720	.653	.808	.528	1.62	.35	.70	35,900	25,130				
	40,000		19,000	.368	.606	.223	1.21	.15	1.31	71,800	94,060				
	54,240		33,240	.211	.458	.097	.92	.09	1.66	179,500	298,000				
	68,320		47,320	.148	.384	.057	.77	.04	1.86	358,000	668,000				
4010	32,080	24,000	8080	.990	.995	.985	1.99	.66	.02	34,610	692				
	40,000	↓	16,000	.500	.707	.354	1.41	.24	1.02	67,200	68,500				
	54,240		30,240	.265	.514	.136	1.03	.09	1.55	168,000	260,400				
7580	60,640		36,640	.218	.467	.102	.93	.07	1.67	235,200	393,000				
	68,320		44,320	.181	.425	.077	.85	.05	1.77	336,000	595,000				
4530	36,240	27,000	9240	.974	.987	.961	1.97	.64	.06	47,400	2844				
5710	45,680	↓	18,680	.482	.694	.335	1.39	.22	1.04	94,800	104,500				
	54,240		27,240	.330	.574	.189	1.15	.13	1.39	158,000	220,000				
	60,640		33,640	.268	.517	.139	1.03	.09	1.55	221,200	343,000				
	68,320		41,320	.218	.467	.102	.93	.07	1.67	316,000	528,000				
5040	40,320	30,000	10,320	.969	.983	.953	1.97	.64	.06	61,500	3690				
	45,680	↓	15,680	.638	.799	.510	1.60	.34	.73	90,000	65,700				
	54,240		24,240	.413	.642	.265	1.28	.18	1.41	150,000	191,500				

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Try pressure goes as $\frac{1}{R^3}$.

$$W_3 = k_1 \int_{\phi=0}^{2\pi} \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{k_2 W (1+\cos\theta)(R^2-h^2)^{1/2} R}{R^3 \cos\theta} \, d\theta \, d\phi$$

$$= \left[\quad\right] \int \frac{k_2 W (1+\cos\theta)(R^2-h^2)^{1/2}}{R^2 \cos\theta} \, d\theta$$

$$= k_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\cos\theta)}{\cos\theta} \left(\frac{R^2-h^2}{R^4}\right)^{1/2} d\theta \, d\phi$$

$$= k_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)}{R} (1-\cos^2\theta)^{1/2} \, d\theta$$

$$= k_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)\cos\theta}{h} (1-\cos^2\theta)^{1/2} \, d\theta$$

$$= k_3 W \left[\int \left(\frac{\cos\theta}{h} + \frac{1}{h}\right) \sin\theta \, d\theta \right.$$

BEST AVAILABLE COPY

$\cos\theta = h/R \qquad -\sin\theta \, d\theta = -\frac{h}{R^2} dR$

$\theta = \cos^{-1}\frac{h}{R}$

$$= k_3 W \int_h^{R_2} \left(\frac{1}{R} + \frac{1}{h}\right) \frac{h}{R^2} \, dR$$

LLNL

$$= \frac{k_3 W h}{} \int_h^{R_2} \frac{1}{R^3} \, dR + k_3 W \int_h^{R_2} \frac{1}{R^2} \, dR$$

$$= \frac{k_3 W h}{2} \left[-\frac{1}{R^2} \right]_h^{R_2} + k_3 W \left[-\frac{1}{R} \right]_h^{R_2}$$

280

Try pressure goes as $\frac{1}{R^3}$.

[redacted]

$$W_3 = k_1 \int_{\phi=0}^{2\pi} \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{k_2 W (1+\cos\theta)(R^2-h^2)^{1/2} R}{R^3 \cos\theta} \, d\theta \, d\phi$$

$$= [\quad] \frac{k_2 W (1+\cos\theta)(R^2-h^2)^{1/2}}{R^2 \cos\theta} \, d\theta \, d\phi$$

$$= k_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\cos\theta)}{\cos\theta} \left(\frac{R^2-h^2}{R^4}\right)^{1/2} d\theta \, d\phi$$

$$= K_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)}{R} (1-\cos^2\theta)^{1/2} \, d\theta$$

$$= K_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)\cos\theta}{h} (1-\cos^2\theta)^{1/2} \, d\theta$$

BEST AVAILABLE COPY

$$= K_3 W \left[\int \left(\frac{\cos\theta}{h} + \frac{1}{h}\right) \sin\theta \, d\theta \right]$$

$\cos\theta = h/R \qquad -\sin\theta \, d\theta = -\frac{h}{R^2} dR$

$\theta = \cos^{-1} h/R$

$$= K_3 W \int_h^{R_2} \left(\frac{1}{R} + \frac{1}{h}\right) \frac{h}{R^2} \, dR$$

$$= \frac{K_3 W h}{} \int_h^{R_2} \frac{1}{R^3} \, dR + K_3 W \int_h^{R_2} \frac{1}{R^2} \, dR$$

LLNL

$$= \frac{K_3 W h}{2} \left| -\frac{1}{R^2} \right|_h^{R_2} + K_3 W \left| -\frac{1}{R} \right|_h^{R_2}$$

LC035 CF53

$$\phi=0 \quad \theta=0 \qquad R^2\cos\theta$$

$$= \left[\quad\right] \frac{K_2 W (1+\cos\theta)(R^2-h^2)^{1/2}}{R^2\cos\theta}\, d\theta$$

$$= K_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\cos\theta)}{\cos\theta}\left(\frac{R^2-h^2}{R^4}\right)^{1/2} d\theta\, d\phi$$

$$= K_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)}{R}\left(1-\cos^2\theta\right)^{1/2} d\theta$$

$$= K_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)\cos\theta}{h}\left(1-\cos^2\theta\right)^{1/2} d\theta$$

$$= K_3 W \left[\int \left(\frac{\cos\theta}{h}+\frac{1}{h}\right) \sin\theta\, d\theta \right.$$

$$\cos\theta = \frac{h}{R} \qquad -\sin\theta\, d\theta = -\frac{h}{R^2}\, dR$$

$$\theta = \cos^{-1}\frac{h}{R}$$

BEST AVAILABLE COPY

$$\sim K_3 W \int_h^{R_2} \left(\frac{1}{R}+\frac{1}{h}\right)\frac{h}{R^2}\, dR$$

$$= \frac{K_3 W h}{} \int_h^{R_2} \frac{1}{R^3}\, dR + K_3 W \int_h^{R_2} \frac{1}{R^2}\, dA$$

LLNL

$$= \frac{K_3 W h}{2}\left[\frac{1}{R^2}\right]_h^{R_2} + K_3 W \left[-\frac{1}{R}\right]_h^{R_2}$$

$$= h K_3 W \left[\frac{1}{h^2}-\frac{1}{R_2^2}\right] + K_3 W \left[\frac{1}{h}-\frac{1}{R_2}\right]$$

$$\int_{\phi=0}^{} \int_{\theta=0}^{R^2 \cos\theta} = \left[\quad \right] \frac{k_2 W (1+\cos\theta)(R^2-h^2)^{1/2}}{R^2 \cos\theta} \, d\theta \, d\phi$$

$$= k_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\cos\theta)}{\cos\theta} \left(\frac{R^2-h^2}{R^4}\right)^{1/2} d\theta \, d\phi$$

$$= K_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)}{R} (1-\cos^2\theta)^{1/2} \, d\theta$$

$$= K_3 W \int_{\theta=0}^{\cos^{-1}\frac{h}{R_2}} \frac{(1+\sec\theta)\cos\theta}{h} (1-\cos^2\theta)^{1/2} \, d\theta$$

$$= K_3 W \left[\int \left(\frac{\cos\theta}{h} + \frac{1}{h}\right) \sin\theta \, d\theta \right.$$

$\cos\theta = h/R \qquad -\sin\theta \, d\theta = -\frac{h}{R^2} dR$

$\theta = \cos^{-1}\frac{h}{R}$

$$= K_3 W \int_{h}^{R_2} \left(\frac{1}{R} + \frac{1}{h}\right) \frac{h}{R^2} \, dR$$

BEST AVAILABLE COPY

$$= K_2 W h \int_{h}^{R_2} \frac{1}{R^3} \, dR + K_3 W \int_{h}^{R_2} \frac{1}{R^2} \, dR$$

$$= \frac{K_3 W h}{2} \left[-\frac{1}{R^2} \right]_{h}^{R_2} + K_3 W \left[-\frac{1}{R} \right]_{h}^{R_2}$$

LLNL

$$= h K_3 W \left[\frac{1}{h^2} - \frac{1}{R_2^2} \right] + K_3 W \left[\frac{1}{h} - \frac{1}{R_2} \right]$$

[redacted]

$$W_D = k_3 W\left(\frac{1}{h} - \frac{h}{R_2^2} + \frac{1}{h} - \frac{1}{R_2}\right)$$ [redacted]

$$= k_3 W\left(\frac{2}{h} - \frac{h}{R_2^2} - \frac{1}{R_2}\right)$$

$$R_2 = 8R_f - 3h$$

$$W_D = k_3 W\left[\frac{2}{h} - \frac{h}{64R_f^2 - 48R_f h + 9h^2} - \frac{1}{8R_f - 3h}\right]$$

$$= k_3 W\left(\frac{2R_2^2 - h^2 - hR_2}{hR_2^2}\right)$$

$$= k_3 W\left(\frac{2R_2^2 - hR_2 - h^2}{hR_2^2}\right)$$

$$= \frac{k_3 W}{h}\left(2 - \left(\frac{h}{R_2}\right)^2 - \frac{h}{R_2}\right)$$

For
$R_2 = 4R_f - 2h$

$W_D = 0$; $R_2 = h$:

$h = 4R_f - 2h$
$3h = 4R_f$
$R_f = \frac{3}{4}h$

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h	w	R_s	$\frac{h}{R_s}$	$(\frac{h}{R_s})^2$	$2-\xi$	w/h	π	mc
500	3	620	.806	.650	.548	.006	.003	15
	5	1020	.490	.240	1.270	.010	.013	65
	7	1316	.380	.144	1.476	.014	.021	105
	10	1676	.298	.089	1.610	.020	.032	160
	30	3076	.163	.027	1.810	.060	.109	545
	100	5332	.094	.009	1.897	.200	.379	1895

h	w	$\frac{h}{R_s}$	$(\ )^2$	$2-\xi$	$5\,w/h \times 10^3$	$\frac{mc}{\pi}$
300	1	.524	.275	1.20	16.7	20
↓	2	.314	.099	1.59	33.3	53
	4	.209	.044	1.75	66.7	117
	10	.132	.017	1.85	167	309
	100	.051	.003	1.95	1670	3256
	.6	.880	.774	.35	10	3.5

For $R_e = 4R_s - 2h$:

h	w
500	9

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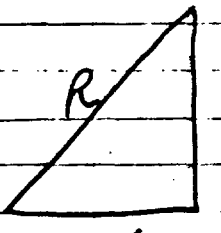
Assume that the effectiveness of the dust is dependent upon
of entry into the fireball and the time-temperature history o
fireball:

time to fireball $t = \dfrac{R' + h + x}{3\,v_f}$ where $x =$ v_f
fireball
same ti

$$\frac{R' + h + v_f t}{3 v_f} = t$$



$$3 v_f t - v_f t = R' + h$$

$$2 v_f t = R' + h$$

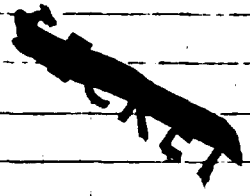
$$t = \frac{R' + h}{2 v_f}$$

LLNL

Assume $v_f \sim w^{1/2}$ since rate of rise should proportion
temp. history of the fireball: time at a g
goes roughly as $w^{1/2}$

$k_2 = 5 \times 10^{-3}$

h/R_s	$(\frac{h}{R_s})^2$	$2-\xi$	W/h	π	$\frac{mc}{\pi}$
.806	.650	.544	.006	.003	15
.490	.240	1.270	.010	.013	65
.380	.144	1.476	.014	.021	105
.298	.089	1.610	.020	.032	160
.163	.027	1.810	.060	.109	545
.094	.009	1.897	.200	.379	1895



$()^2$	$2-\xi$	$5 W/h \times 10^3$	$=\frac{mc}{\pi}$
.275	1.20	16.7	20
.099	1.59	33.3	53
.044	1.75	66.7	117
.017	1.85	167	309
.003	1.95	1670	3256
.774	.35	10	3.5

$4R_s - 2h$:

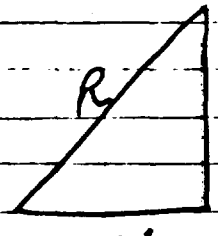
---

the effectiveness of the dust is dependent upon its time the fireball and the time-temperature history of the

fireball $t = \frac{R' + h + x}{3 v_f}$ where $x = v_f t$, the fireball rise in same time.

$v_f t = t$

$\therefore t = R' + h$



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$R' + h$

$\frac{R' + h}{2 v_f}$

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$\sim W^{1/2}$ since rate of rise should proportional to the temp. history of the fireball: time at a given temp goes roughly as $W^{1/2}$

LCCS 0158

10	1676	.298	.009	1.610	.020	.032	160
30	3076	.163	.027	1.810	.060	.109	545
100	5332	.094	.009	1.897	.200	.379	1895

h	W	$\frac{h}{R_e}$	( )$^{-\frac{1}{2}}$	$2-\xi$	$5\frac{W}{h}\times10^3$	$=\frac{\pi c}{\pi}$
300	1	.524	.275	1.20	16.7	20
↓	2	.314	.099	1.59	33.3	53
	4	.209	.044	1.75	66.7	117
	10	.132	.017	1.85	167	309
	100	.051	.003	1.95	1670	3256
	.6	.880	.774	.35	10	3.5

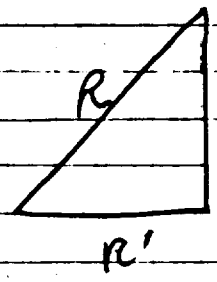
For $R_e = 4R_f - 2h$:

h	W
500	9

Assume that the effectiveness of the dust is dependent upon of entry into the fireball and the time-temperature history o fireball:

time to fireball $t = \frac{R' + h + x}{3 v_f}$ where $x =$ u fireball same t

$$\frac{R' + h + v_f t}{3 v_f} = t$$



$$3 v_f t - v_f t = R' + h$$

$$2 v_f t = R' + h$$

$$t = \frac{R' + h}{2 v_f}$$

LLNL
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Assume $V_f \sim W^{1/2}$ since rate of rise should proportion temp. history of the fireball: time at a g goes roughly as $W^{1/2}$

Then $t \sim \frac{1}{2} \frac{R' + h}{W^{1/2}} \sim \frac{R' + h}{W^{1/2}}$

Assume that $dW_D \sim \frac{\text{Total force}_z \text{ (as before)}}{t_R}$

Then $W_D = k \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{W}{R^3} (1+\cos\theta) \frac{(R^2-h^2)^{1/2}}{\cos\theta} R \frac{W^{1/2}}{(R'+h)}$

$d\theta = \frac{h}{R^2 \sin\theta} dR$ $\quad \sin\theta = (1-\cos^2\theta)^{1/2} = (1-$

$= \frac{h}{R^2} \times \frac{R}{(R^2-h^2)^{1/2}}$ $\quad = \frac{(R^2-h^2)^{1/2}}{R}$

$= \frac{h}{R(R^2-h^2)^{1/2}}$ $\quad R' = (R^2-h^2)^{1/2}$

Then

$$W_D = k \int_{R=h}^{R_2} \frac{W}{R^3} \frac{(1+\cos\theta)}{\cos\theta} \frac{(R^2-h^2)^{1/2} R W^{1/2}}{(R'+h) R (R^2-h^2)^{1/2}}$$

$$= k W^{3/2} \int_{R=h}^{R=R_2} \frac{h(1+\cos\theta)}{R^3 \cos\theta ((R^2-h^2)^{1/2}+h)} dR$$

$$= k W^{3/2} h \int_{h}^{R_2} \frac{R}{R^3} \left(\frac{R+h}{h}\right) \times \frac{1}{(R^2-h^2)^{1/2}+h}$$

$$= k W^{3/2} \int_{h}^{R_2} \frac{R+h}{(R^2-h^2)^{1/2}+h} \frac{dR}{R^3}$$

$$= k W^{3/2} \int_{h}^{R_2} \frac{R+h}{[(R+h)(R-h)]^{1/2}+h} \frac{dR}{R^3}$$

LLNL

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ume that $dW_D \sim \frac{\text{Total force (as before)}}{t_R}$

$$W_D = k \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{W}{R^3} (1+\cos\theta) \frac{(R^2-h^2)^{1/2} R}{\cos\theta} \frac{W^{1/2}}{(R'+h)} d\theta$$

$= R^2 \sin\theta \, dR$ $\quad \sin\theta = (1-\cos^2\theta)^{1/2} = \left(1 - \frac{h^2}{R^2}\right)^{1/2}$

$= \frac{h}{R^2} \times \frac{R}{(R^2-h^2)^{1/2}}$ $\quad = \frac{(R^2-h^2)^{1/2}}{R}$

$= \frac{h}{R(R^2-h^2)^{1/2}}$ $\quad R' = (R^2-h^2)^{1/2}$

$$= k \int_{R=h}^{R_2} \frac{W}{R^3} \frac{(1+\cos\theta)}{\cos\theta} \frac{(R^2-h^2)^{1/2} R W^{1/2} h}{(R'+h) R (R^2-h^2)^{1/2}} dR$$

$$k W^{3/2} \int_{R=h}^{R=R_2} \frac{h}{R^3} \frac{(1+\cos\theta)}{\cos\theta \left((R^2-h^2)^{1/2}+h\right)} dR$$

$$= k W^{3/2} h \int_{h}^{R_2} \frac{1}{R^3} \left(R + \frac{h}{h}\right) \times \frac{1}{(R^2-h^2)^{1/2}+h}$$

$$= k W^{3/2} \int_{h}^{R_2} \frac{R+h}{(R^2-h^2)^{1/2}+h} \frac{dR}{R^3}$$

$$= k W^{3/2} \int_{h}^{R_2} \frac{R+h}{[(R+h)(R-h)]^{1/2}+h} \frac{dR}{R^3}$$

LLNL

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[redacted] [redacted]

1 pt	Sept.	10	Area 3
pokt		15	7
1 pt		16	3
1 pt		20	3
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50T		20	7
50T		25	7
1KT		25	7
10KT		20	7
10KT		25	7

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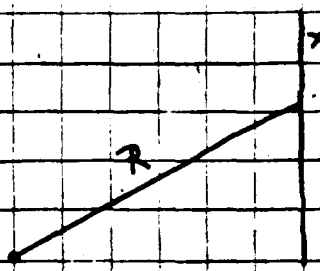
Try:



$$t = \frac{R + x}{3 v_f} = \frac{R + v_f t}{3 v_f}$$

$$3 v_f t = R + v_f t$$

$$2 v_f t = R$$

$$t = \frac{R}{2 v_f}$$

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$$t \sim \frac{R}{2 W^{1/2}} \sim \frac{R}{W^{1/2}}$$

Then

$$W_0 = k \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{w}{R^3} \frac{(1+\cos\theta)}{\cos\theta} (R^2 - h^2)^{1/2} \frac{R}{R} W^{1/2} \; d\theta$$

$$= k W^{3/2} \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{1}{R^3} \frac{R+h}{k} \frac{1}{R} k \; dR$$

$$= k W^{3/2} \int_{h}^{R_2} \frac{R+h}{R^4} \, dR = k W^{3/2} \int_{h}^{R_2} \left(\frac{1}{R^3} + \frac{h}{R^4} \right) dR$$

$$= k W^{3/2} \int_{h}^{R_2} \frac{1}{R^3} dR + k W^{3/2} h \int_{h}^{R_2} \frac{1}{R^4} dR$$

$$= k W^{3/2} \left[\left(\frac{1}{2} \frac{1}{R^2} \right)_{h}^{R_2} + h \left(-\frac{1}{3} \frac{1}{R^3} \right)_{h}^{R_2} \right]$$

LLNL
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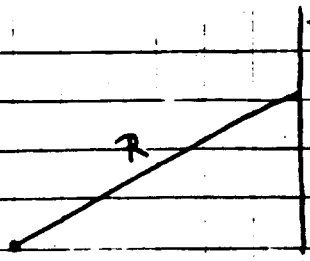
[redacted]

