UPPER-LEVEL PRESSURE, TEMPERATURE, HUMIDITY AND WIND REPORT

I.   GENERAL

The WMO upper-level pressure, temperature, humidity, and wind report is called FM 35-IX Ext. TEMP for reports from land stations; FM 36-IX Ext. TEMP SHIP for reports from sea stations; FM 37-IX Ext. TEMP DROP for sondes released by a carrier balloon or an aircraft; and FM 38-IX Ext. MOBIL for mobile land stations.

The code form is divided into four parts (i.e., Parts A, B, C, and D) for coding purposes. The coding procedures provide for coding each part as a separate message suitable for transmission. Each part can be transmitted separately but the complete report actually consists of four separate messages which may be collected individually in a bulletin, or in combinations.

A.   TIME OF OBSERVATION

The standard times of upper-air soundings taken for synoptic purposes are 0000, 0600, 1200, and 1800 UTC. If only two upper-air soundings are taken per day for synoptic purposes, they shall be taken at 0000 and 1200 UTC.

In the case of upper-air observations, the *actual time* of observation is the time the balloon is actually released to the nearest minute. The *standard time* of observation is the synoptic time, to the nearest whole hour, to which the sounding applies. International agreement specifies that the time of regular upper-air sounding observations should be as close as possible to (H-30) and should not fall outside the time range (H-45) to (H), with H referring to one of the four standard synoptic times of observations. Thus, the actual time of release of a balloon might be 1130 UTC, but the observation applies to 1200Z. It should be noted that the time required for a radiosonde balloon to reach 90,000 feet is approximately 1 1/2 hours. Thus measurements of elements from high elevations may be an hour to 1 1/2 hours after the actual time of observation. Special observations may be made outside these specified release times when authorized.

II. FORMAT OF THE UPPER-AIR REPORT

The upper-air report message is composed of five-figure groups. Each figure in each group has significance according to its position in the group and according to its position in the message following the section indicator. Thus, when data is not available for an element, or position, the missing position will be filled with a solidi (/). The code form is divided into ten sections as follows:

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Section number	Indicator figures or symbolic figure groups	Contents
1	—	Identification and position data.
2	—	Data for standard isobaric surfaces.
3	88	Data for tropopause level(s).
4	66 or 77	Data for maximum wind level(s) and data for vertical wind shear.
5	—	Data for significant levels, with respect to temperature and/or relative humidity.
6	21212	Data for significant levels, with respect to wind.
7	31313	Data on sea-surface temperature and sounding system.
8	41414	Cloud data.
9	51515 52525 59595	Code groups to be developed regionally.
10	61616 62626 69696	Code groups to be developed nationally.

The code form is as follows:

PART A   [Data up to and including 100 mb]

[Section 1] M_iM_iAA $YYGGI_d$ II_iii [Identification-Position]

$99L_aL_aL_a$ $Q_cL_oL_oL_oL_o$ $MMMU_{la}U_{lo}$ $h_oh_oh_oh_oi_m$

[Section 2] $99P_oP_oP_o$ $T_oT_oT_{ao}D_oD_o$ $d_od_of_of_of_o$ [Surface Data]

00hhh	TTT_aDD	ddfff	
92hhh	TTT_aDD	ddfff	
85hhh	TTT_aDD	ddfff	
70hhh	TTT_aDD	ddfff	
50hhh	TTT_aDD	ddfff	
40hhh	TTT_aDD	ddfff	[Standard Isobaric Surfaces]
30hhh	TTT_aDD	ddfff	
25hhh	TTT_aDD	ddfff	
20hhh	TTT_aDD	ddfff	
15hhh	TTT_aDD	ddfff	
10hhh	TTT_aDD	ddfff	

[Section 3] $88P_tP_tP_t$ $T_tT_tT_{at}D_tD_t$ $d_td_tf_tf_tf_t$ [Tropopause Data]
        or 88999

[Section 4] $77P_mP_mP_m$ ⎫
        or   ⎬ $d_md_mf_mf_mf_m$ ($4v_bv_bv_av_a$) [Maximum Wind Data]
        $66P_mP_mP_m$ ⎪
        or 77999   ⎭

