

# Manual on Codes

## Regional Codes and National Coding Practices

### VOLUME II

2011 edition



**World  
Meteorological  
Organization**

Weather • Climate • Water

WMO-No. 306

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# INTRODUCTION

Several international code forms, in particular those needed for the functioning of basic systems in meteorology, contain provisions for regional or national options in the use of certain figure groups or the specification of certain symbolic letters. Volume II of the *Manual on Codes* contains information on the use made by regional associations and individual National Meteorological and Hydrological Services of these options. It also contains full descriptions of additional code forms adopted by regional associations for use within the Region and inventories of those national code forms which might be of interest to other countries. Unlike Volumes I.1 and I.2 of the *Manual on Codes*, Volume II is not considered an annex to the WMO *Technical Regulations*.

The word “shall” in the English text (and the equivalent term in the French, Russian and Spanish texts) has its dictionary meaning and does not have the regulatory character of “shall” (and the equivalent term) as in the WMO *Technical Regulations*.

Volume II consists of seven chapters, six of which are devoted each to a WMO Region, the seventh to the Antarctic. The regional coding procedures are adopted formally by the regional association concerned. Regional codes for use in the Antarctic are adopted by the WMO Executive Council on the advice of the Executive Council Panel of Experts on Polar Observations, Research and Services. The chapters are each divided into six sections (seven in the case of Region VI):

Section A contains regional coding procedures and is subdivided into two subsections:

- Subsection A.1 contains regional coding procedures with regard to international code forms;
- Subsection A.2 contains regional code forms and corresponding coding procedures. Regulation [A.2.3.]1.2.2 of the WMO *Technical Regulations* specifies that symbolic words, groups and letters (or groups of letters) required for regional or national purposes only shall be selected so as not to duplicate those used in international code forms.

Section B contains lists of symbolic letters for regional use which are to be replaced, generally by figures in coded reports, analyses or forecasts, with their specifications. Definitions and coding procedures relating to the specification concerned are added, where appropriate, to the specifications in the form of notes. Where symbolic letters represent coded information, i.e. not just the scale of values as measured, the reference to the tables containing specifications of the code figures is added between brackets. Code tables with a three-figure number are for regional use and are given in Section C. Code tables which are numbered from 0100 to 5299 are part of the system of international code tables as given in Volume I.1, Section C. Whenever symbolic letters appearing in regional codes are already used in the international codes, they retain their international character. Their specifications remain unaltered and are to be found in Volume I.1, Section B.

Section C contains the specifications of code figures for regional use in the form of code tables. The tables are preceded by a description of the numbering system of regional code tables included in the part concerned. Regional code tables are numbered with a three-figure number.

Section D contains national coding procedures with regard to international code forms. Information on the various uses of groups in international code forms which are reserved for national use is printed in roman type. Information is given only for groups which are used. Countries are listed alphabetically under each FM code form. Information on national deviations from international or regional standard coding procedures, provided by Members following Article 9 (b) of the Convention, is included in *italics*. Section 5 of FM 12 SYNOP and FM 13 SHIP shall only contain data which are for national exchange or for exchange between a small group of Members. Section 5 shall not be included in the international exchange over the Global Telecommunication System. Therefore, national coding practices concerning the use of Section 5 of FM 12 SYNOP and FM 13 SHIP are normally not included in Volume II.

Section E contains national code forms. This section contains just the information needed to identify the code forms. Full information about the use of the codes and their specifications should be obtained from the National Meteorological and Hydrological Service concerned.

Section F contains a list of basin indicators and indicators of countries used in international hydrological codes.

Section G (Region VI only) contains the specifications of zone numbers of sub-areas/route segments, notified by Members, for which GAFOR will be provided.

In the appendices to this volume, information is given on ice and satellite ephemeris codes, which do not have the status of WMO Technical Regulations.

Under some international code forms in this volume, meteorological requirements for the international exchange of relevant reports are mentioned. Corresponding rules relating to the telecommunication procedures are contained in the regional sections of Volume II the *Manual on the Global Telecommunication System* (WMO-No. 386).

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This new edition includes the amendments required by Maldives for national coding procedure with regard to FM 12 SYNOP, by Tuvalu for national coding procedure with regard to FM 12 SYNOP and FM 13 SHIP, by New Zealand for national coding procedure with regard to FM 15 METAR and FM 16 SPECI, by Belarus for national coding procedure with regard to FM 15 METAR, FM 16 SPECI and FM 51 TAF, by Sweden for national coding procedure with regard to FM 12 SYNOP, by Switzerland for national coding procedure with regard to FM 12 SYNOP, by the Netherlands for national coding procedure with regard to FM 12 SYNOP, FM 15 METAR, FM 16 SPECI and FM 51 TAF, by Canada for national coding procedure with regard to FM 15 METAR, FM 16 SPECI and FM 51 TAF, and by France to modify the code NIVOMET.



CHAPTER I

**REGION I — AFRICA**



## A — REGIONAL CODING PROCEDURES

### GENERAL REMARKS

- (a) The following instructions, code forms, specifications and code tables were adopted for use in WMO Region I by postal ballot in 1963 (Resolution 48 (63–RA I)), in 1967 (Resolution 58 (67–RA I)), in 1968 (Resolution 59 (68–RA I)), in 1971 (Resolution 46 (71–RA I)), in 1980 (Resolution 31 (80–RA I)) and at the sessions of WMO Regional Association I listed below:

Third session — Addis Ababa, March 1962  
Fifth session — Geneva, October 1969  
Sixth session — Geneva, August 1973  
Seventh session — Nairobi, February 1978  
Eighth session — Cairo, November 1982  
Ninth session — Harare, December 1986  
Tenth session — Bamako, November–December 1990  
Eleventh session — Gaborone, November 1994.

- (b) RA I developed instructions for the use in Region I of the following international codes:

FM 12 — SYNOP  
FM 13 — SHIP  
FM 32 — PILOT  
FM 33 — PILOT SHIP  
FM 35 — TEMP  
FM 36 — TEMP SHIP  
FM 53 — ARFOR  
FM 85 — SAREP

- (c) The following regional codes were developed:

**RF 1/01 VENTAL — Analysis of streamlines and the wind speed along them (modified version of part of the isopleth section of the IAC code (FM 45))**  
**RF 1/02 AGRO — Agrometeorological report of decadal data including monitoring on crops and locust control-related observations**

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## A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

### FM 12 SYNOP and FM 13 SHIP

#### (a) Section 1

1/12.1 *Groups* 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>, 4PPPP or 4a<sub>3</sub>hhh

1/12.1.1 If Regulation 12.2.3.4.2 applies, i.e. if a station cannot report mean sea-level pressure with reasonable accuracy, it shall use the group 4a<sub>3</sub>hhh to report the geopotential height of an agreed standard isobaric surface selected in accordance with the station elevation as follows:

Pressure	Station elevation	
	from greater than	to equal to or less than
850 hPa	500 m	2 300 m
700 hPa	2 300 m	3 700 m

1/12.1.2 Group 4a<sub>3</sub>hhh shall indicate the geopotential of the suitable pressure level expressed in geopotential metres.

1/12.1.3 The group 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> shall be included in the synoptic report in accordance with Regulation 12.2.4.

1/12.2 *Group* 5appp

Stations situated in the area between 20°N and 20°S shall not include this group.

*Notes:*

- (1) Madagascar uses this group for the whole country.
- (2) Chad, Mali, Mauritania and Niger do not use this group.
- (3) See Regulation 1/12.10.2.

1/12.3 *Group* 6RRRt<sub>R</sub> (*Section 1*)

1/12.3.1 This group shall be included in Section 1 of the synoptic report at the main standard times 0000, 0600, 1200 and 1800 UTC.

1/12.3.2 RRR shall relate to:

- (i) The preceding 6 hours at 0000 and 1200 UTC;
- (ii) The preceding 12 hours at 1800 UTC;
- (iii) The preceding 24 hours at 0600 UTC.

#### (b) Section 2

1/12.4 *Group* (2P<sub>w</sub>P<sub>w</sub>H<sub>w</sub>H<sub>w</sub>)

Lightships and coastal stations able to observe wind waves shall include this group in their reports.

1/12.5 *Groups* ((3d<sub>w1</sub>d<sub>w1</sub>d<sub>w2</sub>d<sub>w2</sub>) (4P<sub>w1</sub>P<sub>w1</sub>H<sub>w1</sub>H<sub>w1</sub>) (5P<sub>w2</sub>P<sub>w2</sub>H<sub>w2</sub>H<sub>w2</sub>))

Lightships and coastal stations able to observe one system of swell shall include these groups in their reports in accordance with Regulation 12.3.4.2 (see Volume I.1).

## REGION I

### (c) Section 3

1/12.6 *Group* (0 . . . .)

1/12.6.1 This group shall be used in the form of 0T<sub>g</sub>T<sub>g</sub>R<sub>c</sub>R<sub>t</sub> at 0600 UTC and of 0//R<sub>c</sub>R<sub>t</sub> at 0000 and 1200 UTC.

1/12.6.2 The group 0T<sub>g</sub>T<sub>g</sub>R<sub>c</sub>R<sub>t</sub> shall be reported by all Members at 0600 UTC to meet requirements of agrometeorological monitoring in the Region.

1/12.6.3 The use of the group 0//R<sub>c</sub>R<sub>t</sub> shall be left to the discretion of individual Members of the regional association.

1/12.7 *Group* (1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>)

This group shall be used to report at 1800 UTC the maximum day-time temperature of the preceding 12 hours.

1/12.8 *Group* (2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub>)

This group shall be used to report at 0600 UTC the minimum night-time temperature of the preceding 12 hours.

1/12.9 *Groups* (3Ejjj) (4E'sss)

1/12.9.1 The group 3Ejjj shall not be used in the Region.

1/12.9.2 Group (4E'sss) — Snow-depth data shall be reported by all stations capable of doing so, and included at least once daily at either 0600 or 1200 UTC.

1/12.10 *Groups* (5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>))

1/12.10.1 In the form 5EEEi<sub>E</sub> and 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>), these groups shall be included at 0600 UTC by all stations capable of doing so.

1/12.10.2 In parts of the Region, where the group 5appp is not included in Section 1 (see Regulation 1/12.2), the group 58p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> or 59p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> shall be included in Section 3 to report the variation of the surface pressure over the last 24 hours.

*N o t e* : See Regulation 1/12.2.

1/12.11 *Group* (6RRRt<sub>R</sub>) (*Section 3*)

1/12.11.1 This group shall be included in Section 3 of the synoptic report at the intermediate standard times 0300, 0900, 1500 and 2100 UTC.

1/12.11.2 RRR shall indicate the amount of precipitation (water equivalent) during the 3-hour period preceding the time of observation.

1/12.12 *Group* (7 . . . .)

*N o t e* : Regional regulations have not yet been developed.

1/12.13 *Group* (9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>)

1/12.13.1 The inclusion of this group, except as provided for in Regulation 1/12.13.3, shall be left to national decision.

1/12.13.2 When there is a requirement to give information about certain special phenomena occurring at the time of observation, or on phenomena which have occurred during the period covered by W<sub>1</sub>, W<sub>2</sub>, the group 9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> (Code table 3778 — Supplementary information — *Manual on Codes*, Volume I.1) shall be included.

REGION I

- 1/12.13.3 The group 943C<sub>L</sub>D<sub>p</sub> shall be reported by all stations in the south-west Indian Ocean area lying between latitudes 0° and 40°S and between longitudes 30° and 80°E during the tropical cyclone season.
- 1/12.14 Groups (80000 (0 . . . .) (1 . . . .) . . . .)
- 1/12.14.1 The above groups shall be used in the form (80000 (0L<sub>n</sub>L<sub>c</sub>L<sub>d</sub>L<sub>g</sub> (1s<sub>L</sub>d<sub>L</sub>D<sub>L</sub>v<sub>e</sub>)) to enable the reporting of locust control-related observations and shall be included by all Members capable of doing so and reported at . . . UTC.
- 1/12.14.2 Group (80000) — Indicator figure specifying that additional data in regional code follow.
- 1/12.14.3 Group (0L<sub>n</sub>L<sub>c</sub>L<sub>d</sub>L<sub>g</sub>) — This group shall contain information relating to locust (acridian) name and colour, stage of development of the swarms or bands of locusts and their organizational state.
- 1/12.14.4 Group (1s<sub>L</sub>d<sub>L</sub>D<sub>L</sub>v<sub>e</sub>) — This group shall always be reported in association with group 0L<sub>n</sub>L<sub>c</sub>L<sub>d</sub>L<sub>g</sub> and shall contain information on size and density of the swarms or bands, direction of motion and the extent of vegetation.
- (d) *Requirements for international exchange*
- 1/12.15 Sections 0, 1, 2 and 3 shall always be included in accordance with international regulations (see Volume I.1).
- 1/12.16 When data are available, the inclusion of Sections 4 and 5 shall be left to national decision.
- 1/12.17 Groups 8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub> and 9SpSpSpSp when included shall be reported in accordance with the provisions given in the *Manual on the Global Telecommunication System*.
- 1/12.18 As a meteorological minimum requirement, all groups of the reports received from ships shall be retransmitted.
- 1/12.19 Reports received from ships fitted with radiotelephony shall be edited and coded before transmission over the Global Telecommunication System.

**FM 32 PILOT and FM 33 PILOT SHIP**1/32.1 *Part A, Section 2*

When upper wind is measured without simultaneous pressure measurement, the following altitudes shall then be used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
850	1 500
700	3 000
500	5 700
400	7 500
300	9 600
250	10 800
200	12 300
150	14 100
100	16 500

1/32.2 *Part B, Section 4*

In addition to wind data at significant levels, altitudes of which shall be reported in geopotential units, data shall be included, as available, for the following altitudes: 600, 900, 2 100, 3 900, 4 500 and 5 100 m.

1/32.3 *Part C, Section 2*

The following altitudes shall be used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
70	18 600
50	20 700
30	23 400
20	25 800
10	29 700

1/32.4 *Part D, Section 4*

1/32.4.1 In addition to wind data at significant levels, altitudes of which shall be reported in geopotential units, data for the following fixed levels shall be reported: 21 000, 24 000, 27 000, 30 000, 33 000 m, and all successive levels at 3 000 m intervals, provided that they do not coincide with one of the reported significant levels.

1/32.4.2 The altitudes 30 000 m and above shall be encoded using units of 500 m, i.e. the altitudes 30 000 and 33 000 m shall be coded as 8606/, the altitudes 36 000 and 39 000 m as 8728/, etc.

1/32.5 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.



REGION I

**FM 35 TEMP and FM 36 TEMP SHIP**

1/35.1 *Part B, Section 9*

Section 9 shall be used in the Region in the following form:

51515	77h <sub>7</sub> h <sub>7</sub> h <sub>7</sub>	T <sub>7</sub> T <sub>7</sub> T <sub>a7</sub> D <sub>7</sub> D <sub>7</sub>	d <sub>7</sub> d <sub>7</sub> f <sub>7</sub> f <sub>7</sub> f <sub>7</sub>
	60h <sub>6</sub> h <sub>6</sub> h <sub>6</sub>	T <sub>6</sub> T <sub>6</sub> T <sub>a6</sub> D <sub>6</sub> D <sub>6</sub>	d <sub>6</sub> d <sub>6</sub> f <sub>6</sub> f <sub>6</sub> f <sub>6</sub>

1/35.2 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

**FM 53 ARFOR**

1/53.1 *Group AAAAA*

Plain language shall be used in place of the zone indicator AAAAA.

**FM 85 SAREP**

1/85.1 *Part B, Section 5*

Section 5 shall be used in the Region in the following form:

4S <sub>f</sub> W <sub>f</sub> C <sub>a</sub> H <sub>t</sub>	QL <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub>	(9d <sub>s</sub> d <sub>s</sub> f <sub>s</sub> f <sub>s</sub> )
--	--	---

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## A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS

### RF 1/01 VENTAL — Analysis of streamlines and the wind speed along them (modified version of part of the isopleth section of the IAC code (FM 45))

#### CODE FORM :

VENTAL	10001	333x <sub>1</sub> x <sub>1</sub>	0YYG <sub>c</sub> G <sub>c</sub>	88888	00x <sub>3</sub> x <sub>3</sub> x <sub>3</sub>	
	49uuu	48uuu	yyyyy	yyyyy	.....	(00C <sub>1</sub> 00)
		48uuu	yyyyy	yyyyy	.....	(00C <sub>1</sub> 00)
	.....	.....	.....	.....	.....	
	19191					

#### NOTES :

- (1) The symbolic figures and symbolic letters have the meaning given in the IAC code except for uuu in the group 48uuu.
- (2) In order to avoid confusion between indicator group 48uuu and a position group 48L<sub>o</sub>L<sub>o</sub>k, the value of uuu is the wind speed in knots plus 800.
- (3) The group 49uuu is used only once for each streamline and uuu indicates the altitude of the streamline in decametres.
- (4) The group 48uuu is given as often as necessary to permit those receiving the message to estimate the wind at any point on the streamline by interpolation.
- (5) When two groups 48uuu of the same streamline have the same value and are separated only by one or several yyyyy groups, the speed of the wind is constant along this part of the streamline.
- (6) The last position group yyyyy of a non-closed streamline is always preceded by a 48uuu group giving the wind speed at the last point of the line. In the case of a closed streamline, the last position group is identical to the first one and wind speed does not need to be repeated.

### RF 1/02 AGRO — Agrometeorological report of decadal data including monitoring on crops and locust control-related observations

#### CODE FORM :

Section 0	AGRO	yMMJJ	Q <sub>c</sub> L <sub>a</sub> L <sub>a</sub> L <sub>a</sub> L <sub>a</sub>	L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> L <sub>o</sub>	
Section 1	(99R <sub>i</sub> N <sub>R</sub> N <sub>R</sub>		(0R <sub>n</sub> R <sub>n</sub> R <sub>n</sub> R <sub>n</sub> ))	(1t <sub>s</sub> s <sub>i</sub> h <sub>a</sub> )	
			(2s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub> )	(3s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub> )	(4ssss)
			(5E <sub>p</sub> E <sub>p</sub> E <sub>p</sub> E <sub>p</sub> )	(6f <sub>r</sub> f <sub>r</sub> f <sub>r</sub> f <sub>r</sub> )	(666n <sub>fr</sub> n <sub>fr</sub> )
Section 2	888		(0Q <sub>i</sub> E <sub>g</sub> S <sub>s</sub> )	(1c'c'v'v')	(2C <sub>d</sub> kP <sub>g</sub> P <sub>g</sub> )
			(3F <sub>o</sub> E <sub>d</sub> E <sub>px</sub> S <sub>w</sub> )	(4I <sub>se</sub> I <sub>se</sub> R <sub>s</sub> R <sub>s</sub> )	
Section 3	777		(0L <sub>n</sub> L <sub>c</sub> L <sub>d</sub> L <sub>g</sub> )	(1s <sub>L</sub> d <sub>L</sub> D <sub>L</sub> v <sub>e</sub> )	
Section 4	666		(Groups to be developed nationally)		

NOTE : The code format contains five sections:

Section	Content
0	Identification and position
1	Decadal information
2	Data on crop assessment as a result of agrometeorological monitoring on up to three crops
3	Data on locust control-related observations
4	If included may contain data for national use

## REGION I

### REGULATIONS:

#### 1/02.1 *General*

- 1/02.1.1 The code name AGRO and the groups yMMJJ Q<sub>c</sub>L<sub>a</sub>L<sub>a</sub>L<sub>a</sub>L<sub>a</sub> and L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub> shall appear as a prefix to individual reports.
- 1/02.1.2 The code name AGRO and the group yMMJJ shall be included as the first line of the text of a meteorological bulletin of AGRO reports. Individual reports in the bulletin shall contain neither the code name nor the group yMMJJ.
- 1/02.1.3 The position of an agrometeorological station, in degrees and minutes, shall be indicated by the groups Q<sub>c</sub>L<sub>a</sub>L<sub>a</sub>L<sub>a</sub>L<sub>a</sub> L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>.

#### 1/02.2 *Use of sections*

- 1/02.2.1 Whenever data are available, sections 1, 2 and 3 shall be reported together except that some sections may be reported when data for any other section(s) are not available.
- 1/02.2.2 The groups of section 2 shall be reported for the first crop monitored and repeated, without the indicator group 888, for other crops monitored up to a total maximum of the three most representative crops.
- 1/02.2.3 Groups of section 3 shall all be reported together whenever locust control-related observations can be included by all members capable of doing so.

#### 1/02.3 *Section 1*

- 1/02.3.1 When included, the groups 99R<sub>i</sub>N<sub>R</sub>N<sub>R</sub> and 0R<sub>n</sub>R<sub>n</sub>R<sub>n</sub>R<sub>n</sub> shall refer to the total precipitation measured in periods ending with the reading on the first, eleventh and twenty-first days of each month UTC.
- 1/02.3.2 Reports on the eleventh and twenty-first days of the month UTC shall refer to the total amount of precipitation measured during the period of 10 days ending on the morning of the reporting day, while reports on the first day of the month UTC shall refer to the total amount of precipitation since the end of the period covered by the report of the twenty-first day of the preceding month.
- 1/02.3.3 The group 99R<sub>i</sub>N<sub>R</sub>N<sub>R</sub> shall be used where R<sub>i</sub> indicates whether the total rainfall R<sub>n</sub>R<sub>n</sub>R<sub>n</sub>R<sub>n</sub> reported for the period in question is less than one millimetre or not (see Code table 166).
- 1/02.3.4 R<sub>n</sub>R<sub>n</sub>R<sub>n</sub>R<sub>n</sub> shall be used to report the amount of rainfall for the period in millimetres and 0.5 will be rounded upwards. The rounding up will only apply when R<sub>i</sub> is encoded 6-9 in the group 99R<sub>i</sub>N<sub>R</sub>N<sub>R</sub>.
- 1/02.3.5 When there is no precipitation recorded during the period, 99R<sub>i</sub>N<sub>R</sub>N<sub>R</sub> shall be coded 99000 to indicate this, and in this case the group 0R<sub>n</sub>R<sub>n</sub>R<sub>n</sub>R<sub>n</sub> shall not be included in the report.
- 1/02.3.6 The group 1t<sub>s</sub>s<sub>i</sub>i<sub>E</sub>h<sub>a</sub> when included in the report will give additional information relating to the decadal data reported. Whenever each indicator is reported using a solidus (/), this implies that the appropriate groups relating to it shall not be included in the report.
- 1/02.3.7 The groups 2s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> and 3s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> with their sign of data indicator (s<sub>n</sub>) relate to the reported mean maximum and minimum temperature in tenths of degrees Celsius for the 10 days, respectively.
- 1/02.3.8 Group 4ssss — This group, when included in the report, gives the total sunshine hours in tenths of an hour for the period.
- 1/02.3.9 Group 5E<sub>p</sub>E<sub>p</sub>E<sub>p</sub>E<sub>p</sub> — This group, when included, shall contain information on the total potential evaporation in millimeters for the decadal period.

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- 1/02.3.10 Groups 6f<sub>f</sub>f<sub>f</sub>f<sub>f</sub> 666n<sub>f</sub>n<sub>f</sub> — The reporting of these groups will contain the total wind run in hundredth of kilometres during the period (if the total wind run in 10 days is 700.64 statute miles, this is equivalent to 1127.33 kilometres and will be reported as 6112766633, where n<sub>f</sub>n<sub>f</sub> represents the hundredths digits of the run of wind reported by the f<sub>f</sub>f<sub>f</sub>f<sub>f</sub> group).
- 1/02.4 *Section 2*
- 1/02.4.1 This section consists of the indicator group 888 followed by data on crop assessment groups 0Q<sub>i</sub>E<sub>g</sub>S<sub>s</sub>, 1c'c'v'v', 2C<sub>d</sub>kP<sub>g</sub>P<sub>g</sub>, 3F<sub>o</sub>E<sub>d</sub>E<sub>px</sub>S<sub>w</sub>, 4I<sub>se</sub>I<sub>se</sub>R<sub>s</sub>R<sub>s</sub>. These groups shall be reported only when a station has conducted crop monitoring on at least one crop.
- 1/02.4.2 Group 0Q<sub>i</sub>E<sub>g</sub>S<sub>s</sub> — This group, when included, will contain information on the quality of the crop by general assessment, on the indicator of soil moisture source, on the state of the ground, and on the state of the crop due to moisture stress. The indicator i<sub>f</sub> gives, in addition, predominance of dryness or wetness of ground in the period and whether or not experiments are conducted in the fields.
- 1/02.4.3 Group 1c'c'v'v' — This group contains the type of crop and variety.
- 1/02.4.4 Group 2C<sub>d</sub>kP<sub>g</sub>P<sub>g</sub> — This group, when reported, will contain data on crop damage, on the kind of pest, on disease or adverse weather which caused the damage, and information on the phenological phase of the crop at the time of observation.
- 1/02.4.5 Group 3F<sub>o</sub>E<sub>d</sub>E<sub>px</sub>S<sub>w</sub> — This group reports the field operations during the period concerned, the extent of damage due to diseases, pests, and adverse weather, as well as the extent of the spread of weeds. This group gives complementary information to group 2C<sub>d</sub>kP<sub>g</sub>P<sub>g</sub>.
- 1/02.4.6 Group 4I<sub>se</sub>I<sub>se</sub>R<sub>s</sub>R<sub>s</sub> — This group, when included, shall contain data on soil water reserve and water sufficiency index, when the indices have been calculated. Otherwise, it shall be omitted.
- 1/02.5 *Section 3*
- 1/02.5.1 Section 3 with indicator 777 will consist of data on locust control-related observations.
- 1/02.5.2 Group 0L<sub>n</sub>L<sub>c</sub>L<sub>d</sub>L<sub>g</sub> — This group shall contain information relating to locust (acridian) name and colour, on the stage of development of the swarm or band of locusts, and their organization state.
- 1/02.5.3 Group 1s<sub>L</sub>d<sub>L</sub>D<sub>L</sub>v<sub>e</sub> — This group shall always be reported in association with group 0L<sub>n</sub>L<sub>c</sub>L<sub>d</sub>L<sub>g</sub> and shall contain information on the size and density of the swarm or band of locusts, on the direction of motion, and on the extent of the vegetation.
- 1/02.6 *Section 4*
- This section may be developed nationally.
-



## B — SPECIFICATIONS OF SYMBOLIC LETTERS (or groups of letters) FOR REGIONAL USE

$C_a$	Total cloud cover associated with cloud feature indicated by $S_f$ in the area defined by $QL_aL_aL_oL_o$ . . . . . $QL_aL_aL_oL_o$ . (Code table 126) (FM 85)
$C_d$	Crop damage due to diseases or pests and/or adverse weather. (Code table 136) (RF 1/02)
$c'c'$	Crop observed. (Code table 138) (RF 1/02)
$D_L$	Direction of movement of locust swarm. (Code table 140) (FM 12, RF 1/02)
$\left. \begin{matrix} D_7D_7 \\ D_6D_6 \end{matrix} \right\}$	Dew-point depression at 775 and 600 hPa, respectively. (Code table 0777) (FM 35, FM 36)
$d_L$	Locust population density. (Code table 139) (FM 12, RF 1/02)
$\left. \begin{matrix} d_7d_7 \\ d_6d_6 \end{matrix} \right\}$	True direction (rounded off to the nearest 5°), in tens of degrees, from which the wind is blowing at 775 and 600 hPa, respectively. (FM 35, FM 36)
$E_d$	Extent of damage by diseases. (Code table 141) (RF 1/02)
$E_g$	State of the ground for agrometeorological monitoring purposes. (Code table 142) (RF 1/02)
$E_{px}$	Extent of damage by pests and adverse weather. (Code table 143) (RF 1/02)
$E_pE_pE_pE_p$	Total potential evaporation in millimetres. (RF 1/02)
$F_o$	Field operations carried out during the period concerned. (Code table 152) (RF 1/02)
$\left. \begin{matrix} f_7f_7f_7 \\ f_6f_6f_6 \end{matrix} \right\}$	Wind speed, in metres per second or knots, at 775 and 600 hPa, respectively. (FM 35, FM 36)  (1) See Note (1) under dd (Volume I.1 — Part A, Section B). (2) See Note (1) under YY (Volume I.1 — Part A, Section B).
$f_rf_rf_r$	Total wind run in hundredths of kilometres. (RF 1/02)
$H_t$	Estimated mean height of cloud tops either from infrared data or supplementary aircraft and radar reports. (Use Code table 1535) (FM 85)

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$h_a$	Height of counting anemometer above the ground surface. (Code table 153) (RF 1/02)
$\left. \begin{matrix} h_7 h_7 h_7 \\ h_6 h_6 h_6 \end{matrix} \right\}$	Geopotential of the 775 and 600 hPa isobaric surfaces, respectively in standard geopotential metres and tens of standard geopotential metres. (FM 35, FM 36)
$I_{se} I_{se}$	Water sufficiency index for the crop, calculated according to the method set out in FAO publications Nos. 17 and 73. (RF 1/02) (1) The value 100 is coded 00.
$i_E$	Type of evaporimeter. (Code table 154) (RF 1/02)
$i_f$	Indicator of soil moisture source, predominance of dryness or wetness in the period with or without experimental tests on fertilizers, effects of insecticides or herbicides. (Code table 155) (RF 1/02)
JJ	Tens and units digits of the year. (RF 1/02)
k	Kind of pest, disease and adverse weather. (Code table 157) (RF 1/02)
$L_c$	Locust (maturity) colour. (Code table 159) (FM 12)
$L_d$	Stage of development of locusts. (Code table 160) (FM 12)
$L_g$	Organizational state of swarm or band of locusts. (Code table 161) (FM 12)
$L_n$	Locust (acridian) name. (Code table 162) (FM 12)
MM	Month of the year UTC. (RF 1/02)
$N_R N_R$	Number of precipitation days in the period in which the precipitation equalled or exceeded 0.1 millimetres. (RF 1/02)
$n_{fr} n_{fr}$	The hundredths digits of the run of wind reported by $f_r f_r f_r f_r$ . (RF 1/02)
$P_g P_g$	Phenological phase of the crop at the time of observation. (Code table 163) (RF 1/02)
Q	Quality of the crop by general assessment. (Code table 165) (RF 1/02)



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$R_c$	Character and intensity of precipitation. (Code table 167) (0-group in Section 3 of FM 12 and FM 13) (1) $R_c$ relates to the precipitation, the amount of which is given by RRR in the group 6RRRt <sub>R</sub> .
$R_i$	Indicator specifying the reported rainfall for the period is in tenths of millimetres or in whole millimetres. (Code table 166) (RF 1/02)
$R_t$	Time of beginning or end of precipitation. (Code table 168) (0-group in Section 3 of FM 12 and FM 13) (1) $R_t$ indicates the time of the beginning of the precipitation if it is still falling at the time of observation, but $R_t$ indicates the time of the end of the precipitation if it has stopped before the time of observation. (2) $R_t$ relates to the precipitation, the amount of which is given by RRR in the group 6RRRt <sub>R</sub> .
$R_s R_s$	Useful soil water reserve for the crop, calculated according to the method set out in FAO publications Nos. 17 and 73 and expressed in millimetres. (RF 1/02) (1) The code figure 99 is used for a reserve equal to or higher than 99.
$R_n R_n R_n R_n$	Total amount of precipitation which has fallen during the period. (RF 1/02)
$S_f$	Synoptic interpretation of cloud features. (Code table 170) (FM 85)
$S_s$	State of crop due to moisture stress. (Code table 174) (RF 1/02)
$S_w$	Spread of weeds. (Code table 178) (RF 1/02)
$s_L$	Size of swarm or band of locusts and duration of passage of swarm. (Code table 173) (FM 12, RF 1/02)
$s_i$	Instrument used to measure sunshine. (Code table 172) (RF 1/02)
ssss	Total duration of sunshine in tenths of an hour for the period. (RF 1/02)
$T_{a7}$ $T_{a6}$	Approximate tenths value and sign (plus or minus) of the air temperature at 775 and 600 hPa, respectively. (Code table 3931) (FM 35, FM 36)
$T_g T_g$	Ground (grass) minimum temperature of the preceding night, in whole degrees Celsius. (0-group in Section 3 of FM 12 and FM 13) (1) Negative temperatures shall be indicated by adding 50 to the absolute value of the temperature.

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$\left. \begin{matrix} T_7 T_7 \\ T_6 T_6 \end{matrix} \right\}$	<p>Tens and units digits of the air temperature, not rounded off, in degrees Celsius, at 775 and 600 hPa, respectively. (FM 35, FM 36)</p> <p>(1) The tenths of the temperature, which is measured in degrees and tenths, shall be indicated by means of <math>T_{a7}</math> and <math>T_{a6}</math>, respectively.</p>
$t_s$	<p>Type of temperature sensor. (Code table 179) (RF 1/02)</p>
$v_e$	<p>Extent of vegetation. (Code table 182) (FM 12, RF 1/02)</p>
$v'v'$	<p>Crop variety. (Code table 180) (RF 1/02)</p>
$W_f$	<p>Mean width or mean diameter of the feature specified by <math>S_f</math>. (Code table 4536) (FM 85)</p>
$y$	<p>Period for which rainfall is reported (between morning readings). (Code table 192) (RF 1/02)</p>

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## C — SPECIFICATIONS OF CODE FIGURES (code tables) FOR REGIONAL USE

Code tables in regional use in Region I are numbered with a three-figure number from 120 to 199. The numbering system and codes for each element are given below:

126	$C_a$	155	$i_f$	170	$S_f$
136	$C_d$	157	$k$	172	$s_i$
138	$c'c'$	159	$L_c$	173	$s_L$
139	$d_L$	160	$L_d$	174	$S_s$
140	$D_L$	161	$L_g$	178	$S_w$
141	$E_d$	162	$L_n$	179	$t_s$
142	$E_g$	163	$P_gP_g$	180	$v'v'$
143	$E_{px}$	165	$Q$	182	$v_e$
152	$F_o$	166	$R_i$	192	$y$
153	$h_a$	167	$R_c$		
154	$i_E$	168	$R_t$		

### 126

$C_a$  — *Total cloud cover associated with cloud feature indicated by  $S_f$  in the area defined by  $QL_aL_aL_oL_o \dots QL_aL_aL_oL_o$*

Code  
figure

0	Open (less than 20 per cent)
1	Mostly open (20–50 per cent)
2	Mostly covered (50–80 per cent)
3	Overcast (more than 80 per cent)
/	Unspecified

### 136

$C_d$  — *Crop damage due to diseases or pests and/or adverse weather*

Code  
figure

0	No damage
1	Damage mainly due to diseases – beginning
2	Damage mainly due to diseases – advanced
3	Damage due to pests and diseases
4	Damage due to pests – severe
5	Damage due to pests, diseases and adverse weather
6	Damage due to pests and adverse weather
7	Damage due to adverse weather and diseases
8	Damage due to adverse weather
9	Severe case of damage (mixed) not easy to determine the major cause
/	Observation not made or not included due to bush fires or field abandoned

*c'c'— Crop observed*Code  
figure

	<b>01–09 Beverage and drug plants</b>
01	Cocoa
02	Coffee
03	Tea
04–09	Reserved
	<b>10–19 Cultivated food crops</b>
10	Apple
11	Avocado
12	Banana
13	Mango
14	Pineapple
15–19	Reserved
	<b>20–29 Cereal crops</b>
20	Barley
21	Maize
22	Millet
23	Rice
24	Sorghum
25	Wheat
26–29	Reserved
	<b>30–39 Citrus fruits</b>
30	Grapefruit
31	Lemon
32	Orange
33	Tangerine
34–39	Reserved
	<b>40–49 Leguminous crops</b>
40	Beans
41	Peas
42–49	Reserved
	<b>50–59 Oil-seed crops</b>
50	Cashewnut
51	Groundnut
52	Sunflower
53–59	Reserved
	<b>60–69 Root crops</b>
60	Cassava
61	Potato
62–69	Reserved

(Code table 138 — continued)

Code  
figure

	<b>70–74 Spice crops</b>
70	Pepper
71–74	Reserved
	<b>75–79 Vegetable crops</b>
75	Cabbage
76	Tomato
77–79	Reserved
	<b>80–89 Vegetable and leaf fibre</b>
80	Cotton
81–89	Reserved
	<b>90–94 Saccharines</b>
90	Sugarcane
91–94	Reserved
	<b>95–99 Pasture</b>
95	Pasture
96–99	Reserved

**139** $d_L$  — *Locust population density*Code  
figure

1	Thin density swarm (swarm visible only when near enough for individual locusts to be discerned)
2	Medium density swarm
3	Dense swarm (obscuring nearby features, e.g. trees)
4	Isolated hoppers seen singly
5	Scattered hoppers, several visible simultaneously

**140** $D_L$  — *Direction of movement of locust swarm*Code  
figure

1	Generally in the direction NE
2	Generally in the direction E
3	Generally in the direction SE
4	Generally in the direction S
5	Generally in the direction SW
6	Generally in the direction W
7	Generally in the direction NW
8	Generally in the direction N
9	Specific direction indeterminable

**141** $E_d$  — *Extent of damage by diseases*Code  
figure

0	No disease
1	Death of tissue (necrosis)
2	Abnormal increase of tissue (hypertrophy)
3	Failure to obtain normal size or development
4	Changes in colour
5	Wilting caused by interference with normal water movement
6	Unusual transformation of organs
7	Disintegration of tissue (rot)
8	Excessive gum formation
9	Complicated case, many disease symptoms in the field
/	Not observed

**142** $E_g$  — *State of the ground for agrometeorological monitoring purposes*Code  
figure

0	Surface of the ground not dry or wet (normal)
1	Surface of the ground dry with no loose sand or dust
2	Surface of the ground dry with loose sand or dust
3	Surface of the ground very dry with cracks
4	Surface of the ground freezing (frost)
5	Surface of the ground moist
6	Surface of the ground wet (slippery at places)
7	Surface of the ground wet with standing water in pools
8	Surface of the ground flooded (inundation)
9	Surface of the ground partly or wholly covered with hail

**143** $E_{px}$  — *Extent of damage by pests and adverse weather*Code  
figure

0	Crop free from any damage
1	Damage by pests and/or adverse weather less than 10 per cent
2	Damage by pests and/or adverse weather 25 per cent
3	Damage by pests and/or adverse weather 50 per cent
4	Damage by pests and/or adverse weather 75 per cent
5	Damage by pests and/or adverse weather 100 per cent

**152**

$F_o$  — *Field operations carried out during the period concerned*

Code  
figure

- |   |  |
|---|--|
| 0 | No operations carried out in the field                                       |
| 1 | Clearing, hoeing or ploughing  |
| 2 | Transplanting/sowing   |
| 3 | Thinning   |
| 4 | Weeding  |
| 5 | Manure or fertilizer application   |
| 6 | Pruning or cutting as pasture (or already cut as pasture)                    |
| 7 | Spraying against pests and diseases, or weeds                                |
| 8 | Irrigation   |
| 9 | More than one operation carried out before or during the time of observation |

**153**

$h_a$  — *Height of counting anemometer above the ground surface*

Code  
figure

- |     |   |
|-----|---|
| 1   | Counting anemometer height below 2 metres from ground surface |
| 2   | Counting anemometer height 2 metres above ground surface      |
| 3   | Counting anemometer height above 2 metres from ground surface |
| 4–9 | Not used  |
| /   | Data not available  |

**154**

$i_E$  — *Type of evaporimeter*

Code  
figure

- |     |                                  |
|-----|----------------------------------|
| 1   | Sunken tank or pan               |
| 2   | Tank or pan above ground surface |
| 3–9 | Not used                         |
| /   | Data not available               |

**155**

*i<sub>f</sub> — Indicator of soil moisture source, duration of dryness or wetness in the period with or without experimental tests of fertilizers and effect of insecticides or herbicides*

Code  
figure

- |   |  |
|---|--|
| 0 | Rainfed farming (in rainy areas) has been dry most of the period — no experimental tests         |
| 1 | Rainfed farming (in rainy areas) has been dry most of the period — with experimental tests       |
| 2 | Rainfed farming (in rainy areas) has been wet/flooded most of the period — no experimental tests |
| 3 | Rainfed farming (in rainy areas) has been wet most of the period — with experimental tests       |
| 4 | Rainfed farming (in dry areas) has been dry most of the period — no experimental tests           |
| 5 | Rainfed farming (in dry areas) has been dry most of the period — with experimental tests         |
| 6 | Rainfed farming (in dry areas) has been wet/flooded most of the period — no experimental tests   |
| 7 | Rainfed farming (in dry areas) has been wet most of the period — with experimental tests         |
| 8 | Irrigated fields — no experimental tests   |
| 9 | Irrigated fields — with experimental tests   |

**157**

*k — Kind of pest, disease and adverse weather*

Code  
figure

- |   |  |
|---|--|
| 0 | No pest, disease or adverse weather                      |
| 1 | Insufficient rain – scorching sun                        |
| 2 | Crickets or locusts and/or other insects                 |
| 3 | Army-worm  |
| 4 | Birds  |
| 5 | Frost  |
| 6 | Squall wind, hail and/or heavy rain (floods)             |
| 7 | Bacterial, fungal or viral diseases visible to naked eye |
| 8 | Mammals (baboons, wild-pigs, buffaloes, elephants, etc.) |
| 9 | Others not specified                                     |

**159**

*L<sub>c</sub> — Locust (maturity) colour*

Code  
figure

- |   |                      |
|---|----------------------|
| 0 | Green                |
| 1 | Green or black       |
| 2 | Black                |
| 3 | Yellow and black     |
| 4 | Straw/grey           |
| 5 | Pink                 |
| 6 | Dark red/brown       |
| 7 | Mixed red and yellow |
| 8 | Yellow               |
| 9 | Other                |



**160***L<sub>d</sub> — Stage of development of locusts*Code  
figure

- |   |  |
|---|--|
| 0 | Hoppers (nymphs, larvae), stage 1                                |
| 1 | Hoppers (nymphs, larvae), stage 2 or mixed 1, 2 instars (stages) |
| 2 | Hoppers (nymphs, larvae), stage 3 or mixed 2, 3 instars          |
| 3 | Hoppers (nymphs, larvae), stage 4 or mixed 3, 4 instars          |
| 4 | Hoppers (nymphs, larvae), stage 5 or mixed 4, 5 instars          |
| 5 | Hoppers (nymphs, larvae), stage mixed, all or many instars       |
| 6 | Fledglings (wings too soft for sustained flight)                 |
| 7 | Immature adults  |
| 8 | Mixed maturity adults  |
| 9 | Mature adults  |

**161***L<sub>g</sub> — Organizational state of swarm or band of locusts*Code  
figure

- |   |   |
|---|---|
| 0 | Hoppers only, mainly in bands or clusters   |
| 1 | Winged adults in the vicinity more than 10 kilometres from point of observation               |
| 2 | Locusts in flight, a few seen at the station  |
| 3 | Locusts at the station, most of them on the ground  |
| 4 | Locusts, some on ground and others in flight at a height less than 10 metres                  |
| 5 | Locusts, some on ground and others in flight at a height greater than 10 metres               |
| 6 | Locusts, most in flight at a height less than 10 metres                                       |
| 7 | Locusts, most in flight at a height greater than 10 metres                                    |
| 8 | Locusts, all over inflicting severe damage to vegetation, no extermination operation          |
| 9 | Locusts, all over inflicting severe damage to vegetation, extermination operation in progress |

**162***L<sub>n</sub> — Locust (acridian) name*Code  
figure

- |   |                           |
|---|---------------------------|
| 1 | Schistocerca gregaria     |
| 2 | Locusta migratoria        |
| 3 | Nomadacris septemfasciata |
| 4 | Oedaleus senegalensis     |
| 5 | Anracridium spp           |
| 6 | Other locusts             |
| 7 | Other grasshoppers        |
| 8 | Other crickets            |
| 9 | Spodoptera exempta        |

**163**

$P_gP_g$  — *Phenological phase of the crop at the time of observation*

Code  
figure

01	Emergence, germination Emergence of buds
02	Appearance of new leaves; first new spike Appearance of buds; new shoots; stem Appearance of sucker
03	Sprouting; elongation of stem
04	Appearance of third node
05	Swelling of the buds; swelling of the root
06	Opening of the buds; flower buds; leaf buds
07	Appearance of first flag; first true leaf; first pair of true leaves, appearance of catkin; new leaves
08	Appearance of inflorescence
09	Appearance of second pair of true leaves
10	Third leaf Third true leaf Third pair of leaves
11	Fifth leaf Fifth true leaf
12	Appearance of sixth node
13	Seventh true leaf
14	Ninth leaf
15	Tenth leaf
16	Tillering
17	Shooting
18	Candle stage
19	Budding; rosette
20	Heading; formation of the head
21	Tasseling; silking; earing
22	Flowering of tassel Flowering of inflorescence
23	Flowering
24	Appearance of nuts Appearance of fruits; setting of the fruit
25	Pin head
26	Berry – soft
27	Berry – hard
28	Fruit setting, pod setting
29	Nut setting
30	Opening of the bolls
31	Consumer ripeness; green ripeness
32	Wax ripeness; yellow green ripeness
33	Ripeness; light brown ripeness
34	Ripeness of the fruit
35	Full ripeness
36	Wilting; shedding of leaves

# REGION I

(Code table 163 — continued)

Code figure	
37	Reserved
.	
.	
98	
99	Harvesting
//	Phenological phase not determined

## 165

Q — *Quality of the crop by general assessment*

Code figure	
0	Bad state (poor)
1	Unsatisfactory
2	Moderate
3	Good
4	Excellent
5	Bad state (poor)
6	Unsatisfactory
7	Moderate
8	Good
9	Excellent

Phenological phase in this report same as reported in the previous agrometeorological report

## 166

R<sub>i</sub> — *Indicator specifying the reported rainfall for the period is in tenths of millimetres or in whole millimetres and also height of gauge orifice above ground surface*

Code figure	
0	No precipitation
1	Rainfall measured using precipitation gauge installed with orifice at a level with the surrounding ground
2	Rainfall measured using gauge installed with orifice at 30 centimetres above ground
3	Rainfall measured using a gauge installed with orifice more than 30 centimetres above ground
4	Rainfall derived from an automatic weather station
5	Not used
6	Rainfall measured using a gauge installed with orifice at a level with the surrounding ground
7	Rainfall measured using a gauge installed with orifice at 30 centimetres above ground
8	Rainfall measured using a gauge installed with orifice more than 30 centimetres above ground
9	Rainfall derived from an automatic weather station

In tenths of millimetres

In whole millimetres

**167** $R_c$  — *Character and intensity of precipitation*Code  
figure

0	No precipitation
1	Light intermittent
2	Moderate intermittent
3	Heavy intermittent
4	Very heavy intermittent
5	Light continuous
6	Moderate continuous
7	Heavy continuous
8	Very heavy continuous
9	Variable – alternatively light and heavy

**168** $R_t$  — *Time of beginning or end of precipitation*Code  
figure

0	No precipitation
1	Within the last hour
2	1 to 2 hours ago
3	2 to 3 hours ago
4	3 to 4 hours ago
5	4 to 5 hours ago
6	5 to 6 hours ago
7	6 to 8 hours ago
8	8 to 10 hours ago
9	More than 10 hours ago

**170** $S_f$  — *Synoptic interpretation of cloud features*Code  
figure

1	Vortex in ITC
2	Easterly disturbance (wave)
3	Instability front
4	Cirrus level wind maxima (subtropical jet)
5	Tropical or subtropical Cirrus stream
6	Low-level wind maximum
7	Clouds in longitudinal or transverse bands
8	Tropical cloud lines
9	Cellular clouds forming due to incursion, at low levels, of cold air into tropical areas from higher latitudes
/	Undetermined

## 172

$s_i$  — *Instrument used to measure sunshine*

Code  
figure

1	Glass sphere
2	Photoelectric detector
3	Others
4–9	Not used
/	Data not available

## 173

$s_L$  — *Size of swarm or band of locusts and duration of passage of swarm*

Code  
figure

**When  $L_g = 0$**

1	Area covered by isolated bands < 10 m <sup>2</sup>
2	Area covered by isolated bands 10 – 100 m <sup>2</sup>
3	Area covered by isolated bands 100 – 1 000 m <sup>2</sup>
4	Area covered by isolated bands 1 000 – 10 000 m <sup>2</sup>
5	Area covered by isolated bands 1 – 10 ha
6	Area covered by isolated bands > 10 ha
7	Area covered by dispersed bands < 100 km <sup>2</sup>
8	Area covered by dispersed bands 100 – 1 000 km <sup>2</sup>
9	Area covered by dispersed bands > 1 000 km <sup>2</sup>

**When  $L_g = 1$  to 9**

0	Small swarm less than 1 km <sup>2</sup> or adults in ground, tens or hundreds of individuals visible simultaneously, duration of passage less than 1 hour ago
1	Small swarm less than 1 km <sup>2</sup> or adults in ground, tens or hundreds of individuals visible simultaneously, duration of passage 1 to 6 hours ago
2	Small swarm less than 1 km <sup>2</sup> or adults in ground, tens or hundreds of individuals visible simultaneously, duration of passage over 6 hours ago
3	Medium swarm or scattered adults, several visible simultaneously, duration of passage less than 1 hour ago
4	Medium swarm or scattered adults, several visible simultaneously, duration of passage 1 to 6 hours ago
5	Medium swarm or scattered adults, several visible simultaneously, duration of passage over 6 hours ago
6	Large swarm or isolated adults, seen singly, duration of passage less than 1 hour ago
7	Large swarm or isolated adults, seen singly, duration of passage 1 to 6 hours ago
8	Large swarm or isolated adults, seen singly, duration of passage over 6 hours ago
9	More than one swarm of locusts
/	Size of swarm and/or duration of passage not determined owing to darkness or similar phenomena

**174** $S_s$  — *State of crop due to moisture stress*Code  
figure

1	Normal vegetative development
2	Mild wilting
3	Persistent wilting
4	Partial withering
5	Total withering
/	No observation

**178** $S_w$  — *Spread of weeds*Code  
figure

0	No weeds in the field
1	Weeds can be seen but very few
2–8	Reserved
9	There are plenty of weeds in the field

**179** $t_s$  — *Type of temperature sensor*Code  
figure

1	Liquid in glass thermometer
2	Bimetallic or Bourdon tube sensor
3	Electric thermometer
4	Others
5–9	Not used
/	Data not available

v'v' — *Crop variety*Code  
figure**01–03 Apple**

- 01 Ex-Kilamini Farm
- 02 Golden Delicious
- 03 Sangema

**04–05 Avocado**

- 04 Fuotte
- 05 Hass

**06–08 Banana**

- 06 Plantain
- 07 Petit/Grande Naine or Malindi
- 08 Poyo

**09–11 Barley**

- 09 Proctor
- 10 Amani
- 11 Martin

**12–16 Beans**

- 12 Canadian Wander
- 13 Natal Saga
- 14 Niebbe/Fonio/Soya beans
- 15 La Victoire
- 16 Rubona 5

**17–19 Cabbage**

- 17 Africa Cross
- 18 Cabic
- 19 Drum head

**20–24 Cassava**

- 20 Congo
- 21 Eala
- 22 Kibanda Meno
- 23 Liwalampunu
- 24 Manihot utilisissima

**25 Cashewnut**

- 25 MT-LD

**26 Cocoa**

- 26 Ghana I

**27–28 Coffee**

- 27 Arabica
- 28 Robusta

(Code table 180 — continued)

Code  
figure**29–32 Cotton**

29	L-299-10-75
30	MK 73 (MK series)
31	UK 74 (UK series)
32	15A-205-B

**33–35 Groundnut**

33	Nata I
34	Red-Mwitunde
35	Serere

**36–38 Lemon**

36	Eureka
37	European
38	Tahit Lime

**39–48 Maize**

39	Bambu
40	Gnouli
41	H 613 . . (H series)
42	Katumani
43	MM 504 . . (MM series)
44	Perta
45	R 215 . . (R series)
46	UCA
47	Zanguerini
48	ZS 107 . . (ZS series)

**49–50 Mango**

49	Ngowe
50	Smith

**51–55 Millet**

51	Bullrush
52	Composite
53	M-9
54	PM-VI
55	Steadfast line

**56–58 Oranges**

56	Maltaise Blonde
57	Valencia late
58	Washington Navel

**59–61 Peas**

59	Angola Peas
60	Cow-Peas
61	Pegion



REGION I

(Code table 180 — continued)

Code  
figure

**62–63 Pepper**

62 California Wander

63 Lampong Kawur

**64 Pineapple**

64 Smooth Cayenne

**65–68 Peanut**

65 HNG 18

66 Maressi

67 RMP 12

68 47-10

**69–70 Potato**

69 Irish

70 Sweet Potato (Tis series)

**71–76 Rice**

71 ADNY 11

72 Malawi Faya

73 Supa

74 Keng DEA 03

75 Mankin 1

76 Segadis

**77–83 Sorghum**

77 Franida Red

78 Hageen Dura 1

79 Panicule Lache

80 Red Swazi A

81 Serena

82 SVR 157

83 Tiemarifing

**84–85 Sugarcane**

84 NCO-376

85 Pindar

**86–90 Sunflower**

86 Comet Shaba

87 Cor 104

88 Hungarian

89 Helianthis

90 Rendovik

**91–92 Tomato**

91 Money maker

92 Roma

(Code table 180 — continued)

Code  
figure**93–94 Tangerines**

- 93 Satsuma
- 94 Clementine

**95–98 Wheat**

- 95 Angwa
- 96 Chilli 931
- 97 Kinigi
- 98 Trophy-3505

**99 Pasture**

- 99 Pasture (all types)
- // Variety not specified

**182** $v_e$  — *Extent of vegetation*Code  
figure

- 0 Bare ground
- 1 Dry, presence of few and isolated shrubs
- 2 Sparce vegetation (sprouting)
- 3 Dense vegetation (sprouting)
- 4 Sparce vegetation (growing)
- 5 Dense vegetation (growing)
- 6 Sparce vegetation in flower
- 7 Dense vegetation in flower

**192** $y$  — *Period for which rainfall is reported (between morning readings)*Code  
figure

- 1 1st to 11th day of the month
- 2 11th to 21st day of the month
- 3 21st day of the month to 1st day of the next month

## D — NATIONAL CODING PROCEDURES WITH REGARD TO INTERNATIONAL CODE FORMS

### FM 12 SYNOP and FM 13 SHIP

#### ALGERIA

4PPPP	This group is reported by stations with elevation <i>lower than 750 metres</i> .
4E'sss	<i>This group is used.</i>
54g <sub>o</sub> s <sub>n</sub> d <sub>T</sub>	<i>This group is used.</i>
9S <sub>p</sub> S <sub>p</sub> S <sub>p</sub> S <sub>p</sub>	<i>This Service uses the regional code for special phenomena established for Region VI and not that for Region I.</i>

#### CENTRAL AFRICAN REPUBLIC

4PPPP	This group is reported by stations with elevation <i>lower than 800 metres</i> .
-------	--

#### CÔTE D'IVOIRE

6RRRt <sub>R</sub>	This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.
7wwW <sub>1</sub> W <sub>2</sub>	ww is coded 05 only when horizontal visibility is less than 5 kilometres. ww is coded 10 only when horizontal visibility is 1 kilometre or more and less than 5 kilometres.

#### FRANCE (FRENCH DEPARTMENT OF REUNION)

7wwW <sub>1</sub> W <sub>2</sub>	ww is coded 05 only when horizontal visibility is less than 5 kilometres.
58p <sub>24</sub> P <sub>24</sub> P <sub>24</sub> or 59p <sub>24</sub> P <sub>24</sub> P <sub>24</sub> }	<i>These groups are used in lieu of group 5appp of Section 1 by stations 61972 (Europa Island), 61980 (Saint-Denis/Gillot), 61981 (Le Port) and 61984 (Saint-Pierre).</i>

#### GABON

6RRRt <sub>R</sub>	This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.
7wwW <sub>1</sub> W <sub>2</sub>	ww is coded 05 only when horizontal visibility is less than 5 kilometres. ww is coded 10 only when horizontal visibility is 1 kilometre or more and less than 5 kilometres.

## REGION I

### GUINEA-BISSAU

- 6RRRt<sub>R</sub> This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4. When reported, this group is included in Section 1.
- 7wwW<sub>1</sub>W<sub>2</sub> *If the period covered by W<sub>1</sub> and W<sub>2</sub> was not entirely covered by direct observations, past weather is coded in accordance with the following rules:*
- (i) *Sufficient and reliable indications of the past weather during the period covered by W<sub>1</sub> and W<sub>2</sub> are used to code W<sub>1</sub>, and W<sub>2</sub> is coded as /;*
  - (ii) *If there are no sufficient and reliable indications of the past weather, W<sub>1</sub> is also coded as /.*

### LIBYA

- 6RRRt<sub>R</sub> When reported, this group is included in Section 1.
- 7wwW<sub>1</sub>W<sub>2</sub> ww is coded 37 only when the wind speed is more than 30 knots.  
ww is coded 39 only when horizontal visibility is less than 500 metres.
- Section 4 This section is included whenever relevant data are available.

### MADAGASCAR

- 4PPPP This group is reported by stations with elevation *lower than 760 gpm*.
- 6RRRt<sub>R</sub> When reported, this group is included in Section 1.  
RRR relates to:
- (i) The preceding 6 hours at 0000, 0900, 1200, 1500 and 2100 UTC;
  - (ii) The preceding 12 hours at 0300 and 1800 UTC;
  - (iii) The preceding 24 hours at 0600 UTC.
- Section 2 This section is used in the form 222// 2P<sub>w</sub>P<sub>w</sub>H<sub>w</sub>H<sub>w</sub>.
- 1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is used to report the maximum temperature read at 1400 UTC. This group is included in the reports at 1500 UTC and at 0600 UTC of the next day.
- 2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is used to report the minimum temperature read at 0400 UTC.

### MADEIRA

*Stations in Madeira use regional coding procedures established for Region VI.*

## REGION I

### MALAWI

- 6RRRt<sub>R</sub>      *This group is used in the form 6RRR/.*  
*The group 6RRR/ is only reported at 0600 UTC, in accordance with Regulation 12.2.5.4.*
- 0T<sub>g</sub>T<sub>g</sub>R<sub>c</sub>R<sub>t</sub>      *This group is used in the form 0T<sub>g</sub>T<sub>g</sub>//.*  
*The group 0T<sub>g</sub>T<sub>g</sub>// is only reported at 0600 UTC from 1 May to 30 September.*
- 943C<sub>L</sub>D<sub>p</sub>      *This group is used during the tropical cyclone season only at station 67693 (Chileka).*

### MALI

- 6RRRt<sub>R</sub>      *This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.*
- 7wwW<sub>1</sub>W<sub>2</sub>      *ww is coded 05 only when horizontal visibility is less than 5 kilometres.*  
*ww is coded 10 only when horizontal visibility is 1 kilometre or more and less than 5 kilometres.*

### MOZAMBIQUE

- 5EEei<sub>E</sub>      *This group is reported at 0600 UTC by all stations with evaporation pans. The value of evaporation EEE is for the period of 24 hours of the day before the previous day, observed at 0700 UTC of the preceding day.*

### NIGER

- 4PPPP      *This group is reported by stations with elevation higher than 500 metres.*
- 6RRRt<sub>R</sub>      *This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.*

### SENEGAL

- 6RRRt<sub>R</sub>      *This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.*  
*When reported, this group is included in Section 1.*
- 7wwW<sub>1</sub>W<sub>2</sub>      *ww is coded 05 only when horizontal visibility is less than 5 kilometres.*  
*ww is coded 10 only when horizontal visibility is 1 kilometre or more and less than 5 kilometres.*

### SPAIN (CANARY ISLANDS, 60320 CEUTA and 60338 MELILLA)

- 4PPPP      *This group is reported by stations with elevation equal to 750 metres or lower.*
- 7wwW<sub>1</sub>W<sub>2</sub>      *ww is coded 05 when visibility is less than 10 km and the relative humidity is less than 80 per cent.*
- 9SpSpSp<sub>p</sub>      *The coding established for Region VI is used.*

REGION I

**FM 15 METAR and FM 16 SPECI**

**SPAIN (CANARY ISLANDS and 60338 MELILLA)**

*The code names **METAR** or **SPECI** are not included in the reports.*

**GGggZ**      *This group is not included in a METAR report except when there is more than a 10-minute difference between the time of observation and the time given in the heading of the bulletin.*

*The unit used for wind speed is the knot (kt).*

**ww**      *This group (present weather according to code form SYNOP) is not reported.*

*The value of QNH is reported in hectopascals.*

*In addition to groups **REw'w'** and **WS TKOF RWYD<sub>R</sub>D<sub>R</sub>** and/or **WS LDG RWYD<sub>R</sub>D<sub>R</sub>**, the section on supplementary information may contain information on the state of runways, when appropriate.*

## FM 32 PILOT

### ALGERIA

*This Service follows the procedures established by Region VI for PILOT reports.*

Section 2 When the upper-wind observation is carried out by a method not permitting direct pressure measurements, the altitudes corresponding approximately to the levels of the 850, 700, 500, 400, 300, 200, 150 and 100 hPa (Part A), 70, 50, 30, 20 and 10 hPa (Part C) standard isobaric surfaces are : 1 500, 3 000, 5 400 or 5 500, 7 200, 9 000, 12 000, 13 500 and 16 000 metres (Part A), 18 500, 20 500, 23 500, 26 500 and 31 000 metres (Part C), respectively.

- Section 4
- (1) Sounding carried out by a procedure enabling wind and pressure measurements to be obtained simultaneously:
    - Apart from the significant levels, the wind data at the 900, 800, 600 and 250 hPa levels should be transmitted in Part B.
  - (2) Sounding carried out by a method not permitting direct pressure measurements:
    - (a) Altitudes are expressed in units of 500 metres;
    - (b) Below 14 000 metres, the wind data at 500, 1 000, 2 000, 2 500, 4 000 and 10 000 metres should be included in this section of Part B;
    - (c) The significant levels may be included from above 14 000 metres to the end of the sounding in Parts B and D, except for those appearing in Part C.

**N o t e :** For the coding of dd, the direction from which the wind blows is always rounded to the nearest ten degrees.

### CONGO, CÔTE D'IVOIRE, MALI, NIGER, RWANDA, SENEGAL

Part B,

Section 6 This section is used to report surface wind direction and speed in the following form:

61616      d d f f f

### EGYPT

Part B,

Section 4 *Wind data are reported for the following altitudes, as available: 300, 600, 900, 2 100, 3 900, 4 500, 5 100, 6 600, 10 800 metres.*

Part B,

Section 2 In addition to wind data at the standard isobaric surface, *the wind data at the isobaric surfaces 9, 8, 7, 6, 5, 4, 3 and 2 hPa are reported.* The following altitudes are used as the corresponding altitudes to these isobaric surfaces:

Altitude (m)	Isobaric surface (hPa)
31 000	9
32 000	8
33 000	7
34 500	6
36 000	5
37 500	4
39 000	3
41 000	2

REGION I

**MADEIRA**

Part B,  
Section 6

This section is used to report wind data at 300 metres, in the following form:

61616      101//      ddfff

**MOROCCO**

ddfff

*Wind direction is reported to the nearest five degrees only when the wind speed is greater than 60 knots.*



## REGION I

### FM 35 TEMP

#### ALGERIA

*This Service follows the procedures established by Region VI for TEMP reports.*

Part B,  
Section 6

Apart from the significant levels, this section should include the wind data at 1 000 metres above the surface as well as the data at the 800 and 600 hPa levels.

*N o t e :* For the coding of dd, the direction from which the wind blows is always rounded to the nearest ten degrees.

#### EGYPT

Part C,  
Section 2

In addition to data at the standard isobaric surfaces, *the data at the isobaric surfaces 9, 8, 7, 6, 5, 4, 3 and 2 hPa are reported.*

#### MADEIRA

Part B,  
Section 10

This section is used to report wind data at 300 and 600 metres, in the following form:

61616	11PPP <sub>300</sub>	ddfff <sub>300</sub>
	22PPP <sub>600</sub>	ddfff <sub>600</sub>

#### MOROCCO

ddfff

*Wind direction is reported to the nearest five degrees only when the wind speed is greater than 60 knots.*

# FM 45 IAC

## ALGERIA

### Prognosis for an isobaric surface: isohypses or streamlines and wind speed along these lines

These prognoses are coded in the following code form taken from the IAC code:

Preamble	PREVENTAL	65556	33300	0YYG <sub>c</sub> G <sub>c</sub>	000G <sub>p</sub> G <sub>p</sub>	88888	00x <sub>3</sub> x <sub>3</sub> x <sub>3</sub>
{ Isohypse systems }	{ 99900	8h <sub>t</sub> h <sub>c</sub> h <sub>a</sub> h <sub>a</sub>	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	(md <sub>s</sub> d <sub>s</sub> f <sub>s</sub> f <sub>s</sub> )	(00C <sub>1</sub> 00)	{	
		.....	.....	.....	.....		
Streamlines or isohypses of the isobaric surface x <sub>3</sub> x <sub>3</sub> x <sub>3</sub> and wind speed along these streamlines or isohypses	{ 99922	4e <sub>1</sub> uuu	48uuu 00000	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k 48uuu	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	{	..... (00C <sub>1</sub> 00)
		4e <sub>1</sub> uuu	48uuu	.....	.....		
		99977	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	x <sub>3</sub> ddff			
End	19191						

### Notes:

- (1) The 4e<sub>1</sub>uuu and 48uuu groups, used together, make it possible, by means of the same lines, to indicate the topography or the streamlines of an isobaric surface and the wind data relating to that surface.
- (2) For the 850 hPa and the 700 hPa isobaric surfaces, the section 99900 is not used and the 4e<sub>1</sub>uuu group will be of the form 49uuu, uuu being used as the identification number, whereas, for the 500 hPa, 300 hPa, etc., isobaric surfaces, it will be of the form 40uuu, uuu indicating the value in decametres (the thousands digit, if any, being omitted) of the isohypse described by all the L<sub>a</sub>L<sub>a</sub>L<sub>o</sub>L<sub>o</sub>k groups which follow until the next 40uuu group of the message.
- (3) Along a given isohypse (or streamline), each of the 48uuu groups indicates the wind speed in knots at the point designated by the following L<sub>a</sub>L<sub>a</sub>L<sub>o</sub>L<sub>o</sub>k group. The wind speed is regarded as varying as a linear function between the points at which it is actually given in this way.
- (4) To avoid any confusion between the 48uuu speed group and a L<sub>a</sub>L<sub>a</sub>L<sub>o</sub>L<sub>o</sub>k position group in which L<sub>a</sub>L<sub>a</sub> = 48, each 48uuu group (except for that immediately following the 40uuu — or 49uuu — group) should be preceded by a 00000 key group.
- (5) To permit the linear interpolation of the wind speed, the last L<sub>a</sub>L<sub>a</sub>L<sub>o</sub>L<sub>o</sub>k group of each isohypse (or streamline) should be preceded by the groups 00000 48uuu, where uuu indicates the wind speed at the last L<sub>a</sub>L<sub>a</sub>L<sub>o</sub>L<sub>o</sub>k point. This is no longer mandatory when the isohypse (or streamline) is closed and the last L<sub>a</sub>L<sub>a</sub>L<sub>o</sub>L<sub>o</sub>k group is identical with the first (for which the wind speed has already been given).
- (6) In the code form given above, the code letter x<sub>3</sub> of the section 99977 is the first figure of the symbol x<sub>3</sub>x<sub>3</sub>x<sub>3</sub> of the 00x<sub>3</sub>x<sub>3</sub>x<sub>3</sub> of the preamble.