2y:



$$t = \frac{R+x}{3v_f} = \frac{R+v_f t}{3v_f}$$

$$3v_f t = R + v_f t$$

$$2v_f t = R$$

$$t = \frac{R}{2v_f}$$

$$t \sim \frac{R}{2w^{1/2}} \sim \frac{R}{w^{1/2}}$$

$$0 = k \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{w}{R^3} \frac{(1+\cos\theta)}{\cos\theta} (R^2-h^2)^{1/2} \frac{R}{R} \frac{w^{1/2}}{} \frac{h}{(R^2-h^2)^{1/2}} dR$$

$$= kw^{3/2} \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{1}{R^3} \frac{R+h}{} \frac{1}{R} \; dR$$

$$= kw^{3/2} \int_h^{R_2} \frac{R+h}{R^4} dR = kw^{3/2} \int_h^{R_2} \left(\frac{1}{R^3} + \frac{h}{R^4} \right) dR$$

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$$= kw^{3/2} \int_h^{R_2} \frac{1}{R^3} dR + kw^{3/2} h \int_h^{R_2} \frac{1}{R^4} dR$$

$$= kw^{3/2} \left[\left(-\frac{1}{2} \frac{1}{R^2} \right)_h^{R_2} + h \left(-\frac{1}{3} \frac{1}{R^3} \right)_h^{R_2} \right]$$

LLNL

$$t = \frac{R + x}{3 v_f} = \frac{R + v_f t}{3 v_f}$$

$$3 v_f t = R + v_f t$$

$$2 v_f t = R$$

$$t = \frac{R}{2 v_f}$$

$$t \sim \frac{R}{2 W^{1/2}} \sim \frac{R}{W^{1/2}}$$

Then

$$W_0 = k \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{w}{R^3} \frac{(1+\cos\theta)}{\cos\theta} (R^2 - h^2)^{1/2} \frac{R}{R} \frac{W^{1/2}}{R} \frac{h}{(R^2 - h^2)^{1/2}}$$

$$= k W^{3/2} \int_{\theta=0}^{\cos^{-1} h/R_2} \frac{1}{R^3} \frac{R+h}{R} \frac{1}{R} \, dR$$

$$= k W^{3/2} \int_{h}^{R_2} \frac{R+h}{R^4} \, dR = k W^{3/2} \int_{h}^{R_2} \left(\frac{1}{R^3} + \frac{h}{R^4} \right) dR$$

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$$= k W^{3/2} \int_{h}^{R_2} \frac{1}{R^3} dR + k W^{3/2} h \int_{h}^{R_2} \frac{1}{R^4} dR$$

LLNL

$$= k W^{3/2} \left[\left(-\frac{1}{2} \frac{1}{R^2} \right)_{h}^{R_2} + h \left(-\frac{1}{3} \frac{1}{R^3} \right)_{h}^{R_2} \right]$$

$$= k W^{3/2} \left[\frac{1}{2} \frac{1}{h^2} - \frac{1}{2} \frac{1}{R_2^2} + \frac{1}{3} \frac{h}{h^3} - \frac{1}{3} \frac{h}{R_2^3} \right]$$

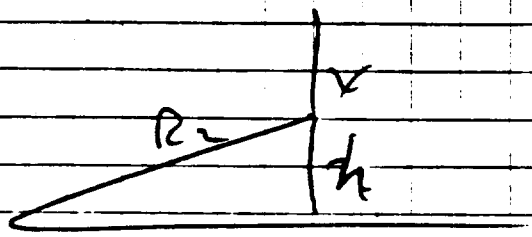
$$= kw^{3/2}\left[\frac{5}{6h^2} - \frac{1}{2R_2^2} - \frac{h}{3R_2^3}\right]$$

$$= \frac{kw^{3/2}}{h^2}\left[\frac{5}{6} - \frac{1}{2}\left(\frac{h}{R_2}\right)^2 - \frac{1}{3}\left(\frac{h}{R_2}\right)^3\right]$$

$R_2 = 6R_f - h$ $\quad W_D = 0$ at $h = 3$

assumption ① page 97

" ② "



Using P 97 assumpti

$$t = \frac{R_2 + x}{3V_f} = \frac{x}{V_f}$$

$x + h = 4$

$x = 4R_f -$

$R_2 + x = 3x$

BEST AVAILABLE COPY

$R_2 = 2x = 2(4R_f - h) = 8R_f -$

$W_D = 0$ at $h = R_2$: $3h = 8R_f$

$h = \frac{8}{3}R$

$$\text{Total } M_c = \frac{K W_f W_f^{3/2}}{h^2}\left[\frac{5}{6} - \frac{1}{2}\left(\frac{h}{R_2}\right) - \frac{1}{3}\right.$$

LLNL

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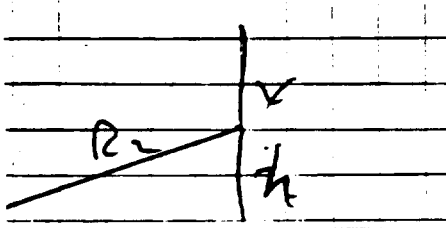
$$kW^{3/2}\left[\frac{5}{6h^2} - \frac{1}{2R_2^2} - \frac{h}{3R_2^3}\right]$$ [redacted]

$$\frac{kW^{3/2}}{h^2}\left[\frac{5}{6} - \frac{1}{2}\left(\frac{h}{R_2}\right)^2 - \frac{1}{3}\left(\frac{h}{R_2}\right)^3\right] \quad (1)$$

$R_2 = 6R_f - h$ $\quad W_0 = 0$ at $h = 3R_f$

assumptions (1) page 97
And " (2) " "



Using P 97 assumptions (1) and (2)

$$= \frac{R_2 + v}{3v_f} = \frac{x}{v_f} \qquad x + h = 4R_f$$

$$x = 4R_f - h$$

$$R_2 + x = 3x$$

$$R_2 = 2x = 2(4R_f - h) = 8R_f - 2h$$

BEST AVAILABLE COPY

$W_0 = 0$ at $h = R_2$; $3h = 8R_f$ LLNL

$$h = \frac{8}{3}R_f$$

$$= \frac{K W_f W_f^{3/2}}{h^2}\left[\frac{5}{6} - \frac{1}{2}\left(\frac{h}{R_2}\right)^2 - \frac{1}{3}\left(\frac{h}{R_2}\right)^3\right]$$

h	W	$8R_4$	2h	R_2	$\Delta = h/R_2$	$\alpha =$ [redacted]	α^2	α^3	$.5\alpha^2$	$.33\alpha^3$	$.83 - \frac{\alpha^2}{2}$	K
300	.6	1240	600	640	.469	.220	.103	.11	.034	.686	1.989	
	1	1472	↓	872	.344	.118	.041	.06	.014	.756	8.399	
	2	1856		1256	.239	.057	.014	.03	.0046	.795	49.96	
	4	2336		1736	.173	.030	.005	.015	.0017	.813	289.06	
	10	3176		2576	.116	.013	.002	.0065	.0007	.823	2890	
	100	6832		6232	.047	.002	-	.001	-	.829	82,900	
1500	75	6208	3000	3208	.468	.219	.102	.110	.034	.686	23	

$$Z_D = K_1 - K_2 e^{-W_D} \quad \text{or} \quad K_1(1 - e^{-K_2 W_D})$$

$$M_c = K_1 W (1 - e^{-K_2 W_D})$$

for $W = 52$ kt, $M_c = 1585$
$W = 7$ kt, $M_c = 121$
$W = 24.5$ kt, $M_c = 687$
$W = 2.5$ kt, $M_c = 42$

$K_1 = 200$

$$M_c = 200 W (1 - e^{-K_2 W_D})$$

$$1585 = 200 \times 52 (1 - e^{-K_2 200})$$

$$3.20003 = 4.01703 + 700 K_2$$

$$700 K_2 = -.817$$

$$K_2 = -.00117 = -1.17 \times 10^{-3}$$

LLNL

BEST AVAILABLE COPY

#Tesla: $M_c = 200 \times 7 (1 - e^{\stackrel{?}{-1.17 \times 10^{-3} \times 170}})$

$= 1400 (1 - e^{-.2}) = 1400 (\times .1$

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	$\Delta =$	$\alpha =$	[redacted]	①	②		$\frac{1}{K}$	$\times 10^6$	$\div W$
2h	R_2	$\frac{h}{R_2}$	α^2	α^3	$.5\alpha^2$	$.33\alpha^3$	$.83-\frac{2}{3}\alpha$	K	
300	640	.469	.220	.103	.011	.034	.686	1789	3.32
↓	872	.344	.118	.041	.06	.014	.756	8,389	8.40
	1256	.239	.057	.014	.08	.0046	.795	49,96	24.98
	1736	.173	.030	.005	.015	.0017	.813	289.06	74.52
	2576	.116	.013	.002	.0065	.0007	.823	2890	289 916
	6232	.047	.002	—	.001	—	.829	82,900	829
3000	3208	.468	.219	.102	.110	.034	.686	23	.46 $\times 2$

$$-Ke^{-w_D} \text{ or } k_1(1 - e^{-k_1 w_D})$$

$$k_1 W (1 - e^{-k_1 w_D})$$

$= 52$ kt, $m_c = 1585$
$= 7$ kt, $m_c = 121$
$= 24.5$ kt, $m_c = 687$
$= 2.5$ kt, $mc = 42$

$= 200$

BEST AVAILABLE COPY

$$200 W (1 - e^{-K_2 W_D})$$

$$200 \times 52 (1 - e^{-K_2 \cdot 200})$$

$$= 4.01703 + 700 K_2$$

$$= -.817$$

$$\approx -.00117 = -1.17 \times 10^{-3}$$

$$1c = 200 \times 7 (1 - e^{\pm 1.17 \times 10^{-3} \times 170})$$

$$= 1400 (1 - e^{-.2}) = 1400 (.18) = 252$$

$\div K_2 = 7$

LLNL

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LCO3 0175

From page 109 with k_2 of page 106: [redacted]

$\alpha =$

h	W	k_2	α^2	$.5\alpha^2$	$1.5-\alpha+.5\alpha^2$	$\div h$	$\sqrt{W}$	$W^{3/2}$	ω_D/π
300	.6	.469	.220	.11	.92	.00307	.774	.46	.00141
	1	.344	.118	.06	1.10	.00367	1	1	.00367
	2	.239	.057	.03	1.23	.00410	1.41	2.82	.0116
	4	.173	.030	.015	1.32	.00440	2	8	.0352
	10	.116	.013	.006	1.37	.00457	3.16	31.6	.144
	100	.047	.002	.001	1.45	.00483	10	1000	4.83

$h = 300$

W	W_D	W_D/W_{D52}	M_c/M_{c52}	$P_{W_D}/P_{W_{D52}}$	$P\sqrt{W_D}$	M_c meas.	M_c/N_D
52	0.8	1	1	1	.050	1585	6340
24.5	.157	.317	.433	.464	.116	687	5922
7	.073	.0405	.076	.178	.032	121	3781
2.5	.017	.009	.026	.042	.0106	42	3962

$$M_c = K_1 W (1 - e^{-k_2 W_D})$$

NG

$$1585 = K_1 52 (1 - e^{-k_2 6000})$$
$$687 = K_1 24.5 (1 - e^{-k_2 1900})$$

$$2.31 = \frac{2.12 (1 - e^{-6000 k_2})}{(1 - e^{-1900 k_2})}$$

BEST AVAILABLE COPY

$$2.31 (1 - e^{-1900 k_2}) = 2.12 (1 - e^{-6000 k_2})$$

$$1.09 - 1.09 e^{-1900 k_2} = 1 - e^{-6000 k_2}$$

$$.09 - 1.09 e^{-1900 k_2} = -e^{-6000 k_2}$$

$$\ln .09 - (\ln 1.09 + 1900 K_2) = -6000 K_2$$

LLNL

$$+2.41 + .086 + 1900 K_2 = 6000 K_2$$

$$4100 K_2 = 2.496$$

$$K_2 = .00061$$

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am page 109 with R_2 of page 106. [redacted] For $P \sim \sqrt{w}$:

$\alpha =$

K_2	α^2	$.5\alpha^2$	$1.5-\alpha=.5\alpha^2$	$\div h$	$\sqrt{w}$	$w^{3/2}$	$\frac{\omega_p}{\pi}$	$w\left(\frac{1.5-\alpha}{h}\right)$
.469	.220	.11	.92	.00507	.774	.96	.00141	.00182
.344	.118	.06	1.10	.00367	1	1	.00367	.00367
.239	.057	.03	1.23	.00410	1.41	2.82	.0116	.00823
.173	.030	.015	1.32	.00440	2	8	.0352	.0176
.116	.013	.006	1.37	.00457	3.16	31.6	.144	.0456
.047	.002	.001	1.45	.00483	10	1000	4.23	.483

w_D/w_{D52}	$\frac{m_c}{m_{c52}}$ Meas.	$\frac{P\sim\sqrt{w}}{w_D/w_{D52}}$	$P\sim\sqrt{w_D}$	m_c meas.	m_T/w_D
1	1	1	.250	1585	6340
.317	.433	.464	.116	687	5922
.0405	.076	.178	.032	121	3781
.009	.026	.042	.0106	42	3962

$$m_c = K_1 W\left(1 - e^{-k_2 w_D}\right)$$

WC

$$B5 = K_1 52\left(1 - e^{-k_2 6000}\right)$$

$$P7 = K_1 24.5\left(1 - e^{-k_2 1900}\right)$$

$$31 = \frac{2.12\left(1 - e^{-6000 k_2}\right)}{\left(1 - e^{-1900 k_2}\right)}$$

$$1 - e^{-1900 k_2}) = 2.12(1 - e^{-6000 k_2})$$

$$-1.09 e^{-1900 k_2} = 1 - e^{-6000 k_2}$$

BEST AVAILABLE COPY

$$? \quad -1.09 e^{-1900 k_2} = -e^{-6000 k_2}$$

$$09 - (\ln 1.09 + 1900 K_2) = -6000 K_2$$

LLNL

$$1 + .086 + 1900 K_2 = 6000 K_2$$

$$4100 K_2 = 2.496$$

$$K_2 = .00061$$

300	.6	.769	.220	.11	.92	.00807	.774	.93	.00141
	1	.344	.118	.06	1.10	.00387	1	1	.00367
	2	.239	.057	.03	1.23	.00410	1.41	2.82	.0116
	4	.173	.030	.015	1.32	.00440	2	8	.0352
	10	.116	.013	.006	1.37	.00457	3.16	31.6	.144
	100	.047	.002	.001	1.45	.00483	10	1000	4.83

W	W_D	W_D/W_{D52}	M_c/M_{c52}	$P \sim \sqrt{W_D}/\sqrt{W_{D52}}$	$P \sqrt{W_D}$	M_c meas.	M_c/W_D
52	1.8	1	1	1	.250	1585	6340
24.5	1.57	.317	.433	.464	.116	687	5922
7	.073	.0405	.076	.128	.032	121	3781
2.5	.017	.009	.026	.042	.0106	42	3962

$$M_c = K_1 W \left(1 - e^{-K_2 W_D}\right)$$

WG

$$1585 = K_1 52 \left(1 - e^{-K_2 6000}\right)$$
$$687 = K_1 24.5 \left(1 - e^{-K_2 1900}\right)$$

$$2.31 = \frac{2.12\left(1 - e^{-6000 K_2}\right)}{\left(1 - e^{-1900 K_2}\right)}$$

$$2.31\left(1 - e^{-1900 K_2}\right) = 2.12\left(1 - e^{-6000 K_2}\right)$$

$$1.09 - 1.09 e^{-1900 K_2} = 1 - e^{-6000 K_2}$$

$$.09 - 1.09 e^{-1900 K_2} = -e^{-6000 K_2}$$

$$\ln .09 - (\ln 1.09 + 1900 K_2) = -6000 K_2$$

$$+2.41 + .086 + 1900 K_2 = 6000 K_2$$

$$4100 K_2 = 2.496$$

$$K_2 = .00061$$

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300

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From page 105, using a pressure dependence of R^{-2}: (vice R^{-3}

$$W_D = KW^{3/2}\int_W^{R_2} \frac{R+h}{R^3}\,dR = KW^{3/2}\int_h^{R_2}\left(\frac{1}{R^2}+\frac{h}{R^3}\right)$$

$$= KW^{3/2}\left[\left|-\frac{1}{R}\right|_h^{R_2} + \left|-\frac{1}{2}\frac{h}{R^2}\right|_h^{R_2}\right]$$

$$= KW^{3/2}\left(\frac{1}{h}-\frac{1}{R_2}+\frac{1}{2}\frac{h}{h^2}-\frac{1}{2}\frac{h}{R_2^2}\right)$$

$$= KW^{3/2}\left(1.5\frac{1}{h}-\frac{1}{R_2}-.5\frac{h}{R_2^2}\right)$$

$$= \frac{KW^{3/2}}{h}\left(1.5-\frac{h}{R_2}-.5\left(\frac{h}{R_2}\right)^2\right)$$

h	W	$8R_f$	2h	$R_2 = \Delta$	h/R_2	$(h/R_2)^2$	$.5(h/R_2)^2$	1.5−ε	$\frac{W}{h}$	500
500	3	2120	1000	1120	.446	.199	.100	.95	.006	2
	5	2520	↓	1520	.329	.108	.054	1.12	.010	5
	7	2816		1816	.275	.076	.038	1.19	.014	8
	10	3176		2176	.230	.053	.026	1.24	.020	12
	100	6832		5832	.086	.007	.004	1.41	.200	14

Should try Eq ①/W using ρ as $1/ft^3$ instead of height scaling difficulty.

This is Eq ① p 106, using W/h^2, not

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h	W	$8R_f$	2h	R_2	h/R_2	$(h/R_2)^2$	$.5(h/R_2)^2$	1.5−ε	$\frac{W^{3/2}}{h}$	W/k / Π
300	25	4304	600	3704	.081	.0066	.0033	1.416	.417	.590
500	25	4304	1000	3304	.151	.0228	.0114	1.338	.250	.334

h	W	h/R_2	$(h/R_2)^2$	$(h/R_2)^3$	$\frac{1}{2}(h/R_2)^2$	$\frac{1}{3}(h/R_2)^3$	.83−ε	
300	25	.081	.0066	.0005	.0033	.00017	.8265	.00
500	25	.151	.0228	.0034	.0114	.0013	.8175	.00

e. 105, using a pressure dependence of R^{-2}: (vice R^{-3})

$$I_D = KW^{3/2}\int_h^{R_2}\frac{R+1}{R^2}\,dR = KW^{3/2}\int_h^{R_2}\left(\frac{1}{R^2}+\frac{1}{R^3}\right)dR$$

$$= KW^{3/2}\left[\left|-\frac{1}{R}\right|_h^{R_2} + \left|-\frac{1}{2}\frac{1}{R^2}\right|_h^{R_2}\right]$$

$$= KW^{3/2}\left(\frac{1}{h}-\frac{1}{R_2}+\frac{1}{2}\frac{h}{h^2}-\frac{1}{2}\frac{h}{R_2^2}\right)$$

$$= KW^{3/2}\left(1.5\frac{1}{h}-\frac{1}{R_2}-.5\frac{h}{R_2^2}\right)$$

$$= \frac{KW^{3/2}}{h}\left(1.5-\frac{h}{R_2}-.5\left(\frac{h}{R_2}\right)^2\right) \qquad (1)$$

R_2	$2h = \Delta$	h/R_2	$(h/R_2)^2$	$.5(h/R_2)^2$	$1.5-\varepsilon$	$\frac{W}{h}$	$5000\frac{W}{h}(1.5-\varepsilon) = mc$
20	1000	1120	.446	.199	.100	.95	.006	28.5
20	↓	1520	.329	.108	.054	1.12	.010	56.0
16		1816	.275	.076	.038	1.19	.014	83.0
26		2176	.230	.053	.026	1.24	.020	124.0
32		5832	.086	.007	.004	1.41	.200	1410.0

try Eq ①/W using P on $1/R^3$ instead to correct ling difference.

