

RESTRICTED DATA

ATOMIC ENERGY ACT OF 1946
SPECIFIC RESTRICTED DATA DISCLOSURE REQUIRED

Copy No. 2 of 3 Copies, Series

H-1 LB-2 p62

CONSOLIDATED CLOUD TOP DATA

(All heights are in thousands of feet MSL)

U. S. Weather Bureau,
Washington 25, D. C.10-25-55
W.G. S.P.-LQ

126452

RG 326 US ATOMIC ENERGY
COMMISSION

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H-Div. Current Files

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10/3/83
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Series and Shot Number	Maximum cloud height observed associated with period of initial rapid rise	Other cloud heights observed at or subsequent to time of stabilization	Absolute cloud height observed	Observation, Time, in minutes after burst time	Method of observation	Source of data	
TRAPOT 1	21.5		21.5		8.0 Photo. EG&G		Fpo (Final point of observation) One camera and cloud drift correction used. Cloud still rising.
18 Feb 55	18.1		18.3		4.0 Theod. Proj 9.4		
1.2			17.5		5.0 " "		Fpo. Cloud still rising.
			18.0		15.0 Airoft		Some peaks to 20,000' observed.
2	24.2		24.2		8.0 Photo. EG&G		Two cameras in good agreement. Cloud drift corrections used.
22 Feb 55		22.8			20.0 " "		Fpo. Cloud leveling off. Cameras not in such good agreement.
	24.7		24.7		4.5 Theod. Proj 9.4		
2.5		23.6			9.5 " "		Fpo. Cloud top leveling off.
		24.9			10.0 Airoft		
		24.0			20.0 " "		
3	30.3		30.3		8.5 Photo. EG&G		Two cameras in good agreement and cloud drift correction used.
17 May 55		27.7			3.0 " "		Fpo. Cloud top rising slowly after sinking to 26,000' at 18 mins.
	30.4		30.4		9.0 Theod. Proj 9.4		Agrees well with photo data.
7		29.2			12.0 " "		Fpo. Cloud top sinking slowly.
		30.0			8.0 Airoft		
		27.0			49.0 " "		

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45.0			10.0 Photo. EG&G	Cloud drift correction used but two cameras not in good agreement. Fpo. Cloud top leveling off.
7 Mar 55	43.0		21.0 " "	
	44.6		6.5 Theod. Proj 9.4	
		47.0 47.0	10.0 " "	Fpo. Data doubtful due to drift and increase in size of mushroom.
	43	40.5	30.0 Airoft "	
		41.0	100.0 " "	
5	37.0		14.0 Photo. EG&G	Two cameras in fair agreement. Cloud drift correction used. Fpo. Cloud top leveled off. Agrees well with photo. Fpo. Height doubtful. Cloud top still rising. Sole observation.
12 Mar 55	37.5	37.5	30.0 " "	
	37.5		14.0 Theod. Proj 9.4	
		39.6 39.6	19.5 " "	
	3.6	36.0	37.0 Airoft "	
6	40.0	40.0	13.5 Photo. EG&G	Cloud drift correction used and two cameras in fair agreement. Fpo. Cloud top leveling off. Fpo. Cloud still rising. Very doubtful due to drift toward observer. Agrees with photo data.
22 Mar 55		39.0	24.0 " "	
		54.3	15.0 Theod. Proj 9.4	
	8.4	40.0	15.0 Airoft "	
		38.4 39.2	13.0 Airoft "	
7			Photo. EG&G	No data taken for this shot.
23 Mar 55	11.6	11.6	5.5 Theod. Proj 9.4	
		9.2	11.5 " "	Fpo. Cloud top sinking slowly. Agrees well with theodolite data.
		12.0	10.0 Airoft "	
	1.2 Efb	10.5	12.0 " "	
8	32.1		10.0 Photo. EG&G	Cloud drift correction used and two cameras in fair agreement. Fpo. Cloud top rising after sinking to 31,200' at 17 mins. Disagreement with photo data is opposite to the usual sense, perhaps due to wind shear. Fpo. Cloud top fluctuating at about 30,000'.
29 Mar 55 0455 PST		32.8 32.8	26.0 " "	
		30.4	9.0 Theod. Proj 9.4	
		29.8	15.0 " "	
	15.5	31.2	10.0 Airoft "	
		30.7 29.0	17.0 " "	
			30.0 " "	
9			Photo. EG&G	None, due to overexposure of film. Fpo. Cloud top still rising. Does not agree with theodolite.
29 Mar 55 PST	31.7	31.7	10.0 Theod. Proj 9.4	
		27.5	10.0 Airoft "	
		31.5	17.0 " "	
		28.7	24.0 " "	