# REGION I

## ALGERIA (continued)

### Prognosis of significant weather

These prognoses are coded in the following code form taken from the IAC code:

Preamble	TEMSI	65556	33300	0YYG <sub>c</sub> G <sub>c</sub>	000G <sub>p</sub> G <sub>p</sub>	
Pressure systems	99900	8P <sub>t</sub> P <sub>c</sub> PP	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	(md <sub>s</sub> d <sub>s</sub> f <sub>s</sub> f <sub>s</sub> )		
		.....	.....	.....		
Frontal systems	99911	66F <sub>t</sub> F <sub>i</sub> F <sub>c</sub>	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	.....	md <sub>s</sub> d <sub>s</sub> f <sub>s</sub> f <sub>s</sub>
		{ .....	.....	.....	.....	}
[Isopleths]	[99922]	40uuu	42000	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	
		{ .....	.....	.....	.....	
		44uuu	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	.....	
		.....	.....	.....	.....	
Weather areas	99944	989w <sub>e</sub> i	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	(L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k)	(.....)	
		.....	.....	(.....)	(.....)	
		988ww	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	(L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k)	(.....)	
		.....	.....	(.....)	(.....)	
Clouds	99966	2C <sub>s</sub> S <sub>1</sub> S <sub>2</sub> Z <sub>1</sub>	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	.....	
		.....	.....	.....	.....	
	77744	{ 7CH <sub>b</sub> H <sub>b</sub> H <sub>b</sub>	6NH <sub>t</sub> H <sub>t</sub> H <sub>t</sub>	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	(L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k)	(.....)
		ISO ZERO DEGREE				}
		ZZZZ	metres	L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k	(L <sub>a</sub> L <sub>a</sub> L <sub>o</sub> L <sub>o</sub> k)	
		.....	.....	.....	.....	
		Text in plain language describing the variations in the weather and meteors during a period of 6 hours before and after the time of reference G <sub>p</sub> G <sub>p</sub>				
		44777				
End		19191				

**N o t e :** The reporting of the altitude of the 0° isotherm by means of one or other of the two sections provided for this purpose is mandatory. In section 99922, the altitude uuu is expressed in geopotential decametres, whereas, in section 77744, the altitude ZZZZ is expressed in geopotential metres.

## FM 51 TAF

### SPAIN (CANARY ISLANDS AND 60338 MELILLA)

The code name **TAF** is not included.

YYGGgg**Z** This group is not included in the TAF report itself.

The unit used for wind speed is the knot (kt).

Groups **TT<sub>F</sub>T<sub>F</sub>/G<sub>F</sub>G<sub>F</sub>**Z**** (temperature forecast), **6I<sub>c</sub>h<sub>i</sub>h<sub>i</sub>h<sub>i</sub>t<sub>L</sub>** (icing forecast) and **5Bh<sub>B</sub>h<sub>B</sub>h<sub>B</sub>t<sub>L</sub>** (turbulence forecast) are not used.

## FM 71 CLIMAT

### CAMEROON, CENTRAL AFRICAN REPUBLIC, CHAD, CONGO, CÔTE D'IVOIRE, GABON, MADAGASCAR, MALI, MAURITANIA, NIGER, SENEGAL

**PPPP** Stations whose altitudes do not exceed 760 gpm report for **PPPP** monthly mean pressure reduced to mean sea level, in tenths of a hectopascal.

### MADAGASCAR

**S<sub>1</sub>S<sub>1</sub>S<sub>1</sub>k<sub>s</sub>k<sub>s</sub>** Monthly total sunshine is reported in the form: INSOLATION, followed by monthly total sunshine in hours and tenths of an hour (in place of the group **S<sub>1</sub>S<sub>1</sub>S<sub>1</sub>k<sub>s</sub>k<sub>s</sub>**).

### RWANDA

**PPPP** Monthly mean geopotential of the 850 hPa level calculated over the eight synoptic observations (0000, 0300, 0600, 0900, 1200, 1500, 1800 and 2100 UTC).

**TTT** Monthly mean air temperature, in tenths of a degree Celsius, calculated over the eight synoptic observations (0000, 0300, 0600, 0900, 1200, 1500, 1800 and 2100 UTC).

**eee** Mean vapour pressure for the month, in tenths of a hectopascal, calculated over the eight synoptic observations (0000, 0300, 0600, 0900, 1200, 1500, 1800 and 2100 UTC).

## FM 75 CLIMAT TEMP

### MADAGASCAR

Mean altitudes of ISO-0°, ISO-10° and ISO-50° are added in plain language at the end of the report.

## E — NATIONAL CODE FORMS

### ALGERIA, CONGO, RWANDA, SUDAN

#### Weather report for national non-aeronautical purposes

AERO                      (GGgg)  
                               IIiii                      Nddff                      VVwwW                      8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>                      (0TTT<sub>d</sub>T<sub>d</sub>)

As regards the elements which are common to the code forms AERO and SYNOP, these practices are the same as those indicated under SYNOP.

#### For **RWANDA**

0TTT<sub>d</sub>T<sub>d</sub>                      This group is always added to the hourly reports for 0000, 0100, 0200 . . . 2300 UTC.

QFE, QNH,  
 QNE                      These Q signals are always added at the end of the report.

Specifications of symbolic letters other than those specified either in Volume I.1 or in Section B of Chapter I of Volume II:

TT                      Air temperature, rounded off to the nearest whole degree Celsius.  
 (1)                      Negative temperatures shall be indicated by adding 50 to the absolute value of the temperature.

T<sub>d</sub>T<sub>d</sub>                      Dew-point temperature, rounded off to the nearest whole degree Celsius.  
 (1)                      See (1) under TT above.

W                      Past weather. (Code table 4561)

#### Special weather report (sudden changes) for national non-aeronautical purposes

MMMMM }  
 BBBBBB }                      GGggw<sub>2</sub>  
                               IIiii                      Nddff                      VVwwW                      8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>                      (0TTT<sub>d</sub>T<sub>d</sub>)

#### For **RWANDA**

QFE, QNH,  
 QNE                      These Q signals are always added at the end of the report.

Specifications of symbolic letters other than those specified either in Volume I.1 or in Section B of Chapter I of Volume II:

TT }  
 T<sub>d</sub>T<sub>d</sub> }                      See under code form AERO above.  
 W }

## MADAGASCAR

**HOURLY SYNOP code form for transmission of additional observations for forecasting purposes during the occurrence of a tropical cyclone in the vicinity of Madagascar**

HOURLY SYNOP based on code form FM 12:

CYCLO or OBS HORAIRE    YYGGi<sub>w</sub>    IIiii

41hVV    Nddff    (1s<sub>n</sub>TTT)    (2s<sub>n</sub>T<sub>d</sub>T<sub>d</sub>T<sub>d</sub>)    (3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>)

4PPPP    (5appp)    7wwW<sub>1</sub>W<sub>2</sub>    8N<sub>n</sub>C<sub>L</sub>C<sub>M</sub>C<sub>H</sub>

(222//    2P<sub>w</sub>P<sub>w</sub>H<sub>w</sub>H<sub>w</sub>)

333    58 }  
or }    p<sub>24</sub>p<sub>24</sub>p<sub>24</sub>    (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>)    911ff    943D<sub>L</sub>D<sub>L</sub>  
59 }

555    6RRR1

### Notes:

- (1) Except for Section 5 which is for national use, all other specifications are the same as in Volumes I.1 and II of the *Manual on Codes*.
- (2) Section 0 is reduced to: CYCLO or OBS HORAIRE YYGGi<sub>w</sub> IIiii.
- (3) In Section 1, group i<sub>R</sub>i<sub>x</sub>hVV is 41hVV. As a result, group 6, which indicates precipitation in one hour as in FM 12 SYNOP, is omitted from Sections 1 and 3, as the new code t<sub>R</sub> indicates the duration of the period, in units of 6 hours, to which the quantity of precipitation refers. However, as this information may be required at the national level, it is transmitted in Section 5. i<sub>x</sub> equal to 1 has been chosen as it is useful to know the evolution of the weather, i.e. past and present weather. Group 7wwW<sub>1</sub>W<sub>2</sub> is therefore transmitted in all cases.

3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>    This group is always included by upper-air stations 67083, 67085, 67107, 67137 and 67152.

7wwW<sub>1</sub>W<sub>2</sub>    This group is always included.

222//    }  
2P<sub>w</sub>P<sub>w</sub>H<sub>w</sub>H<sub>w</sub> }    These groups are always included by coastal stations.

6RRR1    Precipitation in one hour.

## F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C<sub>i</sub>) USED IN INTERNATIONAL HYDROLOGICAL CODES

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country/region*</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Mejerda		01	{ Algeria Tunisia	1 2	
Ch. Melrhir and el Rharsa		02	{ Algeria Tunisia	1 2	
Ch.el Djerid		03	Tunisia	2	
Algerian coast		04	Algeria	1	
Ch.el Hodna		05	Algeria	1	
Ch. ech Chergui		06	Algeria	1	
Tafna		07	{ Morocco Algeria	3 1	
Moulouya		08	Morocco	3	
North-west coast		09	{ Morocco Spain (Canary Islands) Mauritania	3 7 5	
Oued Guir } Daoura } Oued Dra }		10	{ Morocco Algeria	3 1	
Atui		11	{ Western Sahara Mauritania	4 5	
Senegal		12	{ Guinea Mali Mauritania Senegal	6 1 5 8	
Gambia		13	{ Guinea Senegal Gambia	6 8 9	
Geba		14	{ Senegal Guinea-Bissau Guinea	8 1 6	
Corubal		15	{ Guinea Guinea-Bissau	6 1	
South-west coast		16	{ Senegal Gambia Cape Verde Guinea-Bissau Guinea Sierra Leone Liberia Côte d'Ivoire	8 9 5 1 6 2 3 4	For national river basins only

\* The listing of countries or regions against different basins does not imply that these countries or regions are engaged in cooperative action in respect of the basin.

REGION I

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country/region</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Kolenta (Great Scarcies)		17	{ Guinea Sierra Leone	6 2	
Little Scarcies		18	{ Guinea Sierra Leone	6 2	
Moa		19	{ Guinea Liberia Sierra Leone	6 3 2	
Mano-Morro		20	{ Guinea Liberia Sierra Leone	6 3 2	
Lofa		21	{ Guinea Liberia	6 3	
St Paul		22	{ Guinea Liberia	6 3	
St John		23	{ Guinea Liberia	6 3	
Cess (Cestos)		24	{ Côte d'Ivoire Liberia	4 3	
Cavally		25	{ Guinea Côte d'Ivoire Liberia	6 4 3	
Gulf of Guinea		26	{ Côte d'Ivoire Ghana Togo Benin Nigeria Cameroon	4 5 6 7 8 3	For national river basins only
Sassandra		27	{ Guinea Côte d'Ivoire	6 4	
Komoé		28	{ Burkina Faso Côte d'Ivoire	9 4	
Bia		29	{ Ghana Côte d'Ivoire	5 4	
Tano		30	{ Ghana Côte d'Ivoire	5 4	
Volta		31	{ Burkina Faso Mali Ghana Benin Togo Côte d'Ivoire	9 1 5 7 6 4	
Mono		32	{ Benin Togo	7 6	
Ouémé		33	{ Benin Nigeria	7 8	



REGION I

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country/region</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Niger	Bénué	34 } 35 }	Guinea	6	
			Mali	1	
			Côte d'Ivoire	4	
			Burkina Faso	9	
			Niger	2	
			Benin	7	
			Nigeria	8	
			Cameroon	3	
Cross		36	Chad	5	
Chad		37	Cameroon	3	
			Nigeria	8	
			Niger	2	
			Sudan	6	
Sanaga		38	Cameroon	3	
Nyong		39	Cameroon	3	
Ntem		40	Cameroon	3	
			Gabon	6	
			Equatorial Guinea	9	
Benito		41	Gabon	6	
			Equatorial Guinea	9	
Utamboni (Temboni)		42	Gabon	6	
			Equatorial Guinea	9	
Ogooué		43	Cameroon	3	
			Congo	4	
			Gabon	6	
			Equatorial Guinea	9	
Nyanga		44	Congo	4	
			Gabon	6	
Kouilou		45	Congo	4	
Chiloango		46	Angola (Cabinda)	8	
			Democratic Republic of the Congo	1	
			Congo	4	
Congo	Sangha Ubangi Kasai Ruki Lomami Lake Tanganyika	47 } 48 } 49 } 50 } 51 } 52 } 53 }	Democratic Republic of the Congo	1	
			Congo	4	
			Cameroon	3	
			Central African Republic	7	
			Rwanda	8	
			Burundi	9	
			United Republic of Tanzania	2	
			Zambia	5	
			Angola	6	

REGION I

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country/region</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Angola coast		54	Angola	6	
Kunene		55	{ Angola Namibia	6 7	
Etosha Pan		56	{ Angola Namibia	6 7	
Okavango		57	{ Angola Botswana Namibia Zimbabwe	6 3 7 4	
Namibia coast		58	Namibia	7	
Orange		59	{ South Africa Lesotho Botswana Namibia	1 2 3 7	
Cape coast		60	South Africa	1	Orange to Maputo
Mediterranean coast		61	{ Libya Egypt	4 3	
Nile		62	{ Burundi Rwanda United Republic of Tanzania Kenya Uganda Democratic Republic of the Congo Sudan Ethiopia Egypt		To be allocated as needed
	Blue Nile	63		9	
	Tekezze-Atbara	64		8	
	Adar	65			
	Sobat	66		2	
	Behr el Ghazel	67		7	
	Lake Mobutu	68		4	
	Sese Seko	68		1	
	Lake Victoria	69		6	
	Kagera	70		5	
	Mara	71		3	
	Lake Kyoga	72			
		73			
Gash		74	{ Ethiopia Sudan	5 6	
Baraka		75	{ Ethiopia Sudan	5 6	
Red Sea coast and Gulf of Aden		76	{ Egypt Sudan Ethiopia Somalia Djibouti	3 6 5 8 9	
Awash		77	{ Ethiopia Djibouti	5 9	
Wabi Shebelli		78	{ Ethiopia Somalia	5 8	

REGION I

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country/region</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Ogaden		79	{ Ethiopia Somalia	5 8	
Juba		80	{ Ethiopia Somalia Kenya	5 8 7	
Lake Turkana (Rudolf)	Omo	81	{ Ethiopia Kenya	5 7	
		82	{ Sudan Uganda	6 4	
Lake Chew Bahir		83	{ Ethiopia Kenya	5 7	
Lake Natron		84	{ Kenya United Republic of Tanzania	7 2	
Umba		85	{ Kenya United Republic of Tanzania	7 2	
Rufiji		86	United Republic of Tanzania	2	
Great Rift Valley basins		87	{ Ethiopia Kenya United Republic of Tanzania	5 7 2	For national basins
Ruvuma		88	{ Mozambique Malawi United Republic of Tanzania	8 9 2	
East coast and south-west Indian Ocean		89	{ Kenya United Republic of Tanzania Mozambique Madagascar Mauritius Seychelles	7 2 8 3 6 4	For national basins
Lake Rukwa		90	{ United Republic of Tanzania Zambia	2 5	
Zambezi	Shire (Lake Malawi/ Nyasa)	91	{ Angola	6	
		92	{ Botswana	3	
			{ Zambia	5	
			{ Zimbabwe	4	
			{ Malawi	9	
		93	{ Mozambique	8	
					To be allocated as needed
Púngoé and Buzi		94	{ Zimbabwe Mozambique	4 8	

REGION I

<i>Basin</i>	<i>Sub-basin</i>	BB	<i>Country/region</i>	$C_i$	<i>Remarks</i>
Save		95	Zimbabwe	4	
			Mozambique	8	
Limpopo		96	South Africa	1	
			Botswana	3	
			Zimbabwe	4	
			Mozambique	8	
Incomati		97	Swaziland	5	
			South Africa	1	
			Mozambique	8	
Umbeluzi		98	South Africa	1	
			Swaziland	5	
			Mozambique	8	
Maputo		99	South Africa	1	
			Swaziland	5	
			Mozambique	8	

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CHAPTER II

**REGION II — ASIA**



## **A — REGIONAL CODING PROCEDURES**

### **GENERAL REMARKS**

- (a) The following instructions, specifications and code tables were adopted for use in WMO Region II by postal ballot in 1968 (Resolution 27 (69-RA II)), in 1986 (Resolution 24 (86-RA II)), in 1993 (Resolution 18 (93-RA II)), in 1997 (Resolution 18 (97-RA II)), and at the sessions of WMO Regional Association II listed below:

Third session — Bangkok, October 1962  
Fourth session — Tehran, October 1965  
Fifth session — Tokyo, July 1970  
Sixth session — Colombo, September 1975  
Seventh session — Geneva, June 1980  
Ninth session — Beijing, September 1988  
Twelfth session — Seoul, September 2000  
Thirteenth session — Hong Kong, China, December 2004.

- (b) RA II developed instructions for the use in Region II of the following international codes:

FM 12 — SYNOP  
FM 13 — SHIP  
FM 20 — RADIOB  
FM 32 — PILOT  
FM 33 — PILOT SHIP  
FM 35 — TEMP  
FM 36 — TEMP SHIP  
FM 53 — ARFOR  
FM 67 — HYDRA  
FM 68 — HYFOR  
FM 71 — CLIMAT  
FM 85 — SAREP

- (c) No code forms have been established for regional use in Region II.
-





## A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

### FM 12 SYNOP and FM 13 SHIP

#### (a) Section 1

##### 2/12.1 Group 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>

This group shall be included in the reports for global exchange from all stations irrespective of their altitude, to supplement group 4PPPP or, according to Regulation 12.2.3.4.2, to supplement group 4a<sub>3</sub>hhh.

Note: This group can be included at other observational times by the decision of individual Members.

##### 2/12.2 Groups 4PPPP or 4a<sub>3</sub>hhh

##### 2/12.2.1 High-level stations which cannot give pressure at mean sea level to a satisfactory degree of accuracy (see Regulation 12.2.3.4.2) shall report the geopotential height of an agreed standard pressure level in geopotential metres depending on the station elevation, as follows:

Pressure level (hPa) whose height is reported for hhh	Station elevation (m)
850	800–2 300
700	2 300–3 700
500	higher than 3 700

Note: In this case group 4a<sub>3</sub>hhh replaces 4PPPP.

##### 2/12.2.2 When local conditions do not allow for reducing pressure to sea level with acceptable accuracy, stations at elevations from 500 to 800 metres shall report the 925 hPa geopotential.

##### 2/12.3 Group 5appp

In reports from stations in countries situated predominantly in tropical latitudes (up to 30°N), this group shall not be included.

Note: See Regulation 2/12.11.3.

##### 2/12.4 Group 6RRRt<sub>R</sub> (Section 1)

##### 2/12.4.1 With reference to Regulation 12.2.5.1, this group shall be included in Section 1 whenever precipitation over the preceding 6, 12, 18 or 24 hours is reported for RRR.

##### 2/12.4.2 Group 6RRRt<sub>R</sub> (Section 1) may be used at both main and intermediate observation times.

##### 2/12.4.3 At 0000 and 1200 UTC, the precipitation amounts over the 12-hour night-time and daytime periods, respectively, shall be reported for RRR.

Notes:

(1) Ocean weather stations and lightships may include this group in Section 1 of morning and evening reports. RRR in this case indicates the amount of precipitation which has occurred since the morning (evening) observation time. This time is indicated (as necessary) by each Member in the national part of Volume II of the *Manual on Codes*.

(2) See Regulation 2/12.12.

##### 2/12.4.4 At 0600 and 1800 UTC, the precipitation amounts over the preceding 6-hour period should be reported for RRR.

## REGION II

- 2/12.4.5 At intermediate observation times, the periods to which RRR refers shall be determined (in accordance with Regulation 2/12.4.1) by national decision and in accordance with specifications of Code table 4019( $t_P$ ).
- (b) Section 2
- 2/12.5 The inclusion of Section 2 in reports from coastal stations and lightships (using the SYNOP code form) shall be left to national decision.
- (c) Section 3
- 2/12.6 *Group* ( $0E_sT_gT_g$ )
- 2/12.6.1 The inclusion of this group into reports at least at 0000 and 1200 UTC shall be left to national decision.
- 2/12.6.2 Code table 0901 shall be used for coding E (the state of the ground not covered with snow or measurable ice cover). When the ground is covered with snow or ice cover which can be measured, E is replaced by a slash (/), and the state of snow or ice cover is reported in group 4E'sss at E', in accordance with Regulation 2/12.10.
- 2/12.6.3 The ground (grass) temperature ( $s_nT_gT_g$ ) at observational time shall be transmitted throughout the year, irrespective of the presence or absence of snow cover ( $s_n$  is the sign of temperature according to Code table 3845;  $T_gT_g$  is the absolute value of temperature, in whole degrees Celsius).
- 2/12.7 *Group* ( $1s_nT_xT_xT_x$ )
- 2/12.7.1 This group shall be used to report the maximum daytime temperature of the preceding 12 hours.
- 2/12.7.2 The standard time at which this group is to be reported shall be left to national decision.
- 2/12.8 *Group* ( $2s_nT_nT_nT_n$ )
- 2/12.8.1 This group shall be used to report the minimum nighttime temperature of the preceding 12 hours.
- 2/12.8.2 The standard time at which this group is to be reported shall be left to national decision.
- 2/12.9 *Group* ( $3Ejjj$ )
- 2/12.9.1 This group shall be made available only for regional exchange, its inclusion being left to national decision.
- 2/12.9.2 This group shall be used in the form  $3E_sT_gT_g$ .
- 2/12.9.3 If ice and/or snow data are available, this group shall be reported in the form  $3E_sT_gT_g = 3/s_nT_gT_g$ .
- 2/12.10 *Group* ( $4E'sss$ )
- 2/12.10.1 This group shall be included in the synoptic report only if there is ground snow or ice cover.
- 2/12.10.2 The group 4E'sss shall be included at least once daily, preferably at 0000 UTC (the morning observation time over most of Region II).
- 2/12.10.3 Code table 0975 shall be used for coding the indicator (E') of the presence and state of snow or ice cover. E' shall be transmitted by all stations where such observations are carried out.
- 2/12.10.4 The snow depth or the thickness of ice cover shall be reported in sss, in accordance with Code table 3889.

## REGION II

- 2/12.11 *Groups (5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>))*
- 2/12.11.1 These groups shall be used as set out in Regulation 12.4.7 of Volume I.1 of the *Manual on Codes*.
- 2/12.11.2 (a) In the form 5EEEi<sub>E</sub> and 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>), these groups shall be included in synoptic reports by all stations where the corresponding measurements are carried out.
- (b) If these groups are included in the synoptic report, the values of EEE (evaporation or evapotranspiration), j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub> (amount of radiation) and SSS (duration of sunshine) shall refer to the 24 hours preceding the observation time of that report.
- (c) Groups 5EEEi<sub>E</sub> and 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>) shall be transmitted at least once daily at one of the main observation times, preferably at 0000 UTC (the morning observation time over most of Region II).
- (d) Groups 5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>) in the form 553SS (j<sub>5</sub>FFFF) shall be transmitted at the discretion of individual Members.
- 2/12.11.3 In parts of the Region where the group 5appp of Section 1 is not used (see Regulation 2/12.3), the group 5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> in the form 58p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> and 59p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> shall be used to report the surface pressure variations over the preceding 24 hours.
- 2/12.11.4 The inclusion of group 5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> in the form 54g<sub>0</sub>s<sub>n</sub>d<sub>T</sub>, 56D<sub>L</sub>D<sub>M</sub>D<sub>H</sub> and 57CD<sub>a</sub>e<sub>C</sub> in the synoptic report shall be left to national decision.
- 2/12.12 *Group (6RRRt<sub>R</sub>) (Section 3)*
- 2/12.12.1 With reference to Regulation 12.2.5.2, this group shall be included in Section 3 whenever precipitation amounts over periods of 3 hours or other periods required for regional exchange are reported for RRR.
- 2/12.12.2 Group 6RRRt<sub>R</sub> (Section 3) may be used at both intermediate and main observation times.
- 2/12.12.3 The inclusion of group 6RRRt<sub>R</sub> in Section 3 of the synoptic report shall be left to national decision.
- 2/12.13 *Group (7R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>)*
- 2/12.13.1 This group shall be used in Section 3 to report the amount of precipitation for 24 hours, in accordance with Regulation 12.4.9.
- 2/12.13.2 The precipitation amount for the 24-hour period immediately preceding the time of the synoptic report in question shall be reported for R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>. At 0000 UTC, this period shall correspond to the sum of the periods t<sub>R</sub> for which the precipitation amount was reported in groups 6RRRt<sub>R</sub> of Section 1 at the preceding 1200 UTC hour and the 0000 UTC hour in question.
- 2/12.14 *Group (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>)*
- 2/12.14.1 The inclusion of this group shall be left to national decision. However, Members are recommended to include this group in reports as often as possible.
- Note: See Regulation 12.4.10.
- 2/12.14.2 This group shall be used to report additional information on the height of the top of a cloud, in which case N<sub>s</sub> shall be coded 0.
- 2/12.15 *Group (9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>)*
- 2/12.15.1 Code table 3778 — S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> — Supplementary information (*Manual on Codes*, Volume I.1) — shall be used for coding S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>.
- 2/12.15.2 The inclusion of group 9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> in Section 3 of the synoptic report shall be left to national decision.

## REGION II

2/12.16 *Groups* (80000 (0 . . . .) (1 . . . .) . . . .)

Note: Regional regulations for these groups have not yet been developed.

(d) *Requirements for international exchange*

2/12.17 Synoptic reports from surface stations shall in all cases contain Section 0 and the first two groups of Section 1, as well as the other groups of Section 1 and groups of Section 3 when required and if the corresponding data are available.

2/12.18 All groups of the reports received from ships shall be retransmitted.

2/12.19 Reports received from ships fitted with radiotelephony shall be edited and coded in FM 13 code form before transmission over the Global Telecommunication System.

**FM 20** RADOB

Note: For Section 2 of Part B no regional regulations have been developed.

**FM 32** PILOT and **FM 33** PILOT SHIP2/32.1 *Part A, Section 2*

When upper wind is measured without simultaneous pressure measurement, the following altitudes shall then be used as approximations to the standard pressure levels:

Standard isobaric surface (hPa)	Height above sea level (m)
850	1 500
700	3 100
500	5 800
400	7 600
300	9 500
250	10 600
200	12 300
150	14 100
100	16 600

2/32.2 *Part A, Section 3*

The inclusion of group 4v<sub>b</sub>v<sub>b</sub>v<sub>a</sub>v<sub>a</sub> shall be left to national decision. However, Members are recommended to include this group in PILOT reports as often as possible.

2/32.3 *Part B, Section 4*

In addition to wind data at significant levels above sea level, altitudes of which are given in geopotential units, data are included (as available) at least for the following altitudes: 300, 600, 900, 2 100, 3 600, 4 500 and 6 000 metres.

2/32.4 *Part C, Section 2*

When the standard isobaric surfaces cannot be located by means of pressure-measuring equipment, the following altitudes shall be used as approximations of the height of the standard pressure levels:

Standard isobaric surface (hPa)	Height above sea level (m)
70	18 500
50	20 500
30	24 000
20	26 500
10	31 000

2/32.5 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

## REGION II

### FM 35 TEMP and FM 36 TEMP SHIP

#### 2/35.1 *Part A, Section 2*

Data for the standard 925 hPa isobaric surface shall be included in Part A, Section 2, of reports, in accordance with Regulation 35.2.2.1.

#### 2/35.2 *Part A, Section 4*

The inclusion of group 4v<sub>b</sub>v<sub>b</sub>v<sub>a</sub>v<sub>a</sub> shall be left to national decision. However, Members are recommended to include this group in reports as often as possible.

### FM 53 ARFOR

#### 2/53.1 *Group AAAAAA*

Plain language shall be used in place of the zone indicator AAAAAA.

### FM 67 HYDRA and FM 68 HYFOR

#### 2/67.1 The inclusion of the various sections of these codes shall be left to national decision.

### FM 71 CLIMAT

#### 2/71.1 The indicator groups for Sections 1, 2, 3 and 4 of the CLIMAT code form shall be coded as 111, 222, 333 and 444, respectively, without any additional signs. If included in reports, Sections 2, 3 and 4 shall be transmitted without brackets.

*Note:* These coding procedures are internationally introduced in order to facilitate the exact coding of CLIMAT reports in Region II.

#### 2/71.2 *Section 1, group 8m<sub>p</sub>m<sub>p</sub>m<sub>T</sub>m<sub>T</sub>m<sub>Tx</sub>m<sub>Tn</sub>*

##### 2/71.2.1 See Regulation 2/71.3.1

#### 2/71.3 *Section 1, group 9m<sub>e</sub>m<sub>e</sub>m<sub>R</sub>m<sub>R</sub>m<sub>s</sub>m<sub>s</sub>*

##### 2/71.3.1 If observations of sunshine duration (or any other parameter) are missing completely (i.e. for the whole month) at the station, the number of days in the month in question (i.e. 30 or 31, or for February 28 or 29) shall be reported for m<sub>s</sub>m<sub>s</sub> (or m<sub>e</sub>m<sub>e</sub> or m<sub>R</sub>m<sub>R</sub> in group 9 as well as m<sub>p</sub>m<sub>p</sub> or m<sub>T</sub>m<sub>T</sub> in group 8), and the figure 9 should be reported for m<sub>Tx</sub> or m<sub>Tn</sub> in group 8.

#### 2/71.4 *Section 2, groups 8 and 9*

##### 2/71.4.1 If for the period y<sub>b</sub>y<sub>b</sub> – y<sub>c</sub>y<sub>c</sub> (group 0) any years were missing from calculation of the normals, the number of such years with respect to each parameter shall be reported in groups 8 and 9. Coding of y<sub>p</sub>y<sub>p</sub>, y<sub>T</sub>y<sub>T</sub>, etc. as solidi (/) shall be avoided, but if this is impossible, information on the practice shall be included in the *Manual on Codes*, Volume II, Chapter II, Section D — National Coding Procedures with Regard to International Code Forms.

## REGION II

### 2/71.5 Section 4

2/71.5.1 Group 7<sub>y</sub>G<sub>x</sub>G<sub>x</sub>G<sub>n</sub>G<sub>n</sub> (time of reading of extreme temperatures) shall be included only when a change has occurred in the practice given below:

Country	Zone	Time (UTC) of reading of extreme temperatures		i <sub>y</sub> – Indicator to specify type of reading (Code table 1857)
		G <sub>x</sub> G <sub>x</sub>	G <sub>n</sub> G <sub>n</sub>	
CHINA	VIII	1200	1200	1
HONG KONG, CHINA		1200	0000	
INDIA		1200	0300	
JAPAN	IX	1500	1500	2
KAZAKHSTAN	IV-V	All 8	All 8	1
		synoptic hours	synoptic hours	
KYRGYZSTAN	V	0300	1500	
MALDIVES	V	1200	0300	1
MONGOLIA	VIII	1200	0000	1
RUSSIAN FEDERATION	II-XII	All 8	All 8	1, 2, 3
		synoptic hours	synoptic hours	
SRI LANKA	V	1200	0300	1
TURKMENISTAN		1500	0300	
UNITED ARAB EMIRATES	IV	All 4 main	All 4 main	1 for 41217, 41216, 41184, 41198
		synoptic hours	synoptic hours	2 for 41194, 41196, 41218

2/71.6 In preparing the data for inclusion in CLIMAT reports, the following periods shall be taken as the day:

Country	Time zone	Start of meteorological day (UTC)	Observing times (UTC) of the meteorological day	
			Start	Finish
HONG KONG, CHINA	VIII	1600 31 Jan.	1700 31 Jan.	1600 1 Feb.
JAPAN	IX	1500 31 Jan.	1600 31 Jan.	1500 1 Feb.
KAZAKHSTAN	IV-V	1500 31 Jan.	1800 31 Jan.	1500 1 Feb.
MALDIVES	V	2100 31 Jan.	0000 31 Jan.	2100 31 Jan.
MONGOLIA	VIII	1200 31 Jan.	1500 31 Jan.	1200 1 Feb.
RUSSIAN FEDERATION	II	1800 31 Jan.	2100 31 Jan.	1800 1 Feb.
	III-V	1500 31 Jan.	1800 31 Jan.	1500 1 Feb.
	VI-VIII	1200 31 Jan.	1500 31 Jan.	1200 1 Feb.
	IX-XI	0900 31 Jan.	1200 31 Jan.	0900 1 Feb.
	XII	0600 31 Jan.	0900 31 Jan.	0600 1 Feb.
UNITED ARAB EMIRATES	IV	0000	. . . 0000	2400

### FM 85 SAREP

Note: For Section 5 no regional regulations have been developed.





## **A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS**

No code forms have been established for regional use in Region II.

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## **B — SPECIFICATIONS OF SYMBOLIC LETTERS (or groups of letters) FOR REGIONAL USE**

$T_g T_g$	Ground (grass) minimum temperature of the preceding night, in whole degrees Celsius, its sign being given by $s_n$ . (3-group in Section 3 of FM 12)
$T'_g T'_g$	Absolute value of ground (grass) temperature, in whole degrees Celsius, its sign being given by $s_n$ . (0-group in Section 3 of FM 12)

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## **C — SPECIFICATIONS OF CODE FIGURES (code tables) FOR REGIONAL USE**

Code tables in regional use in Region II are numbered with a three-figure number from 220 to 299. As yet no new code tables have been established for regional use in Region II.

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## D — NATIONAL CODING PROCEDURES WITH REGARD TO INTERNATIONAL CODE FORMS

### FM 12 SYNOP and FM 13 SHIP

#### AFGHANISTAN

6RRRt <sub>R</sub>	When reported, this group is included in Section 1.
1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	This group is reported at 1200 UTC.
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	This group is reported at 0300 UTC.

#### BAHRAIN

6RRRt <sub>R</sub>	When reported, this group is included in Section 1.
1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	This group is reported at 1800 UTC.
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	This group is reported at 0600 UTC.

#### BANGLADESH

6RRRt <sub>R</sub>	When reported at standard main hours, this group is included in Section 1. When reported <i>at intermediate hours</i> , this group is included in Section 3 and RRR is the amount of precipitation <i>during the preceding three hours</i> ; t <sub>R</sub> is encoded as / (solidus).
1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	This group is reported at 1200 UTC or 1500 UTC.
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	This group is reported at 0000 UTC or 0300 UTC.

#### CHINA

4PPPP	This group is reported by stations with elevation <i>lower than 1 500 metres</i> .
6RRRt <sub>R</sub>	This group is reported at 0000, 0600, 1200 and 1800 UTC in accordance with Regulation 12.2.5.4. <i>The duration of the period of reference is six hours (t<sub>R</sub> = 1).</i>
333	<i>This group is used in the form 333//.</i>
1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	This group is used at 1800 UTC to report the maximum temperature during the preceding 24 hours.
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	This group is used at 0600 UTC to report the minimum temperature during the preceding 24 hours.

#### DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

6RRRt <sub>R</sub>	When reported, this group is included in Section 3.
1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	This group is reported at 1200 UTC.
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	This group is reported at 0000 UTC.

#### HONG KONG, CHINA

5appp	This group is reported <i>in addition to</i> groups 58p <sub>24</sub> p <sub>24</sub> p <sub>24</sub> or 59p <sub>24</sub> p <sub>24</sub> p <sub>24</sub> .
6RRRt <sub>R</sub>	When reported, this group is included in Section 1.
7wwW <sub>1</sub> W <sub>2</sub>	ww is coded 04, 05 or 10 only when horizontal visibility is less than 5 km.
1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	This group is reported at 1200 UTC.
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	This group is reported at 0000 UTC.

## REGION II

### INDIA

6RRRt<sub>R</sub> This group is used in the form 6RRR/, RRR indicates the amount of precipitation which has fallen since 0300 UTC. When reported, group 6RRR/ is included in Section 3.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1200 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0300 UTC.

### IRAN, ISLAMIC REPUBLIC OF

6RRRt<sub>R</sub> This group is reported at 0000, 0600, 1200 and 1800 UTC in accordance with Regulation 12.2.5.4.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1500 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0300 UTC.

### JAPAN

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1200 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0000 UTC.

### KUWAIT

6RRRt<sub>R</sub> When reported, this group is included in Section 3.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1800 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0600 UTC.

### MALDIVES

6RRRt<sub>R</sub> When reported, this group is included in Section 1.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1200 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0300 UTC.

### MYANMAR

6RRRt<sub>R</sub> When reported, this group is included in Section 3.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1200 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0000 UTC.

### REPUBLIC OF KOREA

6RRRt<sub>R</sub> When reported, this group is included in Section 1.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1200 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0000 UTC.

### RUSSIAN FEDERATION

i<sub>R</sub>i<sub>x</sub>hVV i<sub>R</sub> is encoded as / (solidus) when precipitation is included in Section 5 at intermediate synoptic hours.

4PPPP This group is reported by stations with elevation lower than or equal to 1 000 metres.

6RRRt<sub>R</sub> When reported, at 08 and 20 hours (zone time), this group is included in Section 3.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 20 hours (zone time).

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 08 hours (zone time).

9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> When reported, this group is included in accordance with Regulation 2/12.15.1.



# SAUDI ARABIA

6RRRt<sub>R</sub> This group is used in the form 6RRR/, RRR indicates the amount of precipitation which has fallen during the 12 hours preceding the time of observation. When reported, group 6RRR/ is included in Section 1 at 0000 and 1200 UTC.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1800 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0600 UTC.

8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub> This (these) group(s) is (are) included.

# SRI LANKA

6RRRt<sub>R</sub> This group is used in the form 6RRR/, RRR indicates the amount of precipitation which has fallen since 0300 UTC. When reported, group 6RRR/ is included in Section 3.

# VIET NAM

6RRRt<sub>R</sub> This group is reported by certain stations at 0000, 0600, 1200 and 1800 UTC in accordance with Regulation 12.2.5.4. The duration of the period of reference is indicated by t<sub>R</sub>. When reported this group is included in Section 3.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0000 UTC.

# YEMEN

6RRRt<sub>R</sub> When reported, this group is included in Section 1.

7wwW<sub>1</sub>W<sub>2</sub> ww is coded:  
05 when horizontal visibility is greater than 1.5 kilometres and relative humidity is less than 80 per cent;  
06, 07 when horizontal visibility is between 1 and 5 kilometres and relative humidity is less than 70 per cent;  
09 when horizontal visibility is less than 1.5 kilometres;  
10, 11, 12, 28 when horizontal visibility is less than 1 kilometre;  
30, 31, 32 when horizontal visibility is between 800 metres and 1.5 kilometres;  
33, 34, 35 when horizontal visibility is less than 800 metres.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is reported at 1800 UTC.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is reported at 0600 UTC.

# FM 15 METAR and FM 16 SPECI

# INDIA

REw'w' This group is not used.

# JAPAN

VVVVD<sub>v</sub> V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>D<sub>v</sub> — Even if marked directional variation in horizontal visibility is observed, the prevailing horizontal visibility is reported as VVVV and other parts of the groups are not reported.

# FM 20 RADOB

# JAPAN

D . . . . D When the code is used for a report from a sea station, D . . . . D is given at the beginning of each part, instead of at the end.

**FM 32 PILOT****HONG KONG, CHINA**

Part B,

Section 4

The symbolic figure group 21212 is used. Wind data included refer to significant levels as well as for the following fixed levels: 900, 800 and 600 hPa.

**INDIA**

Reporting of upper winds by rawinsonde stations:

- (a) Rawinsonde stations, except those indicated in (b) below, issue Part B of PILOT reports only, without significant levels, in addition to complete TEMP report.
- (b) Rawinsonde stations, observing upper winds with Selenia radar, do not report wind data in TEMP reports, but issue a complete PILOT report.

**KUWAIT**

Parts B and D,

Section 4

Indicator figures 8 or 9 are always used.

**LAO PEOPLE'S DEMOCRATIC REPUBLIC**

Parts A and C,

Section 2

Indicator figures 55 are always used.

Parts B and D,

Section 4

The altitudes of regional fixed levels and significant levels are given in units of 300 metres.

**RUSSIAN FEDERATION**

Section 1

*The actual time of observation is given for GG in Moscow time and not in UTC.*

**YEMEN**

Part B,

Section 4

Apart from the significant levels, the wind data at the 900, 800 and 600 hPa levels are reported.

**FM 35 TEMP****HONG KONG, CHINA**

Part B,

Section 9

*The following code form is used:*

51515	11P <sub>1</sub> P <sub>1</sub> P <sub>1</sub>	d <sub>1</sub> d <sub>1</sub> f <sub>1</sub> f <sub>1</sub> f <sub>1</sub>
	22800	ddfff
	33600	ddfff

*P<sub>1</sub>P<sub>1</sub>P<sub>1</sub> refers to the pressure (hPa) at 1 000 metres above the surface and d<sub>1</sub>d<sub>1</sub>f<sub>1</sub>f<sub>1</sub>f<sub>1</sub> is its wind. Wind for 800 hPa is described by groups 22800 ddfff and for 600 hPa by groups 33600 ddfff.*

**JAPAN**

Section 10

This section is used under the following code form for reporting wind data for 900, 800 and 600 hPa:

61616	11900	ddfff
	22800	ddfff
	33600	ddfff

# **RUSSIAN FEDERATION**

GG                      *The actual time of observation is given for GG in Moscow time and not in UTC.*

# **SAUDI ARABIA**

Part B,  
Section 10              The following code form is used:

61616	11P <sub>1</sub> P <sub>1</sub> P <sub>1</sub>	d <sub>1</sub> d <sub>1</sub> f <sub>1</sub> f <sub>1</sub> f <sub>1</sub>
	22800	ddfff
	33600	ddfff

P<sub>1</sub>P<sub>1</sub>P<sub>1</sub> refers to the pressure (hPa) at 1 000 metres above the surface and d<sub>1</sub>d<sub>1</sub>f<sub>1</sub>f<sub>1</sub>f<sub>1</sub> is its wind. Wind for 800 hPa is described by groups 22800 ddfff and for 600 hPa by groups 33600 ddfff.

# **YEMEN**

Time of  
observation              One ascent is made at 1200 UTC.

Part B,  
Section 6                Apart from the significant levels, this section includes the wind data at 900, 800 and 600 hPa levels.

# **FM 54 ROFOR**

# **INDIA**

O<sub>i2</sub>zzz                      *This Service uses Code table 1863 with the following additions:*

03CCCC	Up to the aerodrome identified by CCCC
08CCCC	At the aerodrome identified by CCCC

# **FM 71 CLIMAT**

# **AFGHANISTAN**

R<sub>1</sub>R<sub>1</sub>R<sub>1</sub>R<sub>1</sub>R<sub>d</sub>              *Data concerning R<sub>d</sub> are not given.*

# **FM 75 CLIMAT TEMP**

# **AFGHANISTAN**

r <sub>n</sub> r <sub>n</sub>	}              Steadiness of wind is not given.
r <sub>f2</sub> r <sub>f2</sub>	
...	
r <sub>fn</sub> r <sub>fn</sub>	

**FM 82 SFLOC****INDIA** $A_i$ 

*For this symbolic letter, only the repetition rate of atmospherics is given in accordance with the following table:*

Code  
figure

0	Isolated point of activity
1	Low
3	Medium
5	High
7	Very high
9	No assessment

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E — NATIONAL CODE FORMS

HONG KONG, CHINA

Code for objective forecasts of tropical cyclone movement

C O D E F O R M :

(Tropical cyclone identification) Y<sub>2</sub>Y<sub>2</sub>G<sub>2</sub>G<sub>2</sub>g<sub>2</sub>g<sub>2</sub>  
XXL<sub>a</sub>L<sub>a</sub>L<sub>a</sub> Q<sub>c</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>  
(XXL<sub>a</sub>L<sub>a</sub>L<sub>a</sub> Q<sub>c</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>)  
(. . . . . repeated as required)  
REPSN Y<sub>c</sub>Y<sub>c</sub>G<sub>c</sub>G<sub>c</sub> //L<sub>a</sub>L<sub>a</sub>L<sub>a</sub> Q<sub>c</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>  
REPSN Y<sub>c</sub>Y<sub>c</sub>G<sub>c</sub>G<sub>c</sub> //L<sub>a</sub>L<sub>a</sub>L<sub>a</sub> Q<sub>c</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>  
(REPSN Y<sub>c</sub>Y<sub>c</sub>G<sub>c</sub>G<sub>c</sub> //L<sub>a</sub>L<sub>a</sub>L<sub>a</sub> Q<sub>c</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>)

Specifications of symbolic letters:

Y<sub>2</sub>Y<sub>2</sub>G<sub>2</sub>G<sub>2</sub>g<sub>2</sub>g<sub>2</sub> Time of forecast position or terminal time for which the forecast movement is valid.

XX Forecast method indicator:  
VM Veigas-Miller  
PC Persistence and climatology  
RG Regression  
TS Tse  
NF Control point (fixed point)  
NV Control point (variable point)

L<sub>a</sub>L<sub>a</sub>L<sub>a</sub> Latitude, in tenths of degree, of either forecast or reference tropical cyclone centre position.

Q<sub>c</sub> Quadrant of the globe. (Code table 3333)

L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub> Longitude, in tenths of degree, of either forecast or reference tropical cyclone centre position.

REPSN Indicator for reference position of tropical cyclone on which the forecasts are based.

Y<sub>c</sub>Y<sub>c</sub>G<sub>c</sub>G<sub>c</sub> Date time of reference position.

**INDIA****RAREP — Code form for the transmission of ground radar weather observations**

RAREP	IIiii	YYGGgg	
Character of echo	Azimuth and range of points on the periphery		
Intensity of echo	Tendency of echo	Stage of echo	Direction/speed
ALTD	(AZ/ALT/range)		
BRIGHT BAND	(AZ/HT)		

**KAZAKHSTAN, KYRGYZSTAN, TAJIKISTAN, TURKMENISTAN AND UZBEKISTAN**

(See text under Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova, Russian Federation and Ukraine in Region VI)

## F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C<sub>i</sub>) USED IN INTERNATIONAL HYDROLOGICAL CODES

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country*</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Chukotsk and Okhotsk Sea coasts (except Kamchatka)		01	Russian Federation	9	
Kamchatka		02	Russian Federation	9	
Lena-Indigirka		03	Russian Federation	9	
Sakhalin and Kuril Islands		04	Russian Federation	9	
Sea of Japan coast including Suyfun		05	{ Russian Federation China	{ 9 1	
Amur		06	{ China Russian Federation Mongolia	{ 1 9 7	
Lake Baikal		07	{ Mongolia Russian Federation	{ 7 9	
Angara		08	Russian Federation	9	
Yenisey		09	{ Russian Federation Mongolia	{ 9 7	
Upper and Middle Ob		10	{ Russian Federation Kazakhstan China Mongolia	{ 9 3 1 7	
Irtish		11	{ Russian Federation Kazakhstan	{ 9 3	
Lower Ob and Tobol		12	{ Russian Federation Kazakhstan	{ 9 3	
Kazakhstan (Central)		13	Kazakhstan	3	
Lakes Balkhash and Alakol'		14	{ Kazakhstan China	{ 3 1	
Chu, Talas, Asse and Lake Issyk-Kul'		15	{ Kazakhstan Kyrgyzstan	{ 3 4	
Syr Darya		16	{ Kazakhstan Kyrgyzstan Tajikistan Uzbekistan	{ 3 4 5 8	To be allocated as needed
Amu Darya		17	{ Tajikistan Turkmenistan Uzbekistan Afghanistan	{ 5 6 8 2	

\* The listing of countries against different basins does not imply that these countries are engaged in cooperative action in respect of the basin.

REGION I

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Murgab, Tedzen (Harirud) and Atrek		18	{ Tajikistan Turkmenistan Afghanistan Iran, Islamic Republic of	5 6 2 4	
Ural and Emba		19	Russian Federation	9	
Tarim (including Yarkand)		20	{ Kazakhstan Russian Federation China	3 9 1	
South coast of Caspian Sea		21	Iran, Islamic Republic of	4	
Lake Rezayeh		22	Iran, Islamic Republic of	4	
Euphrates-Tigris		95	{ Turkey (RA VI) Syrian Arab Republic (RA VI) Iran, Islamic Republic of Iraq	6 3 4 5	
Karun		23	Iran, Islamic Republic of	4	
Arabian Peninsula		24 25	Saudi Arabia Oman	6 8	To be allocated as needed
Tiban		26	Yemen	1	
Persian Gulf		27	Iran, Islamic Republic of	4	
Central basin		28	Iran, Islamic Republic of	4	
Daryachech-Ye- Sistan	Helmand	29 30	{ Pakistan Afghanistan Iran, Islamic Republic of	3 2 4	
Talab		31	{ Iran, Islamic Republic of Pakistan	4 3	
Dasht		32	{ Pakistan Iran, Islamic Republic of	3 4	
Hingol		33	Pakistan	3	
Pishin Lora		34	{ Pakistan Afghanistan	3 2	
Indus	Jhelum Chenab Ravi Sutlej Kabul Khuram Gomal	35 36 37 38 39 40 41 42	{ China India Pakistan Afghanistan	1 8 3 2	
Uvs Nuur		43	{ Russian Federation Mongolia	9 7	



REGION II

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Char Us Nuur		44	{ Russian Federation Mongolia	9 7	
Urungu		45	{ Mongolia China	7 1	
Ganges	Yamuna Ghaghra Gandar	46 } 47 } 48 } 49 } 50 }	China India Nepal Bangladesh	1 8 5 6	To be allocated as needed
Brahmaputra		51	{ China India Bhutan Bangladesh	1 8 4 6	
Meghna		52	{ India Bangladesh	8 6	
West coast East coast	Mahanadi Godavari	53 } 54 } 55 } 56 }	India	8	
—		57	Sri Lanka	3	To be allocated as needed
Karnafuli		58	{ India Bangladesh	8 6	
Kaladan and Arakan coast		59	{ India Myanmar	8 2	
Irrawaddy		60	{ China India Myanmar	1 8 2	
Sittang		61	Myanmar	2	
Salween		62	{ China Myanmar Thailand	1 2 9	
Tenasserim coast		63	{ Myanmar Thailand	2 9	
Chao Phraya		64	Thailand	9	
Pakchan		65	{ Myanmar Thailand	2 9	
Mekong		66 } 67 } 68 } 69 }	{ China Myanmar Lao People's Democratic Republic Viet Nam Thailand Cambodia	1 2 4 3 9 5	To be allocated as needed
Saigon-Vaico		70	{ Cambodia Viet Nam	5 3	

REGION II

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Indo-China coast		71	Viet Nam	3	
Ca		72	{ Lao People's Democratic Republic Viet Nam	4 3	
Ma-Chu		73	{ Lao People's Democratic Republic Viet Nam	4 3	
Red River (Koi)		74	{ China Viet Nam	1 3	
Tumen		75	{ Democratic People's Republic of Korea China Russian Federation	8 1 9	
Yalu		76	{ China Democratic People's Republic of Korea	1 8	
Han		77	{ Democratic People's Republic of Korea Republic of Korea	8 6	
Po Hai coast	Liao	78 } 79 }	China	1	
Hwang Yangtze	Han Siang Yalung	80 } 81 } 82 } 83 } 84 } 85 }	China	1	
Taiwan coast					
Hsi		86	{ Viet Nam China	3 1	
Hokkaido Pacific coast Japan Sea coast Kyushu		87 } 88 } 89 } 90 } 91 } to } 99 }	Japan	5	To be allocated as needed
					Spare

CHAPTER III

**REGION III — SOUTH AMERICA**



## A — REGIONAL CODING PROCEDURES

### GENERAL REMARKS

- (a) The following instructions, specifications and code tables were adopted for use in WMO Region III by postal ballot in 1960, 1965, 1971, 1980 (Resolution 22 (80-RA III)), 1989, and at the sessions of WMO Regional Association III listed below:

First session — Rio de Janeiro, September 1953  
Second session — Caracas, December 1957  
Third session — Geneva, April 1963  
Fourth session — Quito, November 1966  
Fifth session — Bogota, July 1970  
Sixth session — Buenos Aires, November-December 1974  
Eighth session — Montevideo, March 1982  
Ninth session — Lima, April 1986.

- (b) RA III developed instructions for the use in Region III of the following international codes:

FM 12 — SYNOP  
FM 13 — SHIP  
FM 32 — PILOT  
FM 33 — PILOT SHIP  
FM 35 — TEMP  
FM 36 — TEMP SHIP  
FM 37 — TEMP DROP  
FM 67 — HYDRA  
FM 68 — HYFOR  
FM 85 — SAREP

- (c) The following regional code was developed:

**RF 3/01 ERFEN — Report of daily data from stations engaged in the Regional Study of the *El Niño* Phenomenon (ERFEN)**

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## A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

### FM 12 SYNOP and FM 13 SHIP

#### (a) Section 1

3/12.1 Groups 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>, 4PPPP or 4a<sub>3</sub>hhh

3/12.1.1 If Regulation 12.2.3.4.2 applies, i.e. if a station cannot report mean sea-level pressure with reasonable accuracy, it shall use the group 4a<sub>3</sub>hhh to report the geopotential height of an agreed standard isobaric surface selected in accordance with the station elevation as follows:

Pressure	Station elevation	
	from greater than	to equal to or less than
850 hPa	800 m	2 300 m
700 hPa	2 300 m	3 700 m
500 hPa	3 700 m	

3/12.1.2 Group 4a<sub>3</sub>hhh shall indicate the geopotential of the suitable pressure level expressed in geopotential metres.

3/12.1.3 When local conditions prevent reduction with reasonable accuracy, stations at elevations between 500 and 800 standard geopotential metres shall report the 850 hPa geopotential.

3/12.1.4 The reference temperature to be used in reducing pressure to mean sea level or in calculating the geopotential of a given pressure level shall be the average between the surface temperature at the time of observation and that of 12 hours before.

3/12.1.5 The group 3<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> shall be included in the synoptic report in accordance with Regulation 12.2.4.

3/12.2 Group 5appp

In Bolivia, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, Venezuela and at those stations in Brazil falling to the north of 20°S, this group shall not be included.

N o t e : See Regulation 3/12.9.4.

3/12.3 Group 6RRRt<sub>R</sub> (Section 1)

3/12.3.1 With reference to Regulation 12.2.5.1, this group shall be included in Section 1 if the precipitation amount over the preceding 6 or 24 hours is reported for RRR.

N o t e s :

(1) See Regulation 3/12.10.

(2) This group may only be used at main standard times.

3/12.3.2 RRR shall relate to:

(i) The preceding 6 hours at 0000, 0600 and 1800 UTC;

(ii) The preceding 24 hours at 1200 UTC.

#### (b) Section 3

3/12.4 Group (0 . . . .)

N o t e : Regional regulations have not yet been developed.

3/12.5 Group (1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>)

This group shall be included at 0000 UTC to report maximum daytime temperature.

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- 3/12.6     *Group* (2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub>)  
This group shall be included at 1200 UTC to report minimum nighttime temperature.
- 3/12.7     *Group* (3Ejjj)
- 3/12.7.1   This group shall be made available only for regional exchange, its inclusion being left to national decision.
- 3/12.7.2   This group shall be used in the form 3Es<sub>n</sub>T<sub>g</sub>T<sub>g</sub> and included at 1200 UTC, if possible.
- 3/12.7.3   If ice and/or snow data are available, this group shall be reported in the form 3Es<sub>n</sub>T<sub>g</sub>T<sub>g</sub> = 3/s<sub>n</sub>T<sub>g</sub>T<sub>g</sub>.
- 3/12.8     *Group* (4E'sss)
- 3/12.8.1   This group shall be made available for regional exchange. Where appropriate, the selection of stations for the inclusion of sss shall be decided nationally.  
N o t e : This group is included only if ice and/or snow data are available.
- 3/12.8.2   This group shall be included at least once daily, preferably at 1200 UTC, if possible.
- 3/12.8.3   If the ground is covered by hail, this group shall be included in the next report.
- 3/12.9     *Groups* (5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>))
- 3/12.9.1   These groups may be used in the Region in the form 5EEEi<sub>E</sub>, 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>), 56D<sub>L</sub>D<sub>M</sub>D<sub>H</sub>, 57CD<sub>a</sub>e<sub>C</sub> and 58p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> or 59p<sub>24</sub>p<sub>24</sub>p<sub>24</sub>, as provided for under Regulation 12.4.7.
- 3/12.9.2   When data are available and it is appropriate to do so, these groups shall be included in the form 5EEEi<sub>E</sub> and 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>) at least once daily at one of the main observation times, preferably at 1200 UTC. SSS (duration of sunshine) shall be for the 24 hours of the calendar day immediately preceding the reporting time.
- 3/12.9.3   If the data are available and it is appropriate to do so, the group 5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> shall be included in the form 56D<sub>L</sub>D<sub>M</sub>D<sub>H</sub> and/or 57CD<sub>a</sub>e<sub>C</sub>, its inclusion being left to national decision.
- 3/12.9.4   In those parts of the Region where the group 5appp is not included in Section 1 (under Regulation 3/12.2), the group 5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> shall be included in the form 58p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> or 59p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> in Section 3 in order to report the variation in surface pressure over the previous 24 hours.  
N o t e : See Regulation 3/12.2.
- 3/12.10    *Group* (6RRRt<sub>R</sub>) (Section 3)
- 3/12.10.1   This group shall be included in Section 3, with reference to Regulation 12.2.5.2, when the precipitation amount for 3 hours or other periods required for regional exchange is reported for RRR.  
N o t e s :  
(1) See Regulation 3/12.3.  
(2) This group may be used at both main and intermediate standard times.
- 3/12.10.2   RRR shall indicate the precipitation amount recorded during the period indicated by t<sub>R</sub> and ending at the time of the report.
- 3/12.10.3   The inclusion of this group in Section 3 shall be left to national decision.
- 3/12.11    *Group* (7 . . . .)
- N o t e : Regional regulations have not yet been developed.



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3/12.12    *Group* (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>)

3/12.12.1    The use of this group shall be left to national decision.

3/12.12.2    This group shall be omitted if it includes only information in Section 3 which is already given in Section 1.

3/12.13    *Group* (9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>) (*Code table 3778*)

The inclusion of this group shall be left to national decision.

3/12.14    *Groups* (80000 (0 . . . .) (1 . . . .) . . . .)

N o t e :    Regional regulations have not yet been developed.

(c) *Requirements for international exchange*

3/12.15    For regional exchange, groups with indicator figures 1 to 6, 8 and 9 shall be included as indicated by the regulations, if data are available.

3/12.16    As a meteorological minimum requirement, all groups of the reports received from ships shall be retransmitted.

3/12.17    Reports received from ships fitted with radiotelephony shall be edited and coded before transmission over the Global Telecommunication System.

**FM 32 PILOT and FM 33 PILOT SHIP**3/32.1 *Part A, Section 2*

Altitudes constituting the best approximations to the standard isobaric surfaces shall be determined nationally.

3/32.2 *Part B, Section 4*

In addition to wind data at significant levels, altitudes of which shall be reported in geopotential units, data shall be included, as available, for the following altitudes:

Surface  
300 m  
600 m  
900 m  
2 100 m  
2 400 m  
4 200 m  
6 000 m  
8 100 m

3/32.3 *Part C, Section 2*

The following altitudes shall be used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m) (throughout the Region)
70	18 300
50	20 700
30	23 700
20	26 400
10	30 900

3/32.4 *Part D, Section 4*

3/32.4.1 In addition to wind data at significant levels, altitudes of which shall be reported in geopotential units, data for levels every 3 000 metres, beginning at 33 000 metres, shall be reported as available, provided they do not coincide with one of the included significant levels.

3/32.4.2 The altitudes 33 000 metres and above shall be encoded using units of 500 metres, i.e. the altitude 33 000 metres shall be included as 8661/, the altitudes 36 000 metres and 39 000 metres as 8728/, etc.

3/32.5 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

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**FM 35** TEMP, **FM 36** TEMP SHIP and **FM 37** TEMP DROP

3/35.1      *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

**FM 67** HYDRA and **FM 68** HYFOR

3/67.1      The inclusion of the various sections of these codes shall be left to national decision.

**FM 85** SAREP

N o t e :    For Section 5, no regional regulations have been developed.

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## A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS

### RF 3/01 ERFEN — Report of daily data from stations engaged in the Regional Study of the *El Niño* phenomenon (ERFEN)

#### CODE FORM:

Section 0	ERFEN	JJMMi <sub>w</sub>	Iiii			
Section 1	YYRRR	s <sub>n</sub> $\overline{T_a T_a T_a}$	$\overline{P_a P_a P_a P_a}$	d <sub>p</sub> d <sub>p</sub> $\overline{ff}$	s <sub>n</sub> $\overline{T_o T_o T_o}$	$\overline{H_s H_s H_s H_s}$
	.....	.....				
	.....	.....				
	.....	.....				
	YYRRR	.....				

#### NOTES:

- (1) ERFEN is the name of the code form used in Regional Association III for the exchange of daily information, including daily means, of interest to Members participating in the Regional Study of the *El Niño* Phenomenon (ERFEN).
- (2) The code form ERFEN is used for reporting daily means and totals from surface stations.
- (3) The code form ERFEN is used monthly for sending information from each station in tabular form.
- (4) The code form is divided into the following sections:

Section number	Contents
0	Station identification data, year, month and wind speed units
1	Daily precipitation data and daily means of surface pressure, air temperature, sea-surface temperature, sea level and wind

#### REGULATIONS:

##### 3/01.1 General

The code form ERFEN shall be used for reporting daily data obtained at each surface station participating in the ERFEN programme, in the form of a monthly bulletin to be transmitted within the first 15 days of the month following the observations.

##### 3/01.2 Section 0

The code name ERFEN and the groups JJMMi<sub>w</sub> and Iiii shall appear as a prefix to each tabular report and shall be included in each bulletin.

##### 3/01.3 Section 1

3/01.3.1 The data pertaining to each day shall be included on one line.

3/01.3.2 No group may be omitted; if information on any parameter is not available, solidi (///) shall be reported for the corresponding group.



## B — SPECIFICATIONS OF SYMBOLIC LETTERS (or groups of letters) FOR REGIONAL USE

$d_p d_p$	Predominant direction, in tens of degrees, from which wind is blowing for the day. (Code table 0877) (RF 3/01)
$\overline{ff}$	Daily mean wind speed, in units indicated by $i_w$ . (RF 3/01)
$\overline{H_s H_s H_s H_s}$	Daily mean sea level above zero on the station scale, in centimetres. (RF 3/01)  (1) If levels are below zero, 5000 shall be added to the absolute mean value.
II	Block number. (RF 3/01)
$i_w$	Indicator for source and units of wind speed. (Code table 1855) (RF 3/01)
iii	Station number. (RF 3/01)
JJ	Tens and units digits of the year (UTC), i.e. 1987 = 87. (RF 3/01)
MM	Month of the year (UTC), i.e. 01 = January; 02 = February, etc. (RF 3/01)
$\overline{P_a P_a P_a P_a}$	Daily mean pressure reduced to sea level, in tenths of a hectopascal, omitting the thousands digit. (RF 3/01)  (1) If the value is 1000 hPa or above, the first figure of $\overline{P_a P_a P_a P_a}$ shall be 0.
RRR	Amount of precipitation which has fallen during the 24 hours preceding 1200 UTC. (Code table 3590) (RF 3/01)  (1) 000 shall be used to report zero precipitation.
$s_n$	Sign of the temperature. (Code table 3845) (RF 3/01)
$T_g T_g$	Ground (grass) minimum temperature of the preceding night, in whole degrees Celsius, its sign being given by $s_n$ . (3-group in Section 3 of FM 12)
$\overline{T_a T_a T_a}$	Daily mean air temperature, in tenths of a degree Celsius, its sign being given by $s_n$ . (RF 3/01)

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$\overline{T_0 T_0 T_0}$  Daily mean sea-surface temperature, in tenths of a degree Celsius, its sign being given by  $s_n$ .  
(RF 3/01)

YY Day of the month (UTC).  
(RF 3/01)

\_\_\_\_\_



## **C — SPECIFICATIONS OF CODE FIGURES (code tables) FOR REGIONAL USE**

Code tables in regional use in Region III are numbered with a three-figure number from 320 to 399. As yet no new code tables have been established for regional use in Region III.

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## D — NATIONAL CODING PROCEDURES WITH REGARD TO INTERNATIONAL CODE FORMS

### FM 12 SYNOP

#### ARGENTINA

Section 5 This section is used in the following form:

555 1P<sub>H</sub>P<sub>H</sub>P<sub>H</sub>P<sub>H</sub> 2C<sub>V</sub>C<sub>V</sub>C<sub>V</sub>C<sub>V</sub> 3F<sub>R</sub>F<sub>R</sub>F<sub>R</sub>F<sub>R</sub> 4E<sub>V</sub>E<sub>V</sub>E<sub>V</sub>E<sub>V</sub> 5d<sub>x</sub>d<sub>x</sub>f<sub>x</sub>f<sub>x</sub>  
 55f<sub>x</sub>f<sub>x</sub>f<sub>x</sub> 6H<sub>e</sub>H<sub>e</sub>H<sub>e</sub>H<sub>e</sub> 64H<sub>h</sub>H<sub>h</sub>H<sub>h</sub>H<sub>h</sub> 65H<sub>h</sub>H<sub>h</sub>H<sub>h</sub>H<sub>h</sub> 66T<sub>s</sub>T<sub>s</sub>T<sub>s</sub>T<sub>s</sub> 67T<sub>s</sub>T<sub>s</sub>T<sub>s</sub>T<sub>s</sub> 68D<sub>v</sub>h<sub>v</sub>h<sub>v</sub>  
 7d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub> 74H<sub>h</sub>H<sub>h</sub>H<sub>h</sub>H<sub>h</sub> 77f<sub>m</sub>f<sub>m</sub>f<sub>m</sub>f<sub>m</sub> 8H<sub>m</sub>H<sub>m</sub>H<sub>m</sub>H<sub>m</sub>H<sub>m</sub> 9R<sub>s</sub>R<sub>s</sub>R<sub>s</sub>R<sub>s</sub>R<sub>s</sub>

1. The use of this section, as well as the symbolic form of groups, and the specifications of symbolic letters shall be determined nationally.
2. Section 5 shall be used in the Argentine Republic by all meteorological stations equipped with the necessary instrumentation.
  - 2.1 *Figure group 555*
    - 2.1.1 This figure group identifies Section 5 and should not be omitted when using this section.
  - 2.2 *Group 1P<sub>H</sub>P<sub>H</sub>P<sub>H</sub>P<sub>H</sub>*
    - 2.2.1 P<sub>H</sub>P<sub>H</sub>P<sub>H</sub>P<sub>H</sub> QNH, in tenths of a hectopascal, omitting the thousands digit of the pressure value.
  - 2.3 *Group 2C<sub>V</sub>C<sub>V</sub>C<sub>V</sub>C<sub>V</sub>*
    - 2.3.1 C<sub>V</sub>C<sub>V</sub>C<sub>V</sub>C<sub>V</sub> Indicates the presence of volcanic dust.
    - 2.3.2 This group shall indicate the presence of volcanic dust suspended in the atmosphere.

#### REGULATIONS:

- (1) This group shall be included in Section 5 every time present weather is coded as ww = 04, 06, 08 or 09 in Section 1.
- (2) Coding shall take the form:
 

Presence of volcanic dust	29999
Absence of volcanic dust	20000.
- 2.4 *Group 3F<sub>R</sub>F<sub>R</sub>F<sub>R</sub>F<sub>R</sub>*
  - 2.4.1 This group shall be included in Section 5 of the daily 1200 UTC SYNOP report, and the information contained in it shall correspond to the information recorded at that time.
  - 2.4.2 F<sub>R</sub>F<sub>R</sub>F<sub>R</sub>F<sub>R</sub> Groundwater recorded at 1200 UTC, in centimetres, e.g.:
 

Groundwater	Figures to be reported for F <sub>R</sub> F <sub>R</sub> F <sub>R</sub> F <sub>R</sub>
12.43 m	31243
6.58 m	30658
0.05 m	30005

**ARGENTINA** (continued)**REGULATIONS:**

- (1) This group shall be included in Section 5 by all meteorological stations equipped with facilities for measuring groundwater.
- (2) Meteorological stations whose groundwater instruments are out of order shall use the code 31///.

2.5 *Group* 4E<sub>V</sub>E<sub>V</sub>E<sub>V</sub>E<sub>V</sub>

- 2.5.1 E<sub>V</sub>E<sub>V</sub>E<sub>V</sub>E<sub>V</sub> Quantity of daily evaporation, in tenths of a millimetre.

