

AD-A082 969 ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND WS--ETC F/G 4/2  
193088 MLRS, MISSILE NUMBER 1125, ROUND NUMBER V-98, 11 DECEMBER--ETC(U)  
DEC 79

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Meteorological data gathered for the launching of 19308B MLRS, Missile Number 1125, Round Number V-98 are presented in tabular form.		

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## INTRODUCTION

193088 MLRS, Missile Number 1125, Round Number V-98,  
was launched from BRILLO, White Sands Missile Range (WSMR), New Mexico,  
at 1532:01 MST on 11 December 1979. The scheduled launch time was  
1500 MST.

## DISCUSSION

Meteorological data were recorded and reduced by the White Sands Meteorological Team. Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, New Mexico. The data were obtained by the following methods:

### 1. Observations

#### a. Surface

(1) Standard surface observations to include pressure, temperature ( $^{\circ}\text{C}$ ), relative humidity, dew point ( $^{\circ}\text{C}$ ), density ( $\text{gm}/\text{m}^3$ ), Wind direction and speed, and cloud cover were made at the D 3 $\frac{1}{2}$  Met Site at T-0 minutes.

(2) Anemometer data were provided from existing pole-mounted and tower-mounted anemometers at LC-33. Monitor of wind speed and direction from one anemometer was also provided in the launch control room.

#### b. Upper Air

(1) Low level wind data were obtained from RAPTS T-9 pibal observation at:

### SITE AND ALTITUDE

D 3 $\frac{1}{2}$	2km
DENVER	2km

(2) Air structure data (rawinsonde) were collected at the following Met Sites. Data were collected from surface to 67,000 feet in 500-foot increments.

### SITE AND TIME

NW 30 1532 MST

TABLE 1. Surface Observations taken at 1532 MST,  
 11 December 1979, at NW 30, 19308B MLRS,  
 Missile Number 1125, Round Number V-98.

ELEVATION	4010.40	FT/MSL
PRESSURE	872.5	MBS
TEMPERATURE	18.9	°C
RELATIVE HUMIDITY	25	%
DEW POINT	-1.6	°C
DENSITY	1036.4	GM/M <sup>3</sup>
WIND SPEED	12	KTS
WIND DIRECTION	250	DEGREES
CLOUD COVER	8	Sc





STATION ALTITUDE 4010.40 FEET MSL  
 11 DEC. 79  
 ASCENSION NO. 18

STG. IFLANT LEVLL DATA  
 3450220010  
 NW 30  
 TABLE 4

GEODETIC COORDINATES  
 32.88497 LAT DEG  
 106.49714 LON DEG

PRESSURE MILLIBARS	GEODETIC ALTITUDE MSL FEET	TEMPERATURE AIR DEGREES CENTIGRADE	TEMPERATURE DEWPOINT CENTIGRADE	REL. HUM. PERCENT
872.5	4010.4	18.9	-1.5	25.0
862.2	4345.3	19.2	7.6	47.0
850.0	4746.7	18.0	1.1	32.0
827.4	5199.3	14.7	-0.0	35.0
748.2	8614.6	5.4	-5.9	44.0
700.0	10031.5	1.6	-12.9	33.0
637.4	12838.4	-3.5	-17.1	34.0
609.2	13658.4	-6.1	-16.4	37.0
599.8	14058.1	-6.6	-16.7	45.0
580.6	14454.2	-7.6	-16.0	40.0
572.8	15234.5	-9.5	-20.0	42.0
555.2	16324.5	-11.5	-18.1	38.0
521.6	17569.9	-14.4	-24.7	41.0
513.4	17984.6	-15.0	-22.4	53.0
500.0	18641.9	-15.6	-24.3	47.0
489.4	19172.5	-16.8	-25.0	49.0
479.1	19697.0	-18.0	-19.1	99.0
451.0	21177.3	-20.2	-20.5	99.0
400.0	24964.4	-27.2	-27.5	99.0
394.2	24410.4	-27.7	-27.8	99.0
367.6	26037.5	-31.7	-37.2	58.0
311.5	29324.4	-41.8	-44.6	74.0
307.0	30105.3	-42.1	-45.6	68.0
300.0	30600.9	-43.0	-47.1	68.0
291.0	31322.6	-45.4	-49.5	63.0
259.6	33306.5	-51.6		
250.0	34610.2	-52.5		
225.0	36755.1	-53.2		
217.0	37618.3	-52.0		
203.0	39350.0	-53.4		
183.0	41223.2	-54.9		
171.2	42630.9	-55.4		
150.0	45394.2	-57.9		
134.8	47591.9	-62.4		
121.6	49673.4	-65.7		
111.8	51358.6	-65.4		
108.6	51941.1	-65.7		
100.0	53604.1	-63.4		
75.4	58532.0	-63.9		
70.0	60791.3	-69.5		

