US ARMY ELECTRONICS RESEARCH & DEVELOPMENT ACTIVITY

METEOROLOGICAL DATA REPORT

AEROBEE NE 3.127

BY

MARJORIE McLARDIE HOIDALE

ERDA-65

AUGUST 1963

WHITE SANDS MISSILE RANGE
NEW MEXICO

METEOROLOGICAL DATA REPORT

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METEOROLOGICAL SUPPORT DIVISION
ENVIRONMENTAL SCIENCES DEPARTMENT
U. S. ARMY ELECTRONICS RESEARCH AND DEVELOPMENT ACTIVITY
WHITE SANDS MISSILE RANGE
NEW MEXICO

ABSTRACT

Meteorological data gathered for the launching of Aerobee NE 3.127 are presented for the National Aeronautics and Space Administration, the U. S. Naval Research Laboratory, and for ballistic studies. The data appear, along with calculated ballistic data, in Appendixes A, B, C and D.

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INTRODUCTION

Aerobee NE 3.127 was launched by Naval Ordnance Missile Test Facility personnel, White Sands Missile Range, New Mexico, at 0725 hours MST, 20 June 1963.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Division, U. S. Army Electronics Research and Development Activity, White Sands Missile Range, New Mexico.

DISCUSSION

Wind data for the first 2,000 feet above the surface were obtained from a Double-Theodolite Wind Velocity Computer System [1]. Balloons released at the launch site were observed and tracked from a 2,000-foot baseline. Continuous angular data were transmitted from two electrically instrumented theodolites to a computer where the data were reduced to obtain a velocity-vs-height relationship. The computer output drives two recorders which trace north-south and east-west components on a specially designed wind velocity computer ballistic chart. It is possible to read directly from the chart both the mean wind component values and the mean ballistic wind components in the various ballistic layers.

Temperature, pressure and humidity data, along with upper wind data from 2,000 to approximately 75,000 feet above the surface, were obtained from standard rawinsonde operations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by the equal-area method.

Data appearing in Appendix D are based on the E. L. Walter [2] theory. The "Predicted Impact" includes, where applicable, an adjustment of impact based on the experience of the impact predictor and the forecast of firing time wind conditions.

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[1]. "Double-Theodolite Wind Velocity Computer," UNCLASSIFIED, U. S. Army Signal Research and Development Laboratory, Fort Monmouth, New Jersey, July 1959.

[2]. Walter, E. L., "Six-Variable Ballistic Model for a Rocket," Missile Meteorology Division, U. S. Army Signal Missile Support Agency, White Sands Missile Range, New Mexico, June 1962.

APPENDIX A

CALCULATED ROCKET PERFORMANCE VALUES

AND

TABLE OF BALLISTIC FACTORS

AEROBEE NE 3.127

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APPENDIX A

TABLE A-I

CALCULATED ROCKET PERFORMANCE VALUES

AEROBEE NE 3.127

PAYLOAD 281.6 POUNDS

Unit Wind Effect	4.66 Miles/Mile Per Hour
Tower Tilt Effect	18.55 Miles/Degree
Burnout:	
Velocity	5750 Feet/Second
Altitude	126,500 Feet MSL
Time	52.8 Seconds
Peak:	
Altitude	121.4 Miles MSL
Time	232 Seconds
Total Time of Flight	484 Seconds
Coriolis Effect (West)	5.85 Miles

APPENDIX A

TABLE A-II

TABLE OF BALLISTIC FACTORS

AEROBEE NE 3.127

HEIGHT INTERVAL FEET	BALLISTIC FACTOR	HEIGHT INTERVAL FEET	BALLISTIC FACTOR
143 - 200	.152	5,000 - 10,000	.065
200 - 300	.148	10,000 - 15,000	.032
300 - 400	.083	15,000 - 20,000	.021
400 - 600	.105	20,000 - 25,000	.017
600 - 800	.060	25,000 - 30,000	.014
800 - 1,000	.040	30,000 - 35,000	.011
1,000 - 1,200	.032	35,000 - 40,000	.009
1,200 - 1,400	.020	40,000 - 45,000	.007
1,400 - 1,600	.020	45,000 - 50,000	.005
1,600 - 1,800	.019	50,000 - 60,000	.011
1,800 - 2,000	.011	60,000 - 70,000	.008
2,000 - 3,000	.048	70,000 - 80,000	.005
3,000 - 4,000	.025	80,000 - 90,000	.005
4,000 - 5,000	.022	90,000 - 100,000	.005

APPENDIX B

ANEMOMETER RECORDINGS OF WIND SPEED AND DIRECTION

AND

WIND DATA FROM THE SURFACE TO 10,000 FEET

AEROBEE NE 3.127

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APPENDIX B

TABLE B-I

ANEMOMETER RECORDINGS OF WIND SPEED AND DIRECTION

AEROBEE NE 3.127

TIME (MINUTES)	WIND SPEED (MPH)	DIRECTION (DEGREES)
X - 15	0.5	136
X - 10	0.5	135
X - 5	1.5	148
X - Time	0.5	149
X + 5	Calm	Calm
X + 10	Calm	Calm
X + 15	Calm	Calm

APPENDIX B

TABLE B-II

PILOT-BALLOON-MEASURED WIND DATA

AEROBEE NE 3.127

MEAN WIND COMPONENTS FOR BALLISTIC ZONES IN MILES PER HOUR

DOUBLE-THEODOLITE METHOD

RELEASE NR.	1		2		3		4	
RELEASE TIME (MST)	0345		0405		0430		0455	
LAYERS IN FEET	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
143 - 200	5.0S	0	8.5S	10.5E	9.5S	10.0E	10.5S	8.0E
200 - 300	5.5	1.0E	8.5	9.5	9.5	6.0	12.0	7.5
300 - 400	7.5	0	11.0	7.5	11.5	2.0	11.0	0
400 - 600	8.0	3.0E	12.0	7.0	12.0	2.5	10.5	0
600 - 800	6.0	2.0	9.0	4.0	11.5	2.0	10.5	1.0E
800 - 1,000	5.0	3.5	6.5	5.0	9.5	5.0	7.5	1.5W
1,000 - 1,200	7.5	7.5	5.0	8.5	7.0	4.0	8.5	2.5E
1,200 - 1,400	7.0	11.0	7.0	15.5	7.5	9.0	8.0	2.0
1,400 - 1,600	4.5	16.5	2.0	12.5	7.5	11.5	12.0	10.0
1,600 - 1,800	5.0	14.0	4.0	14.5	7.0	13.5	11.0	13.0
1,800 - 2,000	5.0	17.0	5.5	15.5	5.5	15.5	11.0	15.0