[Section 9] 51515 $A_{df}A_{df}$ ⎫
        52525   ⎪   [Code groups developed regionally.]
        . . . . .   ⎬   [Included in part A of U.S. reports.]
        59595   ⎭

PART B   [Data up to and including 100 hPa]

[Section 1] M_iM_iBB YYGGa4   IIiii   [Identification-Position]
                    $99L_aL_aL_a$ $Q_cL_oL_oL_oL_o$ $MMMU_{la}U_{lo}$ $h_oh_oh_oh_oi_m$

[Section 5] $00P_oP_oP_o$ $T_oT_oT_{ao}D_oD_o$ [Surface Data]
        11PPP TTT_aDD [Significant levels with respect to]
        22PPP TTT_aDD [temperature and/or humidity   ]
        33PPP TTT_aDD
                etc.

[Section 6] 21212 00PPP $d_od_of_of_of_o$ [Significant levels with respect to]
        11PPP   ddfff   [wind]
        22PPP   ddfff
        33PPP   ddfff
                etc.

[Section 7] (31313 $s_rr_ar_as_as_a$ 8GGgg $9s_nT_wT_wT_w$) [Data on sounding system,   ]
                                                    [launch time, and sea-surface   ]
                                                    [temperature   ]

[Section 8] 41414 $N_hC_LhC_MC_H$ [Cloud data]

[Section 9] 51515 $A_{df}A_{df}$ ⎫
        52525   ⎬   [Code groups developed regionally.]
        . . . . .   ⎪
        59595   ⎭
[Section 10] 61616   ⎫
        62626   ⎬   [Code groups developed regionally.]
        . . . . .   ⎪
        69696   ⎭

PART C [Data above100 hPa]

[Section 1] M_iM_iCC $YYGGI_d$ IIiii [Identification-Position]

$99L_aL_aL_a$ $Q_cL_oL_oL_oL_o$ $MMMU_{la}U_{lo}$ $h_oh_oh_oh_oi_m$

[Section 2] 70hhh TTT_aDD ddfff

50hhh TTT_aDD ddfff

30hhh TTT_aDD ddfff

20hhh TTT_aDD ddfff [Standard Isobaric Surfaces]

10hhh TTT_aDD ddfff

07hhh TTT_aDD ddfff

05hhh TTT_aDD ddfff

03hhh TTT_aDD ddfff

02hhh TTT_aDD ddfff

01hhh TTT_aDD ddfff

[Section 3] $88P_tP_tP_t$ $T_tT_tT_{at}D_tD_t$ $d_td_tf_tf_tf_t$ [Tropopause Data]

or 88999

[Section 4] $77P_mP_mP_m$

or

$66P_mP_mP_m$ $d_md_mf_mf_mf_m$ ($4v_bv_bv_av_a$) [Maximum Wind Data]

or 77999

PART D [Data above 100 hPa]

[Section 1] M_iM_iDD YYGG/ IIiii [Identification-Position]

$99L_aL_aL_a$ $Q_cL_oL_oL_oL_o$ $MMMU_{la}U_{lo}$ $h_oh_oh_oh_oi_m$

[Section 5] 11PPP TTT_aDD [Significant levels with respect to]

22PPP TTT_aDD [temperature and/or humidity]

33PPP TTT_aDD

44PPP TTT_aDD

etc.

[Section 6] 21212 11PPP $d_od_of_of_of_o$ [Significant levels with respect to]

22PPP ddfff [wind]

33PPP ddfff

44PPP ddfff

etc.

[Section 9]   51515 $A_{df}A_{df}$ ⎤
              52525   ⎥   [Code groups developed regionally.]
              . . . . .   ⎬
              59595   ⎦

[Section 10] 61616   ⎤
              62626   ⎥   [Code groups developed regionally.]
              . . . . .   ⎬
              69696   ⎦

III. DEFINITION OF INDIVIDUAL GROUPS

Section 1.   Identification and position groups.