STATION ALTITUDE 4010.40 FEET MSL  
11 DEC. 79 1552 HRS MST  
ASCENSION NO. 18

SIGNIFICANT LEVEL DATA  
34502.0013  
NW 30

GEODETIC COORDINATES  
52.88497 LAT DEG  
106.49714 LON DEG

TABLE 4 (CONT)

PRESSURE GEOMETRIC ALTITUDE MILLIBARS MSL FELT	TEMPERATURE AIR TEMPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT
56.8 64906.3	-69.9	
53.2 66215.7	-63.0	
50.0 67487.1	-59.7	

STATION ALTITUDE 4010.40 FEET MSL  
 11 DEC. 79  
 ADULTS: 10. 10

UPPER AIR DATA  
 3450220016  
 14V 30

GEOMETRIC COORDINATES  
 32.86497 LAT DEG  
 106.49714 LONG DEG

TABLE 5

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARMS	AIR TEMPERATURE DEGREES CELSIUS	REL. HUM. PERCENT	DENSITY GM/CM <sup>3</sup> WATER	SPEED SOUND KNOTS	DIRECTION DEGREES (TR)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
4010.4	872.5	16.9	25.6	1050.5	666.6	250.0	12.0	1.000256
4500.0	857.5	16.7	41.2	1019.4	666.9	250.4	12.5	1.000267
5000.0	842.5	16.9	33.0	1003.6	664.4	227.6	13.4	1.000253
5500.0	827.4	14.7	35.4	993.6	661.6	213.6	14.7	1.000249
6000.0	812.4	13.2	36.4	983.7	660.1	213.6	14.8	1.000245
6500.0	797.6	11.7	37.9	973.0	658.3	215.2	13.5	1.000241
7000.0	783.2	10.2	39.3	960.5	656.0	212.1	11.9	1.000237
7500.0	769.6	8.7	40.6	948.2	654.8	200.3	10.3	1.000233
8000.0	755.0	7.2	42.2	936.0	653.0	205.2	11.0	1.000229
8500.0	741.5	5.7	43.7	924.1	651.5	207.7	11.8	1.000225
9000.0	727.6	4.4	41.0	911.7	649.6	214.3	12.8	1.000220
9500.0	714.1	3.0	37.1	899.4	647.9	222.2	14.3	1.000214
10000.0	700.4	1.7	33.2	887.2	646.2	229.3	16.1	1.000209
10500.0	687.6	.6	33.2	873.9	645.0	233.9	18.8	1.000205
11000.0	674.6	-.4	33.4	860.7	643.7	241.6	21.4	1.000202
11500.0	661.9	-1.4	33.6	847.7	642.5	247.4	24.0	1.000198
12000.0	649.4	-2.5	33.8	835.0	641.2	251.9	26.1	1.000195
12500.0	637.1	-3.5	34.0	822.4	640.0	255.6	28.0	1.000192
13000.0	624.9	-4.6	35.3	810.0	638.7	259.7	29.2	1.000188
13500.0	612.9	-5.7	36.6	797.8	637.5	258.7	29.9	1.000185
14000.0	601.2	-6.7	43.8	785.2	636.2	254.1	29.5	1.000184
14500.0	589.5	-7.7	40.1	773.0	635.0	251.7	28.9	1.000180
15000.0	578.1	-8.4	41.4	761.6	633.5	249.6	27.9	1.000177
15500.0	566.8	-10.2	47.4	750.2	632.0	247.4	27.8	1.000174
16000.0	555.7	-11.4	57.5	739.0	630.6	245.1	28.4	1.000173
16500.0	544.6	-12.4	52.8	727.1	629.4	241.8	30.8	1.000169
17000.0	534.0	-13.5	47.4	715.4	628.2	239.1	33.6	1.000165
17500.0	523.5	-14.2	42.0	703.9	627.1	237.9	36.3	1.000162
18000.0	513.1	-15.0	52.9	691.9	626.2	237.1	39.3	1.000160
18500.0	502.9	-15.5	48.3	679.4	625.6	236.6	42.8	1.000156
19000.0	492.9	-16.4	49.3	666.5	624.4	236.4	45.4	1.000154
19500.0	482.9	-17.5	50.2	657.0	623.1	236.4	46.7	1.000154
20000.0	473.2	-18.5	59.0	646.5	622.1	236.4	47.8	1.000152
20500.0	463.7	-19.2	59.0	635.3	621.2	236.7	48.6	1.000149
21000.0	454.5	-19.9	99.0	624.3	620.2	237.1	49.4	1.000146
21500.0	445.0	-21.0	99.0	614.2	618.9	237.4	50.4	1.000144
22000.0	435.8	-22.2	99.0	604.5	617.4	237.7	51.0	1.000141
22500.0	426.9	-23.5	99.0	595.0	615.9	237.9	50.6	1.000138
23000.0	418.1	-24.6	99.0	585.6	614.4	238.2	50.2	1.000135
23500.0	409.5	-25.8	99.0	576.4	612.9	239.0	50.5	1.000133

