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June 1981

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METEOROLOGICAL DATA REPORT

19313A MLRS
Missile Numbers BC-006, BC-007
Round Numbers V-160/MD-27, V-161/MD-28
30 June 1981

by

DONALD C. KELLER
Program Support Coordinator
Phone Number (505) 679-9568
AVN Number 349-9568

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ATMOSPHERIC SCIENCES LABORATORY
WHITE SANDS MISSILE RANGE, NEW MEXICO

E COM

UNITED STATES ARMY ELECTRONICS COMMAND

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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Meteorological data gathered for the launching of the 19313A MLRS, Missile No. BC-006 and BC-007, Round No. V-160/MD-27 and V-161/MD-28 presented in tabular form. | | |

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INTRODUCTION

19313A MLRS, Missile Numbers BC-006 and BC-007, Round Numbers V-160/MD-27 and V-161/MD-28, were launched from Tula Gate, White Sands Missile Range (WSMR), New Mexico, at 1507:02 and 1507:06 MDT, 30 June 1981. The scheduled launch times were 1500 and 1500:04.5 MDT.

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 (gm/m^3), wind direction and speed, and cloud cover were made at the Tula Gate Met Site at T-0 minutes.

(2) Anemometer data were provided from tower-mounted anemometer at Tula Gate. 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 Double Theodolite pibal observations at:

SITE AND ALTITUDE

| | |
|-----------|------|
| Tula Gate | 2 KM |
| MAL | 2 KM |

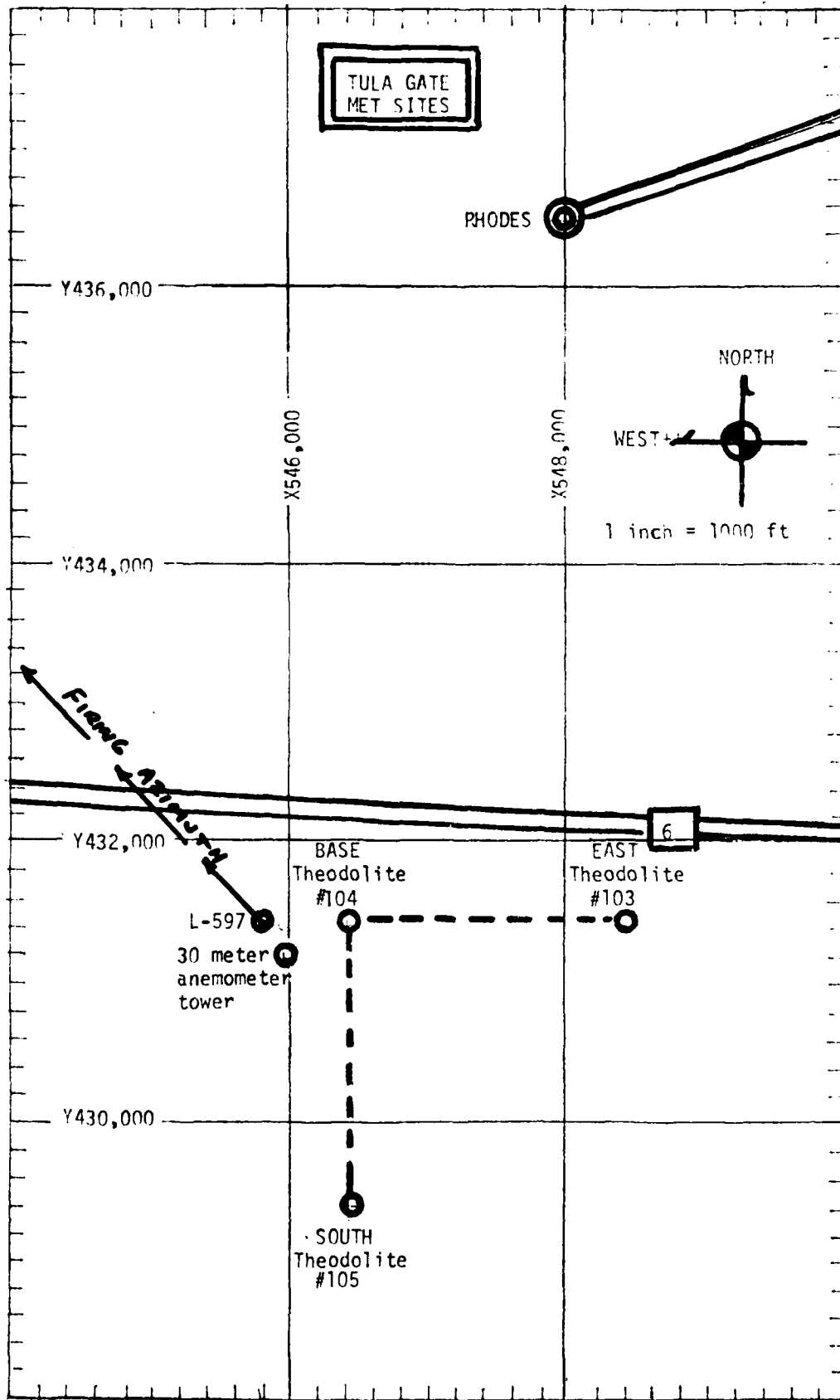
(2) Air structure data (rawinsonde) were collected at the following Met Sites:

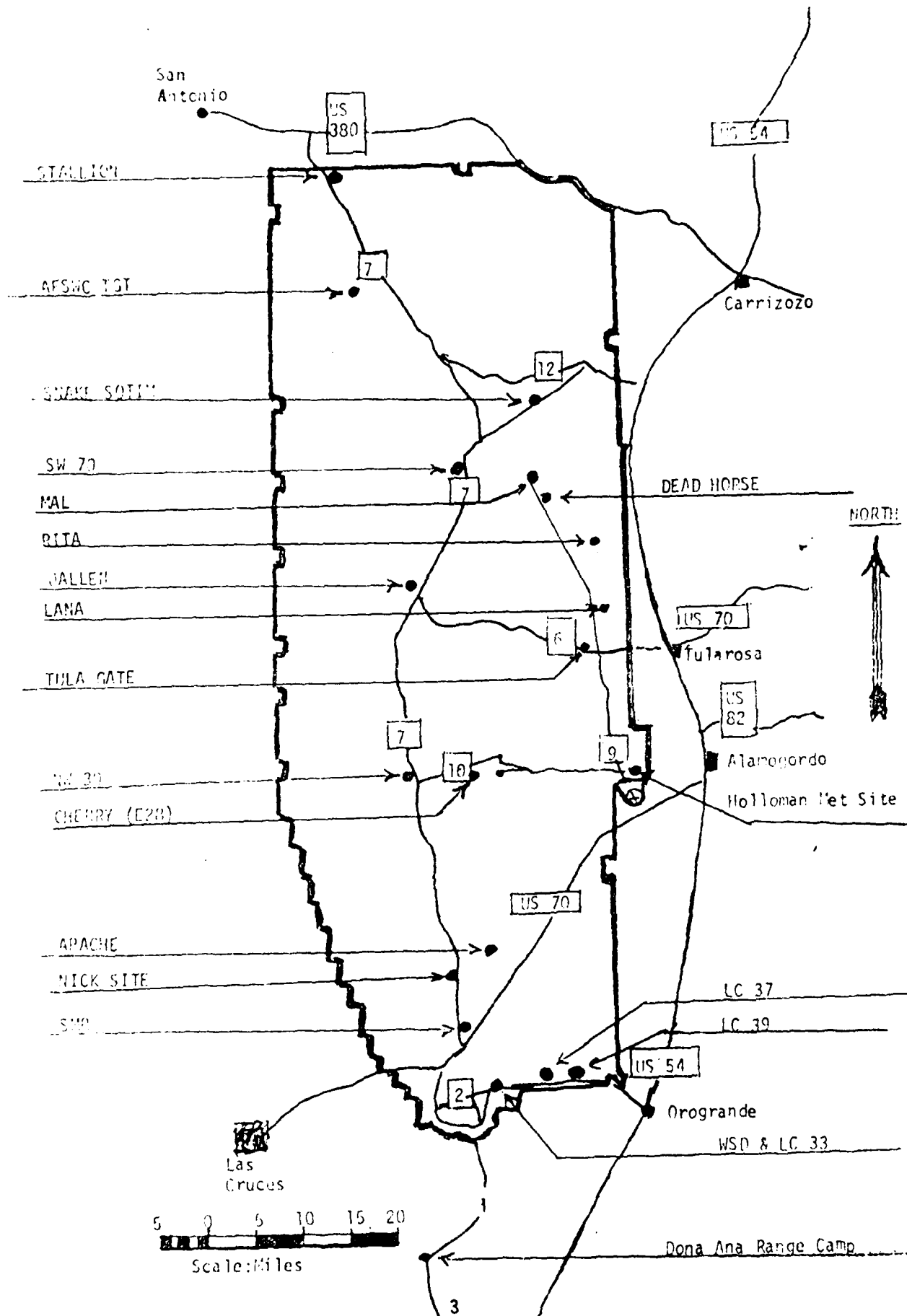
SITE AND TIME

| | |
|------|----------|
| LANA | 1230 MDT |
| RITA | 1325 MDT |
| LANA | 1600 MDT |

| | |
|---------------------|-------------------------------------|
| Accession No. | |
| NTIC GRAF | <input checked="" type="checkbox"/> |
| DTIC TAB | <input type="checkbox"/> |
| Unannounced | <input type="checkbox"/> |
| Justification | |
| By | |
| Distribution | |
| Avail. and/or sales | |