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in Eq ① p. 106, using W/h^2, not $W^{3/2}/h^2$.

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$2h$	R_2	h/R_2	$(h/R_2)^2$	$.5(h/R_2)^2$	$1.5-\varepsilon$	$\frac{W^{3/2}}{h}$	Work Π
600	3704	.081	.0066	.0033	1.416	.417	.590
1000	3304	.151	.0228	.0114	1.338	.250	.334

h/R_2	$(h/R_2)^2$	$(h/R_2)^3$	$\frac{1}{2}(h/R_2)^2$	$\frac{1}{3}(h/R_2)^3$	$.83-\varepsilon$	$\frac{W}{h^2}$	Π
.081	.0066	.0005	.0033	.00017	.8265	.00139	.00115
.151	.0228	.0034	.0114	.0013	.8175	.00050	.00041

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ICC35 0163

Try: Me metal = $\frac{1}{3} T w^{1/2}$ for tower T
+
$3T$ for cab T
6Tc

Shot	w	h	T_T	T_c	$\frac{1}{4}\pi r_c^2 \frac{1}{3} T_T w^{1/2}$	Σ	$3T_c$		Σ
TS-7	13.8	300	52	10	47	63	77	30	60	93
Uk-1	16.3	300	45	12	45	60	81	36	72	96
Uk-2	24.5	300	77	24	95	127	169	72	144	199
Uk-6	27.7	300	45	12	59	79	95	36	72	115
Uk-7	52.0	300	77	24	139	185	211	72	144	257
Moth	2.5	300	60	10	20	26	50	30	60	56
Tesla	9.0	300	63	20	41	55	101	60	120	115
Hornet	3.6	300	98	10	46	62	76	30	60	92
Apple	15.5	500	222	20	218	291	278	60	120	351
Met	24.0	400	130	10	159	212	189	30	60	242
Apple II	31.5	500	370	20		690		60	120	750
Zucchini	32.5	500	123	10	126	234	206	30	60	264
Diablo	~~17~~	~~500~~	370	73	331	~~457~~ 507	600	219	438	~~726~~
Priscilla	40	700	0	2		0		6	12	6
Wilson	10	500	0	1		0		3	6	3

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$M_{e\ metal} = \frac{1}{3} T_F w^{1/2}$ for frame T + $3T$ for cab T

[redacted]

	T_F	T_C	$\frac{1}{3} T_F w^{1/2}$	Σ	$3T_C$	$6T_C$	Σ	$M_{CO}(\Sigma_{TC})$		
100	52	10	63	77	30	60	93	123 420	436	390
100	45	12	60	81	36	72	96	133 415	430	379
00	77	24	127	169	72	144	199	271 660	692	588
00	45	12	79	95	36	72	115	151 895	915	859
00	77	24	185	211	72	144	257	329 1573	1619	1501
00	50	10	26	60	30	60	56	86 11	17	0
00	63	20	55	101	60	120	115	175 83	97	23
00	98	10	62	76	30	60	92	122 14	30	0
00	222	20	291	278	60	120	351	411 49	122	0
00	130	10	212	189	30	60	242	272 691	704	661
00	370	20	690		60	120	750	810 148		88
00	123	10	234	206	30	60	264	294 436	494	406
500	370	73	~~451~~ 331	600	219	438	~~726~~	965 ~~384~~	800	85
00	0	2	0		6	12	6	112 69		63
00	0	1	0		3	6	3	6 18		4

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	W	h	M_{tot}	M_c	M_c	$\frac{1}{2}TW_{\frac{1}{2}}$	Δz	T
			M_c	W_m	W_0	$W_{\frac{1}{2}}$	W_D'	62
TS-7	13.8	300	513	76	437	114	399	57
UK-1	16.3	300	511	76	435	114	397	
UK-2	24.5	300	859	168	691	252	607	102
UK-5	0.3	100	~10	6	~4	~9	~1	30
UK-6	27.7	300	1010	98	984	148	862	57
UK-7	52.0	300	1830	244	1586	366	1464	102
UK-9	32.4	300	3205	82	3123	123	3082	43
UK-10	15.4	524	~100	0.5	~100	.8	~100	0.35
Wasp	1.2	750	~1	~0.2	<1	~.3	<1	?
Moth	2.5	300	67	25	42	38	29	48
Tesla	7.0	300	198	78	120	117	81	98
Turk	40.0	500	~1000	548	~452	822	~178	260
Hornet	3.6	300	106	65	41	98	8	102
Apple	15.5	500	400	318	82	477	~0	242
Bee	7.0	500	~100	100	~0	150	~0	113
Post	1.8	300	~20	36	~0	54	~0	82
Met	24.0	400	933	229	704	344	589	140
Apple II	31.5	500	898	724	174	1086	~0	388
Zucchini	32.5	500	700	253	447 UG	380	320	133
			366		113 AUS			
Boltzmann	11	500	346	185	161 part	278	68	160
			560		375 TOT			
Wilson	10	500	~10	1	~9	1+	~9	1
Priscilla	40	700	~75	1	~74	1+	~74	1.5
Hood	75	1500	~17	4	~13	6	~11	1.5
Diablo	~12	500	>900	511	>389	766	>134	443

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	Meas	m_c	m_c	$\frac{1}{2}Tw_{\frac{1}{2}}$	$\Delta =$	T
h	m_c	w_m	w_0	w_M	w_D'	62
300	513	96	437	114	399	57
300	511	76	435	114	397	
300	859	168	691	252	607	102
100	~10	6	~4	~9	~1	30
300	1010	98	984	148	862	57
300	1830	244	1586	366	1464	102
300	3205	82	3123	123	3082	43
524	~100	0.5	~100	.8	~100	0.35
750	~1	~0.2	<1	~.3	<1	?
300	67	25	42	38	29	48
300	198	78	120	117	81	98
500	~1000	548	~452	822	~178	260
300	106	65	41	98	8	102
500	400	318	82	477	~0	242
500	~100	100	~0	150	~0	113
300	~20	36	~0	54	~0	82
400	933	229	704	344	599	140
500	898	724	174	1086	~0	388
500	700	253	447 WB	380	320	133
	366		113 AUS			
500	346	185	161 part	278	68	160
	560		375 TOT			
500	~~~10~~ 22	1	~9	1+	~9	1
700	~75	1	~74	1+	~74	1.5
1500	~17	4	~13	6	~11	1.5
500	>~~900~~ 890	511	>389	766	>134	443

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LCC35 OF89

From p 106:

$$W_D = K W^{3/2} \left[0.833 - 0.5 \left(\frac{h}{R_2}\right)^2 - 0.333 \left(\frac{h}{R_2}\right)^3 \right]$$

$$R_2 = BR_f - 2h \qquad W_D = 0 \text{ at } h$$

h	W	R_f	BR_f	2h	R_2	$\frac{h}{R_2}$	$.5\left(\frac{h}{R_2}\right)^2$	$.333\left(\frac{h}{R_2}\right)^3$	$.833 - \frac{h}{R_2}$	$W^{3/2}/h$	W
300	0.3	123	984	600	384	.781	.305	.159	.369	.000547	.0
	0.5	146	1170	↓	570	.526	.138	.0486	.646	.00118	.0
	0.7	163	1300		700	.429	.092	.0263	.715	.00195	.0
	1	184	1470		870	.345	.0595	.0137	.760	.00333	.0
	2	232	1860		1260	.238	.0283	.0045	.800	.00940	.0
	4	292	2340		1740	.172	.0148	.0017	.817	.0267	.0
	7	352	2820		2220	.135	.0091	.0009	.823	.0618	.0
	10	396	3170		2570	.117	.0068	.0005	.826	.105	.0
	30	572	4580		3980	.0754	.0028	.0001	.830	.548	.1
	60	721	5770		5170	.0580	.0017	.0001	.832	1.55	.1
	100	855	6840		6240	.0481	.0012	—	.832	3.33	.2
	200	1080	8640		8040	.0373	.0007	—	.833	9.42	.7
	500	1460	11,700		11,100	.0270	.0004	—	.833	37.3	3
W	h	R_f	BR_f							$W^{3/2}/h^2$	
20	1300	500	4000	2600	1400	.929	.432	.267	.134	.0000529	.00
	1000	↓	↓	2000	2000	.500	.125	.0416	.667	.0000894	.00
	700			1400	2600	.269	.0362	.0065	.791	.000182	.00
	500			1000	3000	.167	.0140	.0016	.818	.000358	.00
	200			400	3600	.0556	.0015	.0001	.832	.00224	.01
	100			200	3900	.0263	.0003	—	.833	.00894	.01
	50			100	3900	.0128	.0001	—	.833	.0358	.02
75	1500	776	6210	3000	3210	.467	.109	.034	.690	.000289	.00
10	500	396	3170	1000	2170	.230	.0264	.0041	.803	.000126	.00

If assumption ②, p 197, changed to "... Three

Then:

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$$\frac{R_2 + X}{3V_f} = \frac{X}{V_f}$$

LLNL

$$\frac{R_2 + X}{3} = X$$

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$$R_2 = 2X \qquad X + h = 3R_f$$

$$X = 3R_f - 1.$$

From p 106:

[redacted]

$$W_D = \frac{K w^{3/2}}{h^2}\left[0.833 - 0.5\left(\frac{h}{R_2}\right)^2 - 0.333\left(\frac{h}{R_2}\right)^3\right]$$

$R_2 = 8R_f - 2h$ $\quad W_D = 0$ at $h = \frac{8}{3}R_f$ $\quad$ constant f

$K = 727500$

R_f	$8R_f$	$2h$	R_2	$\alpha = \frac{h}{R_2}$	$.5\alpha^2$	$.333\alpha^3$	$.833-\varepsilon$	$w^{3/2}/h^2$	W_D/K	π	M_{CD}	z
123	984	600	384	.781	.305	.159	.369	.000547	.000202	0.490	.005	
146	1170	↓	570	.526	.138	.0486	.646	.00118	.000762	1.85	.012	
163	1300		700	.429	.092	.0263	.715	.00195	.00139	3.37	.016	
184	1470		870	.345	.0595	.0137	.760	.00333	.00253	6.14	.020	
232	1860		1260	.238	.0283	.0045	.800	.00940	.00752	18.2	.030	
292	2340		1740	.172	.0148	.0017	.817	.0267	.0218	52.9	.044	
352	2820		2220	.135	.0091	.0008	.823	.0618	.0509	123	.058	
396	3170		2570	.117	.0068	.0005	.826	.105	.0867	210	.070	
572	4580		3980	.0754	.0028	.0001	.830	.548	.455	1100	.12	
721	5770		5170	.0580	.0017	.0001	.832	1.55	1.29	3150	.17	
855	6840		6240	.0481	.0012	—	.832	3.33	2.77	6720	.22	
1080	8640		8040	.0373	.0007	—	.833	9.42	7.85	19,000	.317	
1460	11,700		11,100	.0270	.0004	—	.833	37.3	31.1	75,400	.50	
R_f	$8R_f$							$w^{3/2}/h^2$				
500	4000	2600	1400	.929	.432	.267	.134	.0000529	.00000709	5.16	.0008	
↓	↓	2000	2000	.500	.125	.0416	.667	.0000894	.0000596	43.4	.0072	
		1400	2600	.269	.0362	.0065	.791	.000182	.000144	105	.0175	
		1000	3000	.167	.0140	.0016	.818	.000358	.000293	213	.0355	
		400	3600	.0556	.0015	.0001	.832	.00224	.00186	1350	.225	
		200	3800	.0263	.0003	—	.833	.00894	.00745	5420	.903	
		100	3900	.0128	.0001	—	.833	.0358	.0298	21,700	>1	
776	6210	3000	3210	.467	.109	.034	.690	.000289	.000199	145		
396	3170	1000	2470	.230	.0264	.0041	.803	.000126	.000101	73		

If assumption ②, p 197, changed to "... three radii above"

BEST AVAILABLE COPY

LLNL

$$\frac{R_2 + x}{3V_f} = \frac{x}{V_f}$$

$$\frac{R_2 + x}{3} = x$$

$R_2 = 2x$ $\quad x + h = 3R_f$

$R_2 = 8R_f - 2h$ $\quad W_D = 0$ at $h =$

h	W	R_f	$8R_f$	$2h$	$\Delta = R_2$	α	$.5\alpha^2$	$.333\alpha^3$	$.833 - \varepsilon$	$W^{3/2}/h$	$W_s/$
300	0.3	123	984	600	384	.781	.305	.159	.369	.000547	.00
	0.5	146	1170	↓	570	.526	.138	.0486	.646	.00118	.00
	0.7	163	1300		700	.429	.092	.0263	.715	.00195	.00
	1	184	1470		870	.345	.0595	.0137	.760	.00333	.00
	2	232	1860		1260	.238	.0283	.0045	.800	.00940	.00
	4	292	2340		1740	.172	.0148	.0017	.817	.0267	.02
	7	352	2820		2220	.135	.0091	.0008	.823	.0618	.05
	10	396	3170		2570	.117	.0068	.0005	.826	.105	.08
	30	572	4580		3980	.0754	.0028	.0001	.830	.548	.45
	60	721	5770		5170	.0580	.0017	.0001	.832	1.55	1.2
	100	855	6840		6240	.0481	.0012	—	.832	3.33	2.7
	200	1080	8640		8040	.0373	.0007	—	.833	9.42	7.8
	500	1460	11,700		11,100	.0270	.0004	—	.833	37.3	31.1
W	h	R_f	$8R_f$							$W^{3/2}/h^2$	
20	1300	500	4000	2600	1400	.929	.432	.267	.134	.0008529	.0000
	1000	↓	↓	2000	2000	.500	.125	.0416	.667	.0000894	.0000
	700			1400	2600	.269	.0362	.0065	.791	.000182	.0001
	500			1000	3000	.167	.0140	.0016	.818	.000358	.0002
	200			400	3600	.0556	.0015	.0001	.832	.00224	.0018
	100			200	3800	.0263	.0003	—	.833	.00894	.0074
	50			100	3900	.0128	.0001	—	.833	.0358	.029
75	1500	776	6210	3000	3210	.467	.109	.034	.690	.000289	.0001
10	500	396	3170	1000	2170	.230	.0264	.0041	.803	.000126	.0001

If assumption ②, p 197, changed to "... three

Then:

$$\frac{R_2 + X}{3V_f} = \frac{X}{V_f}$$

$$\frac{R_2 + X}{3} = X$$

BEST AVAILABLE COPY

LLNL

$R_2 = 2X$ $\quad X + h = 3R_f$

$X = 3R_f - h$

$R_2 = 6R_f - 2h$

[redacted]

$W_D = 0$, $h = R_2$, $\quad 3h = 6R_f$

$h = 2R_f$

From new R_2, bottom page 112, $R_2 = 6R_f - 2L$

$\Delta = R_2$ $\quad L =$ $\quad \Delta$ $\quad w/k$ $\quad \pi$

h	w	$6R_f$	$2L$	R_2	h/R_2	$.5L^2$	$.333L^3$	w^2/h^2	$.833-\varepsilon$	
300	0.7	975	600	375	.800	.32	.17	.000065	.34	.0000221
	1	1100	↓	500	.600	.18	.07	.000111	.58	.0000644
	2	1400		800	.375	.07	.02	.000313	.74	.000232
	4	1760		1160	.259	.03	.01	.0000890	.79	.0000703
	7	2120		1520	.197	.02	–	.000206	.81	.000167
	10	2380		1720	.174	.02	–	.000350	.81	.000284
	30	3440		2840	.106	.01	–	.00183	.82	.00150
	60	4330		3730	.080	–	–	.00517	.83	.00429
	100	5130		4530	.066	–	–	.0111	↓	.00921
	200	6480		5880	.051	–	–	.0314		.0261
	500	8780		8180	.037	–	–	.124	.83	.103
	1000	11,440		10,840	.0307	–	–	.351	.83	.291
1500	75	4660	3000	1660	.904	.408	.246	.000289	.179	.0000517
500	10	2380	1000	1380	.362	.066	.016	.000126	.751	.0000946
700	40	3770	1400	2370	.295	.043	.009	.000516	.781	.000403
500	40	3774	1000	2774	.180	.016	.002		.815	.00101
900	20	3000	1800	1200	.750	.28	.14	.00011	.41	.000045
700	↓	↓	1400	1600	.438	.10	.03	.00018	.70	.000126
500			1000	2000	.250	.03	.005	.00036	.80	.000288
200			400	2600	.077	.003	–	.00224	.83	.00186
100			200	2800	.036	.0006	–	.00894	.83	.00742
50			100	2900	.017	–	–	.0358	.83	.0297
30			60	2940	.010	–	–	.0893	.83	.0824

From above:

h	w_D/w	$600\ w_D/w$	$1000\ w_D/w$	$e = \beta$	$\beta K w_D$	Z	
900	.000000225	.00135	.00225	~1	29.1	.004E	
700	.000000630	.00378	.00630	.99	80.7	.0134	
500	.0000184	.00864	.0144	.99	184	.0307	
200	.0000930	.0558	.0930	.91	1095	.182	
100	.000371	.223	.371	.69	3312	.552	
50	.00148	.888	1.48	.23	4416	.736	
30	.00412	2.47	4.12	.016	.853	.142	
300	.000000316	.7	.00316	1	1.43		
↓	.000000644	1	.00644	.99	4.13		LLNL
	.0000116	2	.0116	.99	14.8		
	.0000176	4	.0176	.98	44.6		
	.0000739	7	.0239	.98	106		
	.0000284	10	.0284	.97	178		310
	.0000500	30	.0500	.95	922		
	.0000716		.0715	.93	2585		

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R_2, bottom page 112, $R_2 =$ $6R_f - 2L$; [redacted] 13

$\epsilon =$ $\Delta = R_2$ $\quad$ $\frac{1}{K}$ $\quad$ $\frac{w}{k}$ $\quad$ KE 44 7,000

$2L$	$\Delta = R_2$	$1/R_2$	$.54^2$	$.333^3$	ft^2/lb	$.833-\epsilon$	w/k π	πc	Z
600	375	.800	.32	.17	.0000065	.34	.00000221	1.43	.0068
↓	500	.600	.18	.07	.0000111	.58	.00000644	4.17	.0139
	800	.375	.07	.02	.0000313	.74	.0000232	15.0	.025
	1160	.259	.03	.01	.0000890	.79	.0000703	45.5	.038
	1520	.197	.02	–	.000206	.81	.000167	108	.051
	1720	.174	.02	–	.000350	.81	.000284	184	.061
	2840	.106	.01	–	.00183	.82	.00150	970	.108
	3730	.080	–	–	.00517	.83	.01429	2780	.154
	4530	.066	–	–	.0111	↓	.00921	5960	.199
	5880	.051	–	–	.0314		.0261	16,900	.282
	8180	.037	–	–	.124	.83	.103	66,600	.444
	10,140	.0307	–	–	.351		.291	188,000	
3000	1660	.904	.408	.246	.000289	.179	.0000517	33	
1000	1380	.362	.066	.016	.000126	.751	.0000946	61	
1400	2370	.295	.043	.009	.000516	.781	.000403	261	
1000	2774	.180	.016	.002		.815	.00101	634	
1800	1200	.750	.28	.14	.00011	.41	.000045	29.1	.0048
1400	1600	.438	.10	.03	.00018	.70	.000126	81.5	.0136
1000	2000	.250	.03	.005	.00036	.80	.000288	186	.031
400	2600	.077	.003	–	.00224	.83	.00186	1203	.200
200	2900	.036	.0006	–	.00894	.83	.00742	4800	.80
100	2900	.017	–	–	.0358	.83	.0297	19,200	> 1
60	2940	.010	–	–	.0993	.83	.0824	53,313	> 1

500 w/w	1000 w/w	$e^{-1000\ w/w} = \beta$	βKWD	Z		
.00135	.00225	~1	29.1	.0048		
.00378	.00630	.99	80.7	.0134		
.00864	.0144	.99	184	.0307		
.0558	.0930	.91	1095	.182	(.172)	(.186)
.223	.371	.69	3312	.552	(.312)	(.392)
.888	1.48	.23	4416	.736	(.384)	(.512)
2.47	4.12	.016	853	.142	(.355)	(.533)
.7 w	.00316	1	1.43			
1	.00644	.99	4.13			
2	.0116	.99	14.8			
4	.0176	.98	44.6			
7	.0239	.98	106			
10	.0284	.97	178			
30	.0500	.95	922			
60	.0715	.93	2585			
100	.0921	.91	[illegible]			