$M_iM_iM_jM_j$ $YYGGI_d$ IIiii

M_iM_i	-	**Identifier letters for the code form**. $M_iM_i=$ **TT** for a report from a land station; $M_iM_i =$ **UU** for a report from a ship station; $M_iM_i =$ **XX** for a report from a dropsonde; $M_iM_i =$ **II** for a report from a mobile land station.
M_jM_j	-	**Letter identifier that specifies the part of the upper-air report being transmitted**. $M_jM_j =$ **AA** = part A; $M_jM_j =$ **BB** = part B; $M_jM_j =$ **CC** = part C; $M_jM_j =$ **DD** = part D.
YY	-	**Day of the month in UTC** and **wind speed units indicator**. (a) **Knots** - When the **knot** is used for the unit of wind speed, **50 is added** to the value for the day of the month and the sum is encoded for YY. (b) **Meter per second** - When the **meter per second** is used for the unit of wind speed, the value for the day of the month shall be coded directly for YY.
GG	-	**The time of observation** to the nearest whole hours, UTC.
I_d	-	**Wind Indicator**. The last standard isobaric surface for which the wind group (ddfff) is reported in section 2 is coded for I_d according to Code Table 103. Most of the code figures in Code Table 103 have two specifications, one of which applies to Part A, and the other applies to Part C. The exact meaning of the specification depends on whether it is used in Part A or Part C.

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In Part A, the code figure represents the hundreds digit of the hectopascal value of the last standard isobaric surface for which wind data are available. In Part C, the code figure represents the tens digit of the hectopascal value of the last standard isobaric surface for which wind data are available.

a4 - **Type of measuring equipment used**. Included in Part B. See code table 0265.

Code table 0265 a4 — Type of measuring equipment used	
Code figure	Type of equipment
0	Pressure instrument associated with wind-measuring equipment.
1	Optical theodolite
2	Radiotheodolite
3	Radar
4	Pressure instrument associated with wind-measuring equipment but pressure element failed during ascent.
5	VLF-Omega
6	Loran-C
7	Wind profiler
8	Satellite navigation
9	Reserved

II - **Block number** in which the land station is located.

iii - **Station number** identifying the station from which the upper-air data was sent.

Code Table 103		
Code Figure	Part A	Part C
1	100 or 150 hPa[1]	10 hPa
2	200 or 250 hPa[2]	20 hPa
3	300 hPa	30 hPa
4	400 hPa	-------
5	500 hPa	50 hPa
6	--------	-------
7	700 hPa	70 hPa
8	850 hPa	-------
9	--------	-------
0	1000 hPa	-------
/	No wind groups reported for any of the standard isobaric surfaces	No wind groups reported for any of the standard isobaric surfaces.

[1] If the 100-hPa surface is not included in the report due to termination of the ascent, code figure 1 applies only to the 150-hPa surface. When the 100-hPa surface is included in the report but wind data are available only up to and including the 150-hPa surface, the wind group shall be included for both the 150- and 100-hPa surfaces with solidi (/////) encoded for the 100-hPa ddfff group.

[2] If the 200-hPa surface is not included in the report due to termination of the ascent, code figure applies only to the 250-hPa surface. When the 200-hPa surface is included in the report but wind data are available only up to and including the 250-hPa surface, the wind group shall be included for both the 250- and 200-hPa surfaces with solidi (/////) being encoded for the 200-hPa ddfff group.

99   -   **Identifier that position information follows**. This group is used with TEMP SHIP, TEMP DROP, and TEMP MOBILE reports.

$L_aL_aL_a$ -   **Latitude** in tens, units, and tenths of degrees

Q_c -   **Quadrant of the Globe** in which the point of observation occurred. See figure 1. This group is used with TEMP SHIP, TEMP DROP, and TEMP MOBILE reports.
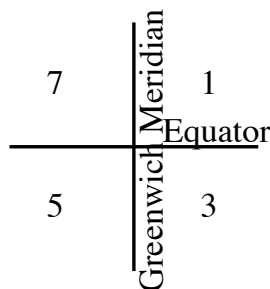
Figure 1. Quadrant of the Globe

$L_oL_oL_oL_o$ - **Longitude** in hundreds, tens, units, and tenths of degrees

MMM - **Number of Marsden square** for the ship's position at the time of observation. The group $MMMU_{la}U_{lo}$ is used to <u>verify</u> the position of the ship as given in the groups $99L_aL_aL_a$ $Q_cL_oL_oL_oL_o$. See Code Table 2590 for the Marsden square numbers. This group is used with TEMP SHIP, TEMP DROP, and TEMP MOBILE reports.