A





PROJECT SURFACE OBSERVATION

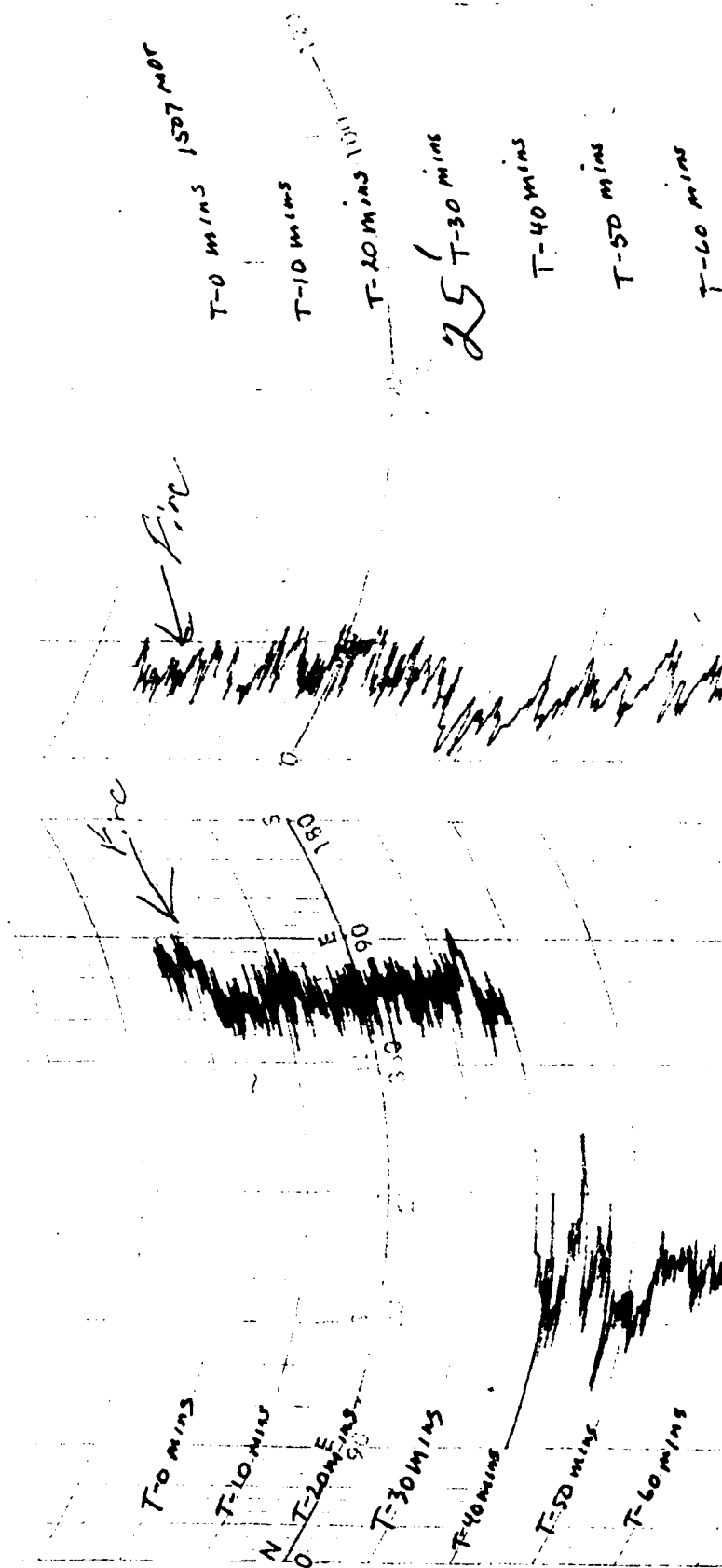
| STATION TULA GATE | | | | | | | | | |
|-------------------|----------|-------------------|-----------|---------------|-------------------|---------------|-----------|-----------|--|
| TABLE 1 | | DATE 30 JUNE 1981 | | X= 545,944.89 | | Y= 431,158.70 | | H= 4102.5 | |
| DAY | | MONTH | | YEAR | | DIRECTION | | WIND | |
| TIME | PRESSURE | TEMPERATURE | DEW POINT | RELATIVE | DENSITY | SPEED | CHARACTER | VISIBIL- | |
| M D I | mbs | OF | OF | HUMIDITY | gm/m ³ | kts | kts | ITY | |
| | | OC | OC | % | | | | | |
| 1507 | 874.9 | 29.4 | 17.3 | 48 | 997 | 14 | G24 | 30 | |
| | | | | | | | | | |
| | | | | | | | | | |

| OBSTRUCTIONS TO VISIBILITY | CLOUDS | | | | | | REMARKS |
|-------------------------------|-----------|------|-----------|-----|-----------|-------|---------|
| | 1st LAYER | | 2nd LAYER | | 3rd LAYER | | |
| | AMT | TYPE | HGT | AMT | TYPE | HGT | |
| | 6 | CU | 6000 | 2 | AC | 12000 | |
| | | | | | | | |
| | | | | | | | |

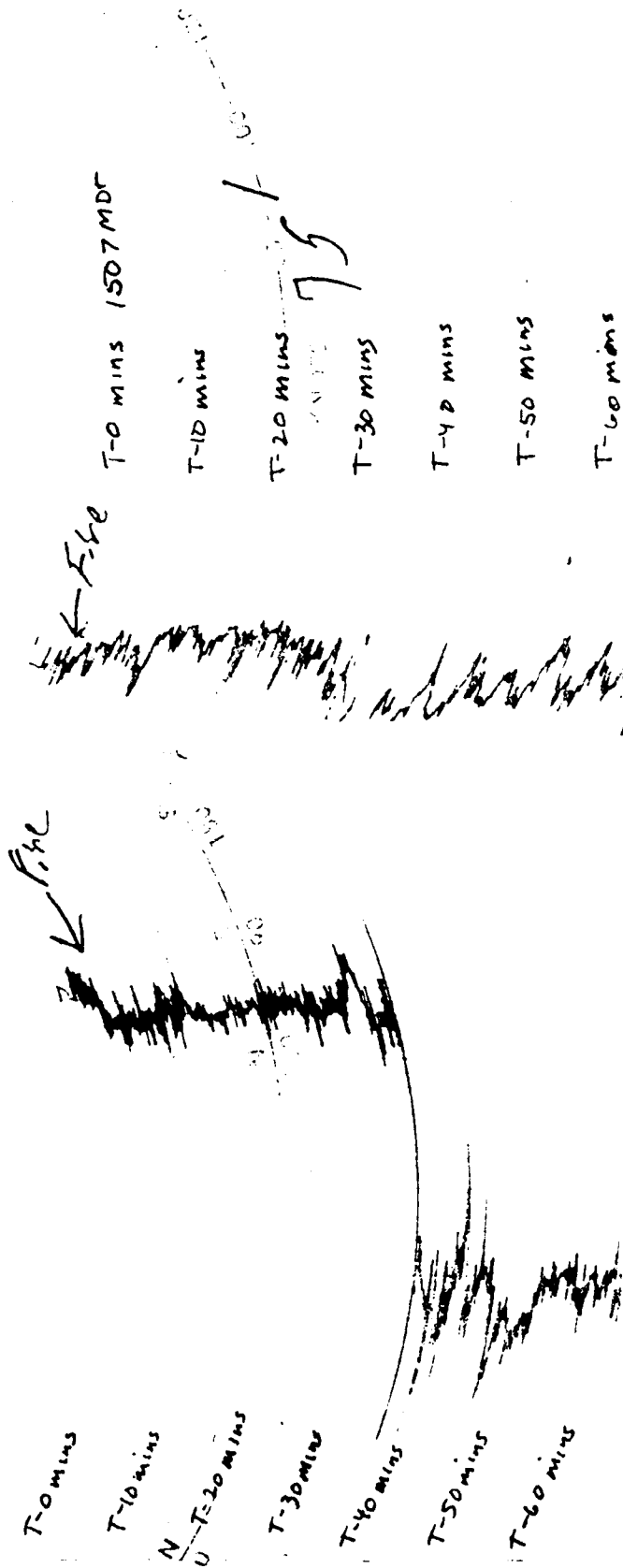
PSYCHROMETRIC COMPUTATION

| | | | |
|-----------------|-----|------|--|
| TIME: | MDT | 1507 | |
| DRY BULB TEMP. | | 29.4 | |
| WET BULB TEMP. | | 20.9 | |
| WET BULB DEPR. | | 8.5 | |
| DEW POINT | | 17.3 | |
| RELATIVE HUMID. | | 48 | |

TABLE: 2



Anemometer data from anemometer mounted 25 feet above ground level; WST# X-545,944.89 Y-431,158.70



Anemometer data from anemometer mounted 75 feet above ground level: WSTP X-545, 244.89 Y-431, 158.70