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210	55.0	55.0	4.3 Photo. EG&G	Fpo. One camera observation. Cloud leveled and dissipating. Data for edge of torous ring, perhaps doubtful. Does not agree with photo data.
6 Apr 55		54.8	7.0 Theod. Proj 9.4	
	52.1-		4.0 " "	
3.2	60.0-	65.0	8.0 Aircraft "	Aircraft well below estimated height.
11	15.2	15.2	6.0 Photo. EG&G	Cloud drift correction used and two cameras in fair agreement. Fpo. Cloud top leveled off. Agrees well with photo data.
9 Apr 55		15.1	13.0 " "	
	15.5		6.5 Theod. Proj 9.4	
		15.7	8.0 " "	
	14.6		9.0 " "	Fpo. This point doubtful. Cloud top apparently leveled at 15,500'. Agrees well with photo and theodolite data.
		15.2	12.0 Aircraft "	
1.5		15.0	15.0 " "	
		15.0	30.0 " "	
12	40.2	40.2	8.0 Photo. EG&G	Cloud drift corrections used and four camera films in good agreement. Fpo. Cloud top leveled off.
15 Apr 55		39.5	14.0 " "	
	41.2		8.0 Theod. Proj 9.4	
		41.5	11.0 " "	Fpo. Cloud top rising slowly after sinking to 41,000' at 9 mins.
	41.5-		11.0 Aircraft "	Agrees well with theodolite data.
24		41.7	23.0 " "	
		41.7	32.0 " "	
		42.8		
13	43.0	43.0	9.5 Photo. EG&G	Cloud drift correction used and two cameras in good agreement. Fpo. Cloud top leveling off. Fpo. Cloud top still rising steadily. Data doubtful after 5 mins
5 May 55		42.0	30.0 " "	
		51.0	14.0 Theod. Proj 9.4	
30		40.5	15.0 Aircraft "	
14	35.8	35.8	5.0 Photo. EG&G	Cloud drift correction used and two camera s in good agreement. Cloud top steady for 4 mins after sinking to 34,600' at 7 mins. Fpo. Cloud top sinking slowly. Data inconsistent with Photo data after 3 mins. Fpo. Cloud top leveling off. Data very doubtful.
15 May 55		35.0	9.0 " "	
		34.0	16.5 " "	
	39.9		5.5 Theod. Proj 9.4	
		40.9	12.5 " "	
29		37.2	15.0 Aircraft "	