- 2.5.2 This group shall be included in Section 5 of the daily 1200 UTC SYNOP report, and the information contained in it shall correspond to the daily evaporation calculated in accordance with the relevant instructions, e.g.:

Calculated evaporation	Figures to be reported for E <sub>V</sub> E <sub>V</sub> E <sub>V</sub> E <sub>V</sub>
10.68 mm	40106
3.84 mm	40038
0.30 mm	40003
0.02 mm	40000

**REGULATIONS:**

- (1) This group shall be included in Section 5 of the SYNOP report by all meteorological stations equipped with evaporation instrumentation.
- (2) The following codes shall be used in cases where some elements of the instruments used for calculating evaporation are out of order:
  - (a) Stations whose class A evaporation pan is out of order shall report 41///;
  - (b) Stations whose evaporimeter is out of order shall report 42///;
  - (c) Stations whose graduated evaporimeter tube is out of order shall report 43///;
  - (d) Stations whose counting anemometer (taxi type) is out of order and whose calculated value is, for example, 10.68 millimetres shall report 44106;
  - (e) Stations whose raingauge is out of order and whose calculated value is, for example, 10.68 millimetres shall report 45106;
  - (f) Stations whose floating thermometer is out of order and whose value is calculated at, for example, 10.68 millimetres shall report 46106;
  - (g) Stations where the contents of evaporation pans have frozen or overflowed owing to excess precipitation shall report 4////.

2.6 *Groups* 5d<sub>x</sub>d<sub>x</sub>f<sub>x</sub>f<sub>x</sub> and 55f<sub>x</sub>f<sub>x</sub>f<sub>x</sub>

- 2.6.1 d<sub>x</sub>d<sub>x</sub> True wind direction at the time when the reported value f<sub>x</sub>f<sub>x</sub> was obtained, in tenths of a degree.
- 2.6.2 f<sub>x</sub>f<sub>x</sub> Maximum gust speed recorded during the hour preceding the observation, in knots.

**REGULATIONS:**

- (1) This group shall report the maximum gust speed recorded during the preceding hour if the gust exceeded or was equal to 30 knots.
- (2) This group shall only be included by meteorological stations equipped with wind-recording instruments.
- (3) If the value to be reported exceeds 99 knots, 99 shall be reported in f<sub>x</sub>f<sub>x</sub>, to which an additional group 55f<sub>x</sub>f<sub>x</sub>f<sub>x</sub> shall be added when the maximum gust speed shall be reported with all its figures in f<sub>x</sub>f<sub>x</sub>f<sub>x</sub>.

**ARGENTINA** (continued)**2.7** Group 6H<sub>e</sub>H<sub>e</sub>H<sub>e</sub>I<sub>v</sub>

2.7.1 This group shall be included in Section 5 of the daily 1200 UTC SYNOP report. The information contained in it shall refer to the 24 hours of the preceding calendar day. Thus, for example, the group included in the 1200 UTC message on day 5 shall refer to the data corresponding to 00–24 hours of calendar day 4.

2.7.2 H<sub>e</sub>H<sub>e</sub>H<sub>e</sub> Daily effective insolation, in hours and tenths of an hour. Divide the number of minutes by six to convert into tenths of an hour, e.g.:  
13 hours 32 minutes shall be coded as H<sub>e</sub>H<sub>e</sub>H<sub>e</sub> = 135 and 0 hour 0 minute shall be coded as H<sub>e</sub>H<sub>e</sub>H<sub>e</sub> = 000.

2.7.3 I<sub>v</sub> Indicates the type of wind meter used.

1 – Anemograph

2 – Anemometer

/ – When group 7d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub> is not used.

**REGULATIONS:**

(1) This group shall be included in Section 5 of the SYNOP report by all meteorological stations equipped with heliographs.

(2) Stations whose heliographs are out of order shall report 6///I<sub>v</sub>.

(3) Stations not using the group 7d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub> for whatever reason shall encode the H<sub>e</sub>H<sub>e</sub>H<sub>e</sub> value and I<sub>v</sub> shall be reported as /.

**2.8** Group 64H<sub>h</sub>H<sub>h</sub>H<sub>h</sub>

2.8.1 Provided a thermograph is available, this group shall be included in the 0000 and 1200 UTC messages and shall report the time at which the maximum temperature was recorded during the preceding 12 hours.

2.8.2 64 Identification of this group, not to be omitted.

2.8.3 H<sub>h</sub>H<sub>h</sub>H<sub>h</sub> Time in hours and tenths of an hour at which maximum temperature was recorded.

2.8.4 If there is no information, this group shall not be included.

**2.9** Group 65H<sub>h</sub>H<sub>h</sub>H<sub>h</sub>

2.9.1 Provided a thermograph is available, this group shall be included in the 0000 and 1200 UTC messages and shall report the time at which the minimum temperature was recorded during the preceding 12 hours.

2.9.2 65 Identification of this group, not to be omitted.

2.9.3 H<sub>h</sub>H<sub>h</sub>H<sub>h</sub> Time in hours and tenths of an hour at which minimum temperature was recorded.

2.9.4 If there is no information, this group shall not be included.

**2.10** Group 66T<sub>s</sub>T<sub>s</sub>T<sub>s</sub>

2.10.1 This group shall be included when the soil temperature has been measured.

2.10.2 66 Identification of the group in which soil temperature greater than or equal to 0 degrees is reported.

2.10.3 T<sub>s</sub>T<sub>s</sub>T<sub>s</sub> Soil temperature greater than or equal to 0, reported in degrees and tenths of a degree Celsius.

## REGION III

### ARGENTINA (continued)

#### 2.11 Group 67T<sub>s</sub>T<sub>s</sub>T<sub>s</sub>

2.11.1 This group shall be included when the soil temperature has been measured.

2.11.2 67 Identification of the group in which soil temperature below 0 degrees is reported.

2.11.3 T<sub>s</sub>T<sub>s</sub>T<sub>s</sub> Soil temperature in degrees and tenths of a degree Celsius.

#### 2.12 Group 68D<sub>v</sub>h<sub>v</sub>h<sub>v</sub>

2.12.1 This group shall be included at all times when, at elevation h<sub>v</sub>h<sub>v</sub>, wind direction D<sub>v</sub> has been determined by an appropriate instrument (an anemometer, a Wild wind vane, etc.).

2.12.2 Information on the elevation and direction obtained by the station's official anemometer shall not be reported in this group.

2.12.3 68 Identification of the group reporting wind direction at a different elevation from the recordings taken by the official anemometer.

2.12.4 D<sub>v</sub> Wind direction

2.12.5 h<sub>v</sub>h<sub>v</sub> Elevation at which the instrument used to determine D<sub>v</sub> is located, in tens of metres.

#### 2.13 Groups 7d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub> and 77f<sub>m</sub>f<sub>m</sub>f<sub>m</sub>

2.13.1 This group shall be included in Section 5 of the daily 1200 UTC SYNOP report. The information contained in it shall refer to the 24 hours of the preceding calendar day. Thus, for example, the group included in the 1200 UTC message on day 5 shall refer to the data corresponding to 00-24 hours of calendar day 4.

2.13.2 d<sub>m</sub>d<sub>m</sub> True direction of maximum gust f<sub>m</sub>f<sub>m</sub>, in tens of degrees.

2.13.3 f<sub>m</sub>f<sub>m</sub> Daily maximum gust speed (or, in the absence of gust, maximum wind speed), in knots.

### REGULATIONS:

(1) If the value to be reported exceeds 99 knots, 99 shall be reported in f<sub>m</sub>f<sub>m</sub> to which an additional group 77f<sub>m</sub>f<sub>m</sub>f<sub>m</sub> shall be added when the daily maximum gust speed shall be reported with all its figures in f<sub>m</sub>f<sub>m</sub>f<sub>m</sub>.

(2) This group shall only be used by stations who meet the following conditions:

- (a) They have an anemograph in operation I<sub>v</sub> = 1;
- (b) They undertake 24 daily observations with anemometer I<sub>v</sub> = 2.

(3) Stations reporting daily maximum wind data but not daily effective insolation shall include the group 6H<sub>e</sub>H<sub>e</sub>H<sub>e</sub>I<sub>v</sub> and report 6///1 or 6///2, whichever is applicable.

(4) Stations equipped with:

- (a) An anemograph shall report in this group the direction and speed of the maximum daily gust;
- (b) An anemometer shall report in this group the daily maximum wind direction and speed selected from the 24 daily observations.

#### 2.14 Group 74H<sub>h</sub>H<sub>h</sub>H<sub>h</sub>

2.14.1 This group shall be included in the daily 1200 UTC report.

2.14.2 74 Identification of the group reporting the time of the occurrence of the maximum gust referred to in group 7d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub>.

2.14.3 H<sub>h</sub>H<sub>h</sub>H<sub>h</sub> Time in hours and tenths of an hour at which maximum gust was recorded.

**ARGENTINA** *(continued)*2.15 *Group* 8H<sub>m</sub>H<sub>m</sub>H<sub>n</sub>H<sub>n</sub>

2.15.1 This group shall be included in Section 5 of the daily 1200 UTC SYNOP report. The information contained in it shall refer to the 24 hours of the preceding calendar day. Thus, for example, the group included in the 1200 UTC message on day 5 shall refer to the data corresponding to 00–24 hours of calendar day 4.

2.15.2 H<sub>m</sub>H<sub>m</sub> Daily maximum value of relative humidity, in percentage, selected from the 24 daily observations.

2.15.3 H<sub>n</sub>H<sub>n</sub> Daily minimum value of relative humidity, in percentage, selected from the 24 daily observations.

**REGULATIONS:**

- (1) This group shall only be used by stations that undertake 24 daily observations for the purpose of reporting extreme values of relative humidity, calculated from psychrometric tables.
- (2) The code 00 shall be used for values of 100 per cent.

2.16 *Group* 9R<sub>s</sub>R<sub>s</sub>R<sub>s</sub>R<sub>s</sub>

2.16.1 R<sub>s</sub>R<sub>s</sub>R<sub>s</sub>R<sub>s</sub> Total weekly precipitation accumulated between the 1200 UTC precipitation observation on Saturday and the 1200 UTC observation the following Friday, in tenths of a millimetre.

2.16.2 This group shall be included in Section 5 of the 1200 UTC SYNOP report on Fridays, e.g.:

Daily 1200 UTC precipitation observations:

Saturday 2.0 mm

Sunday 0.0 mm

Monday 47.0 mm

Tuesday No precipitation

Wednesday No precipitation

Thursday 100.0 mm

Friday 22.0 mm

Weekly accumulated total: 171.0 mm, which shall be coded as 91710.

**REGULATIONS:**

- (1) When coding weekly accumulated precipitation, Code table 3590 shall not be used, otherwise the value transcribed will be the direct amount of precipitation which has fallen during the seven-day observation period.
- (2) When the weekly accumulated precipitation value is the equivalent of 0.0 millimetres, 90000 shall be reported.
- (3) When no precipitation has occurred during the period 1200 UTC Saturday and 1200 UTC the following Friday, 9///0 shall be reported.

REGION III

**FM 15 METAR and FM 16 SPECI**

**BOLIVIA (PLURINATIONAL STATE OF)**

**CAVOK**      *The code word **CAVOK** is not used in the Plurinational State of Bolivia.*

**FM 32 PILOT**

**ARGENTINA**

Part A,  
Section 2

The following altitudes are used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude used in the PILOT reports (m)	
	<i>North of 40°S</i>	<i>South of 40°S</i>
850	1 500	1 500
700	3 000	3 000
500	5 700	5 400
400	7 500	7 200
300	9 600	9 000
250	10 500	10 200
200	12 300	12 000
150	14 100	13 500
100	16 200	15 900

**FM 51 TAF**

**BOLIVIA (PLURINATIONAL STATE OF)**

**CAVOK**      *The code word **CAVOK** is not used in the Plurinational State of Bolivia.*

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## **E — NATIONAL CODE FORMS**

No information available.

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## F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C<sub>i</sub>) USED IN INTERNATIONAL HYDROLOGICAL CODES

Basin	Sub-basin	BB	Country*	C <sub>i</sub>	Remarks	
Juradó		01	{ Colombia Panama	1	See RA IV	
Caribbean Sea	Magdalena-Cauca	02 } 03 }	Colombia	1		
Catatumbo		04	{ Colombia Venezuela (Bolivarian Republic of)	1 2		
Caribbean Sea		05	Venezuela (Bolivarian Republic of)	2		
Orinoco	Meta	06 07	{ Colombia Venezuela (Bolivarian Republic of)	1 2		
Essequibo } Amacuro } Darima }		08	{ Venezuela (Bolivarian Republic of) Guyana	2 3	System of various basins	
North Atlantic Ocean		09	Guyana	3		
Courantijn		10	{ Guyana Suriname	3 4		
North Atlantic Ocean		11	Suriname	4		
Maroni		12	{ Suriname French Guiana	4 5		
North Atlantic Ocean		13	French Guiana	5		
Oiapoque		14	{ French Guiana Brazil	5 6		
Amazon		15	{ Bolivia (Plurinational State of) Brazil Colombia Ecuador Guyana Peru Venezuela (Bolivarian Republic of)	7 6 1 8 3 9 2		
	Beni-Madre de Dios		16	{ Bolivia (Plurinational State of) Brazil Peru	7 6 9	
	Mamoré (Guaporé)		17	{ Bolivia (Plurinational State of) Brazil	7 6	
	Negro		18	{ Brazil Colombia	6 1	
	Napo		19	{ Ecuador Peru	8 9	

\* The listing of countries against different basins does not imply that these countries are engaged in cooperative action in respect of the basin.

REGION III

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Amazon (continued)	Putumayo (Ica)	20	Brazil	6	Numbers reserved for other sub-basins of the Amazon
			Colombia	1	
			Ecuador	8	
			Peru	9	
	Caquetá (Japurá)	21	Brazil	6	
			Colombia	1	
	From its headwaters to Javarí basin }	22	Brazil	6	
	From the Javarí up to the Auati-Paraná }	23	Brazil	6	
	From the Auati-Paraná basin up to upstream of Lake Coarí }	24	Brazil	6	
	From the headwaters of Lake Coarí up to the Río Purus basin }	25	Brazil	6	
	From the Río Purus confluence up to the Río Negro basin }	26	Brazil	6	
	From the Río Negro confluence up to the Río Madeira basin }	27	Brazil	6	
	From the Río Madeira confluence up to the Río Trombetas basin }	28	Brazil	6	
	From the Río Trombetas confluence up to the Río Tapajós basin }	29	Brazil	6	
	From the Río Tapajós confluence up to the Río Xingú basin }	30	Brazil	6	
	Downstream of the Río Xingú confluence, including the mouth of the Río Amazonas }	31	Brazil	6	
		32 to 40 }			
Pacific Ocean		41	Colombia	1	
Patía		42	Colombia	1	
			Ecuador	8	
Mira		43	Colombia	1	
			Ecuador	8	
Pacific Ocean		44	Ecuador	8	
Zarumilla		45	Ecuador	8	
			Peru	9	
Tumbes		46	Ecuador	8	
			Peru	9	

REGION III

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Chira-Catamayo		47	{ Ecuador Peru	8 9	
Pacific Ocean		48	Peru	9	
Tocantins		49	Brazil	6	
North, North-east Atlantic		50	Brazil	6	
San Francisco		51	Brazil	6	
East Atlantic		52	Brazil	6	
South-east Atlantic		53	Brazil	6	
Titicaca-Poopó		54	{ Bolivia (Plurinational State of) Chile Peru	7 1 9	
Laguna Blanca		55	{ Chile Peru	1 9	
Zapaleri		56	{ Argentina Bolivia (Plurinational State of) Chile	2 7 1	
Cancosa Todos los Santos Lauca Cosapilla		57	{ Bolivia (Plurinational State of) Chile	7 1	System of various basins
Plata	Río de la Plata	58	{ Argentina Uruguay	2 4	
	Paranaíba	59	Brazil	6	
	Grande	60	Brazil	6	
	Paraná between the Grande and Tieté confluences, including the Tieté basin	61	Brazil	6	
	Paraná between the Tieté and Paranapanema confluences	62	Brazil	6	
	Paraná between the Paranapanema, including that river's basin, and the Iguazú confluence	63	{ Brazil Paraguay	6 3	Not including the Iguazú river basin
	Paraná between the Iguazú con- fluence, including that river's basin, and the Paraguay confluence	64	{ Argentina Brazil Paraguay	2 6 3	Not including the Paraguay river basin

# REGION III

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Plata (continued)	Paraná between Paraguay and Uruguay rivers }	65	Argentina	2	
	Paraguay from headwaters up to the Río Negro }	66	{ Bolivia (Plurinational State of) Brazil Paraguay	7 6 3	
	Paraguay between Ríos Negro and Apa }	67	{ Bolivia (Plurinational State of) Brazil Paraguay	7 6 3	
	Paraguay between Apa and Paraná confluences }	68	{ Argentina Bolivia (Plurinational State of) Paraguay	2 7 3	
	Uruguay	69	Argentina Brazil Uruguay	2 6 4	
		70			Number reserved for another Plata sub-basin
Laguna Merín		71	{ Brazil Uruguay	6 4	
Atlantic Ocean		72	Uruguay	4	
Puna endorheic basins		73	Argentina	2	System of various basins
Salinas Grandes Laguna Mar Chiquita Pampa de las Salinas Pozo de las Yeguas }		74	Argentina	2	System of various basins
Rivers Desaguadero, Colorado, Negro and rivers flowing into the Atlantic, between the La Plata and Negro Rivers }		75	Argentina	2	System of various basins
Rivers of Patagonia flowing into the Atlantic, south of the Negro River }		76	Argentina	2	System of various basins
Closed basins of the Patagonian plateaux }		77	Argentina	2	System of various basins

REGION III

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Pacific Ocean		$\left\{ \begin{array}{c} 78 \\ 79 \\ 80 \end{array} \right\}$	Chile	1	
Lake Baker Buenos Aires		81	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Gallegos		82	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Lake Fagnano		83	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Vizcachas		84	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Lake San Martín		85	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Lake Pueyrredón		86	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Ríos Simpson, Huemules		87	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Ríos Pico, Cisnes		88	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Ríos Caleufu, Corcovado, Palena		89	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Río Futaleufú		90	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Río Puelo		91	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Río Manso		92	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Río Hua-Hum		93	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array}$	
Laguna del Bayo Laguna Escondida/ Salar del Pular Laguna Mucar Salina de Jama	$\left. \begin{array}{c} \\ \\ \\ \\ \end{array} \right\}$	94	$\left\{ \begin{array}{c} \text{Argentina} \\ \text{Chile} \end{array} \right\}$	$\begin{array}{c} 2 \\ 1 \end{array} \right\}$	System of various basins





## CHAPTER IV

### **REGION IV – NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN**



## A — REGIONAL CODING PROCEDURES

### GENERAL REMARKS

- (a) The following instructions, specifications and code tables were adopted for use in WMO Region IV by postal ballot under IMO Regional Commission IV, and by WMO Regional Association IV in 1961 (Resolution 16 (61-RA IV)), in 1964 (Resolutions 25 and 26 (64-RA IV)), in 1980 (Resolution 29 (80-RA IV)), in 1984 (Resolution 30 (84-RA IV)), in 1986 (Resolution 23 (86-RA IV)), in 1988 (Resolution 24 (88-RA IV)), and at the sessions of WMO Regional Association IV listed below:

First session — Toronto, August 1953  
Second session — Washington, December 1958  
Fourth session — Asheville, October 1966  
Fifth session — Geneva, April 1971  
Sixth session — Guatemala City, November–December 1973  
Seventh session — Mexico City, April–May 1977  
Eighth session — Havana, November–December 1981  
Eleventh session — Mexico City, May 1993.

- (b) RA IV developed instructions for the use in Region IV of the following international codes:

FM 12 — SYNOP  
FM 13 — SHIP  
FM 32 — PILOT  
FM 33 — PILOT SHIP  
FM 35 — TEMP  
FM 36 — TEMP SHIP

RA IV also adopted the following definition for a hurricane in the Caribbean area:

In the Caribbean area a hurricane is a severe storm originating over tropical North Atlantic waters, including the Caribbean Sea and the Gulf of Mexico, in which the winds revolve counter-clockwise around a central vortex of low barometric pressure with a speed of Beaufort scale 12 (64 knots) or greater; in its mature stages it is usually enclosed by circular isobars.

- (c) No code forms have been established for regional use in Region IV.



## A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

### FM 12 SYNOP and FM 13 SHIP

#### (a) Section 1

4/12.1      *Group* 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>

This group shall be included in the synoptic report in accordance with Regulation 12.2.4.

4/12.2      *Group* 4PPPP

The United States method of reducing pressure to sea level shall be used.

4/12.3      *Group* 6RRRt<sub>R</sub> (*Section 1*)

4/12.3.1      This group shall be included in Section 1 of the synoptic report at the main standard times 0000, 0600, 1200 and 1800 UTC.

4/12.3.2      RRR shall indicate the amount of precipitation during the six-hour period preceding the time of observation.

#### (b) Section 3

4/12.4      *Group* (0 . . . .)

4/12.4.1      This group shall be used in the form of 0C<sub>s</sub>D<sub>L</sub>D<sub>M</sub>D<sub>H</sub>.

4/12.4.2      The group 0C<sub>s</sub>D<sub>L</sub>D<sub>M</sub>D<sub>H</sub> shall be included only by stations in the southern part of Region IV, below 1 000 metres elevation and within 500 kilometres of the shore, and only during the part of the year in which tropical weather is observed.

4/12.5      *Group* (1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>)

Maximum temperature shall be reported as follows:

at 0000 and 1800 UTC — previous 12 hours;

at 0600 UTC — previous 24 hours;

at 1200 UTC — previous calendar day.

*N o t e* : Most of the Services in Region IV include this group when appropriate.

4/12.6      *Group* (2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub>)

Minimum temperature shall be reported as follows:

at 0000 UTC — previous 18 hours;

at 0600 and 1800 UTC — previous 24 hours;

at 1200 UTC — previous 12 hours.

*N o t e* : See Note to Regulation 4/12.5.

4/12.7      *Group* (3Ejjj)

4/12.7.1      The inclusion of this group shall be left to the discretion of individual Members of Regional Association IV.

4/12.7.2      Since no decision has been taken as yet regarding the use of the symbolic letters jjj, these symbolic letters shall be encoded as solidi (///) whenever this group is included.

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- 4/12.8      *Group (4E'sss)*  
This group shall be reported by all stations capable of doing so, and included at least once daily at either 0600 or 1200 UTC.
- 4/12.9      *Groups (5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>))*
- 4/12.9.1    In the form 5EEEiE and 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>), these groups shall be included by all stations capable of doing so, when appropriate.
- 4/12.9.2    In the form 58p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> or 59p<sub>24</sub>p<sub>24</sub>p<sub>24</sub>, this group shall be included mainly in that part of the Region comprising the Caribbean Islands, Central America, Mexico and the Bahamas.  
  
N o t e : Other forms of this group may be included by all stations capable of doing so, when appropriate.
- 4/12.10     *Group (6RRRt<sub>R</sub>) (Section 3)*
- 4/12.10.1   This group shall be included in Section 3 of the synoptic report at least at the intermediate standard times, and at the main standard times, as required.
- 4/12.10.2   RRR shall indicate the amount of precipitation during the three-hour period preceding the time of observation or during other periods required for regional exchange.
- 4/12.11     *Group (7 . . . .)*
- 4/12.11.1   This group shall be used in the form 7R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>.
- 4/12.11.2   The group 7R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub> shall be reported by all stations capable of doing so, and included at least once daily at either 0000, 0600, 1200 or 1800 UTC.
- 4/12.12     *Group (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>)*  
  
Regulation 4/12.7.1 shall apply.
- 4/12.13     *Group (9S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>)*  
  
N o t e : This group may be included by all stations capable of doing so, when appropriate.
- 4/12.14     *Additional groups*
- 4/12.14.1   When a tornado is observed at, or within sight of, the station during the preceding hour or at the time of observation, the word TORNADO shall be added at the end of Section 3 of the synoptic report.  
  
N o t e : This practice is applied whether the tornado is the only phenomenon observed, and reported as present weather code figure 19, or if the tornado is observed with e.g. a thunderstorm, in which case the highest applicable present weather code figure shall be selected.
- 4/12.14.2   When, due to a hurricane or tropical storm, the maximum one-minute average wind speed between two times of observation exceeds 34 knots, the value of this maximum one-minute average wind speed shall be included, together with the time of its occurrence, in the following form, added at the end of Section 3 of the synoptic report: ONE-MINUTE MAXIMUM . . . . KNOTS AT . . . . (hour, minute) UTC.
- 4/12.14.3   In case more than one additional group is added at the end of Section 3 of the synoptic report, the additional groups shall be separated by a solidus (/).

REGION IV

N o t e : For example, if a tornado is observed when, due to a hurricane or tropical storm, the maximum one-minute average wind speed between two times of observation exceeds 34 knots, the additional groups should be added at the end of Section 3 of the synoptic report in the following form: TORNADO/ONE-MINUTE MAXIMUM . . . . KNOTS AT . . . . (hour, minute) UTC.

(c) *Requirements for international exchange*

- 4/12.15      Synoptic surface reports from land stations shall include Section 0 and the first two groups of Section 1, and the other groups of Section 1 and the groups of Section 3 whenever data are available and required.
- 4/12.16      All groups of the reports received from ships shall be retransmitted.
- 4/12.17      Reports received from ships fitted only with radiotelephony shall be edited and coded before transmission over the Global Telecommunication System.

**FM 32 PILOT and FM 33 PILOT SHIP**

4/32.1 *Part A, Section 2*

Altitudes constituting the best approximations to the standard isobaric surfaces shall be determined nationally.

4/32.2 *Part B, Section 4*

In addition to wind data at significant levels, altitudes of which shall be reported in geopotential units, data at the following levels shall be included:

300 m	3 600 m
600 m	4 200 m
900 m	4 800 m
1 200 m	6 000 m
1 800 m	7 500 m
2 100 m	9 000 m
2 400 m	15 000 m
2 700 m	

4/32.3 *Part C, Section 2*

Regulation 4/32.1 shall apply.

4/32.4 *Part D, Section 4*

4/32.4.1 In addition to wind data at significant levels, altitudes of which shall be reported in geopotential units, data at the following fixed levels shall be included: 18 000, 21 000, 24 000, 27 000, 30 000, 33 000 metres, and all successive levels at 3 000 metres, provided they do not coincide with one of the included significant levels.

4/32.4.2 The altitude 30 000 metres and above shall be encoded using units of 500 metres, i.e. the altitudes 30 000 metres and 33 000 metres shall be included as 8606/, the altitudes 36 000 metres and 39 000 metres as 8728/, etc.

4/32.5 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

*N o t e :* For exchange within Region IV and inclusion in subregional and regional broadcasts, Parts A and B may be transmitted together or separately, as may Parts C and D.



**FM 35 TEMP and FM 36 TEMP SHIP**

4/35.1 *Part B, Section 9*

When required, additional information for levels up to and including the 100 hPa level shall be reported in this section by including supplementary groups 101A<sub>df</sub>A<sub>df</sub>.

N o t e : The regional code table established for this purpose is Code table 421.

4/35.2 *Part D, Section 9*

4/35.2.1 When available, information for 7, 5, 3, 2 and 1 hPa shall be included in Section 9.

4/35.2.2 When required, additional information shall be reported by including supplementary groups 101A<sub>df</sub>A<sub>df</sub>.

N o t e s :

(1) These groups are included in, or added to, the report as appropriate, or included in separate messages containing corrections to previously transmitted data.

(2) See Note to Regulation 4/35.1.

4/35.3 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

N o t e : See Note to Regulation 4/32.5.

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## **A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS**

No code forms have been established for regional use in Region IV.

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## **B — SPECIFICATIONS OF SYMBOLIC LETTERS (or groups of letters) FOR REGIONAL USE**

$A_{df}A_{df}$	Form of additional data reported. (Code table 421) (FM 35, FM 36)
$C_s$	State of sky in tropics. (Code table 430) (0-group in Section 3 of FM 12 and FM 13)
$R_{24}R_{24}R_{24}R_{24}$	Total amount of precipitation during the 24-hour period ending at the time of observation, in tenths of a millimetre (coded 9998 for 999.8 millimetre or more, and coded 9999 for trace). (7-group in Section 3 of FM 12)

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## C — SPECIFICATIONS OF CODE FIGURES (code tables) FOR REGIONAL USE

Code tables in regional use in Region IV are numbered with a three-figure number from 420 to 499. The numbering system and codes for each element are given below:

421	$A_{df}A_{df}$
430	$C_s$

### 421

$A_{df}A_{df}$  — *Form of additional data reported*

Code  
figure

**00–31**

00	Not to be allocated
01	First day of month (UTC)
02	Second day of month (UTC)
03	Third day of month (UTC)
04	Fourth day of month (UTC)
05	Fifth day of month (UTC)
06	Sixth day of month (UTC)
07	Seventh day of month (UTC)
08	Eighth day of month (UTC)
09	Ninth day of month (UTC)
10	Tenth day of month (UTC)
11	Eleventh day of month (UTC)
12	Twelfth day of month (UTC)
13	Thirteenth day of month (UTC)
14	Fourteenth day of month (UTC)
15	Fifteenth day of month (UTC)
16	Sixteenth day of month (UTC)
17	Seventeenth day of month (UTC)
18	Eighteenth day of month (UTC)
19	Nineteenth day of month (UTC)
20	Twentieth day of month (UTC)
21	Twenty-first day of month (UTC)
22	Twenty-second day of month (UTC)
23	Twenty-third day of month (UTC)
24	Twenty-fourth day of month (UTC)
25	Twenty-fifth day of month (UTC)
26	Twenty-sixth day of month (UTC)
27	Twenty-seventh day of month (UTC)
28	Twenty-eighth day of month (UTC)
29	Twenty-ninth day of month (UTC)
30	Thirtieth day of month (UTC)
31	Thirty-first day of month (UTC)

## REGION IV

(Code table 421—continued)

Code  
figure

### 32–39 Not allocated

### 40–59 Reason for no report or incomplete report

- 40 Report not filed
- 41
- 42 Ground equipment failure
- 43 Observation delayed
- 44 Power failure
- 45 Unfavourable weather conditions
- 46 Low maximum altitude (less than 500 metres above ground)
- 47 Leaking balloon
- 48 Ascent not authorized for this period
- 49 Alert
- 50 Ascent did not extend above the 400 hPa level
- 51 Balloon forced down by icing condition
- 52 Balloon forced down by precipitation
- 53 Atmospheric interference
- 54 Local interference
- 55 Fading signal\*
- 56 Weak signal\*
- 57 Preventive maintenance
- 58 Flight equipment failure (transmitter, balloon, attachments, etc.)
- 59 Any reason not listed above

### 60–64 Miscellaneous

- 60
- 61
- 62 Radiosonde report precedes
- 63
- 64

### 65–69 Doubtful data

- 65 Geopotential and temperature data are doubtful between the following levels:  $0P_n P_n P'_n P'_n$
- 66 Geopotential data are doubtful between the following levels:  $0P_n P_n P'_n P'_n$
- 67 Temperature data are doubtful between the following levels:  $0P_n P_n P'_n P'_n$
- 68 Dewpoint depression is missing for reasons other than “motor-boating” between the following levels:  $0P_n P_n P'_n P'_n$  (not used when  $T_n T_n$  is also missing)
- 69

### 70–74 Not allocated

- 70
- 71
- 72
- 73
- 74

---

\* Fading signals differ from weak signals in that “fading signals” are first received satisfactorily, then become increasingly weaker, and finally become too weak for reception, while “weak signals” are weak from the beginning of the ascent.



# REGION IV

(Code table 421—continued)

Code  
figure

## 75–89 Corrected data

- 75
- 76
- 77
- 78 Corrected tropopause data section follows
- 79 Corrected maximum wind section follows
- 80 Corrected report for the entire report (*first plus second transmissions*) precedes
- 81 Corrected report for the entire *first transmission* precedes
- 82 Corrected report for the entire *second transmission* precedes
- 83 Corrected data for *mandatory levels* follow
- 84 Corrected data for *significant levels* follow
- 85 Minor error(s) in this report; correction follows
- 86 *Significant level(s)* not included in original report follow: //P<sub>n</sub>P<sub>n</sub>P<sub>n</sub> T<sub>n</sub>T<sub>n</sub>T<sub>an</sub>D<sub>n</sub>D<sub>n</sub> or P<sub>n</sub>P<sub>n</sub>P<sub>n</sub>T<sub>n</sub>T<sub>n</sub>
- 87 Corrected data for *surface* follow
- 88 Corrected *additional data* groups follow: 101A<sub>df</sub>A<sub>df</sub> . . . . . etc.
- 89

## 90–99

- 90 Extrapolated geopotential data follow: P<sub>n</sub>P<sub>n</sub>h<sub>n</sub>h<sub>n</sub>h<sub>n</sub> (d<sub>n</sub>d<sub>n</sub>d<sub>n</sub>f<sub>n</sub>f<sub>n</sub>)
- 91 Extrapolated surface data precede\*
- 92
- 93
- 94 Averaged wind for the surface to 1 500 metres layer and the 1 500 to 3 000 metres layer follow: ddfff  
ddfff
- 95 Early transmission of 850 and 500 hPa data and stability index follow: 85hhh TTT<sub>a</sub>DD ddfff  
50hhh TTT<sub>a</sub>DD ddfff i<sub>s</sub>i<sub>s</sub>
- 96 Early transmission of 850, 700 and 500 hPa data and stability index follow: 85hhh TTT<sub>a</sub>DD  
ddfff 70hhh TTT<sub>a</sub>DD ddfff 50hhh TTT<sub>a</sub>DD ddfff i<sub>s</sub>i<sub>s</sub>
- 97 Early transmission of 500 hPa data and stability index follow: 50hhh TTT<sub>a</sub>DD ddfff i<sub>s</sub>i<sub>s</sub>
- 98 Early transmission of 700 hPa data and stability index follow: 70hhh TTT<sub>a</sub>DD ddfff i<sub>s</sub>i<sub>s</sub>
- 99 Not to be allocated

\* Code figure 91 is used only in reports of dropsonde observations.

## 430

*C<sub>s</sub> — State of sky in tropics*Code  
figure

- 0 Cumulus, if any, are quite small; generally less than 2/8 coverage, except on windward slopes of elevated terrain; average width of cloud is at least as great as its vertical thickness
- 1 Cumulus of intermediate size with cloud cover less than 5/8; average cloud width is more than its vertical thickness; towers are vertical with little or no evidence of precipitation, except along slopes of elevated terrain; a general absence of middle and upper clouds
- 2 Swelling Cumulus with rapidly growing tall turrets which decrease in size with height and whose tops tend to separate from the longer cloud body and evaporate within minutes of the separation
- 3 Swelling Cumulus with towers having a pronounced tilt in a downwind direction; vertical cloud thickness is more than 1 1/2 times that of its average width
- 4 Swelling Cumulus with towers having a pronounced tilt in an upwind direction; vertical cloud thickness is more than 1 1/2 times that of its average width
- 5 Tall Cumulus congestus with vertical thickness more than twice the average width; not organized in clusters or lines; one or more layers of clouds extend out from the cloud towers, although no continuous cloud layers exist
- 6 Isolated Cumulonimbus or large clusters of Cumulus turrets separated by wide areas in which clouds are absent; cloud bases are generally dark with showers observed in most cells; some scattered middle and upper clouds may be present; individual Cumulus cells are one to two times higher than they are wide
- 7 Numerous Cumulus extending through the middle troposphere with broken to overcast sheets of middle clouds and/or Cirrostratus; Cumulus towers do not decrease generally in size with height; ragged dark cloud bases with some showers present
- 8 Continuous dense middle clouds and/or Cirrostratus cloud sheets with some large isolated Cumulonimbus or Cumulus congestus clouds penetrating these sheets; light rain occasionally observed from the Altostratus; Cumulonimbus bases ragged and dark with showers visible
- 9 Continuous sheets of middle clouds and/or Cirrostratus with Cumulonimbus and Cumulus congestus in organized lines or cloud bands; rain is generally observed from Altostratus sheets and heavy showers from Cumulonimbus; wind has a squally character
- / State of sky unknown or not described by any of the above

**Note:** In the event of obscuration of clouds due to heavy rain, the observer should use classification 5 or 8. He should use 5 if the rain is localized or is brief in duration; he should use 8 if the rain is widespread or lasts for longer periods of time.

## **D — NATIONAL CODING PROCEDURES WITH REGARD TO INTERNATIONAL CODE FORMS**

### **FM 12 SYNOP and FM 13 SHIP**

#### **ANTIGUA AND BARBUDA, BARBADOS, BELIZE, BRITISH CARIBBEAN TERRITORIES, DOMINICA, GRENADA, GUYANA, JAMAICA, SAINT LUCIA, SAINT VINCENT AND THE GRENADINES, TRINIDAD AND TOBAGO**

9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>      The special phenomena group 909R<sub>t</sub>d<sub>c</sub> shall be included in Section 3 of the report on every occasion that the rainfall group 6RRRt<sub>R</sub> is reported in Section 1.

#### **CANADA**

i<sub>R</sub>i<sub>x</sub>hV<sub>V</sub>      If the sky is completely obscured and clouds are visible below the limit of vertical visibility, h is reported as observed.

6RRRt<sub>R</sub>      In reports from stations which do not make observations every six hours, t<sub>R</sub> indicates the duration of the period of reference. If the coding of t<sub>R</sub> is 2 or greater, the special phenomena group 909R<sub>t</sub>d<sub>c</sub> is omitted.

8N<sub>h</sub>C<sub>L</sub>C<sub>M</sub>C<sub>H</sub>      N<sub>h</sub> and C<sub>L</sub> are reported when the sky is completely obscured and clouds are observed below the limit of vertical visibility from staffed stations.

8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>      Cloud amounts reported in second group and subsequent groups are summation amounts from staffed stations.

#### **UNITED STATES OF AMERICA**

Nddff      In reports from automatic sea stations, metres per second as the unit for reporting wind speed are used. In all other surface synoptic observations, knots as the unit for reporting wind speed are used.

**FM 15 METAR and FM 16 SPECI**

**CANADA**

**METAR or SPECI**

- 15.1.1 METAR or SPECI or LWIS shall appear as the first word of each report. Reports identified by LWIS shall report once per hour the following groups only:

LWIS CCCC YYGGggZ AUTO dddffGf<sub>m</sub>f<sub>m</sub>KT T'T'/T'dT'd AP<sub>H</sub>P<sub>H</sub>P<sub>H</sub>P<sub>H</sub>

- 15.4 Groups not reported shall be omitted. Solidi (/) shall only be used for missing wind speed and/or direction.

(BBB) The BBB format may appear immediately preceding the wind group to indicate if the report has been corrected.

dddffGf<sub>m</sub>f<sub>m</sub>**KT**

- 15.5 The averaging period for mean wind speed and direction is two minutes. Speed is reported in nautical miles per hour.

- 15.5.2 The term VRB may not be used by all AUTO stations.

VVWD<sub>v</sub>

- 15.6 Prevailing visibility is reported in statute miles and fractions up to three miles, then in whole miles up to 15 miles, and in units of five miles thereafter, where suitable visibility markers are available. Automatic weather stations report sensor visibility in statute miles and fractions up to four miles, then in whole miles up to a maximum of nine miles. Statute miles and fractions of statute miles shall be encoded with a space; for example, 1 1/8 statute mile shall be reported as 1 1/8SM. D<sub>v</sub> is not reported, but sector visibilities half (or less) of prevailing visibility are reported in supplementary information (staffed sites only). The letters SM (statute miles) are appended, without a space, to each observation to identify the units.

- 15.6.1 The abbreviation NDV is not used.

V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>D<sub>v</sub>

- 15.6.3 The group V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>D<sub>v</sub> is not used.

**RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>i**

- 15.7.1 RVR is reported whenever the prevailing visibility is one statute mile or less and/or the RVR is 6 000 feet or less. The units of measurement are feet and the abbreviation FT will be included in each message according to the following symbolic format: **RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>**FT**/i**. When the one-minute mean minimum and maximum values are reported, **FT**/i follows the maximum value without a space. RVR is not used as one of the criteria for reporting a SPECI. RVR may not be reported at some aerodromes.

**CANADA** (continued)

w'w'

- 15.8.1 *The following weather phenomena/qualifiers will not be reported by automatic weather stations: FC, IC, SG, GS, FU, VA, SA, SS, DS, MI, BC, PR, DR, SH, VC, PO. Depending on station type and capabilities, AUTO stations may report up to three different precipitation types and one obstruction to visibility simultaneously. At staffed stations, more than three w'w' groups may be reported.*
- 15.8.6 *The term + FC will be used to report any tornado or waterspout when within sight. The term FC will be used to report any funnel cloud when within sight. The symbol UP with appropriate intensity shall be used to describe unknown precipitation reported from an automatic weather station.*
- 15.8.7 *Precipitation preceded by the descriptor FZ shall always appear as a separate group with its own intensity.*
- 15.8.8 *Thunderstorms are reported when thunder is heard or if overhead lightning or hail occurs within the 15-minute period preceding the time of the report.*
- 15.8.10 *The term VCFC shall not be used in Canada. Some AUTO stations are capable of reporting VCTS.*
- 15.8.13 *The phenomena represented by FU, HZ, DU and SA are reported whenever the visibility is reduced by the reported phenomena to six miles or less.*
- 15.8.14 *BR (mist) is reported when it reduces visibility to between  $\frac{5}{8}$  mile and six miles, inclusive.*
- 15.8.19 *The letter abbreviation SQ is reported at staffed stations when the wind speed increases by 15 knots over the two-minute average speed that preceded the increase, and the duration of the peak speed period is at least two minutes, and the wind speed attains a one-minute mean of at least 20 knots during the peak speed period, and the wind speed diminishes by at least 5 knots.*

N<sub>5</sub>N<sub>5</sub>N<sub>5</sub>h<sub>5</sub>h<sub>5</sub>h<sub>5</sub>

- 15.9 *The abbreviation SKC is used by staffed stations when no cloud is visible.*
- 15.9.1.1 *The letters CLR may be used when no clouds below 10 000 feet are reported by automatic weather stations.*
- 15.9.1.2 *The summation principle is used in determining cloud amount. Automatic weather stations report cloud directly overhead; layer amounts are determined by persistence of cloud over top of the sensor.*
- 15.9.1.3 *Significant convective cloud (CB and TCU) information is not available from automatic weather stations.*
- 15.9.1.4 *All cloud layers observed are reported.*

**CAVOK**

- 15.10 *The abbreviation **CAVOK** is not used.*

# REGION IV

## CANADA (continued)

T'T/T'dT'd

15.11 This group is not reported in staffed SPECI reports.

QP<sub>H</sub>P<sub>H</sub>P<sub>H</sub>P<sub>H</sub>

15.12 This group is not reported in staffed SPECI reports.

REW'w'

15.13.2.1 Automatic weather stations cannot report this group.

WS RWYD<sub>R</sub>D<sub>R</sub>

or

WS ALL RWY

15.13.3 Automatic weather stations cannot report this group.

## RMK

15.13.4 Supplementary remarks may be included in observations from Canadian stations following the identifier group **RMK**. Remarks will appear in the following order: (layer type and opacity) (general remarks) and SLPppp, where ppp are the last three digits of the sea-level pressure. TORNADO, FUNNEL CLOUD or WATERSPOUT shall be spelled out and entered in the general remarks section whenever observed.

15.14 Trend forecasts shall not be used.

## MEXICO

### METAR

### National deviations

VVVV Prevailing visibility shall be reported in statute miles and fractions, followed immediately by the letters SM to indicate the units.

RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>i These groups shall not be reported.

N<sub>s</sub>N<sub>s</sub>N<sub>s</sub>h<sub>s</sub>h<sub>s</sub>h<sub>s</sub> All cloud layers shall be reported in ascending order. Convective-type clouds shall always be reported in the body of the report.

QP<sub>H</sub>P<sub>H</sub>P<sub>H</sub>P<sub>H</sub> The pressure value shall be reported in inches of mercury, preceded by the letter A.

15.13.4 Following the identifier group **RMK**, the following groups shall be reported only to meet regional requirements:

(a) C<sub>L</sub>C<sub>M</sub>C<sub>H</sub>D<sub>C</sub>D<sub>L</sub> Group of clouds (according to the international code tables and the International Cloud Atlas);

(b) P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> Pressure reduced to mean sea level, in hectopascals;

(c) 9P<sub>24</sub>P<sub>24</sub>RRR Pressure tendency during the last 24 hours and amount of precipitation, in millimetres.

Trend forecasts shall not be reported.

**MEXICO** *(continued)*

**SPECI**

**National deviations**

*Special reports shall be prepared when visibility drops to:*

- 5 miles,*
- 3 miles,*
- 1 mile,*
- 1/2 mile,*

*and the operational minima of each airport, is either lower than, rises to, or exceeds these values.*

**UNITED STATES OF AMERICA**

The corresponding national deviations from the following global regulations and additions to the code tables are listed below:

15.5.1

*The mean direction and speed of the wind over the two minutes immediately preceding the observation shall be reported for dddff.*

15.5.2

*In the case of variable wind direction, ddd may be encoded as VRB when the mean wind speed is 6 knots or less.*

15.5.3

*If, during the two minutes immediately preceding the observation, the total variation in wind direction is 60 degrees or more and the mean wind speed is greater than 6 knots, the wind direction may be reported as variable.*

15.5.5

*Wind gust speed shall be reported when there are rapid fluctuations of speed with a variation between peaks and lulls of 10 knots or more in the 10-minute period immediately preceding the observation.*

15.6.1

*Prevailing visibility shall be reported in statute miles and fractions of statute miles as described in coding practices 15.6.4 below. The value of the visibility shall be followed immediately by the letters SM to indicate the units.*

*N o t e : Outside of North America, US military stations may report prevailing visibility in metres.*

15.6.2 and 15.6.3

*Directional variations in visibility shall not be reported as called for by these regulations.*

15.6.4

*Prevailing visibility shall be reported using the following steps:*

- (a) Up to  $\frac{3}{8}$  statute mile, rounded down to the nearest  $\frac{1}{16}$  statute mile;*
- (b) From  $\frac{3}{8}$  statute mile to 2 statute miles, rounded down to the nearest  $\frac{1}{8}$  statute mile. (Statute miles and fractions of statute miles shall be encoded with a space; for example,  $1\frac{1}{8}$  statute mile shall be reported as  $1\frac{1}{8}$  SM.);*
- (c) From 2 statute miles to 3 statute miles, rounded down to the nearest  $\frac{1}{4}$  statute mile;*
- (d) From 3 statute miles to 15 statute miles, rounded down to the nearest 1 statute mile;*
- (e) Beyond 15 statute miles, rounded down to the nearest 5 statute miles.*

**UNITED STATES OF AMERICA** *(continued)*

## 15.7

Groups **RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>FT** or **RD<sub>R</sub>D<sub>R</sub>/V<sub>N</sub>V<sub>N</sub>V<sub>N</sub>V<sub>N</sub>V<sub>X</sub>V<sub>X</sub>V<sub>X</sub>FT**

## 15.7.1

*Runway visual range shall be reported in feet. Runway visual range shall be included in the report using the format shown in Regulation 15.7 during periods when the prevailing visibility is 1 statute mile or less and/or the runway visual range for the designated instrument runway is 6000 feet or less. The value of the runway visual range shall be followed immediately by the letters FT to indicate the units of measure (feet).*

*Note: US military stations may not report runway visual range.*

## 15.7.2

*Runway visual range shall only be reported for the designated instrument runway. The values reported shall be based on light setting 5. The lowest reportable value shall be 1000 feet (1000FT) and the highest reportable value shall be 6000 feet (6000FT). When the runway visual range is less than 1000 feet, the group V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub> shall be preceded by M as M1000FT; when the runway visual range is greater than 6000 feet, the group V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub> shall be preceded by P as P6000FT.*

## 15.7.4.3

*The runway visual range tendency shall not be reported.*

## 15.7.5

*When the runway visual range varies by more than a reportable increment during the 10-minute period preceding the observation time report, the lowest reportable value in feet for the 10 minutes preceding the observation shall be reported as V<sub>N</sub>V<sub>N</sub>V<sub>N</sub>V<sub>N</sub>. The highest reportable value in feet for the 10 minutes preceding the observation shall be reported as V<sub>X</sub>V<sub>X</sub>V<sub>X</sub>V<sub>X</sub>.*

## 15.8.1

*US stations shall report for w'w' significant weather and obstructions to vision occurring at the time of observation in accordance with Code table 4678. Appropriate intensity indicators shall be prefixed to all significant weather in accordance with 15.8.4. The following weather phenomena/qualifiers will not be reported by automated stations without manual augmentation: FC, GR, IC, PE, SG, GS, DZ, BR, FU, VA, SA, HZ, SS, DS, TS, MI, BC, DR, BL, SH, VC, PO.*

## 15.8.6

*If more than one significant weather phenomenon is observed, separate w'w' groups shall be used in accordance with Code table 4678. If more than one significant weather phenomenon is observed, entries shall be made in the following order: tornadic activity, thunderstorms, precipitation (in the order liquid, supercooled, frozen; and in the order of decreasing intensity within each type of precipitation), and obstructions to vision.*

## 15.8.8

*A thunderstorm shall be regarded as having ceased 15 minutes after thunder was last heard.*

## 15.8.12

*For w'w' = IC to be reported, the visibility shall be reduced by this phenomenon to 6 statute miles or less.*

## 15.8.13

*Obstructions to vision shall only be reported when the visibility is reported as 6 statute miles or less. Volcanic ash shall, however, always be reported.*

## 15.8.14

*For w'w' = BR to be reported, the prevailing visibility shall be at least  $\frac{5}{8}$  statute mile but no more than 6 statute miles.*



**UNITED STATES OF AMERICA** *(continued)*

15.9.1.1

*The acronym CLR may be used when no clouds below 12 000 feet are reported by automated stations.*

15.9.1.2

*US stations shall report the cumulative amount of clouds occurring at and below each level up to the first overcast layer. Clouds above 12 000 feet cannot be reported from automated stations without manual augmentation.*

15.9.1.3

*US stations shall report all cloud layers (not limited to three) in ascending order up to the first overcast layer. CB and TCU shall always be reported. Significant convective cloud (CB and TCU) information is not available from automated stations without manual augmentation.*

15.9.1.4

*These procedures shall not be used.*

15.10

*CAVOK shall not be used.*

15.13.1, 15.13.2 and 15.13.3

*US stations shall not report supplementary information using the methods described in 15.13.2 and 15.13.3. Similar information may be included as additional supplementary information using the methods described in the US coding practices 15.13.4.*

15.13.4

*Supplementary remarks may be included in observations from US stations following the identifier group RMK. These data are intended as national interest only and are equivalent to Section 5 of FM 12 SYNOP. Observations from automated stations shall have one of the following contractions as the first entry following RMK:*

*AO2 Automated station without manual augmentation;*

*AO2A Automated station with manual augmentation.*

*TORNADO, FUNNEL CLOUD or WATER SPOUT shall be spelled out and entered as the first remark whenever observed (unless the report is from an automated station).*

15.14

*Trend forecasts shall not be used.*

Code table 0300

B — Turbulence

*Code figure X = Extreme turbulence*

*Extreme turbulence: Turbulence in which the aircraft is violently tossed about and is practically impossible to control. It will cause structural damage.*

*Note: May be forecast by US military stations.*

Code table 4678

w'w' — Significant present and forecast weather

*At aerodromes with automated observing stations, precipitation may be reported as of an unknown type (UP) when the precipitation discriminator cannot identify it.*

*UP = Precipitation of unknown type*

*PY = Spray*

**UNITED STATES OF AMERICA** *(continued)*

*Notes:*

- (1) UP shall only be reported at automated stations when the precipitation discriminator cannot identify the type of precipitation.
- (2) PY shall be used only in combination with descriptor BL. Blowing spray is water droplets torn by the wind from a body of water, generally from crests of waves, and carried into the air in such quantities that horizontal visibility is reduced to 6 statute miles (9 000 m) or less.

**FM 32 PILOT and FM 33 PILOT SHIP**

**CANADA**

- Section 3            Only one maximum wind (the greatest maximum) is reported.  $H_m H_m H_m H_m$  is reported in increments of 30 feet, i.e. the altitude in feet of the level of maximum wind is obtained from a coded report by multiplying the value reported for  $H_m H_m H_m H_m$  by 30 ( $1\,400 \times 30 = 42\,000$  ft).
- Section 4            Altitudes of fixed regional levels and significant levels are reported in units of 300 metres.

**FM 35 TEMP and FM 36 TEMP SHIP**

**UNITED STATES OF AMERICA**

- Parts A, B,  
C and D            When the relative humidity at any level is less than 20 per cent, the dew-point depression is encoded as code figure 80.

**FM 37 TEMP DROP**

**UNITED STATES OF AMERICA**

*As an exception starting on 7 April 1998 at 1200 UTC and continue in effect until the requested modifications to the TEMP DROP code forms have been implemented, the USA will add the following:*

1. *In Part A, add the following after SECTION 4*  

SECTION 10	61616 62626	}	Code groups developed nationally
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2. *In Part C, add the following after SECTION 4*  

SECTION 10	61616 62626	}	Code groups developed nationally
------------	----------------	---	----------------------------------

The text following the indicator group “61616”, as national practice data within all TEMP DROP reports for all parts (A – D) will be a character string of six fields:

FIELD<sub>1</sub>    FIELD<sub>2</sub>    FIELD<sub>3</sub>    FIELD<sub>4</sub>    FIELD<sub>5</sub>    FIELD<sub>6</sub>

FIELD<sub>1</sub>    5-character Agency/Aircraft Identifier:

- for the US Air Force, the string “AF” plus last 3 digits of tail number
- for the National Oceanographic and Atmospheric Administration, the string “NOAA” plus last digit of tail number

**UNITED STATES OF AMERICA** *(continued)*

- FIELD<sub>2</sub> 5-character Mission Storm System Indicator:
- Characters 1–2 are either numerics denoting the sequential number of the mission in this storm, or else the string “WX” in the case of a non-tasked mission.
  - Characters 3–4 are either numerics denoting the depression number or else one of the strings “WS”, “WX”, “XX”, “YY”, or “ZZ” if not a depression.
  - Character 5 denotes the location of the system or in the case of no system then use the point of origin/departure of the mission:
    - A = Atlantic, Caribbean, or Gulf of Mexico
    - C = Central Pacific
    - E = Eastern Pacific
    - W = Western Pacific
- FIELD<sub>3</sub> Variable length character string describing the nature of the mission, for example:
- the system name,
  - “CYCLONE”,
  - “INVEST” (short for “INVESTIGATION”) in the cases of unnamed systems or investigative missions,
  - “TRAIN” for untasked, non-storm related missions, or “TRACKxx” where xx is the track number for winter storm operations.
- FIELD<sub>4</sub> The string “OB” (short for “OBSERVATION”).
- FIELD<sub>5</sub> 2 or 3 digits denoting the sequential number of the observation, taking into account “all” RECCO, TEMP DROP, vortex, and supplemental reports for this mission.
- FIELD<sub>6</sub> 4-letter ICAO identifier for the station that copied and disseminated the observations.

The USA will also include a free-form character string following the indicator group “62626” as national practice data within all TEMP DROP reports for all parts (A – D).

**FM 39** ROCOB and **FM 40** ROCOB SHIP

**UNITED STATES OF AMERICA**

$r_m$  — Type of rocket motor (Code table 3644) — *the following additional code figure is used:*

Code  
figure

6	102 mm (4.0 in.), internal burning
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**FM 51 TAF****CANADA**dddffG<sub>m</sub>f<sub>m</sub>

51.3.1 *Wind speeds are always forecast in knots (KT).*

51.3.3 *ddd is also encoded as VRB for wind speed greater than 3 knots when associated with TS.*

**WS**<sub>h<sub>x</sub>h<sub>x</sub>h<sub>x</sub></sub>/dddffKT

New group *The strong non-convective low-level wind shear group shall be included in all TAFs whenever this phenomenon is expected to be significant enough to affect adversely aircraft operation within 1 500 feet above ground level. The wind shear group, when included, will be placed after the wind group followed by one space. The wind shear group is decoded according to the following:*

**WS:** *is the wind shear term*

**h<sub>x</sub>h<sub>x</sub>h<sub>x</sub>:** *is the height (above ground) of the top of the layer in which strong low-level wind shear is forecast*

**ddd:** *is the wind direction at level h<sub>x</sub>h<sub>x</sub>h<sub>x</sub>*

**ffKT:** *is the wind speed in knots (kt) at level h<sub>x</sub>h<sub>x</sub>h<sub>x</sub>. When the wind speed (ff) is expected to be 100 knots or greater, a three-digit figure (fff) shall be used.*

**VVV**

51.4.1 *Prevailing visibility, rather than minimum visibility, is forecast.*

*Visibility is forecast in statute miles and fractions up to three miles, then in whole miles up to six miles. Visibilities greater than six miles are forecast as P6SM. The letters SM (statute miles) are appended, without a space, to each forecast visibility to identify the units.*

**w'w'**

51.5 *When a significant change in visibility is forecast, not only the weather phenomenon responsible for the change shall be indicated, but the entire w'w' group shall be stated.*

51.5.1 *Volcanic ash (VA), when expected, is always forecast regardless of visibility.*

*Smoke (FU), ice crystals (IC), haze (HZ), dust (DU), and sand (SA) are forecast when they are expected to reduce the visibility to six statute miles or less.*

*Mist (BR) is forecast when it is expected to reduce the visibility between <sup>5</sup>/<sub>8</sub> mile and six miles, inclusive. Fog (FG) is forecast when the visibility is expected to be less than <sup>5</sup>/<sub>8</sub> mile.*

**N<sub>s</sub>N<sub>s</sub>N<sub>s</sub>h<sub>s</sub>h<sub>s</sub>h<sub>v</sub>**

51.6.1 *Forecast cloud amounts are cumulative and are forecast for all layers up to and including the first overcast layer, if any.*

**CANADA** (continued)

51.6.1.6 TCU is not forecast.

SKC *The abbreviation SKC is used to forecast the absence of cloud or vertical obscuration at the beginning of any self-contained part period. It may also replace the cloud or vertical visibility group after a change of the form TEMPO/BECMG GGG<sub>c</sub>G<sub>c</sub>.*

**NSC**

51.6.3 **NSC** ("No Significant Cloud") is not used as there is no upper limit to the forecast cloud layers. The abbreviation SKC is used to indicate the absence of cloud.

**CAVOK**

51.7 **CAVOK** is not used.

**TXT<sub>F</sub>T<sub>F</sub>/Y<sub>F</sub>Y<sub>F</sub>G<sub>F</sub>G<sub>F</sub>Z TNT<sub>F</sub>T<sub>F</sub>/Y<sub>F</sub>Y<sub>F</sub>G<sub>F</sub>G<sub>F</sub>Z**

51.10 Forecast maximum and minimum temperatures are not included.

**RMK**

Addition *Remarks will always be included at the end of every TAF. These will indicate the time the next forecast will be issued (NXT FCST BY XXZ) or that the forecast is based on the automatic weather observing system (FCST BASED ON AUTO OBS).*

**MEXICO**

Generally speaking, the code form TAF is used in Mexico with the same format and criteria as those adopted in the USA and Canada.

**National deviations**

dddfG<sub>f</sub>m<sub>f</sub>m<sub>f</sub>**KT** *Wind speed shall be expressed in knots.*

VVVSM *Prevailing visibility shall be forecast in statute miles (SM) and fractions, the values being 0, 1/4, 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 5, 6, and P6.*

N<sub>5</sub>N<sub>5</sub>N<sub>5</sub>h<sub>5</sub>h<sub>5</sub>h<sub>5</sub> *The number of layers to be forecast shall be unlimited.*

CAVOK *The code word **CAVOK** shall not be used.*

w'w' *The abbreviation **NSC** shall not be used.*

PROBC<sub>2</sub>C<sub>2</sub> GGG<sub>e</sub>G<sub>e</sub> *Only PROB40 shall be used to indicate the occurrence of an electric storm or precipitation with a probability of 30–45 per cent.*

**UNITED STATES OF AMERICA****National deviations from the following global regulations:**

## 51.3.3

*In the case of variable wind direction, ddd may be encoded as variable, VRB, when the mean wind speed is forecast to be six knots or less.*

## 51.3.4

*When the peak wind speed is forecast to exceed the lull by 10 knots or more, the maximum wind speed shall be indicated by adding  $Gf_m f_m$  immediately after dddff.*

## 51.4.1

*The prevailing visibility shall be forecast.*

## 51.4.3

*Prevailing visibility shall be forecast in statute miles and fractions of statute miles as described in US coding practice to Regulation 15.6.4. The value of the prevailing visibility shall be followed immediately by the letters SM to indicate the units.*

*Note: US military stations may forecast prevailing visibility in metres.*

## 51.5.1

*Obstructions to vision shall be forecast whenever the prevailing visibility is forecast to be 6 statute miles or less. Visibilities greater than six statute miles shall be indicated by prefixing P as in P6SM. Volcanic ash shall be forecast as relevant, regardless of the degree of obstruction to vision.*

## 51.6.1.2

*All cloud layers up to the first overcast layer shall be forecast.  $N_s N_s N_s$  shall be the cumulative amount of sky cover forecast to be at the level  $h_s h_s h_s$  and all lower layers.*

## 51.6.1.3

*All cloud layers shall be forecast in ascending order. CB clouds, when forecast, shall always be included.*

## 51.6.1.4

*These procedures shall not be followed.*

## 51.7

**CAVOK** shall not be used.

*In addition, the United States may optionally include the following groups immediately preceding the **PROBC<sub>2</sub>C<sub>2</sub>** group:*

**(6I<sub>c</sub>h<sub>i</sub>h<sub>i</sub>h<sub>i</sub>t<sub>L</sub>) (5Bh<sub>B</sub>h<sub>B</sub>h<sub>B</sub>t<sub>L</sub>)**

**(6I<sub>c</sub>h<sub>i</sub>h<sub>i</sub>h<sub>i</sub>t<sub>L</sub>)** Forecast icing group, used to forecast icing not associated with thunderstorms (thunderstorm forecasts imply moderate or greater icing). Repeat as necessary to indicate multiple icing layers. Omit when no icing is forecast. Format icing groups as:

6 Icing group indicator.

I<sub>c</sub> Type of icing from Table 1.5. When more than one type is expected within the same layer, encode the highest code figure.

**UNITED STATES OF AMERICA** (continued)

$h_i h_i h_i$	Height of base of icing layer in hundreds of feet above surface (see Note (1) under h). (Table 1.4).
$t_L$	Thickness of the icing layer in thousands of feet (Table 1.6). When a layer is forecast to be thicker than 9 000 feet, repeat the icing group so that the base of the layer expressed by the second group coincides with the top layer given by the first group (see Note).
$(5Bh_B h_B h_B t_L)$	Forecast turbulence group, used only to forecast turbulence not associated with a thunderstorm (thunderstorms already imply severe or extreme turbulence). Turbulence forecasts apply to category II (CAT II) aircraft. Omit when no turbulence is forecast. Format turbulence groups as:
5	Turbulence group indicator.
B	Turbulence type and intensity. (Table 1.7).
$h_B h_B h_B$	Forecast height of the turbulence layer in hundreds of feet above surface (see Note (1) under h). (Table 1.4).
$t_L$	Thickness of the turbulence layer in thousands of feet (Table 1.6). When a layer is forecast to be thicker than 9 000 feet, repeat the turbulence group so that the base of the layer expressed by the second group coincides with the top layer given by the first group (see Note).

*Note:* Icing and turbulence forecasts are for phenomena not associated with thunderstorm activity, from surface to 10 000 feet above the surface.

**Code tables:****CODE TABLE 1.4**

$h_B h_B h_B$  — Height of lowest level of turbulence

$h_i h_i h_i$  — Height of lowest level of icing

Code figure	Metres	Feet
000	<30	<100
001	30	100
002	60	200
003	90	300
004	120	400
005	150	500
006	180	600
007	210	700
008	240	800
009	270	900
010	300	1 000
011	330	1 100
Etc.	Etc.	Etc.
099	2 970	9 900
100	3 000	10 000
110	3 300	11 000
120	3 600	12 000
Etc.	Etc.	Etc.
990	29 700	99 000
999	30 000 or more	100 000 or more

**UNITED STATES OF AMERICA** *(continued)***CODE TABLE 1.5** $I_c$  — *Type of icing*

Code figure	Type of icing
0	Trace icing
1	Light icing (mixed)
2	Light icing in cloud (rime)
3	Light icing in precipitation (clear)
4	Moderate icing (mixed)
5	Moderate icing in cloud (rime)
6	Moderate icing in precipitation (clear)
7	Severe icing (mixed)
8	Severe icing in cloud (rime)
9	Severe icing in precipitation (clear)

**CODE TABLE 1.6** $t_L$  — *Thickness of turbulence/icing layers*

Code figure	Thickness
1	1 000 feet
2	2 000 feet
3	3 000 feet
4	4 000 feet
5	5 000 feet
6	6 000 feet
7	7 000 feet
8	8 000 feet
9	9 000 feet

**CODE TABLE 1.7** $B$  — *Turbulence type/intensity*

Code figure	Turbulence type and intensity
0	None
1	Light turbulence
2	Moderate turbulence in clear air, occasional
3	Moderate turbulence in clear air, frequent
4	Moderate turbulence in cloud, occasional
5	Moderate turbulence in cloud, frequent
6	Severe turbulence in clear air, occasional
7	Severe turbulence in clear air, frequent
8	Severe turbulence in cloud, occasional
9	Severe turbulence in cloud, frequent
X	Extreme turbulence

*Note: "occasional" is defined as occurring less than  $\frac{1}{3}$  of the time.*



**FM 86 SATEM**

**UNITED STATES OF AMERICA**

$A_t$  — *Index of accuracy (standard error) of tropopause data*

Note: Accuracy applies to the value given for the tropopause level  $P_t P_t P_t$ .

Code  
figure

0	Accuracy not specified
1	10 hPa
2	20 hPa
3	30 hPa
4	40 hPa
5	50 hPa
6	60 hPa
7	70 hPa
8	80 hPa
9	More than 80 hPa

$I_5$  — *Indicator figure for data-processing technique used to identify tropopause level*

Code  
figure

0	Processing technique not specified
1	Automated statistical regression
2–4	Reserved for other automated techniques
5	Manual and computer interactive processing
6–9	Reserved for other integrated manual and automated techniques



## E — NATIONAL CODE FORMS

### UNITED STATES OF AMERICA

#### RECCO — Report from a meteorological reconnaissance flight

#### CODE FORM :

SECTION 1 (Mandatory)	9XXX9 ddfff  (RMK ... Special text)	GGggi <sub>d</sub> TTT <sub>d</sub> T <sub>d</sub> w	YQL <sub>a</sub> L <sub>a</sub> L <sub>a</sub> /jHHH	L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> Bf <sub>c</sub>	h <sub>a</sub> h <sub>a</sub> h <sub>a</sub> d <sub>t</sub> d <sub>a</sub>
SECTION 2 (Additional)	1k <sub>n</sub> N <sub>s</sub> N <sub>s</sub> N <sub>s</sub> 7I <sub>r</sub> I <sub>t</sub> S <sub>b</sub> S <sub>e</sub>  (RMK ... Special text)	Ch <sub>s</sub> h <sub>s</sub> H <sub>t</sub> H <sub>t</sub> 7h <sub>i</sub> h <sub>i</sub> H <sub>i</sub> H <sub>i</sub>	(Ch <sub>s</sub> h <sub>s</sub> H <sub>t</sub> H <sub>t</sub> ) 8d <sub>r</sub> d <sub>r</sub> S <sub>r</sub> O <sub>e</sub>	4ddff 8E <sub>w</sub> E <sub>i</sub> c <sub>e</sub> i <sub>e</sub>	6W <sub>s</sub> S <sub>s</sub> W <sub>d</sub> d <sub>w</sub> 9V <sub>i</sub> T <sub>w</sub> T <sub>w</sub> T <sub>w</sub>
SECTION 3 (Intermediate)	9XXX9 ddfff  (RMK ... Special text)	GGggi <sub>d</sub> TTT <sub>d</sub> T <sub>d</sub> w	YQL <sub>a</sub> L <sub>a</sub> L <sub>a</sub> /jHHH	L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> Bf <sub>c</sub>	h <sub>a</sub> h <sub>a</sub> h <sub>a</sub> d <sub>t</sub> d <sub>a</sub>

#### Notes :

- (1) Sounding data from reconnaissance aircraft are encoded in code form FM 37 TEMP DROP.
- (2) In the code group 9XXX9, XXX may be encoded as either 222 or 777 in Section 1, but only as 555 in Section 3 (see Code table 4-18).
- (3) Plain-language remarks may be added after the coded data.
- (4) The area covered by the report is a circle, centred at the position of the aircraft, with a radius of 30 nautical miles.