TABLE 4

T-TIME PILOT-BALLOON MEASURED WIND DATA

DATE 30 June 1981

SITE: Tula Gate

TIME: 1507 MDT

WSTM COORDINATES:

X= 546,402.29

Y= 431,426.23

H= 4,105.86

SITE: MAL

TIME: 1507 MDT

WSTM COORDINATES:

X= 509,421.05

Y= 495,563.18

H= 4,126.80

| LAYER MIDPOINT METERS AGL | DIRECTION DEGREES | SPEED KNOTS | LAYER MIDPOINT METERS AGL | DIRECTION DEGREES | SPEED KNOTS |
|------------------------------|----------------------|----------------|------------------------------|----------------------|----------------|
| SURFACE | 050 | 12 | SURFACE | 050 | 12 |
| 150 | 047 | 19 | 150 | 073 | 16 |
| 210 | 049 | 17 | 210 | 079 | 14 |
| 270 | 051 | 14 | 270 | 088 | 10 |
| 330 | 051 | 12 | 330 | 105 | 06 |
| 390 | 051 | 10 | 390 | 112 | 06 |
| 500 | 051 | 06 | 500 | 129 | 05 |
| 650 | M I S G | | 650 | M I S G | |
| 800 | M I S G | | 800 | M I S G | |
| 950 | M I S G | | 950 | M I S G | |
| 1150 | M I S G | | 1150 | M I S G | |
| 1350 | M I S G | | 1350 | M I S G | |
| 1550 | M I S G | | 1550 | M I S G | |
| 1750 | M I S G | | 1750 | M I S G | |
| 2000 | M I S G | | 2000 | M I S G | |

Data obtained from Double Theodolite Tracking Pilot-Balloon Observation.

All data is doubtful, but may be used as an indicator of the general flow.

AIMING AND T-TIME COMPUTER MET MESSAGES
30 June 1981

LANA 1230 MDT
METCM1331062
301850127875
00320005 30480875
01355009 30140865
02344014 29860841
03392013 29510803
04344014 29050758
05300018 28640714
06293017 28430673
07294010 28090633
08297018 27760596
09263015 27420560
10274009 27220526
11288007 26980494
12213008 26540449

RITA 1325 MDT
METCM1334061
301940128875
00480007 30490875
01353010 30280865
02346015 29880841
03324014 29520803
04325015 29060758
05306016 28630715
06297017 28320673
07262014 27990634
08291015 27640596
09287014 27400560
10275012 27150526
11260013 26800494
12276009 26390449

LANA 1600 MDT
METCM1331062
302200127874
00107015 30160874
01177015 29820864
02129014 29600839
03344005 29340801
04358013 28960756
05313017 28630712
06300016 28270671
07313015 29750631
08323015 27720594
09327016 27520558
10324017 27430525
11319015 27030493
12298010 26380443

STATION ALTITUDE 4173.04 FEET MSL
 30 JUNE 81
 ASCENSION NO. 1 1230 HRS MDT

SIGNIFICANT LEVEL DATA
 1810320001
 LANA

GEODETTIC COORDINATES
 33.13510 LAT DEG
 106.15446 LON DEG

TABLE 6

| PRESSURE MILLIBARS | GEOMETRIC ALTITUDE MSL FEET | TEMPERATURE | | REL. HUM. PERCENT |
|-----------------------|-----------------------------------|------------------------------|------------------------|----------------------|
| | | AIR DEGREES CENTIGRADE | DEWPOINT CENTIGRADE | |
| 875.0 | 4173.4 | 28.9 | 18.9 | 55.0 |
| 865.4 | 4094.9 | 25.6 | 14.4 | 50.0 |
| 850.0 | 5013.3 | 24.1 | 14.5 | 55.0 |
| 803.8 | 6611.2 | 19.7 | 13.6 | 58.0 |
| 754.4 | 8396.0 | 14.6 | 13.1 | 91.0 |
| 721.8 | 9620.6 | 11.2 | 10.1 | 93.0 |
| 707.0 | 10191.4 | 11.7 | 7.4 | 75.0 |
| 700.0 | 10465.5 | 11.4 | 6.9 | 74.0 |
| 673.0 | 11302.4 | 10.1 | 7.2 | 82.0 |
| 638.8 | 12964.9 | 6.8 | 2.5 | 74.0 |
| 597.8 | 14724.9 | -3.7 | -7.3 | 76.0 |
| 585.4 | 15271.8 | -2.0 | -5.7 | 88.0 |
| 546.0 | 17100.1 | -1.0 | -5.4 | 84.0 |
| 542.8 | 17254.8 | -5 | -4.5 | 74.0 |
| 500.0 | 19404.9 | -3.6 | -9.8 | 62.0 |
| 493.4 | 19750.6 | -3.6 | -11.3 | 55.0 |
| 471.8 | 20910.6 | -5.6 | -15.9 | 44.0 |
| 456.0 | 21786.3 | -7.7 | -17.3 | 40.0 |
| 432.2 | 23154.1 | -9.6 | -19.0 | 46.0 |
| 421.8 | 23771.2 | -11.4 | -19.9 | 49.0 |
| 409.6 | 24510.9 | -12.4 | -21.8 | 45.0 |
| 402.4 | 24856.0 | -13.5 | -19.8 | 59.0 |
| 400.0 | 25105.8 | -13.7 | -21.0 | 54.0 |
| 385.0 | 26059.0 | -15.6 | -23.6 | 50.0 |
| 363.8 | 27460.3 | -17.7 | -26.5 | 38.0 |
| 350.0 | 28409.1 | -19.9 | -28.5 | 46.0 |
| 332.4 | 29661.5 | -23.1 | -34.0 | 36.0 |
| 316.6 | 30832.0 | -24.8 | -39.1 | 25.0 |
| 300.0 | 32112.5 | -28.5 | -40.6 | 30.0 |
| 274.4 | 34196.3 | -33.4 | -49.0 | 19.0 |
| 258.0 | 35610.7 | -37.1 | | |
| 250.0 | 36325.4 | -38.3 | | |
| 200.0 | 41232.8 | -51.7 | | |
| 194.0 | 41882.2 | -52.8 | | |