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18 Apr 53	6	35.0	35.0	32.7	NYO-4602-AEC	Two cameras in fair agreement.
				35.0	7.0 Photo. EG&G	Fpo. Cloud top remaining level.
		37.0	37.0	37.0	10.0 " "	Taken from unidentified graphs.
		36.5	34.2	34.2	11.0 Unk Unk	Fpo. " " "
		32.8	37.3	37.3	12.0 " "	Banger CP smoothed data.
					7.0 Theod. Newgarden	Fpo. Cloud top sinking gradually.
					15.0 " "	Fpo. Cloud top still rising.
					11.0 " "	CP smoothed data.
				36.0	R-265-AEC	Source references, UKP-50 Proj 6.12, ARDC C-36417
25			32.0-			
			36.0		Theod. EM-1378-AEC	Source reference, WT-705
			37.2		Aircraft Newgarden	Source, Col. Packler's aircraft rpts.
25 Apr 53	7	45.0	45.0	45.0	6.0 Photo. EG&G	Based on only one camera.
					10.0 " "	Fpo. Cloud top level 6 thru 10 min
		44.0	44.0	44.0	10.0 Unk Unk	Taken from unidentified graphs --
		45.5	45.5	45.5	14.0 Theod. Newgarden	Fpo. Cloud top still rising.
						Fpo. Smoothed data. Cloud top still rising.
				45.0	R-265-AEC	Source references, UKP-50 proj 6.12, ARDC C-36417
			42.0-			
			45.0		Theod. EM-1378-AEC	Source reference, WT-705
		43.0			Aircraft Newgarden	
			45.0		" "	
			43.2		NYO-4602-AEC	
8 May 53	8	42.0	42.0	42.0	8.0 Photo. EG&G	Based on only one camera.
					10.0 " "	Fpo. Cloud top leveled off.
		42.5	42.5	42.5	12.0 Unk Unk	Taken from unidentified graphs.
		42.0	43.0	43.0	13.0 " "	Fpo. " " "
					13.0 Theod. Newgarden	Fpo. Smoothed data from intersection of Mercury and #93 Highway.
						Cloud top leveling off.
		40.5	40.5	40.5	13.0 " "	Fpo. Smoothed data from base camp.
						Cloud top leveling off.
				42.0	R-265-AEC	Source references, UKP-50 Proj 6.12, ARDC C-36417
			38.0-			
			42.0		Theod. EM-1378-AEC	Source reference, WT-705
			40.5		Aircraft Newgarden	
			40.5		NYO-4602-AEC	
19 May 53	9	42.5	42.5	42.5	11.0 Unk Unk	Taken from unidentified graphs.
					12.0 " "	Fpo. Cloud top leveling off.
		41.8	41.8	41.8	9.0 Theod. Newgarden	Smoothed data.
		40.8			11.0 " "	Fpo. " " " Cloud top sinking steadily.
				42.0	R-265-AEC	Source references, UKP-50 Proj 6.12, ARDC C-36417
			41.0-			
			42.5		Theod. EM-1378-AEC	Source reference, WT-705
		35.0			Aircraft Newgarden	
			44.0		" "	
			44.2		NYO-4602-AEC	

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3 41.9 41.9			7.0 Airoft WT-552	
22 Apr 52	39.0		" WT-568	
	40.0		" Newgarden	
		42.0	" Grossman	
		42.5	R-265-AEC	Source reference, WT-514
31		42.0	Photo. RM-1378-AEC	Source references, R-265-AEC, WT-552
	43.0	43.0	7.0 " R-265-AEC EGG	(Graph p.21) Fpo. Top leveled off.
1 May 52	4 43.5 43.5		9.5 Theod. WT-552	
		42.0	15.0 " "	Fpo. Cloud top sinking and leveling off.
			Airoft WT-568	
		42.5	R-265-AEC	Source reference, WT-514
		39.0	Photo RM-1378-AEC	Source references, R-265-AEC, WT-552
20		40.0	7.0 " R-265-AEC EGG	(Graph p.20) Fpo. Top leveling off.
	41.0	41.0		
7 May 52	5 33.2		8.0 Theod. WT-552	Initial rapid rise was slowed down temporarily at 25-26,000'.
		34.0	15.0 " "	Fpo. Cloud top leveled off.
		32.0	Airoft WT-568	
		31.4	R-265-AEC	Source references, AFSWP-501, WT-564
		26.0	Theod. RM-1378-AEC	Source reference, WT-552. This is a different interpretation of one and the same data.
25 May 52	6 41.2 41.2		7.5 Theod. WT-552	
		40.0	10.0 " "	Fpo. Cloud top sinking and leveling off.
		39.5	Airoft WT-568	
		39.5	R-265-AEC	Source references, AFSWP-501, WT-564
		41.0	Theod. RM-1378-AEC	Source reference, WT-552
1 Jun 52	7 36.9 36.9		6.0 Theod. WT-552	
		35.8	10.0 " "	Fpo. Cloud top leveled off.
		40.0	Airoft WT-568	
		41.5	R-265-AEC	Source references, AFSWP-501, WT-564
		36.0	Theod. RM-1378-AEC	Source reference, WT-552
5 Jun 52	8 40.0 40.0		10.0 Theod. WT-552	Fpo. Cloud top still rising steadily.
		41.0	Airoft WT-568	
		37.0	R-265-AEC	Source references, AFSWP-501, WT-564
		35.0-	Theod. RM-1378-AEC	Source reference, WT-552
		40.0		