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LLNL

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LC035 0E95

	1	1100		800	.600	.10	.01	.000111	.38	.000066
	2	1400		800	.375	.07	.02	.000313	.74	.00023
	4	1760		1160	.259	.03	.01	.0000890	.79	.000070
	7	2120		1520	.197	.02	—	.000206	.81	.000167
	10	2380		1720	.174	.02	—	.000350	.81	.000284
	30	3441		2840	.106	.01	—	.00183	.82	.00150
	60	4330		3730	.080	—	—	.00517	.83	.00429
	100	5130		4530	.066	—	—	.0111	√	.00921
	200	6480		5880	.051	—	—	.0314		.0261
	500	8780		8180	.037	—	—	.124	.83	.103
	1000	11,240		10,440	.0307	—	—	.351	.83	.291
1500	75	4660	3000	1660	.904	.408	.246	.000289	.179	.0000517
500	10	2380	1000	1380	.362	.066	.016	.000126	.751	.0000946
700	40	3770	1400	2370	.295	.043	.009	.000516	.781	.000403
500	40	3774	1000	2774	.180	.016	.002		.815	.00101
900	20	3000	1800	1200	.750	.28	.19	.00011	.41	.000045
700	↓	↓	1400	1600	.438	.10	.03	.00018	.70	.000126
500			1000	2000	.250	.03	.005	.00036	.80	.000288
200			400	2600	.077	.003	—	.00224	.83	.00186
100			200	2800	.036	.0006	—	.00894	.83	.00742
50			100	2900	.017	—	—	.0358	.83	.0297
30			60	2940	.010	—	—	.0993	.83	.0824

From above:

BEST AVAILABLE COPY

h	wo/w	600 wo/w	1000 wo/w	e	=β	βKWD	Z
900	.0000225	.00135	.00225	~1		29.1	.004E
700	.0000630	.00378	.00630	.99		80.7	.0134
500	.0001144	.00864	.01144	.99		184	.0307
200	.0000930	.0558	.0930	.91		1095	.182
100	.000371	.223	.371	.69		3312	.552
50	.00148	.888	1.48	.23		4416	.736
30	.00412	2.47	4.12	.016		853	.142
300	.0000316	.7	.00316	1		1.43	
↓	.0000644	1	.00644	.99		4.13	
	.0000116	2	.0116	.99		14.8	
	.0000176	4	.0176	.98		44.6	
	.0000739	7	.0239	.98		.106	
	.0000284	10	.0284	.97		178	
	.0000500	30	.0500	.95		922	LLNL
	.0000715	60	.0715	.93		2585	
	.0000921	100	.0921	.91		5424	312
	.000130	200	.130	.88		14,870	.248
	.000206	500	.206	.81		53,900	.359
	.000291	1000	.291	.75		141,225	.471

h	W	$6R_s$	$2L$	R_2	h/R_2	$.5K^2$	$.333K^3$	$.83^2-\Sigma$	$\omega^{3/2}$	
100	0.1	510	200	310	.323	.052	.011	.770	.0316	
↓	0.2	648	↓	448	.223	.025	.004	.804	.0894	
	0.4	816		616	.162	.013	.001	.819	.253	
	1	1100		900	.111	.006	—	.827	1	
	10	2380		2180	.046	.001	—	.832	31.6	
	100	5120		4920	.020	-	—	.833	1000	
390	1	1100	600	500	.600	.180	.072	.581	1	
↓	2	1390	↓	790	.380	.072	.018	.743	2.83	
	4	1750		1150	.261	.034	.006	.793	8.00	
	10	2380		1780	.169	.014	.002	.817	31.6	
	50	4070		3470	.086	.004	—	.829	354	
	100	5120		4520	.066	.002	—	.831	1000	
500	3	1590	1000	590	.847	.358	.202	.273	5.20	
↓	5	1890	↓	890	.562	.158	.059	.616	11.2	
	7	2110		1110	.450	.101	.030	.702	18.5	
	10	2380		1380	.362	.066	.016	.751	31.6	
	50	4070		3070	.163	.014	.001	.518	354	
	100	5120		4120	.121	.008	—	.825	1000	
700	7	2110	1400	710	.986	.426	.319	.028	18.5	
	10	2380	↓	980	.714	.255	.121	.457	31.6	
	30	3430		2030	.345	.060	.014	.759	164	
	50	4070		2670	.262	.034	.006	.793	354	
	100	5120		3720	.188	.018	.002	.813	1000	
790	1.5	1370	800	470	.851	.362	.205	.266	1.23	
	3	1590	↓	790	.506	.128	.043	.662	5.20	
	7	2110		1310	.305	.046	.009	.778	18.5	
	10	2380		1580	.253	.032	.005	.794	31.6	
	24	3190		2390	.167	.014	.002	.817	116	
	100	5120		4320	.093	.004	—	.829	1000	

BEST AVAILABLE COPY

LLNL

		.83-2	W.F.	1/k	WD	xWD=Wc	1-e	ΣF	Z
2	.011	.770	.0316	.00000316	.00000243	1.6	1	1.6	.053
5	.004	.804	.0894	.0000894	.00000719	4.7	1	4.7	.078
3	.001	.819	.253	.0000253	.0000207	13	.99	13	.108
6	—	.827	1	.000100	.0000827	54	.95	51	.170
1	—	.832	31.6	.00316	.00263	1700	.61	1040	.347
	—	.833	1000	.100	.0833	54,000	.26	14,000	.467
9	.072	.581	1	.0000111	.00000645	4.2	1	4.2	
12	.018	.743	2.83	.0000314	.0000233	15	1	15	
4	.006	.793	8.00	.0000889	.0000705	46	1	46	
4	.002	.817	31.6	.000351	.000287	186	1	186	
0	—	.829	354	.00393	.00326	2109	.98	2070	
2	—	.831	1000	.0111	.00922	6000	.93	5609	
58	.202	.273	5.20	.0000208	.00000568	3.7	1	3.7	
53	.059	.616	11.2	.0000448	.0000276	18	1	18	
51	.030	.702	18.5	.0000740	.0000519	34	1	34	
66	.016	.751	31.6	.000126	.0000946	61	1	61	
4	.001	.817	354	.00142	.00116	750	1	750	
18	—	.825	1000	.0400	.00330	2140	1	2140	
26	.319	.028	18.5	.0000378	.00000106	0.69	1	0.69	
55	.121	.457	31.6	.0003845	.0000295	19	1	19	
40	.014	.759	164	.000335	.000254	164	1	164	
74	.006	.793	354	.000722	.000573	371	1	371	
18	.002	.813	1000	.00204	.00166	1074	1	1074	
62	.205	.266	1.83	.0000114	.00000303	2.0	1	2	
8	.003	.662	5.20	.0000325	.0000215	14	1	14	
16	.009	.778	18.5	.000112	.0000871	56	1	56	
32	.005	.796	31.6	.000198	.000158	102	1	102	
4	.002	.817	118	.000738	.000603	390	1	390	
1	—	.829	1000	.00625	.00518	3350	.99	3320	

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Try: $W_D \sim \left(\frac{w^2}{R}\right)$ (time-temp dependen

$3V_f$ = dust speed
limiting height for dust entry as batte

OR:
Integrate h to ∞

$$W_D = K W^2 \int_h^\infty \left(\frac{1}{R^4} + \frac{h}{R^5}\right) dR$$

$$= K W^2 \left[\left| -\frac{1}{3}\frac{1}{R^3} \right|_h^\infty + \left| -\frac{1}{4}\frac{h}{R^4} \right|_h^\infty \right]$$

$$= K W^2 \left(\frac{1}{3}\frac{1}{h^3} + \frac{1}{4}\frac{h}{h^4} \right)$$

$$= K W^2 \left(\frac{1}{3} + \frac{1}{4} \right) \frac{1}{h^3}$$

$$= \frac{K' W^2}{h^3}$$

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$$M_{cD} = \frac{K W^2}{h^3}\left(1 - e^{3 w / w_D}\right)$$

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$$= \frac{K W^2}{h^3}\left(1 - e^{K' \frac{w}{h}}\right)$$

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$$K W^2 \left(1 - e^{K \frac{h^3}{w}}\right)$$

$w_D \sim \left(\frac{w}{R}\right)$ (time-temp dependence) [redacted]

$3V_c$ = dust speed

limiting height for dust entry on bottom page 112

Integrate h to ∞

$$w_D = K w^2 \int_h^\infty \left(\frac{1}{R^4} + \frac{h}{R^5}\right) dR$$

$$= Kw^2 \left[\left| -\frac{1}{3}\frac{1}{R^3} \right|_h^\infty + \left| -\frac{1}{4}\frac{h}{R^4} \right|_h^\infty \right]$$

$$= Kw^2 \left(\frac{1}{3}\frac{1}{h^3} + \frac{1}{4}\frac{h}{h^4} \right)$$

$$= \frac{Kw^2}{h^3}\left(\frac{1}{3} + \frac{1}{4}\right)$$

$$= \frac{K' w^2}{h^3}$$

BEST AVAILABLE COPY

$$M_{cD} = \frac{Kw^2}{h^3}\left(1 - e^{3w/w_D}\right)$$

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$$= \frac{Kw^2}{h^3}\left(1 - e^{\frac{K' w h^3}{w^2}}\right)$$

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$$= Kw^2 \left(1 - e^{\frac{K' h^3}{w}}\right) \cdots\cdots$$

OR:

Integrate h to ∞

$$w_0 = K w^2 \int_h^\infty \left(\frac{1}{R^4} + \frac{h}{R^5} \right) dR$$

$$= K w^2 \left[\left| -\frac{1}{3} \frac{1}{R^3} \right|_h^\infty + \left| -\frac{1}{4} \frac{h}{R^4} \right|_h^\infty \right]$$

$$= K w^2 \left(\frac{1}{3} \frac{1}{h^3} + \frac{1}{4} \frac{h}{h^4} \right)$$

$$= \frac{K w^2}{h^3} \left(\frac{1}{3} + \frac{1}{4} \right)$$

$$= \frac{K' w^2}{h^3}$$

$$w_{CD} = \frac{K w^2}{h^3} \left(1 - e^{\beta \frac{w}{w_0}} \right)$$

$$= \frac{K w^2}{h^3} \left(1 - e^{\frac{K' e h^3}{w^2}} \right)$$

$$= \frac{K w^2}{h^3} \left(1 - e^{\frac{K h^3}{w}} \right)$$

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[redacted]

BEST AVAILABLE COPY

[redacted]

Use $R_2 = 3R_f - h$ ($V_{dust} = 2V_f$),

$W_D = 0$ at $h = 1.5 R_f$

$\alpha = \frac{3R_f - h^2}{R_2}$

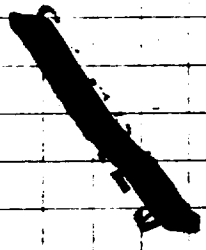
h	w	$3R_f$	R_2	α	$.54^2$	$.333^2$	$.833 - \alpha$	$w^{3/2}$
300	1	550	250					
	2	695	395	.759	.288	.146	.399	2.83
	4	875	575	.522	.136	.047	.650	5.66
	10	1190	890	.337	.057	.013	.763	31.6
	50	2035	1735	.173	.015	.002	.816	354
	100	2560	2260	.133	.009	.001	.823	1000

Try $U_{Dust} = 2V_f$, 2.5 radii above ground

which gives $R_2 = 2.5R_f - h$ $W_D = 0$

		$2.5R_f$	R_2					$w^{1.2}$	$w^{1.}$
300	3	665	365	.822	.338	.185	.310	3.74	.0
	6	838	538	.558	.156	.058	.619	8.59	.0
→	10	990	690	.435	.094	.027	.712	15.9	.0
	20	1250	950	.316	.050	.011	.772	36.4	.0
	50	1695	1395	.215	.023	.003	.807	109	.0
	100	2138	1838	.163	.014	.001	.818	251	.0
500	11	1022	522	.958	.459	.293	.081	17.8	.00
	20	1250	750	.667	.222	.099	.512	36.4	.00
	30	1430	930	.538	.144	.052	.637	59.2	.00
	50	1695	1195	.418	.088	.024	.721	109	.00
	100	2138	1638	.305	.046	.009	.778	251	.00

height dependence needs $h^{1.3}$



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(Vcount = 2 Vf), 3-Radii above gnd assumption

.333 d²	.833-2	$w^{3/2}$	$w^{3/2}/h^2$	$\pi \frac{}{w_0}$	
.146	.399	2.83	.000314	.0000125	
.047	.650	8.04	.0000879	.0000578	(1)
.013	.763	31.6	.000351	.000268	
.002	.816	354	.00393	.00321	
.001	.823	1000	.0111	.00914	

5 radii above gnd assumption.

5 $R_f - h$ $\quad w_0 = 0$ ext $\quad h = 1.25\,R_f + [w^{1.2}]$

		$w^{1.2}$	$w^{1.2}/h^2$	$\frac{}{w_0}$	$\frac{1}{w_0}$	
185	.310	3.74	.0000416	.0000129	23	
058	.619	8.59	.0000954	.0000591	106	(2)
027	.712	15.9	.000147	.000105	189	
011	.772	36.4	.000404	.000312	562	
003	.807	109	.00121	.000976	1757	
001	.818	251	.00279	.00278	4104	
293	.081	17.8	.000712	.000577	10.4	
099	.512	36.4	.000146	.000748	135	
152	.637	59.2	.000237	.000151	272	
24	.721	109	.000436	.000314	565	
209	.778	251	.00100	.000778	1400	

needs $h^{1.3}$

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$$W_{0\,eff} \sim \left(\frac{1}{L}\right)^{1/3} \sim \left(\frac{W^k}{R}\right)^{1/3} = \frac{W^k}{R^{1/3}} \approx \frac{W'}{R}$$

SECRET

$$W_0 = W^{1.2} \int_h^{R_2} \left(\frac{R+h}{R^{3.3}}\right) dR = W^{1.2} \int_h^{R_2} \left(\frac{1}{R^{2.3}} + \frac{h}{R^{3.3}}\right) dR$$

$$= W^{1.2} \left[\left| -\frac{1}{1.3} \frac{1}{R^{1.3}} \right|_h^{R_2} + \left| -\frac{1}{2.3} \frac{h}{R^{2.3}} \right|_h^{R_2} \right]$$

$$= W^{1.2} \left[\frac{1}{1.3} \frac{1}{h^{1.3}} - \frac{1}{1.3} \frac{1}{R_2^{1.3}} + \frac{1}{2.3} \frac{1}{h^{1.3}} - \frac{1}{2.3} \right]$$

$$= \frac{W^{1.2}}{h^{1.3}} \left[\frac{1}{1.3} + \frac{1}{2.3} - \frac{1}{1.3} \left(\frac{h}{R_2}\right)^{1.3} - \frac{1}{2.3} \right]$$

$$= \frac{W^{1.2}}{h^{1.3}} \left[1.204 - .769 \left(\frac{h}{R_2}\right)^{1.3} - .435 \left(\frac{h}{R_2}\right) \right]$$

$$R_2 = 2.5\,R_f - h$$

$W_0 = 0$ at $h = 1.25\,R_f$

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$$W_{o\,eff} \sim \left(\frac{1}{t}\right)^{1/3} \sim \left(\frac{w^{1/2}}{R}\right)^{1/3} = \frac{w^{1/6}}{R^{1/3}} \approx \frac{w^{.2}}{R^{.3}}$$

$$W_o = W^{(1)}_{1.2} \int_h^{R_2} \left(\frac{R+h}{R^{3.3}_{(3.5)}}\right) dR = w^{1.2} \int_h^{R_2} \left(\frac{1}{R^{2.3}} + \frac{h}{R^{3.3}}\right) dR$$

$$= w^{1.2} \left[\left| -\frac{1}{1.3} \frac{1}{R^{1.3}} \right|_h^{R_2} + \left| -\frac{1}{2.3} \frac{h}{R^{2.3}} \right|_h^{R_2} \right]$$

$$= w^{1.2} \left[\frac{1}{1.3} \frac{1}{h^{1.3}} - \frac{1}{1.3} \frac{1}{R_2^{1.3}} + \frac{1}{2.3} \frac{1}{h^{1.3}} - \frac{1}{2.3} \frac{h}{R_2^{2.3}} \right]$$

$$= \frac{w^{1.2}}{h^{1.3}} \left[\underset{(1.3)}{\frac{1}{1.3}} + \underset{(2.3)}{\frac{1}{2.3}} - \underset{(1.3)}{\frac{1}{1.3}} \left(\frac{h}{R_2}\right)^{\overset{(1.3)}{1.3}} - \underset{(2.3)}{\frac{1}{2.3}} \left(\frac{h}{R_2}\right)^{\overset{(2.3)}{2.3}} \right]$$

$$= \frac{W^{(1)}_{1.2}}{h^{1.3}} \left[\underset{(1.3)}{1.204} - \underset{(1.067)}{.769} \left(\frac{h}{R_2}\right)^{\overset{(1.5)}{1.3}} - \underset{(.667)}{.435} \left(\frac{h}{R_2}\right)^{\overset{(2.5)}{2.3}} \right]$$

$$\underset{(1.400)}{}$$

$R_2 = 2.5\, R_f - h$ (p 116)

$W_o = 0$ at $h = 1.25 R_f$

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h	w	$\alpha = w/R$	$.769\alpha^{1.3}$	$.435\alpha^{2.3}$	$1.204-\Sigma$	$w^{1.2}$	$w^{1.2}/h^{1.3}$ (661)	$\frac{w_D}{\pi}$	$M_c = 2560\pi$
300	3	.822	.596	.277	.331	3.74	.00225	.000745	191
	6	.558	.360	.114	.730	8.59	.00517	.00377	96.5
	10	.435	.241	.064	.879	16.9	.00957	.00844	215
	20	.316	.172	.031	1.001	36.4	.0219	.0219	561
	50	.215	.104	.013	1.087	109	.0656	.0713	1825
	100	.163	.073	.007	1.124	251	.151 (3220)	.170	4352
500	11	.958	.727	.384	.083	17.8	.00551	.000457	11.7
	20	.667	.454	.171	.579	36.4	.0113	.00654	167
	30	.538	.344	.104	.754	59.2	.0183	.0138	353
	50	.418	.247	.059	.898	109	.0337	.0303	776
	100	.305	.165	.028	1.011	251	.0777	.0786	2012

The above from page 117 checks data dumped using $M_{c_{mc}} = \frac{1}{3} w^{\frac{1}{2}} T_F$ +

700	50	.704	.488	.194	.522	109	.0218 (5000)	.0114	292
	90	.803	.578	.263	.363	83.7	.0167	.00606	155
1500	75								

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LLNL

Y/R	$.769\alpha^{1.3}$	$.435\alpha^{2.3}$	$1.204-\xi$	$W^{1/2}$	$W^{4.2}/h^{1.3}$ (661)	W_D/π	$M_c = 2560\pi$
822	.596	.277	.331	3.74	.00225	.000745	1.91
558	.340	.114	.730	8.59	.00517	.00377	96.5
135	.241	.064	.879	16.8	.00857	.00741	215
316	.172	.031	1.001	36.4	.0219	.0219	561
215	.104	.013	1.087	109	.0656	.0713	1825
163	.073	.007	1.124	251	.151 (3330)	.170	4352
958	.727	.394	.083	17.8	.00551	.000457	11.7
667	.454	.171	.579	36.4	.0113	.00654	167
538	.344	.104	.754	59.2	.0183	.0138	353
418	.247	.059	.898	109	.0337	.0303	776
305	.165	.028	1.011	251	.0777	.0786	2012

he above from page 117

checks data derived using $M_{c_{ne}} = \frac{1}{3} w^{\frac{1}{2}} T_T + 3T_c$

04	.488	.194	.522	109	.0218 (5000)	.0114	292
03	.578	.263	.363	83.7	.0167	.00606	155