STATION ALTITUDE 4173.44 FEET MSL
 30 JUNE 31
 ASCENSION NO. 1

UPPER AIR DATA
 1410320004
 LANA

GEODETIC COORDINATES
 33.13510 LAT DEG
 106.15446 LONG DEG

TABLE 7

| GEOMETRIC ALTITUDE MSL FEET | PRESSURE MILLIBARS | TEMPERATURE AIR DEGREES | DEWPOINT CENTIGRADE | REL. HUM. PERCENT | DENSITY GM/CUBIC METER | SPEED OF SOUND | | WIND DATA | | INDEX OF REFRACTION |
|--------------------------------|-----------------------|----------------------------|------------------------|----------------------|------------------------------|----------------|--------|-------------------------|----------------|---------------------------|
| | | | | | | KNOTS | METERS | DIRECTION DEGREES(T) | SPEED KNOTS | |
| 4173.4 | 875.0 | 28.9 | 18.9 | 55.0 | 999.6 | 680.3 | 100.0 | 100.0 | 5.1 | 1.000314 |
| 4500.0 | 865.2 | 25.6 | 14.4 | 50.0 | 1001.7 | 675.8 | 190.1 | 190.1 | 5.8 | 1.000293 |
| 5000.0 | 850.4 | 24.1 | 14.5 | 54.9 | 989.2 | 674.2 | 200.7 | 200.7 | 7.3 | 1.000291 |
| 5500.0 | 835.7 | 22.8 | 14.3 | 59.0 | 976.5 | 672.6 | 207.7 | 207.7 | 8.9 | 1.000288 |
| 6000.0 | 821.2 | 21.4 | 14.1 | 63.0 | 964.1 | 671.1 | 212.5 | 212.5 | 10.6 | 1.000285 |
| 6500.0 | 806.9 | 20.0 | 13.7 | 67.1 | 951.8 | 669.5 | 214.5 | 214.5 | 12.2 | 1.000281 |
| 7000.0 | 792.8 | 18.6 | 13.7 | 73.0 | 939.6 | 667.9 | 209.3 | 209.3 | 12.9 | 1.000279 |
| 7500.0 | 778.8 | 17.2 | 13.6 | 79.5 | 927.5 | 666.3 | 204.8 | 204.8 | 13.8 | 1.000277 |
| 8000.0 | 765.1 | 15.7 | 13.4 | 85.9 | 915.6 | 664.7 | 199.1 | 199.1 | 14.6 | 1.000274 |
| 8500.0 | 751.6 | 14.3 | 12.9 | 91.2 | 904.0 | 663.0 | 188.2 | 188.2 | 15.2 | 1.000270 |
| 9000.0 | 738.1 | 12.9 | 11.7 | 92.0 | 892.5 | 661.5 | 178.5 | 178.5 | 16.3 | 1.000262 |
| 9500.0 | 724.9 | 11.5 | 10.4 | 92.8 | 881.3 | 659.5 | 172.9 | 172.9 | 17.5 | 1.000255 |
| 10000.0 | 711.9 | 11.5 | 8.4 | 81.0 | 866.1 | 659.3 | 168.3 | 168.3 | 18.7 | 1.000245 |
| 10500.0 | 699.1 | 11.3 | 7.0 | 74.3 | 851.4 | 658.9 | 156.0 | 156.0 | 18.2 | 1.000237 |
| 11000.0 | 686.5 | 10.6 | 7.1 | 79.1 | 838.2 | 658.0 | 164.3 | 164.3 | 17.2 | 1.000234 |
| 11500.0 | 674.1 | 9.7 | 6.6 | 81.0 | 825.7 | 657.0 | 163.7 | 163.7 | 14.8 | 1.000230 |
| 12000.0 | 661.8 | 8.7 | 5.2 | 78.6 | 813.8 | 655.7 | 163.0 | 163.0 | 11.9 | 1.000224 |
| 12500.0 | 649.8 | 7.7 | 3.8 | 76.2 | 802.7 | 654.4 | 162.5 | 162.5 | 10.4 | 1.000217 |
| 13000.0 | 638.0 | 6.6 | 2.3 | 74.0 | 791.1 | 653.0 | 159.6 | 159.6 | 9.9 | 1.000211 |
| 13500.0 | 626.0 | 3.6 | -5 | 74.6 | 785.2 | 649.3 | 157.4 | 157.4 | 10.5 | 1.000204 |
| 14000.0 | 614.4 | 6 | -3.3 | 75.2 | 779.4 | 645.6 | 157.6 | 157.6 | 13.3 | 1.000198 |
| 14500.0 | 602.9 | -2.4 | -6.0 | 75.7 | 773.7 | 641.9 | 157.7 | 157.7 | 15.9 | 1.000192 |
| 15000.0 | 591.5 | -2.8 | -5.5 | 82.0 | 760.4 | 641.3 | 157.7 | 157.7 | 18.2 | 1.000190 |
| 15500.0 | 580.3 | -1.9 | -3.7 | 87.5 | 747.0 | 642.6 | 154.9 | 154.9 | 18.1 | 1.000190 |
| 16000.0 | 569.4 | -1.6 | -3.6 | 86.4 | 728.2 | 643.0 | 150.4 | 150.4 | 17.0 | 1.000186 |
| 16500.0 | 558.6 | -1.3 | -3.5 | 85.3 | 713.6 | 643.3 | 149.2 | 149.2 | 14.6 | 1.000183 |
| 17000.0 | 548.1 | -1.1 | -3.4 | 84.2 | 699.4 | 643.7 | 143.5 | 143.5 | 12.0 | 1.000180 |
| 17500.0 | 537.7 | -0.9 | -5.1 | 72.6 | 685.4 | 643.8 | 131.6 | 131.6 | 10.3 | 1.000174 |
| 18000.0 | 527.6 | -1.6 | -6.3 | 69.8 | 674.4 | 642.9 | 125.7 | 125.7 | 8.7 | 1.000170 |
| 18500.0 | 517.6 | -2.3 | -7.6 | 67.1 | 664.0 | 642.0 | 122.7 | 122.7 | 7.9 | 1.000166 |
| 19000.0 | 507.8 | -3.0 | -8.8 | 64.3 | 653.3 | 641.1 | 118.0 | 118.0 | 7.3 | 1.000162 |
| 19500.0 | 498.2 | -3.6 | -10.2 | 60.1 | 642.5 | 640.3 | 117.8 | 117.8 | 7.5 | 1.000158 |
| 20000.0 | 488.7 | -4.0 | -12.3 | 52.6 | 631.4 | 639.7 | 120.9 | 120.9 | 7.7 | 1.000153 |
| 20500.0 | 479.3 | -4.9 | -14.2 | 47.9 | 621.5 | 638.6 | 121.7 | 121.7 | 7.5 | 1.000149 |
| 21000.0 | 470.2 | -5.8 | -16.0 | 44.2 | 611.6 | 637.4 | 116.3 | 116.3 | 7.2 | 1.000146 |
| 21500.0 | 461.1 | -7.0 | -16.3 | 45.3 | 602.8 | 636.0 | 114.7 | 114.7 | 6.5 | 1.000143 |
| 22000.0 | 452.2 | -8.0 | -17.5 | 46.0 | 593.3 | 634.8 | 114.2 | 114.2 | 6.2 | 1.000140 |
| 22500.0 | 443.4 | -8.7 | -18.2 | 46.0 | 583.6 | 633.9 | 115.3 | 115.3 | 6.3 | 1.000138 |
| 23000.0 | 434.8 | -9.4 | -19.3 | 46.0 | 573.6 | 633.1 | 119.1 | 119.1 | 6.3 | 1.000135 |
| 23500.0 | 426.3 | -10.6 | -19.5 | 47.7 | 563.1 | 631.6 | 118.9 | 118.9 | 6.3 | 1.000133 |

STATION ALTITUDE 4173.44 FEET MSL
 30 JUNE 81
 ASCENSION NO. 1 1230 HRS NDT

UPPER AIR DATA
 1810320001
 LANA

GEODETTIC COORDINATES
 33.15510 LAT DEG
 106.15446 LON DEG

TABLE 7 CONT

| GEOMETRIC ALTITUDE MSL FEET | PRESSURE MILLIBARS | TEMPERATURE | | REL. HUM. PERCENT | DENSITY GM/CUBIC METER | SPEED OF SOUND KNOTS | "IND" DATA | | INDEX OF REFRACTION |
|-----------------------------------|-----------------------|------------------------------|-----------------------------------|----------------------|------------------------------|----------------------------|--------------------------|----------------|---------------------------|
| | | AIR DEGREES CENTIGRADE | DEWPOINT DEGREES CENTIGRADE | | | | DIRECTION DEGREES(TH) | SPEED KNOTS | |
| 24000.0 | 410.0 | -11.7 | -20.5 | 47.8 | 550.4 | 630.3 | 111.9 | 6.1 | 1.000131 |
| 24500.0 | 409.8 | -12.4 | -21.8 | 45.1 | 546.9 | 629.4 | 115.0 | 6.0 | 1.000128 |
| 25000.0 | 401.7 | -13.6 | -20.1 | 57.5 | 538.4 | 628.0 | 124.3 | 6.0 | 1.000127 |
| 25500.0 | 393.7 | -14.5 | -22.1 | 52.3 | 529.7 | 626.9 | 134.4 | 6.2 | 1.000124 |
| 26000.0 | 385.9 | -15.5 | -23.4 | 50.2 | 521.3 | 625.6 | 149.2 | 6.2 | 1.000121 |
| 26500.0 | 378.2 | -16.3 | -25.1 | 46.2 | 512.5 | 624.7 | 164.3 | 6.5 | 1.000119 |
| 27000.0 | 370.6 | -17.0 | -26.0 | 41.9 | 503.7 | 623.7 | 171.1 | 7.1 | 1.000116 |
| 27500.0 | 363.2 | -17.8 | -28.5 | 38.3 | 495.2 | 622.7 | 171.4 | 8.0 | 1.000114 |
| 28000.0 | 355.9 | -19.0 | -28.5 | 42.6 | 487.4 | 621.3 | 164.0 | 9.5 | 1.000112 |
| 28500.0 | 348.7 | -20.1 | -28.9 | 45.3 | 479.6 | 619.9 | 159.6 | 11.7 | 1.000110 |
| 29000.0 | 341.6 | -21.4 | -31.0 | 41.3 | 472.5 | 618.3 | 157.3 | 13.9 | 1.000108 |
| 29500.0 | 334.6 | -22.7 | -33.2 | 37.3 | 465.2 | 616.7 | 154.4 | 14.2 | 1.000106 |
| 30000.0 | 327.8 | -23.6 | -35.3 | 32.8 | 457.4 | 615.5 | 151.5 | 14.1 | 1.000104 |
| 30500.0 | 321.0 | -24.3 | -37.5 | 28.1 | 449.3 | 614.6 | 147.7 | 13.1 | 1.000102 |
| 31000.0 | 314.4 | -25.3 | -39.2 | 25.7 | 441.7 | 613.4 | 146.9 | 12.3 | 1.000100 |
| 31500.0 | 307.8 | -26.7 | -39.8 | 27.6 | 435.1 | 611.6 | 148.4 | 11.5 | 1.000098 |
| 32000.0 | 301.4 | -28.2 | -40.4 | 29.6 | 428.5 | 609.8 | 150.6 | 11.0 | 1.000097 |
| 32500.0 | 295.1 | -29.4 | -42.0 | 28.0 | 421.6 | 608.3 | 152.4 | 10.7 | 1.000095 |
| 33000.0 | 288.8 | -30.6 | -44.0 | 25.3 | 414.7 | 606.8 | 152.1 | 10.7 | 1.000093 |
| 33500.0 | 282.7 | -31.8 | -46.0 | 22.7 | 407.9 | 605.3 | 153.6 | 10.5 | 1.000091 |
| 34000.0 | 276.7 | -32.9 | -48.1 | 20.0 | 401.3 | 603.8 | 156.9 | 10.1 | 1.000090 |
| 34500.0 | 270.8 | -34.2 | -51.7 | 14.9** | 394.8 | 602.2 | 160.6 | 9.3 | 1.000088 |
| 35000.0 | 265.0 | -35.5 | -57.6 | 8.2** | 388.4 | 600.6 | 165.6 | 8.8 | 1.000087 |
| 35500.0 | 259.2 | -36.8 | -71.0 | 1.5** | 382.1 | 598.9 | 170.9 | 9.4 | 1.000085 |
| 36000.0 | 253.6 | -38.0 | | | 375.8 | 597.4 | 175.2 | 10.3 | 1.000084 |
| 36500.0 | 248.0 | -39.3 | | | 369.4 | 595.8 | 178.5 | 11.4 | 1.000082 |
| 37000.0 | 242.4 | -40.6 | | | 363.2 | 594.1 | 177.9 | 12.1 | 1.000081 |
| 37500.0 | 237.0 | -41.9 | | | 357.0 | 592.4 | 175.4 | 12.6 | 1.000080 |
| 38000.0 | 231.7 | -43.2 | | | 351.0 | 590.0 | 170.6 | 13.0 | 1.000078 |
| 38500.0 | 226.5 | -44.5 | | | 345.1 | 589.1 | 165.7 | 13.6 | 1.000077 |
| 39000.0 | 221.4 | -45.8 | | | 339.3 | 587.4 | 163.7 | 14.1 | 1.000076 |
| 39500.0 | 216.4 | -47.1 | | | 333.6 | 585.7 | 162.3 | 14.7 | 1.000074 |
| 40000.0 | 211.5 | -48.5 | | | 328.0 | 584.0 | 165.0 | 15.0 | 1.000073 |
| 40500.0 | 206.8 | -49.8 | | | 322.5 | 582.3 | | | 1.000072 |
| 41000.0 | 202.1 | -51.1 | | | 317.1 | 580.5 | | | 1.000071 |
| 41500.0 | 197.5 | -52.2 | | | 311.3 | 579.1 | | | 1.000069 |