UPPER AIR DATA  
3450220015  
NW 30

STATION ALTITUDE 4010.40 FEET MSL  
11 DEC. 79 1532 MKS MSL  
ASCENSION NO. 18

GEODETIC COORDINATES  
32.83497 LAT DEG  
106.49714 LON DEG

TABLE 5 (CONT)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CM <sup>3</sup> METR	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE				DIRECTION DEGREES(TN)	SPEED KNOTS	
24000.0	401.1	-27.0	-27.2	99.0	567.4	611.4	239.8	50.9	1.000130
24500.0	392.7	-27.4	-29.3	96.7	557.5	610.2	238.7	51.9	1.000128
25000.0	384.4	-29.1	-31.0	84.1	542.6	608.7	237.0	53.1	1.000125
25500.0	376.3	-30.4	-33.8	71.5	539.8	607.1	234.8	54.4	1.000122
26000.0	368.4	-31.8	-36.9	58.9	531.2	605.5	231.8	55.0	1.000120
26500.0	360.4	-32.9	-38.0	60.0	522.6	603.9	229.5	56.7	1.000118
27000.0	352.6	-34.5	-39.0	62.1	514.1	602.2	227.9	57.5	1.000116
27500.0	344.9	-35.5	-39.9	64.2	505.8	600.5	227.1	58.3	1.000114
28000.0	337.5	-36.9	-40.9	66.3	497.6	598.8	227.5	59.1	1.000112
28500.0	330.1	-38.5	-41.9	68.4	489.6	597.1	223.1	60.2	1.000110
29000.0	323.0	-39.6	-42.9	70.5	481.7	595.4	223.3	61.5	1.000108
29500.0	316.0	-40.9	-43.9	72.6	473.9	593.7	230.0	62.5	1.000106
30000.0	309.1	-42.0	-45.2	70.2	465.7	592.4	230.5	63.4	1.000104
30500.0	302.2	-43.2	-46.6	68.0	457.7	590.8	230.8	63.1	1.000103
31000.0	295.4	-44.5	-48.3	65.5	449.1	589.1	231.0	62.5	1.000101
31500.0	288.8	-45.8	-50.5	53.7**	442.5	587.4	230.9	61.8	1.000099
32000.0	292.2	-47.1	-53.7	46.0**	434.8	585.8	230.8	61.2	1.000097
32500.0	275.7	-48.5	-57.5	33.5**	427.2	584.1	230.5	63.3	1.000095
33000.0	269.4	-49.6	-62.3	20.5**	419.8	582.5	230.2	65.9	1.000094
33500.0	263.3	-50.3	-70.2	7.8**	412.6	580.9	230.6	71.4	1.000092
34000.0	257.5	-51.8			404.9	579.6	231.0	77.6	1.000090
34500.0	251.3	-52.4			396.5	578.9	231.9	82.9	1.000088
35000.0	245.5	-52.6			387.8	578.5	232.9	87.7	1.000086
35500.0	239.7	-52.9			379.0	578.3	233.8	90.1	1.000084
36000.0	234.2	-53.0			370.5	578.1	234.7	90.1	1.000083
36500.0	228.7	-53.1			362.1	577.9	235.2	89.1	1.000081
37000.0	223.4	-53.1			353.7	577.9	235.5	87.6	1.000079
37500.0	218.2	-52.9			345.1	578.2	235.2	86.3	1.000077
38000.0	213.1	-52.9			337.2	578.1	234.8	85.1	1.000075
38500.0	208.2	-53.1			329.6	577.9	234.5	86.2	1.000073
39000.0	203.3	-53.5			322.2	577.7	234.3	87.7	1.000072
39500.0	198.6	-53.5			315.0	577.4	234.5	90.9	1.000070
40000.0	193.9	-53.9			308.2	576.8	234.8	93.9	1.000069
40500.0	189.4	-54.5			301.5	576.3	235.0	94.7	1.000067
41000.0	185.0	-54.7			295.0	575.8	235.2	95.8	1.000066
41500.0	180.7	-55.0			288.5	575.4	235.8	94.6	1.000064
42000.0	176.4	-55.2			281.9	575.2	236.5	93.4	1.000063
42500.0	172.3	-55.4			275.5	574.9	237.7	90.8	1.000061
43000.0	168.2	-55.7			269.5	574.4	238.9	88.1	1.000060
43500.0	164.2	-56.2			263.7	573.8	239.7	84.5	1.000059