APPENDIX B

TABLE B-II (Cont)

RELEASE NR	5		6		7		8	
RELEASE TIME (MST)	0520		0555		0620		0640	
LAYERS IN FEET	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
143 - 200	3.0S	3.5E	1.0S	3.0E	5.0S	9.5E	3.0S	7.5E
200 - 300	4.5	7.0	3.5	5.5	6.0	10.0	3.5	9.5
300 - 400	7.5	11.5	7.0	10.5	7.0	13.0	3.0	10.0
400 - 600	9.5	14.5	7.5	11.5	5.5	10.0	1.5	8.5
600 - 800	8.5	13.0	4.0	12.5	2.0	9.0	1.0	8.0
800 - 1,000	8.0	8.0	2.0	9.5	4.0	13.5	2.5	8.5
1,000 - 1,200	7.0	9.0	3.0	10.5	4.5	12.0	3.0	8.0
1,200 - 1,400	7.5	11.0	4.0	13.0	2.0	8.0	3.0	12.5
1,400 - 1,600	6.0	12.0	3.0	13.0	3.0	10.0	3.5	13.5
1,600 - 1,800	6.5	12.5	2.5	10.5	3.0	10.5	3.0	10.5
1,800 - 2,000	7.0	13.5	2.5	16.5	4.5	10.0	5.5	10.0

APPENDIX B

TABLE B-II (Cont)

RELEASE NR	9		10		11		12	
RELEASE TIME (MST)	0655		0705		0715		0727	
LAYERS IN FEET	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
143 - 200	4.0S	5.0E	4.0S	3.0W	3.0S	2.0E	2.0S	2.0E
200 - 300	3.5	7.0	3.5	2.5	2.0	1.0	3.0	1.0
300 - 400	4.5	9.0	2.0	0.5	1.5	2.0	2.5	0.5
400 - 600	4.0	5.5	1.5	1.0E	1.5	3.0	1.0	0
600 - 800	1.0	6.0	1.5	1.5	2.0	3.5	1.0	0.5E
800 - 1,000	0.5	7.0	0.5	3.5	2.5	5.0	1.0	0.5
1,000 - 1,200	2.0	9.5	1.5	7.5	3.0	5.5	3.0	3.0
1,200 - 1,400	2.5	10.0	4.0	10.0	4.0	8.5	3.0	7.0
1,400 - 1,600	2.5	11.0	4.5	10.0	4.0	9.0	4.0	8.0
1,600 - 1,800	3.0	11.0	5.0	9.0	6.0	10.0	5.5	9.5
1,800 - 2,000	6.5	16.0	8.0	16.0	10.0	13.0	8.0	13.0

APPENDIX B

TABLE B-III

PILOT-BALLOON AND RAWINSONDE-MEASURED WIND DATA

AEROBEE NE 3.127

MEAN WIND COMPONENTS FOR BALLISTIC ZONES IN MILES PER HOUR

RELEASE NR	1*		3*	
RELEASE TIME (CST)	0525		0625	
LAYERS IN FEET	N-S	E-W	N-S	E-W
2,000 - 2,310	9.0S	20.0E	6.0S	15.0E
2,310 - 3,450	8.0	14.0	5.0	4.0
3,450 - 4,560	8.0	2.0	1.0N	6.0W
4,560 - 5,670	2.0N	14.0W	12.0	15.0
5,670 - 6,750	24.0	16.0	15.0	18.0
6,750 - 7,830	17.0	20.0	14.0	14.0
7,830 - 8,910	14.0	19.0	18.0	12.0
8,910 - 10,000	22.0	14.0	14.0	8.0

RELEASE NR	2#	
RELEASE TIME (CST)	0555	
LAYERS IN FEET	N-S	E-W
2,000 - 3,000	1.0S	4.0E
3,000 - 4,000	7.0	1.5
4,000 - 5,000	11.0N	4.0W
5,000 - 10,000	12.0	6.0

* Single-Theodolite Method

Rawinsonde Method

APPENDIX C

TABLES OF RAWINSONDE DATA

AEROBEE NE 3.127

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APPENDIX C

TABLE C-I

UPPER AIR DATA

AEROBEE NE 3.127

MEAN WIND COMPONENTS FOR BALLISTIC ZONES IN KNOTS

RELEASE NR	1		2		3	
RELEASE TIME (MST)	0030		0325		0725	
LAYERS IN FEET	N-S	E-W	N-S	E-W	N-S	E-W
2,000 - 5,000	19.0N	5.0W	8.5S	1.0W	4.0S	7.0W
5,000 - 10,000	2.5	16.0	7.0N	18.0	10.5N	9.5
10,000 - 15,000	0	10.0	5.0	16.5	8.0	12.5
15,000 - 20,000	0	16.0	7.0	24.0	15.5	18.5
20,000 - 25,000	9.5N	26.0	15.0	27.0	19.0	26.0
25,000 - 30,000	27.0	32.0	26.0	38.5	25.5	34.0
30,000 - 35,000	24.0	41.0	28.5	40.5	26.0	38.5
35,000 - 40,000	21.0	36.0	16.5	35.0	18.0	38.5
40,000 - 45,000	11.0	30.5	5.5	38.5	18.5	36.5
45,000 - 50,000	8.5	24.0	12.0	31.0	16.5	17.5
50,000 - 60,000	10.0S	1.5	4.0	8.0E	2.5S	6.5E
60,000 - 70,000	0	8.0E	1.5S	15.5	BALLOON BURST	
70,000 - 80,000	3.5N	18.5	1.0N	18		
80,000 - 90,000	0	17.0	5.5	16.5		
90,000 - 100,000	6.5N	16.5	3.0	21.0		

APPENDIX C

TABLE C-II

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0030 HRS MST
ASCENSION NO. 455