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V_{s0} W', $h^{-1.5}$ R_2 h $W_f/W_0 = \frac{1}{2}$, limiting height $= 4R_f$ for $W_0 = 0$ at

$$W_0 = \frac{W}{h^{1.5}}\left[1.067 - .667\left(\frac{h}{R_2}\right)^{1.5} - .400\left(\frac{h}{R_2}\right)^{2.5}\right]$$

$R_2 =$

h	W	R_f	$4R_f$	$4R_f - h$	h/R_2	$(h/R_2)^{.5}$	$(h/R_2)^{1}$	$(h/R_2)^{1.5}$	$(h/R_2)^{2.5}$	$.667(h/R_2)^{1.5}$	$.4(h/R_2)^{2.5}$	[ ]	
300	1	184	736	436	.688	.829	.473	.570	.392	.380	.157	.530	.00
↓	2	232	928	628	.478	.691	.228	.330	.158	.220	.063	.784	.00
	3	266	1064	764	.393	.627	.154	.246	.097	.164	.039	.864	.00
	6	334	1336	1036	.290	.538	.084	.156	.045	.104	.018	.945	.001
	10	396	1584	1284	.234	.483	.055	.113	.027	.075	.011	.981	.001
	20	500	2000	1700	.176	.418	.031	.074	.013	.049	.005	1.013	.003
	30	572	2288	1988	.151	.388	.023	.059	.009	.039	.004	1.024	.005
	50	678	2712	2412	.124	.352	.015	.044	.005	.029	.002	1.036	.009
	100	855	3420	3120	.096	.310	.009	.030	.003	.020	.001	1.046	.017
700	48	621	2484	1816	.385	.620	.148	.057	.022	.039	.009	.871	.021
500	3			564	.887	.941	.787	.835	.741	.557	.291	.214	.0002
	6			836	.598	.773	.358	.462	.277	.308	.111	.644	.0025
	10			1084	.461	.679	.213	.313	.145	.209	.058	.800	.0081
	20			1500	.333	.576	.111	.192	.064	.128	.026	.913	.0017
	30			1788	.280	.529	.078	.148	.041	.099	.016	.952	.0026
	50			2212	.226	.475	.051	.107	.024	.071	.010	.984	.0044
	100		3RF	2920	.171	.413	.029	.071	.012	.047	.005	1.015	.0089
300	3		798	498	.602	.776	.362	.467	.281	.311	.112	.644	.00457
			.8Rf 665	365	.822	.906	.676	.745	.612	.497	.245	.325	.00576
			.3Rf 612	312	.962	.980	.925	.943	.906	.629	.362	.076	.00457
			3.2Rf 638	338	.888	.942	.789	.836	.743	.558	.297	.212	.00578
	20		1200	900	.333	.577	.111	.192				.913	.00325
1600	70	759	LLNL 1822	322									
700	40		1510	810	.864	.929	.746	.803	.693	.534	.277	.754	.00214

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W', $h^{-1.5}$ — $P = f_h$ — $V/V_0 = 1/2$, limiting height = $4R_f$, $R_2 = 4R_f - h$

$W_D = 0$ at $h = 2R_f$

$$W_D = \frac{W}{h^{1.5}}\left[1.067 - .667\left(h/R_2\right)^{1.5} - .400\left(h/R_2\right)^{2.5}\right]$$

$k = 148{,}600$ ↓

$2R_f$	$4R_f$	$4R_f - h$	h/R_2	$(h/R_2)^{1.5}$	$(h/R_2)^2$	$(h/R_2)^{1.5}$	$(h/R_2)^{2.5}$	$.667(h/R_2)^{1.5}$	$.4(h/R_2)^{2.5}$	[ ]	$W/h^{1.5}$	$\pi \times 10^{+3}$	M_c
34	736	436	.688	.829	.473	.570	.392	.380	.157	.530	.000193	.102	15.2
.2	928	628	.478	.691	.228	.330	.158	.220	.063	.784	.000385	.302	44.9
.6	1064	764	.393	.627	.154	.246	.097	.164	.039	.864	.000578	.499	74.2
34	1336	1036	.290	.538	.084	.156	.045	.104	.018	.945	.00116	1.10	163
16	1584	1284	.234	.483	.055	.113	.027	.075	.011	.981	.00193	1.89	281
0	2000	1700	.176	.418	.031	.074	.013	.049	.005	1.013	.00385	3.90	580
72	2288	1988	.151	.388	.023	.059	.009	.039	.004	1.024	.00578	5.92	880
18	2712	2412	.124	.352	.015	.044	.005	.029	.002	1.036	.00963	9.98	1480
55	3420	3170	.096	.310	.009	.030	.003	.020	.001	1.046	.0193	20.2	3000
9	2516	1816	.385	.620	.148	.239	.092	.159	.037	.871	.00216	1.88	279
		564	.887	.941	.787	.835	.741	.557	.297	.214	.00268	.057	8.47
		836	.598	.773	.358	.462	.277	.308	.111	.648	.00537	.348	51.7
		1084	.461	.679	.213	.313	.145	.209	.058	.800	.00895	.716	106
		1500	.333	.576	.111	.192	.064	.128	.026	.913	.00179	1.63	242
		1788	.280	.529	.078	.148	.041	.099	.016	.952	.00268	2.55	379
		2212	.226	.475	.051	.107	.024	.071	.010	.986	.00447	4.41	655
		2920	.171	.413	.029	.071	.012	.047	.005	1.015	.00895	9.08	1350
	3RF												
	798	498	.602	.776	.362	.467	.281	.311	.112	.644	.000578	.372	55
	2.5Rf 665	365	.822	.906	.676	.745	.612	.497	.245	.325	.000578	.188	28
	2.3Rf 612	312	.962	.980	.925	.943	.906	.629	.362	.076	.000578	.044	6.5
	2.2Rf 638	338	.888	.942	.789	.836	.743	.558	.297	.212	.000578	.123	18.3
	1200	900	.333	.577	.111	.192				.913	.00895	3.52	523
9	1822	322											
	1510	810	.864	.929	.746	.803	.693	.536	.277	.254	.00216	.541	82

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$R_2 = 3R_f - h$

h	w	$3R_f$	$3R_f - h$	$\alpha = h/R_2$	$\alpha^{.5}$	α^2	$\alpha^{1.5}$	$\alpha^{2.5}$	$.667\alpha^{1.5}$	$.4\alpha^{2.5}$	$\frac{1.067}{\varepsilon}$	$\frac{w}{h^{1.5}}$	π	$k = 150{,}000$ Mc
300	2	495	395	.759	.870	.576	.660	.501	.440	.200	.427	.000385	.000164	24.4
	4	875	575	.522	.722	.272	.377	.196	.251	.078	.738	.000771	.000569	85.4
	7	1056	756	.397	.630	.158	.250	.100	.167	.040	.860	.00135	.00116	174
	10	1190	890	.337	.580	.114	.195	.066	.130	.026	.911	.00193	.00176	264
	50	2035	1750	.173	.414	.030	.072	.012	.048	.005	1.014	.00963	.00976	1464
	100	2560	2260	.133	.364	.018	.048	.007	.032	.003	1.032	.0193	.0199	2985

$R_2 = 2.6R_f - h$ $\quad w_D = 0$ at $h = 1.3R_f$ $\quad V_D = 2V_f$

Operating height for dust and = $2.6R_f$

h	w	R_f	$2.6R_f$	$2.6R_f - h$	$\alpha = h/R_2$	$\alpha^{.5}$	α^2	$\alpha^{1.5}$	$\alpha^{2.5}$	$.667\alpha^{1.5}$	$.4\alpha^{2.5}$	$\frac{1.067}{\varepsilon}$	$\frac{w}{h^{1.5}}$	π	$k = 121{,}000$ Mc
0	w	R_f	$2.6R_f$	$2.6R_f - h$	$\alpha = h/R_2$										
100	2	237	603	303	.990	.995	.980	.985	.975	.657	.390	.020	.000412	.000008	1
y	3	265	689	389	.771	.877	.594	.676	.521	.451	.208	.408	.000645	.000263	32
	5	314	814	514	.581	.762	.338	.443	.258	.295	.103	.669	.00113	.000754	91
	7	352	915	615	.488	.698	.238	.341	.166	.227	.066	.774	.00164	.00127	154
	10	396	1030	730	.411	.640	.169	.263	.108	.175	.043	.849	.00243	.00206	249
	20	500	1300	1000	.300	.547	.090	.164	.049	.109	.020	.938	.00520	.00488	590
	40	629	1625	1335	.225	.474	.051	.107	.024	.071	.010	.986	.0111	.0109	1319
	100	854	2220	1920	.156	.395	.024	.062	.009	.041	.004	1.022	.0306	.0313	3787
500	10		1030	530	.943	.971	.889	.916	.863	.611	.345	.111	.00112	.000124	15
↓	20		1300	800	.625	.790	.391	.494	.309	.329	.124	.614	.00241	.00148	179
	40		1635	1135	.441	.664	.194	.293	.129	.195	.052	.820	.00516	.00423	512
	100		2220	1720	.291	.539	.085	.157	.046	.105	.018	.944	.0142	.0134	1621
700	40		1635	935	.749	.865	.561	.648	.485	.432	.194	.441	.00313	.00138	167

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$V_D = 2V_f$ — Running height for dust penetration — $3R_f$ — ($W_D = 0$ at $h = 1.5 R_f$)

$h = 1.5$

$R_2 = 3R_f - h$

$k = 150{,}000$ Mc

$3R_f$	$3R_f - h$	$R_2 =$ h/R_2	$\alpha =$ $\alpha^{.5}$	α^2	$\alpha^{1.5}$	$\alpha^{2.5}$	$.667\alpha^{1.5}$	$.4\alpha^{2.5}$	$\frac{1.067}{E}$	$\frac{w}{h^{1.5}}$	π	
495	395	.759	.870	.576	.660	.501	.440	.200	.427	.000385	.000164	24.4
875	575	.512	.722	.270	.377	.196	.251	.078	.738	.000771	.000569	85.4
1056	756	.397	.630	.158	.250	.100	.167	.040	.860	.00135	.00116	174
1190	890	.337	.580	.114	.195	.046	.130	.026	.911	.00193	.00176	264
2035	175	.173	.414	.030	.072	.012	.048	.005	1.014	.00963	.00976	1464
2560	2260	.133	.364	.018	.048	.007	.032	.003	1.032	.0193	.0199	2985

A

$W_D = 0$ at $h = 1.3 R_f$

$h = 1.5$

$R_2 = 2.6 R_f - h$

$V_D = 2V_f$ — Running height for dust entry $= 2.6 R_f$

$k = 121{,}000$ Mc

$R_f =$	$2.6R_f$	$2.6R_f - h$	$R_2 =$ h/R_2	$\alpha^{.5}$	α^2	$\alpha^{1.5}$	$\alpha^{2.5}$	$.667\alpha^{1.5}$	$.4\alpha^{2.5}$	$\frac{1.067}{E}$	$\frac{w}{h^{1.5}}$	π	Mc
232	603	303	.990	.995	.980	.985	.975	.657	.390	.020	.000412	.000008	1
265	689	389	.771	.877	.594	.676	.521	.451	.208	.408	.000645	.000363	32
314	816	516	.581	.762	.338	.443	.258	.295	.103	.669	.00113	.000754	91
352	915	615	.488	.698	.238	.341	.166	.227	.066	.774	.00164	.00127	154
396	1030	730	.411	.640	.169	.263	.108	.175	.043	.849	.00243	.00196	249
500	1300	1000	.300	.547	.090	.164	.049	.109	.020	.938	.00520	.00488	590
629	1625	1335	.225	.474	.051	.107	.024	.071	.010	.986	.0111	.0109	1319
854	2220	1920	.156	.395	.024	.062	.009	.041	.004	1.022	.0306	.0313	3787
	1630	530	.943	.971	.889	.916	.863	.611	.345	.111	.00112	.000124	15
	1300	800	.625	.790	.391	.494	.309	.329	.124	.614	.00241	.00148	179
	1635	1135	.441	.664	.194	.293	.129	.195	.052	.820	.00516	.00423	512
	2220	1720	.291	.539	.085	.157	.046	.105	.018	.944	.0142	.0134	1621
	1635	935	.749	.865	.561	.648	.485	.432	.194	.441	.00313	.00138	167

B

C

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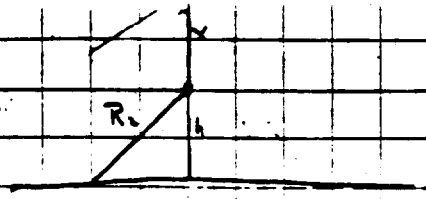

[redacted]

$x = V_f t_T$ where t_T is time to cooling to a certain temp.

$V_f = K_1 W^{1/2}$

$t_T = K_2 W^{1/2}$

If $V_f = \frac{1}{2} V_b$, $x = R_2$

and $R_2 = K W^{1/4}$

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LLCSE 0017

By as page 120 B with $R_2 = 800'$ at $W = 20$, $K = 378$

$W^{1/4}$	$378 W^{1/4}$	$R_2 = h/R_2$	$\alpha = \alpha^{1/2}$	α^2	$\alpha^{1/2}$	$\alpha^{2 1/2}$	$.667\alpha^{1 1/2}$	$.4\alpha^{2 1/2}$	Σ	$\frac{W^{1.1}}{h^{1.5}}$	π	$K' = 126$ Mc
.84	318	.943	.971	.889	.916	.863	.611	.345	.111	.000090	.000510	1.21
1	378	.794	.891	.630	.707	.561	.472	.224	.371	.000193	.000072	9.0
1.19	450	.667	.815	.445	.544	.363	.363	.145	.559	.000412	.000230	29.0
1.41	533	.563	.750	.317	.422	.238	.281	.095	.691	.000886	.000612	77.2
1.78	673	.446	.668	.199	.298	.133	.199	.053	.815	.00243	.00198	250
2.12	801	.375	.612	.141	.230	.086	.153	.034	.880	.00520	.00458	578
2.52	953	.315	.561	.099	.177	.056	.118	.022	.927	.0111	.0103	1300
3.16	1194	.251	.500	.063	.126	.032	.084	.013	.970	.0306	.0297	3748

If $R_2 = K W^{1/2}$, $R_2 = 800$ at $W = 20$, $K = 180$ $K' = 12$

$W^{1/2}$	R_2	$\alpha = h/R_2$	$\alpha^{1/2}$	α^2	$\alpha^{1 1/2}$	$\alpha^{2 1/2}$	$.667\alpha^{1 1/2}$	$.4\alpha^{2 1/2}$	Σ	$\frac{W^{1.1}}{h^{1.5}}$	π	Mc
73	311	.965	.982	.931	.948	.914	.632	.366	.069	.000647	.000045	5.
	360	.833	.912	.694	.760	.633	.507	.253	.307	.000886	.000272	33
3.16	569	.527	.724	.278	.382	.201	.255	.080	.732	.00243	.00178	216
47	805	.373	.610	.139	.228	.085	.152	.034	.881	.00520	.00458	556
32	1138	.264	.513	.070	.135	.036	.090	.014	.963	.0111	.0107	130
0	1800	.167	.408	.028	.068	.011	.045	.004	1.018	.0306	.0312	3791
	569	.879	.936	.773	.823	.724	.549	.290	.228	.00112	.000255	31
	1138	.415	.784	.378	.482	.296	.321	.118	.628	.00314	.00197	239
5	1557	.963	.981	.927	.945	.909	.630	.364	.073	.00200	.000141	17.
	1011	.692	.932	.479	.576	.399	.384	.160	.523	.00314	.00164	20
	1011	.297	.545	.088	.162	.048	.108	.019	.940	.0112	.0105	1302

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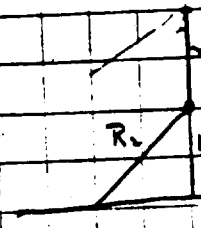
[redacted]



[redacted]

$x = V_f t_T$ where t_T is time to cooling to a ce

$V_f = K_1 W^{1/2}$

$t_T = K_2 W^{1/2}$

If $V_f = \frac{1}{2} V_0$, $x = R_2$

and $R_2 = K W^{1/4}$

Try as page 120 B with $R_2 = 800'$ at $W = 20$, k

h	W	$W^{1/4}$	$378 W^{1/4}$	$R_2 = h/\alpha$	$\alpha^{1/2}$	α	α^2	$\alpha^{1\frac{1}{2}}$	$\alpha^{2\frac{1}{2}}$	$.667\alpha^{1\frac{1}{2}}$	$.4\alpha^{2\frac{1}{2}}$	$1.067 - \Sigma$	$\frac{W^{1/4}}{h^{1.5}}$
300	.5	.84	318	.943	.971	.889	.916	.863	.611	.345	.111		.000090
	1	1	378	.794	.891	.630	.707	.561	.472	.224	.371		.000193
	2	1.19	450	.667	.815	.445	.574	.363	.363	.145	.559		.000412
	4	1.41	533	.563	.750	.317	.422	.238	.281	.095	.691		.000886
	10	1.78	673	.446	.668	.199	.298	.133	.199	.053	.815		.00243
	20	2.12	801	.375	.612	.141	.230	.086	.153	.034	.880		.00520
	40	2.52	953	.315	.561	.099	.177	.056	.118	.022	.927		.0111
	100	3.16	1194	.251	.500	.063	.126	.032	.084	.013	.970		.0306

If $R_2 = K W^{1/2}$, $R_2 = 800$ at $W = 20$ $K = 180$

h	W	$W^{1/2}$	R_2	$\alpha = h/R_2$	$\alpha^{1/2}$	α	$\alpha^{1\frac{1}{2}}$	$\alpha^{2\frac{1}{2}}$	$.667\alpha^{1\frac{1}{2}}$	$.4\alpha^{2\frac{1}{2}}$	$1.067 - \Sigma$	$\frac{W^{1/4}}{h^{1.5}}$
300	3	1.73	311	.965	.982	.931	.948	.914	.632	.366	.069	.0006
	4	2	360	.833	.912	.694	.760	.633	.507	.253	.307	.00088
	10	3.16	569	.527	.724	.278	.382	.201	.255	.080	.732	.00520
	20	4.47	805	.373	.610	.139	.228	.085	.152	.034	.881	.0111
	40	6.32	1138	.264	.513	.070	.135	.036	.090	.014	.963	.0236
	100	10	1800	.167	.408	.028	.068	.011	.045	.004	1.018	.0306
500	10		569	.879	.936	.773	.823	.724	.549	.290	.278	.00112
700	40		1138	.615	.784	.378	.482	.296	.321	.118	.628	.00314
1500	75	8.65	1557	.963	.981	.927	.945	.909	.630	.364	.073	.00200
K=180 700	40		1011	.692	.832	.479	.576	.399	.384	.160	.523	.00314
300	40		1011	.297	.545	.088	.162	.048	.108	.019	.940	.0112

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Tower Weights, Tons

Shot	Area	C	Cab		Tower	
T-S 5	1		12.28	Fe	44.92	Fe
T-S 6	4		12.28	"	44.92	"
T-S 7	3		14.23	"	50.88	"
T-S 8	2		12.23	"	44.92	"
U-K 1	3		12.28	"	44.92	"
U-K 2	4		23.84	"	76.88	"
			42.56	Conc.		
U-K 6	2		12.28	Fe	44.92	"
U-K 7	1		24.07	"		
			47.70	Conc.	76.88	"
U-K 9	3a		6.68	← 23.09 Al →	36.25	Al
				← 17.63 Fe →		
				← 2.21 Misc →		
Moth	3		12.3	Fe	45	Fe

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Hand Tack A + E

$t_j = \frac{\ln f_0 - \ln f_j}{\sigma}$

[redacted]

$M' = \Delta A C_f =$ M/

$\Delta f_{ij} = 0.05$

$\sigma = 1.3$

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[redacted]