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BUSTER 1 22 Oct 51 ~15g	8.0	10.0	6.0 Theod. WT-308	Details uncertain Cloud height variable presumably due to orographic effects. Aircraft operating at 7,500'. Source references, AFSWP-501, WT-412, WT-308
		8.4 8.0	80.0 Airoft WT-422 R-265-AEC	
2 22 Oct 51 3.48	23.0	23.0	8.0 Photo. EGG WT-417	Fpo. Cloud top still rising slowly. Single camera and cloud drift correction used.
		31.7	15.0 Theod. WT-308	
	29.0	29.0	7.0 Photo. R-265-AEC-EGG	(Graph, p. 18) Fpo. Cloud top still rising slowly.
		31.7	R-265-AEC	Source references, AFSWP-501, WT-412, WT-308
		25.0 20.0- 25.0	50.0 Airoft WT-422 Photo. EM-1378-AEC	Aircraft at 24,500'. Source reference, R-265-AEC. Different. xxxxxxxxxx interpreta- tion of one and the same source.
3 10 Oct 51 14.11	40.0	40.0	9.0 Photo. EGG WT-417	Fpo. Cloud top still rising slowly. Single camera & drift cor- rections used.
		41.0	12.0 * WT-308	* Best estimate based on theodolite and aircraft observation
	43.0	43.0	7.0 Photo. R-265-AEC EGG	(Graph, p. 18) Fpo. Cloud top leveling off slowly.
		32.0	Airoft WT-422	Maximum of aircraft 29,000'.
		41.0	R-265-AEC	Source references, AFSWP-501, WT-412, WT-308
4 1 Nov 51 20.94	37.0	37.0	7.5 Photo. R-265-AEC EGG	(Graph, p. 19) Fpo. Cloud top still rising.
	40.0	40.0	8.0 Photo. EGG WT-417	Fpo. Cloud top still rising. Single camera and cloud drift corrections used.
		46.0	Theod. WT-308	
		41.0	110.0 Airoft WT-422	Aircraft at 41,000'.
		46.0	R-265-AEC	Source references, AFSWP-501, WT-412, WT-308
5 5 Nov 51	49.5	49.5	8.0 Photo. R-265-AEC-EGG	(Graph p. 19) Fpo. Cloud top still rising slowly.
	49.5	49.5	9.0 Photo. EGG WT-417	Fpo. Cloud top leveled off. Lower limit of probable height of top 46,000'.
	50.0	50.0	12.0 Theod. WT-308	Nellis APB Data.

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5 (cont'd)		42.0 50.0 45.0	130.0 Aircraft WT-422 R-265-AEC Photo. RM-2578-AEC	Aircraft at 40,000'. Source references, AFSWP-501, WT-412, WT-308. Source reference, R-265-AEC Apparently a special inter- pretation of the same source.
JANGLE 1-S 19 Nov 51	16.0 12.0 15.0	16.0 15.0 15.0 15.0	5.0 Photo. EGG WT-417 9.0 " " " 5.0 Theod. WT-308 R-265-AEC RM-1378-AEC	Fpo. Cloud top sinking slowly. Source references, WT-308, AFSWP final draft of report on Operation Jangle-Aug 1, 1952. Source references, R-265-AEC, WT-308
2-U 29 Nov 51	11.5 10.3	13.0 10.3 10.3	5.0 Photo. EGG WT-417 9.0 " " " 4.5 Theod. WT-308 R-265-AEC	Fpo. Cloud top rising steadily. Small cloud projection to 10,500' at 6.5 mins. Source references, WT-308, AFSWP final draft of report on Operation Jangle- Aug 1, 1952.
GREENHOUSE 1 7 Apr 51		56.0 52.0- 55.0 56.0	R-265-AEC Photo. RM-1378-AEC Theod. AFSWP-501	Source reference, AFSWP-501 " " , Greenhouse Annex 4.1, Part II-1951
2 20 Apr 51	42.0	40.0 43.5 40.0	R-265-AEC 7.0 Photo. R-265-AEC 9.5 " " RM-1378-AEC	Source reference, AFSWP-501 (Graphs, p. 17) Cloud top apparently leveling off. Fpo. Data doubtful. Source ref. Greenhouse Source references, R-265-AEC, Greenhouse Annex 4.1, Part II-1951
3 8 May 51	56.0	57.0 60.0 57.0	R-265-AEC 6.0 Photo. R-265-AEC 8.0 " " RM-1378-AEC	Source reference, AFSWP-501 (Graphs, p. 17) Source ref. Greenhouse Fpo. Data doubtful. Source ref. Greenhouse Source references, R-265-AEC, Greenhouse Annex 4.1, Part II-1951
4 24 May 51		40.0 35.0- 40.0	R-265-AEC Theod. RM-1378-AEC	Source reference, AFSWP-501 Source reference, Greenhouse Annex 4.1, Part II-1951