Specifications of symbolic letters other than those specified either in Volume I.1 or in Section B of Chapter IV of Volume II:

C	Genus of cloud predominating in the layer. (Code table 0500)
c <sub>e</sub>	Character of echo. (Code table 4-1) (1) The term [solid] is used when the individual echoes are not distinctly and widely separated.
d <sub>a</sub>	Method of obtaining flight-level wind. (Code table 4-3)
d <sub>t</sub>	Type of wind at flight altitude. (Code table 4-4)
d <sub>w</sub>	Bearing of distant weather. (Code table 4-2)
dd	Direction, in tens of degrees, from which the wind is blowing at the level given by h <sub>a</sub> h <sub>a</sub> h <sub>a</sub> , or direction, in tens of degrees, from which the surface wind is blowing. (Code table 0877)
d <sub>r</sub> d <sub>r</sub>	Bearing of echo centre from aircraft, in tens of degrees. (Code table 0877) (1) Code figure 99 indicates echoes in all directions.
E <sub>i</sub>	Length of echo axis, in tens of nautical miles.
E <sub>w</sub>	Echo width or diameter, in tens of nautical miles.
f <sub>c</sub>	Flight conditions. (Code table 4-5) (1) The most representative conditions experienced at flight level, along the route of flight, are reported for f <sub>c</sub> .

# REGION IV

## UNITED STATES OF AMERICA *(continued)*

ff	Wind speed, in knots, at the surface. (1) Wind speeds of 100–130 knots inclusive are indicated by adding 50 to dd and subtracting 100 from the actual speed. If the wind speed is greater than 130 knots, dd is indicated without adding 50, ff is coded as //, and the plain language remark SURFACE WIND ABOVE 130 KNOTS is added to the report.
fff	Wind speed, in knots, at the level given by $h_a h_a h_a$ .
$H_i H_i$	Altitude of the top of the layer in which icing occurred. (Code table 1677) (1) Level flight is indicated by //.
$H_t H_t$	Altitude of tops of clouds reported by C. (Code table 1677) (1) The average altitude of cloud bases and tops is reported for $h_s h_s$ and $H_t H_t$ , respectively.
HHH	Geopotential height reported in metres below 500 hPa and decametres at and above 500 hPa, D-value in decametres (500 added if negative), or sea-level pressure in whole hectopascals, as specified by code figure j.
$h_i h_i$	Altitude of the base of the layer in which icing occurred. (Code table 1677) (1) In level flight, the height at which icing occurred is reported for $h_i h_i$ .
$h_s h_s$	Altitude of bases of clouds reported by C. (Code table 1677) (1) See Note (1) under $H_t H_t$ .
$h_a h_a h_a$	Altitude of the aircraft, in decametres. (1) Pressure altitude relative to the 1976 US Standard Atmosphere (altimeter set to 29.92 in Hg).
$I_r$	Rate of icing. (Code table 4–6)
$I_t$	Type of icing and type of contrails. (Code table 4–7)
$i_d$	Dew point, aircraft altitude, and air temperature indicator. (Code table 4–8)
$i_e$	Intensity of echo. (Code table 4–9)
j	Index pertaining to HHH. (Code table 4–10)
$k_n$	Number of cloud layers reported. (1) If the number of cloud layers reported exceeds three, $k_n$ in the first 1-group reports the total number of cloud layers. The second 1-group reports the additional number of layers being reported exclusive of those previously reported.
$L_a L_a L_a$	Latitude, at time GGgg, to the nearest tenth of a degree.
$L_o L_o L_o$	Longitude, at time GGgg, to the nearest tenth of a degree. (1) The hundreds digit is omitted for longitudes 100° to 180°.
$N_s$	Amount of individual cloud layer or mass, of genus C, where s specifies sequential number of the cloud layer. (Code table 2700) (1) The amount of cloud reported for $N_s$ is the amount in the individual layer as though no other cloud were present, i.e. the summation concept is not used.
$O_e$	Orientation of ellipse. (Code table 4–12)
$S_b$	Distance to beginning of icing. (Code table 4–13)
$S_e$	Distance to ending of icing. (Code table 4–13)
$S_r$	Distance to echo centre. (Code table 4–11) (1) If a line of echoes is observed, $S_r$ is the distance to the mid-point of the line.

# REGION IV

## UNITED STATES OF AMERICA (continued)

S <sub>s</sub>	Distance of occurrence of W <sub>s</sub> . (Code table 4–13)
TT	Air temperature at flight level h <sub>a</sub> h <sub>a</sub> h <sub>a</sub> , in whole degrees Celsius. (1) For negative temperatures, 50 is added to the absolute value of the temperature, with the hundreds figure, if any, being omitted. A temperature of –50°C is given as 00, the distinction between –50°C and 0°C being made from i <sub>d</sub> . (Code table 4–8). Missing or unknown temperatures are reported as //.
T <sub>d</sub> T <sub>d</sub>	Dew point, in whole degrees Celsius. (1) For negative values, see Note (1) under TT. A report of // for T <sub>d</sub> T <sub>d</sub> when i <sub>d</sub> is coded as 4 to 7 indicates a relative humidity less than 10 per cent or T <sub>d</sub> T <sub>d</sub> below –49°C.
T <sub>w</sub> T <sub>w</sub> T <sub>w</sub>	Sea-surface temperature, in tenths of a degree Celsius.
V <sub>i</sub>	In-flight horizontal visibility. (Code table 4–14)
W <sub>d</sub>	Distant weather. (Code table 4–15) (1) Weather conditions of importance observed outside the observation circle at the time of the observation (more than 30 nautical miles from the aircraft position) are reported for W <sub>d</sub> .
W <sub>s</sub>	Significant weather changes. (Code table 4–16) (1) Significant weather changes which have occurred along the track of the aircraft since the last observation are reported for W <sub>s</sub> .
w	Present weather. (Code table 4–17) (1) If more than one type of weather is observed, the highest code figure will be reported for w.
XXX	Indicator specifying type of RECCO observation and presence or absence of radar data capability. (Code table 4–18)
1,4,6, 7,8 and 9 }	Group indicator figures specifying the data reported by the remainder of the digits in the group.
9XXX9	Indicator group specifying RECCO observation.

RMK ... Special text...

This special text contains seven fields of characters:

FIELD 1 Five-character Agency/Aircraft Identifier:

- For the US Air Force, the string “AF” plus last three digits of tail number
- For the National Oceanographic and Atmospheric Administration, the string “NOAA” plus last digit of tail number

FIELD 2 Five-character Mission Storm System Indicator:

- Characters 1–2 are either numerics denoting the sequential number of the mission in this storm, or else the string “WX” in the case of a non-tasked mission or “WS” for winter.
- Characters 3–4 are either numerics denoting the depression number or else one of the strings “WS”, “WX”, “XX”, “YY”, or “ZZ” if not a depression.
- Character 5 denotes the location of the system or in the case of no system then use the point of origin/departure of the mission:  
A = Atlantic, Caribbean, or Gulf of Mexico  
C = Central Pacific  
E = Eastern Pacific  
W = Western Pacific

## REGION IV

### UNITED STATES OF AMERICA *(continued)*

FIELD 3 Variable length string describing the nature of the mission, for example: the system name, "CYCLONE", "INVEST" (short for "INVESTIGATION") in the cases of unnamed systems or investigative missions, "TRAIN" for untasked, non-storm related missions, or "TRACKxx" where "xx" is the track number for winter storm operations.

FIELD 4 The string "OB" (short for "OBSERVATION").

FIELD 5 Two or three digits denoting the sequential number of the observation, taking into account "all" RECCO, TEMP DROP, vortex, and supplemental reports for this mission.

FIELD 6 Four-letter ICAO identifier for the station that copied and disseminated the observations.

FIELD 7 Additional remarks may be included as follows:

- (1) For the first weather observation, include the ICAO four-letter identifier for the departure station, time of departure, and estimated time of arrival (ETA) at the interest points, coordinates of the storm, or control point as applicable.
- (2) For diverted aircraft, the first observation on the new mission will include the time of diversion and ETA of coordinates of interest.
- (3) For the final weather observation, include ETA, destination, number of observations, and ICAO identifier of monitoring station that copied the observations.

#### Code tables:

**CODE TABLE 4-1**

$c_e$  — *Character of echo*

Code  
figure

1	Scattered area
2	Solid area
3	Scattered line
4	Solid line
5	Scattered, all quadrants
6	Solid, all quadrants
/	Unknown

**CODE TABLE 4-2**

$d_w$  — *Bearing of distant weather*

Code  
figure

0	No report
1	NE
2	E
3	SE
4	S
5	SW
6	W
7	NW
8	N
9	All directions

**UNITED STATES OF AMERICA** *(continued)*

**CODE TABLE 4-3**

$d_a$  — *Method of obtaining flight-level wind*

Code  
figure

- |   |   |
|---|---|
| 0 | Doppler radar or inertial systems                                   |
| 1 | Other navigation equipment and/or techniques                        |
| / | Unable to obtain wind, or wind not compatible with pressure pattern |

**CODE TABLE 4-4**

$d_t$  — *Type of wind at flight altitude*

Code  
figure

- |   |                  |
|---|------------------|
| 0 | Spot wind        |
| 1 | Average wind     |
| / | No wind reported |

**CODE TABLE 4-5**

$f_c$  — *Flight conditions*

Code  
figure

- |   |   |
|---|---|
| 0 | In the clear  |
| 8 | In and out of clouds (intermediate instrument meteorological conditions)    |
| 9 | In clouds all of the time (continuous instrument meteorological conditions) |
| / | Impossible to determine due to darkness or any other cause                  |

**CODE TABLE 4-6**

$I_r$  — *Rate of icing*

Code  
figure

- |   |          |
|---|----------|
| 7 | Light    |
| 8 | Moderate |
| 9 | Severe   |
| / | Unknown  |

REGION IV

**UNITED STATES OF AMERICA** *(continued)*

**CODE TABLE 4-7**

$I_t$  — *Type of icing and type of contrails*

Code  
figure

0	None
1	Rime ice in cloud
2	Clear ice in cloud
3	Combination rime and clear ice in cloud
4	Rime ice in precipitation
5	Clear ice in precipitation
6	Combination rime and clear ice in precipitation
7	Frost (icing in clear air)
8	Non-persistent contrails (less than $\frac{1}{4}$ nautical mile long)
9	Persistent contrails

**CODE TABLE 4-8**

$i_d$  — *Dew point, aircraft altitude, and air temperature indicator*

Code  
figure

0	Dew point not measured/aircraft below 10 000 metres
1	Dew point not measured/aircraft at or above 10 000 metres
2	Dew point not measured/aircraft below 10 000 metres and flight-level temperature $-50^{\circ}\text{C}$ or colder
3	Dew point not measured/aircraft at or above 10 000 metres and flight-level temperature $-50^{\circ}\text{C}$ or colder
4	Dew point measured/aircraft below 10 000 metres
5	Dew point measured/aircraft at or above 10 000 metres
6	Dew point measured/aircraft below 10 000 metres and flight-level temperature $-50^{\circ}\text{C}$ or colder
7	Dew point measured/aircraft at or above 10 000 metres and flight-level temperature $-50^{\circ}\text{C}$ or colder

**N o t e :** For code figures 4 to 7, see Note (1) under specification of  $T_d T_d$ .

**CODE TABLE 4-9**

$i_e$  — *Intensity of echo*

Code  
figure

2	Weak
5	Moderate
8	Strong
/	Unknown



**UNITED STATES OF AMERICA** *(continued)***CODE TABLE 4-10***j* — *Index pertaining to HHH*Code  
figure

0	Sea-level pressure in whole hectopascals; thousands figure, if any, omitted
1	Altitude of 200 hPa surface in geopotential decametres; thousands figure omitted
2	Altitude of 850 hPa surface in geopotential metres; thousands figure omitted
3	Altitude of 700 hPa surface in geopotential metres; thousands figure omitted
4	Altitude of 500 hPa surface in geopotential decametres
5	Altitude of 400 hPa surface in geopotential decametres
6	Altitude of 300 hPa surface in geopotential decametres
7	Altitude of 250 hPa surface in geopotential decametres; thousands figure, if any, omitted
8	D-value in geopotential decametres; if negative 500 is added to HHH
9	Altitude of 925 hPa surface in geopotential metres; thousands figure omitted
/	Geopotential height not available or not within $\pm 30$ m/4 hPa requirements

Note: When *j* = /, HHH is encoded as ///.**CODE TABLE 4-11***S<sub>r</sub>* — *Distance to echo centre*Code  
figure

0	0– 4 nautical miles
1	5– 14 nautical miles
2	15– 24 nautical miles
3	25– 34 nautical miles
4	35– 44 nautical miles
5	45– 54 nautical miles
6	55– 80 nautical miles
7	80–100 nautical miles
8	100–150 nautical miles
9	More than 150 nautical miles
/	Unknown

**UNITED STATES OF AMERICA** *(continued)*

**CODE TABLE 4-12**

$O_e$  — *Orientation of ellipse*

Code  
figure

0	Circular
1	NNE – SSW
2	NW – SW
3	ENE – WSW
4	E – W
5	ESE – WNW
6	SE – NW
7	SSE – NNW
8	S – N
/	Unknown

**CODE TABLE 4-13**

$S_b$  — *Distance to beginning of icing*

$S_e$  — *Distance to ending of icing*

$S_s$  — *Distance of occurrence of  $W_s$*

Code  
figure

0	No report
1	Previous position
2	Present position
3	30 nautical miles
4	60 nautical miles
5	90 nautical miles
6	120 nautical miles
7	150 nautical miles
8	180 nautical miles
9	More than 180 nautical miles
/	Unknown

**CODE TABLE 4-14**

$V_i$  — *In-flight horizontal visibility*

Code  
figure

1	In-flight visibility 0 to and including 1 nautical mile
2	In-flight visibility greater than 1 and not exceeding 3 nautical miles
3	In-flight visibility greater than 3 nautical miles

**UNITED STATES OF AMERICA** *(continued)*

**CODE TABLE 4-15**

$W_d$  — *Distant weather*

Code  
figure

- |   |   |
|---|---|
| 0 | No report                                 |
| 1 | Signs of a tropical cyclone               |
| 2 | Ugly, threatening sky                     |
| 3 | Duststorm or sandstorm                    |
| 4 | Fog or ice fog                            |
| 5 | Waterspout                                |
| 6 | Cirrostratus shield or bank               |
| 7 | Altostratus or Altocumulus shield or bank |
| 8 | Line of heavy Cumulus                     |
| 9 | Cumulonimbus heads or thunderstorm        |

**CODE TABLE 4-16**

$W_s$  — *Significant weather changes*

Code  
figure

- |   |   |
|---|---|
| 0 | No change                                     |
| 1 | Marked wind shift                             |
| 2 | Beginning or ending of marked turbulence      |
| 3 | Marked temperature change (not with altitude) |
| 4 | Precipitation begins or ends                  |
| 5 | Change in cloud forms                         |
| 6 | Fog or ice fog bank begins or ends            |
| 7 | Warm front                                    |
| 8 | Cold front                                    |
| 9 | Front, type not specified                     |

**UNITED STATES OF AMERICA** *(continued)***CODE TABLE 4-17***w — Present weather*Code  
figure

0	Clear
1	Scattered clouds (trace to $\frac{4}{8}$ coverage)
2	Broken clouds ( $\frac{5}{8}$ to $\frac{7}{8}$ coverage)
3	Overcast or undercast clouds (more than $\frac{7}{8}$ coverage)
4	Fog, thick dust or haze
5	Drizzle
6	Rain (precipitation from stratiform clouds)
7	Snow or mixed rain and snow
8	Showers (precipitation from cumuliform clouds)
9	Thunderstorms
/	Unknown for any cause including darkness

**CODE TABLE 4-18***XXX — Indicator specifying type of RECCO observation and presence or absence of radar data capability*Code  
figure

222	Section 1 observation without radar capability
555	Section 3 observation with or without radar capability
777	Section 1 observation with radar capability

**UNITED STATES OF AMERICA** *(continued)*

**Coded prognosis (grid-point)**

**C O D E F O R M :**

Preamble:	65556	0YYG <sub>c</sub> G <sub>c</sub>	000G <sub>p</sub> G <sub>p</sub>	8x <sub>2</sub> x <sub>2</sub> x <sub>2</sub> 8	00x <sub>3</sub> x <sub>3</sub> x <sub>3</sub>	
	PART X	Geographical area				
Analysis:	I <sub>T</sub> IIJJ	H <sub>1</sub> H <sub>1</sub> H <sub>1</sub> H <sub>2</sub> H <sub>2</sub>	H <sub>1</sub> H <sub>1</sub> H <sub>1</sub> H <sub>2</sub> H <sub>2</sub>	H <sub>1</sub> H <sub>1</sub> H <sub>1</sub> H <sub>2</sub> H <sub>2</sub>	.....	
	I <sub>T</sub> IIJJ	H <sub>1</sub> H <sub>1</sub> H <sub>1</sub> H <sub>2</sub> H <sub>2</sub>	H <sub>1</sub> H <sub>1</sub> H <sub>1</sub> H <sub>2</sub> H <sub>2</sub>	H <sub>1</sub> H <sub>1</sub> H <sub>1</sub> H <sub>2</sub> H <sub>2</sub>	.....	
	etc.					

**N o t e s :**

- (1) The groups in the first line which follows the abbreviated telecommunication heading constitute the preamble. The group 65556 indicates that a prognosis follows. For the meaning of the other groups, see specifications of symbolic letters below.
- (2) The second line may contain further information on the grid area in plain language, e.g., PART 1 North America.
- (3) Lines 3, 4, 5 . . . , etc., consist normally of nine groups.

Specifications of symbolic letters other than those specified either in Volume I.1 or in Section B of Chapter IV of Volume II:

X	Number of a part of the analysis.	
I <sub>T</sub>	Indicator for type of data. If heights are indicated, 1 is to be coded for I <sub>T</sub> ; if winds, 5.	
II	First coordinate of the farthest left point in the line	} with reference to 1.1 origin, located lower-left corner of grid (see Figure 1).
JJ	Second coordinate of the farthest left point in the line	
	Example: The coordinates of the North Pole are II = 33, JJ = 33.	
H <sub>1</sub> H <sub>1</sub> H <sub>1</sub>	Height of point in decametres.	
H <sub>2</sub> H <sub>2</sub>	Height of the next alternate point to the right in the line, with its first figure omitted.	

**UNITED STATES OF AMERICA** *(continued)*

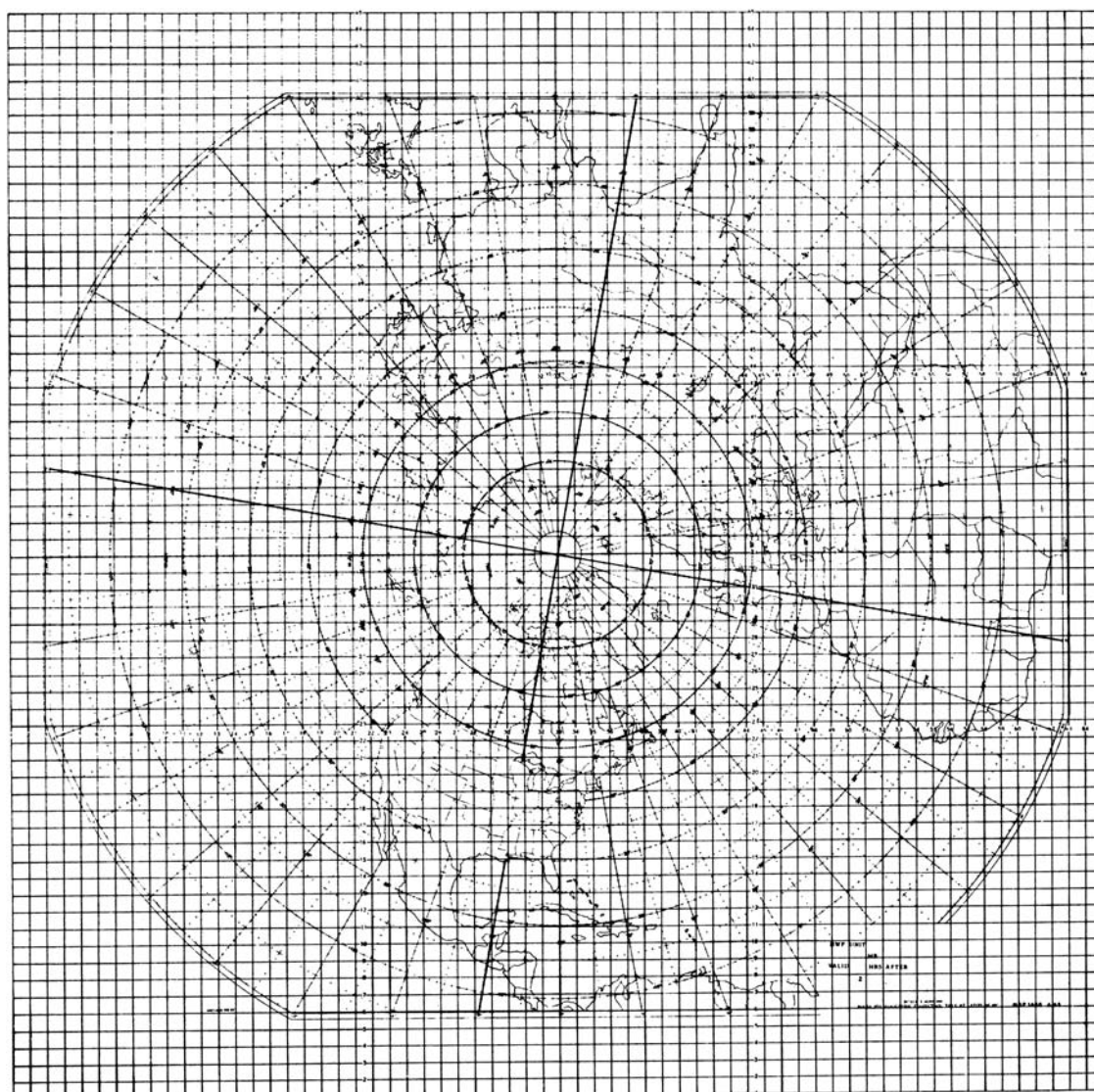


Figure 1

# REGION IV

## UNITED STATES OF AMERICA (continued)

### Form of message for grid-point values of five-day means

#### CODE FORM :

GRID PART X	MMDDN	L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> // L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> // .....	L <sub>a</sub> L <sub>a</sub> PPP L <sub>a</sub> L <sub>a</sub> PPP .....	QH <sub>5</sub> H <sub>5</sub> H' <sub>5</sub> H' <sub>5</sub> QH <sub>5</sub> H <sub>5</sub> H' <sub>5</sub> H' <sub>5</sub> .....	etc.
-------------	-------	---	---	---	------

**Note :** The northern hemisphere is represented by a 473 grid-point array including the North Pole, 4 points on 85°N at 90° intervals, 18 points on 80°N at 20° intervals beginning at 20°W, 18 points on 75°N at 20° intervals beginning at 10°W, and 36 points on the remaining latitudes 15°–70°N at 10° intervals beginning at 10°W for even-numbered latitudes and 05°W for odd-numbered latitudes. Data within each transmission are arranged by longitude, so that each part of the four-part transmission only includes data for one octant of the globe.

Specifications of symbolic letters other than those specified either in Volume I.1 or in Section B of Chapter IV of Volume II:

DD	Day of month of first day of period from which mean data are computed.
N	Number of day in period from which mean data are computed (N is normally 5 except for final period of each month where it can be 3, 4, 5 or 6).
L <sub>o</sub> L <sub>o</sub> L <sub>o</sub>	Longitude of a grid point (005° to 360° west of Greenwich).
L <sub>a</sub> L <sub>a</sub>	Latitude of a grid point (15° to 90° N).
PPP	Sea-level pressure, in tenths of a hectopascal.
H <sub>5</sub> H <sub>5</sub>	Mean height of the 500 hPa level, in geopotential decametres.
H' <sub>5</sub> H' <sub>5</sub>	Mean thickness of the layer between the 500 hPa and 1000 hPa levels, in geopotential decametres.

**UNITED STATES OF AMERICA** *(continued)*

**SEALEV — Form for exchange of information on local relative sea level**

**CODE FORM/TABULAR FORMAT:**

SEALEV

<u>LAT</u>	<u>LONG</u>	<u>TIME</u>	<u>STATION</u>
L <sub>a</sub> L <sub>a</sub> L <sub>a</sub> L <sub>a</sub> A	L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> L <sub>o</sub> B	DDDGGgg	D . . . . D

LEVELS

zzzz zzzz zzzz . . .

**Notes:**

- (1) This code form presents, in tabular form, information on local relative sea level from selected US stations in the South Pacific. Underlined words represent table headings.
- (2) The bulletin begins with the word SEALEV, which identifies it as a bulletin of local relative sea-level values.
- (3) The data portion of the message consists of a variable number of groups indicating the mean local relative sea level. The water level relative to an arbitrary datum is sampled every two seconds, and averaged over a three or four-minute period depending on the instrumentation at that station. The averaged values are represented by the four-digit groups zzzz. The number of groups may vary from bulletin to bulletin.

Specifications of symbolic letters other than those specified either in Volume I.1 or in Section B of Chapter IV of Volume II:

DDDGGgg	Seven-digit time group. The first three digits (DDD) are the Julian day of the year, and GGgg are the UTC time of the end of the last observation, in hours and minutes.
D . . . . D	Variable length alphanumeric station identifier.
zzzz	Four-digit averaged water level relative to an arbitrary datum in hundredths of feet.



## F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C<sub>i</sub>) USED IN INTERNATIONAL HYDROLOGICAL CODES

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Arctic Ocean		01	USA (Alaska)	1	
Pacific Ocean		02	USA (Alaska)	1	
Yukon		03	{ USA Canada	1 2	
Stikine		04	{ USA Canada	1 2	
Pacific Ocean		{ 05 06 }	Canada	2	
Fraser		07	{ Canada USA	2 1	
Arctic Ocean		{ 08 to 12 }	Canada	2	Including islands
Nelson-Saskatchewan		13	{ Canada USA	2 1	
Hudson Bay		14	Canada	2	
Columbia		15	{ Canada USA	2 1	
Columbia		{ 16 to 18 }			Reserve numbers for sub-basins of Columbia River as needed
Mississippi		19	{ Canada USA	2 1	
		{ 20 to 30 }			Reserve numbers for sub-basins of Mississippi-Missouri as needed
St John		31	{ Canada USA	2 1	
Great Lakes		{ 32 to 42 }	Canada USA	2 1 }	To be allocated as needed
St Lawrence		43	{ Canada USA	2 1	
Atlantic Ocean		44	Canada	2	
Pacific Ocean		{ 45 46 }	USA	1	
Atlantic Ocean		{ 47 48 }	USA	1	

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<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Gulf of Mexico		{ 49 50 }	USA	1	
Grande		51	{ USA Mexico	1 3	
Colorado		52	{ USA Mexico	1 3	
Concepción } Yaqui }		53	{ USA Mexico	1 3 }	Two-basin system
Tijuana		54	{ USA Mexico	1 3	
Pacific Ocean		{ 55 56 57 }	Mexico	3	
Gulf of Mexico		{ 58 59 }	Mexico	3	
Hondo-Azul		60	{ Belize Mexico Guatemala	2 3 4	
Candelaria		61	{ Mexico Guatemala	3 4	
Usumacinta-Grijalva		62	{ Mexico Guatemala	3 4	
Suchiate-Coatan } Achute }		63	{ Mexico Guatemala	3 4	
Lempa		64	{ Guatemala Honduras El Salvador	4 5 6	
Paz		65	{ Guatemala El Salvador	4 6	
Motagua		66	{ Guatemala Honduras	4 5	
Goascorán		67	{ El Salvador Honduras	6 5	
Caribbean Sea		68	Honduras	5	
Coco (Segovia)		69	{ Honduras Nicaragua	5 7	
Choloteca-Negro		70	{ Honduras Nicaragua	5 7	
Pacific Ocean		71	Nicaragua	7	
Caribbean Sea		72	Nicaragua	7	
San Juan		73	{ Nicaragua Costa Rica	7 8	

REGION IV

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Pacific Ocean		74	Costa Rica	8	
Caribbean Sea		75	Costa Rica	8	
Sixaola-Teribe		76	{ Costa Rica Panama	8 9	
Pacific Ocean		77	Panama	9	
Caribbean Sea		78	Panama	9	
Bahamas		79	Bahamas	1	
Cuba		{ 80 81 }	Cuba	2	
Dominican Republic		82	Dominican Republic	3	
Haiti		83	Haiti	4	
Jamaica		84	Jamaica	5	
Puerto Rico		85	USA	1	
Trinidad and Tobago		86	Trinidad and Tobago	6	
Barbados		87	Barbados	7	
Colombia		88	Colombia	1	
		89 } to } 95 }			Numbers reserved for other Caribbean islands as needed
Belize-Sarstún		96	{ Belize Guatemala	2 4	
Changuinola		97	{ Panama Costa Rica	9 8	



CHAPTER V

**REGION V — SOUTH-WEST PACIFIC**



## A — REGIONAL CODING PROCEDURES

### GENERAL REMARKS

- (a) The following instructions, specifications and code tables were adopted for use in WMO Region V by postal ballot in 1967 (Resolution 21 (67–RA V)), in 1980 (Resolutions 22 and 23 (80–RA V)), in 1989 (Resolution 22 (89–RA V)), and at the sessions of WMO Regional Association V listed below:

Fourth session — Wellington, February 1966  
Fifth session — Kuala Lumpur, August 1970  
Seventh session — Jakarta, July 1978  
Eighth session — Melbourne, September 1982  
Ninth session — Wellington, March 1986  
Eleventh session — Noumea, May 1994.

- (b) RA V developed instructions for the use in Region V of the following international codes:

FM 12 — SYNOP  
FM 13 — SHIP  
FM 32 — PILOT  
FM 33 — PILOT SHIP  
FM 35 — TEMP  
FM 36 — TEMP SHIP  
FM 37 — TEMP DROP  
FM 45 — IAC  
FM 85 — SAREP

- (c) No code forms have been established for regional use in Region V.

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## A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

### FM 12 SYNOP and FM 13 SHIP

#### (a) Section 1

5/12.1 *Groups* 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>, 4PPPP or 4a<sub>3</sub>hhh

5/12.1.1 If Regulation 12.2.3.4.2 applies, i.e. if a station cannot report mean sea-level pressure with reasonable accuracy, it shall use the group 4a<sub>3</sub>hhh to report the geopotential height of an agreed standard isobaric surface selected in accordance with the station elevation as follows:

Pressure	Station elevation	
	from greater than	to equal to or less than
850 hPa	800 m	2 300 m
700 hPa	2 300 m	3 700 m
500 hPa	3 700 m	

5/12.1.2 Group 4a<sub>3</sub>hhh shall indicate the geopotential of the suitable pressure level expressed in geopotential metres.

5/12.1.3 When local conditions prevent reduction with reasonable accuracy, stations at elevations between 500 and 800 metres (m) shall report the 850 hPa geopotential.

5/12.1.4 The group 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> shall be included in the synoptic report in accordance with Regulation 12.2.4.

5/12.2 *Group* 5appp

The group 5appp shall be used to report the characteristic pressure tendency and amount of pressure variation, in tenths of a hectopascal, during the preceding three hours.

5/12.3 *Group* 6RRRt<sub>R</sub> (Section 1)

5/12.3.1 The group 6RRRt<sub>R</sub> shall be included in Section 1 whenever data are available at the main standard times 0000, 0600, 1200 and 1800 UTC.

5/12.3.2 Whenever the group 6RRRt<sub>R</sub> is used, RRR shall refer to:

- (i) The amount of precipitation during the preceding 24-hour period in the 0000 UTC report;
- (ii) The amount of precipitation during the six-hour period in the 0600, 1200 and 1800 UTC reports.

#### (b) Section 2

5/12.4 *Groups* (1P<sub>wa</sub>P<sub>wa</sub>H<sub>wa</sub>H<sub>wa</sub>) (2P<sub>w</sub>P<sub>w</sub>H<sub>w</sub>H<sub>w</sub>) ((3d<sub>w1</sub>d<sub>w1</sub>d<sub>w2</sub>d<sub>w2</sub>) (4P<sub>w1</sub>P<sub>w1</sub>H<sub>w1</sub>H<sub>w1</sub>) (5P<sub>w2</sub>P<sub>w2</sub>H<sub>w2</sub>H<sub>w2</sub>))

Lightships and coastal stations able to observe the direction and height of waves shall include this (these) group(s) in their reports, in accordance with international specifications.

#### (c) Section 3

5/12.5 *Group* (0 . . . .)

N o t e : Regional regulations have not yet been developed.

## REGION V

- 5/12.6 *Group* (1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>)  
This group shall be included in the 1200 UTC report. It shall be used to report the maximum temperature, in degrees and tenths of a degree Celsius, recorded during the preceding 24 hours.
- 5/12.7 *Group* (2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub>)  
This group shall be included in the 0000 UTC report. It shall be used to report the minimum temperature, in degrees and tenths of a degree Celsius, recorded during the preceding 24 hours.
- 5/12.8 *Group* (4E'sss)  
This group shall be included by all stations capable of doing so at least once daily at either 0000 or 1800 UTC, whenever data are available.
- 5/12.9 *Groups* (5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>))
- 5/12.9.1 In the form 5EEEi<sub>E</sub> and 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>), these groups shall be included by all stations capable of doing so at least once daily at either 0000, 0600 or 1200 UTC, whenever data are available.
- 5/12.9.2 In the form 56D<sub>L</sub>D<sub>M</sub>D<sub>H</sub>, the group shall be used to report direction of cloud drift as observed from a land and fixed ship station.
- 5/12.9.3 In the form 58p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> or 59p<sub>24</sub>p<sub>24</sub>p<sub>24</sub>, this group shall be included in the 0000 or 1200 UTC reports only to report the variation of pressure during the preceding 24 hours.
- 5/12.10 *Group* (6RRRt<sub>R</sub>) (*Section 3*)
- 5/12.10.1 This group shall be included in Section 3 of the synoptic report at least at the intermediate standard times, and the main standard times, as required.
- 5/12.10.2 RRR shall indicate the amount of precipitation during the three-hour period preceding the time of observation or during other periods required for regional exchange.
- 5/12.11 *Group* (7R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>)  
This group shall be used to report the total amount of precipitation during the 24-hour period ending at the time of observation, in tenths of a millimetre (coded 9998 for 999.8 millimetres or more, and coded 9999 for trace).
- 5/12.11.1 The inclusion of group 7R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub> in Section 3 of the synoptic report shall be left to national decision.
- 5/12.12 *Group* (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>)  
This group shall be included in the report in accordance with international specifications.  
  
N o t e : This group may be used to report additional information on the height of the top of a cloud, in which case N<sub>s</sub> = 0.
- 5/12.13 *Group* (9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>)  
N o t e This group may be included by all stations capable of doing so, when appropriate.
- 5/12.13.1 When there is a requirement to give information on certain special phenomena occurring at the time of observation, or on phenomena which have occurred during the period covered by W<sub>1</sub>, W<sub>2</sub>, the group 9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> (Code table 3778 — Supplementary information — *Manual on Codes*, Volume I.1) shall be used.

## REGION V

5/12.13.2 The inclusion of this group shall be left to national decision.

5/12.14 *Groups* (80000 (0 . . . .) (1 . . . .) . . . .)

Note: Regional regulations have not yet been developed.

### (d) *Requirements for international exchange*

5/12.15 Use of groups YYGGi<sub>w</sub>, i<sub>R</sub>i<sub>x</sub>hVV, Nddff, 1s<sub>n</sub>TTT, 2s<sub>n</sub>T<sub>d</sub>T<sub>d</sub>T<sub>d</sub>, 4PPPP, 5appp, 6RRRt<sub>R</sub>, 7wwW<sub>1</sub>W<sub>2</sub> and 8N<sub>h</sub>C<sub>L</sub>C<sub>M</sub>C<sub>H</sub> shall be in accordance with international regulations.

5/12.16 Any required intermediate surface synoptic observations in the Region shall be made at 0300, 0900, 1500 and 2100 UTC.

5/12.17 As a meteorological minimum requirement, all groups of the reports received from ships shall be retransmitted.

5/12.18 Reports received from ships fitted with radiotelephony shall be edited and coded before transmission over the Global Telecommunication System.

## **FM 32 PILOT and FM 33 PILOT SHIP**

5/32.1 *Parts A and C, Section 2*

When no pressure measurements are available, wind data shall be reported for altitudes which constitute the best approximation to the standard isobaric surfaces, and which shall be determined nationally.

5/32.2 *Parts A and C, Section 3*

The levels reported, in addition to the level of the greatest maximum wind speed (or the highest level attained by the sounding, if the wind speed there is the greatest), shall be the levels of other speed maxima in the sounding, provided their speeds exceed the intervening minimum speeds by more than 10 m s<sup>-1</sup>.

5/32.3 *Part B, Section 4*

In addition to wind data at significant levels, altitudes of which shall be given in geopotential units, data, whenever available, shall be reported for the following levels: 900, 2100 and 4200 metres.

5/32.4 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

## **FM 35 TEMP, FM 36 TEMP SHIP and FM 37 TEMP DROP**

5/35.1 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

## REGION V

### FM 45 IAC

Positions in the International Analysis Code FM 45 shall be reported to the nearest half-degree, where this accuracy is practicable, by the use of the position group  $L_aL_aL_oL_o$ k.

### FM 85 SAREP

5/85.1 *Part B, Section 5*

5/85.1.1 The groups  $5C_fT_fC_aH_t$   $QL_aL_aL_oL_o$  . . . . . ( $9d_sd_sf_sf_s$ ) shall be used in the Region to report the mesoscale description of cloud features.

5/85.1.2 *Group(s)*  $QL_aL_aL_oL_o$  . . . . .  
These groups shall delineate the analysed area, as reported in  $C_f$ , in clockwise sequence.

5/85.1.3 *Group* ( $9d_sd_sf_sf_s$ )  
The movement of the system under consideration, when known, shall be included in the report by means of the group  $9d_sd_sf_sf_s$ .

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## **A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS**

No code forms have been established for regional use in Region V.

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## **B — SPECIFICATIONS OF SYMBOLIC LETTERS (or groups of letters) FOR REGIONAL USE**

$C_a$	Total cloud cover associated with cloud feature as indicated by $C_f$ . (Code table 531) (FM 85)
$C_f$	Synoptic interpretation of mesoscale cloud features. (Code table 534) (FM 85)
$H_t$	Estimated mean height of cloud tops either from infrared data or supplementary aircraft and radar reports. (Code table 1535) (FM 85)
$T_t$	State of feature specified by $C_f$ . (Code table 580) (FM 85)

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## C — SPECIFICATIONS OF CODE FIGURES (code tables) FOR REGIONAL USE

Code tables in regional use in Region V are numbered with a three-figure number from 520 to 599. The numbering system and codes for each element are given below:

531	$C_a$
534	$C_f$
580	$T_f$

### 531

$C_a$  — *Total cloud cover associated with cloud feature indicated by  $C_f$*

Code  
figure

0	Open (less than 20 per cent)
1	Mostly open (20–50 per cent)
2	Mostly covered (51–80 per cent)
3	Overcast (more than 80 per cent)
/	Unspecified

### 534

$C_f$  — *Synoptic interpretation of mesoscale cloud features*

Code  
figure

1	Vortex
2	Disturbance in equatorial trough, ITCZ, monsoon trough
3	Cloud clusters
4	Instability front
5	Cirrus level wind maxima, jet stream
6	Low-level wind maximum
7	Clouds in longitudinal or transverse bands
8	Tropical cloud lines (e.g. squall lines)
9	Cellular clouds forming due to incursion, at low levels, of cold air into tropical areas from higher latitudes
/	Undetermined

**580**

$T_f$  — *State of feature specified by  $G_f$*

Code  
figure

- |   |              |
|---|--------------|
| 1 | Intensifying |
| 2 | No change    |
| 3 | Dissipating  |
| / | Undetermined |

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## D — NATIONAL CODING PROCEDURES WITH REGARD TO INTERNATIONAL CODE FORMS

### FM 12 SYNOP and FM 13 SHIP

#### AUSTRALIA

4PPPP This group is reported by *all* stations with a barometer.

6RRRt<sub>r</sub> *In reports from stations which do not make observations every six hours, t<sub>r</sub> indicates the duration of the period of reference.*

#### MALAYSIA

6RRRt<sub>r</sub> When reported, this group is included in Section 1.

#### NEW CALEDONIA

7wwW<sub>1</sub>W<sub>2</sub> ww is coded 05 *only when haze reduces visibility to less than 5 kilometres.*

S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> This group is used in SYNOP reports from automatic stations 91570 and 91574. It is used in the form 911f<sub>x</sub>f<sub>x</sub>f<sub>x</sub>f<sub>x</sub> indicating maximum wind peaks, in knots, during the preceding three hours.

#### NEW ZEALAND

7wwW<sub>1</sub>W<sub>2</sub> When using Regulation 12.2.6.6.2, if more than one code figure is required to describe adequately the past weather, *the code figure for W<sub>1</sub> describes the type of weather which occurred prior to that described by W<sub>2</sub>.*

#### TUVALU

5EEEi<sub>E</sub> This group is reported at 0000 UTC by all stations with evaporation pans. The value of EEE is for the period of 24 hours prior to 2100 UTC, 3 hours earlier.

**FM 15 METAR and FM 16 SPECI****AUSTRALIA****National deviations**

1. *Cloud amount will continue to be described in oktas and cloud type retained.*
2. *The abbreviation UTC will be used in lieu of **Z**.*
3. *INTER will be retained with its current meaning.*
4. *The period of trend type landing forecasts in Australia will be three hours.*

**MALAYSIA**

1. *The RVR group, i.e. **RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>i** or **RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>i**, shall not be reported as the stations are located quite a distance from the runways and RVR equipment is not installed at the airports.*
2. *Wind shear group, i.e. **WS TKOF RWYD<sub>R</sub>D<sub>R</sub>** and/or **WS LDG RWYD<sub>R</sub>D<sub>R</sub>**, shall not be reported.*

**NEW ZEALAND****National deviations from the following global regulations:**

- 15.1 *The criteria covering the issue of SPECI are described in the following table.*
- 15.5 *Wind speed will be reported in knots.*
- 15.5.2 *At all wind speeds and with any amount of variation in direction, wind direction will only be reported as variable "VRB" when it is impossible to determine a single wind direction.*
- 15.5.3 *The variation in wind direction group is reported if the total variation is 60 degrees or more and the mean wind speed is greater than 3 knots.*
- 15.5.6 *For wind speeds of 100 knots or more, the exact number of wind speed units (knots) shall be coded in lieu of the two-figure code ff or f<sub>m</sub>f<sub>m</sub>.*
- 15.6.3 *Other than at Auckland (NZAA), Wellington (NZWN) and Christchurch (NZCH) when the horizontal visibility is 10 km or more, it will be coded in whole kilometres followed by the letters KM.*
- 15.6.4 *Other than at Auckland (NZAA), Wellington (NZWN) and Christchurch (NZCH) CAVOK is not used.*
- 15.7 *Runway visual range is only reported at Auckland (NZAA).*
- 15.9.1.1 *Other than at Auckland (NZAA), Wellington (NZWN) and Christchurch (NZCH) NSC is not used, clouds are reported at all heights and SKC is used to report no cloud.*
- 15.10 *Other than at Auckland (NZAA), Wellington (NZWN) and Christchurch (NZCH) CAVOK is not used.*

**NEW ZEALAND** (continued)

## CHANGE CRITERIA

ELEMENT	SPECI	TREND	TAF
WIND DIRECTION A change of 60 degrees or more provided the mean speed is 10 knots or more before and/or after the change:	yes	yes	yes
MEAN WIND SPEED (a) A change by 10 knots or more since the last report:	yes	no	no
(b) An expected change of 10 knots or more:	no	yes	yes
GUSTINESS An increase of 10 knots or more provided mean wind speed is 15 knots or more before and/or after the change:	yes	no	no
VISIBILITY Value changes to or passes through:	8 000 m 5 000 m 3 000 m 1 500 m 800 m	8 000 m 5 000 m 3 000 m 1 500 m 800 m	8 000 m 5 000 m 3 000 m 1 500 m 800 m
RUNWAY VISUAL RANGE (RVR) RVR changes to or passes through: Note: At Auckland (NZAA) only.	800 m 600 m 350 m 150 m	no	no
CLOUD Provided cloud amount is BKN or OVC before and/or after the change, when the height changes to or passes through:	1 500 ft 1 000 ft 500 ft 300 ft* 200 ft** 100 ft***	1 500 ft 1 000 ft 500 ft 300 ft* 200 ft** 100 ft***	1 500 ft 1 000 ft 500 ft 300 ft* 200 ft** 100 ft***
Provided the height of base is at or below 1 500 feet:	When the amount is observed or forecast to change from SCT or less to BKN or OVC, or vice versa		
When CB are forecast to develop or dissipate:	no	yes	yes

\* At Whenuapai (NZWP) only.

\*\* At Auckland (NZAA), Ohakea (NZOH) and Christchurch (NZCH) only.

\*\*\* At Auckland only.

## REGION V

### UNITED STATES OF AMERICA

*Stations in Hawaii use the same symbolic and abbreviated language code form for aviation weather reports as used by US stations in Regional Association IV.*

### FM 32 PILOT

#### AUSTRALIA

Parts A and C,  
Section 2

Altitudes constituting the best approximations to the standard isobaric surfaces are determined as follows:

Groups of stations	Location
A	North of 25°S plus Kalgoorlie (94637)
B	25°S–33°S
C	33°S–40°S
D	40°S–45°S
E	Macquarie Island (94998)

Standard isobaric surface (hPa)	Altitude used in the PILOT reports (m) Groups of stations (see table above)			
	A	B	C	D
850	1 500	1 500	1 500	1 500
700	3 100	3 100	3 100	3 000
500	5 800	5 700	5 700	5 600
400	7 600	7 400	7 300	7 200
300	9 600	9 400	9 300	9 200
250	10 900	10 700	10 500	10 400
200	12 400	12 100	12 000	11 800
150	14 200	13 900	13 800	13 600
100	16 500	16 400	16 300	16 200
70	18 600	18 600	18 600	18 500
50	20 700	20 700	20 700	20 600
30	23 900	24 000	24 000	23 900
20	26 600	26 600	26 600	26 600
10	31 200	31 300	31 300	31 300

## AUSTRALIA (continued)

## E — MACQUARIE ISLAND (94998)

Pressure	January	February	March	April	May	June	July	August	September	October	November	December
1 000	-12	7	-5	0	1	6	35	19	-4	-17	-38	-10
950	406	425	412	416	415	419	447	431	410	397	377	406
900	847	865	849	853	853	855	883	867	846	833	812	845
850	1 306	1 322	1 309	1 308	1 307	1 308	1 334	1 319	1 300	1 285	1 264	1 303
750	2 298	2 314	2 299	2 293	2 288	2 290	2 312	2 296	2 279	2 265	2 243	2 288
700	2 841	2 855	2 839	2 830	2 824	2 824	2 845	2 828	2 813	2 797	2 779	2 829
600	4 030	4 046	4 019	4 007	3 995	3 990	4 011	3 989	3 979	3 967	3 947	4 012
500	5 392	5 410	5 385	5 359	5 334	5 326	5 344	5 320	5 313	5 305	5 293	5 373
400	7 001	7 018	6 980	6 936	6 907	6 894	6 900	6 882	6 878	6 878	6 871	6 978
300	8 962	8 990	8 940	8 886	8 828	8 801	8 802	8 783	8 791	8 808	8 811	8 914
250	10 170	10 201	10 143	10 074	10 003	9 966	9 961	9 942	9 962	9 992	10 009	10 114
200	11 631	11 653	11 590	11 500	11 411	11 354	11 343	11 318	11 367	11 417	11 462	11 565
150	13 516	13 538	13 465	13 350	13 236	13 171	13 152	13 108	13 205	13 281	13 360	13 449
100	16 184	16 185	16 097	15 968	15 828	15 755	15 719	15 657	15 816	15 923	16 030	16 121
80	17 654	17 641	17 535	17 410	17 252	17 178	17 126	17 056	17 264	17 390	17 504	17 583
70	18 545	18 522	18 419	18 279	18 119	18 016	17 995	17 899	18 153	18 282	18 389	18 545
60	19 559	19 526	19 409	19 256	19 095	18 994	18 969	18 839	19 157	19 287	19 389	19 559
50	20 781	20 740	20 615	20 407	20 269	20 130	20 100	20 018	20 382	20 472	20 568	20 781
40	22 271	22 228	22 073	21 808	21 753	21 508	21 505	21 442	21 922	21 993	22 100	22 271
30	24 199	24 133	24 050	23 550	23 583	23 233	23 295	23 259	23 869	24 023	24 000	24 199
25	25 430	25 348	25 255	24 697	24 733	24 352	24 425	24 393	25 079	25 259	25 231	25 420
20	26 956	26 846	26 750	26 400	26 137	25 710	25 804	25 763	26 548	26 828	26 800	26 956
15	28 949	28 798	28 700	28 300	27 940	27 567	27 591	27 655	28 473	28 796	28 700	28 949
10	31 815	31 614	31 400	31 000	30 680	30 050	30 046	30 212	31 153	31 587	31 700	31 815
8	33 423	33 188	32 936	32 474	32 113	31 469	31 429	31 648	32 676	33 138	33 299	33 420
7	34 395	34 140	33 868	33 372	32 988	32 336	32 276	32 525	33 600	34 078	34 265	34 389
6	35 525	35 250	34 956	34 423	34 015	33 355	33 273	33 554	34 680	35 174	35 389	35 517
5	36 873	36 576	36 258	35 686	35 252	34 582	34 478	34 793	35 973	36 485	36 731	36 863
4	38 540	38 219	37 876	37 261	36 799	36 119	35 991	36 342	37 581	38 112	38 391	38 527
3	40 716	40 370	39 999	39 339	38 847	38 157	38 002	38 392	39 695	40 246	40 580	40 701
2.5	42 112	41 752	41 368	40 684	40 176	39 481	39 313	39 723	41 058	41 620	41 951	42 095
2	43 836	43 464	43 066	42 359	41 837	41 136	40 954	41 384	42 751	43 323	43 672	43 818
1.5	46 087	45 703	45 293	44 567	44 031	43 326	43 132	43 579	44 974	45 556	45 920	46 068
1	49 312	48 923	48 506	47 769	47 227	46 519	46 319	46 775	48 185	48 771	49 144	49 292

Note: The figures above can be taken as the altitude in metres.

## REGION V

### AUSTRALIA (continued)

#### Part B

##### Section 4

- (a) In addition to wind data at significant levels, data whenever available are reported for the following levels: 600, 900, 2 100, 3 600 and 4 200 metres.
- (b) Data reported for the regional pressure levels refer to the next computation above that pressure level when the computation is not made at the pressure level.
- (c) Criteria for determining significant levels:
  - (i) Wind speed differs by  $10 \text{ m s}^{-1}$  or more from the wind speed at the nearest lower level reported;
  - (ii) Wind direction differs by  $45^\circ$  or more from the nearest lower level reported when the wind speed at the level under consideration is  $10 \text{ m s}^{-1}$  or more;
  - (iii) The highest level attained up to and including the 100 hPa level.

#### Part D

*Part D is not used in Australian PILOT reports.*

Common use of FM 32:

*Some wind data are obtained at stations 89571 Davis, 94637 Kalgoorlie and 96996 Cocos Island from radiosonde ascents but they are reported in FM 32 for uniformity of Australian practice.*

Note on hours of observation:

*During SUMMER TIME, Australian standard times for upper wind synoptic observations are 0500, 1100, 1700 and 2300 UTC. These standard times apply in all Australian States and at island stations operated by Australia, but they do not apply to Australian Antarctic stations.*

*WMO standard times of 0000, 0600, 1200 and 1800 UTC apply, in all Australian States and at island stations operated by Australia, at all other TIMES, except in Western Australia, where 1700 UTC flights will replace 1800 UTC flights throughout the year.*

*The Western Australian stations involved are:*

94203	Broome	94430	Meekatharra
94212	Halls Creek	94610	Perth
94300	Carnarvon	94637	Kalgoorlie
94302	Learmonth	94638	Esperance
94312	Port Hedland	94646	Forrest
94403	Geraldton	94802	Albany



## REGION V

### FRENCH POLYNESIA

Parts A and C,  
Section 2

Altitudes constituting the best approximations to the standard isobaric surfaces are determined as follows:

Standard isobaric surface (hPa)	Altitude used in the PILOT reports (m)
850	1 500
700	3 000
500	5 700
400	7 500
300	9 600
250	10 800
200	12 300
150	14 100
100	16 500
70	18 600
50	20 700
30	24 000
20	26 700
10	31 200

Part B,  
Section 4

In addition to wind data at significant levels and at fixed levels for Region V, data whenever available are reported for the following levels: surface, 300, 600 and 8 400 metres.

### INDONESIA

Parts A and C,  
Section 2

Altitudes constituting the best approximations to the standard isobaric surfaces are the averages of the heights of such surfaces determined from radiosonde data.

### MALAYSIA

Parts A and C,  
Section 2

Altitudes constituting the best approximations to the standard isobaric surfaces are determined as follows:

Standard isobaric surface (hPa)	Altitude used in the PILOT reports (m)
850	1 500
700	3 100
500	5 800
400	7 600
300	9 700
250	10 800
200	12 400
150	14 200
100	16 500
70	18 600
50	20 600
30	23 800
20	26 400
10	30 000

## REGION V

### **MALAYSIA** *(continued)*

Part B,

Section 4

In addition to wind data at significant levels, altitudes of which are given in geopotential units, data whenever available are reported for the following levels: surface, 300, 900, 2 100, 3 600, 4 200 and 10 800 metres.

### **NEW CALEDONIA AND LOYALTY ISLANDS**

Parts A and C,

Section 2

Altitudes constituting the best approximations to the standard isobaric surfaces are determined as follows:

Standard isobaric surface (hPa)	Altitude used in the PILOT reports (m)
850	1 500
700	3 000
500	5 700
400	7 500
300	9 600
250	10 800
200	12 300
150	14 100
100	16 500
70	18 900
50	20 700
30	24 000
20	26 700
10	31 200

### **NEW ZEALAND**

Missing data

A stratum of missing data is encoded as follows:

The levels bounding the missing data stratum will be encoded as significant levels. Between these, the mean wind for the stratum will be encoded with the height indicator as / (solidus). Fixed levels falling within this stratum are not encoded.

### **PAPUA NEW GUINEA**

Part B

Section 4

- (a) Data whenever available are reported for the 600 and 3 600 metres levels in addition to those levels specified for regional use.
- (b) Data reported for the regional pressure levels refer to the next computation above that pressure level when the computation is not made at the pressure level.
- (c) Criteria for determining significant levels:
  - (i) Wind speed differs by  $10 \text{ m s}^{-1}$  or more from the wind speed at the nearest lower level reported;
  - (ii) Wind direction differs by  $45^\circ$  or more from the nearest lower level reported when the wind speed at the level under consideration is  $10 \text{ m s}^{-1}$  or more;
  - (iii) The highest level attained up to and including the 100 hPa level.

Part D

*Part D is not used in PILOT reports.*

Note on hours of observation:

Standard times for upper wind synoptic observations are 0500, 1100, 1700 and 2300 UTC.

## REGION V

### PHILIPPINES

Parts A and C,  
Section 2

Altitudes constituting the best approximations to the standard isobaric surfaces are determined as follows:

Standard isobaric surface (hPa)	Altitude used in the PILOT reports (m)
850	1 500
700	3 100
500	5 800
400	7 500
300	9 600
250	10 800
200	12 300
150	14 100
100	16 500
70	18 600
50	20 500
30	23 800
20	26 500
10	31 000

### SINGAPORE

Parts A and C,  
Section 2

Altitudes constituting the best approximations to the standard isobaric surfaces are determined as follows:

Standard isobaric surface (hPa)	Altitude used in the PILOT reports (m)
850	1 500
700	3 100
500	5 800
400	7 600
300	9 700
250	10 800
200	12 400
150	14 200
100	16 500
70	18 600
50	20 600
30	23 800
20	26 400
10	30 000

Part B,  
Section 4

In addition to wind data at significant levels, altitudes of which are given in geopotential units, data whenever available are reported for the following levels: 300, 600, 900, 2 100 and 4 200 metres.

## FM 35 TEMP

### AUSTRALIA

Parts B and D,  
Section 5

The criteria for determining significant levels in respect to relative humidity shall be obtained by linear interpolation between adjacent significant levels, such that the dew point shall not deviate by more than 2°C from the observed value.

Upper wind reports in FM 35:

The majority of upper wind observations at Australian controlled stations are carried out by wind-finding radar equipment. They are therefore not included in TEMP reports in the code form FM 35.

Note on hours of observation:

*During SUMMER TIME, Australian standard times for upper temperature, humidity and pressure synoptic observations are 1100 and 2300 UTC in all Australian States and at island stations operated by Australia, but not at Australian Antarctic stations.*

### NEW CALEDONIA AND LOYALTY ISLANDS

D<sub>n</sub>D<sub>n</sub>

*When the relative humidity is less than 10 per cent for levels where the temperature is higher than -40°C, a relative humidity constant of 8 per cent is used in the calculation of the dew-point temperature.*

### PHILIPPINES

Parts B and D,  
Section 6

*Transmission of this section is optional.*

## FM 50 WITEM

### NEW ZEALAND

In the WITEM forecasts issued by New Zealand, each latitude and longitude coordinate shall include a decimal point (.) between the values of degrees and tenths.

## FM 51 TAF

### AUSTRALIA

#### National deviations

1. Cloud amount will continue to be described in oktas and cloud type retained.
2. The abbreviation UTC will be used in lieu of Z.
3. INTER will be retained with its current meaning.

## **NEW ZEALAND**

### **National deviations from the following global regulations:**

51.1.4 and 51.11

*The criteria governing change groups are described in the table on page II – 5 – D — 3.*

51.3

*Wind speed will be given in knots.*

51.3.3

*VRB may be used for wind speeds of 5 knots or less.*

51.4.2 and 51.7

**CAVOK** is not used.

51.4.3

*When the forecast horizontal visibility is 10 kilometres or more, it will be coded as whole kilometres followed immediately by the letters KM, e.g. 15KM.*

51.6

*Clouds will be reported in the form N<sub>s</sub>CCh<sub>s</sub>h<sub>s</sub>h<sub>s</sub> where the symbols have the same meaning as in old code form FM 51-VIII Ext.*

51.6.2

*Vertical visibility is not used.*

51.6.3

**NSC** is not used.

51.8, 51.9 and 51.12

*The optional groups for temperature, icing and turbulence are not used.*

51.11.1

*Probabilities of less than 30 per cent may be used.*

## **FM 53 ARFOR**

## **AUSTRALIA**

### **National deviations**

1. *Cloud amount will continue to be described in oktas and cloud type retained.*
2. *The abbreviation UTC will be used in lieu of Z.*
3. *INTER will be retained with its current meaning.*

**FM 54 ROFOR**

**AUSTRALIA**

**National deviations**

1. *Cloud amount will continue to be described in oktas and cloud type retained.*
2. *The abbreviation UTC will be used in lieu of Z.*
3. *INTER will be retained with its current meaning.*

**FM 71 CLIMAT**

**FRENCH POLYNESIA, NEW CALEDONIA AND LOYALTY ISLANDS**

$\overline{PPPP}$	Monthly mean pressure (at sea level) of the three-hourly observations made each day.
$\overline{TTT}$	Mean air temperature for the month of the three-hourly observations made each day.
$\overline{eee}$	Mean vapour pressure for the month of the three-hourly observations made each day.

**FM 75 CLIMAT TEMP**

**NEW CALEDONIA AND LOYALTY ISLANDS**

$\overline{D_n D_n D_n}$	When the relative humidity is less than 10 per cent, the dew-point temperature is calculated using a relative humidity value of 8 per cent.
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## **E — NATIONAL CODE FORMS**

No information available.

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## F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C<sub>i</sub>) USED IN INTERNATIONAL HYDROLOGICAL CODES\*

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>State or Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
AUSTRALIA					
North-east coast		01	Queensland	1	
South-east coast		02	{ New South Wales Victoria	2 3	
Tasmania		03			
Murray-Darling		04	{ Queensland New South Wales Victoria South Australia Capital Territory	1 2 3 4 5	
South Australian Gulf		05	South Australia	4	
South-west coast		06	Western Australia	6	
Indian Ocean		07	Western Australia	6	
Timor Sea		08	{ Western Australia Northern Territory	6 7	
Gulf of Carpentaria		09	{ Queensland Northern Territory	1 7	
Lake Eyre		10	{ Queensland Northern Territory South Australia New South Wales	1 7 4 2	
Bulloo-Bancannia		11	{ Queensland New South Wales	1 2	
Western Plateau		12	{ Western Australia Northern Territory South Australia	6 7 4	
		13 } to } 20 }			To be allocated as needed
REST OF RA V					
Golok		21	{ Thailand Malaysia	1 2 }	See also RA II
Malaysia (Peninsular, Sarawak and Sabah)		22 } to } 31 }	Malaysia	2	To be allocated as needed

**\* Notes:**

- (1) There being only a few international river basins in WMO Region V, Members may not have a need to apply the international system of station identification numbers for hydrological observing stations. On the other hand, for the sake of uniformity, Members may wish to consider allocation of such numbers to national river basins as well.
- (2) Australia has the largest river basins in the Region, and is composed of a number of separate States. The allocation of BB and C<sub>i</sub> has been made separately for Australian basins bearing in mind the existing national system.

REGION V

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>State or Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
REST OF RA V (continued)					
Singapore		32	Singapore	7	
Sembakung		33	{ Malaysia Indonesia	2 3	
Borneo (Kalimantan)		34	Indonesia	3	
Sumatra		35 } to } 40 }	Indonesia	3	To be allocated as needed
Java		41 } 42 }	Indonesia	3	
Lesser Sunda Isles		43 } to } 45 }	Indonesia	3	
Timor		46 } 47 }	Indonesia	3	
Malucas		48	Indonesia	3	
Tami		49	{ Indonesia Papua New Guinea	3 5	
Sepik		50	{ Papua New Guinea Indonesia	5 3	
Fly		51	{ Papua New Guinea Indonesia	5 3	
West Irian		52	Indonesia	3	
East Irian		53	Papua New Guinea	5	
Luzon		54 } 55 } 56 } 57 } 58 } 59 } 60 } 61 }	Philippines	6	To be allocated as needed
Palawan		55 }			
Mindoro		56 }			
Panay		57 }			
Negros		58 }			
Samar		59 }			
Mindanao		60 } 61 }			
New Caledonia		62	(France)	7	
North Island		63 } to } 65 }	New Zealand	8	To be allocated as needed
South Island		66 } to } 70 }			
Hawaii		71	USA	9	

CHAPTER VI

**REGION VI — EUROPE**



## A — REGIONAL CODING PROCEDURES

### GENERAL REMARKS

- (a) The following instructions, code forms, specifications and code tables were adopted for use in WMO Region VI by postal ballot in 1954, 1959, 1963, 1967, 1971, 1980 (Resolution 28 (80–RA VI)), 1989 (Resolution 29 (89–RA VI)), and at the sessions of WMO Regional Association VI and IMO Regional Commission VI listed below:

Third session of Regional Commission VI — Paris, April 1948  
Fourth session of Regional Commission VI — London, June–July 1949  
First session of Regional Association VI — Zurich, May–June 1952  
Second session of Regional Association VI — Dubrovnik, March 1956  
Third session of Regional Association VI — Madrid, September–October 1960  
Fourth session of Regional Association VI — Paris, April 1965  
Fifth session of Regional Association VI — Varna, May 1969  
Sixth session of Regional Association VI — Bucharest, September 1974  
Extraordinary session of Regional Association VI — Budapest, October 1976  
Eighth session of Regional Association VI — Rome, October 1982  
Ninth session of Regional Association VI — Potsdam, September 1986  
Tenth session of Regional Association VI — Sofia, May 1990  
Thirteenth session of Regional Association VI — Geneva, May 2002.

- (b) RA VI developed instructions for the use in Region VI of the following international codes:

FM 12 — SYNOP  
FM 13 — SHIP  
FM 20 — RADOB  
FM 32 — PILOT  
FM 33 — PILOT SHIP  
FM 35 — TEMP  
FM 36 — TEMP SHIP  
FM 53 — ARFOR  
FM 67 — HYDRA  
FM 68 — HYFOR  
FM 85 — SAREP.

- (c) The following regional codes were developed:

RF 6/01 EXFOR — Forecast of extreme temperatures  
RF 6/02 GAFOR — General aviation forecast  
RF 6/03 WAFOR — Warning forecast of hazardous weather phenomena  
RF 6/04 WAREP — Warning report of the actual occurrence of hazardous weather phenomena.



## A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

### FM 12 SYNOP and FM 13 SHIP

#### (a) Section 1

6/12.1 *Groups* 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>, 4PPPP or 4a<sub>3</sub>hhh

6/12.1.1 If Regulation 12.2.3.4.2 applies, i.e. if a station cannot report mean sea-level pressure with reasonable accuracy, it shall use the group 4a<sub>3</sub>hhh to report the geopotential height of an agreed standard isobaric surface selected in accordance with the station elevation as follows:

Pressure	Station elevation	
	from greater than	to equal to or less than
925 hPa		1 000 m
850 hPa	1 000 m	2 300 m
700 hPa	2 300 m	3 700 m
500 hPa	3 700 m	

*N o t e :* In reports from high-level (automatic land) stations provided with an instrument to measure pressure, but for which it is not possible to calculate the pressure reduced to mean sea level to a sufficient degree of accuracy, the procedure shall be adopted such that stations whose elevation does not exceed 1 000 metres give the geopotential of the 925 hPa level, those whose elevation is between 1 000 metres and 2 300 metres give the geopotential of 850 hPa. Stations whose elevation is between 2 300 metres and 3 700 metres give the geopotential of the 700 hPa level for hhh. Stations whose elevation is above 3 700 metres give the geopotential of the 500 hPa level for hhh.

6/12.1.2 Group 4a<sub>3</sub>hhh shall indicate the geopotential of the suitable pressure level expressed in geopotential metres, omitting the thousands digit.

6/12.1.3 The group 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> shall be included in the synoptic report in accordance with Regulation 12.2.4.

6/12.2 *Group* 6RRRt<sub>R</sub> (*Section 1*)

6/12.2.1 With reference to Regulation 12.2.5.1, this group shall be included in Section 1 at the main standard times, when precipitation amount over the preceding six or 12 hours shall be reported for RRR.

6/12.2.2 At 0600 and 1800 UTC, the precipitation amounts over the preceding 12 nighttime and daytime hours, respectively, shall be reported for RRR.

6/12.2.3 At 0000 and 1200 UTC, the precipitation amounts over the preceding six hours should be reported (i.e. 1800–0000 UTC at 0000 UTC, and 0600–1200 UTC at 1200 UTC), as determined by national decision.

*N o t e :* At intermediate observation times, this group may be included by national decision in Section 1 in addition to Section 3 if, in accordance with Regulation 12.2.5.2, two precipitation amounts for two different time periods over the preceding 1, 2, 3, 9 and 15 hours are reported.

6/12.2.4 Regulations 6/12.2.1 to 6/12.2.3 shall apply to ocean weather stations and lightships where the data are available.