Level i	f_{ij}	f_j	f_{j+1}	$\ln f_0$	$\ln f_j$	$\ln f_{j+1}$	t_j	t_{j+}
1	0.125	0.100	0.150	2.07944	-2.303	-1.897	3.37110	3.05
	0.425	0.4	.45		-0.916	-0.799	2.30418	2.21
	1.025	1	1.05		0	.04879	1.59956	1.56
	4.025	4	4.05		1.38629	1.39872	.53319	.523
	10.025	10	10.05		2.30259	2.30757	.17165	.1754
	40.025	40	40.05		3.68888	3.69011	1.23803	1.238
	100.025	100	100.05		4.60517	4.60567	1.94286	1.943
	0.04	0.015 ~~0.005~~	0.065		-4.259 -4.1997	-2.736 -2.7334	4.8754	3.
6	0.125			0.53063			2.17971	1.867
	0.425						1.11279	1.022
	1.025						.40817	.370
	4.025						.65820	.6677
	10.025						1.36304	1.3668
	40.025						2.42942	2.4303
	100.025						3.13421	3.1346
	0.04	0.015	0.065				4.7896	3.266

Hdtk A $f_{ij} = 0.04$

Layer	M
10	53
9	100
8	121
7	108
6	66
5	4
4	3
3	2
2	~~1.5~~ 2
1	1.5 2

BEST AVAILABLE COPY

f_j	f_{j+1}	$\ln f_0$	$\ln f_j$	$\ln f_{j+1}$	t_j	t_{j+1}	A_{j+1}	$A_j - A_{j+1}$
0.100	0.150	2.07944	-2.303	-1.897	3.37110	3.05880	.0007	
0.4	.45		-0.916	-0.799	2.30418	2.214 18	.0028	
1	1.05		0	.04879	1.59956	1.56203	.0044	
4	4.05		1.38629	1.39872	.53319	.52363	.0043	
10	10.05		2.30259	2.30757	.17165	.17548	.0015	
40	40.05		3.68888	3.69011	1.23803	1.23897	.00017	
100	100.05		4.60517	4.60567	1.94286	1.94325	.00003	
~~2.015~~ 1.005	0.065		-4.259 4.1997	-2.736	4.8754	3.7038	.5a: -.4999=.0001	3
		0.53063		2.7334	2.17971	1.86740	.01627	
					1.11279	1.02279	.02032	
					.40817	.37064	.01388	
					.65820	.66776	.00306	
					1.36304	1.36687	.00061	
					2.42942	2.43036	.00003	
					3.13421	3.13464	.00001	
					4.7896	3.2666	.0005	

2.015 0.065

Hdtk A $f_U = 0.04$

M	
53	
100	
121	
108	
66	
4	
3	
2	
~~1.5~~	2
1.5	2

BEST AVAILABLE COPY

	from	to	ln to	ln from	Δ/σ	A	x	$1+x$
1	0.0274	8	2.07944	-3.8728	4.579	.5000	.0000	1.0
2	0.0822	8		-2.49860	3.522	.4998	.0002	1.0
3	0.1369	8		-1.98778	3.129	.4991	.0009	1.00
4	0.1918	8		-1.65026	2.869	.4980	.0020	1.00
5	0.2465	8		-1.4001	2.677	.4963	.0037	1.00
6	0.3013	1.7	0.53063	-1.17319	1.311	.4049	.0951	1.11
7	0.3562	1.7		-.9326	1.126	.3708	.1292	1.15
8	0.4109	1.7		-.8892	1.092	.3621	.1379	1.16
9	0.4656	1.7		-.7643	0.996	.3413	.1587	1.19
10	0.5205	1.7		-.6529	0.910	.3186	.1814	1.22

Of assign M mc to all levels as fallout fraction, Gaussians add to M

Of subtract activity on fall-times > 12 hours:

	Hardtack A: % loss of YZ	Hardtack B
Layer 10	0.012	0.015
9	0.031	0.026
8	0.033	0.030
7	0.028	0.023
6	0.013	0.012
	0.124	0.106

BEST AVAILABLE COPY

Of M_{12} mc within 12 hours, then for calcu

$YZ = M_D = 1.12\ M_{12}$ HTK 13

Hardtack A, $M_D = 1.14\ M_{12}$ and this number which should be cranked into calcu

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for 40,000, ≤12 hours arrival

$t =$ $1 - \frac{1}{X} = \gamma$

f_0	$\ln f_0$	$\ln f_{min}$	Δ/σ	A	X	
8	2.07944	-3.8728	4.579	.5000	.0000	1.00
8		-2.49860	3.522	.4998	.0002	1.00
8		-1.98778	3.129	.4991	.0009	1.00
8		-1.65026	2.869	.4980	.0020	1.00
8		-1.40061	2.677	.4963	.0037	1.00
1.7	0.53063	-1.17319	1.311	.4049	.0951	1.11
1.7		-.9326	1.126	.3708	.1292	1.15
1.7		-.8892	1.092	.3621	.1379	1.16
1.7		-.7643	0.996	.3413	.1587	1.19
1.7		-.6529	0.910	.3186	.1814	1.22

assign M mc to all levels as fallout fraction, all sions add to M

& subtract activity on fall-times > 12 hours:

dtock A:

	% loss of Y2	Handtock B
10	0.019	0.015
9	0.031	0.026
8	0.033	0.030
7	0.028	0.023
6	0.013	0.012
	0.124	0.106

If M_{12} mc within 12 hours, then for calculation:

$Y2 = M_D = 1.12\ M_{12}$ HTK 13

Handtock A, $M_D = 1.14\ M_{12}$ and this is the number which should be cranked into calculations

BEST AVAILABLE COPY

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for 40,000, ≤12 hrs. arrival

H	t mer	h	ft/hr fmin	knots fmin	fo	i
10,000'	3 hr	500	167	.0274	8	1
		1500	500	.0822	8	2
		2500	833	.1369	8	3
		3500	1167	.1918	8	4
		4500	1500	.2465	8	5
		5500	1833	.3013	1.7	6
		6500	2167	.3562	1.7	7
		7500	2500	.4109	1.7	8
		8500	2833	.4656	1.7	9
		9500	3167	.5205	1.7	10
80,000'	24hr	4000	167			
		12,000				
		20,000				
		28,000				
		36,000				
		44,000				
		52,000				
		60,000				
		68,000				
		76,000	3167			

H 30,000' t 12

BEST AVAILABLE COPY

	fmin	fo	ln fo	ln fmin	ε = Δ/σ
1	.0205	8	2.07944	-3.88733	4.58982
2	.0616	8		-2.78709	3.74348
3	.1027	8		-2.27303	3.34805
4	.1438	8		-1.93795	3.09030
5	.1849	8		-1.68740	2.89756
6	.2260	1.7	0.53063	-1.48773	1.55270
7	.2671	1.7		-1.32051	1.42395
8	.3082	1.7		-1.17766	1.31406
9	.3493	1.7		-1.05269	1.21793
10	.3904	1.7		-0.94161	1.13249

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HDTK-A $M_\infty = 1.09\ M_{12}$

HDTk-B $M_\infty = 1.08\ M_{12}$

ft/hr	knots	[redacted]	L
fmin	fmin	fo	
167	.0274	8	2
500	.0822	8	3
833	.1369	8	4
1167	.1918	8	5
1500	.2465	8	6
1833	.3013	1.7	7
2167	.3562	1.7	8
2500	.4109	1.7	9
2833	.4656	1.7	10
3167	.5205	1.7	

167

3167

H	Crew	Ni	/hr	Knots
30,000'	12	1500	125	.0205
		4500	375	.0616
		7500	625	.1027
		10,500	875	.1438
		13,500	1125	.1849
		16,500	1375	.2260
		19,500	1625	.2671
		22,500	1875	.3082
		25,500	2125	.3493
		28,500	2375	.3904

for 30,000', ≤12 hrs arrival

BEST AVAILABLE COPY

fo	ln fo	ln fmin	ε = Δ/σ	A_T	Loss	Loss in % of CF at K: A	B
8	2.07944	-3.88733	4.58982	1.00	0	0	0
8		-2.78709	3.74348	1.00	0	0	0
8		-2.27303	3.34805	1.00	0	0	0
8		-1.93795	3.09030	1.00	0	0	0
8		-1.68740	2.89756	1.00	0	0	0
1.7	0.53063	-1.48773	1.55270	0.94	.06	.008	.007
1.7		-1.32051	1.42395	0.92	.08	.017	.014
1.7		-1.17766	1.31406	0.91	.09	.022	.020
1.7		-1.05269	1.21793	0.89	.11	.021	.018
1.7		-0.94161	1.13249	0.87	.13	.014	.011
						.082	.070

$M_\infty = 1.09\ M_{12}$

$M_\rho = 1.08\ M_{12}$

LLNL

[redacted]

[redacted] A

.01	.02	.03	.04	.05	.06	.07	.08	.09
0	0	80	42	98 203	243	523	693	343
0	0	0	82	404	248	1042	1341	1680
0	0	0	110	247	1083	1419	1855	2291
0	0	0	90	441	1191	1141	1491	1841
0	0	0	62	305	540	787	1028	1269
0	0	0	8	13	18	24	29	34
0	0	0	5	9	13	17	20	24
0	0	0	4	7	10	13	16	19
0	0	0	4	6	9	11	14	16
0	0	0	3	4	6	8	10	12

BEST AVAILABLE COPY

LLNL

[redacted]

[redacted] A

.04	.05	.06	.07	.08	.09
42	98	223	428	633	843
82	404	448	1042	1341	1680
110	847	983	1419	1855	2291
90	741	941	1141	1491	1841
62	605	540	797	1028	1269
8	13	18	24	29	34
5	9	13	16	20	24
4	7	10	13	16	19
4	6	9	11	14	16
3	4	6	8	10	12

B f = .04

45	.01	42
192	.01	82
152	.01	110
153	.01	90
120	.01	62
6	.01	8
4	.01	5
3	.01	4
4	.01	4
3	.01	3

BEST AVAILABLE COPY

LLNL

[redacted]

BEST AVAILABLE COPY

[redacted] HARDTACK MODEL A, B C - FRACTI

Fall Rate Level		0.10	0.11	0.12	0.13	0.14
Top	10	1093	1163	1372	1372	1521
	9	1999	2148	2668	2709	2763
	8	2727	3163	3563	3660	3721
	7	2191	2541	2912	2939	2987
	6	1510	1751	2017	2031	2070
	5	40	45	53	59	63
	4	28	31	37	39	44
	3	22	25	28	30	32
	2	.000018	.000021	.000024	.000027	.000030
	1	.000008	.000009	.000011	.000012	.000013
Base		.000014	.000017	.000019	.000022	.000024
		.000007	.000008	.000009	.000010	.000012

		0.22	0.24	0.27	0.30	0.33
Top	10	1373	1823	1813	1793	1758
	9	3267	3393	3400	3393	3378
	8	4209	4331	4514	4534	4514
	7	3371	3469	3611	3682	4992
	6	2389	2460	2509	2572	4430
	5	114	2640	2693	2732	.002546
	4	61	67	.000143	.000155	.000173
	3	78	.000087	.000076	.000084	.000092
	2	37	.000041	.000099	.000104	.000114
	1	64	.000071	.000046	.000051	.000056
Base		28	.000031	.000035	.000039	.000043
		.000053	.000059	.000067	.000074	.000081
		.000023	.000026	.000030	.000033	.000036
		.000043	.000048	.000054	.000059	.000065
		.000021	.000023	.000026	.000029	.000032

		0.50	0.55	0.60	0.65	0.70
Top	10	1591	.001550	.001501	.001451	.001410
	9	2037	.001984	.001922	.001858	.001806
	8	.003162	.003081	.002983	.002885	.002804
	7	.003783	.003686	.003568	.003452	.003354
	6	.004210	.004101	.003971	.003841	.003732
	5	.004656	.004536	.004392	.004248	.004128
	4	.003434	.003345	.003239	.003133	.003044
	3	.004132	.004026	.003898	.003770	.003664
	2	.002396	.002325	.002251	.002177	.002116
	1	.002561	.002495	.002416	.002336	.002270
Base		.000242	.000256	.000267	.000279	.000290
		.000129	.000136	.000142	.000148	.000155
		.000166	.000176	.000184	.000192	.000200
		.000078	.000083	.000087	.000090	.000094
		.000135	.000143	.000149	.000152	.000162
		.000060	.000063	.000066	.000069	.000072
		.000113	.000120	.000125	.000130	.000136
		.000050	.000053	.000056	.000058	.000060
		.000091	.000096	.000101	.000105	.000109
		.000044	.000046	.000049	.000051	.000053

		1.00	1.10	1.20	1.30	1.40
Top	10	1148	1074	1009	951	LLNL 886
	9	1470	1376	1292	1218	1134
	8	2262	2135	2005	1891	1765
	7	2730	2554	2398	2262	2106
	6	3035	2843	2669	2517	2347
	5	3360	3144	2952	2784	2592
		2478	2319	2177	2053	1912
		2982	2790	2620	2471	2300
		1722	1611	1513	1427	1328
		1848	1729	1624	1531	1424
		336	350	357	365	371
		179	186	190	194	198

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HARDTACK MODEL A, B C - FRACTION per 0.05 knots

0.10	0.11	0.12	0.13	0.14	0.16	0.18	0.20
1093	1163	1323	1372	1504	1579	1617	1725
1999	2248	2668	2709	2763	2689	2015	2731
2727	3163	3599	3660	3721	3843	3965	4087
3191	2541	2891	2981	2987	3083	3179	3275
1510	1751	1992	2031	2070	2148	2226	2304
40	45	50	53	63	76	89	102
28	31	35	37	44	53	62	70
22	25	28	30	36	43	50	57
18	11	13	14	16	19	22	25
08	.000021	.000024	.000027	.000030	.000036	.000042	.000046
08	.000009	.000011	.000012	.000013	.000016	.000019	.000021
14	.000017	.000019	.000022	.000024	.000029	.000034	.000039
07	.000008	.000009	.000010	.000012	.000014	.000016	.000019

0.24	0.27	0.30	0.33	0.36	0.40	0.44
1823	1813	1793	1758	1723	1673	1648
3393	3400	3393	3378	3358	3325	3276
4209	4331	4534	4992	4470	4427	3920
3371	3469	3611	3682	3644	4896	.004362
2460	2509	2542	2558	.003664	.003611	.004824
2640	2693	2732	.002746	.004409	.004345	.003558
26	.000143	.000158	.000173	.002546	.002534	.004281
67	.000076	.000084	.000092	.002732	.002693	.002472
.000087	.000097	.000109	.000119	.000117	.000205	.002653
.000041	.000046	.000051	.000056	.000100	.000109	.000222
.000071	.000080	.000088	.000097	.000104	.000141	.000118
.000031	.000035	.000039	.000043	.000046	.000114	.000153
.000059	.000067	.000074	.000081	.000087	.000051	.000072
.000026	.000030	.000033	.000036	.000039	.000046	.000055
.000048	.000054	.000059	.000065	.000070	.000077	.000084
.000023	.000026	.000029	.000032	.000034	.000037	.000040

0.55	0.60	0.65	0.70	0.75	0.80	0.90
.001550	.001501	.001451	.001410	.001361	.001312	.001230
.001984	.001922	.001858	.001806	.001743	.001680	.001575
.003071	.002973	.002885	.002804	.002706	.002605	.002445
.003686	.003568	.003452	.003354	.003237	.003120	.002925
.004101	.003971	.003841	.003732	.003602	.003472	.003255
.004536	.004392	.004248	.004128	.003984	.003840	.003600
.003345	.003239	.003133	.003044	.002938	.002832	.002655
.004026	.003898	.003770	.003664	.003536	.003408	.003195
.002325	.002251	.002177	.002116	.002042	.001965	.001845
.002495	.002416	.002336	.002270	.002191	.002112	.001980
.002567	.002487	.002407	.002340	.002258	.002178	.002042
.000136	.000142	.000148	.000155	.000159	.000164	.000172
.000176	.000154	.000192	.000200	.000205	.000212	.000223
.000083	.000087	.000090	.000094	.000097	.000100	.000105
.000143	.000149	.000156	.000162	.000166	.000172	.000181
.000063	.000067	.000069	.000072	.000074	.000076	.000080
.000120	.000125	.000130	.000136	.000139	.000144	.000151
.000053	.000056	.000058	.000060	.000062	.000064	.000067
.000096	.000101	.000105	.000109	.000112	.000116	.000122
.000046	.000049	.000051	.000053	.000054	.000056	.000059

1.10	1.20	1.30	1.40	1.60	1.80	2.00
1074	1001	951	886	787	697	LLNL 625
1376	1292	1218	1134	1008	892	800
2135	2005	1891	1760	1565	1386	1242
2554	2398	2262	2106	1872	1658	1486
2843	2669	2517	2344	2093	1844	1654
3144	2952	2784	2592	2304	2040	1829
2319	2177	2053	1912	1699	1504	1349
2790	2620	2471	2300	2045	1810	1623
1611	1513	1427	1328	1181	1046	937
1729	1624	1531	1426	1267	1122	1006
350	357	365	371	382	390	395
186	190	194	198	203	207	210

BEST AVAILABLE COPY

	8						
	7	2191	2541		2939	2987	3083
	6	1510	1751	1992	2031	2070	2148
	5				53		
	4	28	31	39	37	44	53
	3	22	25	28	30	32	25
	2	.000018	.000021	.000024	.000027	.000036	.000043
	1	.000008	.000009	.000011	.000012	.000016	.000019
Base		.000014	.000017	.000019	.000022	.000024	.000029
		.000007	.000008	.000009	.000010	.000012	.000014

		0.22	0.24	0.27	0.30	0.33	0.36
Top	10	1813	1823	1813	1793	1762	1723
	9	3267	3393	3400	3393	3378	3358
	8	4209	4331	4562	4534	4514	4470
	7	3371	3469	3611	3682	3992	4044
	6	2589	2640	2693	2732	2752	.003654
	5	114	126	.000143	.000158	.000173	.004409
	4	61	67	.000076	.000084	.000092	.002546
	3	.000078	.000087	.000099	.000109	.000119	.002732
	2	.000037	.000041	.000046	.000051	.000056	.000129
	1	.000024	.000027	.000030	.000033	.000036	.000061
Base		.000028	.000031	.000035	.000039	.000043	.000046
		.000053	.000059	.000067	.000074	.000081	.000087
		.000023	.000026	.000030	.000033	.000036	.000039
		.000021	.000023	.000026	.000029	.000032	.000034

		0.50	0.55	0.60	0.65	0.70	0.75
Top	10	1591	.001550	.001501	.001451	.001410	.001361
	9	2037	.001984	.001922	.001858	.001806	.001743
	8	.003162	.003021	.002953	.002865	.002804	.002706
	7	.003783	.003686	.003568	.003452	.003554	.003237
	6	.004210	.004101	.003971	.003841	.003732	.003602
	5	.004656	.004536	.004392	.004248	.004128	.003984
	4	.003434	.003345	.003239	.003133	.003044	.002938
	3	.004132	.004026	.003898	.003770	.003664	.003536
	2	.002366	.002325	.002251	.002177	.002116	.002042
	1	.002561	.002495	.002416	.002334	.002270	.002191
Base		.000242	.000256	.000267	.000279	.000290	.000275
		.000129	.000136	.000142	.000148	.000155	.000159
		.000166	.000176	.000184	.000192	.000200	.000205
		.000078	.000083	.000087	.000090	.000094	.000097
		.000135	.000143	.000149	.000156	.000162	.000156
		.000060	.000063	.000066	.000069	.000072	.000074
		.000113	.000120	.000125	.000130	.000136	.000137
		.000050	.000053	.000056	.000058	.000060	.000062
		.000044	.000046	.000049	.000051	.000053	.000054

		1.00	1.10	1.20	1.30	1.40	1.60
Top	10	1470	1376	1292	1218	1134	1008
	9	2730	2554	2398	2262	2106	1872
	8	3360	3144	2952	2784	2592	2304
	7	2982	2790	2620	2471	2300	2045
	6	1848	1729	1624	1531	1426	1267
	5	336	350	357	365	371	382
	4	179	186	190	194	198	203
	3	231	241	245	261	255	263
	2	109	114	116	118	120	124
	1	187	195	199	204	207	213
Base		83	86	88	90	92	94
		157	163	167	171	174	179
		70	73	74	76	77	79
		126	132	134	137	140	144
		61	64	65	66	67	69