U_{la} - **Units digit in the reported latitude** of the Marsden square.

U_{lo} - **Units digit in the reported longitude** of the Marsden square.

$h_oh_oh_oh_o$ - **Elevation of a mobile land station** making an upper-air observation, in either meters or feet as indicated by i_m. This group is used only with TEMP MOBILE reports.

i_m - **Indicator for units of elevation**, and confidence factor for accuracy of elevation. See code table 1845.

Code table 1845 i_m – Indicator for units of elevation, and confidence factor for accuracy of elevation		
Code	Units	Confidence factor
1	Meters	Excellent (within 3 meters)
2	Meters	Good (within 10 meters)
3	Meters	Fair (within 20 meters)
4	Meters	Poor (more than 20 meters)
5	Feet	Excellent (within 10 feet)
6	Feet	Good (within 30 feet)
7	Feet	Fair (within 60 feet)
8	Feet	Poor (more than 60 feet)

Section 2. Surface Data and Standard Isobaric Surfaces up to 100 hPa.

99$P_oP_oP_o$ $T_oT_oT_{ao}D_oD_o$ $d_od_of_of_of_o$ Surface Data Groups

> 99   -   **Identifier** specifying that surface data follows the group in Part A.
>
> $P_oP_oP_o$ -   **Surface pressure** in whole hectopascals. For pressure values equal to or greater than 1000 hPa, the thousands digit is dropped.
>
> $T_oT_oT_{ao}$ -   All **air temperatures** are reported to the approximate tenths degrees Celsius. The tenths value, T_{ao}, also indicates the sign of the temperature as shown in code table 3931. An even digit for T_{ao} represents positive values and an odd digit represents negative values.
>
> D_oD_o -   **Depression of the dew-point temperature** in tenths of a degree Celsius from 0.0^{o}C to 4.9^{o}C and in whole degrees Celsius from 5.0^{o}C and more, in accordance with code table 0777.

Code table T_{ao} — Sign of temperature 3931		
Code	Sign of	Temperature
Figure	Temperature	(^{o}C)
0	+	0.0 and 0.1
1	-	0.0 and 0.1
2	+	0.2 and 0.3
3	-	0.2 and 0.3
4	+	0.4 and 0.5
5	-	0.4 and 0.5
6	+	0.6 and 0.7
7	-	0.6 and 0.7
8	+	0.8 and 0.9
9	-	0.8 and 0.9

Code Table 0777 — Dew point depression	
Code Figure	Depression of Dew- Point Temperature (^oC)
00	0.0
01	0.1
02	0.2
etc.	
10	1.0
11	1.1
etc.	
20	2.0
etc.	
49	4.9
50	5.0
51 52 53 54 55	Not Used
56	6.0
57	7.0
etc.	
60	10
etc.	
70	20
etc.	
80	30
etc.	
98	48
99	49 or more.

d_od_o -   **True wind direction** from which the wind is blowing. The wind direction is encoded to the nearest 5°, which requires the use of the entire five-figure wind group. The observed wind direction is rounded to the nearest 5° before coding: 293° is rounded to 295°; and 292° is rounded to 290°. The hundreds and tens digit is encoded for d_od_o. The rounded units of the direction is added to the hundreds digit of the wind speed, and the sum is encoded for $f_of_of_o$. For example, if the rounded wind direction is 295° and the speed is 162 knots, d_od_o is coded 29 and $f_of_of_o$ is coded 662 (162 + 500). If the rounded direction is 290° and the speed is 162 knots, d_od_o is coded 29 and $f_of_of_o$ is coded 162 (162 + 000 = 162).

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$f_of_of_o$ - **Wind speed** in knots or meters per second. In WMO Region IV and V, wind speed is reported in knots.

00hhh TTT$_a$DD ddfff **Standard Isobaric Level Data**
  etc.