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### (b) Section 3

#### 6/12.3 Group (0 . . . .)

Note: Regional regulations have not yet been developed.

#### 6/12.4 Group (1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>)

This group shall be included at 1800 UTC and may be included at 0600 UTC to report the maximum temperature of the preceding 12 hours.

#### 6/12.5 Group (2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub>)

This group shall be included at 0600 UTC and may be included at 1800 UTC to report the minimum temperature of the preceding 12 hours.

#### 6/12.6 Group (3Ejjj)

##### 6/12.6.1 The inclusion of this group shall be left to national decision.

Note: This group may be added in all seasons.

##### 6/12.6.2 This group shall be used in the form 3Es<sub>n</sub>T<sub>g</sub>T<sub>g</sub>.

##### 6/12.6.3 When used, the group 3Es<sub>n</sub>T<sub>g</sub>T<sub>g</sub> shall be added by a selection of stations to the SYNOP reports of 0600 UTC or, where this is not practicable, as an exception rather than a rule, to the reports of 0900 UTC.

##### 6/12.6.4 In any case, the observations of the elements reported in this group shall be made at 0600 UTC.

##### 6/12.6.5 If ice and/or snow are observed, this group shall be reported in the form 3Es<sub>n</sub>T<sub>g</sub>T<sub>g</sub> = 3/s<sub>n</sub>T<sub>g</sub>T<sub>g</sub>.

#### 6/12.7 Group (4E' sss)

##### 6/12.7.1 This group shall be included only if snow or ice cover is observed on the ground.

##### 6/12.7.2 Group 4E' sss shall be transmitted at least once daily, preferably at 0600 UTC (the morning observation time over most of Region VI). Members of the Region are also recommended to include this group at 1800 UTC.

##### 6/12.7.3 Code table 0975 shall be used to code the indicator (E') of the presence and state of snow or ice cover. E' shall be transmitted by all stations making these observations.

##### 6/12.7.4 The snow depth or the thickness of ice cover shall be reported for sss. Where appropriate, a selection of stations for the inclusion of sss shall be decided nationally.

#### 6/12.8 Groups (5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>))

##### 6/12.8.1 These groups shall be used in accordance with Regulation 12.4.7 of Volume I.1 of the *Manual on Codes*.

##### 6/12.8.2 (a) In the form 5EEEi<sub>e</sub> and 5SSSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>), these groups shall be included by all stations carrying out the corresponding measurements.

(b) If these groups are included, the values of EEE (evaporation or evapotranspiration) and j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub> (amount of radiation) shall be for the 24 hours preceding the observation time of the synoptic report, and SSS (duration of sunshine) shall be for the 24 hours of the calendar day immediately preceding the reporting time.

(c) Groups 5EEEi<sub>e</sub> and 5SSSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>) shall be transmitted at least once daily at one of the main observation times, preferably at 0600 UTC (the morning observation time over most of Region VI).



## REGION VI

- 6/12.8.3 In the form 54g<sub>0</sub>s<sub>n</sub>d<sub>T</sub>, 56D<sub>L</sub>D<sub>M</sub>D<sub>H</sub>, 57CD<sub>a</sub>e<sub>C</sub>, 58p<sub>24</sub>p<sub>24</sub>p<sub>24</sub> and 59p<sub>24</sub>p<sub>24</sub>p<sub>24</sub>, the group 5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> shall be included by national decision (see Regulation 12.4.7.1.2(b), (e), (f), (g) and (h)).
- 6/12.9 *Group (6RRRt<sub>R</sub>) (Section 3)*
- 6/12.9.1 This group shall be included in Section 3, with reference to Regulation 12.2.5.2, when the precipitation amount for three hours or other periods required for regional exchange is reported for RRR.
- 6/12.9.2 This group may be used at all observation times.
- 6/12.9.3 The inclusion of this group in Section 3 shall be left to national decision. When included, at both main and intermediate observation times RRR should be used to report the precipitation amount over the preceding three hours; at the other observation times, RRR should be used to report the precipitation amount over the preceding hour.
- 6/12.10 *Group (7 . . . .)*
- 6/12.10.1 In the form 7R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>, this group shall be included in Section 3 at 0600 UTC.
- 6/12.10.2 The inclusion of group 7R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub> at 0000, 1200 and 1800 UTC and at intermediate observation times shall be left to national decision.
- 6/12.10.3 If the group is included, the precipitation amount for the preceding 24 hours shall be reported for R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>R<sub>24</sub>.
- 6/12.11 *Group (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>)*  
The inclusion of this group shall be left to national decision.
- 6/12.12 *Group (9S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>)*
- 6/12.12.1 Code table 3778 — S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>S<sub>P</sub> — Supplementary information (*Manual on Codes*, Volume I.1) — shall be used to code S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>.
- 6/12.12.2 Groups 9S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>, as given in the annex to this regulation (see next page), should be used for regional exchange of data on dangerous weather phenomena. The inclusion of the remaining groups 9S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>S<sub>P</sub> given in Code table 3778 in Section 3 shall be left to national decision.
- 6/12.13 *Groups (80000 (0 . . . .) (1 . . . .) . . . .)*  
N o t e : Regional regulations have not yet been developed.

### (c) *Requirements for international exchange*

- 6/12.14 In reports of surface synoptic (land and sea) stations, groups 8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub> and 9S<sub>P</sub>S<sub>P</sub>S<sub>P</sub>S<sub>P</sub> shall be included when available. In the case of radio broadcast, however, they should be included only if scheduled transmission time is available (see *Manual on the Global Telecommunication System*, publication WMO–No. 386, for details).
- 6/12.15 As a meteorological minimum requirement, all groups of the reports received from ships shall be retransmitted.
- 6/12.16 Reports received from ships fitted with radiotelephony shall be edited and coded before transmission over the Global Telecommunication System.
- 6/12.17 Mobile ships shall be requested to report the maximum number of groups feasible, according to the instrumentation of the ship.

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Annex to Regulation 6/12.12.2

Groups 9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> to be used for regional  
exchange of data on dangerous weather phenomena

No.	Phenomenon		Time of observation	9S <sub>p</sub> S <sub>p</sub> S <sub>p</sub> S <sub>p</sub>
1	Tornado cloud (destructive) at/or within sight of station		At the observation time or during the preceding hour	96119
2	Nature and/or type of water spout(s), tornadoes, whirlwinds, dustdevils (M <sub>w</sub> ), and direction from which they approach the station (D <sub>a</sub> )		Between observation times	919M <sub>w</sub> D <sub>a</sub>
3	Nature and/or type of squall (s <sub>q</sub> ), and direction from which it approaches the station (D <sub>p</sub> )		Between observation times	918s <sub>q</sub> D <sub>p</sub>
4	Highest gust		At the observation time (i.e. during the 10-minute period immediately preceding it)	910ff
			Between observation times	911ff
5	Drifting and blowing snow, sky invisible, impossible to determine whether snow is falling or not	Slight or moderate	At observation time or between times	9298S'₈
		Heavy	At observation time or between times	9299S'₈
6	Maximum diameter of hailstones		At observation time or between times	932RR
7	Frozen deposit (diameter)	Glaze	At observation time or between times	934RR
		Rime	At observation time or between times	935RR
		Compound deposits	At observation time or between times	936RR
		Wet-snow deposits	At observation time or between times	937RR

N o t e : Threshold values should be applied by national decision to provide transmission at appropriate levels of severity of each type of phenomena.

# **FM 20 RADOB**

6/20.1 *Part B, Section 2*

6/20.1.1 The section shall be used in the following form:

51515     $n_1$ REEE    ( $h_e h_e H_e H_e$ )     $n_2$ REEE    ( $h_e h_e H_e H_e$ )    . . . . .  
            $n_n$ REEE    ( $h_e h_e H_e H_e$ )

6/20.1.2 This section shall be used to indicate the range of the radar equipment and the angle of elevation of the antenna at the time of observation of each of the echo systems described in Part B using each series of groups  $N_e N_e W_R H_e I_e /555/ N_e N_e a_e D_e f_e$ .

6/20.1.3 *Group  $n_1$ REEE*

This group shall refer to the first system of echoes described.

6/20.1.4 *Group  $n_2$ REEE*

This group shall refer to the second system of echoes, etc.

6/20.1.5 *Group ( $h_e h_e H_e H_e$ )*

These groups, when included, shall indicate the height of the base and the top of the systems of echoes described.

# **FM 32 PILOT and FM 33 PILOT SHIP**

6/32.1 *Part A, Section 2*

When upper-wind observation is carried out without simultaneous pressure measurement, the following altitudes shall be used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)	or
850	1 500	1 500
700	3 000	3 000
500	5 500	5 400
400	7 000	7 200
300	9 000	9 000
250	10 500	10 500
200	12 000	12 000
150	13 500	13 500
100	16 000	15 900

6/32.2 *Part A, Section 3*

The inclusion or omission of the group  $4v_b v_b v_a v_a$  shall be left to national decision.

*N o t e :* Members are encouraged to include this group as often as possible.

6/32.3 *Part B, Section 4*

6/32.3.1 (i) When upper-wind observation is carried out without simultaneous pressure measurement and altitudes are indicated in geopotential units (use of symbolism for  $8/9t_n u_1 u_2 u_3$  d d f f f), wind data shall be included in this section for the significant levels as well as for the following fixed regional levels:

either: 1 000, 2 000, 4 000 metres (when the group  $8t_n u_1 u_2 u_3$  is used);

or: 900, 2 100, 4 200 metres (when the group  $9t_n u_1 u_2 u_3$  is used);

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- (ii) When upper-wind observation is carried out with simultaneous pressure measurement and altitudes are indicated in pressure units (in whole hectopascals) (use of the symbolic form 21212  $n_n n_n P_n P_n P_n d_n d_n f_n f_n f_n$ ), wind data shall be included in this section for the significant levels as well as for the following fixed regional levels: 900, 800 and 600 hPa (considered as approximations to the levels 1 000, 2 000 and 4 000 metres, respectively).

6/32.3.2 The different levels of Section 4 shall be inserted so that they succeed each other in ascending order of altitude.

6/32.4 *Part C, Section 2*

When upper-wind observation is carried out without simultaneous pressure measurement, the following altitudes shall be used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)	or
70	18 500	18 300
50	20 500	20 700
30	23 500	23 700
20	26 500	26 400
10	31 000	30 900

6/32.5 *Part C, Section 3*

Regulation 6/32.2 shall apply.

6/32.6 *Part D, Section 4*

This section shall contain wind data for significant levels up to the top of the ascent.

6/32.7 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

## FM 35 TEMP and FM 36 TEMP SHIP

6/35.1 *Part A, Section 4*

The inclusion or omission of the group 4 $v_b v_b v_a v_a$  shall be left to national decision.

Note: Members are encouraged to include this group as often as possible.

6/35.2 *Part B, Section 9*

6/35.2.1 This section shall be used in the following form:

51515	11 $P_1 P_1 P_1$	$d_1 d_1 f_1 f_1 f_1$
	22800	ddfff
	33600	ddfff

6/35.2.2 The subsection beginning with the symbolic figure group 51515 shall be included to transmit the following wind data:

- (i) Wind for 900 or 1 000 metres above the surface, described by groups 11 $P_1 P_1 P_1 d_1 d_1 f_1 f_1 f_1$  in which  $P_1 P_1 P_1$  is the pressure (in hectopascals) at 900 or 1 000 metres above the surface. These winds are included to calculate wind vector differences;
- (ii) Wind for 800 hPa, described by groups 22800 ddfff;
- (iii) Wind for 600 hPa, described by groups 33600 ddfff.

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6/35.3 *Part C, Section 4*

Regulation 6/35.1 shall apply.

6/35.4 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges.

### **FM 53 ARFOR**

6/53.1 *Group AAAAA*

Plain language shall be used in place of the zone indicator AAAAA.

### **FM 67 HYDRA**

6/67.1 The use of this code and, in particular, the inclusion or omission of various sections shall be left to national decision.

6/67.2 *Group ts<sub>n</sub>T<sub>t</sub>T<sub>t</sub>T<sub>t</sub>*

Code figures 6 and 7 should be used for the following specifications of t (Code table 4001):

6 Air temperature measured 12 hours before the time of observation;

7 Water temperature measured 12 hours before the time of observation.

### **FM 68 HYFOR**

6/68.1 Regulation 6/67.1 shall apply.

### **FM 85 SAREP**

Note: For Section 5 no regional regulations have been developed.



## A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS

### RF 6/01 EXFOR — Forecast of extreme temperatures

#### CODE FORM:

EXFOR        I I I I         $T_{x1}T_{x1}T_{n1}T_{n1}T_{x2}$         ( $T_{x2}T_{n2}T_{n2}C_1C_1$ )

#### NOTES:

- (1) The code form RF 6/01 EXFOR is used for reporting forecast extreme temperatures.
- (2) Members requiring these forecasts from other Members arrange for the exchange of EXFOR reports on the basis of bilateral or multilateral agreement.
- (3) The group in brackets is used only on special request between Members.

#### REGULATIONS:

##### 6/01.1        *General*

The code name EXFOR shall be included at the beginning of an individual report; however, in case of a group of such reports, the code name EXFOR shall be included only in the heading of the collective.

##### 6/01.2        *Group $T_{x1}T_{x1}T_{n1}T_{n1}T_{x2}$*

If the group  $T_{x2}T_{n2}T_{n2}C_1C_1$  is not transmitted, the last symbolic letter of the first group shall be coded as  $T_{x2} = /$ .

##### 6/01.3        *Group ( $T_{x2}T_{n2}T_{n2}C_1C_1$ )*

6/01.3.1        This optional group shall be included only when information on extreme temperatures of the next day and following night is needed.

6/01.3.2        The two confidence figures  $C_1$  and  $C_1$  refer to  $T_{x2}T_{x2}$  and  $T_{n2}T_{n2}$ , respectively.

##### 6/01.4        *Requirements for international exchange*

The arrangement of the exchange of EXFOR reports shall be left to the Members concerned.

**RF 6/02 GAFOR — General aviation forecast****CODE FORM :**

GAFOR	CCCC	$G_1 G_1 G_2 G_2$		
	AAAA	(zone number(s))	$w_g w_g w_g$	
	or			
	BBBB	(zone number(s))	$w_g(k) (/w_g(k))$	$(w'w')$
	TTTTT	$G'_1 G'_1 G'_2 G'_2$	$w_g(k) (/w_g(k))$	$(w'w')$
	LLL	$w_g(k)$	$(w'w')$	

**REGULATIONS :**

- 6/02.1 The GAFOR report shall include the information following indicator AAAA or the one following BBBB, but not both of them.
- 6/02.2 In section BBBB, if one visibility/cloud base category applies, use shall be made of  $w_g(k)$ . If the category is expected to be within two limits, use shall be made of  $w_g(k)/w_g(k)$ .  
 Note: Each category of  $w_g$  includes its lower but not its upper threshold values for visibility and cloud base.
- 6/02.3 Zone number(s) shall be given as:  $a_g a_g$  for sub-area or route segment;  $a_g a_g / a_g a_g$  for continuous series of sub-areas/route segments (example: 61/67 means 61, 62, 63, 64, 65, 66 and 67); or  $a_g a_g . . . a_g a_g$  for non-continuous sequence of sub-areas (example: 61, 63, 66, 67).

**RF 6/03 WAFOR — Warning forecast of hazardous weather phenomena****CODE FORM :**

WAFOR	YYGGi <sub>W</sub>	Ii <sub>C</sub> i <sub>N</sub> i <sub>N</sub>	$G_1 G_1 G_2 G_2$	$(C_w C_w$	$1d_1 d_1 d_2 d_2$	$2f_1 f_1 f_2 f_2)$
				$(C_w C_w$	$33R_1 R_1 R_1$	$44R_2 R_2 R_2)$
				$(C_w C_w$	$55s_1 s_1 s_1$	$66s_2 s_2 s_2)$
				$(C_w C_w$	$7T_1 T_1 T_2 T_2$	and/or
					$8T_{m1} T_{m1} T_{m2} T_{m2})$	
				$(C_w C_w)$	—	—
				(. . .)		
				etc.		

**NOTES :**

- WAFOR is the name of the code for a warning forecast of hazardous weather phenomena expected over an agreed land area ( $i_C i_N i_N$ ) of a neighbouring partner country.
- Owing to the variability of meteorological elements in space and time, and the limitations of forecasting techniques, the specific indications given in a warning should be understood by the recipient to be the most probable expected time and area of occurrence.
- Each code figure in Code table 642 ( $C_w C_w$ ) is defined as *one* or *one combined* phenomenon and/or threshold value.



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- (4) The code form may include combination(s)/sequence(s) of indicator figure groups with the combination(s)/sequence(s) being preceded by *one*  $C_wC_w$  group which indicates the type of the expected phenomenon and/or threshold value, or by individual  $C_wC_w$  groups not linked with mandatory indicator figure groups, as specified in the regulations.
- (5) By convention, in meteorological warnings, the “worse” or “more dangerous” threshold value and/or phenomenon should preferably be indicated.
- (6) Symbolic letters not specifically commented follow the rules and regulations as laid down in FM 12 SYNOP.
- (7) Code table 642 ( $C_wC_w$ ) contains a variety of phenomena and/or threshold values which are available for selective agreements between partner countries.

### REGULATIONS:

- 6/03.1 The code name WAFOR shall always be included in the message.
- 6/03.2 *Group*  $YYGGi_w$   
This group shall always be included in the message. YY and GG are used to specify the day of the month and the time of issue (UTC) of the message. For  $i_w$ , only the code figures 0 or 3 (estimated wind speed) shall be used as appropriate.
- 6/03.3 *Group*  $G_1G_1G_2G_2$   
  - (a) When the period of forecast commences at midnight,  $G_1G_1$  shall be encoded 00.
  - (b) When the period of forecast ends at midnight,  $G_2G_2$  shall be encoded 24.
  - (c) When the period of forecast is between 25 and 48 hours after  $G_1G_1$ ,  $G_2G_2$  shall be encoded by adding 50 to the time of ending of the period of forecast.
  - (d) The reference period of  $C_wC_w$  phenomena (particularly of combined phenomena) shall in no case be longer than the period indicated by  $G_1G_1G_2G_2$ .
- 6/03.4 *Group*  $IIi_Ci_Ni_N$
- 6/03.4.1 Countries with the same block number II shall add after II as the third digit a specific country indicator  $i_C$  whose coded figure corresponds to the leading hundreds figure of the iii station numbering system (Code table 644).
- 6/03.4.2 Based on agreements between partner countries, the selection of  $i_Ni_N$  areas from which the expected hazardous phenomena and/or threshold values are desired by the recipient partner country shall be left to national decision (Code table 646).
- 6/03.4.3 The WMO Secretariat shall be notified of the  $i_Ni_N$  allocation to be published in Volume II of the *Manual on Codes*.
- 6/03.5 *Group*  $C_wC_w$
- 6/03.5.1 Based on agreements between partner countries, the selection of  $C_wC_w$  code figures (Code table 642) to be exchanged between them shall be left to national decision.
- 6/03.5.2 The groups with indicator figures 1 to 8 shall always be preceded by one relevant  $C_wC_w$  group.
- 6/03.5.3 *One* WAFOR message may contain more than one  $C_wC_w$  phenomenon. The first part of the message shall include the  $C_wC_w$  phenomena that are followed by indicator figure groups.  
After the last indicator figure group, as many further  $C_wC_w$  phenomena may be added as are expected for the  $G_1G_1G_2G_2$  period and specified  $i_Ci_Ni_N$  area.

Example:  $C_wC_w$  1 . . . . 2 . . . .  $C_wC_w$  7 . . . .  $C_wC_w$   $C_wC_w$  . .

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- 6/03.5.4 Within each the first and the second part of a WAFOR message, the  $C_wC_w$  code figures shall be arranged in ascending order.
- 6/03.5.5 The  $C_wC_w$  code figures used in *one* WAFOR message shall refer to only *one* period of time and to *one* area as specified by  $G_1G_1G_2G_2$  and  $i_{C_iN_iN_i}$ .
- 6/03.5.6 If a  $C_wC_w$  phenomenon and/or threshold value is expected for a selected area  $i_{C_iN_iN_i}$  (Code tables 644 and 646), this very same  $C_wC_w$  shall be reported again for the same  $i_{C_iN_iN_i}$  area if, between the cessation of this phenomenon and/or threshold value and the expected next occurrence of the same phenomenon, a period of at least 24 hours has elapsed.
- 6/03.6 *Indicator figure groups*
- If an expected range of values (i.e. from . . . to . . . ) can reliably be given, both the lowest (index 1) and the highest (index 2) value shall be reported. In case only *one* boundary value (lowest or highest) can be given with reasonable reliability, the remaining code element shall be reported as */(/)*.
- Examples:  $1d_1d_1//$  or  $1//d_2d_2$ ,  $2f_1f_1//$  or  $2//f_2f_2$   
 $33R_1R_1R_1$   $44//$ , or  $33//$   $44R_2R_2R_2$   
 $7T_1T_1//$  or  $7//T_2T_2$   
 $8T_{m1}T_{m1}//$  or  $8//T_{m2}T_{m2}$
- 6/03.7 *Groups  $7T_1T_1T_2T_2$ ,  $8T_{m1}T_{m1}T_{m2}T_{m2}$*
- 6/03.7.1 Within the conditions laid down in the  $C_wC_w$  Code table 642, group 7. . . . shall indicate the expected highest and/or lowest of the  $C_wC_w$  phenomenon and/or threshold value and group 8. . . . shall indicate the highest and/or lowest diurnal (i.e. 24-hour) mean air temperature value covering the 0000 to 2400 UTC diurnal mean.
- 6/03.7.2 Regulation 6/03.6 shall apply.
- 6/03.8 *Frequency of WAFOR messages*
- 6/03.8.1 If a  $C_wC_w$  phenomenon and/or threshold value has been forecast for *one* specified  $G_1G_1G_2G_2$  period and for *one* specified  $i_{C_iN_iN_i}$  area, this very same phenomenon may be forecast again if, between the cessation of the actual occurrence of a selected  $C_wC_w$  phenomenon (which might even have been reported in a WAREP message) and the next expected time of occurrence of the same  $C_wC_w$  phenomenon, a time interval of at least 24 hours has elapsed.
- 6/03.8.2 Usually *one*  $C_wC_w$  phenomenon shall be forecast only once within 24 hours. However, it should be left to the discretion of the issuing country to reduce the interim waiting time to less than 24 hours in grave synoptic situations.

**RF 6/04 WAREP — Warning report of the actual occurrence of hazardous weather phenomena****CODE FORM :**

WAREP	YYGGi <sub>w</sub>	Iiii	(C <sub>w</sub> C <sub>w</sub>	1ddff)
			(C <sub>w</sub> C <sub>w</sub>	3RRRt <sub>r</sub> t <sub>r</sub> )
			(C <sub>w</sub> C <sub>w</sub>	55sss)
			(C <sub>w</sub> C <sub>w</sub>	—
			(. . .)	—

**NOTES :**

- (1) WAREP is the name of the code for a report on hazardous weather phenomena actually observed at the agreed stations Iiii of a neighbouring partner country.
- (2) The code form may include combination(s)/sequence(s) of indicator figure groups with the combination(s)/sequence(s) being preceded by:
  - (a) One C<sub>w</sub>C<sub>w</sub> group which indicates the type of the observed phenomenon and/or threshold value;  
or
  - (b) Individual C<sub>w</sub>C<sub>w</sub> groups not linked with mandatory indicator figure groups, as specified in the regulations.
- (3) By convention, in meteorological reports, the “worse” or “more dangerous” phenomena and/or threshold values should preferably be indicated.
- (4) Symbolic letters not specifically commented follow the rules and regulations as laid down in FM 12 SYNOP.
- (5) Code table 642 (C<sub>w</sub>C<sub>w</sub>) contains a variety of phenomena and/or threshold values which are available for selective agreements between partner countries.
- (6) Each code figure of Code table 642 (C<sub>w</sub>C<sub>w</sub>) is defined as *one* or *one combined* phenomenon and/or threshold value which may release a WAREP report.

**REGULATIONS :**

- 6/04.1 The code name WAREP shall always be included in the report.
- 6/04.2 *Group YYGGi<sub>w</sub>*  
This group shall always be included in the report. YY and GG are used to specify the day of the month and the time (UTC) when the reported phenomena actually occurred.
- 6/04.3 *Group Iiii*  
The selection of Iiii stations to be exchanged shall be agreed upon by partner countries.
- 6/04.4 *Group C<sub>w</sub>C<sub>w</sub>*  
Based on agreements between partner countries, the selection of C<sub>w</sub>C<sub>w</sub> code figures (Code table 642) to be exchanged between them shall be left to national decision.
- 6/04.5 *Group 1ddff*  
This group shall always be preceded by the agreed C<sub>w</sub>C<sub>w</sub> threshold value.
- 6/04.6 *Group 3RRRt<sub>r</sub>t<sub>r</sub>*  
This group shall always be preceded by the agreed C<sub>w</sub>C<sub>w</sub> threshold group, with t<sub>r</sub>t<sub>r</sub> indicating the added total time during which the RRR threshold value has accumulated.
- 6/04.7 *Group 55sss*  
This group shall always be preceded by the agreed C<sub>w</sub>C<sub>w</sub> threshold value.

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6/04.8 *Frequency of WAREP reports*

- 6/04.8.1 If a  $C_wC_w$  phenomenon has been reported at *one* observation hour, this very same  $C_wC_w$  phenomenon may be reported again if, between the cessation of the actual (by a WAFOR message forecast or not forecast) occurrence of a selected  $C_wC_w$  phenomenon and the next actual (by a WAFOR message forecast or not forecast) occurrence of the same  $C_wC_w$  phenomenon, a time interval of at least 24 hours has elapsed.
- 6/04.8.2 Usually *one*  $C_wC_w$  phenomenon shall be reported only once within 24 hours. However, it shall be left to the discretion of the disseminating partner country to reduce the interim/waiting time to less than 24 hours in grave synoptic situations.
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## B — SPECIFICATIONS OF SYMBOLIC LETTERS (or groups of letters) FOR REGIONAL USE

AAAA	Indicator letter group used to identify forecasts of prevailing conditions of visibility and cloud base throughout the six-hour period specified by $G_1G_1G_2G_2$ , in three periods of two hours. (RF 6/02)
$a_ga_g$	Sub-area or route segment for which the forecast is provided (specified by the country concerned) (see Section G). (RF 6/02)
BBBB	Indicator letter group used to identify forecasts of prevailing conditions of visibility and cloud base throughout the six-hour period specified by $G_1G_1G_2G_2$ by means of change groups as appropriate. (RF 6/02)
$C_wC_w$	Type of hazardous phenomenon. (Code table 642) (RF 6/03, RF 6/04)
CCCC	ICAO indicator of the centre originating the GAFOR report. (RF 6/02)
dd	True direction, in tens of degrees, from which wind is blowing (or will blow). (Code table 0877) (RF 6/04)
$d_1d_1$	Left-hand limit of forecast sector of wind direction, in tens of degrees. (Code table 0877) (RF 6/03)
$d_2d_2$	Right-hand limit of forecast sector of wind direction, in tens of degrees. (Code table 0877) (RF 6/03)
EEE	Angle of elevation of the antenna, in tenths of a degree. (Section 2 in FM 20) (1) Positive angles from $00.0^\circ$ to $90.0^\circ$ are expressed by the numbers 000 to 900. (2) For negative angles, from $-00.1^\circ$ to $-09.9^\circ$ , add 900 to the absolute value of the angle of elevation. Consequently, negative angles are expressed by the numbers 901 to 999.
ff	Wind speed, in units indicated by $i_w$ . (RF 6/04)
$f_1f_1$	Minimum limit of forecast wind speed. (RF 6/03)
$f_2f_2$	Maximum limit of forecast wind speed. (RF 6/03)
GG	Time of issue, to the nearest whole hour UTC. (RF 6/03)
—	Time, to the nearest whole hour UTC, at which a hazardous phenomenon set off. (RF 6/04)
$G_1G_1$	Time of commencement of period of forecast, in whole hours UTC. (RF 6/03)

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$G_2G_2$	Time of ending of period of forecast, in whole hours UTC. (RF 6/03)
$G_1G_1G_2G_2$	Period of validity of the forecast. (RF 6/02)
$G'_1G'_1G'_2G'_2$	Validity period associated with TTTT. (RF 6/02)
$H_eH_e$	Height of top, above mean sea level, of the system of echoes described. (Code table 1677) (Section 2 in FM 20)
$h_eh_e$	Height of base, above mean sea level, of the system of echoes described. (Code table 1677) (Section 2 in FM 20)
II	Block number. (RF 6/03, RF 6/04)
$i_C$	Country indicator of a country sharing with other countries the same block number II. (Code table 644) (RF 6/03)
$i_w$	Indicator for source and units of wind speed. (Code table 1855) (RF 6/03, RF 6/04)
$i_Ni_N$	Specification of sub-areas of a country. (Code tables 644, 646) (RF 6/03)
iii	Station number. (RF 6/04)
k	Index used to specify a sub-category of $w_g$ , when $w_g$ is M or D. (Code table 691) (RF 6/02)
LLL	ICAO standard abbreviation to specify variations in space. (RF 6/02)
$\left. \begin{matrix} n_1 \\ n_2 \\ \dots \\ n_n \end{matrix} \right\}$	Sequence number of the echo. (Section 2 in FM 20)
R	Range of the radar apparatus, at time of observation, given in units of 20 kilometres. (Section 2 in FM 20) (1) The code figure R = 0 signifies 200 kilometres or more.
RRR	Amount of precipitation which has fallen during the period preceding the time of observation, as indicated by $t_r t_r$ . (Code table 3590) (RF 6/04)
$R_1R_1R_1$	Minimum limit of forecast precipitation amount. (Code table 3590) (RF 6/03)
$R_2R_2R_2$	Maximum limit of forecast precipitation amount. (Code table 3590) (RF 6/03)

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$R_{24}R_{24}R_{24}R_{24}$	Total amount of precipitation during the 24-hour period ending at the time of observation, in tenths of a millimetre (coded 9998 for 999.8 millimetres or more, and coded 9999 for trace). (7-group in Section 3 of FM 12)
sss	Total depth of snow. (Code table 3889) (RF 6/04)
$s_1s_1s_1$	Minimum limit of forecast depth of the snow cover. (Code table 3889) (RF 6/03)
$s_2s_2s_2$	Maximum limit of forecast depth of the snow cover. (Code table 3889) (RF 6/03)
$T_gT_g$	Ground (grass) minimum temperature of the preceding night, in whole degrees Celsius, its sign being given by $s_n$ . (3-group in Section 3 of FM 12)
$T_{m1}T_{m1}$	Minimum of forecast diurnal mean temperature covering the period from 0000 to 2400 UTC of the day after day of issue (YY + 1), in whole degrees Celsius. (RF 6/03)
$T_{m2}T_{m2}$	Maximum of forecast diurnal mean temperature covering the period from 0000 to 2400 UTC of the day after day of issue (YY + 1), in whole degrees Celsius. (RF 6/03)
$T_{n1}T_{n1}$	Minimum temperature forecast for the night following the issue of the report, in whole degrees Celsius (period 1800–0600 UTC). (RF 6/01)
$T_{n2}T_{n2}$	Minimum temperature forecast for the second night following the issue of the report, in whole degrees Celsius (period 1800–0600 UTC). (RF 6/01)
$T_{x1}T_{x1}$	Maximum temperature forecast for the day of issue of the report, in whole degrees Celsius (period 0600–1800 UTC). (RF 6/01)
$T_{x2}T_{x2}$	Maximum temperature forecast for the day following the day of issue of the report, in whole degrees Celsius (period 0600–1800 UTC). (RF 6/01)
$T_1T_1$	Minimum temperature after a forecast drop of temperature by at least . . . K. (RF 6/03)
$T_2T_2$	Maximum temperature after a forecast drop of temperature by at least . . . K. (RF 6/03)
TTTTT	Change indicator. (RF 6/02)
$t_r t_r$	Accumulated duration of rainfall, in full hours. (RF 6/04)
$w_g$	Category of forecast prevailing conditions of visibility and cloud base. (Code table 691) (RF 6/02)

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w'w' Significant forecast weather. (Code table 4678)  
(RF 6/02)

YY Day of the month (UTC), with 01 indicating the first day, 02 the second day, etc.  
(RF 6/03, RF 6/04)

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## **C — SPECIFICATIONS OF CODE FIGURES (code tables) FOR REGIONAL USE**

Code tables in regional use in Region VI are numbered with a three-figure number from 620 to 699. The numbering system and codes for each element are given below:

642      $C_w C_w$

644      $\begin{cases} i_C \\ i_N i_N \end{cases}$

646      $i_N i_N$

691      $\begin{cases} k \\ w_g \end{cases}$

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$C_w C_w$  — Type if hazardous phenomenon

00	10	20	30	40	50	60	70	80	90
	Wind speed	Temperature		Horizontal visibility		Rain	Snow		Miscellaneous
0	Mean value $\geq 20 \text{ m s}^{-1}$					$\geq 25 \text{ mm/6 h}$	$\geq 15 \text{ cm/12 h}$		Hail
1	Gusts $\geq 25 \text{ m s}^{-1}$					$\geq 50 \text{ mm/6 h}$			
2		$T_{\text{max}}$ decreasing in 24 h by $\geq 10 \text{ K}$ down to below $-10^\circ\text{C}$				$\geq 25 \text{ mm/24 h}$			
3		Mean value decreasing in 24 h by $\geq 10 \text{ K}$					Blowing snow, depth of loose snow = 15 cm; mean wind speed $> 8 \text{ m s}^{-1}$		
4				Widespread $< 200 \text{ m}$					
5									
6		$T_{\text{max}}$ increasing to $\geq 5^\circ\text{C}$ with snow cover $\geq 15 \text{ cm}$ and rain							
7				Widespread $< 100 \text{ m}$ with snow/dust- storm		With glaze on ground and/or structures	Snowstorm and snowfall (mean wind speed $> 8 \text{ m s}^{-1}$ )		
8	Squalls; gusts $\geq 25 \text{ m s}^{-1}$								
9	Squalls, gusts $\geq 25 \text{ m s}^{-1}$ thunderstorm or tornado	Decreasing with frontal passage by $\geq 10 \text{ K}$ in 3 h		Widespread $< 50 \text{ m}$					

Note:  Phenomenon agreed upon by partner countries for bilateral exchange (the thickly lined squares are merely examples).

## 644

$i_C$  — Country indicator of a country sharing with other countries the same block number II

$i_{NiN}$  — Specification of sub-areas of a country

Derivation of  $i_C i_{NiN}$  sub-areas in countries which share one and the same block number II — the system is based upon three indicator letters, i.e.:

(a)  $i_C$  = the first digit of the country's international station numbers (except in the area of II = 40);

(b)  $i_{NiN}$  = two digits indicating the areal subdivision within the country  $i_C$ .

IIiii	Country	II <i>i<sub>C</sub></i> <i>i<sub>N</sub></i> <i>i<sub>N</sub></i> (sub-area)
02000 – 02699	Sweden	020. .
800 – 999	Finland	028. .
03000 – 03949	United Kingdom	030. .
250 – 999	Ireland	032. .
04000 – 04199	Iceland	040. .
200 – 399	Greenland	041. .
06000 – 06199	Denmark	060. .
200 – 399	Netherlands	062. .
400 – 499	Belgium	064. .
580 – 599	Luxembourg	065. .
600 – 999	Switzerland and Liechtenstein	066. .
08000 – 08494	Spain	080. .
495 – 499	Gibraltar	084. .
500 – 599	Portugal	085. .
11000 – 11399	Austria	110. .
400 – 799	Czech Republic	114. .
800 – 999	Slovakia	118. .
12000 – 12699	Poland	120. .
700 – 999	Hungary	127. .
13000 – 13489	Serbia, Montenegro	130. .
13490 – 13599	The former Yugoslav Republic of Macedonia	130. .
600 – 699	Albania	136. .
15000 – 15499	Romania	150. .
500 – 999	Bulgaria	155. .
16000 – 16595	Italy	160. .
596 – 599	Malta	165. .
600 – 799	Greece	166. .
17000 – 17399	Turkey	170. .
600 – 617	Cyprus	176. .
40000 – 40099	Syrian Arab Republic	400. .
100 – 149	Lebanon	401. .
150 – 199	Israel	402. .
250 – 349	Jordan	403. .

Note: Groups of the immediate neighbouring countries "Netherlands, Belgium, Luxembourg", "Switzerland, Liechtenstein", "Spain, Gibraltar", "Bosnia and Herzegovina, Croatia, Slovenia, the former Yugoslav Republic of Macedonia, Serbia, Montenegro, Albania" and "Syrian Arab Republic, Lebanon, Israel, Jordan" are invited to examine the usefulness of their individual countries being combined into *one* integrated  $i_{NiN}$  sub-area numbering system ( $i_{NiN}$  = 01, 02, 03, . . .), with  $i_C$  still serving as the (issuing) country indicator.

$i_N i_N$  — *Specification of sub-areas of a country*

Sub-areas within *one* country (or a group of countries):

Example of two Region VI (Europe) countries, neighbouring or not, both with the same imaginary block number II = 99

Country A

$II i_C i_N i_N = 99000 \dots 990. .$

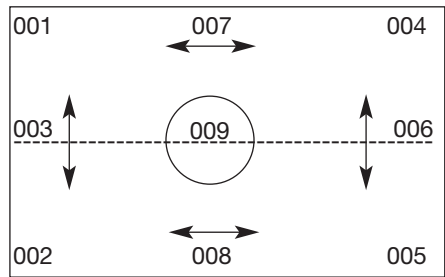
001 + 002 = 003  
004 + 005 = 006  
001 + 004 = 007  
002 + 005 = 008  
001 + 004 }  
002 + 005 }  
or  
{ 003 + 006 } = 009  
or  
{ 007 + 008 }

Country B

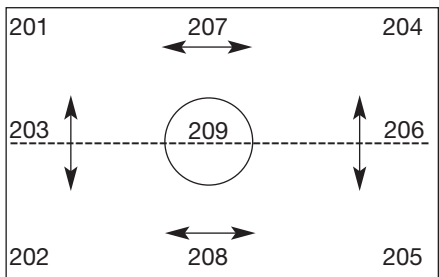
$II i_C i_N i_N = 99200 \dots 992. .$

201 + 202 = 203  
204 + 205 = 206  
201 + 204 = 207  
202 + 205 = 208  
201 + 204 }  
202 + 205 }  
or  
{ 203 + 206 } = 209  
or  
{ 207 + 208 }

Country A ( $i_C i_N i_N = 0. .$ )



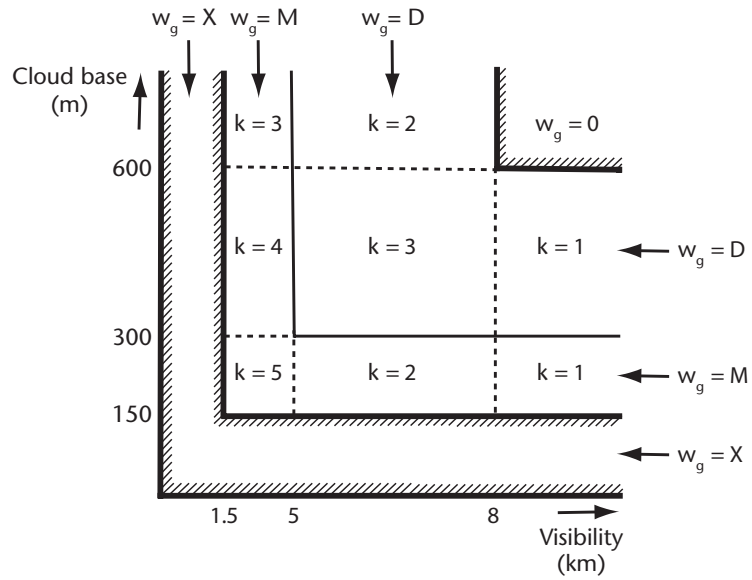
Country B ( $i_C i_N i_N = 2. .$ )



**691**

$k$  — Index used to specify a sub-category of  $w_g$ , when  $w_g$  is M or D

$w_g$  — Category of forecast prevailing conditions of visibility and cloud base





## D — NATIONAL CODING PROCEDURES WITH REGARD TO INTERNATIONAL CODE FORMS

### FM 12 SYNOP and FM 13 SHIP

#### AUSTRIA

$i_R i_x h V V$	Prevailing visibility is reported instead of minimum visibility.
$7wwW_1W_2$	<p>ww is coded 05 when the visibility is 5 kilometres or less and the relative humidity is less than 80 per cent.</p> <p>ww is coded 10 when the visibility is 5 kilometres or less but not less than 1 kilometre, and the relative humidity is equal to or greater than 80 per cent.</p>
553SS	In Section 3, this group is used for automated stations to report duration of sunshine in the past hour. <i>The group is included only for whole hours of possible sunshine between sunrise and sunset.</i>
$9S_p S_p S_p S_p$	<p>The group 931ss is used to report at 0600 UTC the depth of fresh snow fallen <i>during the preceding 24 hours</i>. (No time-group is used together with this group. The possible group 90768 = more than 18 hours is less significant.)</p> <p>ss is coded as given in Code table 3870 with the following exceptions: 00 and 91 to 96 <i>are not used</i>, 97 = <i>less than 5 millimetres</i>.</p>
Section 5	In Section 5, some stations which do not carry out synoptic observations at 1800 UTC report maximum temperature and amount of precipitation from 0600 to 1800 UTC of the day before with the groups $1s_n T_x T_x T_x$ 6RRR/.

#### BELGIUM

$6RRRt_R$	When reported, this group is included in Section 3.
$7wwW_1W_2$	<p>ww is coded 05 when horizontal visibility is between 1 and 5 kilometres and the relative humidity is less than 80 per cent.</p> <p>ww is coded 10 when horizontal visibility is between 1 and 5 kilometres and the relative humidity is equal to or greater than 80 per cent.</p>

#### CYPRUS

$6RRRt_R$	When reported, this group is included in Section 1.
$7wwW_1W_2$	<p>ww is coded 04, 05, 06 or 07 when horizontal visibility is less than 10 kilometres.</p> <p>ww is coded 09 when horizontal visibility is between 1 000 metres and 5 kilometres.</p> <p>ww is coded 10 when horizontal visibility is 1 000 metres or more and less than 10 kilometres.</p> <p>ww is coded 30, 31 or 32 only when horizontal visibility is 200 metres or more and less than 1 000 metres.</p> <p>ww is coded 33, 34 or 35 only when horizontal visibility is less than 200 metres.</p>

**CZECH REPUBLIC**

4PPPP	This group is reported by all stations with elevation <i>lower than or equal to 550 metres</i> .
6RRRt <sub>R</sub>	When reported, this group is included in Section 1 to report precipitation amount over the preceding six or 12 hours. In addition, this group is included in Section 3 to report precipitation amount over the preceding one or three hours.
3Es <sub>n</sub> T <sub>g</sub> T <sub>g</sub>	This group is reported by all stations at 0600 UTC. If glaze on the ground is occurring (E = 5), this group is reported in the form 35/// at 1800 UTC.
4E'sss	When reported, this group is included at 0600 and 1800 UTC.
55SSS	This group is reported at 0000 UTC.
9S <sub>P</sub> S <sub>P</sub> S <sub>P</sub> S <sub>P</sub>	This group is used in the following forms: 910ff, 911ff, 919M <sub>w</sub> D <sub>a</sub> , 9298S' <sub>8</sub> , 9299S' <sub>8</sub> , 931ss, 932RR, 934RR, 935RR, 936RR, 937RR, 951N <sub>v</sub> n <sub>4</sub> , 96048 and 96049. The group 911ff is used to report the highest gust during the period covered by W <sub>1</sub> W <sub>2</sub> if ff is equal to or greater than 20 m s <sup>-1</sup> . The groups 90710 931ss are used to report the depth of newly fallen snow during the preceding one hour if this depth of newly fallen snow is equal to or greater than 1 centimetre. The other groups shall be transmitted regardless of the intensity of the phenomenon.

**DENMARK**

6RRRt <sub>R</sub>	When reported, this group is included in Section 1 and, for certain stations, in Section 3. t <sub>R</sub> = 0 means: more than 24 hours, or period of reference not covered by Code table 4019, or period of reference does not end at the time of the report. (ref. Volume I.1, Code table 4019, Note (2))
7wwW <sub>1</sub> W <sub>2</sub>	ww is coded 10 only when horizontal visibility due to mist is 1–9 kilometres (inclusive). ww is coded 27 also when showers of snow, or of rain and snow, together with hail (small hail, snow pellets), have occurred during the preceding hour but not at the time of observation. ww is coded 30, 31, 32, 33, 34 or 35 only when horizontal visibility due to duststorm or sandstorm is less than 1 kilometre. ww is coded 38 or 39 only when horizontal visibility due to blowing snow is less than 10 kilometres. The following figures for W <sub>1</sub> W <sub>2</sub> , as given in Code table 4561, are coded as follows: 5 Drizzle and/or freezing drizzle 6 Rain, freezing rain and/or drizzle and rain 7 Snow, rain and snow mixed, ice pellets, snow grains, diamond dust and/or isolated star-like snow crystals.
7w <sub>a</sub> w <sub>a</sub> W <sub>a1</sub> W <sub>a2</sub>	w <sub>a</sub> w <sub>a</sub> , as given in Code table 4680, may additionally be coded as follows: 89 Shower(s) of snow pellets, small hail and/or hail (light, moderate or heavy). The following figures for W <sub>a1</sub> /W <sub>a2</sub> , as given in Code table 4531, are coded as follows: 5 Drizzle and/or freezing drizzle 6 Rain, freezing rain and/or drizzle and rain 7 Snow, rain and snow mixed, ice pellets, snow grains and/or diamond dust.



## REGION VI

### DENMARK *(continued)*

3Es<sub>n</sub>T<sub>g</sub>T<sub>g</sub> }  
4E'sss } When reported, these groups are included at 0600 UTC, except that stations in Greenland (II = 04) observe and include them at 1200 UTC.

8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub> This group is included.

9SpSpSpSp This group is included.

#### Notes:

- (1) In SYNOPs from Danish automatic weather stations not taken at international standard hours (e.g. 1300, 1400, 1600, 1700, . . . UTC), the period covered by W<sub>a1</sub>W<sub>a2</sub> will be one hour.
- (2) Danish automatic weather stations cannot cope with Regulations 12.2.6.7.2 second part and 12.2.6.7.4 in Volume I.1, Part A, but will always report either the highest possible code figure for W<sub>a1</sub> and the next highest for W<sub>a2</sub> corresponding to observed weather phenomena, or if no discernible change in weather has occurred during the period, then the highest possible code figure for both W<sub>a1</sub> and W<sub>a2</sub>. Neither can they stand up to the rules mentioned in Regulation 12.4.10, but will report up to four layers of clouds in ascending order and with summation amounts. N is reported equal to N<sub>s</sub> of the highest of these layers, and no genus of cloud is reported.

### FRANCE

#### FM 12 SYNOP

7wwW<sub>1</sub>W<sub>2</sub> ww is coded as 05 when haze reduces visibility to less than 3 kilometres.  
ww is coded as 10 when mist reduces visibility to less than 3 kilometres.  
  
Note: The specifications for ww = 44 and 45 have been expanded to read: neither appreciable change nor evolution could be observed during the preceding hour.

4E'sss When there is snow on the ground, this group is reported at 0600 and 1800 UTC.

9SpSpSpSp This group 931ss is used to report the depth of newly fallen snow with the form 931s's' where s's' is the depth of newly fallen snow in centimetres (99 means 99 cm or more).

#### FM 13 SHIP

7wwW<sub>1</sub>W<sub>2</sub> ww is coded as 05 when haze reduces visibility to less than 5 kilometres.  
ww is coded as 10 when mist reduces visibility to less than 5 kilometres.  
  
Note: The specifications for ww = 44 and 45 have been expanded to read: neither appreciable change nor evolution could be observed during the preceding hour.

### GERMANY

3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> This group is reported by all stations in addition to group 4PPPP.

4PPPP This group is reported by stations with elevation *lower than or equal to 750 metres*.

6RRRt<sub>R</sub> When reported, this group is included in Section 1.

7wwW<sub>1</sub>W<sub>2</sub> ww is coded 05 when horizontal visibility is between 1 and 8 kilometres and the relative humidity is less than 80 per cent.  
ww is coded 10 when horizontal visibility is between 1 and 8 kilometres and the relative humidity is equal to or greater than 80 per cent.

## REGION VI

### GERMANY (continued)

*If no direct observations were available for the whole of the period covered by  $W_1$  and  $W_2$ , past weather is coded in accordance with the following rules:*

- (a) *If sufficient and reliable indications of the past weather during the period covered by  $W_1$  and  $W_2$  are available, they are used to code  $W_1$  and  $W_2$ ;*
- (b) *If there are no sufficient and reliable indications of the past weather, at least  $W_2$  is coded as /.*

$3E_sT_gT_g$  *If ice and/or snow are observed and, at the same time, glaze on ground is occurring ( $E = 5$ ), this group is reported in addition to group  $4E'sss$  in the form:*

- (a)  *$35s_nT_gT_g$  at 0600 UTC; and*
- (b)  *$35///$  at 1800 UTC.*

Section 4 This section is used only to report clouds with tops at or below station level.

### GREECE

$6RRRt_R$  When reported, this group is included in Section 3.

### HUNGARY

$6RRRt_R$  When reported, this group is included in Section 3.

$8N_sCh_sh_s$  This (these) group(s) is (are) included.

### IRELAND

$6RRRt_R$  When reported, this group is included in Section 1.

### ISRAEL

$7wwW_1W_2$   $ww$  is coded 06 when horizontal visibility is less than 5 kilometres and the relative humidity is less than 70 per cent.  
 $ww$  is coded 07 or 09 when horizontal visibility is between 1 and 5 kilometres in the direction of the dust or sand raised by wind.  
 $ww$  is coded 11, 12, 30 to 39 or 41 to 49 only when horizontal visibility is less than 1 kilometre.

### ITALY

$Nddff$  In reports from auxiliary ships only the code figures for mean wind speed equivalents (in knots) of the various degrees of the Beaufort scale are used.

$6RRRt_R$  When reported, this group is included in Section 1.

**NETHERLANDS**

All Dutch SYNOP observations are generated fully automatically. There are 3 types of stations, which use the SYNOP code form, if appropriate, with Code tables 4680 and 4531 for  $w_a w_a$  and  $W_{a1} W_{a2}$ :

Automatic wind only stations

Automatic weather stations without a present weather sensor

Automatic weather stations with a present weather sensor

**Additional or different national coding procedures when included:**

**Section 1**

6RRRt <sub>R</sub>	When reported, this group is included in Section 1.
7w <sub>a</sub> w <sub>a</sub> W <sub>a1</sub> W <sub>a2</sub>	When this group is included, Code tables 4680 and 4531 are used for w <sub>a</sub> w <sub>a</sub> and W <sub>a1</sub> W <sub>a2</sub> .
8N <sub>h</sub> C <sub>L</sub> C <sub>M</sub> C <sub>H</sub>	When included, this group is encoded as 8////.

**Section 3**

1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	When reported, this group is included at 1800 UTC.
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	When reported, this group is included at 0600 UTC.
3/s <sub>n</sub> T <sub>g</sub> T <sub>g</sub>	When reported, this group is included at 0600 UTC, T <sub>g</sub> T <sub>g</sub> being given in whole degrees Celsius.
7R <sub>24</sub> R <sub>24</sub> R <sub>24</sub> R <sub>24</sub>	When reported, this group is included at 0600 UTC.
8N <sub>s</sub> Ch <sub>s</sub> h <sub>s</sub>	When included, the symbolic form 8N <sub>s</sub> /h <sub>s</sub> h <sub>s</sub> is used.
9SpSpSpSp	This group is used in the following forms:
910ff	These 3 groups are always included in reports from land stations as well as in reports from fixed sea stations.
911ff	
912ff	

**Section 5****Nationally developed groups**

2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	Minimum temperature in tenths of a degree Celsius, during the preceding 14 hours.
4s <sub>n</sub> T <sub>g</sub> T <sub>g</sub> T <sub>g</sub>	Minimum surface temperature, in tenths of a degree Celsius, recorded at 10 cm above the ground during the preceding 14 hours.
	The above two groups are included at 0800 UTC, during the period from October to March.
511ff	Highest gust during the preceding hour
512ff	Maximum 10-minute mean wind during the preceding hour.
	The above two groups are always included in reports from land stations as well as in reports from fixed sea stations, regardless of the wind speed, and are only included at intermediate and main hours to report the highest hourly gust and the highest 10-minute mean.

## REGION VI

### NETHERLANDS *(continued)*

51722	Snow grains during the preceding hour
518w <sub>a</sub> w <sub>a</sub>	The precipitation reported by w <sub>a</sub> w <sub>a</sub> in groups 7w <sub>a</sub> w <sub>a</sub> W <sub>a1</sub> W <sub>a2</sub> and 518w <sub>a</sub> w <sub>a</sub> is very light.
53Q <sub>h</sub> Q <sub>h</sub> Q <sub>h</sub>	Global radiation, Q <sub>h</sub> Q <sub>h</sub> Q <sub>h</sub> being reported in Joules per cm <sup>2</sup>
5975V <sub>m</sub>	Visibility in tens of metres, included when visibility, reported in the group i <sub>R</sub> i <sub>x</sub> hVV, is less than 100 m.

### PORTUGAL

6RRRt <sub>R</sub>	When reported, this group is included in Section 1.
3Es <sub>n</sub> T <sub>g</sub> T <sub>g</sub>	This group is reported at 0600 UTC.
4E'sss	When reported, this group is included in 0600 UTC reports.
8N <sub>s</sub> Ch <sub>s</sub> h <sub>s</sub>	This (these) group(s) is (are) included.

### RUSSIAN FEDERATION

i <sub>R</sub> i <sub>x</sub> hVV	i <sub>R</sub> is coded as / (solidus) when precipitation is included in Section 5 at intermediate synoptic hours.
4PPPP	This group is repeated by stations with elevation <i>lower than or equal to 1 000 metres</i> .
6RRRt <sub>R</sub>	When reported, at 08 and 20 hours (zone time), this group is included in Section 3.
1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	This group is reported at 20 hours (zone time).
2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub>	This group is reported at 08 hours (zone time).
9SpSpSpSp	This group is included in accordance with Regulation 6/12.12.2.

### SLOVAKIA

4PPPP	This group is reported by all stations with elevation <i>lower than or equal to 550 metres</i> .
6RRRt <sub>R</sub>	When reported, this group is included in Section 1 to report precipitation amount over the preceding six or 12 hours. In addition, this group is included in Section 3 to report precipitation amount over the preceding one or three hours in case of an emergency situation.
55SSS	This group is reported at 0000 UTC.
9SpSpSpSp	This group is used in the following forms: 910f <sub>m</sub> f <sub>m</sub> , 911f <sub>x</sub> f <sub>x</sub> , 919M <sub>w</sub> D <sub>a</sub> , 9298S'8, 9299S'8, 931ss, 932RR, 934RR, 935RR, 936RR, 937RR, 951N <sub>v</sub> /, 96048 and 96049. The group 911f <sub>x</sub> f <sub>x</sub> is used to report the highest gust during the period covered by W <sub>1</sub> W <sub>2</sub> if f <sub>x</sub> f <sub>x</sub> is equal to or greater than 20 m s <sup>-1</sup> . The group 931ss (or the groups 90730 931ss) is (are) used to report the depth of newly fallen snow <i>during the preceding three hours if this depth of newly fallen snow is equal to or greater than 5 centimetres</i> .

## REGION VI

### SPAIN

- 4PPPP This group is reported by stations with elevation *equal to 750 metres or lower*.
- 6RRRt<sub>R</sub> When reported, this group is included in Section 1.
- 7wwW<sub>1</sub>W<sub>2</sub> ww is coded 05 when horizontal visibility is less than 10 kilometres and the relative humidity is less than 80 per cent.

### SWEDEN

7wwW<sub>1</sub>W<sub>2</sub> *The period covered by W<sub>1</sub>, W<sub>2</sub> is, since the last main observing time:*

- (a) Six hours for observations at 0000, 0600, 1200 and 1800 UTC;
- (b) Five hours for observations at 0500, 1100, 1700 and 2300 UTC;
- (c) Four hours for observations at 0400, 1000, 1600 and 2200 UTC;
- (d) Three hours for observations at 0300, 0900, 1500 and 2100 UTC;
- (e) Two hours for observations at 0200, 0800, 1400 and 2000 UTC;
- (f) One hour for observations at 0100, 0700, 1300 and 1900 UTC.

### SWITZERLAND

- 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> This group is reported by all stations in addition to group 4PPPP.
- 3Es<sub>n</sub>T<sub>g</sub>T<sub>g</sub> This group is reported in the following form:
  - (a) 3E/// at 0600 UTC; and
  - (b) 3/s<sub>n</sub>T<sub>g</sub>T<sub>g</sub> at 0900 UTC, T<sub>g</sub>T<sub>g</sub> is measured at 0900 UTC.
- 4PPPP This group is reported by stations with elevation equal to 600 metres or lower.
- 6RRRt<sub>R</sub> When reported, this group is included in Section 1.
- 7wwW<sub>1</sub>W<sub>2</sub> ww is coded 05 when horizontal visibility is between 1 and 14 kilometres and the relative humidity is less than 75 per cent.  
ww is coded 10 when horizontal visibility is between 1 and 14 kilometres and the relative humidity is equal to or greater than 75 per cent.  
*If no direct observations were available for the whole of the period covered by W<sub>1</sub> and W<sub>2</sub>, past weather is coded in accordance with the following rules:*
  - (a) *If sufficient and reliable indications of the past weather during the period covered by W<sub>1</sub> and W<sub>2</sub> are available, they are used to code W<sub>1</sub> and W<sub>2</sub>;*
  - (b) *If there are no sufficient and reliable indications of the past weather, W<sub>1</sub> and W<sub>2</sub> are coded as //.*
- 9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> Depth of newly fallen snow is reported as follows:  
at 0600 UTC for the last 24 hours with the groups 90768 931ss; and  
at 1800 UTC for the last 12 hours with the groups 90766 931ss.

### SYRIAN ARAB REPUBLIC

- 6RRRt<sub>R</sub> When reported, this group is included in Section 1.
- 7wwW<sub>1</sub>W<sub>2</sub> ww is coded 07 only when horizontal visibility is greater than 1 kilometre.  
ww is coded 30, 31, 32, 33, 34 or 35 only when horizontal visibility is less than 1 kilometre.

**UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND**

- 6RRRt<sub>R</sub> When reported, this group is included in Section 1.  
This group is not used at present in reports from British ships.
- 7wwW<sub>1</sub>W<sub>2</sub> ww is coded 30, 31 or 32 only when horizontal visibility is 200 metres or more and less than 1 kilometre.  
ww is coded 33, 34 or 35 only when horizontal visibility is less than 200 metres.
- 4E' sss When the ground representative of the station is more than half-covered with snow or ice (E' = other than 1 or 5), sss is reported as 001 to 997 or 999 as appropriate. If the ground representative of the station is less than half-covered with snow or ice (E' = 1 or 5), sss is reported as 998.
- 8N<sub>5</sub>Ch<sub>5</sub>h<sub>5</sub> When the sky is obscured and the vertical visibility cannot be estimated, this group is omitted.

**FM 15 METAR and FM 16 SPECI****AUSTRIA**

- General:** *In Austria, aeronautical meteorological stations are divided in two groups:*  
*Meteorological stations at international airports*  
*These are aeronautical meteorological stations at the following international airports:*  
*Wien, Linz, Salzburg, Innsbruck, Graz, Klagenfurt.*  
*Other stations:*  
*Aeronautical meteorological stations at:*  
— *aerodromes for international general aviation;*  
— *other airfields;*  
— *military aerodromes;*  
— *not located at aerodromes/airfields.*

- CCCC** *Other stations:*  
*Instead of a location indicator, the station index number IIiii is used by stations not located at an aerodrome/airfield.*

- CAVOK** *International airport stations:*  
*Additional condition: Clouds — no TCU.*  
*Other stations:*  
*The code word **CAVOK** is not used.*

- VVVD<sub>V</sub> V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>D<sub>V</sub> — *All stations:*  
*For the group VVVV the prevailing visibility is used instead of the minimum visibility.*  
*The group D<sub>V</sub> V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>D<sub>V</sub> will not be reported.*

- w'w' *All stations:*  
*If deposit of rime is observed, the descriptor FZ is used in combination with the letter abbreviations BCFG, PRFG, and BR too.*

- N<sub>5</sub>N<sub>5</sub>N<sub>5</sub>h<sub>5</sub>h<sub>5</sub>h<sub>5</sub> — *Other stations:*  
*Types:*  
*All cloud types are reported; e.g. OVC010ST.*  
*Height of the cloud base:*  
*Not reported for the cloud types: CI, CC and CS; e.g. SCTCI.*  
*h<sub>5</sub>h<sub>5</sub>h<sub>5</sub> = not reported if only the top but not the cloud base of a convective cloud is visible in a mountainous region, e.g. FEWCB.*

**AUSTRIA** (continued)

Supplementary information — Other stations:

*The indicator "RMK" is not used.*

*All supplementary information available is added and distributed internationally.*

**BELARUS**

15.5.5 *The maximum speed shall be reported as  $Gf_m f_m$  if it exceeds the mean speed by  $3 \text{ m s}^{-1}$  or more.*

15.14.12 (2) *The onset or cessation of other weather phenomena indicated in Code table 4678 that can cause considerable change of the visibility shall be reported additionally.*

**BELGIUM**

ww This group is not used.

**WS TKOF RWY** $D_R D_R$  } *These groups are not used.*  
**WS LDG RWY** $D_R D_R$  }

Additional deviations from the global regulations on the part of the *AIR FORCE STATIONS*:

1. Group  $d_n d_n d_n V d_x d_x d_x$ :  
— *This group is not used.*
2. Groups  $V V V D_v$ ,  $V_x V_x V_x V_x D_v$  and  $R D_R D_R / V_R V_R V_R V_R V V_R V_R V_R i$ :  
—  $D_v$  in the group  $V V V D_v$  is not used.  
— The group  $V_x V_x V_x V_x D_v$  is not used.  
— The group  $R D_R D_R / V_R V_R V_R V_R V V_R V_R V_R i$  is not used.
3. Groups  $w'w'$  and  $ww$ :  
— The group  $ww$  is omitted from the report.
4. Code word **CAVOK**:  
— The code word **CAVOK** is not used.
5. Group  $N_s N_s N_s h_s h_s h_s$ :

The cloud amount is reported according to the following table:

SKC	Sky clear
FEW	$1/8 - 2/8$
SCT	$3/8 - 4/8$
BKN	$5/8 - 7/8$
OVC	$8/8$

**BELGIUM** (continued)

## 6. Trend forecasts:

The Air Force stations use the colour code, together with the change groups (BECMG and TEMPO) without a time group, according to the following table:

Colour code		Visibility	Cloud base
Blue	BLU	8 km or more	2 500 ft or more
White	WHT	5 km – 8 km	1 500 ft – 2 500 ft
Green	GRN	3.7 km – 5 km	700 ft – 1 500 ft
Yellow	YLO	1.6 km – 3.7 km	300 ft – 700 ft
Amber	AMB	0.8 km – 1.6 km	200 ft – 300 ft
Red	RED	Less than 0.8 km	Less than 200 ft
Black	BLACK	Airfield not in use due to other reasons than visibility and cloud base	

Note: The significant cloud base is  $\frac{3}{8}$  or more.

**CZECH REPUBLIC**

The first line METAR YYGGggZ or SPECI YYGGggZ will not be included at the beginning of the text of the METAR or SPECI bulletins, respectively.

**RD<sub>R</sub>RD<sub>R</sub>/VR<sub>R</sub>VR<sub>R</sub>VR<sub>R</sub>i** Except Praha/Ruzyne aerodrome, civil aerodromes continue to report instantaneous values of RVR without tendencies.

**RD<sub>R</sub>RD<sub>R</sub>/VR<sub>R</sub>VR<sub>R</sub>VR<sub>R</sub>VV<sub>R</sub>VR<sub>R</sub>VR<sub>R</sub>i** Except Praha/Ruzyne aerodrome, this group is not used.

**WS TKOF RWYD<sub>R</sub>D<sub>R</sub>**  
and/or  
**WS LDG RWYD<sub>R</sub>D<sub>R</sub>** } These groups are not used.

**ESTONIA**

15.5.1, 15.5.3, 15.5.5 The averaging period for wind observations for aerodrome Tartu/Ülenurme is 2 minutes.

15.5.3 The group **d<sub>n</sub>d<sub>n</sub>d<sub>n</sub>Vd<sub>x</sub>d<sub>x</sub>d<sub>x</sub>** not in use for reports for aerodrome Tartu/Ülenurme.

**FINLAND****National deviations from the following global regulations:**

15.8.9 In addition to Regulation 15.8.9: The qualifier FZ is also used with precipitation forming ice on cold ground or surface (icing).

15.9.2 In the group **VVh<sub>s</sub>h<sub>s</sub>h<sub>s</sub>**, information on vertical visibility is always based on estimation of vertical visibility.

**National deviation from the ICAO regulations:**

Technical Regulation [C.3.1.]4.3.3(e)(ii)

Concerning visibility, both 5 000 metres and 8 000 metres are considered as significant threshold values in selected special reports and aerodrome forecasts.



**FRANCE**

The groups METAR YYGGggZ or SPECI YYGGggZ will not be included as the first line of the text of the bulletins. The code name METAR will not be included at the beginning of each report.

VWh<sub>5</sub>h<sub>5</sub>h<sub>5</sub> This group is used in the form **VV///** when the group N<sub>5</sub>N<sub>5</sub>N<sub>5</sub>h<sub>5</sub>h<sub>5</sub>h<sub>5</sub> is not coded due to invisible sky (fog, drift snow, etc.).

**WS TKOF RWYD<sub>R</sub>D<sub>R</sub>**  
and/or  
**WS LDG RWYD<sub>R</sub>D<sub>R</sub>** } The groups related to wind shear are not used.

Group Mw<sub>2</sub> or Bw<sub>2</sub> — France continues to use the supplementary group Mw<sub>2</sub> or Bw<sub>2</sub> and the related code table. The supplementary group is added at the end of the SPECI report. The symbolic letters have the following specifications:

M or B Indicator letters signifying, respectively, that the report concerns a deterioration or an improvement of weather.

w<sub>2</sub> Indication of the meteorological element which is the feature of the SPECI report

Code  
figure

0	Gusts
1	Wind (either wind direction or speed, or both)
2	Visibility
3	Cloud (amount or height)
4	Precipitation
5	Pressure
6	State of sea or of swell, i.e. waves
7	Duststorm, sandstorm or blowing snow
8	Thunderstorm (with or without precipitation)
9	Squall or tornado

**LATVIA**

15.1.1 The group METAR YYGGggZ is not included as the first line of the text of the bulletins. The code name METAR is included at the beginning of each report. SPECI reports are not used in Latvia.

15.7.5 Except Riga aerodrome, the group **RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>i** is not used.

15.8.8 For Riga aerodrome, thunderstorm is reported when thunderstorm is fixed by automatic weather station thunderstorm sensor.

15.13.3 Except Riga aerodrome, the group **WS RWYD<sub>R</sub>D<sub>R</sub>** or **WS ALL RWY** is not included.

15.14 Except Riga aerodrome, the group TREND is not included.

**LITHUANIA**

Regulations	Remarks
15.5, 15.5.2, 15.5.3, 15.5.5	} There is no wind measurement system. The equipment for measuring wind speed and direction does not meet the requirements of these regulations (two-minute average wind speed maximum and direction).
15.7, 15.7.4, 15.7.4.2, 15.7.4.3, 15.7.5	
	} There is no RVR automatic system and tendencies, discontinuities and significant variations of RVR cannot be reported. The equipment for measuring visibility does not meet the requirements of these regulations. Minimum visibility is given for 60 seconds and RVR is supplied in accordance with the ICAO tables.