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
3989	876.6	26.0	8.1	32	1016.2	675	130	6	1.000272
5000	846.5	27.0	-1.1	16	980.0	675	76	11	1.000242
6000	817.7	26.0	-8.0	10	950.9	674	23	16	1.000226
7000	789.7	23.7	-9.7	10	925.6	671	355	18	1.000219
8000	762.5	21.3	-11.5	10	900.9	669	325	19	1.000212
9000	735.9	18.9	-13.4	10	877.0	666	310	19	1.000205
10000	710.1	16.3	-12.7	12	853.7	663	300	17	1.000201
11000	685.0	13.5	-10.5	18	831.4	660	289	16	1.000198
12000	660.5	10.6	-9.6	23	809.6	656	280	16	1.000194
13000	636.7	7.8	-9.4	29	788.3	653	274	17	1.000190
14000	613.5	4.8	-9.7	34	767.5	650	272	17	1.000185
15000	590.9	2.0	-10.0	41	746.9	646	272	14	1.000181
16000	568.9	-0.9	-10.7	48	726.8	643	276	11	1.000176
17000	547.5	-3.8	-11.3	56	706.9	640	284	10	1.000171
18000	526.6	-6.6	-11.9	66	687.2	636	284	10	1.000166
19000	506.6	-9.2	-14.3	67	667.8	633	281	10	1.000160
20000	487.0	-11.9	-17.0	66	648.7	630	275	10	1.000154
21000	467.9	-14.6	-19.7	66	630.0	626	276	12	1.000148
22000	449.4	-16.8	-23.6	56	610.3	624	276	17	1.000141
23000	431.5	-17.7	-30.5	32	588.4	622	281	22	1.000134
24000	414.3	-18.3	-40.7	12	566.3	622	287	25	1.000127
25000	397.7	-20.6			548.6	619	292	25	1.000122
26000	381.7	-22.4			530.4	617	296	25	1.000118
27000	366.1	-24.2			512.4	614	299	28	1.000114
28000	351.2	-25.8			494.6	612	301	32	1.000110
29000	336.7	-27.3			477.2	610	302	36	1.000106
30000	322.7	-29.5			461.5	608	303	39	1.000103
31000	309.2	-31.7			446.1	605	305	41	1.000099
32000	296.1	-33.9			431.2	602	308	42	1.000096
33000	283.5	-36.4			417.2	599	308	44	1.000093
34000	271.3	-39.0			403.7	596	308	46	1.000090
35000	259.5	-41.4			390.1	593	306	47	1.000087
36000	248.1	-43.5			376.4	590	304	50	1.000084

TABLE C-II (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0030 HRS MST
ASCENSION NO. 455

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
37000	237.1	-45.6			363.1	587	302	51	1.000081
38000	226.5	-47.8			350.1	585	302	51	1.000078
39000	216.2	-49.9			337.5	582	302	49	1.000075
40000	206.4	-51.5			324.5	580	303	46	1.000072
41000	196.9	-53.2			311.9	577	303	42	1.000069
42000	187.8	-54.8			299.8	575	303	38	1.000067
43000	179.1	-56.5			288.0	573	303	34	1.000064
44000	170.7	-58.2			276.7	571	299	32	1.000062
45000	162.6	-59.9			265.7	569	293	31	1.000059
46000	154.9	-61.6			255.1	566	288	33	1.000057
47000	147.5	-63.3			244.8	564	289	35	1.000055
48000	140.3	-65.0			234.9	562	292	35	1.000052
49000	133.5	-66.7			225.4	559	294	34	1.000050
50000	126.9	-68.5			216.1	557	293	30	1.000048
51000	120.6	-69.8			206.7	555	289	27	1.000046
52000	114.6	-70.5			197.1	554	284	24	1.000044
53000	108.9	-71.1			187.8	553	277	21	1.000042
54000	103.5	-71.8			179.0	553	276	19	1.000040
55000	98.3	-71.4			169.7	553	281	16	1.000038
56000	93.4	-69.4			159.7	556	282	11	1.000036
57000	88.8	-70.1			152.3	555	267	6	1.000034
58000	84.3	-70.7			145.2	554	200	2	1.000032
59000	80.2	-66.0			134.9	560	140	5	1.000030
60000	76.3	-65.5			128.0	561	114	9	1.000028
61000	72.6	-65.0			121.5	562	121	11	1.000027
62000	69.1	-64.5			115.3	563	101	10	1.000026
63000	65.7	-63.9			109.5	563	112	8	1.000024
64000	62.6	-63.4			104.0	564	121	5	1.000023
65000	59.6	-62.8			98.6	565	106	3	1.000022
66000	56.7	-61.4			93.3	567	104	6	1.000021
67000	54.0	-60.0			88.3	568	95	10	1.000020
68000	51.5	-58.7			83.6	570	87	14	1.000019
69000	49.1	-57.3			79.2	572	87	17	1.000018

TABLE C-II (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0030 HRS MST
ASCENSION NO. 455

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
70000	46.8	-56.9			75.3	573	84	17	1.000017
71000	44.6	-56.5			71.7	573	85	17	1.000016
72000	42.5	-56.1			68.2	574	85	16	1.000015
73000	40.5	-55.7			65.0	574	85	16	1.000014
74000	38.7	-55.4			61.8	575	86	17	1.000014
75000	36.9	-55.0			58.9	575	83	17	1.000013
76000	35.2	-54.6			56.0	576	80	19	1.000012
77000	33.5	-54.2			53.4	576	78	20	1.000012
78000	32.0	-53.8			50.8	577	75	21	1.000011
79000	30.5	-53.4			48.4	577	72	20	1.000011
80000	29.1	-53.0			46.1	578	69	18	1.000010
81000	27.8	-52.1			43.8	579	70	18	1.000010
82000	26.5	-51.2			41.6	580	73	17	1.000009
83000	25.3	-50.3			39.6	581	79	17	1.000009
84000	24.2	-49.3			37.6	583	84	18	1.000008
85000	23.1	-48.4			35.8	584	87	19	1.000008
86000	22.1	-47.5			34.0	585	89	18	1.000008
87000	21.1	-46.6			32.4	586	91	20	1.000007
88000	20.1	-45.6			30.8	587	94	22	1.000007
89000	19.2	-45.5			29.4	587	99	23	1.000007
90000	18.4	-45.5			28.1	587	100	21	1.000006
91000	17.6	-45.5			26.9	587	99	20	1.000006
92000	16.8	-45.6			25.7	587	101	19	1.000006
93000	16.1	-45.6			24.6	587	101	17	1.000005
94000	15.3	-45.6			23.5	587	99	16	1.000005
95000	14.7	-45.2			22.4	588	99	16	1.000005
96000	14.0	-44.5			21.3	589	101	18	1.000005
97000	13.4	-43.7			20.3	590	92	17	1.000005
98000	12.8	-43.0			19.4	591	83	17	1.000004
99000	12.2	-42.2			18.5	592	74	18	1.000004
100000	11.7	-41.5			17.6	593	68	19	1.000004
101000	11.2	-40.7			16.8	594	65	20	1.000004
102000	10.7	-40.0			16.0	595	67	21	1.000004