00, 85, etc. - **Identifier for the level for which data follows**; 00 = 1000-hPa; 92 = 925 hPa; 850 = 850-hPa, 70 = 700-hPa, etc. At and below 100-hPa (i.e., Part A) the hundreds and tens digit of the hectopascal value of a standard isobaric surface is used to identify the group. Above 100-hPa (i.e., Part C) the tens and units digits of the hectopascal value of the standard isobaric surface are used.

hhh - **Geopotential height** of the specified standard isobaric surfaces. Geopotential heights (height above sea level) are reported in whole geopotential meters (i.e., 3,249 meters is coded as 249) for surfaces up to, but not including, 500 hPa and in tens of geopotential meters for surfaces at 500-hPa and higher (i.e., only the thousands, hundreds, and tens digits of the height are reported). If necessary, the tens of thousands digit will be omitted. The approximate heights of the standard isobaric surfaces along with the coded height is shown below.

Standard Surface (hPa)	Approximate Height (meters)	Code Figure
1000	111	111
925	762	762
850	1,457	457
700	2,969/3,012	969/012
500	5,574	557
400	7,186	719
300	9,164	916
250	10,363	036
200	11,784	178
150	13,608	361
100	16,180	618
70	18,500	850
50	20,100	010
30	23,700	370
20	26,500	650
10	31,000	100
7	33,400	340
5	33,570	357
3	39,400	940
2	42,500	250
1	47,200	720

TTT_a — **Air temperature** to the approximate tenths degree Celsius at the isobaric level reported. The air temperature is encoded in the same manner as is the surface air temperature data. Code table 3931 is used to encode T_a to indicate the sign of the air temperature.

DD — **Depression of the wet-bulb temperature**. DD is encoded in the same manner as D_oD_o is encoded for the surface data using code table 0777.

dd — **True direction from which the wind is blowing** rounded to the nearest 5°. Reported in the same manner as d_od_o in the surface data.

fff — **Wind speed in knots** or meters per second. For WMO Region IV and V, wind speed is reported in knots. It is coded the same as $f_of_of_o$ in the surface data group.

Section 3.   Tropopause Data

$88P_tP_tP_t$ $T_tT_tT_{at}D_tD_t$ $d_td_tf_tf_tf_t$
or 88999

88 — **Indicator that tropopause data follows**.

$P_tP_tP_t$ — **Atmospheric pressure** of the surface at which the tropopause was determined to be located. When reported in Part A, the pressure will be reported in whole hectopascals. When reported in Part C, the pressure will be reported in tenths of a hectopascal.

$T_tT_tT_{at}$ — **Temperature at the level of the tropopause**. It is reported to the approximate tenths of a degree Celsius in the same manner as reporting surface temperature data. Code table 3931 is used to encode the sign of the temperature.

D_tD_t — **Dew-point depression** at the level of the tropopause. It is reported in the same manner as surface dew-point depression using code table 0777.

d_td_t — **Wind direction** at the level of the tropopause reported in Part A or Part C. It is encoded in the same manner as the surface wind direction data.

$f_tf_tf_t$ — **Wind speed** in knots or meters per second at the tropopause. It is encoded in the same manner as the surface wind speed.

88999 — Reported when a **tropopause is not observed**.

Section 4.   Maximum Wind Data

77
or $P_mP_mP_m$ $d_md_mf_mf_mf_m$ $4v_bv_bv_av_a$ or 77999
66

66 or 77	-	**Indicator** to specify that data at the level of the maximum wind follow. Code 66 is reported to identify the maximum wind groups only when the wind speed observed at the terminating level is the greatest wind speed observed throughout the sounding and its speed is greater than 60 knots. Code 77 is reported to identify the maximum wind groups when the maximum wind occurs at a level below the terminating level of the sounding.
$P_mP_mP_m$	-	**Pressure at the level at which the maximum wind occurs**. In Part A it is reported in whole hectopascals. In Part C it is reported in tenths of a hectopascal.
d_md_m	-	**Direction of the wind** at the level of the maximum wind reported to the nearest 5°. It is coded the same as the wind direction for the surface data groups.
$f_mf_mf_m$	-	**Speed of the wind** at the level of the maximum wind reported in meters per second or whole knots. For WMO Region IV and V, it is reported in whole knots in the same manner as for the surface data groups.
4	-	**Identifier for the Vertical wind shear** data group.
v_bv_b	-	**Vector difference below the maximum wind level**. The absolute value of the vector difference between the maximum wind and the wind blowing at 3000 feet below the level of the maximum wind. It is reported to the nearest whole knot in WMO Region IV and V. If the vector difference is 99 knots or more, 99 is encoded.
v_av_a	-	**Vector difference above the maximum wind level**. The absolute value of the vector difference between the maximum wind level and 3000 ft above the maximum wind level. It is reported to the nearest whole knot in WMO Region IV and V. If the vector difference is 99 knots or more, 99 is encoded.
77999	-	Reported when a level of **maximum wind is not observed**.

