

## DAILY SYNOPTIC UPPER-AIR REPORTS

The upper-air reports are derived in the same general manner as the surface data. For the most part, these observations have been for 0300Z, especially in Canada, Alaska, and the United States, with some additional observations at other hours when the station does not report at or near 0300Z. In the U.S.S.R. observations for all available hours have been included. Stations using the 1945 Radiosonde Code use the convention of adding 50 to the Greenwich time to indicate that part of the observation above 400 millibars of pressure, commonly known as the "second transmission." Many stations outside North America indicate the time of observation other than on-the-hour by adding to the Greenwich hour 25, for 15 minutes past the hour; 50, for 30 minutes; and 75, for 45 minutes. Although this has not been "subtracted out" of the reports, the data have been listed chronologically by hour within station.

### Assignment of Index Numbers:

The same method used in assigning station numbers in surface reports has been employed.

### Station Lists:

The upper-air numerical station index which precedes the upper-air data is presented in the same form as the surface index. The alphabetic index following the charts includes all stations, both surface and upper-air. Stations for upper-air only are designated with a single asterisk; those for both upper-air and surface, with two asterisks; while those for surface only are merely listed.

### Method of Presentation:

The upper-air data are presented in the same general way as the surface data. Stations are listed numerically within certain geographical areas according to their International Index Numbers. The teletype data have been edited for obvious errors, garbled data, etc.; but no attempt has been made to present the various winds aloft and radiosonde codes in a standard-level form. To the right of each line of the listed observations is a code number which indicates the type of code used for that report, as follows:

- |                  |                                   |
|------------------|-----------------------------------|
| 1. PIBAL         | 5. TEMPS                          |
| 2. RAWIN         | 6. PRAWT                          |
| 3. RABAL         | 7. PRAT                           |
| 4. Russian PIBAL | 8. CORAC and 1945 Radiosonde Code |
| 9. Russian RAOBS |                                   |

While the upper-air observations usually have more than one line to an observation, the station number and hour appear only on the first line.

All land stations are listed first, and are followed by ship reports.

### Description of Codes:

1. Winds Aloft
  - a. IIIGG Hddvv Hddvv ..... Hddvv
  - b. IIIGG Hddvv Hddvv ..... 9999n Hddvv
  - c. IIIGG Hddvv Hddvv ..... Hddvv C<sub>L</sub>C<sub>M</sub>HHM
  - d. IIIGG HHddv<sub>5</sub> HHddv<sub>5</sub> ..... HHddv<sub>5</sub>
  - e. IIIGG 8ddvv 9ddvv Oddvv ..... M<sub>x</sub>H<sub>x</sub>H<sub>x</sub>H<sub>x</sub>C<sub>x</sub>  
(Russian)

The meaning of symbols in above codes, whose values will be found in tables of international codes and symbols, is as follows:

- C International cloud code.
- C<sub>L</sub> Form of low cloud (International code).
- C<sub>M</sub> Form of middle cloud (International code).
- dd Wind direction in tens of degrees.
- GG Greenwich hour or Moscow time.
- H Height in thousands feet/meters.
- HH Height of last observation.
- HH Height in hectometers.
- H<sub>x</sub>H<sub>x</sub>H<sub>x</sub>H<sub>x</sub> Height at which observations were discontinued in tens of meters.
- III Station index number.
- M Reason for ceasing upper wind observation (International code).

### M<sub>x</sub> Reason for ceasing upper wind observation (Russian code).

- |                           |                         |
|---------------------------|-------------------------|
| 0 - Entering cloud        | 5 - Lost behind cloud   |
| 1 - Lost in fog           | 6 - Lost in background  |
| 2 - Lost in mist          | 7 - Lost in distance    |
| 3 - Lost accidentally     | 8 - Lost, balloon burst |
| 4 - Lost in precipitation | 9 - Lost, other causes  |

### v<sub>5</sub> Wind speed (International code).

vv Wind speed in miles per hour/knots.

vv Wind speed in meters per second (Russian code).

8,9,0,1 etc. Height levels (Russian code).

- 8 - Surface
- 9 - 200 meters
- 0 - 500 meters
- 1 - 1000 meters
- 2 - 2000 meters
- .
- .
- .
- .
- 0 - 10000 meters

9999<sub>n</sub> Change in decade of thousands, the figure for n to give the tens of thousands digit for levels following.

Code "a" is generally used in North America and from stations controlled by United States. Code "b" is readily identified by group, 9999<sub>n</sub>, and is used mainly in Europe. Code "c" may be identified by its last group and is also used in some European reports. Code "e" is identified by its height indicators and by the code number 4 at the extreme right-hand column of each line of the observation.