TABLE C-II (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0030 HRS MST
ASCENSION NO. 455

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
103000	10.3	-39.2			15.3	596	69	23	1.000003
104000	9.8	-38.6			14.6	596	68	24	1.000003
105000	9.4	-38.0			13.9	597	68	26	1.000003
106000	9.0	-37.5			13.3	598	72	28	1.000003
107000	8.6	-36.9			12.7	598	75	28	1.000003
108000	8.2	-36.4			12.1	599	78	27	1.000003
109000	7.9	-36.1			11.6	599	87	27	1.000003
110000	7.6	-36.5			11.1	599	95	26	1.000002
111000	7.2	-36.8			10.7	599	101	25	1.000002
112000	6.9	-37.2			10.2	598			1.000002
113000	6.6	-37.5			9.8	598			1.000002
114000	6.3	-37.9			9.4	597			1.000002
115000	6.1	-38.2			9.0	597			1.000002

APPENDIX C

TABLE C-III

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0325 HRS MST
ASCENSION NO. 456

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
3989	879.4	20.5	6.5	40	1039.1	669	0	0	1.000274
5000	848.8	21.9	6.3	36	998.1	670	51	5	1.000264
5500	834.0	20.7	5.4	37	984.9	669	76	7	1.000259
6000	819.4	19.5	4.4	37	971.8	667	102	10	1.000254
6500	805.0	18.7	2.9	35	957.6	666	127	12	1.000247
7000	790.8	18.0	1.2	32	943.3	665	137	9	1.000240
7500	776.8	17.3	-0.6	30	929.2	665	146	7	1.000233
8000	763.1	16.6	-2.5	27	915.3	664	209	6	1.000227
8500	749.5	15.9	-4.5	24	901.5	663	282	6	1.000221
9000	736.2	15.2	-6.6	22	887.9	662	299	8	1.000215
9500	723.1	14.5	-8.9	19	874.5	661	302	12	1.000209
10000	710.1	13.7	-11.5	16	861.2	660	302	15	1.000204
10500	697.3	12.7	-12.3	16	848.8	659	301	17	1.000200
11000	684.8	11.4	-11.6	19	837.2	657	296	18	1.000198
11500	672.4	10.1	-11.1	21	825.8	656	291	20	1.000196
12000	660.1	8.8	-10.8	24	814.5	654	288	21	1.000194
12500	648.1	7.5	-10.7	26	803.3	653	285	22	1.000192
13000	636.2	6.2	-10.7	29	792.3	651	285	23	1.000190
13500	624.4	4.8	-10.7	32	781.4	650	286	23	1.000187
14000	612.9	3.4	-10.5	35	770.9	648	286	22	1.000185
14500	601.4	1.9	-10.5	39	760.4	646	287	21	1.000183
15000	590.2	0.5	-10.6	43	750.1	645	288	20	1.000181
15500	579.1	-0.9	-10.8	47	739.9	643	288	18	1.000179
16000	568.1	-2.4	-11.2	51	729.8	641	288	16	1.000176
16500	557.3	-3.9	-11.6	55	719.9	640	288	16	1.000174
17000	546.7	-5.3	-12.1	59	710.0	638	288	15	1.000171
17500	536.1	-6.8	-12.4	65	700.2	636	287	14	1.000169
18000	525.8	-8.3	-12.5	72	690.5	634	285	14	1.000166
18500	515.6	-9.6	-13.5	74	680.5	633	284	16	1.000163
19000	505.5	-9.7	-20.1	43	667.9	632	282	18	1.000156
19500	495.6	-9.8	-33.9	12	655.6	632	281	20	1.000148
20000	486.0	-10.8			645.2	631	280	21	1.000145
20500	476.4	-11.8			635.1	629	281	23	1.000143

TABLE C-III (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0325 HRS MST
ASCENSION NO. 456

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
21000	467.0	-12.9			625.2	628	282	25	1.000140
21500	457.8	-14.0			615.3	627	285	26	1.000138
22000	448.7	-15.0			605.6	626	287	27	1.000135
22500	439.7	-16.1			596.0	624	289	27	1.000133
23000	430.9	-17.2			586.6	623	291	27	1.000131
23500	422.3	-18.3			577.2	622	295	28	1.000129
24000	413.7	-19.4			568.0	620	297	28	1.000127
24500	405.3	-20.5			558.9	619	295	27	1.000125
25000	397.1	-21.6			549.9	618	295	27	1.000122
25500	388.9	-22.6			540.8	616	296	27	1.000120
26000	381.0	-23.6			531.8	615	296	28	1.000118
26500	373.1	-24.5			522.9	614	296	29	1.000116
27000	365.4	-25.5			514.2	613	297	31	1.000115
27500	357.8	-26.5			505.5	611	301	33	1.000113
28000	350.3	-27.6			497.0	610	303	35	1.000111
28500	343.0	-28.6			488.6	609	305	37	1.000109
29000	335.8	-29.6			480.3	608	306	38	1.000107
29500	328.7	-30.6			472.2	606	306	39	1.000105
30000	321.7	-31.6			464.1	605	306	41	1.000103
30500	314.9	-32.7			456.2	604	305	43	1.000102
31000	308.1	-33.7			448.3	603	304	45	1.000100
31500	301.5	-34.7			440.6	601	303	47	1.000098
32000	295.0	-35.8			433.0	600	303	48	1.000096
32500	288.6	-36.8			425.5	599	303	49	1.000095
33000	282.4	-37.9			418.1	597	303	50	1.000093
33500	276.2	-38.9			410.8	596	303	50	1.000091
34000	270.1	-40.0			403.6	595	304	51	1.000090
34500	264.2	-41.0			396.6	593	304	51	1.000088
35000	258.3	-42.1			389.6	592	304	52	1.000087
35500	252.6	-43.2			382.7	590	304	52	1.000085
36000	246.9	-44.1			375.5	589	305	52	1.000084
36500	241.4	-45.0			368.5	588	305	52	1.000082
37000	235.9	-45.8			361.6	587	305	50	1.000081