BEST AVAILABLE COPY

LLNL

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LLNL

2.40	2.70	3.00	3.30	3.60	4.00	4.40
566	508	439	385	332	297	250	216
224	651	562	494	425	380	320	277
625	1019	872	766	660	590	497	430
346	1209	1043	916	790	706	595	515
497	1345	1161	1020	879	786	662	573
556	1488	1294	1128	972	869	732	634
521	1097	947	832	717	641	540	467
470	1321	1140	1001	863	771	650	562
49	763	658	576	498	445	375	325
11	818	706	620	535	478	403	348
96	396	393	985	372	357	333	308
11	211	209	205	198	190	177	164
72	272	270	265	256	245	229	212
28	128	128	125	121	116	108	100
21	221	219	215	208	199	186	172
85	98	97	95	92	88	82	76
29	185	184	180	174	167	156	144
9	82	82	80	77	74	69	64
2	149	140	145	140	134	125	116
	72	71	70	68	65	60	56

5.00	5.50	6.00	6.50	7.00	7.50	8.00	9.00
205	151	129	112	98	87	75	61
59	193	165	144	126	111	97	78
97	300	256	223	196	173	150	121
74	359	306	267	234	207	179	144
4	399	341	297	260	230	200	161
2	442	377	329	288	254	221	178
3	326	278	242	212	188	163	131
5	392	278	292	256	226	196	158
1	226	193	169	148	130	113	91
	243	207	181	158	140	121	98
	246	223	204	187	171	157	118
	131	119	109	100	91	84	63
	170	145	140	129	118	108	81
	80	72	66	61	56	51	38
	138	125	114	104	95	88	66
	61	55	50	46	42	39	29
	115	104	95	87	80	73	55
	51	46	42	39	36	33	24
	93	84	77	70	64	59	44
	45	41	37	34	31	29	21

11.0	12.0	13.0	14.0	16.0	18.0	20.0
41	35	30	26	20	16	13
53	45	39	33	26	21	17
82	70	60	52	40	32	26
99	84	72	62	48	38	31
110	93	80	69	53	43	35
121	103	88	76	59	47	38
90	76	65	56	44	35	28
108	92	78	67	52	42	34
62	53	45	39	30	24	20
67	57	48	42	32	26	21
103	92	81	72	59	49	42
55	49	43	39	31	26	22
71	63	56	50	41	34	29
34	30	26	24	19	16	14
58	51	45	40	33	27	23
25	23	20	18	15	12	10
48	43	38	34	28	23	19
21	19	17	15	12	10	9
39	35	30	27	22	18	16
19	17	15	13	11	9	8

24.0	27.0	30.0	33.0	36.0	40.0	50.0
9	7	6	5	4	3	2
12	9	8	6	5	4	3
18	15	12	10	8	7	4
22	18	14	12	10	8	5
24	20	16	13	11	9	6
27	22	18	15	12	10	6
20	16	13	11	9	7	5
24	19	16	13	11	9	6
18	11	9	8	6	5	3
15	12	10	8	7	6	4
31	25	21	18	16	13	8
16	14	11	10	8	7	5
21	17	15	12	11	9	6
10	8	7	6	5	4	3
17	14	12	10	9	7	5
8	6	5	4	4	3	2
14	12	10	8	7	6	4

BEST AVAILABLE COPY

LLNL

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		2.20	2.40	2.70	3.00	3.30	3.60
		566	508	439	385	332	297
Top	10	724	651	562	494	425	380
	9	1125	1011	872	766	660	590
	8	1346	1209	1043	916	790	706
	7	1479	1345	1161	1020	879	786
	6	1656	1488	1284	1128	972	869
	5	1221	1097	947	832	717	641
	4	1470	1321	1140	1001	863	771
	3	849	763	658	578	498	445
	2	911	818	706	620	535	478
	1	396	396	393	385	372	357
Ease		211	211	209	205	198	190
		272	272	270	265	256	245
		128	128	128	125	121	116
		221	221	219	215	208	199
		98	98	97	95	92	88
		185	185	184	180	174	167
		82	82	82	80	77	74
		149	149	145	145	140	134
		72	72	71	70	68	65

		5.00	5.50	6.00	6.50	7.00	7.50
		175	151	129	112	98	87
Top	10	225	193	165	144	126	111
	9	349	300	256	223	196	173
	8	417	359	306	267	234	207
	7	464	399	341	297	260	230
	6	514	442	377	329	288	254
	5	379	326	278	242	212	188
	4	456	392	278	292	256	226
	3	263	226	193	169	148	131
	2	282	243	207	181	158	140
	1	270	242	223	204	187	171
Base		144	131	119	109	100	91
		186	170	145	140	129	118
		88	80	72	66	61	56
		150	136	125	114	104	95
		66	61	55	50	46	42
		126	115	104	95	87	80
		56	51	46	42	39	36
		102	93	84	77	70	64
		49	45	41	37	34	31

		10.0	11.0	12.0	13.0	14.0	16.0
		50	41	35	30	26	20
Top	10	64	53	45	39	33	26
	9	99	82	70	60	52	40
	8	118	99	84	72	62	48
	7	131	110	93	80	69	53
	6	145	121	103	88	76	59
	5	107	90	76	65	56	44
	4	129	108	92	78	67	52
	3	74	62	53	45	39	30
	2	80	67	57	48	42	32
	1	116	103	92	81	72	59
Base		63	55	49	43	39	31
		81	71	63	56	50	41
		38	34	30	26	24	19
		66	58	51	45	40	33
		29	25	23	20	18	15
		55	48	43	38	34	28
		24	21	19	17	15	12
		44	39	35	30	27	22
		21	19	17	15	13	11

		22.0	24.0	27.0	30.0	33.0	36.0
		11	9	7	6	5	4
Top	10	14	12	9	8	6	5
	9	22	18	15	12	10	8
	8	26	22	18	14	12	10
	7	32	27	20	16	13	11
	6	24	20	22	18	15	12
	5	28	24	16	13	11	9
	4	16	15	19	16	13	11
		18	31	11	9	8	6
		36	16	12	10	8	7
		19	21	25	21	18	15
		25	17	14	11	10	8
		17	11	17	15	12	11

BEST AVAILABLE COPY

		849	763	658	578	498	445	65
	6	911	818	706	620	535	478	37
	5	396	396	393	385	372	357	40
	4	211	211	209	205	198	190	33
	3	272	272	270	265	256	245	17
	2	128	128	128	125	121	116	22
Base	1	221	221	219	215	208	199	105
		98	98	97	95	92	88	164
		185	185	184	180	174	167	82
		82	82	82	80	77	74	156
		149	149	148	145	140	134	69
		72	72	71	70	68	65	125
		5.00	5.50	6.00	6.50	7.00	7.50	8.00
		175	151	129	112	96	87	75
Top	10	225	193	165	144	126	111	97
	9	349	300	256	223	196	173	150
	8	417	359	306	267	234	207	179
	7	464	399	341	297	260	230	200
	6	514	442	377	329	288	254	221
	5	379	326	278	242	212	182	163
	4	456	392	278	292	256	226	196
	3	263	226	193	169	148	130	113
	2	282	243	207	181	158	140	121
	1	270	246	223	204	187	171	157
		144	131	119	109	100	91	84
		186	170	145	140	129	118	105
		88	80	72	66	61	56	57
		150	138	125	114	104	95	88
		66	61	55	50	46	42	39
		126	115	104	95	87	80	73
		56	51	46	42	39	36	33
Base		102	93	84	77	70	64	57
		49	45	41	37	34	31	29
		10.0	11.0	12.0	13.0	14.0	16.0	18.0
		50	41	35	30	26	20	16
Top	10	64	53	45	39	33	26	21
	9	99	82	70	60	52	40	32
	8	118	99	84	72	62	48	38
	7	131	110	93	80	69	53	43
	6	145	121	103	88	76	59	47
	5	107	90	76	65	56	44	35
	4	129	108	92	78	67	52	42
	3	74	62	53	45	39	30	24
	2	80	67	57	48	42	32	26
	1	118	103	92	81	72	59	49
		63	55	49	43	39	31	26
		81	71	63	56	50	41	34
		38	34	30	26	24	19	16
		66	58	51	45	40	33	27
		29	25	23	20	18	15	12
		55	48	43	38	34	28	23
		24	21	19	17	15	12	10
Base		44	39	35	30	27	22	18
		21	19	17	15	13	11	9
		22.0	24.0	27.0	30.0	33.0	36.0	40.0
		11	9	7	6	5	4	3
Top	10	14	12	9	8	6	5	4
	9	22	18	15	12	10	8	7
	8	26	22	18	14	12	10	8
	7	29	24	20	16	13	11	9
	6	32	27	22	18	15	12	10
	5	24	20	16	13	11	9	7
	4	28	24	19	16	13	11	9
	3	16	14	11	9	8	6	5
	2	18	15	12	10	8	7	6
	1	36	31	25	21	18	15	13
		19	16	14	11	10	8	7
		25	21	17	15	12	11	9
		12	10	8	7	6	5	4
		20	17	14	12	10	9	7
		9	8	6	5	4	3	3
Base		17	14	12	10	8	7	6
		7	6	5	4	3	3	2

BEST AVAILABLE COPY

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5.50	6.00	6.50	7.00	7.50	8.00	9.00
151	129	112	98	87	75	61
193	165	144	126	111	97	78
303	256	223	196	173	150	121
359	306	267	234	207	179	144
399	341	297	260	230	200	161
442	377	329	288	254	221	178
326	278	242	212	188	163	131
392	278	292	256	226	196	158
226	193	169	148	130	113	91
243	207	181	158	140	121	98
246	223	204	187	171	157	118
131	119	109	100	91	84	63
170	145	140	129	118	108	81
80	72	66	61	56	57	38
138	125	114	104	95	88	66
61	55	50	46	42	39	29
115	104	95	87	80	73	55
51	46	42	39	36	33	24
93	84	77	70	64	59	44
45	41	37	34	31	29	21
11.0	12.0	13.0	14.0	16.0	18.0	20.0
41	35	30	26	20	16	13
53	45	39	33	26	21	17
82	70	60	52	40	32	26
99	84	72	62	48	38	31
110	93	80	69	53	43	35
121	103	88	76	59	47	38
90	76	65	56	44	35	28
108	92	78	67	52	42	34
62	53	45	39	30	24	20
67	57	48	42	32	26	21
103	92	81	72	59	49	42
55	49	43	39	31	26	22
71	63	56	50	41	34	29
34	30	26	24	19	16	14
58	51	45	40	33	27	23
25	23	20	18	15	12	10
48	43	38	34	28	23	19
21	19	17	15	12	10	9
39	35	30	27	22	18	16
19	17	15	13	11	9	8
24.0	27.0	30.0	33.0	36.0	40.0	50.0
9	7	6	5	4	3	2
12	9	8	6	5	4	3
18	15	12	10	8	7	4
22	18	14	12	10	8	5
24	20	16	13	11	9	6
27	22	18	15	12	10	6
20	16	13	11	9	7	5
24	19	15	13	11	9	6
14	11	9	8	6	5	3
15	12	10	8	7	6	4
31	25	21	18	15	13	8
16	14	11	10	8	7	5
21	17	15	12	10	9	6
10	8	7	6	5	4	3
17	14	12	10	8	7	5
8	6	5	4	3	3	2
14	12	10	8	7	6	4
6	5	4	3	3	2	2
12	10	8	7	6	5	3
6	5	4	3	3	2	2

BEST AVAILABLE COPY

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[redacted]

LLNL

[redacted]

350

ELF

Total Yield
Fission Yield DELETED
Fallout Yield
Cloud Height 70-75 kft
Radii 2, 9 n. mi.
W fallout yield 10x Batzel's. Σ
Na etc fallout yield ½ "

SECRET

BEST AVAILABLE COPY

Dose, 1hr to 100 days, fission : 9.6
Dose, 1hr to ∞ " : 14
Dose, 1hr to 100 days, W : 16
" , 1hr to ∞ , " : 16

For (1 hr) arrival, W = 1.14 fission Dose
Total Dose = (2.14) × fission inf

Dose 2hr to 100 days, fission : 8.4
" " " ∞ " : 11
" " " 100 days, W : 15.6
" " " ∞ " W : 15.6

For (2hr) arrival, W = 1.42 fission Dose
Total Dose = (2.42) × fission Inf.

Dose 3 hr to 100 days, fission : 7.6
" " " ∞ " : 10
" 3 hr " 100 days, W : 14.8
" " " ∞ " "

For (3 hr) arrival, W = 1.48 fissi

Total Dose = (2.48) fission D
4 hr " " = 2.40
5 = 2.49
6 = 2.46
→

LLNL

351

Total Yield [redacted]
Fission Yield
Fallout Yield
Cloud Height 70-75 kft
Radii 2, 9 n. mi.
W fallout yield 10x Batzel's. ✗
Na etc fallout yield ½ "

DELETED

BEST AVAILABLE COPY

ose, 1 hr to 100 days, fission : 9.6
ose, 1 hr to ∞ " : 14
ose, 1 hr to 100 days, W : 16
" 1 hr to ∞ " : 16

For (1 hr) arrival, W = 1.14 fission Dose
Total Dose = (2.14) × fission inf Dose

Dose 2 hr to 100 days, fission : 8.4
" " " ∞ " : 11
" " " 100 days, W : 15.6
" " " ∞ " : 15.6

For (2 hr) arrival, W = 1.42 fission Dose
Total Dose = (2.42) × fission Inf. Dose

Dose 3 hr to 100 days, fission : 7.6
" " " ∞ " : 10
" 3 hr " 100 days, W : 14.8
" " " ∞ " "

For (3 hr) arrival, W = 1.48 fission Dose
Total Dose = (2.48) fission Dose
4 hr " " = 2.40 " "
5 = 2.49
6 = 2.46
7
8
9

LLNL

Cloud Height 10-15 Kft
Radii 2, 9 n. mi.
W fallout yield 10x Batzel's. Z
Na etc fallout yield X "

BEST AVAILABLE COPY

Dose, 1 hr to 100 days, fission : 9.6
Dose, 1 hr to ∞ " : 14
Dose, 1 hr to 100 days, W : 16
" , 1 hr to ∞ , " : 16

For (1 hr) arrival, W = 1.14 fission Dose
Total Dose = (2.14) × fission inf

Dose 2 hr to 100 days, fission : 8.4
" " " ∞ , " : 11
" " " 100 days, W : 15.6
" " " ∞ " W , 15.6

For (2 hr) arrival, W = 1.42 fission Dose
Total Dose = (2.42) × fission Inf.

Dose 3 hr to 100 days, fission : 7.6
" " ∞ , " : 10
" 3 hr " 100 days, W : 14.8
" " " ∞ " "

For (3 hr) arrival, W = 1.48 fission D
Total Dose = (2.48) fission Dose
4 hr " " = 2.40 " "
5 = 2.49
6 = 2.46
7
8
9
10
11
12

LLNL

F18

DELETED

K&E SEMI-LOGARITHMIC 359-91
KEUFFEL & ESSER CO. MADE IN U.S.A.
3 CYCLES X 70 DIVISIONS

LLNL

35

from 5 min.

DELETED

K+E SEMI-LOGARITHMIC 359-91
KEUFFEL & ESSER CO. MADE IN U.S.A.
5 CYCLES X 70 DIVISIONS

LLNL

DELETED

DELETED

LLNL

357

Fir.

DELETED

BEST AVAILABLE COPY

xhrs → ∞ F	Tungsten Dose x hr → ∞	Sfc Dose xhr → ∞ x3.75 for prog 2 date		F+W+S		$\beta = \frac{F+W+S}{F}$	
12.0	16.3	9.0	2.4	37.3	30.7	2.56	3.11
11.0	15.6	7.9	2.1	34.5	28.7	2.61	3.14
10.5	14.7	7.1	1.9	32.3	27.1	2.58	3.08
10.0	13.9	6.4	1.7	30.3	25.6	2.56	3.03
9.5	13.2	5.6	1.5	28.3	24.2	2.55	2.98
9.0	12.7	5.2	1.4	26.9	23.1	2.57	2.99
8.5	12.1	5.2	1.4	25.8	22.0	2.59	3.04
9.0	11.5	4.5	1.2	25.0	21.7	2.41	2.78
8.5	11.2	4.1	1.1	23.8	20.8	2.45	2.80
8.5	10.8	4.1	1.1	23.4	20.4	2.40	2.75
8.0	10.5	3.8	1.0	22.3	19.5	2.44	2.79
8.0	10.1	3.8	1.0	21.9	19.1	2.39	2.74
7.5	4.1	1.5	0.4	13.1	12.0	1.60	1.75
5.5	1.7	1.1	0.3	8.3	7.5	1.36	1.51

LLNL

Fir. [redacted]

Ecst

Total Yield
Fission Yield
Fallout Yield
Cloud Height 70-75 KFt.
Cloud Radii 2 & 9 mi

DELETED

Tungsten fallout yield :

Na etc fallout yield :

DELETED

X hr ↓	Fission Doses X hrs → 100 days	X hrs → ∞ F	Tungsten Dose X hr → ∞	Sfc Dose X hr → ∞ X3.75 for prog 2 date		F+W+S	
1	9.5	12.0	16.3	9.0	2.4	37.3	30.7
2	8.3	11.0	15.6	7.9	2.1	34.5	28.7
3	7.6	10.5	14.7	7.1	1.9	32.3	27.1
4	7.1	10.0	13.9	6.4	1.7	30.3	25.6
5	6.7	9.5	13.2	5.6	1.5	28.3	24.2
6	6.3	9.0	12.7	5.2	1.4	26.9	23.1
7	6.1	8.5	12.1	5.2	1.4	25.8	22.0
8	6.0	9.0	11.5	4.5	1.2	25.0	21.7
9	5.8	8.5	11.2	4.1	1.1	23.8	20.8
10	5.6	8.5	10.8	4.1	1.1	23.4	20.4
11	5.4	8.0	10.5	3.8	1.0	22.3	19.5
12	5.3	8.0	10.1	3.8	1.0	21.9	19.1
50	3.3	7.5	4.1	1.5	0.4	13.1	12.0
100	2.2	5.5	1.7	1.1	0.3	8.3	7.5

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[redacted]

21

LLNL

360

Observation Time	Fcst Ready	Fallout Ready	Briefing
1200	1900		
500	~~1900~~ 1915	~~2030~~ 2045	~~2115~~ 2130
800	2300		
100	0100	0230	0300
400	0400		
200	0330	0500	0530
400	0530		
600	1230	1400	1430

ull obs 45 stations

artial obs 9 stat.

termediate obs 15 stat.

ocal obs. 4 stations
Eniwetok, Bikini, Uterik, Kusae, (Maybe Skyie.)

LLNL

BEST AVAILABLE COPY

	Observation Time	Fcst Ready	Fallout Ready
*	1200	1900	
‡	1500	1915 ~~1900~~	2045 ~~2030~~
△	1800	2300	
‡	2100	0100	0230
*	2400	0400	
⊠	0200	0330	0500
⊠	0400	0530	
△	0600	1230	1400

* Full obs 45 stations

‡ Partial obs 9 stat.

△ Intermediate obs 15 stat.