Section 5.   Station Surface Data and Significant Levels for levels up to 100 hPa.

00$P_oP_oP_o$ $T_oT_oT_{ao}D_oD_o$ Surface Data. Station surface data is included
with significant level data in part B. Station surface
data is not included in Part D.

> 00   - **Identifier** that data for the surface level follows.

> $P_oP_oP_o$ - **Pressure at the surface** in whole hectopascals. The hundreds, tens, and units digits are reported.

> $T_oT_oT_{ao}$ - **Temperature at the surface** reported in approximate tenths of a degree Celsius. Code Table 3931 is used to report the tenths digit and the sign of the temperature.

> D_oD_o - **Depression of the dew point** at the surface. Code Table 0777 is used to encode the dew-point depression.

> Note: Wind data is not reported for significant levels.

11PPP TTT$_a$DD   [Significant levels with]
22PPP TTT$_a$DD   [respect to temperature]
33PPP TTT$_a$DD   [and/or humidity.   ]
44PPP TTT$_a$DD
    etc.

> 11, 22, etc - **Significant level indicator number**. The number 11 identifies the first significant level above the surface; 22 identifies the second significant level above the surface; etc.

> PPP   - **Pressure at the significant level** identified. In Part B, PPP is reported in whole hectopascals. In Part D, PPP is reported in tenths of hectopascals.

> TTT$_a$ - **Temperature at the significant level** identified. It is reported to the approximate tenths of a degree Celsius. Code Table 3931 is used to encode T_a to show the sign of the temperature and the approximate tenths value.

> DD   - **Dew-point depression at the significant level** identified. Code table 0777 is used to encode and decode DD.

Section 6. Significant Levels with respect to Wind.

21212 00PPP $d_o d_o f_o f_o f_o$ [Significant levels with respect to   ]
       11PPP ddfff   [wind   ]
       22PPP ddfff
       33PPP ddfff
       44PPP ddfff
            etc.

21212   -   **Identifier** that data for significant levels with respect to wind follow. NOTE: This section is not included in reports transmitted from U.S. stations. A separate report, FM-32-IX PILOT, FM-33-IX PILOT SHIP, or FM-34-IX PILOT MOBIL are used to report upper-air winds.

00   -   **Indicato**r that pressure and wind data for the station level follows.

11, 22, etc   -   **Indicator for the first, second, etc**. significant level above the surface.

PPP   -   **Pressure at the significant level** reported in whole hectopascals. For pressures equal to or greater than 1000 hPa, the thousands digit is dropped.

ddfff   -   **Wind direction and speed for the indicated significant level**, reported in the same manner as wind direction and speed is reported in section 2.

Section 7. Data on Sounding system, Launch time, and Sea-surface temperature.

(31313 $s_r r_a r_a s_a s_a$ 8GGgg $9 s_n T_w T_w T_w$)

31313   -   **Indicator** that data on the sounding system used, the launch time, and sea-surface temperature follows.

s_r -   **Solar and infrared radiation correction**. See table 3849.

Code table 3849 s_r — Solar and infrared radiation correction	
Code figure	
0	No correction
1	CIMO solar corrected and CIMO infrared corrected
2	CIMO solar corrected and infrared corrected
3	CIMO solar corrected only
4	Solar and infrared corrected automatically by radiosonde system
5	Solar corrected automatically by radiosonde system
6	Solar and infrared corrected as specified by country
7	Solar corrected as specified by country

$r_a r_a$ - **Radiosonde/sounding system used**. See code table 3685.