APPENDIX C

TABLE C-III (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0325 HRS MST
ASCENSION NO. 456

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
37500	230.6	-46.7			354.8	586	306	48	1.000079
38000	225.4	-47.6			348.2	585	306	47	1.000078
38500	220.2	-48.5			341.6	584	307	45	1.000076
39000	215.2	-49.4			335.1	582	306	44	1.000075
39500	210.3	-50.3			328.7	581	305	42	1.000073
40000	205.4	-51.2			322.5	580	303	41	1.000072
40500	200.7	-52.1			316.3	579	301	41	1.000070
41000	196.0	-53.0			310.2	578	299	40	1.000069
41500	191.4	-53.9			304.3	577	297	38	1.000068
42000	187.0	-54.8			298.4	575	295	38	1.000066
42500	182.6	-55.8			292.6	574	293	37	1.000065
43000	178.3	-56.7			286.9	573	290	36	1.000064
43500	174.0	-57.6			281.3	572	287	36	1.000063
44000	169.9	-58.5			275.8	570	283	35	1.000061
44500	165.8	-59.5			270.4	569	279	35	1.000060
45000	161.9	-60.4			265.1	568	275	35	1.000059
45500	158.0	-61.4			259.9	567	273	36	1.000058
46000	154.1	-62.2			254.5	566	272	38	1.000057
46500	150.4	-63.0			249.3	564	274	39	1.000056
47000	146.7	-63.9			244.2	563	276	40	1.000054
47500	143.1	-64.7			239.2	562	279	41	1.000053
48000	139.6	-65.5			234.2	561	282	41	1.000052
48500	136.1	-66.4			229.4	560	284	41	1.000051
49000	132.8	-67.2			224.6	559	285	41	1.000050
49500	129.5	-68.1			219.9	558	286	40	1.000049
50000	126.2	-68.9			215.3	556	285	38	1.000048
50500	123.1	-69.8			210.8	555	285	35	1.000047
51000	119.9	-70.6			206.3	554	286	35	1.000046
51500	116.9	-70.9			201.4	554	287	34	1.000045
52000	114.0	-71.1			196.5	553	289	32	1.000044
52500	111.1	-71.4			191.8	553	292	31	1.000043
53000	108.3	-71.6			187.2	553	296	30	1.000042
53500	105.5	-71.9			182.7	552	300	30	1.000041

TABLE C-III (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0325 HRS MST
ASCENSION NO. 456

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
54000	102.8	-72.1			178.2	552	303	27	1.000040
54500	100.2	-70.3			172.1	555	307	23	1.000038
55000	97.7	-69.6			167.2	556	312	18	1.000037
55500	95.3	-69.1			162.7	556	320	12	1.000036
56000	92.9	-68.6			158.2	557	337	8	1.000035
56500	90.6	-68.2			153.9	557	30	7	1.000034
57000	88.3	-67.7			149.8	558	83	5	1.000033
57500	86.1	-67.3			145.7	559	100	6	1.000032
58000	84.0	-66.8			141.8	559	115	7	1.000032
58500	81.9	-66.3			138.0	560	121	8	1.000031
59000	79.9	-65.9			134.3	561	121	8	1.000030
59500	77.9	-65.4			130.7	561	119	7	1.000029
60000	76.0	-65.0			127.2	562	112	6	1.000028
60500	74.1	-64.5			123.8	562	104	5	1.000028
61000	72.3	-64.1			120.5	563	90	7	1.000027
61500	70.6	-63.6			117.3	564	76	8	1.000026
62000	68.8	-63.2			114.2	564	78	8	1.000025
62500	67.2	-62.7			111.2	565	80	8	1.000025
63000	65.5	-62.3			108.3	565	81	9	1.000024
63500	64.0	-61.8			105.4	566	81	9	1.000023
64000	62.4	-61.4			102.7	567	82	8	1.000023
64500	60.9	-60.9			100.0	567	83	7	1.000022
65000	59.4	-60.5			97.4	568	86	6	1.000022
65500	58.0	-60.0			94.9	568	89	6	1.000021
66000	56.6	-59.6			92.4	569	93	6	1.000021
66500	55.3	-59.1			90.0	570	95	8	1.000020
67000	54.0	-58.7			87.7	570	96	9	1.000020
67500	52.7	-58.3			85.4	571	97	12	1.000019
68000	51.4	-57.8			83.2	571	97	15	1.000019
68500	50.2	-57.4			81.1	572	97	17	1.000018
69000	49.0	-57.2			79.1	572	96	18	1.000018
69500	47.8	-57.2			77.2	572	95	20	1.000017
70000	46.7	-57.1			75.3	572	95	21	1.000017

TABLE C-III (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0325 HRS MST
ASCENSION NO. 456