Only when a station designates its winds-aloft observation by the word RAWIN or RABAL have the codes 2 and 3 been listed in the right-hand column.

### 2. RAOBS

#### a. 1945 Radiosonde Code.

IIIGG P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>T<sub>0</sub>T<sub>0</sub> U<sub>0</sub>U<sub>0</sub>x<sub>1</sub>x<sub>2</sub>x<sub>3</sub> 00hhh TTU<sub>m</sub><sub>m</sub><sub>r</sub>  
(Oddvv) 85hhh TTU<sub>m</sub><sub>m</sub><sub>r</sub> 70hhh TTU<sub>m</sub><sub>m</sub><sub>r</sub>  
50hhh TTU<sub>m</sub><sub>m</sub><sub>r</sub> nnPPP TTU<sub>m</sub><sub>m</sub><sub>r</sub> .....  
IIIG<sub>50</sub>G<sub>50</sub> 30hhh TTU<sub>m</sub><sub>m</sub><sub>r</sub> (Oddvv) 20hhh  
TTU<sub>m</sub><sub>m</sub><sub>r</sub> 10hhh TTU<sub>m</sub><sub>m</sub><sub>r</sub> nnPPP TTU<sub>m</sub><sub>m</sub><sub>r</sub> .....  
101A<sub>df</sub>A<sub>df</sub>

#### b. TEMPS

IIIGG H<sub>d</sub>H<sub>d</sub>PPP TTTUU ..... 00000  
H<sub>d</sub>H<sub>d</sub>H<sub>d</sub>H<sub>d</sub>H<sub>d</sub> TTTUU .....

#### c. PRAWT

IIIGG P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>T<sub>0</sub>T<sub>0</sub> U<sub>0</sub>U<sub>0</sub>DDV n<sub>0</sub>n<sub>9</sub>n<sub>8</sub>n<sub>7</sub>n<sub>6</sub> n<sub>5</sub>n<sub>4</sub>n<sub>3</sub>n<sub>2</sub>n<sub>1</sub>  
HHTTU Uddvv 95TTU Uddvv HHTTU Uddvv 85TTU  
Uddvv ..... 77788 P<sub>1</sub>P<sub>2</sub>P<sub>3</sub>P<sub>4</sub>P<sub>5</sub> PPTTU Uddvv  
.....

#### d. PRAT

IIIGG P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>T<sub>0</sub>T<sub>0</sub> U<sub>0</sub>U<sub>0</sub>KK- n<sub>0</sub>n<sub>9</sub>n<sub>8</sub>n<sub>7</sub>n<sub>6</sub> n<sub>5</sub>n<sub>4</sub>n<sub>3</sub>n<sub>2</sub>n<sub>1</sub>  
HHTTU 95TTU HHTTU 85TTU HHTTU ..... 77788  
P<sub>1</sub>P<sub>2</sub>P<sub>3</sub>P<sub>4</sub>P<sub>5</sub> ...PX PPTTU

#### e. CORAC

IIIGG P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>T<sub>0</sub>T<sub>0</sub> U<sub>0</sub>U<sub>0</sub>x<sub>1</sub>x<sub>2</sub>x<sub>3</sub> (Oddvv) P<sub>1</sub>P<sub>1</sub>h<sub>1</sub>h<sub>1</sub>h<sub>1</sub>  
T<sub>1</sub>T<sub>1</sub>U<sub>1</sub>u<sub>1</sub>u<sub>1</sub> P<sub>2</sub>P<sub>2</sub>h<sub>2</sub>h<sub>2</sub>h<sub>2</sub> T<sub>2</sub>T<sub>2</sub>U<sub>2</sub>u<sub>2</sub>u<sub>2</sub> .....  
a. 11199 nnPPP TTUuu  
hh  
or  
77788 P<sub>1</sub>P<sub>1</sub>T<sub>1</sub>T<sub>1</sub>U<sub>1</sub> ..... 10171  
1u<sub>1</sub>u<sub>1</sub>u<sub>2</sub> 3u<sub>3</sub>u<sub>3</sub>u<sub>4</sub> etc.

f. Russian RAOB

IIIGG H<sub>1</sub>H<sub>1</sub>H<sub>1</sub>T<sub>1</sub>T<sub>1</sub> H<sub>2</sub>H<sub>2</sub>H<sub>2</sub>T<sub>2</sub>T<sub>2</sub> ..... 98765  
 H<sub>a</sub>H<sub>a</sub>PPP T<sub>a</sub>T<sub>a</sub>T<sub>a</sub>UU QQQEE H<sub>b</sub>H<sub>b</sub>PPP T<sub>b</sub>T<sub>b</sub>T<sub>b</sub>UU  
 QQQEE .....