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

STATION ALTITUDE 4173.44 FEET MSL
 30 JUNE 61
 ASCENSION NO. 1

MANDATORY LEVELS
 1810320001
 LAJA

GEOMETRIC COORDINATES
 53.15510 LAT DEG
 106.15446 LONG DEG

TABLE 8

| PRESSURE MILLIBARS | GEO-POTENTIAL FEET | TEMPERATURE AIR DEGREES CENTIGRADE | REL. HUM. PERCENT | WIND DATA | | |
|-----------------------|-----------------------|---|----------------------|--------------------------|----------------|--|
| | | | | DIRECTION DEGREES(TN) | SPEED KNOTS | |
| 850.0 | 5010. | 24.1 | 55. | 200.9 | 7.3 | |
| 800.0 | 6740. | 19.3 | 70. | 211.9 | 12.5 | |
| 750.0 | 8552. | 14.1 | 91. | 187.1 | 15.3 | |
| 700.0 | 10456. | 11.4 | 74. | 166.1 | 18.3 | |
| 650.0 | 12481. | 7.7 | 70. | 162.5 | 10.4 | |
| 600.0 | 14613. | -3.1 | 76. | 157.7 | 16.5 | |
| 550.0 | 16897. | -1.1 | 84. | 148.7 | 12.5 | |
| 500.0 | 19378. | -3.6 | 62. | 139.9 | 7.4 | |
| 450.0 | 22092. | -8.2 | 46. | 114.4 | 0.2 | |
| 400.0 | 25065. | -13.7 | 50. | 120.3 | 0.0 | |
| 350.0 | 28358. | -19.9 | 46. | 160.5 | 11.2 | |
| 300.0 | 32049. | -28.5 | 30. | 151.0 | 11.0 | |
| 250.0 | 36246. | -38.8 | | 177.3 | 10.9 | |
| 200.0 | 41134. | -51.7 | | | | |

STATION ALTITUDE 418,074 FEET MSL
 30 JUNE 61 13⁵⁵ HRS MDZ
 ASCENSION NO. 1

SIGNIFICANT LEVEL DATA
 1810210001
 R11A

STATION ALTITUDE 418,074 FEET MSL
 30 JUNE 61 13⁵⁵ HRS MDZ
 ASCENSION NO. 1

TABLE 9

| PRESSURE MILLIBARS | GEOMETRIC ALTITUDE MSL FEET | TEMPERATURE | | REL. HUM. PERCENT |
|-----------------------|-----------------------------------|----------------|------------------------|----------------------|
| | | AIR DEGREES | DEWPOINT CENTIGRADE | |
| 675.3 | 4180.7 | 29.7 | 15.8 | 43.0 |
| 650.0 | 5039.6 | 24.1 | 14.5 | 55.0 |
| 790.4 | 7114.9 | 18.9 | 12.2 | 65.0 |
| 741.6 | 8902.1 | 14.0 | 9.4 | 74.0 |
| 700.0 | 10495.9 | 10.1 | 6.0 | 87.0 |
| 648.2 | 12591.1 | 6.9 | 4.2 | 83.0 |
| 626.6 | 13504.8 | 4.3 | 2.7 | 89.0 |
| 612.6 | 14109.9 | 3.3 | 2.5 | 93.0 |
| 577.2 | 15692.5 | .6 | -3.1 | 76.0 |
| 560.0 | 16491.2 | -3 | -2.5 | 85.0 |
| 526.4 | 18114.4 | -3.0 | -4.1 | 92.0 |
| 518.0 | 18533.8 | -3.6 | -4.7 | 92.0 |
| 509.8 | 18949.5 | -3.4 | -4.5 | 92.0 |
| 500.0 | 19453.2 | -5.5 | -10.8 | 60.0 |
| 485.8 | 20195.2 | -7.0 | -15.9 | 49.0 |
| 474.6 | 20793.6 | -7.4 | -15.6 | 51.0 |
| 462.0 | 21481.2 | -9.1 | -19.9 | 41.0 |
| 454.4 | 21903.2 | -9.6 | -20.5 | 41.0 |
| 449.7 | 22167.5 | -9.5 | -20.8 | 39.0 |
| 446.6 | 22343.2 | -9.9 | -21.5 | 38.0 |
| 431.4 | 23219.4 | -11.6 | -25.3 | 31.0 |
| 416.6 | 24098.4 | -12.4 | -20.7 | 24.0 |
| 400.0 | 25117.1 | -14.2 | -37.2 | 20.0 |
| 373.0 | 26949.1 | -18.0 | -36.4 | 27.0 |
| 359.0 | 27786.2 | -20.3 | -31.4 | 36.0 |
| 345.4 | 28726.7 | -20.9 | -41.5 | 14.0 |
| 319.0 | 30645.8 | -24.8 | -43.8 | 12.0 |
| 300.0 | 32105.3 | -28.6 | -46.9 | 12.0 |
| 287.6 | 33095.2 | -31.4 | | |
| 270.0 | 34557.3 | -34.8 | | |
| 252.6 | 36077.4 | -38.4 | | |