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
70500	45.6	-57.0			73.5	572	96	22	1.000016
71000	44.5	-56.9			71.8	573	97	21	1.000016
71500	43.5	-56.9			70.0	573	99	21	1.000016
72000	42.5	-56.8			68.4	573	99	21	1.000015
72500	41.5	-56.7			66.7	573	98	20	1.000015
73000	40.5	-56.6			65.1	573	97	20	1.000014
73500	39.5	-56.5			63.6	573	96	21	1.000014
74000	38.6	-56.3			62.0	573	94	21	1.000014
74500	37.7	-56.0			60.5	574	92	20	1.000013
75000	36.8	-55.6			58.9	574	90	20	1.000013
75500	35.9	-55.3			57.5	575	89	20	1.000013
76000	35.1	-54.9			56.0	575	89	20	1.000012
76500	34.3	-54.6			54.6	576	89	20	1.000012
77000	33.5	-54.2			53.3	576	89	18	1.000012
77500	32.7	-53.9			51.9	577	89	17	1.000012
78000	31.9	-53.5			50.7	577	87	16	1.000011
78500	31.2	-53.1			49.4	578	83	15	1.000011
79000	30.5	-52.8			48.2	578	78	15	1.000011
79500	29.8	-52.4			47.0	578	80	15	1.000010
80000	29.1	-52.1			45.8	579	82	15	1.000010
80500	28.4	-51.7			44.7	579	84	16	1.000010
81000	27.8	-51.4			43.6	580	86	17	1.000010
81500	27.1	-51.0			42.5	580	87	18	1.000009
82000	26.5	-50.7			41.5	581	90	18	1.000009
82500	25.9	-50.3			40.5	581	94	19	1.000009
83000	25.3	-50.0			39.5	582	98	20	1.000009
83500	24.7	-49.6			38.5	582	96	19	1.000009
84000	24.2	-49.3			37.6	583	94	18	1.000008
84500	23.6	-49.0			36.7	583	93	18	1.000008
85000	23.1	-48.6			35.8	583	94	17	1.000008
85500	22.5	-48.3			34.9	584	95	17	1.000008
86000	22.0	-47.9			34.1	584	92	16	1.000008
86500	21.5	-47.6			33.3	585	88	15	1.000007

TABLE C-III (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0325 HRS MST
ASCENSION NO. 456

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
87000	21.0	-47.2			32.5	585	83	14	1.000007
87500	20.6	-46.9			31.7	586	77	15	1.000007
88000	20.1	-46.6			30.9	586	70	15	1.000007
88500	19.7	-46.2			30.2	587	65	16	1.000007
89000	19.2	-45.9			29.5	587	62	17	1.000007
89500	18.8	-45.5			28.8	587	60	18	1.000006
90000	18.4	-45.2			28.1	588	58	19	1.000006
90500	18.0	-44.8			27.4	588	56	19	1.000006
91000	17.6	-44.5			26.7	589	54	19	1.000006
91500	17.2	-44.2			26.1	589	57	20	1.000006
92000	16.8	-43.8			25.5	590	60	20	1.000006
92500	16.4	-43.5			24.9	590	63	20	1.000006
93000	16.0	-43.2			24.3	591	64	20	1.000005
93500	15.7	-42.8			23.7	591	65	21	1.000005
94000	15.3	-42.5			23.2	591	68	21	1.000005
94500	15.0	-42.2			22.6	592	72	21	1.000005
95000	14.7	-41.8			22.1	592	77	20	1.000005
95500	14.3	-41.5			21.6	593	79	20	1.000005
96000	14.0	-41.1			21.1	593	82	20	1.000005
96500	13.7	-40.8			20.6	594	84	20	1.000005
97000	13.4	-40.5			20.1	594	83	20	1.000004
97500	13.1	-40.1			19.6	594	82	19	1.000004
98000	12.8	-40.0			19.2	595	83	20	1.000004
98500	12.5	-40.0			18.8	595	85	21	1.000004
99000	12.3	-40.0			18.3	594	87	22	1.000004
99500	12.0	-40.1			17.9	594	87	23	1.000004
100000	11.7	-40.1			17.6	594	86	24	1.000004
100500	11.5	-40.1			17.2	594	85	24	1.000004
101000	11.2	-40.1			16.8	594	81	22	1.000004
101500	11.0	-40.1			16.4	594	76	20	1.000004
102000	10.7	-40.1			16.1	594	73	18	1.000004
102500	10.5	-40.2			15.7	594	81	19	1.000003
103000	10.3	-40.2			15.4	594	89	21	1.000003

APPENDIX C

TABLE C-III (Cont)

UPPER AIR DATA

WHITE SANDS SITE

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0325 HRS MST
ASCENSION NO. 456

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
103500	10.1	-40.2			15.0	594			1.000003
104000	9.8	-39.7			14.7	595			1.000003
104500	9.6	-39.0			14.3	596			1.000003
105000	9.4	-38.4			14.0	597			1.000003
105500	9.2	-37.7			13.6	597			1.000003
106000	9.0	-37.0			13.3	598			1.000003

APPENDIX C

TABLE C-IV

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0725 HRS MST
ASCENSION NO. 458

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
3989	880.4	24.8	11.1	42	1023.7	674	0	0	1.000284
5000	849.8	21.2	4.7	34	1002.0	669	46	2	1.000261
5500	835.0	20.3	4.9	36	987.5	668	69	3	1.000258
6000	820.3	19.4	4.9	38	973.3	667	91	4	1.000255
6500	805.9	18.4	4.9	41	959.2	666	114	5	1.000252
7000	791.7	17.5	4.8	43	945.2	665	217	4	1.000249
7500	777.7	17.9	1.4	33	928.1	665	323	4	1.000237
8000	764.0	18.2	-3.1	23	911.4	665	321	9	1.000225
8500	750.5	18.2	-8.0	16	896.1	665	319	13	1.000215
9000	737.3	16.9	-8.6	17	884.1	664	318	16	1.000211
9500	724.2	15.6	-9.3	17	872.3	662	318	18	1.000208
10000	711.2	14.4	-10.0	18	860.6	661	319	17	1.000205
10500	698.5	13.1	-10.7	18	849.0	659	320	17	1.000202
11000	685.9	11.8	-11.4	19	837.5	658	321	15	1.000199
11500	673.5	10.5	-12.2	19	826.2	656	321	14	1.000195
12000	661.3	9.2	-13.0	19	815.0	655	321	12	1.000192
12500	649.2	7.9	-13.7	20	803.8	653	319	12	1.000189
13000	637.3	6.6	-14.5	20	792.9	652	317	11	1.000186
13500	625.6	5.3	-15.4	21	782.0	650	314	11	1.000183
14000	614.0	3.9	-15.4	23	771.3	648	310	11	1.000181
14500	602.5	2.5	-15.4	25	760.8	647	309	11	1.000179
15000	591.3	1.1	-15.6	28	750.4	645	308	11	1.000176
15500	580.2	-0.3	-15.9	30	740.1	644	305	12	1.000174
16000	569.2	-1.8	-16.3	32	729.9	642	302	12	1.000171
16500	558.4	-3.2	-16.7	34	719.9	640	301	13	1.000169
17000	547.7	-4.6	-17.2	37	709.9	638	300	14	1.000167
17500	537.2	-6.1	-17.8	39	700.1	637	299	16	1.000164
18000	526.9	-7.5	-18.5	41	690.4	635	301	18	1.000161
18500	516.6	-8.4	-21.2	35	679.4	634	303	20	1.000157
19000	506.6	-8.1	-33.1	11	665.8	634	305	21	1.000150
19500	496.8	-9.2			655.7	633	306	22	1.000147
20000	487.1	-10.5			645.9	631	307	23	1.000145
20500	477.5	-11.7			636.3	630	308	24	1.000142