**NETHERLANDS**

Civil stations: FM 15-XIV AUTO METAR and FM 15-XIV METAR

Military stations: FM 15-XIV AUTO METAR and FM 16-XIV AUTO SPECI

**Both CIVIL and MILITARY stations**

- 15.4 *With reference to fully automatically produced observations:  
If any element cannot be observed, the group in which it would have been encoded shall be replaced by the appropriate number of solidi, in accordance with the table below.*

Encoding of missing values in reports of AUTO METAR and AUTO SPECI – as of 18 November 2010		
Code group	Reporting practice	Total number of solidi – remarks
1. Wind	///12KT	3 – wind direction information not available
2.	230//KT	2 – wind speed information not available
3.	////KT	5 – wind speed and wind direction not available
4. Visibility	////	4 – visibility information not available
5. RVR	R////////	8 – RVR information not available; 1 group R//////// will replace all possible RVR groups
6.	R13/////	5 – RVR information not available for given touchdown zone; to be used when at least 1 other RVR value is available (in such case, R//////// cannot be used)
7. Present weather	//	2 – no PW sensor available or sensor defect; 1 group // will replace all possible present weather groups
8. Recent weather	RE//	2 – information on recent weather phenomena not available; 1 group RE// will replace all possible recent weather groups
9. Clouds	////////	9 – no information on cloud amount, height and type; 1 group ////////// will replace all possible cloud groups
10.	BKN020///	3 – cloud type not available for given layer
11.*	///// (////////CB)	6 – cloud amount and height not available; system is capable of detecting cloud type; 1 group ////////// will replace all possible cloud groups
12.	BKN////////	6 – cloud height and type not available for given amount
13.	BKN/// (BKN///CB)	3 – cloud height not available; system is capable of detecting cloud type for the given cloud amount
14.	///020///	6 – cloud amount and type not available for given cloud height
15.	///020 (///020CB)	3 – cloud amount not available; system is capable of detecting cloud type for the given cloud height
16.	NCD	no clouds detected
17.**	NSC	detected clouds are not operationally significant; system is capable of detecting cloud type
18. Air temperature and dew-point temperature	////	5 – air temperature and dew-point temperature not available; replaced by 4 ////
19.	14///	3 – dew point temperature not available; replaced by 2 //
20.	///12	3 – air temperature not available; replaced by 2 //
21. Atmospheric pressure	Q///	4 – QNH information not available
22. Water temperature and sea state (North Sea platforms)	W////	5 – water temperature not available; replaced by 2 // and sea state not available; replaced by 2 //
23.	W///S3	3 – water temperature not available; replaced by 2 //
24.	W17///	3 – sea state not available; replaced by 2 //

- \* If the system is capable of detecting cloud type, but not to associate this type to a given cloud layer, two cases are possible:  
1. If the system has not detected CB or TCU, cloud type is nevertheless considered as available for all cloud layers (the group of 3 /// is not added, as information about the absence of CB and TCU is available);

**NETHERLANDS** (continued)

2. If the system has detected CB or TCU, an additional cloud group (/////CB or /////TCU) is included.

**\*\* The abbreviation NSC shall not be used by the ROYAL AIR FORCE and the ROYAL NAVY.**

15.8.9 In fully automatically generated reports, qualifier FZ shall only be used to report freezing fog (FZFG) in a situation with subzero temperatures (<0°C) and a horizontal visibility of <1 000 metres, whether rime ice is deposited or not.

Fog types PRFG, BCFG, MIFG and VCFG cannot be detected by the system.

15.9.2 In case of fog, the maximum reported value for  $h_s h_s h_s$  shall be 500 ft.

In case of precipitation, the maximum reported value for  $h_s h_s h_s$  shall be 1 000 ft.

15.10 In fully automatically generated reports, the code word CAVOK shall not be used.

**CIVIL stations only**

**Note :** Fully automated observation station Vlissingen (EHFS) is not an aeronautical station. It produces AUTO METARs only (and no TREND).

15.8.9 In METAR (manned situation) the visible deposition of rime ice is used as an extra criterium.

In a situation with subzero temperatures (<0°C), observed rime ice and the fog types FG, PRFG and BCFG, qualifier FZ shall be used to report FZFG.

Shallow fog and any fog in the vicinity of the aerodrome shall always be reported as MIFG and VCFG respectively, whether rime ice is deposited or not.

15.14 Trend forecasts:

1. Visibility: an extra criterium of 8 km for the horizontal visibility shall be used.

2. Wind: a deviated criterium for the mean surface wind is:

if the mean surface wind direction has changed by 30° or more and the mean speed before and/or after the change is 10 knots or more.

**Stations of the ROYAL AIR FORCE and the ROYAL NAVY only**

REMARK: The observations of all military stations are produced fully automatically.

15.7.1 During periods when either the horizontal visibility is observed to be less than 3 700 metres or the runway visual range is less than 3 000 metres, the group **RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>** shall be included in the report.

15.7.6 When RVR is assessed to be more than 3 000 metres, it shall be reported as P3000.

15.8.12 IC shall be reported when visibility is less than 10 km.

15.8.13 HZ shall be reported when visibility is less than 10 km.

## REGION VI

### NETHERLANDS (continued)

- 15.8.14 BR shall be reported when visibility is less than 10 km but 1 000 metres or more.
- 15.9.1.1 The abbreviation NSC shall not be used.
- As appropriate, clouds present at and above 5 000 ft also shall be reported.
- 15.13.3 The wind shear groups **WS RD<sub>R</sub>D<sub>R</sub>** and WS ALL RWY shall not be used.
- 15.13.6 The state of the runway group **RD<sub>R</sub>D<sub>R</sub>/E<sub>R</sub>C<sub>R</sub>e<sub>R</sub>e<sub>R</sub>B<sub>R</sub>B<sub>R</sub>** shall not be used.
- 15.14 Trend forecasts:
1. The stations of the Royal Air Force and the Royal Navy shall use the 2-ATAF weather colour code, together with the change groups without a time group.
  2. Also, a CIVIL TREND forecast shall be added to the report, directly after the 2-ATAF weather colour code.

2-ATAF WEATHER COLOUR CODE			
Colour code		Visibility	Cloud base
Blue	BLU	8 km or more	2 500 ft or more
White	WHT	5 km – 8 km	1 500 ft – 2 500 ft
Green	GRN	3.7 km – 5 km	700 ft – 1 500 ft
Yellow	YLO	1.6 km – 3.7 km	300 ft – 700 ft
Amber	AMB	0.8 km – 1.6 km	200 ft – 300 ft
Red	RED	Less than 0.8 km	Less than 200 ft
BLACK		Aerodrome not in use due to other reasons than visibility and cloud base	

### NORWAY

#### National deviation from the following global regulation:

- 15.6.4 Horizontal visibility will be reported in steps rounded down to the nearest 100 metres also for visibility up to 500 metres.

### ROMANIA

#### National deviations from the following global regulations:

- 15.7.4 Runway visual range (RVR) will be reported as the value obtained at the time of observation instead of the mean value over the 10-minute period preceding the observation.
- 15.7.5 The group **RD<sub>R</sub>D<sub>R</sub>/V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>V<sub>R</sub>i** is not used.
- 15.8 The group ww is omitted from the report.

## SPAIN

The code names **METAR** or **SPECI** are not included in the reports.

**GGggZ** This group is not included in a METAR report except when there is more than a 10-minute difference between the time of observation and the time given in the heading of the bulletin.

The unit used for wind speed is the knot (kt).

**ww** This group (present weather according to code form SYNOP) is not reported.

The value of QNH is reported in hectopascals.

In addition to groups **REw'w'** and **WS TKOF RWYD<sub>R</sub>D<sub>R</sub>** and/or **WS LDG RWYD<sub>R</sub>D<sub>R</sub>**, the section on supplementary information may contain information on the state of runways, when appropriate.

## SWEDEN

**National deviations from the following global regulations:**

### 15.1.1

**SPECI** reports are not issued in Sweden. METARs are instead issued every 30 minutes.

### 15.6

When a directional variation (reduction) in visibility is restricted to a minor sector (e.g. due to local fog patches) and this sector does not coincide with the area of final approach, then the reduction in visibility is not considered significant and thus disregarded.

### 15.7

Tendencies, discontinuities and significant variations of RVR are given only when values of RVR are taken from automatic systems.

### 15.8.12

Diamond dust (IC) will be reported independent of the associated visibility.

### 15.8.13

Haze (HZ) will be reported independent of the associated visibility.

### 15.8.14

Mist (BR) will be reported when visibility is expected to be at least 1 000 metres but no more than 10 kilometres.

### 15.10

The restriction "or below the highest minimum sector altitude" will not be applied since only two airports have highest minimum sector altitudes just slightly above 5 000 feet.

**SWITZERLAND**

Regulations 15.6.2 and 15.6.3 will not be used by Switzerland and will be replaced by the following regulation:

*If the meteorological visibility is not identical in all directions, the prevailing visibility will be indicated by the group VVVV. The prevailing visibility is defined as the value which is reached or exceeded at least within half a circle. This could be formed by different sectors, which are separated among them.*

**CAVOK** The code word **CAVOK** is inserted when, the other conditions being satisfied, there is no cloud below the following altitudes:

Zurich-Kloten	8 000 ft
Genève-Cointrin	12 000 ft
Bern-Belp	10 000 ft
Lugano-Agno	9 000 ft
Altenrhein	9 000 ft
Grenchen	7 000 ft
Sion	16 000 ft

**UKRAINE**

**National deviations from the following global regulations:**

15.7.4 and 15.7.5

*Runway visual range (RVR) is reported as the value obtained at the time of observation instead of the mean value over the 10-minute period preceding the observation. The reason for this is that the instruments currently used at Ukrainian aerodromes for determining horizontal visibility do not, according to their technical specifications, carry out averaging of the measured values.*

15.8 — Group w'w' (Code table 4677)

*This regulation is not used.*

NOTE (2) to Regulation 15.8.9

This note is amended to read: *“When visibility is 3 kilometres or more, it is not necessary to specify whether or not there is supercooled precipitation of the shower type.”* This is because of the requirements of civil aviation to indicate in reports the nature of falling (including supercooled) precipitation when the values are lower than the minima for landing.

15.13.2.1

*“Squall” and “spout” are added to the list of dangerous weather phenomena.*

15.13.4

*The supplementary information is expanded to include information on icing and turbulence in the vicinity of the aerodrome, which is based on data received from flight crews and coded according to FM 51 TAF, Regulations 51.8 and 51.9.*

Notes to Code table 4678

- (5) The following sentence is added: *“The intensity qualifier + is also used in coding supercooled fog accompanied by the formation of glaze.”*
- (6) This note is amended to read: *“As a rule, one descriptor shall be included in a w'w' group, for example BCFG or SHRA. The use of two descriptors is permitted when reporting supercooled fog: shallow (i.e. ground) MIFZFG, or patches BCFZFG, as well as supercooled rain showers FZSHRA.”*
- (9) The first sentence is amended to read: *“When blowing snow is observed with snow falling from cloud, both phenomena are reported, in such a way that the one which, in the observer’s opinion, makes the greater contribution to the deterioration of horizontal visibility is given first: SN or BLSN.”*

## UNITED KINGDOM

### Surface wind

*Military aerodromes will not report variations in wind direction.*

### Horizontal visibility

*Military aerodromes will not report maximum visibility, nor the directions of the minimum and maximum visibility.*

### Cloud

*Military aerodromes will report cloud amount in accordance with the following table:*

$N_s N_s N_s$	Cloud amount
SKC	Sky clear
FEW	1 – 2 oktas
SCT	3 – 4 oktas
BKN	5 – 7 oktas
OVC	8 oktas

### Runway visual range

*Civil aerodromes will continue to report instantaneous values of RVR; until further notice means and trends in RVR will not be reported. Military aerodromes will continue not reporting RVR.*

### Present weather

*At military aerodromes, there will be no restriction placed on the reporting or forecasting of mist, haze, smoke, dust, sand and diamond dust at visibilities above 3 000 metres.*

### Vertical visibility

*Values of vertical visual range will not be specified. When sky is obscured and cloud is not discernible, **W///** will be reported or forecast.*

### Supplementary groups

*Information on wind shear will not be reported.*

REGION VI

**FM 20 RADOB**

**BELGIUM**

Only Part B of this code form is used.

**GERMANY**

*Radar observations are transmitted in abbreviated plain language.*

**SWITZERLAND**

*Radar observations are transmitted in clear language.*



**FM 32 PILOT****AUSTRIA**

Parts A and C,  
Section 3

When the last maximum wind level occurs 1 kilometre before the top of the sounding, *the group*  $4v_b v_b v_a v_a$  *is coded as*  $4v_b v_b //$ .

Part B,  
Section 6

This section is used to report wind data at 500 and 800 metres above mean sea level, in the following form:

61616      dfff<sub>500</sub>      dfff<sub>800</sub>

**FRANCE**

dfff  
d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub>f<sub>m</sub> }

*The direction from which wind is blowing is always indicated, in tens of degrees, by means of Code table 0877.*

Part B,  
Section 4

Data are sent for *three* additional levels: surface, 500 and 2500 metres, these last two levels being considered as approximations to the surfaces 950 and 750 hPa.

Parts B and D,  
Section 6

This section is used in the following form:

61616      n<sub>0</sub>A<sub>0</sub>A<sub>0</sub>A<sub>0</sub>A<sub>0</sub>      d<sub>0</sub>d<sub>0</sub>F<sub>0</sub>F<sub>0</sub>F<sub>0</sub>      . . . . .  
                 n<sub>n</sub>A<sub>n</sub>A<sub>n</sub>A<sub>n</sub>A<sub>n</sub>A<sub>n</sub>      d<sub>n</sub>d<sub>n</sub>F<sub>n</sub>F<sub>n</sub>F<sub>n</sub>F<sub>n</sub>

n<sub>0</sub> } Sequential number of significant levels.  
n<sub>1</sub> } Note: The code figure n = 0 is used only to identify the surface level; significant  
. . . } successive levels are numbered in ascending order with code figures n = 1, 2, 3  
n<sub>n</sub> } . . . 9, 1, 2, 3 . . .

A<sub>0</sub>A<sub>0</sub>A<sub>0</sub>A<sub>0</sub>A<sub>0</sub> }  
A<sub>1</sub>A<sub>1</sub>A<sub>1</sub>A<sub>1</sub>A<sub>1</sub> } Altitude of significant level, in decametres.  
. . . }  
A<sub>n</sub>A<sub>n</sub>A<sub>n</sub>A<sub>n</sub>A<sub>n</sub> }

d<sub>0</sub>d<sub>0</sub> }  
d<sub>1</sub>d<sub>1</sub> } True direction, in tens of degrees, from which wind is blowing at specified  
. . . } levels, starting with station level (Code table 0877).  
d<sub>n</sub>d<sub>n</sub> }

F<sub>0</sub>F<sub>0</sub>F<sub>0</sub>F<sub>0</sub> }  
F<sub>1</sub>F<sub>1</sub>F<sub>1</sub>F<sub>1</sub> } Wind speed, in knots, at specified levels, starting with station level.  
. . . }  
F<sub>n</sub>F<sub>n</sub>F<sub>n</sub>F<sub>n</sub> }

## REGION VI

### GERMANY

Part A,

Section 2

The following altitudes are used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
850	1 500
700	3 000
500	5 400
400	7 200
300	9 000
250	10 500
200	12 000
150	13 500
100	15 900

Part B,

Section 4

Wind data are reported for the following altitudes, as available: 900, 2 100 and 4 200 metres (above mean sea level) and for the three first 300-metres steps (above mean sea level), where the first step has to be 150 metres above station level. Up to two additional steps shall be reported when at these heights significant wind changes (direction and/or speed) have been observed.

Part C,

Section 2

The following altitudes are used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
70	18 300
50	20 700
30	23 700
20	26 400
10	30 900

Parts A and C,

Section 3

The group  $4v_b v_b v_a v_a$  shall be reported for each wind maximum.

### PORTUGAL (including AZORES)

Part A,

Section 2

The following altitudes are used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
850	1 500
700	3 000
500	5 400
400	7 200
300	9 000
250	10 500
200	12 000
150	13 500
100	15 900

Part B,

Section 4

Wind data are reported for the following altitudes, as available: 600, 900, 1 200, 2 100 and 4 200 metres.

**PORTUGAL (including AZORES) (continued)**Part B,  
Section 6

This section is used to report wind data at 300 metres, in the following form:

61616      101//      ddfff

Part C,  
Section 2

The following altitudes are used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
70	18 300
50	20 700
30	23 700
20	26 400
10	30 900

**ROMANIA**Part B,  
Section 4

*Wind data are reported for the following altitudes, as available: 900, 1 200, 1 800, 2 100, 2 400, 2 700, 4 200, 6 000, 8 100 and 9 000 metres.*

**RUSSIAN FEDERATION**

In Parts B and D, a section beginning with the symbolic figure group 51515 is added:

Part B      51515       $\sqrt{V_b V_b V_a V_a}$   
 Part D      51515       $\sqrt{V_b V_b V_a V_a}$        $H_e H_e d_e d_e f_e$

$\sqrt{V_b V_b V_a V_a}$       Group indicating vertical wind shear in layers 1 kilometre below and 1 kilometre above maximum wind level. The specifications of this group are as follows:

$V_b V_b$       Absolute magnitude of the vector difference, in whole metres per second, between maximum wind speed and wind speed observed 1 kilometre below the maximum wind level.

$V_a V_a$       Absolute magnitude of the vector difference, in whole metres per second, between maximum wind speed and wind speed observed 1 kilometre above the maximum wind level.

When the absolute value of vector difference is under  $10 \text{ m s}^{-1}$  the first figure of  $V_b V_b$  or  $V_a V_a$  is coded as 0.

**Notes:**

- (1) This group may be included not more than twice in Part B, the first group relating to the level of the highest maximum wind speed, the second group relating to the level of the second highest maximum wind speed.
- (2) This group is included only once in Part D, and only if the wind data of the entire ascent indicate that the highest or second highest maximum wind speed is above 100 hPa (16 kilometres). The wind at the highest point of the ascent is not taken into account in this regard.

## REGION VI

### RUSSIAN FEDERATION *(continued)*

$H_e H_e d_e d_e f_e$  This group is included in Part D from 1 April until 30 September if, at heights above 16 kilometres and up to the ascent, or in a layer with a vertical extent exceeding 5 kilometres, a change of the wind from westerly directions (230°–320°) to easterly directions (040°–140°) is observed. The specifications of this group are as follows:

$H_e H_e$  Height, in kilometres, of the lower boundary of the layer, where a steady wind of an easterly direction is observed.

$d_e d_e$  Direction of the wind, in tens of degrees, at the lower boundary of the layer in which steady easterly winds are observed. Units of degrees of wind direction are rounded off to the nearest ten in the usual manner.

$f_e$  Wind speed, in metres per second, at the lower boundary of the layer in which steady easterly winds are observed. Wind speed 10 m s<sup>-1</sup> and greater is reported by 0.

**Note:** If a number of layers with reversed wind direction are observed, the transmitted data refer only to the lowest layer.

### SWITZERLAND

Part B,  
Section 4 *Wind data are reported for the following altitudes, as available: 1 000, 2 000, 4 000, 5 000, 6 000 and 14 000 metres.*

### UNITED KINGDOM

Part A,  
Section 2 The following altitudes are used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
850	1 500
700	3 000
500	5 400
400	7 200
300	9 000
250	10 500
200	12 000
150	13 500
100	15 900

Part C,  
Section 2 The following altitudes are used as approximations to the standard isobaric surfaces:

Standard isobaric surface (hPa)	Altitude (m)
70	18 300
50	20 700
30	23 700
20	26 400
10	30 900

Parts A and C,  
Section 3 The group  $4v_b v_b v_a v_a$  shall be reported for each maximum wind.

## FM 33 PILOT SHIP

### UNITED KINGDOM

Part A,  
Sections 2 and 3 See FM 32 PILOT.

Part C,  
Sections 2 and 3 See FM 32 PILOT.

## FM 35 TEMP

### AUSTRIA

Parts A and C,  
Section 4 When the last maximum wind level occurs 1 kilometre before the top of the sounding, *the group*  $4v_b v_b v_a v_a$  *is coded as*  $4v_b v_b //$ .

Part B,  
Section 10 This section is used to report upper-air data at 500 and 800 metres above mean sea level, in the form:

61616	11PPP <sub>500</sub>	ddfff <sub>500</sub>
	22PPP <sub>800</sub>	ddfff <sub>800</sub>

### CZECH REPUBLIC

Part B,  
Section 9 This section is used to report wind data at 1 000 metres above the surface and at the 800 and 600 hPa levels:

51515	11P <sub>1</sub> P <sub>1</sub> P <sub>1</sub>	d <sub>1</sub> d <sub>1</sub> f <sub>1</sub> f <sub>1</sub> f <sub>1</sub>
	22800	d <sub>8</sub> d <sub>8</sub> f <sub>8</sub> f <sub>8</sub> f <sub>8</sub>
	33600	d <sub>6</sub> d <sub>6</sub> f <sub>6</sub> f <sub>6</sub> f <sub>6</sub>

P<sub>1</sub>P<sub>1</sub>P<sub>1</sub> Pressure, in hPa, at 1 000 metres above the surface.

d<sub>1</sub>d<sub>1</sub>f<sub>1</sub>f<sub>1</sub>f<sub>1</sub> Direction and speed of wind at 1 000 metres above the surface.

d<sub>8</sub>d<sub>8</sub>f<sub>8</sub>f<sub>8</sub>f<sub>8</sub> Direction and speed of wind at the 800 hPa level.

d<sub>6</sub>d<sub>6</sub>f<sub>6</sub>f<sub>6</sub>f<sub>6</sub> Direction and speed of wind at the 600 hPa level.

### FRANCE

Parts B and D,  
Section 6 When the wind speed is less than 2.5 m s<sup>-1</sup>, the wind direction is not considered for the determination of the significant levels of wind.

ddfff	} The direction from which wind is blowing is always indicated in tens of degrees by means of Code table 0877.
d <sub>0</sub> d <sub>0</sub> f <sub>0</sub> f <sub>0</sub> f <sub>0</sub>	
d <sub>1</sub> d <sub>1</sub> f <sub>1</sub> f <sub>1</sub> f <sub>1</sub>	
.....	
d <sub>n</sub> d <sub>n</sub> f <sub>n</sub> f <sub>n</sub> f <sub>n</sub>	
d <sub>m</sub> d <sub>m</sub> f <sub>m</sub> f <sub>m</sub> f <sub>m</sub>	
d <sub>t</sub> d <sub>t</sub> f <sub>t</sub> f <sub>t</sub> f <sub>t</sub>	

## REGION VI

### GERMANY

Parts A and C,  
Section 4

The group  $4v_b v_b v_a v_a$  shall be reported for each maximum wind.

### HUNGARY

Part B,  
Section 10

This section is used in the following symbolic form:

61616      92hhh      TTTDD      ddfff

and contains the geopotential hhh, temperature TTT, dew-point depression DD, wind direction dd and wind speed fff at the 925 hPa level.

This section is included in the reports for 0000 and 1200 UTC.

### ITALY

Part B,  
Section 9

This section is used to indicate wind data at 900 metres above the station.

### NORWAY

Part B,  
Section 10

This section is used in the form:

61616      ddfff      ddfff      ddfff

where ddfff refers to thermal winds in the layers:

700 hPa–900 m

500 hPa–900 m

300 hPa–500 hPa.

### PORTUGAL (including AZORES)

Part B,  
Section 10

This section is used to report wind data at 300 and 600 metres, in the following form:

61616      11PPP<sub>300</sub>      ddfff<sub>300</sub>  
                 22PPP<sub>600</sub>      ddfff<sub>600</sub>

## REGION VI

### RUSSIAN FEDERATION

Part B,

Section 9

*This section is used in the following symbolic form:*

51515       $\backslash V_b V_b V_a V_a$

The specifications and the use of group  $\backslash V_b V_b V_a V_a$  are the same as those indicated for Part B of PILOT.

Part D,

Section 9

*This section is used in the following symbolic form:*

51515       $\backslash V_b V_b V_a V_a$        $H_e H_e d_e d_e f_e$

The specifications and the use of groups  $\backslash V_b V_b V_a V_a$  and  $H_e H_e d_e d_e f_e$  are the same as those indicated for Part D of PILOT, except that the lower boundary of the layer, where steady east winds are observed, is given in pressure units of 1 hPa.

### UNITED KINGDOM

Parts A and C,

Section 4

The group  $4v_b v_b v_a v_a$  shall be reported for each maximum wind.

Part B,

Section 9

Groups  $11P_1 P_1 P_1$  and  $d_1 d_1 f_1 f_1 f_1$  are used to report the pressure and wind at 900 metres above the surface.

### FM 36 TEMP SHIP

### NORWAY

Part B,

Section 10

See FM 35 TEMP.

### UNITED KINGDOM

Parts A and C,

Section 4

See FM 35 TEMP.

Part B,

Section 9

See FM 35 TEMP.

**FM 45 IAC****RUSSIAN FEDERATION**

The Russian Service uses the IAC code form with the following deviations and additions:

$F_t$	Code figure 7 in Code table 1152 has the following specification: $F_t = 7$ : Instability line or secondary front.
$f_s f_s$	Speed of system, front or area is given in kilometres per hour and not in knots.
$G_c G_c$	Synoptic hour of observation of data from which chart is prepared is given for $G_c G_c$ in Moscow time and not in UTC.
PP	In the group $8P_t P_c PP$ , PP is given for one point on the axis of the ridge (trough).
$4e_1 uuu$	When the group 40uuu is used, 500 is added for minus values of isalohypses. When the group 44uuu is used, 500 is added for minus values of isallobars. When the group 48uuu is used, uuu is given in metres per second and not in knots.

An additional section, beginning with the group 99977, is used for the transmission of the wind forecast at selected levels. It has the following form:

IIiii	$8d_p d_p f_p f_p$	$7d_p d_p f_p f_p$	$5d_p d_p f_p f_p$	$4d_p d_p f_p f_p$
	$3d_p d_p f_p f_p$	$2d_p d_p f_p f_p$	$1d_p d_p f_p f_p$	

Indicators 8, 7, 5, 4, 3, 2 and 1 mean that wind data which approximate best to the 850, 700, 500, 400, 300, 200 and 100 hPa surfaces follow.

$d_p d_p$	Forecast direction, in tens of degrees.
$f_p f_p$	Forecast speed, in tens of kilometres per hour.

**FM 51 TAF****AUSTRIA**

The code name TAF is not included.

**CAVOK, NSC:** These abbreviations are not used in forecasts for aerodromes for international general aviation.

The forecasted visibility has to be understood as prevailing visibility.

**BELARUS**

51.5.1 (2) The onset or cessation of other weather phenomena indicated in Code table 4678 that can cause considerable change of the visibility shall be reported additionally.

**BELGIUM**

$\left. \begin{array}{l} TT_F T_F / G_F G_F Z \\ 6l_c h_i h_i h_i t_L \\ 5Bh_B h_B h_B t_L \end{array} \right\}$  These groups are not used.

Additional deviation from the global regulations on the part of the AIR FORCE STATIONS:

Groups  $N_s N_s N_s h_s h_s h_s$  or **VV** $h_s h_s h_s$  or **SKC** or **NSC**:

– The abbreviation **NSC** is not used by the Air Force.



**CZECH REPUBLIC**

*The first line TAF will not be included at the beginning of the text of the TAF bulletins.*

**FRANCE**

*The code name TAF is not included as the first line of the text of the bulletins. The single word "TAF" will not be included at the beginning of each report.*

**VV**h<sub>s</sub>h<sub>s</sub>h<sub>s</sub> See FM 15 METAR and FM 16 SPECI.

**LATVIA**

51.1.1 *The code name TAF is not included as the first line of the text of the bulletins.*

*The code name TAF is included at the beginning of each report.*

**LITHUANIA****Regulation                      Remarks**

51.1.2 *The group YYGGgg**Z** is not included in each individual forecast.*

**NETHERLANDS****Both CIVIL and MILITARY stations**

51.6.2 *In case of fog, the maximum value forecast for h<sub>s</sub>h<sub>s</sub>h<sub>s</sub> shall be 500 ft.*

*In case of precipitation, the maximum value forecast for h<sub>s</sub>h<sub>s</sub>h<sub>s</sub> shall be 1 000 ft.*

51.10 *The group (T**XT**<sub>F</sub>T<sub>F</sub>/Y<sub>F</sub>Y<sub>F</sub>G<sub>F</sub>G<sub>F</sub>**Z** T**NT**<sub>F</sub>T<sub>F</sub>/Y<sub>F</sub>Y<sub>F</sub>G<sub>F</sub>G<sub>F</sub>**Z**) shall not be included in the report.*

**CIVIL station only**

51.8 *Change groups*

*If modified conditions are forecast for horizontal visibility and/or mean surface wind, the following additional criteria values shall apply:*

1. *Visibility: an extra criterium of 8 kilometres.*
2. *Wind: if the wind direction is forecast to change by 30° or more and the wind speed before and/or after the change is expected to be 10 knots or more.*

**Stations of the ROYAL AIR FORCE and the ROYAL NAVY only****Notes:**

(5) *The abbreviation CNL shall not be used.*

51.4.1 *The group VVV shall be used to forecast the lowest visibility.*

51.6.3 *The abbreviation NSC shall not be used.*

51.7 *The code word CAVOK shall not be used.*

51.8 *Change groups*

*If modified conditions are forecast for horizontal visibility and/or cloud height, the associated criteria values used are derived from the 2-ATAF weather colour code.*

## NORWAY

### National deviation from the following global regulation:

51.4.3 *Forecasted visibility will be given in 100 metres steps also for visibility up to 500 metres.*

## ROMANIA

### National deviation from the following global regulations:

51.8, 51.9 } *The additional groups **TT<sub>F</sub>T<sub>F</sub>/G<sub>F</sub>G<sub>F</sub>Z** 6I<sub>C</sub>h<sub>i</sub>h<sub>i</sub>h<sub>i</sub>t<sub>L</sub> and 5Bh<sub>B</sub>h<sub>B</sub>h<sub>B</sub>t<sub>L</sub> are not used.*  
and 51.12 }

## SPAIN

*The code name **TAF** is not included.*

YYGGgZ *This group is not included in the **TAF** report itself.*

*The unit used for wind speed is the knot (kt).*

*By regional air navigation agreement, the abbreviation **NSC** is used as provided for in Regulation 51.6.3 of the TAF code form.*

*Groups **TT<sub>F</sub>T<sub>F</sub>/G<sub>F</sub>G<sub>F</sub>Z** (temperature forecast), 6I<sub>C</sub>h<sub>i</sub>h<sub>i</sub>h<sub>i</sub>t<sub>L</sub> (icing forecast) and 5Bh<sub>B</sub>h<sub>B</sub>h<sub>B</sub>t<sub>L</sub> (turbulence forecast) are not used.*

## SWEDEN

### National deviations from the following global regulations:

51.1.2 *The group YYGGgZ will not be included in each individual forecast.*

51.4.1 *No deviation, but the issue may be reconsidered after a six-month trial period. (See Regulation 15.6 – FM 15 METAR and FM 16 SPECI).*

51.5.1 *The list of significant forecast weather phenomena (w'w') will be extended to include:*

*“Ice pellets, snow grains, and rain and snow mixed, independent of intensity; (inserted after the second clause: Moderate or heavy ... rain and snow mixed;)”*

*The last clause will read:*

*“Other weather phenomena given in Code table 4678 which are expected to cause a reduction in visibility below 10 kilometres.”*

*Mist (BR) will be forecast when visibility is expected to be at least 1 000 metres but no more than 10 kilometres.*

*Haze (HZ) and diamond dust (IC) will be forecast independent of the associate visibility.*

*The combination freezing rain and snow (±FZRASN or ±FZSNRA) will be allowed.*

51.6.1.5 *Will read: “The height of the base of forecast cloud layer (mass) shall be coded in units of 30 metres (100 feet) up to 3 000 metres (10 000 feet), and above 10 000 feet in units of 300 metres (1 000 feet), in the form h<sub>s</sub>h<sub>s</sub>h<sub>s</sub>” (in alignment with Annex 3 (1/7/93), paragraph 4.9.5).*

51.6.3 } *See Regulation 15.10 – FM 15 METAR and FM 16 SPECI.*  
51.7 }

## UKRAINE

### National deviations from the following global regulations:

51.7 *The phenomena “squall” and “spout” are added under (c).*

51.8 *The following text is added: “The forecast temperature shall be included in reports when it is expected that its value will be within the range –5° to +5°C, ≥ +25°C, or ≤ –25°C.”*

**UKRAINE** (continued)

Notes to Code table 4678

- (5) The following sentence is added: *"The intensity qualifier + is also used in coding supercooled fog accompanied by the formation of glaze."*
- (6) This note is amended to read: *"As a rule, one descriptor shall be included in a w'w' group, for example BCFC or SHRA. The use of two descriptors is permitted when reporting supercooled fog: shallow (i.e. ground) MIFZFG, or patches BCFZFG, as well as supercooled rain showers FZSHRA."*
- (9) The first sentence is amended to read: *"When blowing snow is observed with snow falling from cloud, both phenomena are reported, in such a way that the one which, in the observer's opinion, makes the greater contribution to the deterioration of horizontal visibility is given first: SN or BLSN."*

**UNITED KINGDOM**

See FM 15 METAR and FM 16 SPECI.

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## E — NATIONAL CODE FORMS

### ARMENIA, AZERBAIJAN, BELARUS, GEORGIA, REPUBLIC OF MOLDOVA, RUSSIAN FEDERATION AND UKRAINE

Addenda to code forms RF 6/03 WAFOR and RF 6/04 WAREP for use in the member countries of the Interstate Council on Hydrometeorology of the Countries of the Commonwealth of Independent States (ICH CIS)

#### INTRODUCTION

1. The catastrophic impacts which hazardous and extreme hydrometeorological phenomena may have in the socio-economic sphere, through either their sudden development or forecasting difficulties, call for the organization of a system for supplying additional information on the presence and occurrence of phenomena in border areas.
2. Mutual warning of hazardous and extreme phenomena may be improved by concluding bilateral agreements between neighbouring countries requiring the national Hydrometeorological Services to warn their partners in good time in cases when hazardous or extreme phenomena occur or are expected in their own territory and may directly or indirectly affect that of the neighbouring country. Such information shall be transmitted at the times, and covering the areas (stations), agreed upon between the partners.
3. The phenomena and parameters generally covered by such exchanges of additional information shall be: strong wind, precipitation, sharp drop in temperature, heavy snowfall, blowing snow, glaze, rime and other hazardous phenomena for the area. The phenomena and parameters to be exchanged shall be selected on the basis of the general state of the atmosphere and specific local conditions causing dangerous weather phenomena of given intensity and on their development in the given area.
4. The thresholds at which these phenomena are considered hazardous and which should be included in an exchange of additional information for warning purposes shall be determined by joint decision.
5. Bilateral exchanges shall include information and warnings concerning really hazardous phenomena.
6. Information and warnings of hazardous and extreme phenomena shall be exchanged in standard format in compliance with the meteorological telecommunication procedures for addressed messages.
7. The regional code forms RF 6/03 WAFOR and RF 6/04 WAREP, together with the present addenda recommended by sessions of the ICH CIS, shall be used to exchange the information or warnings. If necessary, Code tables 642 (RF 6/04 WAREP) and 644 (RF 6/03 WAFOR) may be expanded and amended by the partners, in which case the Executive Committee of the ICH CIS and the WMO Secretariat shall be duly informed.

#### A. ADD UNDER THE NOTE TO CODE TABLE 644:

**Note 2:** The country indicator  $i_C$  in group  $IIi_Ci_Ni_N$  for two countries with the same block number  $II$  shall be determined by joint decision taking account of the leading hundreds figure of the  $iii$  station numbering system as agreed with the other countries in the same block. The Executive Committee of the ICH CIS and its WG-1 shall be informed accordingly.

#### B. ADD TO THE REGULATIONS FOR RF 6/04 WAREP:

- 6/04.2 The time group takes the form YYGGg<sub>gi<sub>w</sub></sub> or GGg<sub>gi<sub>w</sub></sub>. In the existing practice, storm reports in CIS countries are transmitted with the time group GGg<sub>gi<sub>w</sub></sub> (the day of the month is not indicated). The use of either group shall be determined on a bilateral basis.
- 6/04.9 Group 2ddww  
This group shall be used in spout ( $C_wC_w = 19$ ) and thunderstorm ( $C_wC_w = 91$ ) reports. The direction in which the spout or thunderstorm is observed shall be reported for dd, and the type of precipitation (if any) for ww (if there is no precipitation, ww shall be reported as 19 in the case of a spout and 17 in the case of a thunderstorm).

**ARMENIA, AZERBAIJAN, BELARUS, GEORGIA, REPUBLIC OF MOLDOVA, RUSSIAN FEDERATION AND UKRAINE** *(continued)*

- 6/04.10 Group 4T<sub>x</sub>T<sub>x</sub>T<sub>n</sub>T<sub>n</sub>  
This group shall be used in intense heat ( $C_wC_w = 21$ ) or severe frost ( $C_wC_w = 24$ ) reports. The minimum night-time temperature shall be reported for T<sub>n</sub>T<sub>n</sub> and the sign of the temperature shall be given by C<sub>w</sub>C<sub>w</sub> (if  $C_wC_w = 21$  it is positive and if  $C_wC_w = 24$  it is negative).
- 6/04.11 Group 5f<sub>x</sub>f<sub>x</sub>  
This group shall be transmitted after group 1ddff if it is necessary to report f<sub>x</sub>f<sub>x</sub> in addition to ff.
- 6/04.12 Group 6RRRt<sub>R</sub>  
This group may, by bilateral agreement, be reported instead of group 3RRRt<sub>R</sub>t<sub>R</sub> if it is important for the partner countries to maintain the five-figure group.
- 6/04.13 Group 7VVww  
This group shall be used in low cloud ( $C_wC_w = 30$ ) reports whenever precipitation is observed; in blowing snow ( $C_wC_w = 76$ ) reports, the type of blowing snow shall be reported for ww.
- 6/04.14 Group 8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>  
This group shall be included in low clouds ( $C_wC_w = 30$ ) and low visibility ( $C_wC_w = 40$ ) reports. The content of the group shall be in accordance with code form FM 12 SYNOP (KN-01).
- 6/04.15 Groups 932RR and RR<sub>n</sub>TT  
In these groups, the diameter of hailstones, glaze, rime, mixed deposits and wet snow deposits (corresponding to code figures  $C_wC_w = 90, 53, 54, 55$  and  $56$ ) shall be reported for RR.

**C. SPECIFICATIONS OF SYMBOLIC LETTERS\***

C	Genus of cloud. (Code table 0500)
ff	Wind speed, in units indicated by i <sub>w</sub> .
f <sub>x</sub> f <sub>x</sub>	Highest gust wind speed, in metres per second.
gg	Minutes.
h <sub>s</sub> h <sub>s</sub>	Height of cloud base. (Code table 1677)
N <sub>s</sub>	Amount of individual cloud layer whose height is indicated by h <sub>s</sub> h <sub>s</sub> . (Code table 2700)
RR	Diameter of hailstones (maximum), diameter of glaze and rime deposits. (Code table 3570)
RRR	Amount of precipitation which has fallen during the period preceding the time of observation, as indicated by t <sub>R</sub> t <sub>R</sub> or by t <sub>R</sub> (Code table 4019). (Code table 3590)
s <sub>n</sub>	Sign (+ or -) of the air temperature.
TT	Air temperature.
T <sub>n</sub> T <sub>n</sub>	Minimum night-time temperature, in whole degrees Celsius.
T <sub>x</sub> T <sub>x</sub>	Maximum diurnal temperature, in whole degrees Celsius.
t <sub>R</sub>	Duration of period of reference for amount of precipitation. (Code table 4019)
W	Meteorological optical range. (Code table 4377)
ww	Present weather. (Code table 4677)

\* Reference is made to the code tables of the code form KN-01 (1989 Russian Federation version).

**ARMENIA, AZERBAIJAN, BELARUS, GEORGIA, REPUBLIC OF MOLDOVA, RUSSIAN FEDERATION AND UKRAINE** *(continued)*
**D. CODE TABLE 642**

Phenomenon	C <sub>w</sub> C <sub>w</sub>	Additional groups
Wind speed (mean value greater than 25 m s <sup>-1</sup> )	10	1ddff
* Wind speed (thresholds determined by the partners)	11	1ddff 577f <sub>x</sub> f <sub>x</sub>
	12	
	13	
	14	
	15	
	16	
* Squall (gusts less than 25 m s <sup>-1</sup> )	17	1ddff 577f <sub>x</sub> f <sub>x</sub>
Squall (gusts greater than 25 m s <sup>-1</sup> )	18	1ddff 577f <sub>x</sub> f <sub>x</sub>
Squall (gusts greater than 25 m s <sup>-1</sup> and thunderstorm) and/or spout	19	1ddff 577f <sub>x</sub> f <sub>x</sub> 2ddww
* Intense heat	20	
Sharp drop in T <sub>max</sub> compared with T <sub>max</sub> in preceding 24 hours	21	4T <sub>x</sub> T <sub>x</sub> T <sub>n</sub> T <sub>n</sub>
Sharp drop in mean daily T	22	
	23	
* Severe frost	24	4T <sub>x</sub> T <sub>x</sub> T <sub>n</sub> T <sub>n</sub>
Sharp drop in T <sub>min</sub> compared with T <sub>min</sub> in preceding 24 hours	25	
T <sub>max</sub> increasing to more than 5°C with sss being greater than 15 cm and rain	26	
	27	
	28	
Sharp drop in T in 3 hours	29	
Low cloud	30	(7VVww) 8N <sub>s</sub> Ch <sub>s</sub> h <sub>s</sub>
	31	
	32	
	33	
	34	
* Duststorm or sandstorm	35	1ddff 577f <sub>x</sub> f <sub>x</sub> 7VVww
	36	
	37	
	38	
	39	

\* Phenomena (and their C<sub>w</sub>C<sub>w</sub> code figures) recommended for inclusion in exchanges of information between CIS countries in addition to those recommended in the main code.

**ARMENIA, AZERBAIJAN, BELARUS, GEORGIA, REPUBLIC OF MOLDOVA, RUSSIAN FEDERATION AND UKRAINE** (continued)**D. CODE TABLE 642** (continued)

Phenomenon	C <sub>w</sub> C <sub>w</sub>	Additional groups
* Visibility (less than 3 000 m)	40	7VVww (8N <sub>s</sub> Ch <sub>s</sub> h <sub>s</sub> ) (1ddff 577f <sub>x</sub> f <sub>x</sub> )
	41	
	42	
	43	
Visibility less than 200 m	44	
	45	
Visibility less than 100 m with snowstorm/duststorm	46	
	47	
Visibility less than 50 m	48	
	49	
* Glaze * Rime * Mixed deposits * Wet snow deposits * Glazed frost	50	RRs <sub>n</sub> TT RRs <sub>n</sub> TT RRs <sub>n</sub> TT RRs <sub>n</sub> TT
	51	
	52	
	53	
	54	
	55	
	56	
	57	
	58	
	59	
Rain more than 25 mm h <sup>-1</sup>	60	3RRRt <sub>r</sub> t <sub>r</sub> or 6RRRt <sub>R</sub> 3RRRt <sub>r</sub> t <sub>r</sub> or 6RRRt <sub>R</sub> 3RRRt <sub>r</sub> t <sub>r</sub> or 6RRRt <sub>R</sub>
	61	
	62	
	63	3RRRt <sub>r</sub> t <sub>r</sub> or 6RRRt <sub>R</sub>
	64	
	65	
* Intense (heavy) rain	66	3RRRt <sub>r</sub> t <sub>r</sub> or 6RRRt <sub>R</sub>
Rain with glaze on ground and/or structures	67	
* Ice storm	68	
Heavy mixed precipitation	69	3RRRt <sub>r</sub> t <sub>r</sub> or 6RRRt <sub>R</sub>
Increase in the depth of snow by more than 5 cm in 12 hours	70	3RRRt <sub>r</sub> t <sub>r</sub> or 6RRRt <sub>R</sub> 55sss
	71	
	72	

\* Phenomena (and their C<sub>w</sub>C<sub>w</sub> code figures) recommended for inclusion in exchanges of information between CIS countries in addition to those recommended in the main code.



**ARMENIA, AZERBAIJAN, BELARUS, GEORGIA, REPUBLIC OF MOLDOVA, RUSSIAN FEDERATION AND UKRAINE** (continued)**D. CODE TABLE 642** (continued)

Phenomenon	C <sub>w</sub> C <sub>w</sub>	Additional groups
Blowing snow, depth of loose snow greater than 15 cm, mean wind speed greater than 8 m s <sup>-1</sup>	73 74 75 76	3RRRt <sub>t</sub> or 6RRRt <sub>R</sub> 1ddff 577f <sub>x</sub> f <sub>x</sub> 7VVww
* Heavy snowfall	77	55sss
* Blowing snow	78	
Snowstorm and snowfall, mean wind speed greater than 8 m s <sup>-1</sup>	79	
	80 81 82 83 84 85 86 87 88 89	
Hail	90	932RR
* Thunderstorm	91 92 93 94 95 96 97 98 99	1ddff 577f <sub>x</sub> f <sub>x</sub> 2ddww

\* Phenomena (and their C<sub>w</sub>C<sub>w</sub> code figures) recommended for inclusion in exchanges of information between CIS countries in addition to those recommended in the main code.

**BELGIUM, SWITZERLAND****Weather report for national non-aeronautical purposes**

AERO (GGgg)  
 Iiii Nddff VVwwW 8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub> (0TTT<sub>d</sub>T<sub>d</sub>)

As regards the elements which are common to the code forms AERO and SYNOP, these practices are the same as those indicated under SYNOP.

Specifications of symbolic letters other than those specified either in Volume I.1 — Part A or in Section B of Chapter VI of Volume II:

TT Air temperature, rounded off to the nearest whole degree Celsius.  
 (1) Negative temperatures shall be indicated by adding 50 to the absolute value of the temperature.

T<sub>d</sub>T<sub>d</sub> Dew-point temperature, rounded off to the nearest whole degree Celsius.  
 (1) See Note (1) under TT.

W Past weather. (Code table 4561)

**BELGIUM, POLAND, ROMANIA, SWITZERLAND****Special weather report (sudden changes) for national non-aeronautical purposes**

MMMMM }  
 BBBBB } GGggw<sub>2</sub>  
 Iiii Nddff VVwwW 8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub> (0TTT<sub>d</sub>T<sub>d</sub>)

The indicator MMMMM denotes a sudden deterioration, BBBBB a sudden improvement.

For **POLAND**, the indicator STORM is used instead of MMMMM and the indicator AVIO is used instead of BBBBB.

Specifications of symbolic letters other than those specified either in Volume I.1 — Part A or in Section B of Chapter VI of Volume II:

TT }  
 T<sub>d</sub>T<sub>d</sub> } See under code form AERO above (Belgium, Switzerland).  
 W }

w<sub>2</sub> — *Indication of the element forming the principal object of a report of deterioration or improvement of the weather or for the taking of a special weather report*

Code  
 figure

- 0 Gusts
- 1 Wind (either wind direction or speed, or both)
- 2 Visibility
- 3 Cloud (amount or height)
- 4 Precipitation
- 5 Pressure
- 6 State of sea or of swell, i.e. waves
- 7 Duststorm, sandstorm or blowing snow
- 8 Thunderstorm (with or without precipitation)
- 9 Squall or tornado

**CZECH REPUBLIC****Special weather report (sudden changes) for national non-aeronautical purposes**

MMMMw <sub>2</sub> } BBBBw <sub>2</sub> }	YYGGg'			
	Iiii	i <sub>R</sub> i <sub>x</sub> hVV	Nddff	7wwW <sub>1</sub> W <sub>2</sub>
	333	8N <sub>s</sub> Ch <sub>s</sub> h <sub>s</sub>	9S <sub>p</sub> S <sub>p</sub> S <sub>p</sub> S <sub>p</sub>	

The indicator MMMMw<sub>2</sub> denotes a sudden deterioration, BBBBw<sub>2</sub> a sudden improvement of the weather element indicated by w<sub>2</sub>.

Specifications of symbolic letters other than those specified either in Volume I.1 — Part A or in Section B of Chapter VI of Volume II:

g' Tenths of an hour which have passed since the time of the last regular hourly weather report.

w<sub>2</sub> See under MMMMM/BBBBB above (Belgium, Poland, Romania, Switzerland).

The group 9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub> is used only in the form 910ff.

**FRANCE, SPAIN****NIVOMET — Code form for the transmission of NIVO-METEOROLOGICAL observations****C O D E F O R M :**

Section 0	AAXX	YYGGi <sub>w</sub>						
Section 1	Iiii	i <sub>R</sub> i <sub>x</sub> h//	Nddff	1s <sub>n</sub> TTT	29UUU	7wwW <sub>1</sub> W <sub>2</sub>	8N <sub>h</sub> C <sub>L</sub> C <sub>M</sub> C <sub>H</sub>	9GGgg
Section 3	333	(1s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub>	2s <sub>n</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub> )	4/sss	7R <sub>24</sub> R <sub>24</sub> R <sub>24</sub> R <sub>24</sub>	907tt	931s's'	
Section 5	555	7I <sub>z</sub> Z <sub>x</sub> Z <sub>x</sub> Z <sub>x</sub>	8I <sub>t</sub> d <sub>t</sub> q <sub>t</sub> q <sub>t</sub>	1s <sub>n</sub> T <sub>s</sub> T <sub>s</sub> T <sub>s</sub>	E' <sub>n</sub> P <sub>s</sub> P <sub>s</sub> N <sub>v</sub> C <sub>n</sub>	L' <sub>1</sub> L' <sub>2</sub> L' <sub>3</sub> L' <sub>4</sub> L' <sub>5</sub>		
		L <sub>6</sub> L <sub>7</sub> L <sub>8</sub> L <sub>9</sub> L <sub>5</sub>	(2ddff	ssss's')	(4F <sub>1</sub> F <sub>2</sub> e <sub>c</sub> e <sub>c</sub> )	(5IM <sub>v</sub> M <sub>v</sub> M <sub>v</sub> )		

**Note :**

Section number	Symbolic figure group	Contents
0	—	Identifier, date/time and units of wind speed used
1	—	Data common to code form SYNOP
3	333	Data common to Section 3 of code form SYNOP
5	555	Data for snow

Specifications of symbolic letters other than those specified either in Volume I.1 — Part A or in Section B of Chapter VI of Volume II:

C <sub>L</sub> , C <sub>M</sub> , C <sub>H</sub>	Low, medium and high clouds (Code table 6–1)  The cloud base is above station level. A clear sky above shall be coded as 0000. If the sky is invisible (cloud cannot be seen owing to fog, blowing snow ...), the group shall be coded as 9///.
C <sub>n</sub>	Blowing snow at altitude (the direction of the blowing snow depends on the direction of the wind) (Code table 6–2)
d <sub>t</sub>	Prevailing direction of drifting snow in 24 hours (Code table 6–3)
E' <sub>n</sub>	State of snow (Code table 6–4)
e <sub>c</sub> e <sub>c</sub>	Thickness of refrozen crust in cm  Thickness of refrozen crust on the surface or, in the absence of any on the surface, of the refrozen crust in the 10 cm below the surface. If there is no refrozen crust, e <sub>c</sub> e <sub>c</sub> = 00. If the thickness of the refrozen crust is unknown, e <sub>c</sub> e <sub>c</sub> = //. If the thickness of the refrozen crust is less than 1 cm, e <sub>c</sub> e <sub>c</sub> = 01.
F <sub>1</sub> F <sub>2</sub>	Type of grain on the surface (Code table 6–5)
ff	Wind speed, in m s <sup>-1</sup>
I	Indicator on the homogeneity of the snow layer (10 centimetres from the surface) (Code table 6–6)
I <sub>t</sub>	Indicator of type of snow drift sensor (Code table 6–7)

**FRANCE, SPAIN** (*continued*)

$I_w$	Indicator of wind sensor and unit of measure = 1 (m s <sup>-1</sup> )
$I_z$	Indicator of maximum altitude of the rain/snow boundary (Code table 6–8)
$L'_1 - L'_5$ : Avalanches – natural release	
$L'_1$	Number of avalanche(s) observed (Code table 6–9)
$L'_2$	Size of avalanche(s) (Code table 6–10)
$L'_3$	Type of avalanche(s) (Code table 6–11)
$L'_4$	Altitude of avalanche release (Code table 6–12)
$L'_5$	Orientation of avalanche (Code table 6–13)
$L_5 - L_9$ : Avalanches – artificial release	
$L_5$	Evaluation of the avalanche risk (Code table 6–14)
$L_6$	Types of release (Code table 6–15)
$L_7$	Type of avalanche(s) (same as $L'_3$ natural release) (Code table 6–16)
$L_8$	Altitude of avalanche release (same as $L'_4$ natural release) (Code table 6–17)
$L_9$	Orientation of avalanche (same as $L'_4$ natural release) (Code table 6–18)
$M_V M_V M_V$	Density of snow, in kg m <sup>-3</sup> (Code table 6–19)
$N_h$	Cloud cover in oktas of the lowest $C_L$ or $C_M$ type clouds above station level (Code table 6–20)
$N_v$	Clouds in the valley(s) (Code table 6–21)
$P_s P_s$	Depth of penetration of ramsonde, in centimetres (Code table 6–22)
$q_t q_t$	Quantity of drifted snow
$s' s'$	Depth, in centimetres, of newly fallen snow at altitude since the last observation
$sss$	Total depth, in centimetres, of the snow lying on the ground, at the measuring point at altitude
$T_s T_s T_s$	Temperature of the surface snow, in tenths of a degree Celsius
$ww$	Present weather at time of observation (Code table 6–23)
$W_1, W_2$	Weather since the last observation (Code table 6–24)
$Z_x Z_x Z_x$	Maximum altitude of the rain/snow boundary since the last observation, in decametres

Code tables:

**CODE TABLE 6–1** $C_L$  — *Low clouds*Code  
figure

0	No low clouds	
2	Cumulus	Clouds with a flat and horizontal base developing vertically in mounds or cauliflower-like shapes
5	Stratocumulus	Banks or a layer of grey or whitish clouds generally caught on mountaintops. The base may be fuzzy or smooth and generally horizontal.
6	Stratus	A frequently continuous layer of clouds, sometimes in the form of ragged patches along the flanks of mountain ridges at a low altitude above the observer
9	Cumulonimbus	Dense and heavy cloud with a considerable mountain- or tower-shaped vertical extension. These clouds, the base of which is quite dark, may give rise to thunderstorms and generally heavy precipitation in the form of rain, snow, fine or large hail, sometimes accompanied by strong wind gusts.
/	Station in fog, sky invisible	

**FRANCE, SPAIN** *(continued)***C<sub>M</sub>** — *Medium clouds*Code  
figure

0	No medium clouds	
1	Altostratus	A greyish layer generally with a uniform base, allowing a glimpse of the sun with no halo phenomenon
2	Nimbostratus	A layer of very dark clouds constantly obscuring the sun, giving rise to precipitation in the form of more or less continuous rain or snow. A mountain observer is frequently in the cloud.
3	Altostratus	Banks or layers of white or grey clouds that generally are not caught on hills or mountains
4	Altostratus lenticularis	An isolated cloud in the shape of a lens or almond with narrowing along the edges, usually above a summit
7	Altostratus altostratus	Two or more layers of altostratus at different altitudes or the simultaneous presence of altostratus and altostratus
/	Medium clouds are invisible	

**C<sub>H</sub>** — *High clouds*Code  
figure

0	No high clouds	
2	Cirrus	Clouds with more or less tangled filaments that are never caught on hills or mountains
7	Cirrostratus	More or less transparent milky cloud veil giving rise to the halo phenomenon
9	Cirrocumulus	Banks of small, fluffy balls with an apparent diameter of less than one degree
/	High clouds are invisible	

**CODE TABLE 6-2****C<sub>n</sub>** — *Blowing snow at altitude (the direction of the blowing snow depends on the direction of the wind)*Code  
figure

	Direction and force	
0	No blowing snow	
1	There has been blowing snow since the last observation and no blowing snow at altitude at the time of observation	
2	Moderate blowing snow from the east	
3	Moderate blowing snow from the south	
4	Moderate blowing snow from the west	
5	Moderate blowing snow from the north	
6	Severe blowing snow from the east	
7	Severe blowing snow from the south	
8	Severe blowing snow from the west	
9	Severe blowing snow from the north	
/	No observations (due to clouds or fog)	

**FRANCE, SPAIN** *(continued)***CODE TABLE 6-3** $d_t$  — *Prevailing direction of drifting snow in 24 hours*Code  
figure

0	No drifting snow
1	North-east
2	East
3	South-east
4	South
5	South-west
6	West
7	North-west
8	North
9	Multiple directions
/	Unknown

**CODE TABLE 6-4** $E_n$  — *State of snow*Code  
figure

0	Fresh, dry snow (or recently fallen)
1	Fresh, dry snow (or recently fallen), with ice on the surface
2	Fresh, moist snow (or recently fallen)
3	Unbearing drifted snow
4	Bearing drifted snow
5	Old, moist snow, unbearing (rotten)
6	Old, moist snow, bearing (not crusted)
7	Unbearing refrozen crust
8	Bearing refrozen crust
9	Surface smooth and icy

**CODE TABLE 6-5** $F_1F_2$  — *Type of grain on the surface*Code  
figure

1	Fresh snow
2	Recognizable particles
3	Fine grains
4	Faceted crystals
5	Depth hoar
6	Rounded grains
7	Crusts
8	Surface hoar
9	Graupel

**FRANCE, SPAIN** (continued)

Notes:

- (1)  $F_1$  indicates the type of grain predominant in the layer.
- (2)  $F_2$  indicates the most predominant type of grain after  $F_1$ .
- (3) The layer is made up of only one type of grain,  $F_1 = F_2$ . Example: layer of fresh snow  $F_1F_2 = 11$ .
- (4) The snow cover is made up of a crust of hard ice,  $F_1 = 7$ :
  - (a) The grains are not identifiable –  $F_2 = 7$ . Coding:  $F_1F_2 = 77$ ;
  - (b) The grains are identifiable –  $F_2 =$  type of grain. Example: crust of hard ice,  $F_1 = 7$ ; rounded grains,  $F_2 = 6$ . Coding:  $F_1F_2 = 76$ .
- (5) The snow cover is made up of an ice crust in the process of breaking up. Coding:  $F_2 = 7$ .  $F_1$  is then the type of grain. Example: ice crust in the process of breaking up,  $F_2 = 7$ ; rounded grains,  $F_1 = 6$ . Coding:  $F_1F_2 = 67$ .

**CODE TABLE 6-6**

$I$  — Indicator on the homogeneity of the snow layer (10 centimetres from the surface)

Code  
figure

- |   |   |
|---|---|
| 0 | It has snowed at least 5 centimetres since the last observation ( $s's' \geq 5$ centimetres) – fresh snow vertical core drilling  |
| 1 | It has not snowed (or less than 5 centimetres) and the layer 10 centimetres below the surface is homogeneous (only one strata); horizontal core drilling between the surface of the snow and the level – 10 centimetres (See note 2, Code table 6-16) |
| 2 | It has not snowed (or less than 5 centimetres) and the layer 10 centimetres below the surface is made up of several stratas of compost or of different hardness – no measurement for the density of the snow (See note 1, Code table 6-16)            |

**CODE TABLE 6-7**

$I_t$  — Indicator of type of snow drift sensor

Code  
figure

- |   |                       |
|---|-----------------------|
| 1 | Driftometer with bags |
| 2 | FlowCapt              |
| / | No measurement        |

**CODE TABLE 6-8**

$I_z$  — Indicator of maximum altitude of the rain/snow boundary

Code  
figure

- |   |   |
|---|---|
| 0 | The maximum altitude of the rain/snow boundary is equal to the value $Z_xZ_xZ_x$<br>Since the last observation, rain has risen again (temporarily) to this altitude |
| 1 | The maximum altitude of the rain/snow boundary is above the value $Z_xZ_xZ_x$<br>Since the last observation, it has rained at least up to this altitude             |
| 2 | The maximum altitude of the rain/snow boundary is below the value $Z_xZ_xZ_x$<br>Since the last observation, it has snowed continuously below this altitude         |
| / | The altitude of the rain/snow boundary is unknown or there is no precipitation  |

**FRANCE, SPAIN** (continued)**CODE TABLE 6-9** $L'_1$  — *Number of avalanche(s) observed*Code  
figure

0	Nothing to report. No avalanches, only superficial sluffs can be observed
1	One avalanche
2	Two avalanches observed
3	Three avalanches observed
4	Four avalanches observed
5	Five avalanches observed
6	Six to 10 avalanches
7	11 to 20 avalanches observed
8	21 to 30 avalanches observed
9	More than 30 avalanches observed
/	Unknown (observation impossible)

**CODE TABLE 6-10** $L'_2$  — *Size of avalanche(s)*Code  
figure

0	Nothing to report. No avalanches, only superficial sluffs can be observed
1	Small
2	Mostly small, a few medium (1 or 2)
3	Mostly medium (no large)
4	Mostly small and a few large
5	Mostly medium and a few large
6	Mostly large
7	At least one large avalanche with an unusual trajectory
/	Unknown (observation impossible)

**CODE TABLE 6-11** $L'_3, L_7$  — *Type of avalanche(s)*Code  
figure

0	Nothing to report. No avalanches, no sluffs, no cracks
1	No avalanches, but cracks in the snow cover
2	Sluffs, dry or damp
3	Recent avalanche(s), dry, localized release
4	Recent avalanche(s), damp, localized release
5	Loose snow avalanche(s) (linear release, dry snow, rather fine deposit)
6	Slab avalanche(s) (linear release, dry snow, deposit in blocks)
7	Avalanche(s) of old damp or wet snow
8	Dry snow avalanche(s) above a crust (linear release)
9	Avalanche(s) of old damp or wet snow (localized or linear release)
/	Unknown



**FRANCE, SPAIN** *(continued)***CODE TABLE 6-12** $L'_4, L_8$  — *Altitude of avalanche release*Code  
figure

0	Nothing to report
1	Below 1 500 m
2	Between 1 500 and 1 750 m
3	Between 1 750 and 2 000 m
4	Release at several altitudes but most below 2 000 m
5	Between 2 000 and 2 250 m
6	Between 2 250 and 2 500 m
7	Between 2 500 and 3 000 m
8	Above 3 000 m
9	Release at several altitudes but most above 3 000 m
/	Unknown

**CODE TABLE 6-13** $L'_5, L_9$  — *Orientation of avalanche*Code  
figure

0	Nothing to report
1	Mostly in a north-eastern direction
2	Mostly in an eastern direction
3	Mostly in a south-eastern direction
4	Mostly in a southern direction
5	Mostly in a south-western direction
6	Mostly in a western direction
7	Mostly in a north-western direction
8	Mostly in a northern direction
9	No dominant orientation
/	Unknown

**CODE TABLE 6-14** $L_5$  — *Evaluation of the avalanche risk*Code  
figure

1	Low risk
2	Limited risk
3	Pronounced risk
4	High risk
5	Very high risk
/	Unknown

**FRANCE, SPAIN** (*continued*)**CODE TABLE 6-15** $L_6$  — *Types of release*Code  
figure

0	Nothing to report. No shooting, no avalanche
1	No avalanche (all shooting negative)
2	Positive artificial release (most of the shooting negative, some positive shooting)
3	Positive artificial release (most of the shooting positive, some negative shooting)
4	1 accidental release (no shooting or negative shooting)
5	1 accidental release (at least 1 positive shooting)
6	Several accidental releases (no shooting or negative shooting)
7	Several accidental releases (at least 1 positive shooting)
/	Unknown (observation impossible)

**CODE TABLE 6-16** $M_V M_V M_V$  — *Density of snow, in kg m<sup>-3</sup>*

Notes:

- (1) If  $I = 2$  and liquid water content has been measured,  $M_V M_V M_V$  = density measured for content of liquid water.
- (2) If  $I = 1$  and liquid water content has been measured,  $M_V M_V M_V$  = density measured for content of liquid water (it is not necessary to make a new measure).
- (3) No measurement:  $M_V M_V M_V$  is coded with 3 slashes ( $M_V M_V M_V = ///$ ).

**CODE TABLE 6-17** $N_h$  — *Cloud cover in oktas of the lowest  $C_L$  or  $C_M$  type clouds above station level*Code  
figure

0	No cloud or only $C_H$ type cloud
1-8	Fraction of sky covered, in oktas
9	The sky is invisible owing to fog or blowing snow

**CODE TABLE 6-18** $N_v$  — *Clouds in the valley(s)*Code  
figure

Altitude of cloud top

0	No clouds in the valley	
1	Isolated clouds	Below 1 000 metres
2	Isolated clouds	Between 1 000 and 1 500 metres
3	Isolated clouds	Above 1 500 metres
4	Partial sea of clouds	Below 1 000 metres
5	Partial sea of clouds	Between 1 000 and 1 500 metres
6	Partial sea of clouds	Above 1 500 metres
7	Complete sea of clouds	Below 1 000 metres
8	Complete sea of clouds	Between 1 000 and 1 500 metres
9	Complete sea of clouds	Above 1 500 metres
/	No observations	(Station in the fog)

Note: The cloud base is below the level of the station.

**FRANCE, SPAIN** *(continued)***CODE TABLE 6-19**

$P_s P_s$  — *Depth of penetration of ramsonde, in centimetres*

**Notes:**

- (1) The ram tube has to be placed vertically (without pressure) on the snow layer.
- (2) If the level of penetration is more than 99 centimetres: code 99 and explain clearly, at the end of the message, the exact depth of the penetration.

**CODE TABLE 6-20**

*ww* — *Present weather at time of observation*

Code  
figure

00 None of the following phenomena at the station at the time of observation: fog, rain, snow or thunderstorm

**FOG**

44 Fog, sky visible  
45 Fog, sky invisible  
48 Ice fog, sky visible  
49 Ice fog, sky invisible

**RAIN**

16 Rain within sight, but not falling at station  
60 Intermittent slight rain  
61 Continuous slight rain (with no interruption since onset)  
63 Moderate rain  
65 Heavy rain  
67 Freezing rain  
69 Rain and snow mixed  
81 Rain shower(s)

**SNOW**

16 Snow within sight, but not falling at station  
36 Blowing snow at station  
70 Intermittent slight snow  
71 Continuous slight snow (with no interruption since onset)  
73 Moderate snow  
75 Heavy snow  
84 Showers of rain and snow  
86 Snow showers  
88 Showers of small hail or snow pellets

**THUNDERSTORM**

17 Thunder heard but no precipitation at station  
95 Thunderstorm with rain or snow at station  
96 Thunderstorm with hail at station

Note: If two types of weather are present at the time of observation, *ww* is the highest code figure.

**FRANCE, SPAIN** (continued)**CODE TABLE 6-21**

$W_1, W_2$  — Weather since the last observation

Code  
figure

0	No significant phenomenon
3	Blowing snow at the station
4	Fog
6	Rain, drizzle (liquid water)
7	Snow, hail (snow crystals)
9	Thunderstorm

Note:

The  $W_1$  and  $W_2$  code figures should describe as fully as possible the meteorological conditions that were prevailing at the time of observation.

If there were two types of prevailing weather since the last observation,  $W_1$  is the highest code figure,  $W_2$  is the lowest code figure.

If there was only one type of prevailing weather, the same code figure is transmitted twice  $W_1 = W_2$ .

If past weather is entirely unknown,  $W_1 W_2 = //$  (two bars) is transmitted.

If only part of past weather is known, the code  $W_1$  is transmitted and for  $W_2$  one enters / (one bar).

**GERMANY****Report of surface observations from an auxiliary station**

WEHI

CCCC GGgg dddffGf<sub>m</sub>f<sub>m</sub>**KT** VVV w'w' N<sub>s</sub>N<sub>s</sub>N<sub>s</sub>h<sub>s</sub>h<sub>s</sub>h<sub>s</sub>  
(T'T'/T<sub>d</sub>T<sub>d</sub>) (QP<sub>H</sub>P<sub>H</sub>P<sub>H</sub>P<sub>H</sub>) (REw'w') (PIC INp)

Symbolic letters are used with their international specifications with regard to FM 15 METAR.