UPPER AIR DATA
 1.10210001
 RTIA

STATION ALTITUDE 4186.74 FEET MSL
 30 JUNE 81
 ASCENSION NO. 1

OPTIC COORDINATES
 33.18295 LAT DEG
 106.15114 LONG DEG

TABLE 10

| GEOMETRIC ALTITUDE MSL FEET | PRESSURE MILLIBARS | AIR TEMPERATURE DEGREES CELSIUS | REL. HUM. PERCENT | GM/CUBIC METER | SPEED OF SOUND KNOTS | DIRECTION OF DEGRADATION | INDEX OF REFRACTION |
|-----------------------------|--------------------|---------------------------------|-------------------|----------------|----------------------|--------------------------|---------------------|
| 4186.7 | 475.3 | 29.7 | 43.0 | 99.9.0 | 680.6 | 270.0 | 1.000297 |
| 4500.0 | 865.9 | 27.6 | 47.4 | 995.2 | 678.3 | 249.7 | 1.000295 |
| 5000.0 | 851.2 | 24.4 | 54.4 | 989.3 | 674.5 | 217.8 | 1.000292 |
| 5500.0 | 836.4 | 22.9 | 57.2 | 976.9 | 672.8 | 197.5 | 1.000287 |
| 6000.0 | 821.9 | 21.7 | 59.6 | 964.1 | 671.3 | 189.2 | 1.000282 |
| 6500.0 | 807.6 | 20.4 | 62.0 | 951.6 | 669.9 | 185.7 | 1.000278 |
| 7000.0 | 793.6 | 19.2 | 64.4 | 939.2 | 668.4 | 180.0 | 1.000273 |
| 7500.0 | 779.6 | 17.8 | 66.9 | 927.1 | 666.8 | 174.7 | 1.000268 |
| 8000.0 | 765.8 | 16.5 | 69.5 | 915.2 | 665.1 | 169.4 | 1.000263 |
| 8500.0 | 752.3 | 15.1 | 72.0 | 903.5 | 663.5 | 164.5 | 1.000258 |
| 9000.0 | 739.0 | 13.8 | 74.8 | 891.8 | 661.9 | 177.6 | 1.000253 |
| 9500.0 | 725.7 | 12.5 | 78.9 | 879.6 | 660.5 | 175.5 | 1.000249 |
| 10000.0 | 712.7 | 11.3 | 83.0 | 867.6 | 659.0 | 173.1 | 1.000245 |
| 10500.0 | 699.9 | 10.1 | 87.0 | 855.8 | 657.6 | 170.8 | 1.000242 |
| 11000.0 | 687.2 | 9.3 | 86.0 | 842.7 | 656.6 | 168.4 | 1.000236 |
| 11500.0 | 674.7 | 8.6 | 85.1 | 829.9 | 655.6 | 165.7 | 1.000230 |
| 12000.0 | 662.4 | 7.8 | 84.1 | 817.2 | 654.7 | 159.1 | 1.000225 |
| 12500.0 | 650.4 | 7.0 | 83.2 | 804.7 | 653.7 | 153.6 | 1.000220 |
| 13000.0 | 638.4 | 5.7 | 85.7 | 793.0 | 652.1 | 151.3 | 1.000215 |
| 13500.0 | 626.7 | 4.3 | 89.0 | 783.3 | 650.4 | 154.9 | 1.000211 |
| 14000.0 | 615.1 | 3.5 | 92.3 | 771.2 | 649.4 | 158.5 | 1.000208 |
| 14500.0 | 603.7 | 2.6 | 88.8 | 759.4 | 648.3 | 162.0 | 1.000202 |
| 15000.0 | 592.4 | 1.8 | 83.4 | 747.9 | 647.2 | 165.5 | 1.000196 |
| 15500.0 | 581.4 | .9 | 78.1 | 736.5 | 646.0 | 162.6 | 1.000190 |
| 16000.0 | 570.5 | .3 | 79.5 | 724.0 | 645.2 | 161.5 | 1.000187 |
| 16500.0 | 559.8 | -.3 | 85.0 | 712.3 | 644.6 | 160.0 | 1.000185 |
| 17000.0 | 549.2 | -1.1 | 87.2 | 701.1 | 643.6 | 158.5 | 1.000181 |
| 17500.0 | 538.9 | -2.0 | 89.4 | 690.0 | 642.6 | 157.0 | 1.000178 |
| 18000.0 | 528.7 | -2.8 | 91.5 | 679.1 | 641.6 | 154.1 | 1.000175 |
| 18500.0 | 518.7 | -3.6 | 92.0 | 668.1 | 640.7 | 149.7 | 1.000171 |
| 19000.0 | 508.8 | -3.6 | 89.4 | 659.6 | 640.0 | 147.7 | 1.000168 |
| 19500.0 | 499.1 | -3.6 | 84.9 | 648.5 | 637.9 | 146.6 | 1.000158 |
| 20000.0 | 489.5 | -3.6 | 53.5 | 636.8 | 636.5 | 143.9 | 1.000153 |
| 20500.0 | 480.1 | -7.2 | 55.1 | 627.9 | 635.8 | 139.0 | 1.000150 |
| 21000.0 | 470.8 | -7.9 | 55.0 | 617.4 | 634.9 | 139.9 | 1.000148 |
| 21500.0 | 461.7 | -9.1 | 41.0 | 606.5 | 633.3 | 132.2 | 1.000142 |
| 22000.0 | 452.7 | -9.6 | 40.3 | 597.7 | 632.6 | 130.6 | 1.000140 |
| 22500.0 | 443.8 | -10.2 | 36.7 | 587.5 | 632.0 | 128.6 | 1.000137 |
| 23000.0 | 435.2 | -11.2 | 32.8 | 578.2 | 630.8 | 127.6 | 1.000133 |
| 23500.0 | 426.6 | -11.9 | 28.8 | 568.4 | 629.9 | 123.6 | 1.000131 |

STATION ALTITUDE 4186.74 FEET MSL
 30 JUNE 81 1325 HRS MDT
 ASCENSION NO. 1

UPPER AIR DATA
 1410210001
 RITA
 TABLE 10 CONT

GEODESLIC COORDINATES
 33.18295 LAT LEG
 106.15114 LONG LEG

| GEOMETRIC ALTITUDE MSL FEET | PRESSURE MILLIBARS | AIR TEMPERATURE DEGREES CENTIGRADE | TEMPERATURE DEWPOINT CENTIGRADE | REL. HUM. PERCENT | DENSITY GM/CUBIC METER | SPEED OF SOUND KNOTS | WIND DATA DIRECTION (T) SPEED (T) KNOTS | INDEX OF REFRACTION |
|-----------------------------------|-----------------------|---|---------------------------------------|----------------------|------------------------------|----------------------------|--|---------------------------|
| 2400.0 | 410.2 | -12.3 | -28.3 | 24.8 | 550.3 | 629.4 | 141.5 | 1.000128 |
| 2450.0 | 410.0 | -13.1 | -30.1 | 22.4 | 549.0 | 628.4 | 140.2 | 1.000125 |
| 2500.0 | 401.9 | -14.0 | -31.8 | 20.5 | 540.0 | 627.3 | 139.5 | 1.000123 |
| 2550.0 | 393.9 | -15.0 | -32.1 | 21.5 | 531.4 | 626.0 | 144.7 | 1.000121 |
| 2600.0 | 386.0 | -16.1 | -32.1 | 23.6 | 523.0 | 624.7 | 150.7 | 1.000119 |
| 2650.0 | 378.3 | -17.2 | -32.2 | 25.6 | 514.7 | 623.3 | 154.4 | 1.000117 |
| 2700.0 | 370.7 | -18.4 | -32.1 | 28.4 | 506.7 | 622.0 | 156.5 | 1.000115 |
| 2750.0 | 363.2 | -19.6 | -31.6 | 33.3 | 498.8 | 620.5 | 159.1 | 1.000114 |
| 2800.0 | 355.9 | -20.4 | -31.1 | 31.0 | 490.4 | 619.4 | 161.9 | 1.000111 |
| 2850.0 | 348.6 | -20.8 | -30.1 | 19.3 | 481.1 | 619.0 | 161.8 | 1.000108 |
| 2900.0 | 341.5 | -21.5 | -41.9 | 13.7 | 472.6 | 618.1 | 158.4 | 1.000106 |
| 2950.0 | 334.5 | -22.5 | -43.1 | 13.2 | 464.8 | 616.9 | 153.7 | 1.000104 |
| 3000.0 | 327.7 | -23.5 | -44.3 | 12.7 | 457.1 | 615.6 | 147.3 | 1.000103 |
| 3050.0 | 320.9 | -24.5 | -45.5 | 12.2 | 449.6 | 614.3 | 159.8 | 1.000101 |
| 3100.0 | 314.3 | -25.7 | -46.6 | 12.0 | 442.4 | 612.8 | 152.5 | 1.000099 |
| 3150.0 | 307.7 | -27.0 | -47.7 | 12.0 | 435.5 | 611.2 | 131.3 | 1.000097 |
| 3200.0 | 301.3 | -28.3 | -48.7 | 12.0 | 428.7 | 609.6 | 135.2 | 1.000096 |
| 3250.0 | 295.0 | -29.7 | -49.1 | 7.2** | 422.1 | 607.8 | 142.0 | 1.000094 |
| 3300.0 | 288.8 | -31.1 | -50.9 | 1.2** | 415.7 | 606.1 | 145.9 | 1.000093 |
| 3350.0 | 282.6 | -32.3 | | | 408.8 | 604.5 | 148.1 | 1.000091 |
| 3400.0 | 276.6 | -33.5 | | | 402.1 | 603.1 | 154.1 | 1.000090 |
| 3450.0 | 270.7 | -34.7 | | | 395.4 | 601.6 | 164.2 | 1.000088 |
| 3500.0 | 264.8 | -35.8 | | | 388.8 | 600.1 | 163.0 | 1.000087 |
| 3550.0 | 259.1 | -37.0 | | | 382.2 | 598.6 | | 1.000085 |
| 3600.0 | 253.5 | -38.2 | | | 375.6 | 597.1 | | 1.000084 |

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

STATION ALTITUDE 4186.74 FEET MSL
 30 JUNE 61 1325 HRS MDT
 ASCENSION NO. 1

MANDATORY LEVELS
 1,10210001
 RITA

TABLE 11

GEODETIC COORDINATES
 53.18295 LAT DEG
 106.15114 LONG DEG

| PRESSURE GEOPOTENTIAL | | TEMPERATURE | | REL. HUM. | WIND (MKT) | |
|-----------------------|--------|----------------|------------------------|-----------|--------------------------|----------------|
| MILLIBARS | FEET | AIR DEGREES | DEWPOINT CENTIGRADE | PERCENT | DIRECTION DEGREES(TN) | SPEED KNOTS |
| 850.0 | 5036. | 24.1 | 14.5 | 55. | 215.0 | 7.5 |
| 800.0 | 6768. | 19.8 | 12.0 | 63. | 185.9 | 13.4 |
| 750.0 | 8501. | 14.9 | 10.0 | 72. | 180.0 | 16.5 |
| 700.0 | 10486. | 10.1 | 8.0 | 87. | 170.9 | 15.5 |
| 650.0 | 12503. | 7.0 | 4.4 | 83. | 153.5 | 15.2 |
| 600.0 | 14648. | 2.4 | .4 | 67. | 163.1 | 15.5 |
| 550.0 | 16944. | -1.1 | -3.0 | 67. | 158.0 | 12.5 |
| 500.0 | 19427. | -5.5 | -10.8 | 60. | 146.5 | 13.9 |
| 450.0 | 22118. | -9.5 | -20.8 | 39. | 157.9 | 8.1 |
| 400.0 | 25076. | -14.2 | -32.2 | 20. | 140.2 | 10.1 |
| 350.0 | 28354. | -20.7 | -37.0 | 22. | 161.8 | 13.4 |
| 300.0 | 32042. | -28.6 | -48.9 | 12. | 136.7 | 12.6 |