The meaning of symbols in above codes, whose values will be found in tables of international codes and symbols, is as follows:

A<sub>df</sub>A<sub>df</sub> Form of additional data follows (1945 Radiosonde code).  
 DD Direction of wind near ground on 32-point scale.  
 dd Wind direction in tens of degrees.  
 EE Equivalent potential temperature in °C.  
 GG Greenwich hour or Moscow time.  
 HH (PRAT and PRAWT) Height in tens of feet or whole meters dependent on KK.  
 H<sub>a</sub>H<sub>a</sub>, H<sub>b</sub>H<sub>b</sub> Height in hectometers.  
 H<sub>d</sub>H<sub>d</sub> Height in hundreds of geodynamic meters.  
 H<sub>d</sub>H<sub>d</sub>H<sub>d</sub>H<sub>d</sub> Height to which upper-air observations of temperature and humidity are referred, expressed in geodynamic meters.  
 H<sub>1</sub>H<sub>1</sub>H<sub>1</sub>, H<sub>2</sub>H<sub>2</sub>H<sub>2</sub> (Russian code) Height in geodynamic decameters at pressure levels as follows:  
 1 - 1000 mb.      6 - 400  
 2 - 900            7 - 300  
 3 - 700            8 - 200 etc.  
 4 - 500  
 hh Height of level in 100's of feet or tens of meters according to regional agreement.  
 hhh, h<sub>1</sub>h<sub>1</sub>h<sub>1</sub>, h<sub>2</sub>h<sub>2</sub>h<sub>2</sub> Height in tens of feet or whole meters.  
 III Station index number.  
 KK Indicator of form of report in PRAT code.  
 m<sub>r</sub>m<sub>r</sub> Mixing ratios in grams of water vapor per kilogram of dry air.  
 nn Significant levels given consecutively, 11, 22, 33, etc.  
 n<sub>0</sub>n<sub>9</sub>n<sub>8</sub>n<sub>7</sub>n<sub>6</sub> n<sub>5</sub>n<sub>4</sub>n<sub>3</sub>n<sub>2</sub>n<sub>1</sub> Thousands figure in heights above M.S.L. of the 1000 mb, 900 mb, etc.  
 PP Pressure in tens of millibars.  
 PPP Pressure in whole millibars.

P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> Station level pressure.  
 P<sub>1</sub>P<sub>1</sub>, P<sub>2</sub>P<sub>2</sub> Pressure in tens of millibars of 1st, 2nd, etc. levels.  
 P<sub>1</sub>P<sub>2</sub>P<sub>3</sub>P<sub>4</sub>P<sub>5</sub> Units figure of pressures for following levels which report in tens of millibars.  
 QQQ (Russian code) Mixing ratio in grams and tenths.  
 TT Temperature of air in whole degrees.  
 T<sub>o</sub>T<sub>o</sub> Temperature of air at surface.  
 T<sub>1</sub>T<sub>1</sub>, T<sub>2</sub>T<sub>2</sub> Temperature at certain levels.  
 TTT Temperature in degrees and tenths.  
 U, U<sub>1</sub> Relative humidity (International code).  
 UU Relative humidity in percent (split between 2 groups in PRAWT code).  
 U<sub>o</sub>U<sub>o</sub> Relative humidity in percent at surface.  
 uu, u<sub>1</sub>u<sub>1</sub>, u<sub>2</sub>u<sub>2</sub> Moisture values indicated by x<sub>3</sub>.  
 v One-fifth actual wind speed.  
 vv Wind speed.  
 X Used to make a five digit group.  
 x<sub>1</sub>x<sub>2</sub>x<sub>3</sub> Indicator figures to show units used, x<sub>1</sub> for heights, x<sub>2</sub> for wind, x<sub>3</sub> for moisture values. (International code.)  
 O Indicator figure for wind group.  
 00000 Indicates that temperatures and humidities are for fixed pressures, 1000, 900, 800 mbs., etc.  
 00,85,70,50 etc. (1945 Radiosonde) Indicator figures for 1000, 850, 700 mb. levels.  
 101 Indicator for additive data group.  
 11199 Indicator for additional groups following.  
 77788 " " " " "  
 10171 " " " moisture groups following.  
 98765 Indicator (Russian code) that significant levels follow.

The following symbols, not used in the data section, are listed here to explain the symbols in the station models printed at the lower left corner of each upper air map:

HHHH Height in tens of feet above MSL.  
 vv Wind speed in knots; half barb = 5 knots, whole barb = 10 knots, pennant = 50 knots.