

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 0400Z, especially in Canada, Alaska, and the United States, with some additional observations at other hours when the station does not report at or near 0400Z. 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 _L C _M HHM |
| d. IIIGG HHddv ₅ HHddv ₅ HHddv ₅ |
| e. IIIGG 8ddvv 9ddvv Oddvv M H H H C
x x x x |
- (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 _L | Form of low cloud (International code). |
| C _M | 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 H H
x x x | Height at which observations were discontinued in tens of meters. |
| III | Station index number. |
| M | Reason for ceasing upper wind observation (International code). |

M_x 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 |

v₅ 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_n 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_n, 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 P₀P₀P₀T₀T₀ U₀U₀x₁x₂x₃ 00hhh TTU_{m_rm_r}
(Oddvv) 85hhh TTU_{m_rm_r} 70hhh TTU_{m_rm_r}
50hhh TTU_{m_rm_r} nnPPP TTU_{m_rm_r}
IIIG₅₀G₅₀ 30hhh TTU_{m_rm_r} (Oddvv) 20hhh
TTU_{m_rm_r} 10hhh TTU_{m_rm_r} nnPPP TTU_{m_rm_r}
101A_{df}A_{df}

b. TEMPS

IIIGG H_dH_dPPP TTTUU 00000
H_dH_dH_dH_dH_d TTTUU

c. PRAWT

IIIGG P₀P₀P₀T₀T₀ U₀U₀DDv n₀n₉n₈n₇n₆ n₅n₄n₃n₂n₁
HHTTU Uddvv 95TTU Uddvv HHTTU Uddvv 85TTU
Uddvv 77788 P₁P₂P₃P₄P₅ PPTTU Uddvv
.....

d. PRAT

IIIGG P₀P₀P₀T₀T₀ U₀U₀KK- n₀n₉n₈n₇n₆ n₅n₄n₃n₂n₁
HHTTU 95TTU HHTTU 85TTU HHTTU 77788
P₁P₂P₃P₄P₅ ...PX PPTTU

e. CORAC

IIIGG P₀P₀P₀T₀T₀ U₀U₀x₁x₂x₃ (Oddvv) P₁P₁h₁h₁h₁
T₁T₁U₁U₁U₁ P₂P₂h₂h₂h₂ T₂T₂U₂U₂U₂

a. 11199_{hh} nnPPP TTUuu

or

77788 P₁P₁T₁T₁U₁ 10171

1u₁u₁u₂ 3u₃u₃u₄ etc.

f. Russian RAOB

IIIGG H₁H₁H₁T₁T₁ H₂H₂H₂T₂T₂ 98765
H_aH_aPPP T_aT_aT_aUU QQQEE H_bH_bPPP T_bT_bT_bUU
QQQEE

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

A_{df}A_{df} 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_aH_a, H_bH_b Height in hectometers.
H_dH_d Height in hundreds of geodynamic meters.
H_dH_dH_dH_dH_d Height to which upper-air observations of temperature and humidity are referred, expressed in geodynamic meters.
H₁H₁H₁, H₂H₂H₂ (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, h₁h₁h₁, h₂h₂h₂ Height in tens of feet or whole meters.
III Station index number.
KK Indicator of form of report in PRAT code.
m_rm_r Mixing ratios in grams of water vapor per kilogram of dry air.
nn Significant levels given consecutively, 11, 22, 33, etc.
n₀n₉n₈n₇n₆ n₅n₄n₃n₂n₁ 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.

P₀P₀P₀ Station level pressure.
P₁P₁, P₂P₂ Pressure in tens of millibars of 1st, 2nd, etc. levels.
P₁P₂P₃P₄P₅ 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.
T₀T₀ Temperature of air at surface.
T₁T₁, T₂T₂ Temperature at certain levels.
TTT Temperature in degrees and tenths.
U, U₁ Relative humidity (International code).
UU Relative humidity in percent (split between 2 groups in PRAWT code).
U₀U₀ Relative humidity in percent at surface.
uu, u₁u₁, u₂u₂ Moisture values indicated by x₃.
v One-fifth actual wind speed.
vv Wind speed.
X Used to make a five digit group.
x₁x₂x₃ Indicator figures to show units used, x₁ for heights, x₂ for wind, x₃ 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.