**Special weather report (sudden changes) for national non-aeronautical purposes (M-REP)**

NF 03 M-REP — Special weather report of the actual occurrence of hazardous weather phenomena

Iiii MMMMM GGggi<sub>w</sub> w<sub>2</sub>i<sub>x</sub>/VV (1s<sub>n</sub>TTT) (7wwW<sub>1</sub>/)  
(333) (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>) (910ff) (9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>)

Symbolic letters are used with their international specifications with regard to FM 12/FM 13 SYNOP/SHIP.

w<sub>2</sub> in the group w<sub>2</sub>i<sub>x</sub>/VV is applied for indicating hazardous weather phenomena:

Code  
figure

0	Gusts
2	Visibility
3	Ceiling
4	Hail, ice pellets, freezing precipitation
8	Thunderstorm
9	Squall line or funnel cloud

**IRELAND, UNITED KINGDOM****Special weather report (sudden changes) for national non-aeronautical purposes**

M M M M M }  
 B B B B B }      G G g g i<sub>w</sub>  
                       I I i i i      w<sub>2</sub> i<sub>x</sub> h V V      N d d f f      7 w w W<sub>1</sub> W<sub>2</sub>      (8 N<sub>s</sub> C h<sub>s</sub> h<sub>s</sub>)

The indicator M M M M M denotes a sudden deterioration, B B B B B a sudden improvement.

Specifications of symbolic letters other than those specified either in Volume I.1 or in Section B of Chapter VI of Volume II:

w<sub>2</sub>                      See under M M M M M / B B B B B above (Belgium, Poland, Romania, Switzerland).

**ITALY****RSD — Regular and special ground radar observation reports for aeronautical purposes**

RSD is followed by notes in abbreviated plain language.

The above-mentioned reports contain the following elements in this order:

- (a) Designation of the type of observation (RSD);
- (b) Time group in hours and minutes (UTC);
- (c) ICAO station location indicator;
- (d) Type and coverage of echo;
- (e) Echo intensity and its tendency;
- (f) Average diameter of the single echo or average width of the echo line, in kilometres (in case of an area of echoes or a single echo of a very irregular form, this indication will be omitted);
- (g) Echo coordinates (bearing in whole degrees and range in kilometres);  
and, if available:
- (h) Direction in eight points of the compass and speed of movement, in knots, measured over the last 15 minutes;
- (i) Height of base and top in metres.

**N o t e s :**

- (1) In the case of an area of echoes, the coordinates of the centre are reported.
- (2) In the case of a line of echoes, the coordinates of the extremities of the axis are reported and, if necessary, those of the other intermediary points.
- (3) Coordinates may be replaced by known place names when the two indications correspond.
- (4) Normally data for not more than three single echoes constituting a line or area of echoes will be transmitted, in order of decreasing intensity. Four groups may be transmitted in case of strong echoes.
- (5) If there are no echoes or when all echoes disappeared at least 10 minutes previously, the following message will be transmitted: RSD GGgg CCCC ECNIL.
- (6) When the apparatus is out of service, the following message will be transmitted: RSD GGgg CCCC EQPAN.

This message will be transmitted regularly every hour as from the beginning of the breakdown until the apparatus is back in operation. When the apparatus is about to resume operation, a regular or special report will be transmitted, as appropriate, even if echoes are not present.

**NETHERLANDS****NATIONAL CODE NF 01 – AUTO KLIM** (Additional climatological observation) from a fully automated station

Section 0:	$M'_i M'_i M'_j M'_j$	YYGGw <sub>i</sub>			
Section 1:	IIiii	$1f_x f_x f_h f_h$	$2w_{a1} w_{a2} w_{a3} w_{a4}$	$3w_{a5} w_{a6} w_{a7} i_{Rh}$	$(4D_R R_h R_h R_h)$
Section 2:	(222	$1s_n T_{x6} T_{x6} T_{x6}$	$2s_n T_{n6} T_{n6} T_{n6}$	$3h_{Tx6} h_{Tx6} h_{Tn6} h_{Tn6}$	$4s_n T_{g6} T_{g6} T_{g6})$
Section 3:	(333	$1s_n T_{b1} T_{b1} T_{b1}$ $4s_n T_{b4} T_{b4} T_{b4}$ $7s_n T_{nb1} T_{nb1} T_{nb1}$	$2s_n T_{b2} T_{b2} T_{b2}$ $5s_n T_{b5} T_{b5} T_{b5}$ $8s_n T_{xb2} T_{xb2} T_{xb2}$	$3s_n T_{b3} T_{b3} T_{b3}$ $6s_n T_{xb1} T_{xb1} T_{xb1}$ $9s_n T_{nb2} T_{nb2} T_{nb2}$	

**Wherein:****Section 0**

$M'_i M'_i M'_j M'_j$	A KLIM report is identified by the symbolic letters $M'_i M'_i M'_j M'_j$ = KLIM
YYGGw <sub>i</sub>	Date and time group and indicator of type of observation

**Section 1**

IIiii	Block and station number
$1f_x f_x f_h f_h$	Highest gust and mean wind speed recorded during the preceding hour
$2w_{a1} w_{a2} w_{a3} w_{a4}$	Weather indicators
$3w_{a5} w_{a6} w_{a7} i_{Rh}$	Weather indicators and precipitation indicator
$4D_R R_h R_h R_h$	Duration and total amount of precipitation during the last hour

**Section 2**

222	Indicator group for Section 2
$1s_n T_{x6} T_{x6} T_{x6}$	Maximum temperature recorded during the preceding 6 hours, in tenths of a degree C
$2s_n T_{n6} T_{n6} T_{n6}$	Minimum temperature recorded during the preceding 6 hours, in tenths of a degree C
$3h_{Tx6} h_{Tx6} h_{Tn6} h_{Tn6}$	Hour wherein the maximum and minimum temperature during the preceding 6 hours occurred
$4s_n T_{g6} T_{g6} T_{g6}$	Ground (grass) minimum temperature, in the preceding 6 hours, in tenths of a degrees C

**NETHERLANDS** *(continued)***Section 3**

333 Indicator group for Section 3

1s<sub>n</sub>T<sub>b1</sub>T<sub>b1</sub>T<sub>b1</sub> Soil temperature at a depth of 5 cm2s<sub>n</sub>T<sub>b2</sub>T<sub>b2</sub>T<sub>b2</sub> Soil temperature at a depth of 10 cm3s<sub>n</sub>T<sub>b3</sub>T<sub>b3</sub>T<sub>b3</sub> Soil temperature at a depth of 20 cm4s<sub>n</sub>T<sub>b4</sub>T<sub>b4</sub>T<sub>b4</sub> Soil temperature at a depth of 50 cm5s<sub>n</sub>T<sub>b5</sub>T<sub>b5</sub>T<sub>b5</sub> Soil temperature at a depth of 100 cm6s<sub>n</sub>T<sub>xb1</sub>T<sub>xb1</sub>T<sub>xb1</sub> Maximum soil temperature at a depth of 5 cm7s<sub>n</sub>T<sub>nb1</sub>T<sub>nb1</sub>T<sub>nb1</sub> Minimum soil temperature at a depth of 5 cm8s<sub>n</sub>T<sub>xb2</sub>T<sub>xb2</sub>T<sub>xb2</sub> Maximum soil temperature at a depth of 10 cm9s<sub>n</sub>T<sub>nb2</sub>T<sub>nb2</sub>T<sub>nb2</sub> Minimum soil temperature at a depth of 10 cm

Temperatures recorded during  
the 6 hours preceding the time  
of observation

**Note:** Temperatures are given in tenths of a degree Celsius

Code tables:

**CODE TABLE 10418***D<sub>R</sub> — Duration of precipitation*Code  
figure

0	Less than three minutes; the amount less than 0.1 mm
1	0.1 of an hour
2	0.2 of an hour
.	...
9	0.9 of an hour
—	During the whole hour
/	Measurement impossible

**CODE TABLE 13918***i<sub>Rh</sub> — Indicator for hourly precipitation data*Code  
figure

0	No precipitation measured; group 4D <sub>R</sub> R <sub>h</sub> R <sub>h</sub> R <sub>h</sub> omitted
1	Duration and total amount of precipitation obtained from equipment
2	Duration and total amount of precipitation not obtained from equipment; group 4D <sub>R</sub> R <sub>h</sub> R <sub>h</sub> R <sub>h</sub> omitted
8	Duration of precipitation obtained from equipment; total amount of precipitation not available
9	Duration of precipitation not available; total amount of precipitation obtained from equipment

**NETHERLANDS** *(continued)***CODE TABLE 31838** $R_h R_h R_h$  — *Total amount of precipitation in tenths of a millimetre during the preceding hour*Code  
figure

000	Not used
00–	Trace (less than 0.1 mm)
001	0.1 mm
002	0.2 mm
...	...
011	1.1 mm
012	1.2 mm
...	...
999	99.9 mm or more

**CODE TABLE 15339** $w_i$  — *Indicator for type of observation*Code  
figure

/	Visual observation
1	Fully automated observation

**CODE TABLE 15370** $w_{a1}$  t/m  $w_{a7}$  — *Weather indicators*

$w_{a1}$	Fog and/or ice fog	}	Occurred during the preceding hour, a part of that hour and/or at the time of observation
$w_{a2}$	Rain and/or drizzle and/or rainshowers, freezing or not freezing		
$w_{a3}$	Snow and/or snow grains and/or snow pellets and/or snow showers		
$w_{a4}$	Hail, small hail and/or ice pellets		
$w_{a5}$	Thunderstorm		
$w_{a6}$	Deposition of ice		
$w_{a7}$	Precipitation, type unknown		



**NORWAY****FM 12/FM 13: Section 5 — National code groups transmitted regularly or occasionally on the GTS**

0St<sub>z</sub>f<sub>x</sub>f<sub>x</sub> This group is used to report state of sea (S — Code table 3700) and maximum wind speed.

t<sub>z</sub> — *Time of maximum mean wind speed or changes in wind speed during last three hours*

Code  
figure

0	At observation time	
1	0– 1 hour before observation time	} time indication of maximum mean wind speed
2	1– 2 hours before observation time	
3	2– 3 hours before observation time	
4	3– 6 hours before observation time	
5	6– 9 hours before observation time	
6	9–12 hours before observation time	
7	Wind speed decreasing	} not possible to indicate time for maximum wind speed
8	Wind speed unchanged	
9	Wind speed increasing	
x	Maximum wind speed or changes in wind speed cannot be indicated	

f<sub>x</sub>f<sub>x</sub> Maximum mean wind speed, in knots, since the preceding main observation hour, or maximum mean wind speed during the last 12 hours for stations which do not observe all the main observational hours.

1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub> This group is included at 0600 UTC to report maximum night temperature during the last 12 hours.

2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub> This group is included at 1800 UTC to report minimum day temperature during the last 12 hours.

3s<sub>n</sub>T<sub>g</sub>T<sub>g</sub>T<sub>g</sub> This group is included at 0600 UTC to report minimum temperature just above the ground during last night.

4R<sub>T</sub>W<sub>d</sub>W<sub>d</sub>W<sub>d</sub> This group gives additional information on weather phenomena reported in other sections. R<sub>T</sub> is used to report tenths of millimetres precipitation. This group is also included when precipitation amount is under 1 millimetre.

W<sub>d</sub>W<sub>d</sub>W<sub>d</sub> gives additional information on past weather which cannot be reported under W<sub>1</sub>W<sub>2</sub>, or, for stations which do not observe all the main observational hours, on past weather since the preceding main observation and before the period covered by W<sub>1</sub>W<sub>2</sub>.

W<sub>d</sub> — *Additional information on past weather*

Code  
figure

0	Dew
1	Hoar frost, rime
2	Blowing snow
3	Fog
4	Glaze
5	Rain, rain showers or drizzle
6	Rain and snow, showers of rain and snow
7	Snow, snow showers, snow grains, diamond dust
8	Hail, small hail, ice pellets
9	Thunderstorm
/	No additional information

**UNITED KINGDOM****British light-vessels report**

IIiii Nddff VVwwW 4TTT<sub>s</sub>T<sub>s</sub> (1d<sub>w</sub>d<sub>w</sub>P<sub>w</sub>H<sup>1</sup><sub>w</sub>) (PPP//) (PPPapp)

A selection of light-vessels report pressure in the form PPP// or pressure and tendency in the form PPPapp.

Specifications of symbolic letters other than those given either in Volume I.1 or in Section B of Chapter VI of Volume II:

TT }  
W } See under code form AERO above (Belgium, Switzerland).

H<sup>1</sup><sub>w</sub> — *Mean maximum height of waves*

Code figure			50 added to d <sub>w</sub> d <sub>w</sub>		
	m	ft	Code figure	m	ft
0	0.25	1	0	5	16
1	0.5	1½	1	5.5	17½
2	1	3	2	6	19
3	1.5	5	3	6.5	21
4	2	6½	4	7	22½
5	2.5	8	5	7.5	24
6	3	9½	6	8	25½
7	3.5	11	7	8.5	27
8	4	13	8	9	29
9	4.5	14	9	9.5	31
/	Height not determined				

**Notes:**

- (1) The range of heights covered by a number is half a metre; e.g., number 3 applies to waves whose heights are between 1.25 metres and 1.75 metres (4 feet and 5¾ feet).
- (2) Waves whose heights are greater than 9.75 metres (32 feet) are reported by coding H<sup>1</sup><sub>w</sub> as 9 and adding after the code group the word WAVE and the actual height in metres or feet, e.g. WAVE 40 feet.
- (3) If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported.
- (4) Code figures 49 or 99 for d<sub>w</sub>d<sub>w</sub> mean "waves confused, directions indeterminate".

PPP Pressure at mean sea level, in tenths of a hectopascal, omitting thousands' and hundreds' digits of hectopascals of the pressure value.

pp Amount of pressure tendency at station level during the three hours preceding the time of observation, expressed in tenths of a hectopascal.

T<sub>s</sub>T<sub>s</sub> Sea-surface temperature, rounded off to the nearest degree Celsius.

## F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C<sub>i</sub>) USED IN INTERNATIONAL HYDROLOGICAL CODES

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
(Iceland)		01	Iceland	4	
Shannon		02	Ireland	5	
(Rest of Ireland)		03	{ Ireland United Kingdom	5 6	
Scotland		04	United Kingdom	6	
England north of Dee and Humber		05	United Kingdom	6	
East England from Thames to Humber		06	United Kingdom	6	
South England from Thames to Bristol Channel		07	United Kingdom	6	
Wales except Severn		08	United Kingdom	6	
Central England		09	United Kingdom	6	
North and west coast		10	Spain	2	
Mino } Lima }		11	{ Spain Portugal	2 1	
Duero		12	{ Spain Portugal	2 1	
Tajo		13	{ Spain Portugal	2 1	
West coast		14	Portugal	1	
South coast		15	{ Spain Portugal	2 1	
Guadiana		16	{ Spain Portugal	2 1	
Guadalquivir		17	{ Spain Portugal	2 1	

REGION VI

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
English Channel coast		18	{ France Belgium	1 2	
Atlantic coast		19	France	1	
Schelde		20	{ France Belgium Netherlands	1 2 4	
Meuse		21	{ France Belgium Germany Netherlands	1 2 3 4	
Seine		22	France	1	
Loire		23	France	1	
Dordogne		24	France	1	
Garonne		25	{ France Spain	1 2	
Ebro		26	{ Spain France Andorra	2 1 3	
South-east coast		27	Spain	2	
Languedoc coast		28	France	1	
Common to Norway- Sweden		29	{ Norway Sweden	7 2	
Common to Norway- Finland-Russian Federation		30	{ Norway Finland Russian Federation	7 8 9	
Norway only		31	Norway	7	
Common to Sweden- Finland		32	{ Sweden Finland	2 8	
(Sweden)		33	Sweden	2	
(Denmark)		34	Denmark	9	
Rhine	Moselle	35	{ Switzerland Austria Germany	9 2 3	
		36	{ France Netherlands Luxembourg	1 4 8	

# REGION VI

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Weser		37	Germany	3	
North Sea coast (including Ems)		38	{ Netherlands Germany	4 3	
Rhone		39	{ Switzerland France	9 1	
Elbe		40	{ Czech Republic Germany	1 3	
Baltic Sea coast		41	{ Germany Poland	3 4	
Danube	Inn	42	Germany	3	To be allocated as needed
	Tisza-Mures	43	Switzerland	9	
	Sava	44	Austria	2	
		45	Czech Republic	1	
		46	Hungary	4	
	Drava	47	Bosnia and Herzegovina	5	
	Vel Morova		Serbia	6	
			Montenegro	7	
			(Albania)	8	
			Croatia		
			Republic of Moldova		
			Romania		
			Slovakia		
			Bulgaria		
Po		48	{ Italy Switzerland	3 9	
Venetian coast		49	{ Italy Switzerland	3 9	
Corsica } Sardinia }		50	{ France Italy	1 3	
(Southern Italy)		51 } 52 } 53 }	Italy	3	To be allocated as needed
(Finland)		54 } 55 }	Finland	8	To be allocated as needed
West Baltic coast		56	Poland	4	
Odra		57	{ Czech Republic Poland Germany	1 4 3	
Wista		58	{ Slovakia Poland	1 4	
Adriatic coast (north)		59	Bosnia and Herzegovina	5	To be allocated as needed

# REGION VI

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Adriatic coast (north)		59	{ Bosnia and Herzegovina Croatia	5	To be allocated as needed
Adriatic coast (south)		60	{ Albania Greece	6 2	
(Greece)		61 62	} Greece	2	To be allocated as needed
Vardar		63	{ The former Yugoslav Republic of Macedonia Greece	2	To be allocated as needed
Mesta (Nestos) Struma (Strimon)		64	{ Bulgaria Greece The former Yugoslav Republic of Macedonia	8 2	To be allocated as needed
Marica (Meric Nehri)		65	{ Bulgaria Turkey Greece	8 6 2	
Black Sea coast (east)		66	{ Romania Bulgaria Turkey	7 8 6	
		67 68 69	}		Spare numbers
Northern district		70	Russian Federation	9	
Kola peninsula		71	Russian Federation	9	
Karelia, north-west and Estonia		72	{ Russian Federation Estonia	9 1	To be allocated as needed
West Dvina and rivers between West Dvina and Neman		73	{ Belarus Latvia Lithuania Russian Federation	2 3 5 9	To be allocated as needed
Neman and Kaliningrad		74	{ Lithuania Russian Federation Poland	5 9 4	To be allocated as needed
Upper Volga		75	Russian Federation	9	
Kama		76	Russian Federation	9	
Lower Volga		77	Russian Federation	9	

REGION VI

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Don		78	Russian Federation	9	
Upper Dnieper and Bug		79	{ Belarus Russian Federation Ukraine	{ 2 9 6 }	To be allocated as needed
Middle and lower Dnieper		80	{ Russian Federation Ukraine	{ 9 6 }	To be allocated as needed
Black Sea west of Dnieper		81	{ Republic of Moldova Poland Ukraine	{ 7 4 6 }	To be allocated as needed
Black Sea east of Dnieper		82	{ Russian Federation Ukraine	{ 9 6 }	To be allocated as needed
Sea of Azov		83	{ Russian Federation Ukraine	{ 9 6 }	To be allocated as needed
Northern Caucasus		84	Georgia	8	
Eastern Transcaucasus		85	{ Russian Federation Armenia Azerbaijan	{ 9 3 5 }	To be allocated as needed
		86			Spare number
Black Sea (north and east coast)		87	Turkey	6	
Black Sea (south coast)		88	Turkey	6	
Caspian Sea (west)		89	{ Iran, Islamic Republic of (RA II)	4	
Kura-Araks		90	{ Armenia Azerbaijan Georgia Turkey Iran, Islamic Republic of (RA II)	{ 3 5 8 6 4 }	To be allocated as needed
Turkish Mediterranean coast		91	{ Turkey Greece	{ 6 2 }	
Asi		92	{ Lebanon Syrian Arab Republic Turkey	{ 8 3 6 }	
Eastern Mediterranean coast		93	{ Syrian Arab Republic Lebanon Israel	{ 3 8 5 }	

REGION VI

<i>Basin</i>	<i>Sub-basin</i>	<i>BB</i>	<i>Country</i>	<i>C<sub>i</sub></i>	<i>Remarks</i>
Internal basins and Gulf of Aquaba		94	{ Syrian Arab Republic	3	
			{ Lebanon	8	
			{ Israel	5	
			{ Jordan	7	
			{ Saudi Arabia (RA II)	6	
Euphrates-Tigris		95	{ Turkey	6	
			{ Syrian Arab Republic	3	
			{ Iran, Islamic Republic of (RA II)	4	
			{ Iraq (RA II)	5	



## G — SPECIFICATIONS OF ZONE NUMBERS OF SUB-AREAS/ROUTE SEGMENTS, NOTIFIED BY MEMBERS, FOR WHICH GAFOR WILL BE PROVIDED

### AUSTRIA

#### Specification of route segments

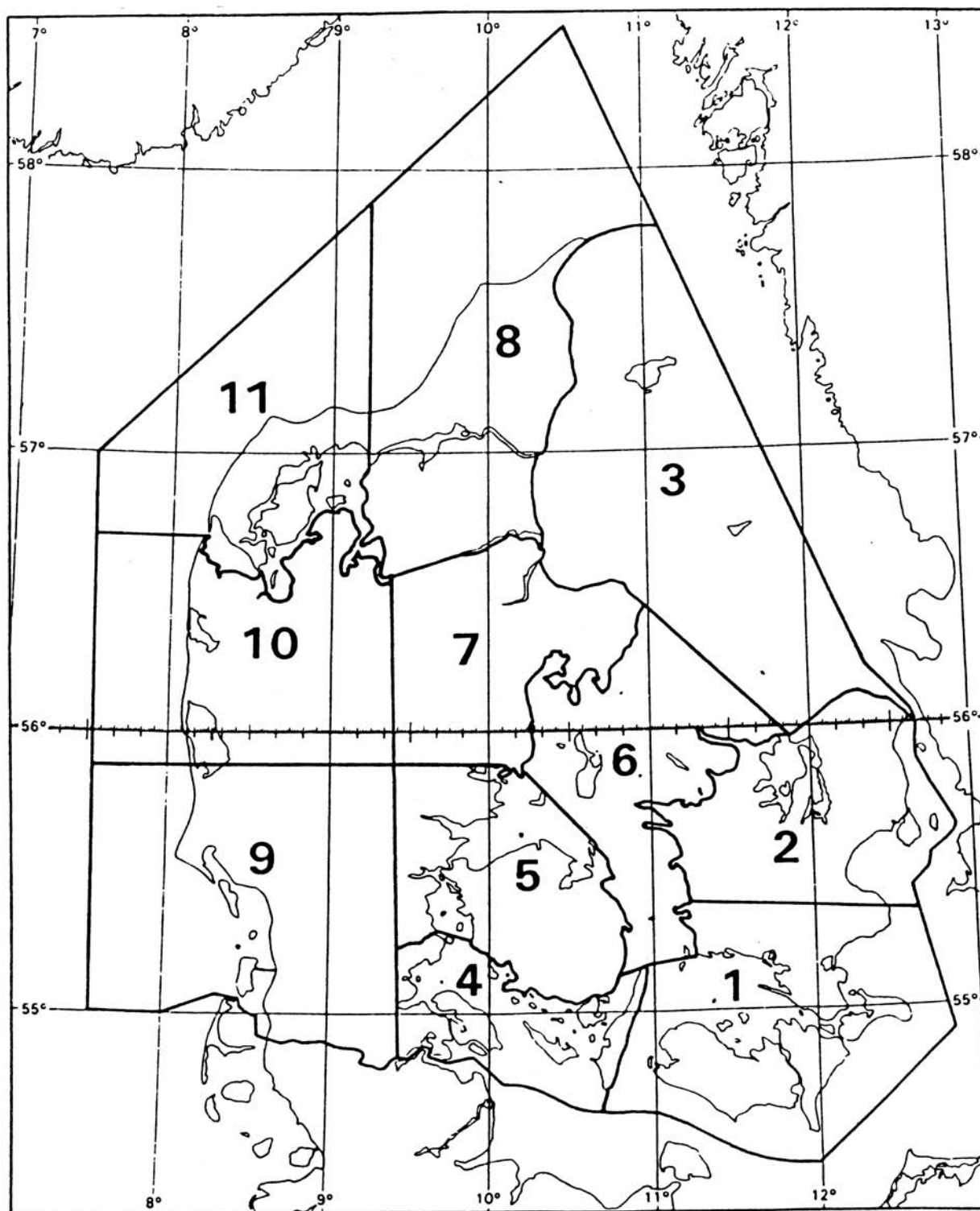
<i>a<sub>g</sub>a<sub>g</sub></i>	<i>Identification group of the specific routes</i>	<i>Reference height above mean sea level</i>
10	Kempton - Fernpass - Innsbruck	4 300 ft
11	Hohenems - Arlberg - Innsbruck	6 000 ft
12	Innsbruck - Inntal - Kufstein	2 000 ft
13	Kufstein - Autobahn - Salzburg	2 000 ft
14	Salzburg - Autobahn - Linz	2 000 ft
15	Linz - St. Pölten - Krems	1 400 ft
16	Krems - Donautal - Wien	1 000 ft
17	Vilshofen - Autobahn - Linz	1 500 ft
18	Linz - Pregarten - Freistadt	3 000 ft
19	Freistadt - Kerschbaumer - Sattel - Budweis	3 000 ft
20	Innsbruck - Gerlos - Zell/See	5 000 ft
21	Zell/See - Salzachtal - Radstadt	3 200 ft
22	Radstadt - Ennstal - Aigen	2 900 ft
23	Aigen - Schoberpass - Kapfenberg	2 800 ft
24	Kapfenberg - Semmering - Wr. Neustadt	3 300 ft
25	Wr. Neustadt - Wien	900 ft
26	Wien - Poysdorf - Brunn	1 500 ft
30	Mauterndorf - Murtal - Kapfenberg	3 600 ft
40	Zell/See - Felbertauern - Lienz	8 500 ft
41	Lienz - Drautal - Spittal/Drau	2 300 ft
42	Spittal/Drau - Villach - Klagenfurt	2 200 ft
43	Klagenfurt - Griffener Berg - Wolfsberg	2 500 ft
44	Wolfsberg - Packsattel - Graz	3 900 ft
45	Graz - Autobahn - Pinkafeld	2 000 ft
46	Pinkafeld - Wechsel - Wr. Neustadt	3 300 ft
47	Graz - Punitz	1 500 ft
48	Punitz - Oberwart - Pinkafeld	1 500 ft
49	Innsbruck - Finstermünzpass - Samedan	5 600 ft
50	Innsbruck - Brenner - Bozen	5 000 ft
55	Kufstein - St. Johann/Tirol - Zell/See	3 300 ft
56	Zell/See - Unken - Salzburg	2 500 ft
60	Salzburg - Lammertal - Radstadt	3 500 ft
61	Radstadt - Katschberg - Spittal/Drau	6 000 ft
62	Klagenfurt - Kanaltal - Ronchi	3 600 ft
65	Salzburg - Pötschenhöhe - Aigen	3 400 ft
70	Linz - Kirchdorf	1 500 ft
71	Kirchdorf - Pyhrnpass - Aigen	3 200 ft
75	Klagenfurt - Neumarkter Sattel - Zeltweg	3 300 ft
76	Klagenfurt - Seeberg - Sattel - Portoroz	5 000 ft
81	Krems - Annaberg - Mariazell	3 500 ft
82	Mariazell - Steirischer Seeberg - Kapfenberg	4 500 ft
83	Kapfenberg - Murtal - Graz	1 700 ft
84	Graz - Radlpaß - Portoroz	5 000 ft
90	Wr. Neustadt - Sopron - Siofok	3 500 ft



**DENMARK**

**Specification of sub-areas**

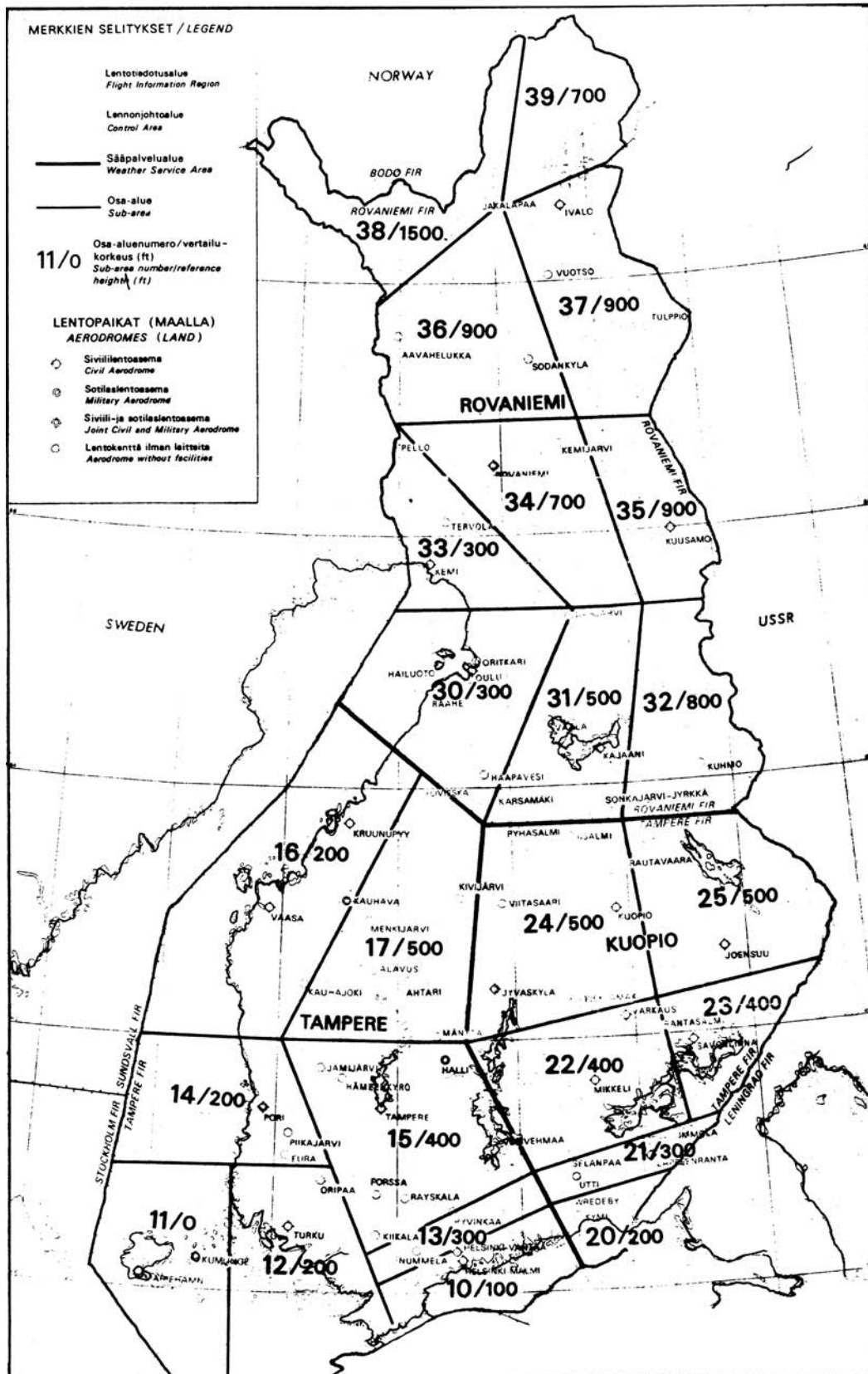
The eleven sub-areas for which the GAFOR is provided



# REGION VI

## FINLAND

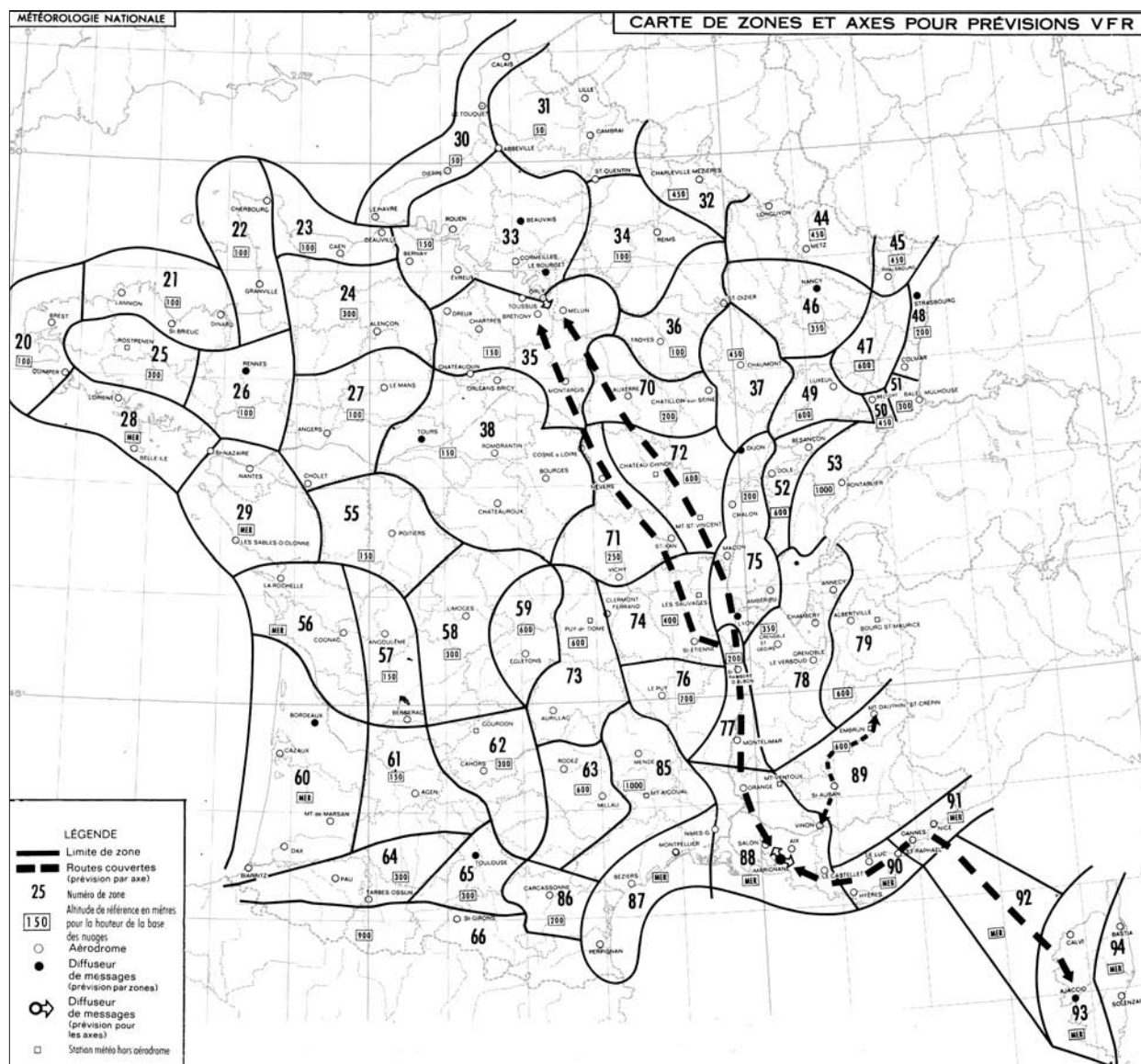
### Specification of sub-areas





## FRANCE

## Specification of sub-areas



Note : Sub-areas 32, 47 and 53 are not covered by GAFOR forecasts due to lack of observations.

REGION VI

**GERMANY**

**Specification of sub-areas**

<i>Area No.</i>	<i>Geographical designation</i>	<i>Reference height above mean sea level</i>
01	Ostfriesland	100 ft
02	Nordfriesland-Dithmarschen	100 ft
03	Schleswig-Holsteinische Geest	200 ft
04	Schleswig-Holsteinisches Hügelland	300 ft
05	Nordwestliches Niedersachsen	200 ft
06	Lüneburger Heide	400 ft
07	Westliches Niedersachsen	300 ft
08	Hannover	500 ft
09	Teutoburger Wald	700 ft
10	Weser-Leine Bergland	1 400 ft
11	Mecklenburgisches Tiefland	300 ft
12	Vorpommern	200 ft
13	Westliche Mecklenburgische Seenplatte und Prignitz	400 ft
14	Östliche Mecklenburgische Seenplatte und Uckermark	400 ft
15	Altmark	400 ft
16	Hoher Fläming	600 ft
17	Rhin-Havelluch und Ostbrandenburgisches Seengebiet	300 ft
18	Barnim und Oderbruch	400 ft
19	Spreewald und Gubener Waldland	400 ft
20	Magdeburger Börde und Nördliches Harzvorland	700 ft
21	Harz	2 000 ft
22	Leipziger Tieflandsbucht und Elbe-Elster Niederung	600 ft
23	Niederlausitzer Heiden	600 ft
24	Thüringer Becken	1 400 ft
25	Mittelsächsisches Hügelland	1 300 ft
26	Oberlausitz und Lausitzer Gebirge	1 500 ft
27	Thüringer Wald, Frankenwald und Fichtelgebirge	2 700 ft
28	Erzgebirge	2 700 ft
31	Niederrheinisches Tiefland	300 ft
32	Münsterland	500 ft
33	Ruhrgebiet	500 ft
34	Niederrheinische Bucht	700 ft
35	Bergisches Land	1 400 ft
36	Sauerland	2 400 ft
37	Eifel	2 000 ft
38	Neuwieder Becken	800 ft
39	Westerwald	1 900 ft
41	Hunsrück	2 300 ft
42	Taunus	1 900 ft
43	Nordhessisches Bergland mit Vogelsberg	2 000 ft
44	Rheinpfalz und Saarland	1 900 ft
45	Rhein-Main Gebiet und Wetterau	700 ft
46	Odenwald und Spessart	1 700 ft
47	Rhön	2 800 ft
51	Oberrheinische Tiefebene	900 ft
52	Kraichgau	1 100 ft
53	Neckar-Kocher-Jagst-Gebiet	1 700 ft
54	Mainfranken und Nördliches Unterfranken	1 400 ft
55	Mittelfranken	1 700 ft
56	Oberfranken	1 900 ft

REGION VI

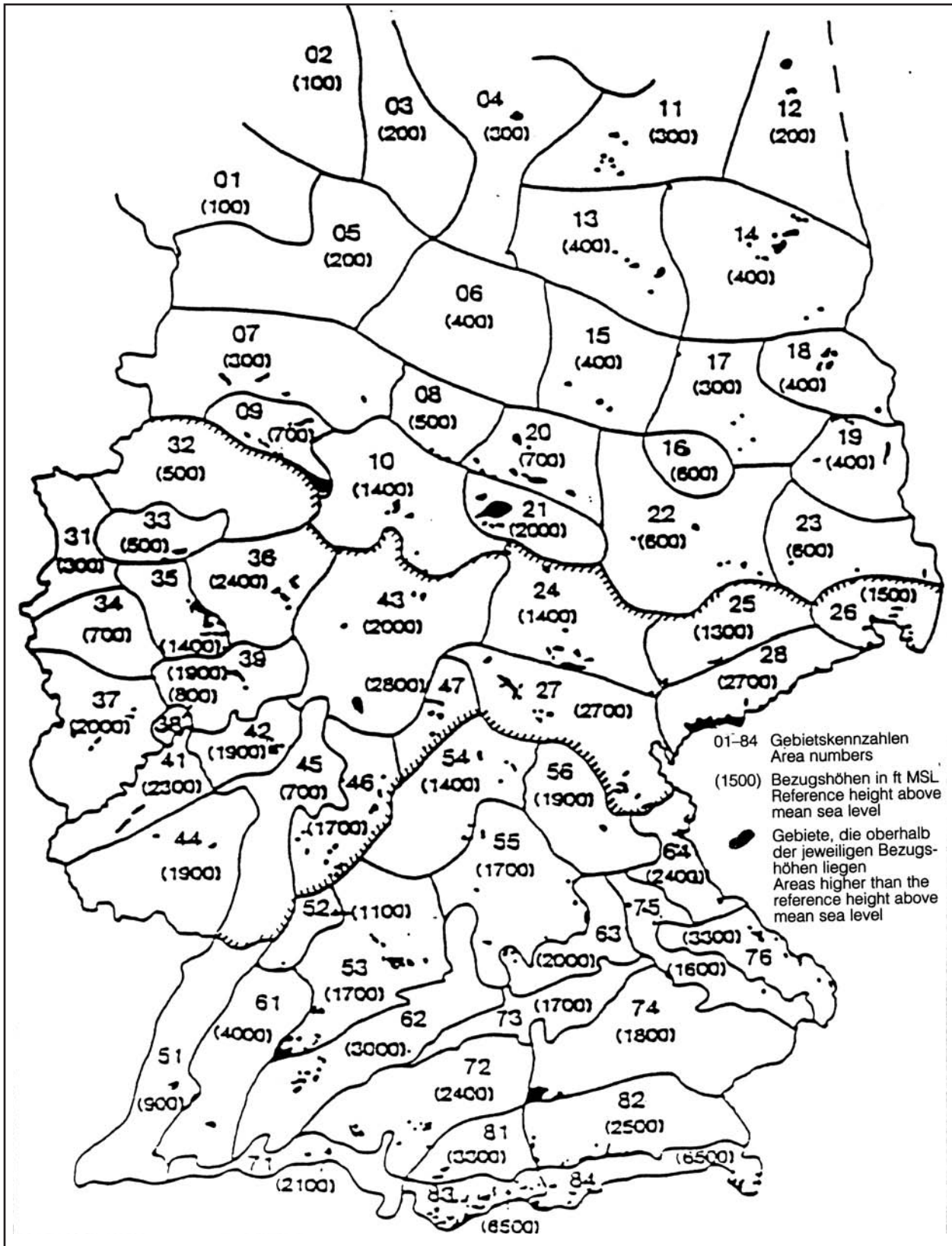
**GERMANY** *(continued)*

**Specification of sub-areas** *(continued)*

<i>Area No.</i>	<i>Geographical designation</i>	<i>Reference height above mean sea level</i>
61	Schwarzwald	4 000 ft
62	Schwäbische Alb	3 000 ft
63	Fränkische Alb	2 000 ft
64	Oberpfälzer Wald	2 400 ft
71	Hochrhein- und Bodenseeraum	2 100 ft
72	Schwäbische Hochebene	2 400 ft
73	Westliche Donauniederung	1 700 ft
74	Südbayerisches Hügelland	1 800 ft
75	Östliche Donau- und Naabniederung	1 600 ft
76	Bayerischer Wald	3 300 ft
81	Westliches Alpenvorland	3 300 ft
82	Östliches Alpenvorland	2 500 ft
83	Allgäuer Alpen	6 500 ft
84	Östliche Bayerische Alpen	6 500 ft

REGION VI

GERMANY (continued)





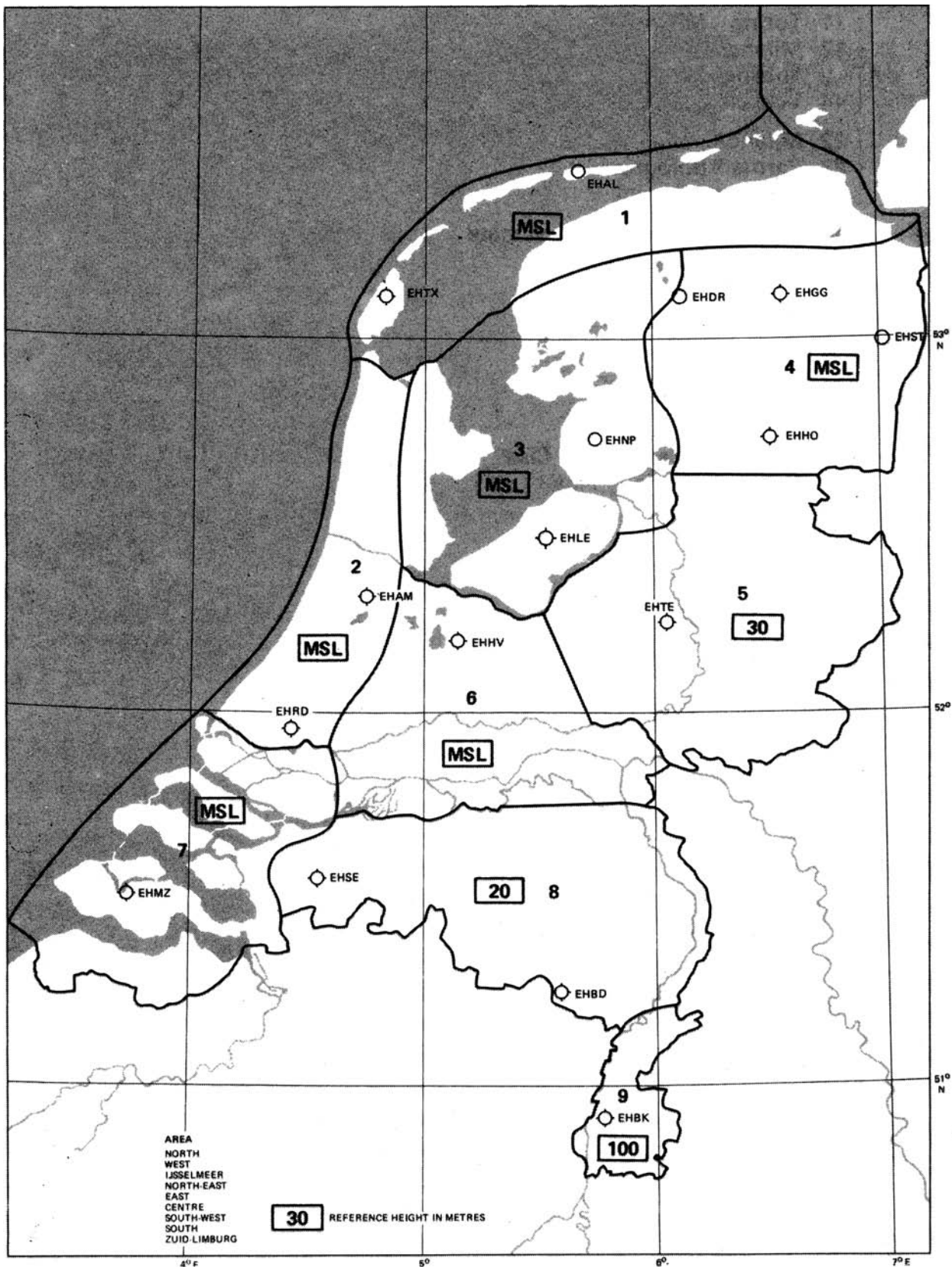
## ITALY

## Specification of route segments

$a_g a_g$	Route segments
10	<ul style="list-style-type: none"> <li>11 Torino - Milano/Linate</li> <li>12 Milano/Linate - Verona Villafranca</li> <li>13 Verona Villafranca - Venezia Tesserà</li> <li>14 Venezia Tesserà - Ronchi dei Legionari</li> </ul>
20	<ul style="list-style-type: none"> <li>22 Milano/Linate - Parma</li> <li>23 Parma - Bologna</li> <li>24 Bologna - Rimini</li> </ul>
30	<ul style="list-style-type: none"> <li>31 Monte Bisbino - Milano/Linate</li> <li>32 Milano/Linate - Voghera</li> <li>33 Voghera - Genova Sestri</li> </ul>
40	<ul style="list-style-type: none"> <li>42 Bolzano - Garda</li> <li>43 Garda - Milano/Linate</li> </ul>
50	<ul style="list-style-type: none"> <li>51 Voghera - Albenga</li> <li>52 Albenga - Ventimiglia</li> </ul>
60	<ul style="list-style-type: none"> <li>61 Voghera - Passo della Cisa</li> <li>62 Passo della Cisa - Pisa</li> </ul>

NETHERLANDS

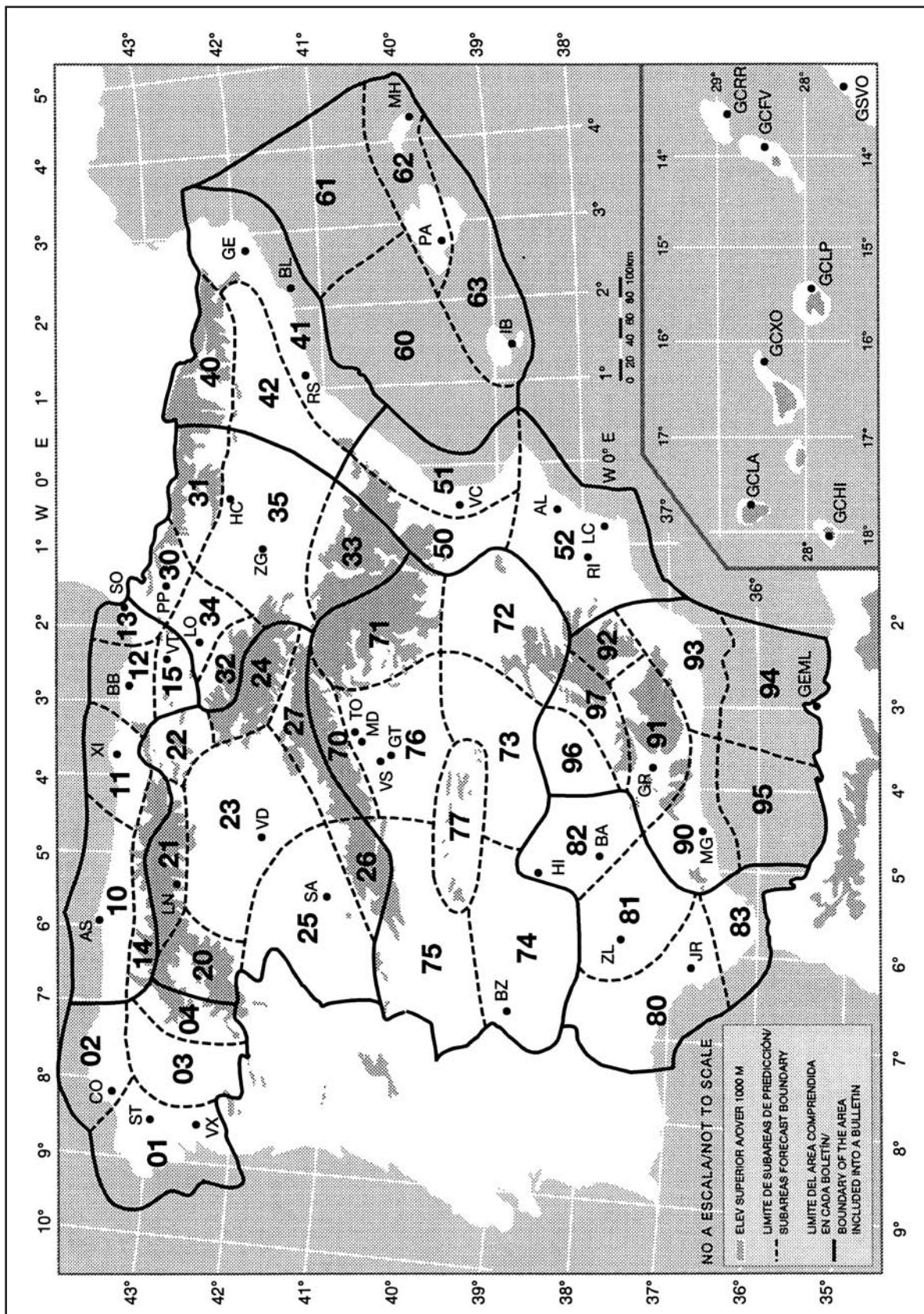
Specification of sub-areas





SPAIN

Specification of sub-areas

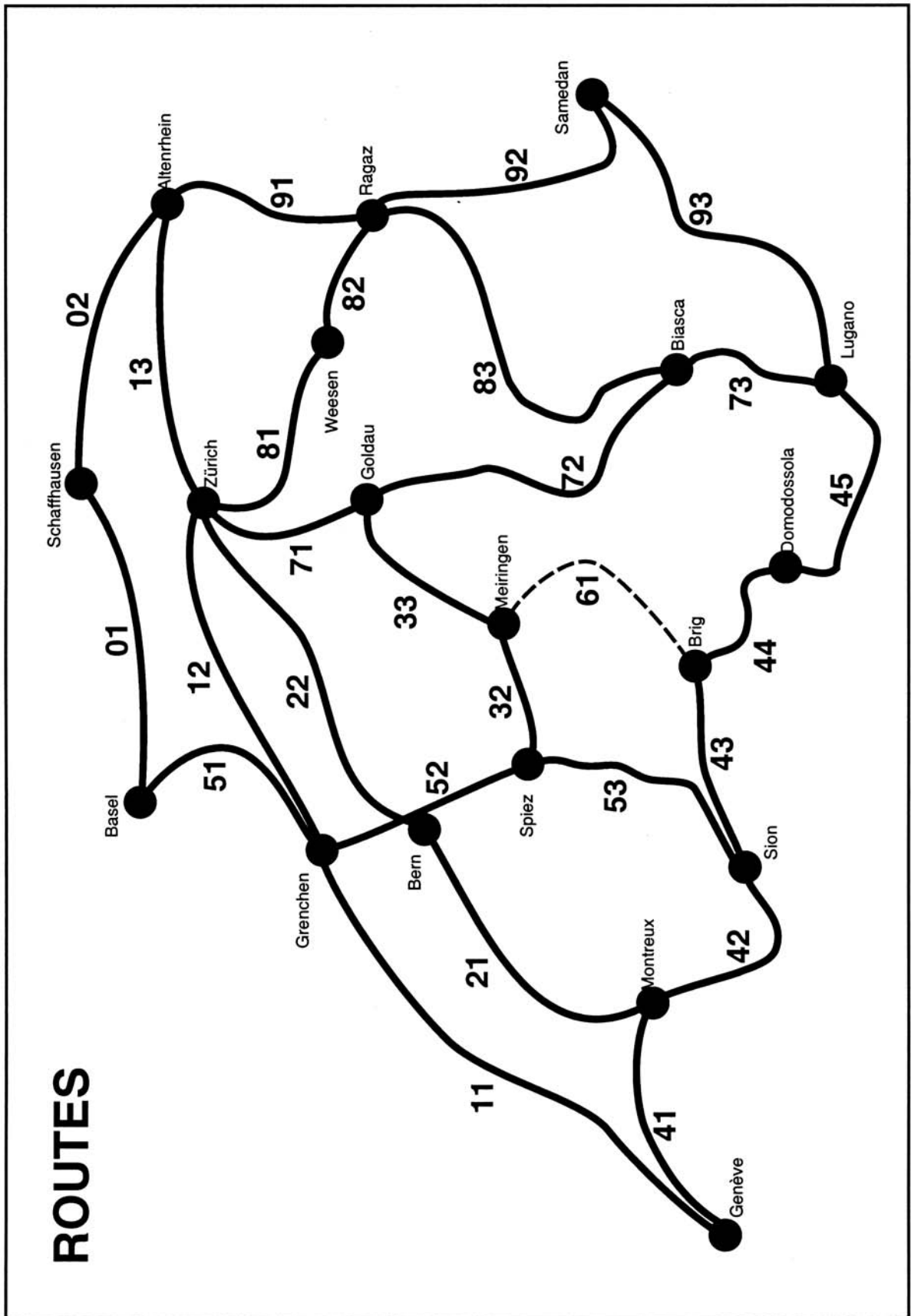


**SWITZERLAND****Specification of route segments**

<i>a<sub>g</sub>a<sub>g</sub></i>	<i>Routes</i>	<i>Reference height above mean sea level</i>
01	Basel - Schaffhausen	1 600 ft
02	Schaffhausen - Altenrhein	1 600 ft
11	Genève - Morges - Grenchen	1 900 ft
12	Grenchen - Bremgarten - Zürich	1 900 ft
13	Zürich - Attikon - Altenrhein	1 900 ft
21	Montreux - Romont - Fribourg - Neuenegg - Bern	2 900 ft
22	Bern - Moossee - Sursee - Bremgarten - Zürich	2 900 ft
32	Spiez - Meiringen	1 900 ft
33	Meiringen - Brünig - Küssnacht - Goldau	3 600 ft
41	Genève - Montreux	1 600 ft
42	Montreux - Sion	1 600 ft
43	Sion - Brig	2 300 ft
44	Brig - Simplon - Domodossola	6 800 ft
45	Domodossola - Laveno - Lugano	1 600 ft
51	Basel - Langenbruck - Grenchen	2 600 ft
52	Grenchen - Bern - Spiez	1 900 ft
53	Spiez - Gemmi - Sion	8 200 ft
61	Meiringen - Grimsel - Brig	7 200 ft
71	Zürich - Bremgarten - Goldau	1 900 ft
72	Goldau - Gotthard - Biasca	7 200 ft
73	Biasca - Lugano	1 900 ft
81	Zürich - Horgen - Weesen	1 600 ft
82	Weesen - Ragaz	1 600 ft
83	Ragaz - Lukmanier - Biasca	6 500 ft
91	Altenrhein - Ragaz	1 600 ft
92	Ragaz - Lenzerheide - Julier - Samedan	7 500 ft
93	Samedan - Maloja - Menaggio - Lugano	6 200 ft
<i>Groups of routes</i>		
00	Basel - Schaffhausen - Altenrhein	1 600 ft
10	Genève - Grenchen - Zürich - Altenrhein	1 900 ft
20	Montreux - Bern - Zürich	2 900 ft
30	Spiez - Meiringen - Brünig - Goldau	3 600 ft
40	Genève - Simplon - Lugano	6 800 ft
50	Basel - Gemmi - Sion	8 200 ft
70	Zürich - Gotthard - Lugano	7 200 ft
80	Zürich - Lukmanier - Biasca	6 500 ft
90	Altenrhein - Julier - Maloja - Lugano	7 500 ft
99	All routes	8 200 ft

**N o t e :** A map showing these routes follows on the next page.

SWITZERLAND (continued)





**BOSNIA AND HERZEGOVINA**  
**CROATIA**  
**SLOVENIA**  
**THE FORMER YUGOSLAV REPUBLIC**  
**OF MACEDONIA**  
**SERBIA, MONTENEGRO**

**Specification of route segments**

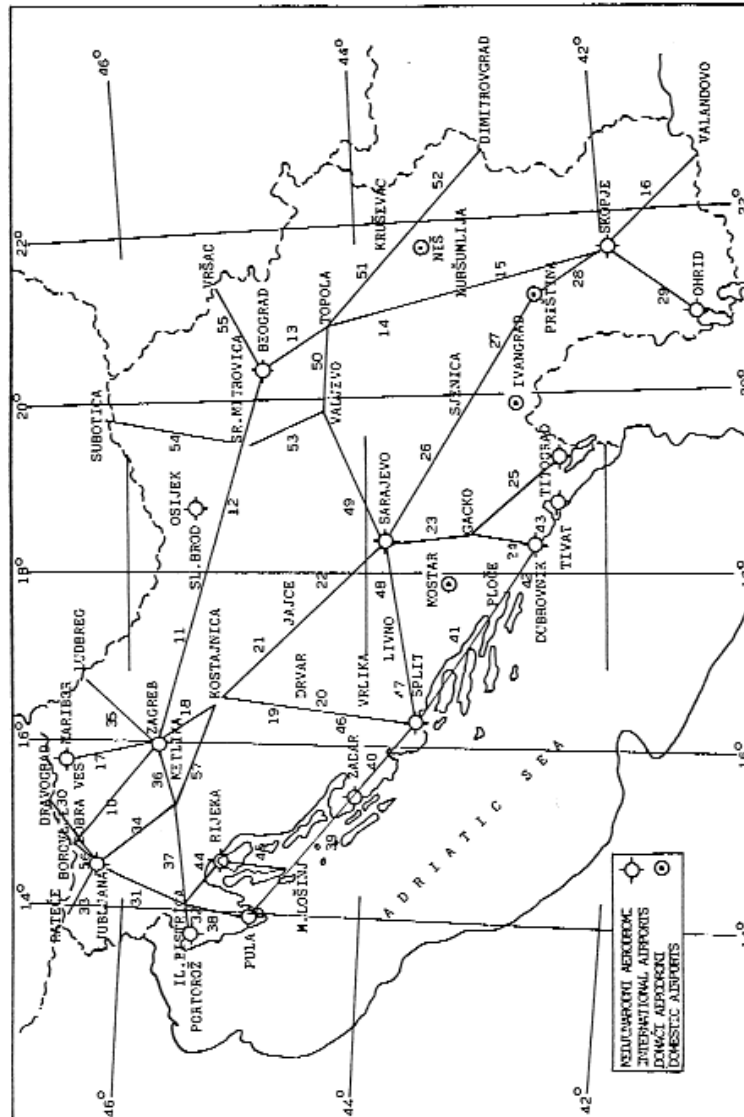
<i>a<sub>g</sub>a<sub>g</sub></i>	<i>Route segments</i>	<i>Reference height – m (ft)</i>
10	Dobra Ves – Zagreb	430 (1 400) Dobra Ves, 120 (400) Zagreb
11	Zagreb – Slavonski Brod	120 (400)
12	Slavonski Brod – Beograd	90 (300)
13	Beograd – Topola	90 (300)
14	Topola – Kuršumlija	120 (400) Topola, 240 (800) Kuršumlija
15	Kuršumlija – Skopje	210 (700)
16	Skopje – Valandovo	210 (700) Skopje, 90 (300) Valandovo
17	Maribor – Zagreb	270 (900) Maribor, 90 (300) Zagreb
18	Zagreb – Kostajnica	90 (300)
19	Kostajnica – Drvar	90 (300) Kostajnica, 450 (1 500) Drvar
20	Drvar – Split	450 (1 500) Drvar, 120 (400) Split
21	Kostajnica – Jajce	120 (400)
22	Jajce – Sarajevo	120 (400) Jajce, 450 (1 500) Sarajevo
23	Sarajevo – Gacko	450 (1 500) Sarajevo, 1 200 (4 000) Gacko
24	Gacko – Dubrovnik	1 200 (4 000) Gacko, 150 (500) Dubrovnik
25	Gacko – Titograd	1 200 (4 000) Gacko, 100 (350) Titograd
26	Sarajevo – Sjenica	450 (1 500) Sarajevo, 950 (3 100) Sjenica
27	Sjenica – Priština	950 (3 100) Sjenica, 550 (1 800) Priština
28	Priština – Skopje	550 (1 800) Priština, 210 (700) Skopje
29	Skopje – Ohrid	210 (700) Skopje, 670 (2 200) Ohrid
30	Dravograd – Ljubljana	490 (1 600) Dravograd, 330 (1 100) Ljubljana
31	Ljubljana – Ilirska Bistrica	330 (1 100) Ljubljana, 490 (1 600) Ilirska Bistrica
32	Ilirska Bistrica – Portorož	490 (1 600) Ilirska Bistrica, 90 (300) Portorož
33	Rateče – Ljubljana	880 (2 900) Rateče, 330 (1 100) Ljubljana
34	Ljubljana – Metlika	330 (1 100) Ljubljana, 210 (700) Metlika
35	Ludbreg – Zagreb	120 (400)
36	Zagreb – Metlika	120 (400)
37	Metlika – Ilirska Bistrica	210 (700) Metlika, 490 (1 600) Ilirska Bistrica
38	Ilirska Bistrica – Pula	490 (1 600) Ilirska Bistrica, 60 (200) Pula
39	Pula – Zadar	60 (200)
40	Zadar – Split	60 (200)
41	Split – Ploče	60 (200)
42	Ploče – Dubrovnik	60 (200)
43	Dubrovnik – Tivat	90 (300)
44	Ilirska Bistrica – Rijeka	490 (1 600) Ilirska Bistrica, 60 (200) Rijeka
45	Rijeka – Mali Lošinj	60 (200)
46	Zadar – Vrljika	60 (200)
47	Split – Livno	120 (400) Split, 730 (2 400) Livno
48	Livno – Sarajevo	730 (2 400) Livno, 450 (1 500) Sarajevo
49	Sarajevo – Valjevo	450 (1 500) Sarajevo, 120 (400) Valjevo
50	Valjevo – Topola	120 (400)
51	Topola – Kruševac	120 (400)
52	Kruševac – Dimitrovgrad	120 (400) Kruševac, 450 (1 500) Dimitrovgrad
53	Valjevo – S. Mitrovica	90 (300)
54	S. Mitrovica – Subotica	90 (300)
55	Beograd – Vršac	90 (300)
56	Borovlje – Ljubljana	880 (2 900) Borovlje, 490 (1 600) Ljubljana
57	Metlika – Kostajnica	120 (400)

REGION VI

BOSNIA AND HERZEGOVINA  
CROATIA  
SLOVENIA  
THE FORMER YUGOSLAV REPUBLIC  
OF MACEDONIA  
SERBIA, MONTENEGRO

(continued)

Route segments







CHAPTER VII

**THE ANTARCTIC**



## A — REGIONAL CODING PROCEDURES

### GENERAL REMARKS

- (a) The following instructions, code forms, specifications and code tables, complementary to existing international instructions, were adopted by the Executive Committee of WMO for use in the Antarctic during the International Geophysical Year. The Executive Committee subsequently decided that these codes would remain in force after the IGY and completed them in accordance with the provisions of Resolution 19 (EC-XII). Finally, these codes were amended as a temporary measure by voting by correspondence of Members signatory to the Antarctic Treaty in 1963. These codes are applicable to the Antarctic continent, the Falkland Islands (Malvinas) and all isolated islands south of 60°S. New amendments, valid as from 1 January 1967, were adopted by the Executive Committee in Resolution 8 (EC-XVIII). Further modifications, valid as from 1 January 1968 and resulting from changes in international codes, were adopted by Resolution 17 (67-EC). A complete revision of Chapter VII was adopted by Resolution 3 (EC-XXXIII). New modifications, valid as from 1 November 1987 and 1988, were adopted by the Executive Council in Resolutions 14, 15 and 16 (EC-XXXIX).

N o t e : Degrees Celsius and metric units are used for all meteorological reports from the Antarctic.

- (b) Special instructions have been drawn up regarding the use in the Antarctic of the following international codes:

FM 12 — SYNOP  
FM 15 — METAR  
FM 32 — PILOT  
FM 35 — TEMP  
FM 36 — TEMP SHIP  
FM 37 — TEMP DROP  
FM 71 — CLIMAT

- (c) The following regional code was developed:

**RF 7/01 MOBIL — Report of surface observation from a mobile land station**

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## A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

### FM 12 SYNOP and FM 14 SYNOP MOBIL

#### (a) Section 1

7/12.1 Groups 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>, 4PPPP or 4a<sub>3</sub>hhh

7/12.1.1 If Regulation 12.2.3.4.2 applies, i.e. if a station cannot report mean sea-level pressure with reasonable accuracy, it shall use the group 4a<sub>3</sub>hhh to report the geopotential height of an agreed standard isobaric surface selected in accordance with the station elevation as follows:

Pressure	Station elevation	
	from greater than	to equal to or less than
850 hPa	750 m	2 300 m
700 hPa	2 300 m	3 700 m

7/12.1.2 Group 4a<sub>3</sub>hhh shall indicate the geopotential of the suitable pressure level expressed in geopotential metres.

7/12.1.3 When local conditions prevent reduction with reasonable accuracy, stations at elevations between 500 and 750 metres shall report the 850 hPa geopotential.

7/12.1.4 The group 3P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> shall be included in the synoptic report in accordance with Regulation 12.2.4.

7/12.2 Group 6RRRt<sub>R</sub> (Section 1)

7/12.2.1 This group shall be included in Section 1 at 0000, 0600, 1200 and 1800 UTC, in accordance with Regulation 12.2.5.4.

7/12.2.2 RRR shall indicate the amount of precipitation (water equivalent) accumulated since the last 0000 UTC observation.

7/12.2.3 If the measurement of precipitation amount is impossible (very frequently due to blowing snow), i<sub>R</sub> shall be coded 4 in the group i<sub>R</sub>i<sub>x</sub>hVV and the group 6RRRt<sub>R</sub> shall be omitted.