TABLE C-IV (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0725 HRS MST
ASCENSION NO. 458

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
21000	468.1	-12.9			626.7	628	309	24	1.000140
21500	458.8	-14.2			617.3	627	310	24	1.000138
22000	449.7	-15.4			608.0	625	311	24	1.000136
22500	440.7	-16.6			598.6	624	312	24	1.000133
23000	431.9	-17.5			588.7	623	312	25	1.000131
23500	423.2	-18.5			578.9	621	311	26	1.000129
24000	414.6	-19.4			569.3	620	309	26	1.000127
24500	406.2	-20.3			559.8	619	308	28	1.000125
25000	398.0	-21.2			550.4	618	306	29	1.000123
25500	389.8	-22.2			541.3	617	305	29	1.000121
26000	381.8	-23.2			532.3	616	305	30	1.000119
26500	374.0	-24.2			523.4	614	305	31	1.000117
27000	366.2	-25.2			514.6	613	306	32	1.000115
27500	358.6	-26.2			506.0	612	305	33	1.000113
28000	351.2	-27.2			497.5	611	305	34	1.000111
28500	343.8	-28.2			489.1	609	305	35	1.000109
29000	336.6	-29.2			480.8	608	305	36	1.000107
29500	329.5	-30.2			472.6	607	305	37	1.000105
30000	322.5	-31.2			464.5	606	305	38	1.000103
30500	315.7	-32.3			456.6	604	307	40	1.000102
31000	308.9	-33.3			448.8	603	309	41	1.000100
31500	302.3	-34.3			441.0	602	309	42	1.000098
32000	295.8	-35.3			433.4	600	309	44	1.000097
32500	289.4	-36.4			425.9	599	308	45	1.000095
33000	283.1	-37.4			418.5	598	307	46	1.000093
33500	276.9	-38.5			411.2	596	306	47	1.000092
34000	270.9	-39.6			404.0	595	306	47	1.000090
34500	264.9	-40.6			396.9	594	305	47	1.000088
35000	259.0	-41.7			390.0	592	304	47	1.000087
35500	253.3	-42.8			383.1	591	303	47	1.000085
36000	247.6	-43.9			376.3	590	304	47	1.000084
36500	242.1	-45.0			369.7	588	305	47	1.000082
37000	236.6	-46.1			363.1	587	305	47	1.000081

TABLE C-IV (Cont)

APPENDIX C

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0725 HRS MST
ASCENSION NO. 458

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
37500	231.3	-46.9			356.2	586	305	46	1.000079
38000	226.0	-47.8			349.5	585	304	46	1.000078
38500	220.9	-48.6			342.8	583	304	45	1.000076
39000	215.8	-49.5			336.2	582	304	45	1.000075
39500	210.9	-50.3			329.8	581	302	45	1.000073
40000	206.0	-51.2			323.4	580	301	45	1.000072
40500	201.3	-52.0			317.1	579	299	44	1.000071
41000	196.6	-52.9			311.0	578	297	43	1.000069
41500	192.0	-53.8			304.9	577	295	42	1.000068
42000	187.5	-54.6			299.0	576	294	42	1.000067
42500	183.1	-55.5			293.1	574	292	42	1.000065
43000	178.8	-56.4			287.4	573	291	42	1.000064
43500	174.6	-57.2			281.7	572	289	41	1.000063
44000	170.4	-58.1			276.2	571	288	41	1.000061
44500	166.4	-59.0			270.7	570	289	42	1.000060
45000	162.4	-59.9			265.3	569	290	43	1.000059
45500	158.5	-60.8			260.0	567	292	43	1.000058
46000	154.7	-61.7			254.8	566	294	42	1.000057
46500	150.9	-62.6			249.7	565	297	42	1.000056
47000	147.2	-63.5			244.6	564	299	41	1.000054
47500	143.6	-64.2			239.4	563	301	41	1.000053
48000	140.1	-64.9			234.4	562	303	41	1.000052
48500	136.6	-65.6			229.4	561	303	39	1.000051
49000	133.3	-66.3			224.5	560	303	37	1.000050
49500	130.0	-67.1			219.7	559	303	35	1.000049
50000	126.7	-67.8			215.0	558	303	33	1.000048
50500	123.6	-68.2			210.1	557	303	31	1.000047
51000	120.5	-68.2			204.8	557	304	29	1.000046
51500	117.5	-68.1			199.7	558	305	27	1.000044
52000	114.6	-68.1			194.7	558	307	25	1.000043
52500	111.7	-68.1			189.8	558	312	21	1.000042
53000	108.9	-68.1			185.1	558	318	17	1.000041
53500	106.2	-68.1			180.4	558	324	13	1.000040

APPENDIX C

TABLE C-IV (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0725 HRS MST
ASCENSION NO. 456