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA  
 3450220010  
 NY 30

STATION ALTITUDE 4010.40 FEET MSL  
 11 DEC. 79  
 1532 HRS MS1  
 ASCENSION NO. 10

GEODETIC COORDINATES  
 32.88497 LAT DEG  
 106.49714 LON DEG

TABLE 5 (CONT)

GEODETIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	AIR TEMPERATURE DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CM <sup>3</sup> WATER	SPEED OF SOUND KNOTS	WIND DIRECTION DEGREES (TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
44000.0	160.3	-50.6	250.0	573.2	240.4	81.1	1.000057	
44500.0	156.6	-57.1	252.4	572.6	240.7	78.1	1.000056	
45000.0	152.9	-57.5	247.0	572.0	241.0	75.2	1.000055	
45500.0	149.2	-58.1	241.6	571.3	241.3	73.5	1.000054	
46000.0	145.6	-59.1	237.1	569.9	241.7	71.7	1.000053	
46500.0	142.1	-60.2	232.5	568.6	242.3	69.8	1.000052	
47000.0	138.7	-61.2	228.0	567.2	243.0	67.8	1.000051	
47500.0	135.4	-62.2	223.6	565.8	244.3	65.8	1.000050	
48000.0	132.1	-63.0	219.0	564.7	240.1	64.0	1.000049	
48500.0	128.9	-63.9	214.5	563.6	247.3	64.3	1.000048	
49000.0	125.7	-64.6	210.0	562.6	248.5	64.5	1.000047	
49500.0	122.6	-65.4	205.7	561.5	249.0	64.1	1.000046	
50000.0	119.6	-65.6	200.8	561.2	249.4	63.3	1.000045	
50500.0	116.7	-65.6	195.8	561.3	249.5	60.5	1.000044	
51000.0	113.8	-65.5	190.9	561.4	249.6	57.8	1.000043	
51500.0	111.0	-65.5	186.2	561.4	249.4	55.0	1.000041	
52000.0	108.3	-65.6	181.8	561.2	249.2	52.9	1.000040	
52500.0	105.6	-64.9	176.7	562.2	249.0	52.1	1.000039	
53000.0	103.0	-64.2	171.8	563.1	248.8	51.6	1.000038	
53500.0	100.5	-63.5	167.1	564.0	248.6	52.1	1.000037	
54000.0	98.1	-63.4	162.9	564.2	248.1	53.3	1.000036	
54500.0	95.7	-63.5	159.0	564.1	248.5	57.4	1.000035	
55000.0	93.3	-63.5	155.1	564.0	245.1	60.8	1.000035	
55500.0	91.1	-63.6	151.4	564.0	244.7	60.8	1.000034	
56000.0	89.0	-63.6	147.7	563.9	244.2	60.8	1.000033	
56500.0	86.7	-63.7	144.2	563.8	244.9	54.6	1.000032	
57000.0	84.6	-63.7	140.7	563.6	240.8	44.9	1.000031	
57500.0	82.5	-63.8	137.3	563.7	249.6	35.1	1.000031	
58000.0	80.5	-63.8	134.0	563.6	251.5	25.9	1.000030	
58500.0	78.5	-63.9	130.7	563.5	254.9	16.8	1.000029	
59000.0	76.6	-63.1	126.2	562.0	255.6	11.1	1.000029	
59500.0	74.7	-60.5	125.8	560.3	243.9	11.6	1.000028	
60000.0	72.8	-67.3	123.4	558.6	233.5	12.6	1.000027	
60500.0	71.0	-68.8	121.1	556.9	223.4	16.3	1.000027	
61000.0	69.3	-69.3	118.5	555.9	229.0	22.2	1.000026	
61500.0	67.5	-69.6	115.6	555.9	230.0	28.2	1.000026	
62000.0	65.8	-69.6	112.7	553.8	232.2	31.2	1.000025	
62500.0	64.2	-69.7	109.9	555.7	234.9	33.0	1.000024	
63000.0	62.6	-69.7	107.2	555.7	237.0	34.5	1.000024	
63500.0	61.0	-69.4	104.5	555.6	241.2	34.5	1.000023	