STATION ALTITUDE 4173.44 FEET MSL
 30 JUNE 51 1600 HRS MDT
 ASCENSION NO. 3

SIGNIFICANT LEVEL DATA
 1810320003
 LAJA

GEODETIC COORDINATES
 33.13510 LAT DEG
 106.15446 LONG DEG

TABLE 12

| PRESSURE MILLIBARS | GEOMETRIC ALTITUDE MSL FEET | TEMPERATURE | | REL. HUM. PERCENT |
|-----------------------|-----------------------------------|------------------------------|------------------------|----------------------|
| | | AIR DEGREES CENTIGRADE | DEWPOINT CENTIGRADE | |
| 873.7 | 4173.4 | 25.9 | 17.5 | 60.0 |
| 867.8 | 4368.6 | 21.9 | 15.5 | 67.0 |
| 850.0 | 4960.0 | 20.6 | 13.2 | 71.0 |
| 817.4 | 6071.6 | 19.6 | 14.0 | 70.0 |
| 783.4 | 7270.6 | 16.5 | 13.2 | 61.0 |
| 748.4 | 8547.7 | 14.0 | 11.0 | 82.0 |
| 700.0 | 10394.3 | 10.1 | 8.7 | 91.0 |
| 648.0 | 12494.7 | 5.9 | 4.7 | 92.0 |
| 597.4 | 14676.8 | 3.0 | -1.0 | 75.0 |
| 570.4 | 15906.5 | 1.1 | -2.3 | 78.0 |
| 534.8 | 17612.7 | .5 | -2.0 | 83.0 |
| 519.0 | 18404.4 | -.5 | -3.9 | 78.0 |
| 500.0 | 19361.1 | -3.6 | -7.5 | 74.0 |
| 493.8 | 19705.4 | -4.4 | -8.6 | 71.0 |
| 482.2 | 20321.1 | -5.4 | -10.2 | 69.0 |
| 477.2 | 20589.7 | -6.9 | -11.8 | 68.0 |
| 457.8 | 21651.2 | -9.4 | -14.5 | 66.0 |
| 442.2 | 22531.2 | -10.8 | -16.4 | 63.0 |
| 400.0 | 25047.1 | -15.5 | -24.0 | 57.0 |
| 349.2 | 28380.7 | -21.9 | -30.1 | 47.0 |
| 343.2 | 28800.2 | -22.5 | -30.9 | 46.0 |
| 303.8 | 31706.1 | -29.7 | -38.4 | 42.0 |
| 300.0 | 32001.4 | -30.1 | -39.5 | 39.0 |
| 250.0 | 36189.4 | -40.0 | -49.0 | 37.0 |
| 227.6 | 38279.4 | -44.8 | | |
| 206.8 | 40369.1 | -49.6 | | |
| 200.0 | 41087.3 | -51.6 | | |
| 191.8 | 41977.5 | -54.1 | | |

STATION ALTITUDE 4173.44 FEET MSL
 30 JUNE 61 1600 HRS MDT
 ASCENSION NO. 3

UPPER AIR DATA
 1410320003
 LATA

SYNOPTIC COORDINATES
 33.13510 LAT DEG
 106.19446 LONG DEG

TABLE 13

| GEOMETRIC ALTITUDE MSL FEET | PRESSURE MILLIBARS | TEMPERATURE | | REL. HUM. PERCENT | DENSITY GM/CUBIC METER | SPEED OF SOUND KNOTS | WIND DATA | | INDEX OF REFRACTION |
|--------------------------------|-----------------------|------------------------------|-----------------------------------|----------------------|------------------------------|----------------------------|----------------------------|----------------|---------------------------|
| | | AIR DEGREES CENTIGRADE | DEWPOINT DEGREES CENTIGRADE | | | | DIRECTION DEGREES (TRU) | SPEED KNOTS | |
| 4173.44 | 873.7 | 25.9 | 17.5 | 60.0 | 1008.4 | 676.6 | 00.0 | 15.0 | 1.000310 |
| 4500.0 | 863.8 | 21.6 | 15.4 | 67.9 | 1013.1 | 671.4 | 03.0 | 13.3 | 1.000302 |
| 5000.0 | 848.8 | 20.6 | 15.1 | 71.0 | 999.0 | 670.2 | 09.2 | 10.8 | 1.000298 |
| 5500.0 | 834.0 | 20.1 | 14.6 | 70.5 | 983.2 | 669.7 | 79.1 | 6.5 | 1.000292 |
| 6000.0 | 819.5 | 19.7 | 14.1 | 70.1 | 967.7 | 669.1 | 105.1 | 4.5 | 1.000287 |
| 6500.0 | 805.1 | 18.5 | 13.8 | 73.9 | 954.6 | 667.8 | 167.5 | 4.2 | 1.000283 |
| 7000.0 | 790.9 | 17.2 | 13.4 | 78.5 | 942.0 | 666.3 | 205.3 | 8.6 | 1.000279 |
| 7500.0 | 777.0 | 16.1 | 12.8 | 81.2 | 929.2 | 664.9 | 206.5 | 11.7 | 1.000274 |
| 8000.0 | 763.2 | 15.1 | 11.9 | 81.6 | 916.1 | 663.7 | 199.9 | 12.6 | 1.000268 |
| 8500.0 | 749.7 | 14.1 | 11.1 | 82.0 | 903.1 | 662.5 | 191.2 | 13.0 | 1.000262 |
| 9000.0 | 736.2 | 13.0 | 10.4 | 84.2 | 890.4 | 661.2 | 162.1 | 13.4 | 1.000257 |
| 9500.0 | 723.0 | 12.0 | 9.8 | 86.6 | 877.7 | 659.9 | 178.7 | 14.8 | 1.000252 |
| 10000.0 | 710.1 | 10.9 | 9.2 | 89.1 | 865.3 | 658.7 | 176.4 | 16.3 | 1.000246 |
| 10500.0 | 697.3 | 9.9 | 8.5 | 91.1 | 853.1 | 657.4 | 172.9 | 16.3 | 1.000243 |
| 11000.0 | 684.6 | 8.9 | 7.5 | 91.3 | 840.7 | 656.1 | 169.6 | 16.2 | 1.000237 |
| 11500.0 | 672.1 | 7.9 | 6.6 | 91.5 | 828.6 | 654.9 | 168.5 | 15.4 | 1.000231 |
| 12000.0 | 659.9 | 6.9 | 5.6 | 91.8 | 816.6 | 653.6 | 168.7 | 14.6 | 1.000226 |
| 12500.0 | 647.9 | 5.9 | 4.7 | 92.0 | 804.8 | 652.4 | 173.1 | 14.2 | 1.000221 |
| 13000.0 | 635.9 | 5.2 | 3.4 | 88.1 | 792.1 | 651.5 | 176.2 | 14.5 | 1.000215 |
| 13500.0 | 624.2 | 4.6 | 2.1 | 84.2 | 779.6 | 650.6 | 178.1 | 15.1 | 1.000209 |
| 14000.0 | 612.7 | 3.9 | .8 | 80.3 | 767.3 | 649.7 | 178.6 | 15.1 | 1.000203 |
| 14500.0 | 601.3 | 3.2 | -.5 | 76.4 | 755.2 | 648.9 | 179.9 | 15.1 | 1.000197 |
| 15000.0 | 590.2 | 2.5 | -.9 | 75.8 | 743.2 | 648.0 | 162.1 | 15.4 | 1.000193 |
| 15500.0 | 579.2 | 1.7 | -1.9 | 77.0 | 731.5 | 647.0 | 163.4 | 15.5 | 1.000190 |
| 16000.0 | 568.4 | 1.1 | -2.3 | 78.3 | 719.6 | 646.2 | 163.6 | 15.4 | 1.000186 |
| 16500.0 | 557.8 | .9 | -2.2 | 79.7 | 708.5 | 645.1 | 163.7 | 15.3 | 1.000184 |
| 17000.0 | 547.3 | .7 | -2.1 | 81.2 | 693.7 | 645.9 | 163.2 | 15.3 | 1.000181 |
| 17500.0 | 537.1 | .5 | -2.1 | 82.7 | 681.1 | 645.7 | 162.7 | 15.3 | 1.000178 |
| 18000.0 | 527.0 | .0 | -2.9 | 80.6 | 669.7 | 645.0 | 162.2 | 15.4 | 1.000174 |
| 18500.0 | 517.1 | -.8 | -4.2 | 77.6 | 659.3 | 644.0 | 161.6 | 15.5 | 1.000170 |
| 19000.0 | 507.3 | -2.4 | -6.1 | 75.6 | 650.9 | 642.0 | 160.5 | 15.3 | 1.000165 |
| 19500.0 | 497.7 | -3.9 | -8.0 | 72.9 | 642.3 | 640.1 | 179.4 | 15.0 | 1.000161 |
| 20000.0 | 486.2 | -4.9 | -9.5 | 70.0 | 632.5 | 638.6 | 179.6 | 14.1 | 1.000157 |
| 20500.0 | 478.9 | -6.4 | -11.2 | 68.3 | 624.1 | 636.9 | 160.3 | 12.9 | 1.000153 |
| 21000.0 | 469.6 | -7.9 | -12.9 | 67.2 | 615.5 | 635.1 | 174.0 | 11.6 | 1.000149 |
| 21500.0 | 460.5 | -9.0 | -14.2 | 66.3 | 606.4 | 633.6 | 176.5 | 10.2 | 1.000146 |
| 22000.0 | 451.6 | -10.0 | -15.3 | 64.8 | 596.7 | 632.5 | 169.4 | 9.7 | 1.000143 |
| 22500.0 | 442.7 | -10.8 | -16.4 | 63.1 | 586.9 | 631.5 | 169.3 | 9.7 | 1.000140 |
| 23000.0 | 434.0 | -11.7 | -17.5 | 61.9 | 577.5 | 630.6 | 157.3 | 10.2 | 1.000137 |
| 23500.0 | 425.4 | -12.6 | -18.6 | 60.7 | 568.1 | 629.2 | 160.6 | 11.0 | 1.000134 |