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
54000	103.6	-68.0			175.9	558	358	9	1.000039
54500	101.0	-68.0			171.5	558	35	5	1.000038
55000	98.5	-68.0			167.2	558	69	2	1.000037
55500	96.0	-68.0			163.1	558	96	5	1.000036
56000	93.6	-68.0			159.0	558	122	8	1.000035
56500	91.3	-68.0			155.0	558	142	11	1.000035
57000	89.0	-68.0			151.2	558	148	12	1.000034
57500	86.8	-68.0			147.4	558	154	13	1.000033
58000	84.6	-68.0			143.7	558	160	14	1.000032
58500	82.5	-68.0			140.2	558	164	13	1.000031
59000	80.5	-67.6			136.4	558	169	12	1.000030
59500	78.5	-67.2			132.7	559	169	10	1.000030
60000	76.5	-66.7			129.2	559	166	8	1.000029
60500	74.6	-66.2			125.7	560	162	5	1.000028
61000	72.8	-65.7			122.3	561	138	4	1.000027
61500	71.0	-65.3			119.0	561	104	3	1.000026
62000	69.3	-64.8			115.8	562	69	3	1.000026
62500	67.6	-64.3			112.7	563	51	3	1.000025
63000	65.9	-63.9			109.7	563	43	4	1.000024
63500	64.3	-63.4			106.8	564	35	6	1.000024
64000	62.7	-62.9			104.0	565	39	6	1.000023
64500	61.2	-62.5			101.3	565	55	5	1.000023
65000	59.7	-62.0			98.6	566	71	4	1.000022
65500	58.3	-61.5			96.0	566	82	4	1.000021
66000	56.9	-61.1			93.5	567	88	4	1.000021
66500	55.5	-60.6			91.0	568	93	4	1.000020
67000	54.2	-60.2			88.7	568	98	5	1.000020
67500	52.9	-59.7			86.3	569	99	6	1.000019
68000	51.6	-59.2			84.1	569	101	8	1.000019
68500	50.4	-58.8			81.9	570	103	9	1.000018
69000	49.2	-58.3			79.8	571	100	10	1.000018
69500	48.0	-57.9			77.7	571	97	11	1.000017
70000	46.9	-57.4			75.7	572			1.000017

TABLE C-IV (Cont)

UPPER AIR DATA

STATION ALTITUDE 3989FEET MSL
DATE 20 JUN 1963, 0725 HRS MST
ASCENSION NO. 458

WHITE SANDS SITE

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
70500	45.8	-57.0			73.8	573			1.000016
71000	44.7	-56.5			71.9	573			1.000016
71500	43.7	-56.1			70.1	574			1.000016
72000	42.6	-55.6			68.3	574			1.000015
72500	41.6	-55.2			66.5	575			1.000015
73000	40.7	-54.7			64.8	575			1.000014

APPENDIX D

IMPACT PREDICTION DATA

TABLE		PAGE
D-I.	Impact Prediction Data	32

APPENDIX D

TABLE D-I

IMPACT PREDICTION DATA

MISSILE: AEROBEE NE 3.127 DATE: 20 JUNE 1963

RELEASE TIME (MST)		DISPLACEMENT OF IMPACT DUE TO WIND IN MILES				THEORETICAL IMPACT IN MILES	
RAWIN-SONDE	PIBAL	143 TO 2,000 FT	2,000 TO 10,000 FT	10,000 TO 100,000 FT	TOTAL	N-S OF LAUNCHER	E-W OF LAUNCHER
R_1 0030		19.7S	10.7N	5.6N	3.4S		
R 0030	P 0345	9.3E	6.9W	12.7W	10.3W	36.6N	7.3W
R_1 0030		26.6S	10.7N	5.6N	10.3S		
R 0030	P 0405	28.1E	6.9W	12.7W	8.5E	29.7	11.5E
R_1 0030		31.3S	10.7N	5.6N	15.0S		
R 0030	P 0430	19.4E	6.9W	12.7W	0.2W	25.0	2.8
R_1 0030		34.1S	10.7N	5.6N	17.8S		
R 0030	P 0455	14.6E	6.9W	12.7W	5.0W	22.2	2.0W
R_1 0325		20.4S	1.8S	8.1N	14.1S		
R 0325	P 0520	29.5E	2.9W	15.0W	11.6E	25.9	14.6E
	P_1 0525	12.6S	0.8N	8.1N	3.7S		
R 0325	P 0555	26.0E	0.4W	15.0W	10.6W	36.3	7.6W
R_2 0555		16.4S	2.7N	8.1N	5.6S		
R 0325	P 0620	33.1E	3.5W	15.0W	14.6E	34.4	17.6E
	P_1 0625	10.3S	3.1N	8.1N	0.9N		
R 0325	P 0640	28.8E	3.2W	15.0W	10.6E	39.1	13.6
	P_1 0625	10.6S	3.1N	8.1N	0.6N		
R 0325	P 0655	22.8E	3.2W	15.0W	4.6W	39.4	1.6W
	P_1 0625	9.0S	3.1N	8.1N	2.2N		
R 0325	P 0705	1.6E	3.2W	15.0W	16.6W	37.8	13.6
	P_1 0625	8.5S	3.1N	8.1N	2.7N		
R 0325	P 0715	9.5E	3.2W	15.0W	8.7W	37.3	5.7
*R_1 0725		7.7S	1.2N	9.1N	2.6N		
*R 0725	*P 0727	5.9E	6.0W	11.0W	11.1W	12.6	8.1

P = Double Theodolite Winds (143-2,000 Ft)
P_1 = Single Theodolite Winds (2,000-10,000 Ft)
R = Rawinsonde Winds (Above 10,000 Ft)
R_1 = Rawinsonde Winds (2,000-10,000 Ft)
R_2 = Rawin Winds (2,000-10,000 Ft)
* Post-Shoot
** Sonic Observation of Trajectory and Impact of Missiles

Final Predicted Booster Impact
(From Launcher) 020°/1200 Feet

Launcher Setting (Inches of Jack)
West 22 East 17
Launcher Azimuth 012.5 Degrees
Launcher Elevation 87.9 Degrees
**SOTIM Actual Impact (From Launcher)
52.0 Miles North 14.0 Miles West
Final Predicted Impact (From Launcher)
40 Miles North 0 Miles East-West
No Wind Imapct (From Launcher)
40.0 Miles North 3.0 Miles East

U. S. ARMY ELECTRONICS RESEARCH AND DEVELOPMENT ACTIVITY
WHITE SANDS MISSILE RANGE
NEW MEXICO

WILLIAM G. SKINNER
COLONEL, SIGNAL CORPS
COMMANDING

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HEADQUARTERS
U. S. ARMY ELECTRONICS RESEARCH AND DEVELOPMENT ACTIVITY
WHITE SANDS MISSILE RANGE
NEW MEXICO

August 1963

1. Data Report ERDA-65 has been prepared under the supervision of the Meteorological Support Division and is published for the information and guidance of all concerned.

2. Suggestions or criticisms relative to the form, contents, purpose, or use of this publication should be referred to the Commanding Officer, U. S. Army Electronics Research and Development Activity, ATTN: SELWS-M, White Sands Missile Range, New Mexico.

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