⊠ Local obs. 4 stations Eniwetok, Bikini, Uterik, Kusae, C

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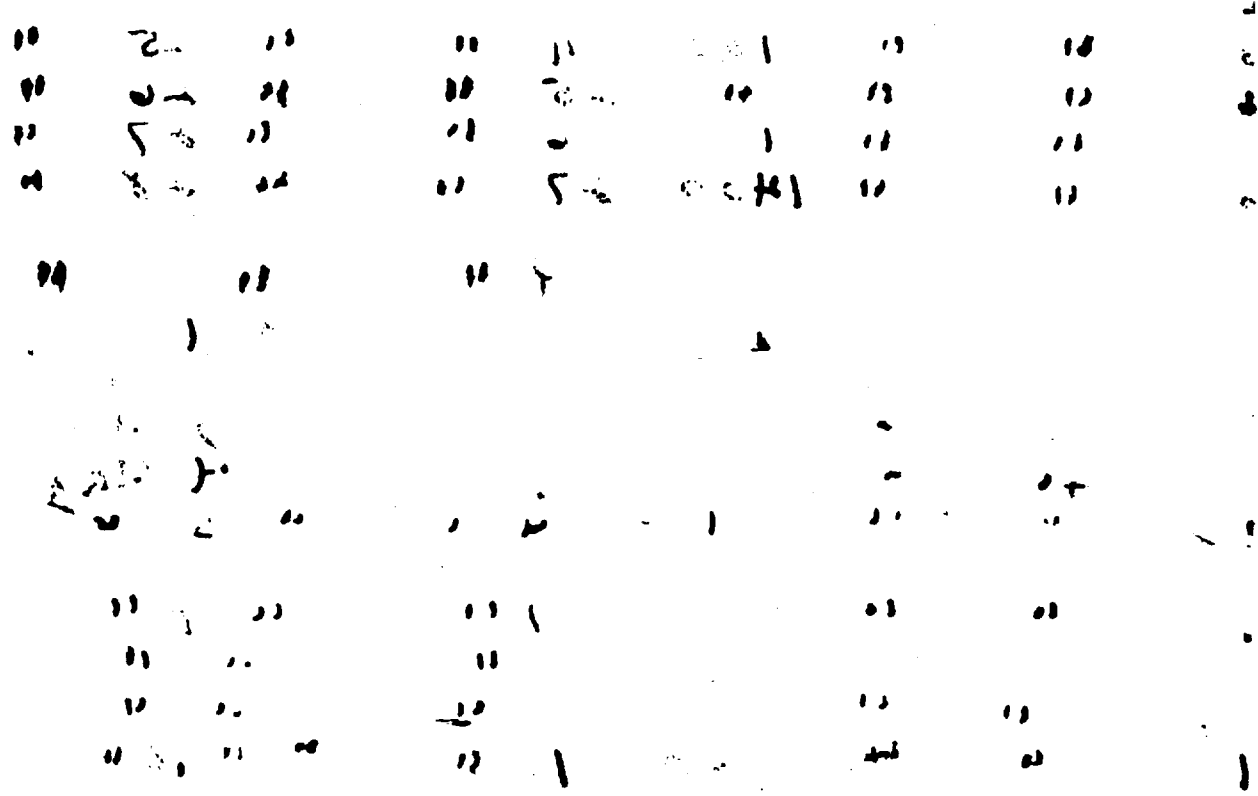
138

Yucca: Fired 1440, 28 April ~90 kft



BEST AVAILABLE COPY

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Yucca: Fired 1440, 28 April ~90 kft, ~75 mi WNE Eniwetok

BEST AVAILABLE COPY

LLNL

[redacted]

Ready date: 23 April

1	Turned	off	1430	22 April	for	23	April
2	"	"	"	23 April	"	24	"
3	"	"	2100	24 "	"	25	"
4	"	"	"	25 "	"	26	"
5	"	"	2100	26 "	"	27	"
6	"	"	1430	27 "	"	28	"
7	"	"	2100	28 "	"	29	"
8	"	"	2100	29 "	"	30	"
9	"	"	2100	30 "	"	1	May
10	"	"	0500	1 May		2	May
11	"	"	~~0430~~	~~2~~ 2 "		3	May
12	"	"	~~1430~~	~~3~~ 3 "		4	May
13	"	"	2100	4 "	"	5	"
14	"	"	1430	5 "	"	6	"
15	"	"	0300	7 "	"	7	"
16	"	"	2100	7 "	"	8	"
17	"	"	1430	8 "	"	9	"
18	"	"	0300	10 "	"	10	"

BEST AVAILABLE COPY

LLNL

[redacted]

~75mi
NE
niwetok

Fir. [redacted]

Ready date: 23 April

1	Turned	off	1430	22 April	f
2	"	"	"	23 April	"
3	"	"	2100	24 "	"
4	"	"	"	25 "	"
5	"	"	2100	26 "	
6	"	"	1430	27 "	
7	"	"	2100	28 "	
8	"	"	2100	29 "	
9	"	"	2100	30 "	
10	"	"	0500	1 May	
11	"	"	~~0430~~	2 "	
12	"	"	~~0430~~	3 "	
13	"	"	2100	4 "	"
14	"	"	1430	5 "	"
15	"	"	0300	7 "	"
16	"	"	2100	7 "	
17	"	"	1430	8 "	
18	"	"	0300	10 "	

BEST AVAILABLE COPY

LLNL

[redacted]

BEST AVAILABLE COPY

LLNL

actus

[redacted]

Fallout yield DELETED
Cloud Ht 30 kft
Radii 0.5/2

1 Turned off 0300/29 April for 30 April
2 " " 2100/30 " " 1 May ← Bomb Brok
3 " " 0600 3 May " 3 May
4 " " 0500 4 May " 4 May
~~5~~
5 " " 2100 4 May " 6 May

BEST AVAILABLE COPY

[redacted]

142

Koa

Total yield [redacted]
Fission "
Fallout " DELETED
Cloud height "
Radii 2!10mi, n.

BEST AVAILABLE COPY

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Butternut

Total yield [redacted]

Fallout "

Cloud height 35-56 kft

Radii 1:4 n mi

Turned off 0300 10 MAY for 0600 10 MAY

DELETED

BEST AVAILABLE COPY

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[redacted]

144

[redacted] Calc Surface Dose

5.5 R if FIR

4.1 R if KOA

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Fallout, Parry Island . Court in compound.

Date	Rate mr/hr	Time	5/12/0550 Fir-Butternut +	7/12/0615
May 13	0.02	1530	33.67	34.08
May 14	12	0800	50.16	50.58
	12	0815	50.42	50.83
	13	0830	50.67	51.08
	13	0845	50.92	51.33
	14	0900	51.17	51.58
	14	0915	51.42	51.83
	15	0930	51.67	52.08
	15	0945	51.92	52.33
	16	1000	52.17	52.58
	15	1015	52.42	52.83
	17	1030	52.67	53.08
	15	1045	52.92	53.33
	15	1100	53.17	53.58
	15	1115	53.42	53.83
	17	1155	54.09	54.50
	18	1215	54.42	54.83
	18	1230	54.67	55.08
	19	1245	54.92	55.33
	17	1300	55.17	55.58
	19	1345	55.92	56.33
	18	1430	56.67	57.08
	18	1530	57.67	58.08
	14	1630	58.67	59.08
	18	1945	61.92	62.33
	17	2140	63.84	64.25
May 15	15	0715	74.42	74.83
	15	0830	75.67	76.08
	15	0940	76.83	77.24
	14	1055	78.08	78.49
	14	1135	78.75	79.16
	13	1335	80.75	81.16
	11	1405	81.25	81.66
	12	1440	81.83	82.24
	11	1500	82.16	82.57
	11	1530	82.66	83.07
	12	1630	83.66	84.07
			DH 11	DH 57

BEST AVAILABLE COPY

[redacted]

5/1:

hrs

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372

oot, Parry Island, Court in Compound.

	Rate mr/hr	Time	5/12/0550 Fir-Butternut +	5/12/0615	hrs	5/13/0630 Koa +
3	0.02	1530	33.67	34.08		9.00
4	12	0800	50.16	50.58		25.50
	12	0815	50.42	50.83		25.75
	13	0830	50.67	51.08		26.00
	13	0845	50.92	51.33		26.25
	14	0900	51.17	51.58		26.50
	14	0915	51.42	51.83		26.75
	15	0930	51.67	52.08		27.00
	15	0945	51.92	52.33		27.25
	16	1000	52.17	52.58		27.50
	15	1015	52.42	52.83		27.75
	17	1030	52.67	53.08		28.00
	15	1045	52.92	53.33		28.25
	15	1100	53.17	53.58		28.50
	15	1115	53.42	53.83		28.75
	17	1155	54.09	54.50		29.42
	18	1215	54.42	54.83		29.75
	18	1230	54.67	55.08		30.00
	19	1245	54.92	55.33		30.25
	17	1300	55.17	55.58		30.50
	19	1345	55.92	56.33		31.25
	18	1430	56.67	57.08		32.00
	18	1530	57.67	58.08		33.00
	14	1630	58.67	59.08		34.00
	18	1945	61.92	62.33		37.25
	17	2140	63.84	64.25		39.17
	15	0715	74.42	74.83		49.75
	15	0830	75.67	76.08		51.00
	15	0940	76.83	77.24		52.16
	14	1055	78.08	78.49		53.41
	14	1135	78.75	79.16		54.08
	13	1335	80.75	81.16		56.08
	11	1405	81.25	81.66	LLNL	56.58
	12	1440	81.83	82.24		57.16
	11	1500	82.16	82.57		57.49
	11	1530	82.66	83.07		57.99
	12	1630	83.66	84.07		58.99
	12	1700	84.16	84.57		59.49
6	9	0755	99.08	99.49		74.41
						75.49

BEST AVAILABLE COPY

BEST AVAILABLE COPY

May 13				
May 14	12	0800	50.16	50.58
	12	0815	50.42	50.83
	13	0830	50.67	51.08
	13	0845	50.92	51.33
	14	0900	51.17	51.58
	14	0915	51.42	51.83
	15	0930	51.67	52.08
	15	0945	51.92	52.33
	16	1000	52.17	52.58
	15	1015	52.42	52.83
	17	1030	52.67	53.08
	15	1045	52.92	53.33
	15	1100	53.17	53.58
	15	1115	53.42	53.83
	17	1155	54.09	54.50
	16	1215	54.42	54.83
	18	1230	54.67	55.08
	19	1245	54.92	55.33
	17	1300	55.17	55.58
	19	1345	55.92	56.33
	18	1430	56.67	57.08
	18	1530	57.67	58.08
	14	1630	58.67	59.08
	18	1945	61.92	62.33
	17	2140	63.84	64.25
May 15	15	0715	74.42	74.83
	15	0830	75.67	76.08
	15	0940	76.83	77.24
	14	1055	78.08	78.49
	14	1135	78.75	79.16
	13	1335	80.75	81.16
	11	1405	81.25	81.66
	12	1440	81.83	82.24
	11	1500	82.16	82.57
	11	1530	82.66	83.07 LLNL
	12	1630	83.66	84.07
	12	1700	84.16	84.57
May 16	9	0755	99.08	99.49
	10	0900	100.16	100.57
	8	1210	103.32	103.73
May 17	7	0730	122.74	123.15 374
	7	1020	125.58	125.99

0.02	1530	33.67	34.08	1.00
12	0800	50.16	50.58	25.50
12	0815	50.42	50.83	25.75
13	0830	50.67	51.08	26.00
13	0845	50.92	51.33	26.25
14	0900	51.17	51.58	26.50
14	0915	51.42	51.83	26.75
15	0930	51.67	52.08	27.00
15	0945	51.92	52.33	27.25
16	1000	52.17	52.58	27.50
15	1015	52.42	52.83	27.75
17	1030	52.67	53.08	28.00
15	1045	52.92	53.33	28.25
15	1100	53.17	53.58	28.50
15	1115	53.42	53.83	28.75
17	1155	54.09	54.50	29.42
18	1215	54.42	54.83	29.75
18	1230	54.67	55.08	30.00
19	1245	54.92	55.33	30.25
17	1300	55.17	55.58	30.50
19	1345	55.92	56.33	31.25
18	1430	56.67	57.08	32.00
18	1530	57.67	58.08	33.00
14	1630	58.67	59.08	34.00
18	1945	61.92	62.33	37.25
17	2140	63.84	64.25	39.17
15	0715	74.42	74.83	49.75
15	0830	75.67	76.08	51.00
15	0940	76.83	77.24	52.16
14	1055	78.08	78.49	53.41
14	1135	78.75	79.16	54.08
13	1335	80.75	81.16	56.08
11	1405	81.25	81.66	56.58
12	1440	81.83	82.24	57.16
11	1500	82.16	82.57	57.49
11	1530	82.66	83.07	57.99
12	1630	83.66	84.07	58.99
12	1700	84.16	84.57	59.49
9	0755	99.08	99.49	74.41
10	0900	100.16	100.57	75.49
8	1210	103.32	103.73	78.65
7	0730	122.74	123.15	98.07
7	1020	125.58	125.99	100.91

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[redacted]

Date	Rate	Time	Fir - Butterwort	Koa
May 17	4.3	2015	134.11 [illegible]	110.[illegible]
May 18	4.3	0850	147. 146.58	123
	3.5	1445	153	128
	3.5	1510	153	128
	3.2	2240	160	135
May 19	3.2 ~~4.10~~	0815	170	145
	3.4	0940	172	147
	3.5	1120	173	148

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Fir

	F	W	Na
"Dose" ratios	70	120	70
	1	1.5	.98
Batzel's ratios	1	.56	.45
Mult B's curves X:	1	2.68	1.96

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B: Time, hr	F	W	Na
10	2650	3550	2820
20	1260	2370	1780
50	445	1060	445
100	178	237	31.5
200	75	14.1	2.0
500	25	.57	.18
30	850	1780	1200
70	265	600	133
280	44	2.7	.76

Fir:	F
	2650
	1260
	445
	178
	75
	25
	850
	265
	44

	F	W	Na
"close" ratios	70	120	70
	1	1.5	.78
Tyel's ratios	1	.56	.45
B's curve X:	1	2.68	1.96

[redacted]

br F	W	Na
2650	3550	2820
1260	2370	1780
445	1060	445
178	237	31.5
75	14.1	2.0
25	.57	.18
850	1780	1200
265	600	133
44	2.7	.76

Fir: F	W	Na	Σ
2650	9514	5527	17,69
1260	6352	3489	11,101
445	2841	872	4158
178	635	62	875
75	38	3.9	117
25	65	.35	27
850	4770	2352	7972
265	1608	261	2134
44	7.2	1.5	53

BEST AVAILABLE COPY

[redacted]

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	N	N'
0	8	0
.1 - .19	4	2
.2 - .29	22	4
.3 - .39	27	6
.4 - .49	28	5
.5 - .59	28	6
.6 - .69	24	5
.7 - .79	27	0
.8 - .89	31	1
.9 - .99	9	2
1 - 1.09	4	0
1.1 - 1.19	5	0
1.2 - 1.29	2	2
1.3 - 1.39	0	0
1.4 - 1.49	2	1
1.5 - 1.59	1	0
> 1.6	3	0

[redacted]

Total ave = 138.92 / 225 = 0.6

ave = 18.59 / 34 = 0.54

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BEST AVAILABLE COPY

.35	.67	.40	.62
.40 ✓	.94	.56	.82
1.28 ✓	.83	.33 ✓	.51
.80 ✓	.92	.25	.77
.82	.42	.24	.22
.56	.27 ✓	.29	.45
.12	.81	.45	.43
.75	.94 ✓	1.04	.64
.57	.13 ✓	.33 ✓	.77
.42	.28	.33 ✓	.52
.49 ✓	.37	1.18	.81
.54	1.48 ✓	.81	.49
0	.28 ✓	.50	.64
.60	.87	0	.49
.74	.87	.28	.74
.58 ✓	.32	.24	.25
.76	.73	0	.91
.83	.74	0	1.40
.83	.60 ✓	.48 ✓	.74
0	.35	.44 ✓	.51
0	.72	.56 ✓	.62
.65 ✓	1.13	.87	.86
.96	.52	.24 ✓	.77
.44	.95	.61	.78
.85	0	.56	.82
.50 ✓	.64	.62 ✓	.90
.53 ✓	.27	.44	.77
.56	.44	.49	.59
.73	.50 ✓	.67 ✓	.56
.68	.60	.36 ✓	.86
.88	1.18	.90 ✓	.22
.40	.38	.44 ✓	.82
.32	1.19	.72	.89
.50	.89	.55	5.11
.85	.30	.68 ✓	.88
.43	.31 ✓	.30	LLNL .75
.83	.32 ✓	.50 ✓	1.83
.54	.80	.35	.84
.63	.34	.74	.55
.12	.89	2.33	.34
.27 ✓	.62	.78	.39
.72	1.27 ✓	.47	1.14
			.40

BEST AVAILABLE COPY

.67	.40	[illegible]	.70
.94	.56	.82	.31
.83	.33 ✓	.51	.37
.92	.25	.77	.46
.42	.24	.22	.96
.27 ✓	.29	.45	.38
.81	.45	.43	.26
.94 ✓	1.04	.64	.60
.13 ✓	.33 ✓	.77	.31
.28	.33 ✓	.52	.30
.37	1.18	.81	.29
1.46 ✓	.81	.49	.34
.28 ✓	.50	.64	.47
.87	0	.49	.60
.87	.28	.74	.44
.32	.24	.25	.56
.73	0	.91	.60
.74	0	1.40	.29
.60 ✓	.48 ✓	.74	.25
.35	.44 ✓	.51	0
.72	.56 ✓	.62	.28
1.13	.87	.86	1.02
.52	.24 ✓	.77	.50
.95	.61	.78	.25
0	.56	.82	.43
.64	.62 ✓	.90	1.08
.27	.44	.77	.50
.44	.49	.59	.25
.50 ✓	.67 ✓	.56	.26
.60	.36 ✓	.86	.70
1.18	.90 ✓	.22	.72
.38	.44 ✓	.82	.72
1.19	.72	.89	1.56
.89	.55	5.11	.49
.30	.68 ✓	.88	.67
.31 ✓	.30	.75	.63
.32 ✓	.50 ✓	1.83	.85
.80	.35	.84	.73
.34	.74	.55	.73
.89	2.33	.34	.33
.62	.78	.39	.82
[illegible]	[illegible]	[illegible]	[illegible]

LLNL

[redacted]

.82	.42	.24	.22
.56	.27 ✓	.29	.45
.12	.81	.45	.43
.75	.94 ✓	1.04	.64
.57	.13 ✓	.33 ✓	.77
.42	.28	.33 ✓	.52
.49 ✓	.37	1.18	.81
.54	1.48 ✓	.81	.49
0	.28 ✓	.50	.64
.60	.87	0	.49
.74	.87	.28	.74
.58 ✓	.32	.24	.25
.76	.73	0	.91
.83	.74	0	1.40
.83	.60 ✓	.48 ✓	.74
0	.35	.44 ✓	.51
0	.72	.56 ✓	.62
.65 ✓	1.13	.87	.84
.96	.52	.24 ✓	.77
.44	.95	.61	.78
.85	0	.56	.82
.50 ✓	.64	.62 ✓	.90
.53 ✓	.27	.44	.77
.56	.44	.49	.59
.73	.50 ✓	.67 ✓	.56
.68	.60	.36 ✓	.86
.88	1.18	.90 ✓	.22
.40	.38	.44 ✓	.82
.32	1.19	.72	.89
.50	.89	.55	5.11
.85	.30	.68 ✓	.88
.43	.31 ✓	.30	.75
.83	.32 ✓	.50 ✓	1.83
.51	.80	.35	.84
.63	.34	.74	.55
.12	.89	2.33	.34
.27 ✓	.62	.78	.39
.72	1.27 ✓	.47	1.14
.66	1.01	.85	.49
.60	.11 ✓	.44	.58
.32	.35	.48	.58

BEST AVAILABLE COPY

LLNL

.42	.47	.22	.76
.27 ✓	.29	.45	.38
.81	.45	.43	.26
.94 ✓	1.04	.64	.60
.13 ✓	.33 ✓	.77	.31
.28	.33 ✓	.52	.30
.37	1.18	.81	.29
1.46 ✓	.81	.49	.34
.28 ✓	.50	.64	.47
.87	0	.49	.60
.87	.28	.74	.44
.32	.24	.25	.56
.73	0	.91	.60
.74	0	1.40	.29
.60 ✓	.48 ✓	.74	.25
.35	.44 ✓	.51	0
.72	.56 ✓	.62	.28
1.13	.87	.86	1.02
.52	.24 ✓	.77	.50
.95	.61	.78	.25
0	.56	.82	.43
.64	.62 ✓	.90	1.08
.27	.44	.77	.50
.44	.49	.59	.25
.50 ✓	.67 ✓	.56	.26
.60	.36 ✓	.86	.70
1.18	.90 ✓	.22	.72
.38	.44 ✓	.82	.72
1.19	.72	.89	1.56
.89	.55	5.11	.49
.30	.68 ✓	.88	.67
.31 ✓	.30	.75	.63
.32 ✓	.50 ✓	1.83	.85
.80	.35	.84	.73
.34	.74	.55	.73
.89	2.33	.34	.33
.62	.78	.39	.82
1.27 ✓	.47	1.14	.85
1.01	.85	.48	.78
.11 ✓	.44	.58	.86
.35	.48	.58	.72

BEST AVAILABLE COPY

LLNL

[redacted]

LLNL