STATION ALTITUDE 4173.44 FEET MSL
 30 JUNE 81 1600 HRS MDT
 ASCENSION NO. 3

UPPER AIR DATA
 1410320003
 LANA

GEODETIC COORDINATES
 33.13510 LAT DEG
 106.15440 LONG DEG

TABLE 13 CONT

| GEOMETRIC ALTITUDE MSL FEET | PRESSURE MILLIBARS | TEMPERATURE AIR DEGREES CENTIGRADE | REL. HUM. PERCENT | DENSITY GM/CUBIC METER | SPEED OF SOUND KIPTS | WIND DATA DIRECTION (10) DEGREES (10) | SPEED KNOTS | INDEX OF REFRACTION |
|--------------------------------|-----------------------|--|----------------------|------------------------------|----------------------------|---|----------------|---------------------------|
| 24000.0 | 417.1 | -13.5 | 59.5 | 554.0 | 620.1 | 102.5 | 11.5 | 1.000132 |
| 24500.0 | 400.8 | -14.5 | 58.3 | 550.0 | 620.9 | 109.1 | 12.0 | 1.000129 |
| 25000.0 | 400.8 | -15.4 | 57.1 | 541.1 | 623.7 | 171.5 | 11.6 | 1.000127 |
| 25500.0 | 392.7 | -16.4 | 55.6 | 532.3 | 624.0 | 172.0 | 11.1 | 1.000124 |
| 26000.0 | 388.8 | -17.3 | 54.1 | 523.5 | 623.4 | 171.1 | 10.4 | 1.000122 |
| 26500.0 | 377.0 | -18.3 | 52.6 | 514.9 | 622.2 | 170.9 | 9.9 | 1.000119 |
| 27000.0 | 369.4 | -19.2 | 51.1 | 506.5 | 621.0 | 170.9 | 9.4 | 1.000117 |
| 27500.0 | 362.0 | -20.2 | 49.6 | 498.2 | 619.8 | 170.0 | 9.5 | 1.000115 |
| 28000.0 | 354.7 | -21.2 | 48.1 | 490.0 | 618.6 | 170.0 | 9.4 | 1.000112 |
| 28500.0 | 347.5 | -22.1 | 46.7 | 481.9 | 617.5 | 170.9 | 9.1 | 1.000110 |
| 29000.0 | 340.3 | -23.0 | 45.7 | 473.7 | 616.3 | 170.0 | 8.9 | 1.000108 |
| 29500.0 | 333.3 | -24.2 | 45.0 | 466.2 | 614.8 | 170.0 | 9.3 | 1.000106 |
| 30000.0 | 326.3 | -25.5 | 44.3 | 458.8 | 613.2 | 170.8 | 10.6 | 1.000104 |
| 30500.0 | 319.6 | -26.7 | 43.7 | 451.6 | 611.7 | 170.0 | 12.1 | 1.000102 |
| 31000.0 | 312.9 | -28.0 | 43.0 | 444.5 | 610.1 | 170.4 | 13.5 | 1.000101 |
| 31500.0 | 306.4 | -29.2 | 42.3 | 437.5 | 608.6 | 170.9 | 14.3 | 1.000099 |
| 32000.0 | 300.0 | -30.1 | 39.0 | 429.9 | 607.4 | 171.0 | 14.7 | 1.000097 |
| 32500.0 | 293.6 | -31.3 | 38.0 | 422.7 | 605.9 | 174.1 | 15.0 | 1.000095 |
| 33000.0 | 287.2 | -32.5 | 38.5 | 415.7 | 604.5 | 170.0 | 16.3 | 1.000094 |
| 33500.0 | 281.1 | -33.6 | 38.3 | 408.7 | 603.0 | 180.0 | 16.8 | 1.000092 |
| 34000.0 | 275.0 | -34.0 | 38.0 | 401.9 | 601.5 | 184.9 | 16.3 | 1.000090 |
| 34500.0 | 269.1 | -36.0 | 37.8 | 395.2 | 600.0 | 187.7 | 16.1 | 1.000089 |
| 35000.0 | 263.3 | -37.2 | 37.6 | 388.7 | 598.5 | 187.7 | 16.1 | 1.000087 |
| 35500.0 | 257.6 | -38.4 | 37.3 | 382.2 | 597.0 | 183.0 | 16.0 | 1.000086 |
| 36000.0 | 252.1 | -39.6 | 37.1 | 375.9 | 595.5 | 180.5 | 14.6 | 1.000084 |
| 36500.0 | 246.5 | -40.7 | 31.5** | 369.5 | 594.0 | 185.3 | 13.2 | 1.000083 |
| 37000.0 | 241.1 | -41.9 | 22.6** | 363.1 | 592.5 | 185.8 | 12.2 | 1.000081 |
| 37500.0 | 235.7 | -43.0 | 13.8** | 356.8 | 591.0 | 195.2 | 12.2 | 1.000080 |
| 38000.0 | 230.5 | -44.2 | 4.9** | 350.6 | 589.5 | 190.7 | 12.3 | 1.000078 |
| 38500.0 | 225.3 | -45.3 | | 344.5 | 588.0 | 191.3 | 12.7 | 1.000077 |
| 39000.0 | 220.2 | -46.5 | | 338.4 | 586.6 | 190.1 | 13.5 | 1.000075 |
| 39500.0 | 215.2 | -47.6 | | 332.4 | 585.1 | 199.6 | 13.7 | 1.000074 |
| 40000.0 | 210.3 | -48.8 | | 326.5 | 583.0 | 192.1 | 13.6 | 1.000073 |
| 40500.0 | 205.5 | -50.0 | | 320.8 | 582.0 | 184.0 | 13.4 | 1.000071 |
| 41000.0 | 200.8 | -51.4 | | 315.4 | 580.2 | | | 1.000070 |
| 41500.0 | 196.2 | -52.8 | | 310.1 | 578.4 | | | 1.000069 |

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

STATION ALTITUDE 4173.44 FEET MSL
 30 JUNE 51 16 30 HRS MDI
 ASCENSION NO. 3

MANDATORY LEVELS
 1410321000
 LANA

GEODETIC COORDINATES
 33.13510 LAT DEG
 106.15446 LONG DEG

TABLE 14

| PRESSURE GEOPOTENTIAL | | TEMPERATURE | | REL. HUMID. | | WIND DATA | |
|-----------------------|--------|-------------|----------------------|-------------|-----------------------|-------------|--|
| MILLIBARS | FEET | AIR DEGREES | DEW POINT CENTIGRADE | PERCENT | DIRECTION DEGREES(TN) | SPEED KNOTS | |
| 850.0 | 4957. | 20.6 | 15.2 | 71. | 08.6 | 11.0 | |
| 800.0 | 6675. | 18.0 | 13.7 | 70. | 190.9 | 5.7 | |
| 750.0 | 8481. | 14.1 | 11.1 | 82. | 191.5 | 13.0 | |
| 700.0 | 10385. | 10.1 | 8.7 | 91. | 173.7 | 16.3 | |
| 650.0 | 12399. | 6.1 | 4.9 | 92. | 172.5 | 14.3 | |
| 600.0 | 14544. | 3.2 | - | 76. | 180.2 | 15.1 | |
| 550.0 | 16850. | .8 | -2.1 | 81. | 163.4 | 15.3 | |
| 500.0 | 19355. | -3.6 | -7.5 | 74. | 179.7 | 15.1 | |
| 450.0 | 22055. | -10.1 | -15.5 | 65. | 168.0 | 9.6 | |
| 400.0 | 25006. | -15.5 | -22.0 | 57. | 171.7 | 11.6 | |
| 350.0 | 28275. | -21.8 | -30.0 | 47. | 170.8 | 9.2 | |
| 300.0 | 31939. | -30.1 | -39.5 | 39. | 171.8 | 14.7 | |
| 250.0 | 36111. | -40.0 | -49.0 | 37. | 179.3 | 14.0 | |
| 200.0 | 40989. | -51.6 | | | | | |