UPPER AIR DATA  
 3450220010  
 NW 30

STATION ALTITUDE 4010.40 FEET MSL  
 11 DEC. 79 1532 HRS MST  
 ASCENSION NO. 10

GEODETIC COORDINATES  
 32.86397 LAT DEG  
 106.49714 LON DEG

TABLE 5 (CONT)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
						DIRECTION DEGREES(TN)	SPEED KNOTS	
6400.0	59.5	-69.8		101.9	555.5	249.8	34.7	1.000023
6450.0	58.0	-69.9		99.4	555.5	247.4	37.6	1.000022
6500.0	56.5	-69.4		96.7	550.1	249.5	40.7	1.000022
6550.0	55.1	-60.8		93.1	559.7	251.5	42.6	1.000021
6600.0	53.8	-64.1		89.6	563.2	253.5	44.1	1.000020
6650.0	52.5	-62.5		86.7	565.7			1.000019
6700.0	51.2	-61.0		84.1	567.5			1.000019

STATION ALTITUDE 4010.40 FEET MSL  
 11 DEC 79 1532 HRS MST  
 ASCENSION NO. 14

MANDATORY LEVELS  
 3450220018  
 114 30

GEODETIC COORDINATES  
 32.86497 LAT DEG  
 106.49714 LON DEG

TABLE 6

PRESSURE MILLIBARS	GEOPOTENTIAL FEET	TEMPERATURE		REL. HUM. PERCENT	WIND DATA		
		AIR DEGREES CENTIGRADE	DEWPOINT CENTIGRADE		DIRECTION DEGREES(TN)	SPEED KNOTS	
850.0	4743.	18.0	1.1	32.	233.1	12.9	
800.0	6425.	12.0	-2.0	36.	215.2	13.7	
750.0	8181.	6.7	-5.1	43.	204.8	11.3	
700.0	10022.	1.6	-12.9	33.	229.7	16.3	
650.0	11467.	-2.4	-16.2	34.	251.7	26.0	
600.0	14034.	-6.8	-16.7	45.	253.9	29.5	
550.0	16242.	-11.9	-19.0	55.	243.4	29.5	
500.0	18617.	-15.6	-24.3	47.	236.7	43.7	
450.0	21201.	-20.3	-20.4	99.	237.2	49.9	
400.0	24026.	-27.2	-27.3	99.	239.9	50.9	
350.0	27137.	-34.7	-39.3	63.	227.4	57.8	
300.0	30602.	-43.6	-47.1	68.	230.8	62.9	
250.0	34537.	-52.5			232.1	83.8	
200.0	39259.	-53.4			234.5	89.8	
175.0	42065.	-55.2			236.8	92.7	
150.0	45275.	-57.9			241.3	73.9	
125.0	48982.	-64.8			248.6	64.5	
100.0	53442.	-63.4			248.6	52.2	
80.0	57935.	-63.9			252.0	24.2	
70.0	60590.	-69.5			229.7	19.4	
60.0	63605.	-69.8			243.3	34.6	
50.0	67239.	-59.7					