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RANGER			
1	16.0	4.0 Theod. Kent&Holzman	Fpo. Cloud top leveled off.
27 Jan 51	17.0	R-265-AEC	Source references, AFSWP-501, WT-202
	17.0	Theod. RM-1378-AEC	Source references, WT-202, WB report on Operation Ranger.
	17.0	Aircraft WT-202	Aircraft 1000' above cloud.
1.27			
2	35.0	5.0 Theod. Kent&Holzman	Fpo.
28 Jan 51	35.0	R-265-AEC	Source references, AFSWP-501, WT-202
	35.0	Theod. RM-1378-AEC	Source references, WT-202, USWB report on Operation Ranger.
	34.0-35.0	Aircraft WT-202	Aircraft at 18-20,000'.
1.48			
3	12.5	Theod. Kent&Holzman	No details available.
1 Feb 51	12.0	R-265-AEC	Source references, AFSWP-501, WT-202
	12.0	Theod. RM-1378-AEC	Source references, WT-202, USWB report on Operation Ranger.
4	28.0	Theod. Kent&Holzman	No details available.
2 Feb 51	36.0	R-265-AEC	Source references, AFSWP-501, WT-202
	36.0	Theod. RM-1378-AEC	Source references, WT-202, USWB report on Operation Ranger.
5	42.0	Theod. Kent&Holzman	No details available
6 Feb 51	42.0	R-265-AEC	Source references, AFSWP-501, WT-202
	42.0	Theod. RM-1378-AEC	Source references, WT-202, USWB report on Operation Ranger.
	43.0	Aircraft WT-202	Aircraft at 18-20,000'.
2.2			

** Note - The USWB report on Operation Ranger, referred to by RM-1378-AEC, specifically states that cloud heights were determined by aircraft and not by theodolite as implied by RM-1378-AEC.

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SANDSTONE

1	56.0	56.0	12.5	Theod. Humphrey Rpt	Fpo. Cloud top still rising.
		45.0-			
13 Apr 48		56.0		R-265-AEC	Source references, Annex 1, OS-10, Annex 10, OS-35, AFSWP-501
	36.6	45.0		Theod. HM-1378-AEC	Source reference Humphrey Rpt, data doubtful.
2	56.0	56.0	12.0	Theod. Humphrey Rpt	Fpo. Cloud top still rising.
		43.0-			
30 Apr 48		56.0		R-265-AEC	Source references, Annex 1, OS-10, Annex 10, OS-35, AFSWP-501
	47.7	43.0		Theod. HM-1378-AEC	Source reference, Humphrey Rpt, data doubtful.
3	28.5	33.0	8.0	Theod. Humphrey Rpt	Main cloud leveled off.
			12.0	"	Fpo. Only part of cloud rose to this level.
14 May 48		28.0-			
		33.0		R-265-AEC	Source references, Annex 1, OS-10, Annex 10, OS-35, AFSWP-501
		28.0		Theod. HM-1378-AEC	Source references, Humphrey Rpt, data doubtful.

** Note - HM-1378-AEC doubts the value of data beyond the 6th or 7th minute after burst hence the lower height values from this source.

CROSSROADS

1		30.0		R-265-AEC	Source references, Shureliff's "Bombs at Bikini", & private communication from Gwynn.
30 Jun 46		30.0		HM-1378-AEC	Source reference, Shureliff's "Bombs at Bikini".
2		8.0		R-265-AEC	Source references, Shureliff's "Bombs at Bikini", & private communication from Gwynn.
24 Jul 46					

NAGASAKI

7 Aug 45

HIROSHIMA

5 Aug 45

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R-265-AEC

Source references, SC-2850(TR),
Reines' private communication,
H.D. Smyth.

16 Jul 45

35.0

Search-~~RM-1372-AEC~~
light

Source reference, LA-531

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