Code table 3685 r_a — Radiosonde/sounding system used	
Code figure	
02	No radiosonde/passive target (e.g. balloon plus reflector, etc.)
03	No radiosonde/active target (e.g. balloon plus transponder)
04	No radiosonde/passive temperature-humidity profiler
05	No radiosonde/active temperature-humidity profiler
06	No radiosonde/radio-acoustic sounder
07	No radiosonde/...reserved
08	No radiosonde/...reserved
09	No radiosonde/sounding system not specified or unknown
10	RS VIZ type A
11	RS VIZ type B
12	RS SDC (Space Data Corporation)
13	Astor
14	Beukers/VIZ microsonde
15	EEC Company type 23
16	Elin
17	Graw G.
18	Reserved for allocation of radiosondes
19	Graw M60
20	Indian Met Service MK3
21	Jinyang
22	Meisei RS2-80
23	Mesurai FMO 1950A

24	Mesurai FMO 1945A
25	Mesurai MH73A
26	Meteolabor Basora
27	AVK-MRZ
28	Meteorit Marz2-1
29	Meteorit Marz2-2
30	Oki RS2-80
31	Sangamo
32	Shanghai Radio
33	UK Met Office MK3
34	Vinohrady
35	Vaisala RS-18
36	Vaisala RS21
37	Vaisala RS80
38	Beukers LOCATE (Loran-C)
39	Sprenger E076
40	Sprenger E084
41	Sprenger E085
42	Sprenger E086
43	Air IS-4A-1680
44	Air IS-4A-1680 X

45
etc.   } Reserved for allocation of radiosondes
59

60	Vaisala RS80/MicroCora
61	Vaisala RS80/DigiCora or Marwin
62	Vaisala RS80/PCCora
63	Vaisala RS80/Star

64
etc.   } Reserved for allocation of automated sounding systems
89

90	Radiosonde not specified or unknown
91	Pressure-only radiosonde
92	Pressure-only radiosonde plus transponder
93	Pressure-only radiosonde plus radar-reflector
94	No-pressure radiosonde plus transponder
95	No-pressure radiosonde plus radar-reflector
96	Descending radiosonde

97
98   } Reserved for allocation of sounding systems with
99   incomplete sondes

$s_a s_a$ - **Tracking technique/status of system used**. See code table 3872.

Code table 3872 $s_a s_a$ — Tracking technique/status of system used	
Code figure	
00	No windfinding
01	Automatic with auxilliary optical direction finding
02	Automatic with auxilliary radio direction finding
03	Automatic with auxilliary ranging
04	Not used
05	Automatic with multiple VLF-Omega frequencies
06	Automatic cross chain Loran-C
07	Automatic with auxilliary wind profiler
08	Automatic satellite navigation
09 - 18	Reserved
19	Tracking technique not specified
20-29	Ship systems
30-39	Sounding systems
40-49	Launch facilities Reserved for ASAP
50-59	Data acquisition systems
60-69	Communications
70	All systems in normal operation
71-98	Reserved
99	Status of system and its components not specified

8GGgg   **Time of launch of radiosonde / release of sonde.**

GGgg   -**Actual time of launching of radiosonde** or release of dropsonde in whole hours and minutes.

9$s_n T_w T_w T_w$ **Sea-surface temperature group.**This group is included only in the FM 36-IX Ext. TEMP SHIP report.

s_n - **Sign of temperature**.   0 = temperature is positive or zero; 1 = temperature is negative.

$T_w T_w T_w$ - **Sea-surface temperature** in tenths of degree Celsius.

Section 8.   Cloud Group. This section is not included in U.S. upper-air reports.

41414 $N_hC_LhC_MC_H$ - Cloud Group section

    41414   -   Identifier for Section 8

    $N_hC_LhC_MC_H$ -   Cloud group

      N_h - **Amount of all the C_L cloud present** or, if no C_L cloud is present, the amount of all the C_M cloud present. See code table 2700.

Code table 2700 N_h — Amount of C_L, or C_M cloud present	
Code figure	
0	0
1	1 okta or less, but not zero
2	2 oktas
3	3 oktas
4	4 oktas
5	5 oktas
6	6 oktas
7	7 oktas or more, but not 8 oktas
8	8 oktas
9	Sky obscured by fog and/or other meteorological phenomena
/	Cloud cover is indiscernible for reasons other than fog or other meteorological phenomena, or observation is not made.

      C_L - **Type of cloud** of genera Stratocumulus, Stratus, Cumulus, and Cumulonimbus.

      h   - **Height above ground surface of the base of the lowest cloud seen**. See code table 1600.