#### (b) Section 2

7/12.3 Coastal stations shall add this section to their reports on request by the Antarctic Weather Centre to report data on sea ice, sea temperature and state of the sea.

#### (c) Section 3

7/12.4 Group (0 . . . .)

7/12.4.1 This group shall be used in the form 0d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub>.

7/12.4.2 The group 0d<sub>m</sub>d<sub>m</sub>f<sub>m</sub>f<sub>m</sub> shall be included whenever the speed of the maximum wind observed during the preceding six hours has equalled or exceeded 33 knots.

N o t e : Only stations equipped with an anemograph should transmit this group.

## THE ANTARCTIC

- 7/12.5      *Group* (1s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>)
- This group shall be included at 0000 and 1200 UTC to report the maximum temperature of the preceding 12 hours whenever this temperature is measured.
- 7/12.6      *Group* (2s<sub>n</sub>T<sub>n</sub>T<sub>n</sub>T<sub>n</sub>)
- This group shall be included at 0000 and 1200 UTC to report the minimum temperature of the preceding 12 hours whenever this temperature is measured.
- 7/12.7      *Group* (4E'sss)
- 7/12.7.1      Snow-depth data shall be reported by all stations capable of doing so, and included at least once daily at either 0600 or 1800 UTC.
- N o t e : When appropriate, the relevant special phenomena groups for time at which precipitation given by RRR began or ended and depth of the snow freshly fallen since the last 0000 UTC observation shall be reported in lieu of the group 4E'sss.
- 7/12.7.2      A 0000 UTC observation shall be reported at 0600 UTC, and a 1200 UTC observation shall be reported at 1800 UTC.
- 7/12.8      *Groups* (5j<sub>1</sub>j<sub>2</sub>j<sub>3</sub>j<sub>4</sub> (j<sub>5</sub>j<sub>6</sub>j<sub>7</sub>j<sub>8</sub>j<sub>9</sub>))
- 7/12.8.1      In the form 5EEEi<sub>E</sub> and 55SSS (j<sub>5</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>F<sub>24</sub>), these groups shall be included at 0600 UTC by all stations capable of doing so.
- 7/12.8.2      In the form 56D<sub>L</sub>D<sub>M</sub>D<sub>H</sub>, this group shall be included whenever the direction of movement of clouds reported for C<sub>L</sub>, C<sub>M</sub> and/or C<sub>H</sub> can be determined.
- 7/12.9      *Group* (6RRRt<sub>R</sub>) (*Section 3*)
- 7/12.9.1      This group shall be included in Section 3 of the synoptic report at the intermediate standard times 0300, 0900, 1500 and 2100 UTC.
- 7/12.9.2      RRR shall indicate the amount of precipitation (water equivalent) during the three-hour period preceding the time of observation.
- 7/12.10      *Group* (7 . . . .)
- 7/12.10.1      This group shall be used in the form 7D<sub>m</sub>D<sub>L</sub>D<sub>M</sub>D<sub>H</sub>.
- 7/12.10.2      The group 7D<sub>m</sub>D<sub>L</sub>D<sub>M</sub>D<sub>H</sub> shall be included in the report when:
- (a) The prevailing wind direction during the preceding six hours is significantly different from the current wind direction (e.g. a difference of 45° is considered significant); and/or
  - (b) Whenever the direction of movement of clouds reported for C<sub>L</sub>, C<sub>M</sub> and/or C<sub>H</sub> can be determined.
- 7/12.11      *Group* (8N<sub>s</sub>Ch<sub>s</sub>h<sub>s</sub>)
- One or more of these groups shall be reported when appropriate.
- 7/12.12      *Group* (9S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>S<sub>p</sub>)
- 7/12.12.1      This group shall be reported, when appropriate, using the code established for this purpose (Code table 3778 — Supplementary information — *Manual on Codes*, Volume I.1).
- N o t e : This group may be included by all stations capable of doing so, when appropriate.

## THE ANTARCTIC

- 7/12.12.2 A group 915dd shall be included in the report when the prevailing wind direction during the preceding six hours is significantly different from the current wind direction (e.g. a difference of 45° is considered significant).
- 7/12.12.3 A group 931ss shall be used, when appropriate, to report the depth of the snow freshly fallen since the last 0000 UTC observation and shall be included at 0000, 0600, 1200 and 1800 UTC when precipitation has occurred since the last 0000 UTC report.
- 7/12.12.4 Each time the phenomenon whiteout is observed, the appropriate group 9SpSpw<sub>1</sub>w<sub>1</sub> shall be included.

N o t e : In the absence of hydrometeors and blowing snow, and with a completely overcast sky over an unbroken snow cover, contours of landscape may vanish because all shadows disappear and the horizon cannot be distinguished. This phenomenon is called whiteout.

**FM 15 METAR**7/15.1 *Group* ( $T/T_d$ )

This group shall be included in the report whenever possible.

**FM 32 PILOT and FM 34 PILOT MOBIL**7/32.1 *Part A, Section 2*

When the standard isobaric surfaces cannot be located by means of pressure equipment, the following altitudes shall be used as approximations to the standard isobaric surfaces:

Altitude (m)		Standard isobaric surface (hPa)
<i>either</i>	<i>or</i>	
1 500	1 200	850
3 000	2 700	700
5 000	5 100	500
6 500	6 600	400
8 500	8 400	300
		250
11 000	10 800	200
12 500	12 600	150
15 000	14 700	100

7/32.2 *Part B, Section 4*

## 7/32.2.1 In addition to wind data at significant levels, altitudes of which are given in geopotential units, data at the following fixed levels shall be reported:

When indicator figure 9 is used:

300 m	3 600 m
600 m	4 200 m
900 m	4 800 m
1 500 m	6 000 m
1 800 m	7 500 m
2 100 m	9 000 m
2 400 m	12 000 m
3 000 m	

and the highest reportable level reached if below the 100 hPa surface.

When indicator figure 8 is used:

500 m	5 500 m
1 000 m	6 000 m
2 000 m	7 000 m
2 500 m	7 500 m
3 500 m	9 000 m
4 000 m	12 000 m
4 500 m	

and the highest reportable level reached if below the 100 hPa surface.

## 7/32.2.2 If a significant level occurs within 150 metres of one of the fixed levels when indicator figure 9 is used, or within 250 metres when indicator figure 8 is used, the data for the significant level shall be reported in the fixed level group in place of the data observed at the fixed level.



## THE ANTARCTIC

### 7/32.3 *Part C, Section 2*

When the standard isobaric surfaces cannot be located by means of pressure equipment, the following altitudes shall be used as approximations to the standard isobaric surfaces:

Altitude (m)		Standard isobaric surface (hPa)
<i>either</i>	<i>or</i>	
18 500	18 300	70
20 500	20 700	50
23 500	23 700	30
26 500	26 400	20
31 000	30 900	10

### 7/32.4 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges and in exchanges within the Antarctic.

*N o t e :* If the data in Parts A and/or C are completely duplicated in a TEMP report, Parts A and/or C may be omitted.

## **FM 35 TEMP, FM 36 TEMP SHIP, FM 37 TEMP DROP and FM 38 TEMP MOBIL**

### 7/35.1 *Requirements for international exchange*

Parts A, B, C and D shall all be included in international exchanges and in exchanges within the Antarctic.

## **FM 71 CLIMAT**

### 7/71.1 The NORMAL section shall not be included in the reports.

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## **A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS**

No code forms for regional use currently exist for the Antarctic.



## B — SPECIFICATIONS OF SYMBOLIC LETTERS (or groups of letters) FOR REGIONAL USE

$D_m$	<p>Prevailing wind direction during the preceding six hours. (Code table 0700) (7-group in Section 3 of FM 12)</p> <p>(1) By prevailing wind direction is meant the direction from which the wind blew the greater portion of the time during the preceding six hours.</p>
$d_m d_m$	<p>Direction of maximum wind (from which it blew) during the preceding six hours. (Code table 0877) (0-group in Section 3 of FM 12)</p> <p>(1) See Notes (1), (2), (3) under <math>f_m f_m</math>.</p> <p>(2) See Note (1) under dd (Volume I.1 — Section B).</p>
$f_m f_m$	<p>Speed of maximum wind, in knots, observed during the preceding six hours. (0-group in Section 3 of FM 12)</p> <p>(1) For this purpose, a maximum wind is defined as the wind that reaches the highest average speed during any one-minute interval (i.e. during 60 consecutive seconds).</p> <p>(2) For wind speeds of 100–199 knots inclusive, 50 is added to <math>d_m d_m</math> meaning that 100 knots are to be added to the number of knots shown by <math>f_m f_m</math>.</p> <p>(3) For wind speeds of 200–299 knots inclusive, the code group 00200 is added after the group <math>0d_m d_m f_m f_m</math> indicating that 200 knots are to be added to the number of knots shown by <math>f_m f_m</math> in the 4-group. 50 is <i>not</i> added to <math>d_m d_m</math>.</p>
HHHH	<p>Elevation (exact or approximate), in metres, of the MOBIL station at the time of observation. (RF 7/01)</p>
$I_5$	<p>Indicator of the accuracy of elevation indication. (Code table 746) (RF 7/01)</p>



## C — SPECIFICATIONS OF CODE FIGURES (code tables) FOR REGIONAL USE

Code tables for Antarctic are numbered with a three-figure number from 720 to 799. The numbering system and codes for each element are given below:

746            I<sub>5</sub>

### 746

I<sub>5</sub> — *Indicator of the accuracy of elevation indication*

Code  
figure

- |   |  |
|---|--|
| 0 | The exact elevation of the point of observation is reported for HHHH             |
| 5 | The approximate elevation of the point of observation is reported for HHHH       |
| 9 | The elevation of the point of observation is unknown (//// is reported for HHHH) |

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## **D — NATIONAL CODING PROCEDURES WITH REGARD TO INTERNATIONAL CODE FORMS**

### **FM 12 SYNOP**

#### **STATIONS OPERATED BY AUSTRALIA**

6RRRt<sub>R</sub>      *In reports from stations which do not make observations every six hours, t<sub>R</sub> indicates the duration of the period of reference.*

7wwW<sub>1</sub>W<sub>2</sub>      *The period normally covered by W<sub>1</sub>, W<sub>2</sub> is three hours but may increase to six or more hours since the previous observation at stations where observational programmes are not fully implemented.*

*N o t e :* The period actually covered by past weather reports may be shorter than the period since the previous observation if weather watch has not been maintained throughout the period since the last report.

### **FM 32 PILOT**

#### **STATIONS OPERATED BY AUSTRALIA**

Parts A and C,  
Section 2      *When the standard isobaric surfaces cannot be located by means of pressure-measuring equipment, long-term monthly means of the heights of such surfaces determined from radiosonde data are used as the best approximations to standard surfaces as follows:*

## STATIONS OPERATED BY AUSTRALIA (continued)

(a) For use with stations 89571 Davis and 94986 Mawson:

Isobaric surface	January	February	March	April	May	June	July	August	September	October	November	December
850	1 204	1 207	1 149	1 150	1 161	1 181	1 141	1 119	1 115	1 097	1 154	1 189
700	2 678	2 670	2 593	2 585	2 593	2 605	2 554	2 529	2 528	2 519	2 607	2 660
500	5 127	5 115	5 013	4 985	4 994	4 997	4 924	4 897	4 908	4 900	5 021	5 106
400	6 675	6 662	6 542	6 497	6 504	6 508	6 411	6 388	6 406	6 401	6 551	6 651
300	8 580	8 570	8 428	8 364	8 360	8 357	8 237	8 215	8 244	8 240	8 422	8 549
250	9 765	9 757	9 609	9 528	9 505	9 491	9 353	9 329	9 364	9 367	9 574	9 729
200	11 232	11 229	11 074	10 965	10 898	10 846	10 683	10 653	10 692	10 715	10 966	11 180
150	13 155	13 146	12 978	12 820	12 696	12 596	12 381	12 332	12 378	12 457	12 790	13 089
100	15 883	15 856	15 655	15 429	15 220	15 059	14 778	14 709	14 817	14 936	15 411	15 810
70	18 320	18 275	18 019	17 705	17 478	17 322	16 938	16 815	16 993	17 184	17 761	18 250
50	20 663	20 516	20 274	19 836	19 621	19 349	18 895	18 923	19 039	19 335	19 970	20 587
30	24 200	23 940	23 695	23 000	22 663	22 320	21 610	21 860	22 225	22 804	23 355	24 150
20	27 100	26 550	26 365	25 600	25 040	24 960	23 810	24 230	24 927	25 545	26 169	27 000
10	32 000	31 500	30 830	29 900	29 310	29 000	28 000	29 485	30 390	31 001	31 950	30 122

## STATIONS OPERATED BY AUSTRALIA (continued)

(b) For use with station 89611 Casey:

Isobaric surface	January	February	March	April	May	June	July	August	September	October	November	December
850	1 192	1 183	1 133	1 116	1 136	1 162	1 135	1 106	1 082	1 066	1 143	1 188
700	2 678	2 661	2 600	2 567	2 584	2 611	2 579	2 547	2 525	2 507	2 609	2 664
500	5 147	5 121	5 034	4 984	4 999	5 017	4 980	4 942	4 917	4 919	5 048	5 128
400	6 705	6 673	6 570	6 511	6 520	6 527	6 487	6 451	6 419	6 402	6 586	6 683
300	8 621	8 581	8 465	8 392	8 395	8 379	8 331	8 289	8 257	8 238	8 474	8 587
250	9 814	9 773	9 651	9 566	9 551	9 517	9 459	9 413	9 383	9 382	9 643	9 774
200	11 286	11 257	11 123	11 013	10 947	10 881	10 801	10 749	10 730	10 801	11 062	11 240
150	13 221	13 186	13 030	12 888	12 763	12 652	12 533	12 457	12 462	12 584	12 931	13 162
100	15 956	15 906	15 721	15 520	15 304	15 136	14 962	14 856	14 902	15 106	15 621	15 899
70	18 389	18 317	18 102	17 816	17 518	17 295	17 072	16 955	17 066	17 399	18 033	18 328
50	20 673	20 582	20 322	19 962	19 562	19 326	19 039	18 920	19 096	19 543	20 311	20 625
30	24 177	24 030	23 703	23 201	22 700	22 477	21 961	21 919	22 225	22 963	23 831	24 131
20	26 977	26 792	26 379	25 785	25 137	24 954	24 260	24 284	24 730	25 648	26 666	26 952
10	31 919	31 575	30 994	30 161	29 311	29 074	28 400	28 307	29 065	30 334	30 585	31 868

Notes:

- (1) The above mean values were computed from information accumulated in the period 1957-1972.
- (2) The same means are used with data from both Davis and Mawson because they are both at approximately the same latitude.



## **E — NATIONAL CODE FORMS**

No information available.

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## **F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C<sub>i</sub>) USED IN INTERNATIONAL HYDROLOGICAL CODES**

No list of indicators used in international hydrological codes has been established for use in the Antarctic.

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## APPENDICES

### ICE AND SATELLITE EPHEMERIS CODES



## APPENDIX I

### ICE CODES

#### GENERAL REMARKS

Various ICE codes are currently in use to report ice conditions prevailing over areas or at some locations. These various codes are reviewed hereafter.

#### BALTIC SEA ICE CODE

The code is intended to be used for reporting ice conditions in fairways, harbour areas, coast sectors and selected sea routes. It is used by the following countries: Denmark, Finland, Germany, Netherlands, Norway, Poland, Sweden and the Russian Federation.

#### CODE FORM

The code form is the following:

ICE	AA	1A <sub>B</sub> S <sub>B</sub> T <sub>B</sub> K <sub>B</sub>	2A <sub>B</sub> S <sub>B</sub> T <sub>B</sub> K <sub>B</sub>	.....	nA <sub>B</sub> S <sub>B</sub> T <sub>B</sub> K <sub>B</sub>
	BB	1A <sub>B</sub> S <sub>B</sub> T <sub>B</sub> K <sub>B</sub>	2A <sub>B</sub> S <sub>B</sub> T <sub>B</sub> K <sub>B</sub>	.....	nA <sub>B</sub> S <sub>B</sub> T <sub>B</sub> K <sub>B</sub>
	CC	etc.			

#### SPECIFICATIONS OF SYMBOLIC LETTERS

AA BB etc.	}	Index letters defining districts for fairway sections or sea areas to which the following five-figure groups refer.
1 2 ... n	}	Identifier figures of code groups referring to fairway sections or sea areas within the districts defined by AA, BB, CC, etc. The number of sections or areas within each district cannot exceed 9.

A<sub>B</sub> — *Amount and arrangement of sea ice*

Code  
figure

0	Ice-free
1	Open water – concentration less than 1/10
2	Very open pack ice – concentration 1/10 to less than 4/10
3	Open pack ice – concentration 4/10 to 6/10
4	Close pack ice – concentration 7/10 to 8/10
5	Very close pack ice – concentration 9/10 to 9+/10*
6	Compact pack ice, including consolidated pack ice – concentration 10/10
7	Fast ice with pack ice outside
8	Fast ice
9	Lead in very close or compact pack ice or along the fast ice edge
/	Unable to report

**Note:** The higher code figure has greater priority in reporting.

\* 9+/10 means 10/10 ice concentration with small openings.

## ICE CODES

### $S_B$ — *Stage of ice development*

Code  
figure

0	New ice or dark nilas (less than 5 centimetres thick)
1	Light nilas (5-10 centimetres thick) or ice-rind
2	Grey ice (10-15 centimetres thick)
3	Grey-white ice (15-30 centimetres thick)
4	Thin first-year ice first stage (30-50 centimetres thick)
5	Thin first-year ice second stage (50-70 centimetres thick)
6	Medium first-year ice (70-120 centimetres thick)
7	Ice predominantly thinner than 15 centimetres with some thicker ice
8	Ice predominantly 15-30 centimetres with some ice thicker than 30 centimetres
9	Ice predominantly thicker than 30 centimetres with some thinner ice
/	No information or unable to report

**Notes:** If  $A_B$  is reported as 0, a solidus (/) should be reported for  $S_B$ .

### $T_B$ — *Topography or form of ice*

Code  
figure

0	Pancake ice, ice cakes, brash ice – less than 20 metres across
1	Small ice floes – 20-100 metres across
2	Medium ice floes – 100-500 metres across
3	Big ice floes – 500-2 000 metres across
4	Vast or giant ice floes – more than 2 000 metres across – <i>or level ice</i>
5	Rafted ice
6	Compacted slush or shuga, or compacted brash ice
7	Hummocked or ridged ice
8	Thaw holes or many puddles on the ice
9	Rotten ice
/	No information or unable to report

**Notes:**

- (1) The figures 0 to 4 – forms of ice – should be used only if the ice concentration is less than 7/10 and no compacted ice is present; in this case,  $T_B = 4$  means vast ice floes. The figures 4 to 9 should be reported if the ice concentration is more than 7/10; in this case,  $T_B = 4$  means level ice.
- (2) If  $A_B$  is reported as 0, a solidus (/) should be reported for  $T_B$ .

## ICE CODES

### $K_B$ — *Navigational conditions in ice*

Code  
figure

0	Navigation unobstructed
1	Navigation difficult or dangerous for wooden vessels without ice sheathing
2	Navigation difficult for unstrengthened or low-powered vessels built of iron or steel. Navigation for wooden vessels even with ice sheathing not advisable
3	Navigation without ice-breaker assistance possible only for high-powered vessels of strong construction and suitable for navigation in ice
4	Navigation proceeds in lead or a broken ice-channel without the assistance of an ice-breaker
5	Ice-breaker assistance can only be given to vessels suitable for navigation in ice and of special size
6	Ice-breaker assistance can only be given to vessels of special ice class and of special size
7	Ice-breaker assistance can only be given to vessels after special permission
8	Navigation temporarily closed
9	Navigation has ceased
/	Unknown

#### Notes:

- (1) When a section is free of ice, the corresponding group may be omitted from the report; it should however always be coded as n0// $K_B$  the first two days after it has become ice-free and only omitted the third day, if the ice-free conditions continue.
- (2) When all sections within a district are ice-free, the whole district shall be omitted from the report.
- (3) The districts for which ice information is issued by countries using this code are indicated for each country in Chapter I, Part I of Volume D — *Information for Shipping* (WMO-No. 9).

A detailed description of the ice terms used is to be found in *WMO Sea-ice Nomenclature* (WMO-No. 259).

## DUTCH ICE CODE

### CODE FORM

The code form is the following:

Ijsbericht, Ice report      AA      ijkijk      BB      ijkijk      etc.

### Notes:

- (1) The index letters AA, BB, etc., are included in the report to indicate to which main group of zones the following three-figure groups refer.
- (2) Each main group of zones is composed of two zones; information for each zone is given by a triad ijk.
- (3) Only main groups from which at least one zone reports ice are included.

### SPECIFICATIONS OF SYMBOLIC LETTERS

#### i — *Character of the ice*

Code  
figure

0	Ice-free
1	New ice or nilas (< 5 centimetres)
2	Thin, level, fast ice (5-15 centimetres) or rotten ice
3	Open or very open pack-ice (1-6/10)
4	Compact slush, brash ice or pancake ice
5	Thick, level, fast ice (> 15 centimetres)
6	Close or very close pack-ice (7-10/10)
7	Consolidated pack-ice
8	Ridged or hummocked ice
9	Fracture or lead
x	No information

#### j — *Ice development*

Code  
figure

0	No change
1	Ice situation has improved
2	Ice situation has deteriorated
3	Ice has been broken up
4	Ice has opened or drifted away
5	New ice has been formed and/or the thickness of the ice has increased
6	Ice has been frozen together
7	Ice has drifted into the area or has been squeezed together
8	Warning of ridged ice
9	Warning of hummocking or screwing
x	No information

## ICE CODES

### k — *Effect of the ice on navigation*

Code  
figure

- |   |   |
|---|---|
| 0 | Navigation unobstructed   |
| 1 | Navigation unobstructed for power-driven vessels built of iron or steel, dangerous for wooden vessels without ice sheathing       |
| 2 | Navigation difficult for low-powered vessels without the assistance of an ice-breaker, dangerous for vessels of weak construction |
| 3 | Navigation without ice-breaker assistance possible only for high-powered vessels of strong construction                           |
| 4 | Ice-breaker assistance available in case of need  |
| 5 | Navigation proceeds in channel without the assistance of an ice-breaker   |
| 6 | Navigation possible only with the assistance of an ice-breaker  |
| 7 | Ice-breaker can give assistance only to ships strengthened for navigation in ice  |
| 8 | Temporarily closed for navigation   |
| 9 | Navigation has ceased   |
| x | No information  |

The zones for which information is given are listed under Netherlands in *Weather Reporting* (WMO-No. 9), Chapter I, Part I of Volume D — *Information for Shipping*.

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## APPENDIX II

### SATELLITE EPHEMERIS CODES

#### UNITED STATES CODE FOR SATELLITE EPHEMERIS PREDICT MESSAGE

##### GENERAL REMARKS

The TBUS is a code form to transmit information for predicting the path, or locating the position, of polar-orbiting environmental satellites.

The TBUS-1 code form is used to convey information about satellites which are descending in daylight (i.e. north-to-south direction of travel in daytime) while the TBUS-2 code form relates to satellites which are ascending in daylight (south to north).

##### CODE FORMS

For daylight descending satellites the code form is the following:

TBUS 1 KWBC  
APT PREDICT  
MMYYSS

##### PART I

0N <sub>r</sub> N <sub>r</sub> N <sub>r</sub> N <sub>r</sub>	0Y <sub>r</sub> Y <sub>r</sub> G <sub>r</sub> G <sub>r</sub>	0g <sub>r</sub> g <sub>r</sub> s <sub>r</sub> s <sub>r</sub>	Q <sub>r</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>	Tggss	LL <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>
N <sub>4</sub> N <sub>4</sub> N <sub>4</sub> N <sub>4</sub> G <sub>4</sub>	G <sub>4</sub> g <sub>4</sub> g <sub>4</sub> s <sub>4</sub> s <sub>4</sub>	Q <sub>4</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>			
N <sub>8</sub> N <sub>8</sub> N <sub>8</sub> N <sub>8</sub> G <sub>8</sub>	G <sub>8</sub> g <sub>8</sub> g <sub>8</sub> s <sub>8</sub> s <sub>8</sub>	Q <sub>8</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>			
N <sub>12</sub> N <sub>12</sub> N <sub>12</sub> N <sub>12</sub> G <sub>12</sub>	G <sub>12</sub> g <sub>12</sub> g <sub>12</sub> s <sub>12</sub> s <sub>12</sub>	Q <sub>12</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>			

##### NIGHT PART II

02Z <sub>02</sub> Z <sub>02</sub> Q <sub>02</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	04Z <sub>04</sub> Z <sub>04</sub> Q <sub>04</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
06Z <sub>06</sub> Z <sub>06</sub> Q <sub>06</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	08Z <sub>08</sub> Z <sub>08</sub> Q <sub>08</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
10Z <sub>10</sub> Z <sub>10</sub> Q <sub>10</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to terminator (near North Pole)	

##### NIGHT PART III

02Z <sub>02</sub> Z <sub>02</sub> Q <sub>02</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	04Z <sub>04</sub> Z <sub>04</sub> Q <sub>04</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
06Z <sub>06</sub> Z <sub>06</sub> Q <sub>06</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	08Z <sub>08</sub> Z <sub>08</sub> Q <sub>08</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
10Z <sub>10</sub> Z <sub>10</sub> Q <sub>10</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to terminator (near South Pole)	

##### DAY PART II

28Z <sub>28</sub> Z <sub>28</sub> Q <sub>28</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	30Z <sub>30</sub> Z <sub>30</sub> Q <sub>30</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
32Z <sub>32</sub> Z <sub>32</sub> Q <sub>32</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to last point north of Equator	

##### DAY PART III

56Z <sub>56</sub> Z <sub>56</sub> Q <sub>56</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	58Z <sub>58</sub> Z <sub>58</sub> Q <sub>58</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
60Z <sub>60</sub> Z <sub>60</sub> Q <sub>60</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to terminator (near South Pole)	

# SATELLITE EPHEMERIS CODES

## PART IV

AAAAAAAA BBBB CCCCCCCCCC DDEEFFGGHHIII JJJJJJ KKKKKKKK LLLLLLLL  
 MMMMMMMM NNNNNNNN 0000000 PPPPPPP QQQQQQQQ RRRRRRRR SSSSSSSSS  
 TTTTTTTTTT UUUUUUUUU VVVVVVV WWWWWWWW XXXXXXXX YYYYYYYY ZZZaaabbb  
 cccc dddddddddd eeeeeeee fffffff ggggggg hh . . . . . zz

APT TRANSMISSION FREQUENCY XXX.XX MHz  
 HRPT TRANSMISSION FREQUENCY XXXX.XX MHz  
 BEACON (DSB) TRANSMISSION FREQUENCY XXX.XX MHz  
 APT DAY X/X APT NIGHT X/X  
 DCS TIME DDD XXXX.XXX  
 (ADDITIONAL PLAIN-LANGUAGE REMARKS WHEN NEEDED)

For daylight ascending satellites the code form is the following:

TBUS 2 KWBC  
 APT PREDICT  
 MMYYS

## PART I

0N <sub>r</sub> N <sub>r</sub> N <sub>r</sub> N <sub>r</sub>	0Y <sub>r</sub> Y <sub>r</sub> G <sub>r</sub> G <sub>r</sub>	0g <sub>r</sub> g <sub>r</sub> s <sub>r</sub> s <sub>r</sub>	Q <sub>r</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>	Tggss	LL <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>
N <sub>4</sub> N <sub>4</sub> N <sub>4</sub> N <sub>4</sub> G <sub>4</sub>	G <sub>4</sub> g <sub>4</sub> g <sub>4</sub> s <sub>4</sub> s <sub>4</sub>	Q <sub>4</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>			
N <sub>8</sub> N <sub>8</sub> N <sub>8</sub> N <sub>8</sub> G <sub>8</sub>	G <sub>8</sub> g <sub>8</sub> g <sub>8</sub> s <sub>8</sub> s <sub>8</sub>	Q <sub>8</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>			
N <sub>12</sub> N <sub>12</sub> N <sub>12</sub> N <sub>12</sub> G <sub>12</sub>	G <sub>12</sub> g <sub>12</sub> g <sub>12</sub> s <sub>12</sub> s <sub>12</sub>	Q <sub>12</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub> I <sub>o</sub>			

## NIGHT PART II

28Z <sub>28</sub> Z <sub>28</sub> Q <sub>28</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	30Z <sub>30</sub> Z <sub>30</sub> Q <sub>30</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
32Z <sub>32</sub> Z <sub>32</sub> Q <sub>32</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to last point north of Equator	

## NIGHT PART III

56Z <sub>56</sub> Z <sub>56</sub> Q <sub>56</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	58Z <sub>58</sub> Z <sub>58</sub> Q <sub>58</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
60Z <sub>60</sub> Z <sub>60</sub> Q <sub>60</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to terminator (near South Pole)	

## DAY PART II

02Z <sub>02</sub> Z <sub>02</sub> Q <sub>02</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	04Z <sub>04</sub> Z <sub>04</sub> Q <sub>04</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
06Z <sub>06</sub> Z <sub>06</sub> Q <sub>06</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	08Z <sub>08</sub> Z <sub>08</sub> Q <sub>08</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
10Z <sub>10</sub> Z <sub>10</sub> Q <sub>10</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to terminator (near North Pole)	

## DAY PART III

02Z <sub>02</sub> Z <sub>02</sub> Q <sub>02</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	04Z <sub>04</sub> Z <sub>04</sub> Q <sub>04</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
06Z <sub>06</sub> Z <sub>06</sub> Q <sub>06</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	08Z <sub>08</sub> Z <sub>08</sub> Q <sub>08</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>
10Z <sub>10</sub> Z <sub>10</sub> Q <sub>10</sub>	L <sub>a</sub> L <sub>a</sub> I <sub>a</sub> L <sub>o</sub> L <sub>o</sub> I <sub>o</sub>	. . . . . to terminator (near South Pole)	

## SATELLITE EPHEMERIS CODES

### PART IV

AAAAAAAAA BBBB CCCCCCCCCC DDEEFFGGHHIIII JJJJJJ KKKKKKKK LLLLLLLL  
 MMMMMMMM NNNNNNNN 00000000 PPPPPPP QQQQQQQQ RRRRRRRR SSSSSSSSS  
 TTTTTTTTT UUUUUUUUU VVVVVVV WWWWWWWW XXXXXXXX YYYYYYYY ZZZaaabbb  
 cccc dddddddddd eeeeeeee fffffff ggggggg hh . . . . . zz

APT TRANSMISSION FREQUENCY XXX.XX MHz  
 HRPT TRANSMISSION FREQUENCY XXXX.XX MHz  
 BEACON (DSB) TRANSMISSION FREQUENCY XXX.XX MHz  
 APT DAY X/X APT NIGHT X/X  
 DCS TIME DDD XXXX.XXX  
 (ADDITIONAL PLAIN-LANGUAGE REMARKS WHEN NEEDED)

### SPECIFICATIONS OF SYMBOLIC WORDS AND LETTERS

TBUS 1 (or TBUS 2)	APT bulletin originating in the United States: TBUS-1 is north-to-south daylight orbit. TBUS-2 is south-to-north daylight orbit.
KWBC	Traffic entered at Washington, D.C.
APT PREDICT	Identifies message content.
MMYYSS	Message serial number. MM Month. YY Day of month. SS Number of spacecraft to which predict applies.
PART I	Equator-crossing reference information follows.
0	Code group indicator for first three groups.
N <sub>r</sub> N <sub>r</sub> N <sub>r</sub> N <sub>r</sub>	Number of reference orbit. (N o t e : Information in Parts II and III is also related to this reference orbit.)
	Reference orbit Equator-crossing time (UTC), satellite northbound:
Y <sub>r</sub> Y <sub>r</sub>	Day of month.
G <sub>r</sub> G <sub>r</sub>	Hour.
g <sub>r</sub> g <sub>r</sub>	Minutes.
s <sub>r</sub> s <sub>r</sub>	Seconds. N o t e : In TBUS-1, northbound Equator crossing takes place on <i>night</i> side of orbit. In TBUS-2, northbound Equator crossing takes place on <i>day</i> side of orbit.
Q <sub>r</sub>	Octant satellite is entering after crossing Equator on reference orbit. (Code table 3300)
L <sub>o</sub> L <sub>o</sub> l <sub>o</sub> l <sub>o</sub>	Reference orbit Equator-crossing longitude, in degrees and hundredths.
T	Indicator, nodal period follows (always shown as "T").
gg	Nodal period, minutes.
ss	Nodal period, seconds. N o t e : Hundreds group will not be included. Example: 100 minutes 13 seconds will be coded as 0013.
L	Indicator, nodal longitude increment follows (always shown as "L").

## SATELLITE EPHEMERIS CODES

$L_o L_o I_o I_o$	Degrees and hundredths of degrees longitude between successive Equator crossings.
$N_4 N_4 N_4 N_4$	Orbit number of fourth orbit following reference orbit.
$G_4 G_4$ $g_4 g_4$ $s_4 s_4$	Hour Minutes Seconds
	} Time of fourth orbit following reference orbit.
$Q_4$	Octant satellite is entering after crossing Equator on fourth orbit after reference orbit.
$L_o L_o I_o I_o$	Equator-crossing longitude of fourth orbit after reference orbit.
(Above information is repeated for eighth ( $N_8 N_8 N_8 N_8$ ) and twelfth ( $N_{12} N_{12} N_{12} N_{12}$ ) orbits following reference orbit.)	

### NIGHT PART II (TBUS-1)

DAY PART II (TBUS-2)	Satellite altitude and sub-point coordinates at two-minute intervals after time of Equator crossing follow.
02	Indicator: satellite altitude and sub-point coordinates at two minutes after Equator crossing follow.
$Z_{02} Z_{02}$	Satellite altitude, in tens of kilometres, at two minutes after Equator crossing. N o t e : Thousands' figure understood; hence 1 440 km is encoded as 44.
$Q_{02}$	Octant of globe at two minutes after Equator crossing.
$L_a L_a I_a I_a$	Latitude of satellite sub-point, in degrees and tenths of a degree, at two minutes after Equator crossing.
$L_o L_o I_o I_o$	Longitude of satellite sub-point, in degrees and tenths of a degree, at two minutes after Equator crossing.

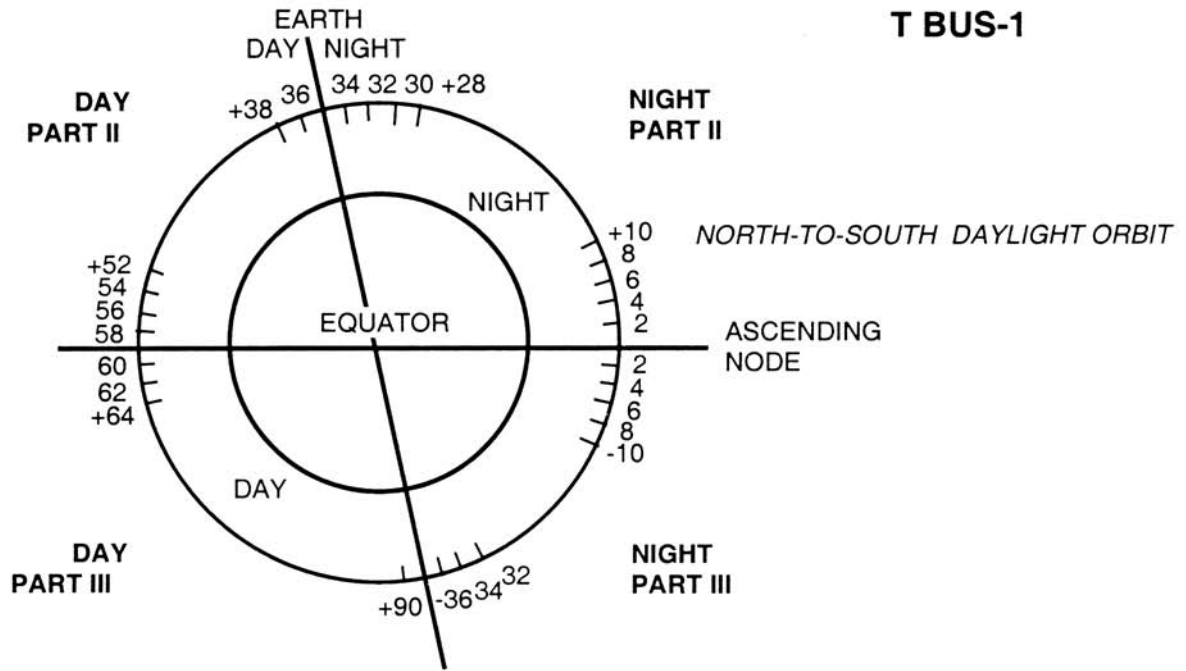
(This information is repeated at two-minute intervals over the *night* portion of the orbit north of the Equator for TBUS-1, and *day* portion of the orbit north of the Equator for TBUS-2.)

### NIGHT PART III (TBUS-1)

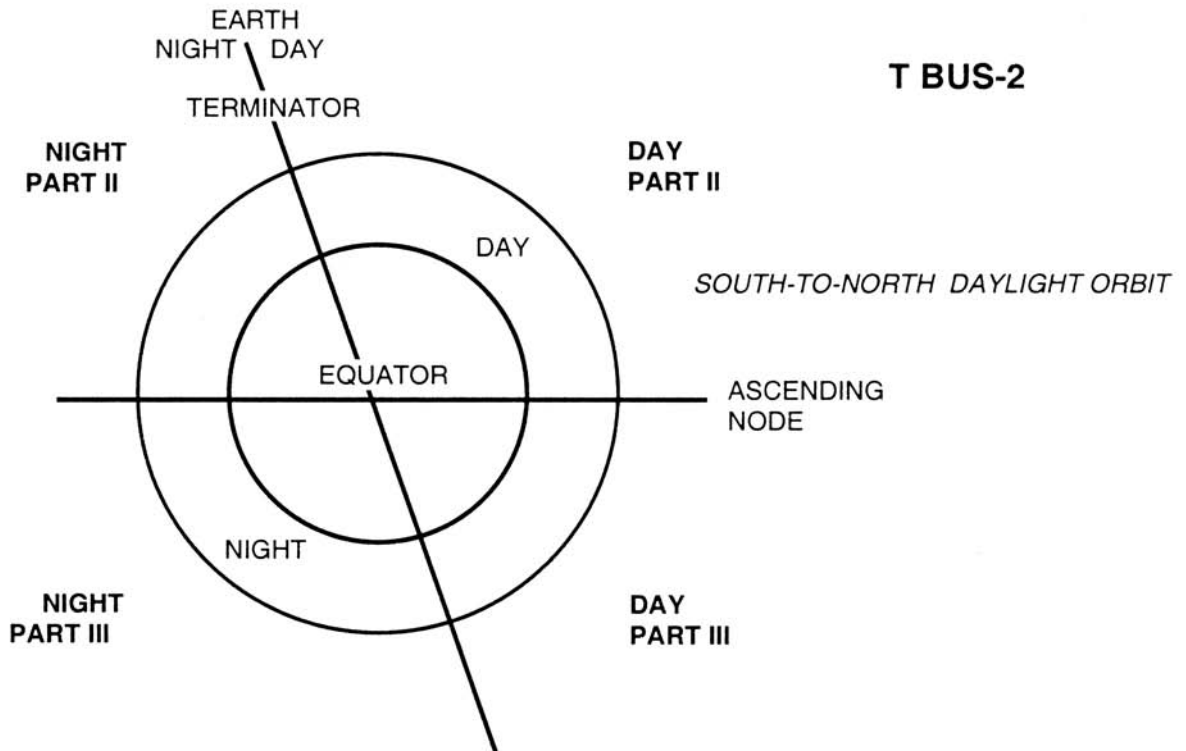
DAY PART III (TBUS-2)	Satellite altitude and sub-point coordinates at two-minute intervals prior to time of Equator crossing follow.
02	Information pertinent to two minutes before Equator crossing follows.
$Z_{02} Z_{02}$	Satellite altitude, in tens of kilometres, at two minutes before Equator crossing.
$Q_{02}$	Octant of globe at two minutes before Equator crossing.
$L_a L_a I_a I_a$	Latitude of satellite sub-point, in degrees and tenths of a degree, at two minutes before Equator crossing.
$L_o L_o I_o I_o$	Longitude of satellite sub-point, in degrees and tenths of a degree, at two minutes before Equator crossing.

(This information is repeated at two-minute intervals over the *night* portion of the orbit south of the Equator for TBUS-1, and *day* portion of the orbit south of the Equator for TBUS-2.)

**T BUS-1**



**T BUS-2**



## SATELLITE EPHEMERIS CODES

### DAY PART II (TBUS-1)

NIGHT PART II (TBUS-2) Satellite altitude and sub-point coordinates at two-minute intervals after time of Equator crossing follow.

28	Information pertinent to 28 minutes after Equator crossing follows.
$Z_{28}Z_{28}$	Satellite altitude, in tens of kilometres, at 28 minutes after Equator crossing.
$Q_{28}$	Octant of globe at 28 minutes after Equator crossing.
$L_aL_aI_a$	Latitude of satellite sub-point, in degrees and tenths of a degree, at 28 minutes after Equator crossing.
$L_oL_oI_o$	Longitude of satellite sub-point, in degrees and tenths of a degree, at 28 minutes after Equator crossing.

(This information is repeated at two-minute intervals over the *day* portion of the orbit north of the Equator for TBUS-1, and *night* portion of the orbit north of the Equator for TBUS-2.)

### DAY PART III (TBUS-1)

NIGHT PART III (TBUS-2) Satellite altitude and sub-point coordinates at two-minute intervals south of the Equator on the descending side of the orbit follow. This will be a continuation of Part II with the same format.

(This information is repeated at two-minute intervals over the *day* portion of the orbit south of the Equator for TBUS-1, and *night* portion of the orbit south of the Equator for TBUS-2.)

**Note:** Should the time after ascending node become greater than 99, the hundreds will be assumed (example: minute 102 will be encoded as 02).

PART IV	Orbital elements, transmission frequencies and remarks.
AAAAAAAA	Spacecraft identification (international designator — see <i>COSPAR Guide to Rocket and Satellite Information and Data Exchange</i> , Information Bulletin No. 9, July 1962).
BBBBBB	Orbit number at epoch.
CCCCCCCCCCCC	Time of ascending node (days from 1 January at 0000Z, to nine decimal places).
DD	Epoch year.
EE	Epoch month.
FF	Epoch day.
GG	Epoch hour.
HH	Epoch minute.
IIII	Epoch second, to three decimal places.
JJJJJJ	Greenwich Hour Angle at Aries at epoch, to four decimal places.
KKKKKKKK	Anomalistic period (minutes), to four decimal places.
LLLLLLLL	Nodal period (minutes), to four decimal places.

## SATELLITE EPHEMERIS CODES

MMMMMMMM	Eccentricity, to eight decimal places.
NNNNNNNN	Argument of perigee (degrees), to five decimal places.
OOOOOOOO	Right ascension of the ascending node (degrees), to five decimal places.
PPPPPPPP	Inclination (degrees), to five decimal places.
QQQQQQQQ	Mean anomaly (degrees), to five decimal places.
RRRRRRRR	Semi-major axis (kilometres), to three decimal places.
SSSSSSSSSS	Sign and epoch X position component (kilometres), to four decimal places.
TTTTTTTTTT	Sign and epoch Y position component (kilometres), to four decimal places.
UUUUUUUUUU	Sign and epoch Z position component (kilometres), to four decimal places.
VVVVVVVVVV	Sign and epoch X velocity (Xdot) component ( $\text{km s}^{-1}$ ), to six decimal places.
WWWWWWWWW	Sign and epoch Y velocity (Ydot) component ( $\text{km s}^{-1}$ ), to six decimal places.
XXXXXXXXXX	Sign and epoch Z velocity (Zdot) component ( $\text{km s}^{-1}$ ), to six decimal places.
YYYYYYYYYY	Ballistics coefficient CD-A/M ( $\text{m}^2 \text{kg}^{-1}$ ), to eight decimal places.
ZZZ	Daily solar flux value (10.7 centimetres) [ $10^{-7} \text{ W m}^{-2}$ ].
aaa	90-day running mean of solar flux [ $10^{-7} \text{ W m}^{-2}$ ].
bbb	Planetary magnetic index [ $2 \times 10^{-5}$ gauss].
cccc	Drag modulation coefficient, to four decimal places.
dddddddddd	Radiation pressure coefficient, to 10 decimal places.
eeeeeeee	Sign and perigee motion day/day, to five decimal places.
ffffff	Sign and motion of right ascension of the ascending node, in degrees per day, to five decimal places.
ggggggg	Sign and rate of change of mean anomaly at epoch, in degrees per day, to two decimal places.
hh . . . . zz	Spares.

The first eight spare groups in Part IV (hh . . . . zz) are used with the following meanings:

hhhhhhh	Equator crossing longitude of the epoch reference orbit, measured as East longitude, to five decimal places.
iiiiii	Month, day, and year (MMDDYY) of the last TIP* clock correction.
jjjjjj	Sign and clock error after last correction, measured in seconds, to three decimal places**.
kkkkkk	Month, day, and year (MMDDYY) of the current clock error.
llllll	Sign and current clock error, measured in seconds, to three decimal places**.
mmmmmm	Month, day, and year (MMDDYY) of the measured clock error rate.

## SATELLITE EPHEMERIS CODES

nnnnnn	Sign and clock error rate, expressed as milliseconds/day**.
oooooo	Month, day, and year (MMDDYY) of the next TIP* clock correction (oooooo if unknown).

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\* TIP = TIROS Information Processor

\*\* Indicates that these entries will be set to 999999 if the value is unknown, and all signed values in Part IV are preceded by a "P" or "M" to denote a plus (+) or minus (-) value.

APT TRANSMISSION FREQUENCY XXX.XX MHz	either 137.50 or 137.62 MHz.
HRPT TRANSMISSION FREQUENCY XXXX.XX MHz	1698.0, 1702.5 or 1707.0 MHz.
BEACON (DSB) TRANSMISSION FREQUENCY XXX.XX MHz	136.77 or 137.77 MHz.
APT DAY X/X APT NIGHT X/X	AVHRR channels used for APT transmissions.
DCS TIME DDD XXXXX.XXX	Data-collection system clock re-set time (in seconds) at 0000Z on day DDD.
(ADDITIONAL PLAIN-LANGUAGE REMARKS WHEN NEEDED)	



# **RUSSIAN FEDERATION CODE FOR TRANSMITTING SATELLITE EPHEMERIS DATA**

## **GENERAL REMARKS**

The content and coding procedures of code form ORBIT have been standardized for the purposes of both computerized and manual processing.

The code form is intended for transmitting initial data for the reception and processing of information from meteorological and oceanographic satellites and contains data for several days depending on the frequency with which the orbit is tracked.

## **CODE FORMS**

Section 0		ORBIT	0JJMM	$n_d n_d I_1 I_2 I_2$			
Section 1	111	$g_s g_s s_s s_s s_s$ $g_7 g_7 s_7 s_7 s_7$ $g_7 g_7 s_7 s_7 s_7$ $Y_n Y_n n_1 G_1 G_1$	$L_o L_o III$ $Q L_o L_o II$ $Q L_o L_o II$	$Y_1 Y_1 n_1 G_1 G_1$ $Y_2 Y_2 n_1 G_1 G_1$ ..... $Q L_o L_o II$	$g_1 g_1 s_1 s_1 s_1$ $g_1 g_1 s_1 s_1 s_1$ ..... $Y_n Y_n n_7 G_7 G_7$	$Q L_o L_o II$ $Q L_o L_o II$ ..... $g_7 g_7 s_7 s_7 s_7$	$Y_1 Y_1 n_7 G_7 G_7$ $Y_2 Y_2 n_7 G_7 G_7$ ..... $Q L_o L_o II$
Section 2	222	NNNNN $P_d P_d P_d P_d P_d$ $A_p A_p A_p A_p A_p$ $b_a b_a b_a b_a b_a$ $Z_c s_r zzz$ $s_r V_z V_z V_z V_z$ $S_m P_m P_m P_m P_m$ $m_p m_p m_p m_p m_p$	JJMMY $P_d P_d P_d P_d P_d$ $K_a K_a K_a K_a K_a$ $b_a b_a b_a b_a b_a$ zzzzz $V_z V_z V_z V_z V_z$ $C_m C_m C_m C_m C_m$ $s_r m_u m_u m_u m_u$	$Y G_1 G_1 g_1 g_1 g_1$ $e_s e_s e_s e_s e_s$ $K_a K_a K_a K_a K_a$ $X_c s_r xxx$ $V_x V_x V_x V_x V_x$ $r_p r_p r_p r_p r_p$ $m_u m_u m_u m_u m_u$	$s_1 s_1 s_1 s_1 s_1$ $e_s e_s e_s e_s e_s$ $K_a K_a K_a K_a K_a$ xxxxx $V_x V_x V_x V_x V_x$ $r_p r_p r_p r_p r_p$ $m_u m_u m_u m_u m_u$	$s_r L_o L_o L_o L_o L_o$ $e_s e_s e_s e_s e_s$ $i_o i_o i_o i_o i_o$ $Y_c s_r yyy$ $s_r V_y V_y V_y V_y$ $r_p r_p r_p r_p r_p$ $m_u m_u m_u m_u m_u$	$L_o L_o L_o L_o L_o$ $A_p A_p A_p A_p A_p$ $i_o i_o i_o i_o i_o$ yyyyy $V_y V_y V_y V_y V_y$ $S_r S_r S_r S_r S_r$ $s_r m_p m_p m_p m_p$
Section 3	333	$g_f g_f H_s H_s H_s$ $g_f g_f H_s H_s H_s$	$Q L_a L_a II$ $Q L_a L_a II$	$L_o L_o II 0$ $L_o L_o II 0$	$g_f g_f H_s H_s H_s$ .....	$Q L_a L_a II$ .....	$L_o L_o II 0$
Section 4	(444	$I_3 I_4 I_4 g_d g_d$ $G_s G_s g_s g_s g_s$ ..... $8MMY_1 Y_1$ ..... $8MMY_1 Y_1$ ..... $8MMY_1 Y_1$ ..... $8MMY_1 Y_1$ ..... .....)	$8MMY_1 Y_1$ ..... $8MMY_1 Y_1$ ..... $8MMY_1 Y_1$ ..... $8MMY_1 Y_1$ ..... $8MMY_1 Y_1$ ..... .....)	$G_s G_s g_s g_s g_s$ $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... .....)	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....)	$G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... .....)	$8MMY_2 Y_2$ ..... $I_3 I_4 I_4 g_d g_d$ $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... $G_s G_s g_s g_s g_s$ ..... .....)
Section 5	555	Plain language					

## SATELLITE EPHEMERIS CODES

### NOTES:

- (1) ORBIT is the name of the code for transmitting initial data for the reception and processing of satellite information.
- (2) The content of a report with initial data is identified by the letter group ORBIT.
- (3) The code form is divided into five sections:

<i>Section number</i>	<i>Symbolic figure group</i>	<i>Content</i>
0	—	Identification of the coded data
1	111	Data on satellite's period and longitude increment, as well as daily data on the ascending nodes on the first and seventh daily orbits
2	222	Data on the orbital elements covered by the forecast
3	333	Reference orbit information: satellite altitude and sub-point coordinates for each even minute after equator crossing
4	444	Operating modes of payload functioning on a non-routine basis. Section to be developed nationally for global exchange
5	555	Plain-language text containing non-routine information on the operating mode of the satellite's payload, changes in this mode, time check data and frequency of information transmission. Also included is the time of entry into, and exit from night (in minutes after Equator crossing) for several days (Sun-synchronous satellites for mid-month). The date of the next ORBIT message is regularly included

### REGULATIONS:

1. *General*
  - 1.1 The code name ORBIT shall appear as a prefix to every individual report.
    - 1.1.1 The code name ORBIT shall be included as the first line of the text of the report.
    - 1.1.2 The report's period of validity, the name of the satellite-owning country and the number (series) of the satellite shall be reported by the groups 0JJMM and  $n_d n_d I_1 I_2 I_2$  on the first line after the code name.
  - 1.2 *Sections*

When included in the report, the sections shall be reported in the following order: 0, 1, 2, 3, 4, 5. Each section is identified by an indicator.

    - 1.2.1 *Section 0 — Code name, report's period of validity, name of the satellite-owning country and number (series) of the satellite*
      - 1.2.1.1 Group ORBIT identifies a report containing initial data for the reception and processing of satellite information.
      - 1.2.1.2 Groups 0JJMM and  $n_d n_d I_1 I_2 I_2$  indicate the report's period of validity, the satellite-owning country and the satellite's number (series).
    - 1.2.2 *Section 1 — Satellite's period and longitude increment and daily data on the ascending node of the first and seventh daily passes*

- 1.2.2.1 Group 111 is the indicator of Section 1.
- 1.2.2.2 Group  $g_s g_s s_s s_s$  indicates the satellite's period and group  $L_o L_o I I I$  the longitude increment.
- 1.2.2.3 Groups  $Y_1 Y_1 n_1 G_1 G_1 g_1 g_1 s_1 s_1 s_1 Q L_o L_o I I$  —  $Y_n Y_n n_1 G_1 G_1 g_1 g_1 s_1 s_1 s_1 Q L_o L_o I I$  indicate daily data on the ascending node for the first daily pass, an groups  $Y_1 Y_1 n_7 G_7 G_7 g_7 g_7 s_7 s_7 s_7 Q L_o L_o I I$  —  $Y_n Y_n n_7 G_7 G_7 g_7 g_7 s_7 s_7 s_7 Q L_o L_o I I$  for the seventh daily pass.
- 1.2.3 *Section 2 — Orbital elements*
- 1.2.3.1 Group 222 is the indicator of Section 2.
- 1.2.3.2 Groups NNNNN JJMMY YG<sub>1</sub>G<sub>1</sub>g<sub>1</sub>g<sub>1</sub> s<sub>1</sub>s<sub>1</sub>s<sub>1</sub>s<sub>1</sub> s<sub>r</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub> and L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>L<sub>o</sub> indicate the number, date, time and longitude of the ascending node of the orbit whose elements are being reported. The number of the month shall be given for YY, the first digit of which (the tens figure) is placed in the group JJMMY and the second digit (the units figure) in the group YG<sub>1</sub>G<sub>1</sub>g<sub>1</sub>g<sub>1</sub>.
- 1.2.3.3 Groups P<sub>d</sub>P<sub>d</sub>P<sub>d</sub>P<sub>d</sub>P<sub>d</sub> and P<sub>d</sub>P<sub>d</sub>P<sub>d</sub>P<sub>d</sub>P<sub>d</sub> indicate the satellite's nodal period.
- 1.2.3.4 Groups e<sub>s</sub>e<sub>s</sub>e<sub>s</sub>e<sub>s</sub>e<sub>s</sub> and e<sub>s</sub>e<sub>s</sub>e<sub>s</sub>e<sub>s</sub>e<sub>s</sub> indicate the orbit's eccentricity, and groups A<sub>p</sub>A<sub>p</sub>A<sub>p</sub>A<sub>p</sub>A<sub>p</sub> and A<sub>p</sub>A<sub>p</sub>A<sub>p</sub>A<sub>p</sub>A<sub>p</sub> the argument of perigee.
- 1.2.3.5 Groups K<sub>a</sub>K<sub>a</sub>K<sub>a</sub>K<sub>a</sub>K<sub>a</sub> and K<sub>a</sub>K<sub>a</sub>K<sub>a</sub>K<sub>a</sub>K<sub>a</sub> indicate the right ascension of the ascending node, and groups i<sub>o</sub>i<sub>o</sub>i<sub>o</sub>i<sub>o</sub>i<sub>o</sub> and i<sub>o</sub>i<sub>o</sub>i<sub>o</sub>i<sub>o</sub>i<sub>o</sub> the orbit's inclination.
- 1.2.3.6 Groups b<sub>a</sub>b<sub>a</sub>b<sub>a</sub>b<sub>a</sub>b<sub>a</sub> and b<sub>a</sub>b<sub>a</sub>b<sub>a</sub>b<sub>a</sub>b<sub>a</sub> indicate the orbit's semi-major axis.
- 1.2.3.7 Groups X<sub>c</sub>s<sub>r</sub>xxx xxxxx Y<sub>c</sub>s<sub>r</sub>yyy yyyyy Z<sub>c</sub>s<sub>r</sub>zzz and zzzzz indicate the coordinates of the centre of the satellite's mass.
- 1.2.3.8 Groups s<sub>r</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub> V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub>V<sub>x</sub> s<sub>r</sub>V<sub>y</sub>V<sub>y</sub>V<sub>y</sub>V<sub>y</sub> V<sub>y</sub>V<sub>y</sub>V<sub>y</sub>V<sub>y</sub>V<sub>y</sub> s<sub>r</sub>V<sub>z</sub>V<sub>z</sub>V<sub>z</sub>V<sub>z</sub> and V<sub>z</sub>V<sub>z</sub>V<sub>z</sub>V<sub>z</sub>V<sub>z</sub> indicate the values of the velocity components on the x, y and z-axes.
- 1.2.3.9 Groups b<sub>c</sub>b<sub>c</sub>b<sub>c</sub>b<sub>c</sub>b<sub>c</sub> and b<sub>c</sub>b<sub>c</sub>b<sub>c</sub>b<sub>c</sub>b<sub>c</sub> indicate the ballistics coefficient.
- 1.2.3.10 If used, groups (S<sub>r</sub>S<sub>r</sub>S<sub>r</sub>S<sub>m</sub>S<sub>m</sub> S<sub>m</sub> P<sub>m</sub>P<sub>m</sub>P<sub>m</sub>P<sub>m</sub> and C<sub>m</sub>C<sub>m</sub>C<sub>m</sub>C<sub>m</sub>C<sub>m</sub>) indicate the daily solar flux value, the 90-day running mean of solar flux, the planetary magnetic index, and the drag modulation coefficient.
- 1.2.3.11 If used, groups (r<sub>p</sub>r<sub>p</sub>r<sub>p</sub>r<sub>p</sub>r<sub>p</sub> and r<sub>p</sub>r<sub>p</sub>r<sub>p</sub>r<sub>p</sub>r<sub>p</sub>) indicate the radiation pressure coefficient.
- 1.2.3.12 If used, groups (s<sub>m</sub>m<sub>p</sub>m<sub>p</sub>m<sub>p</sub>m<sub>p</sub> m<sub>p</sub>m<sub>p</sub>m<sub>p</sub>m<sub>p</sub>m<sub>p</sub> s<sub>r</sub>m<sub>u</sub>m<sub>u</sub>m<sub>u</sub>m<sub>u</sub> and m<sub>u</sub>m<sub>u</sub>m<sub>u</sub>m<sub>u</sub>m<sub>u</sub>) indicate motion of perigee and of right ascension of the ascending node.
- 1.2.4 *Section 3 — Reference orbit data*
- 1.2.4.1 Group 333 is the indicator of Section 3.
- 1.2.4.2 Groups g<sub>f</sub>g<sub>f</sub>H<sub>s</sub>H<sub>s</sub>H<sub>s</sub> Q L<sub>a</sub>L<sub>a</sub>I I and L<sub>o</sub>L<sub>o</sub>I I I shall be used to report information on the sub-satellite track of the reference orbit and the satellite altitude for each even minute after Equator crossing.
- N o t e :** The reference orbit is calculated for the pass on which the ORBIT report is given.
- 1.2.5 *Section 4 — Groups to be developed nationally*
- This section shall include data on the operating mode of the satellite's payload functioning on a non-routine basis. It shall only be included in reports when the satellite has such payload.
- 1.2.5.1 Group 444 is the indicator of Section 4.

## SATELLITE EPHEMERIS CODES

- 1.2.5.2 Group  $I_3I_4I_dg_d$  indicates the type of payload from which information is transmitted as well as the operating mode and duration. It is repeated in a report as many times as the type of payload and the latter's operating mode change during the report's period of validity.
- 1.2.5.3 Groups 8MMYY and  $G_sG_sg_sg_s$  indicate the date and time when the payload is switched on for each day of the report's period of validity.
- 1.2.6 *Section 5 — Plain language covering changes in the operating mode of the payload, transmission frequencies, data on the satellite-Earth time check, and time of entry into, and exit from night (in minutes after Equator crossing)*

**Note :** Time check data are reported only when information is transmitted from the satellite in playback (VI) mode from a space-borne tape deck.

Group 555 is the indicator of Section 5.

### SYMBOLIC LETTERS AND NOTES ON CODING METHODS

O	Identifier figure
MM	Month of the year
JJ	Tens and units of the year
$n_d n_d$	Number of days covered by the forecast
$I_1$	Satellite-owning country (Code table 1)
$I_2 I_2$	Number (series) of the satellite (for oceanographic satellites, 50 shall be added to the satellite number)
$g_s g_s$	Minutes of the satellite's nodal period (the hundreds figure shall be omitted)
$s_s s_s s_s$	Seconds and tenths of the satellite's nodal period
$L_o L_o$	Longitude increment, in whole degrees
III	Thousandths of a degree
YY	Number of the month
$n_1$	First daily pass
$G_1 G_1$	Time, in whole hours UTC, of the satellite's ascending node on the first daily pass
$g_1 g_1$	Minutes of the time of the ascending node
$s_1 s_1 s_1$	Seconds and tenths of the time of the ascending node
$n_7$	Seventh daily pass
$G_7 G_7$	Time, in whole hours UTC, of the satellite's ascending node on the seventh daily pass
$g_7 g_7$	Minutes of the time of the ascending node
$s_7 s_7 s_7$	Seconds and tenths of the time of the ascending node
NNNNN	Number of the pass for which the orbital elements are being forecast

# SATELLITE EPHEMERIS CODES

$G_1 G_1$	Time, in whole hours UTC, of the ascending node of the orbit for which the orbital elements are being forecast
$g_1 g_1$	Minutes of the ascending node
$s_1 s_1 s_1 s_1 s_1$	Seconds and thousandths of the ascending node
$s_r$	Sign of orbital element values (Code table 2)
$L_o L_o L_o L_o L_o L_o L_o L_o L_o L_o$	Longitude of the ascending node of the orbit whose elements are being reported, to six decimal places
$P_d P_d P_d P_d P_d P_d P_d P_d P_d P_d$	Nodal period (minutes), to seven decimal places
$e_s e_s e_s e_s e_s e_s e_s e_s e_s e_s$	Eccentricity, to 10 decimal places
$A_p A_p A_p A_p A_p A_p A_p A_p A_p A_p$	Argument of perigee (degrees), to seven decimal places
$K_a K_a K_a K_a K_a K_a K_a K_a K_a K_a$	Right ascension of the ascending node (degrees), to seven decimal places
$i_o i_o i_o i_o i_o i_o i_o i_o i_o i_o$	Inclination (degrees), to seven decimal places
$b_a b_a b_a b_a b_a b_a b_a b_a b_a b_a$	Semi-major axis (kilometres), to five decimal places
$X_c$	Prefix indicating coordinates of the centre of the satellite's mass on the x-axis (to be coded as X)
xxx xxxxx	Value of the coordinates of the centre of the satellite's mass on the x-axis (kilometres), to four decimal places
$Y_c$	Prefix indicating coordinates of the centre of the satellite's mass on the y-axis (to be coded as Y)
yyy yyyyy	Value of the coordinates of the centre of the satellite's mass on the y-axis (kilometres), to four decimal places
$Z_c$	Prefix indicating coordinates of the centre of the satellite's mass on the z-axis (to be coded as Z)
zzz zzzzz	Value of the coordinates of the centre of the satellite's mass on the z-axis (kilometres), to four decimal places
$V_x V_x V_x V_x V_x V_x V_x V_x V_x V_x$	Sign of the X velocity component ( $\text{km s}^{-1}$ ), to seven decimal places
$V_y V_y V_y V_y V_y V_y V_y V_y V_y V_y$	Sign of the Y velocity component ( $\text{km s}^{-1}$ ), to seven decimal places
$V_z V_z V_z V_z V_z V_z V_z V_z V_z V_z$	Sign of the Z velocity component ( $\text{km s}^{-1}$ ), to seven decimal places
$b_c b_c b_c b_c b_c b_c b_c b_c b_c b_c$	Ballistics coefficient ( $\text{m}^3 \text{kg}^{-1} \text{s}^{-2}$ ), to nine decimal places
$S_r S_r S_r$	Daily solar radiation flux value (10.7 centimetres) ( $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$ )
$S_m S_m S_m$	90-day running mean of solar radiation flux ( $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$ )
$P_m P_m P_m P_m$	Planetary magnetic index (kp)
$C_m C_m C_m C_m C_m$	Drag modulation coefficient, to five decimal places
$r_p r_p r_p r_p r_p r_p r_p r_p r_p r_p$	Radiation pressure coefficient, to 10 decimal places
$m_p m_p m_p m_p m_p m_p m_p m_p m_p m_p$	Perigee motion day/day, in degrees per day, to five decimal places
$m_u m_u m_u m_u m_u m_u m_u m_u m_u m_u$	Motion of the right ascension of the ascending node in degrees per day, to five decimal places

## SATELLITE EPHEMERIS CODES

$g_f g_r$	Even minute after Equator crossing
$H_s H_s H_s$	Satellite's altitude above the Earth's surface (kilometres) (the thousands figure shall be omitted)
Q	Octant of globe in which satellite sub-point is located
$L_a L_a$	Latitude of satellite sub-point, in whole degrees
II	Hundredths of a degree
$L_o L_o$	Longitude of satellite sub-point (the hundreds figure shall be omitted)
II	Hundredths of a degree
0	Identifier figure
$I_3$	Indicator of type of payload (Code table 3)
$I_4 I_4$	Indicator of payload operating mode (Code table 4)
$g_d g_d$	Duration of payload functioning, in minutes (Code table 5)
8	Identifier figure
$G_s G_s$	Time in hours (UTC) when payload switched on
$g_s g_s g_s$	Minutes and tenths of the time when payload switched on

### CODE TABLE 1

$I_1$  — *Satellite-owning country*

Code  
figure

0	European Union
1	Japan
2	United states
3	Russian Federation
4	India
5	China
6-9	Reserved

### CODE TABLE 2

$s_r$  — *Sign of orbital element values*

Code  
figure

0	Positive value
1	Negative value

**CODE TABLE 3***I<sub>3</sub> — Type of payload*Code  
figure

1	Television (TV) – visible part of the spectrum (telephotometer, multizonal scanner, etc.)
2	Single-channel or multi-channel infrared (IR) radiometer
3	Side-looking radar (SLR)
4	Microwave scanning radiometer (RM-08)
5	Combined mode of payload operation
6-9	Reserved

**CODE TABLE 4***I<sub>4</sub>I<sub>4</sub> — Payload operating mode*Code  
figure

Set	Channel
11	1
12	2
13	3
14	4
15	5
21	1
22	2
23	3
24	4
25	5
30	Regular operating mode of payload
31	Channel 4 multizonal scanner M + SLR + RM-08 switched on
32	Channel 4 multizonal scanner M + RM-08 switched on
33	Channel 4 multizonal scanner M + SLR switched on
34	SLR + RM-08 switched on
35	SLR switched on
36	RM-08 switched on
37	Channel 1 multizonal scanner M switched on
38	Channel 2 multizonal scanner M switched on
39	Channel 3 multizonal scanner M switched on
40	Channel 4 multizonal scanner M switched on
41	Channel 1 multizonal scanner M information readout mode
42	Channel 4 multizonal scanner M + SLR + RM-08 information readout mode
43	Channel 4 multizonal scanner M + RM-08 information readout mode
44	Channel 4 multizonal scanner M + SLR information readout mode

**CODE TABLE 5**

$g_d g_d$  — *Duration of payload functioning*

Code  
figure

06	Functioning for six minutes after being switched on
10	Functioning for 10 minutes after being switched on
15	Functioning for 15 minutes after being switched on, etc.
95	Functioning from the time switched on until satellite's entry into night
96	Functioning from the time switched on until satellite's exit from night
97	Functioning over Earth's daylight area (from satellite's exit from, until its entry into night)
98	Functioning over Earth's night area (from satellite's entry into, until its exit from night)
99	Functioning over the whole orbital segment

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