Code table 1600 h — Height above surface of the base of the lowest cloud seen.	
Code figure	
0	0 to 50 m
1	50 to 100 m
2	100 to 200 m
3	200 to 300 m
4	300 to 600 m
5	600 to 1000 m
6	1000 to 1500 m
7	1500 to 2000 m
8	2000 to 2500 m
9	2500 m or more, or no clouds
/	Height of base of cloud not known or base of clouds at a level lower and tops at a level higher than that of the station.

C_M - **Cloud type of the genera** Altocumulus, Altostratus, and Nimbostratus.

C_H - **Clouds of the genera Cirrus**, Cirrocumulus and Cirrostratus.

Section 9.   Regional Code Groups

$$51515\ A_{df}A_{df}$$
$$52525$$
$$.\ .\ .\ .\ .$$
$$59595$$

Regional Code Group Identifiers.

51515 - **Identifier for the first Regional code group.**

101 - **Additional data group indicator**.

$A_{df}A_{df}$ - **Code group providing additional data** as necessary.   Code Table 101 is used to encode $A_{df}A_{df}$.

	Code Table 101				

Code Figure	Specification	Code Figure	Specification
00	Not assigned.	70-74	Not Assigned.
01-31	Not assigned.	75	
32-39	Not assigned.	76	
40	Report not filed.	77	
41	Incomplete report.	78	Corrected Trop. data follows.
42	Ground Equipment failure.	79	Corrected Maximum Wind data
43	Observation delayed.		follows.
44	Power failure.	80	Corrected entire report precedes.
45	Unfavorable weather conditions	81	Corrected report for Part A
46	Low maximum altitude.		and B precedes.
	(less than 500 feet)	82	Corrected report for Part C and
47	Leaking balloon.		D precedes.
48	Ascent not authorized for this	83	Corrected data for mandatory
	period.		levels follows.
49	Alert.	84	Corrected data for significant
50	Ascent did not go above the		levels follows.
	100-hPa level.	85	Minor errors in this report,
51	Balloon forced down by icing.		correction follows.
52	Balloon forced down by	86	Significant levels not included
	precipitation.		in original report follows.
53	Atmospheric interference.	87	Corrected surface data follows.
54	Local interference.	88	Corrected additional data follows.
55	Fading signal.	89	
56	Weak signal.	90	Extrapolated altitude data
57	Preventive maintenance.		follows PPhhh.
58	Flight equipment failure.	91	Extrapolated surface data precedes
59	Any reason not listed above.	92	
60	Not assigned.	93	
61	Aerometeorograph report	94	Low-level mean winds for surface
	precedes.		to 5000 ft. layer and 5000 to
62	Radiosonde report precedes.		10,000 ft. layer in ddfff, ddfff
63		95	Early transmission of 850-hPa,
64	Stability Index follows. First		500-hPa data and stability
	three digits of stability		index follow.... 85hhh
	will be 000.[1]		TTTaDD ddfff 50hhh
65	Altitude and temperature data		TTTaDD ddfff isis.
	are doubtful between level	96	Early transmission of 850-hPa,
	0P$_1$P$_1$P$_2$P$_2$.		700-, 500-hPa and stability 66
Altitude levels doubtful between			index.
	levels 0P$_1$P$_1$P$_2$P$_2$.	97	Early transmission of 500-hPa 67
Temp. doubtful between			data and stability index.

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levels $0P_1P_1P_2P_2$. Dew-point depression missing between levels $0P_1P_1P_2P_2$. 69 Dew-point depression missing at following levels, PPhhh, PPhhh, (or nnPPP, etc.).	98 Early transmission of 700-hPa 68 data and stability index. 99 Not assigned.

(1) The Stability Index reported at stations in the United States is computed using the Showalter Index computation procedure, except that the base level used varies with the elevation of the station according to the following:

Station Elevation	Base Level
Less than 1000 gpm	850 mb
1000 to 1400 gpm	800 mb
1401 to 2000 gpm	750 mb

Section 10.   National Code Groups

61616
62626
. . . . .
69696
      Identifiers of nationally developed groups. No nationally developed groups are included in the U.S. upper-air report.