WORLD METEOROLOGICAL ORGANIZATION

MANUAL ON CODES

VOLUME II

REGIONAL CODES
AND
NATIONAL CODING PRACTICES

1998 edition

WMO – No. 306

Manual on Codes

Regional Codes
and
National Coding Practices

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This new edition includes the additions required by RA II (Resolution 18 (97-RA II)) for regional coding procedure of FM 71 CLIMAT, by Canada for national coding procedure with regard to FM 15 METAR and FM 16 SPECI, by the United States for national coding procedure with regard to FM 15 METAR and FM 16 SPECI, for deleting obsolete information with regard to FM 86 SATEM, FM 87 SARAD and FM 88 SATOB, for including additions to national code RECCO, by Austria for national coding procedure with regard to FM 12 SYNOP, FM 15 METAR, FM 16 SPECI and FM 51 TAF, by the Czech Republic for national coding procedure with regard to FM 12 SYNOP, by Denmark for national coding procedure with regard to FM 12 SYNOP, by Estonia for national coding procedure with regard to FM 15 METAR and FM 16 SPECI, by the Netherlands for national coding procedure with regard to FM 12 SYNOP, by the United States to modify the Satellite Code TBUS and by the Russian Federation to replace the Satellite Code FANAS by EPHEMERIS.

Important note:

A simplification of the *Manual on Codes* and a better identification of the modifications generated by the amendments has been undertaken following the recommendations by the CBS Working Group on Data Management.

The CBS session number does not appear anymore with the references to International Code Forms, unless specifically meaningful (i.e. reference to an old code form on purpose), since these references become rapidly obsolete. When the code form number is referenced in the *Manual*, the CBS number is not indicated with it. It is the responsibility of the regional association to establish the Regional Coding Procedures with regards to the use of the relevant parts of the current International Code Forms (as defined in Volume I.1) and, after agreement between its Members, to define by a resolution any change which might be necessary. It is also the responsibility of the WMO Members to update their National Coding Procedures with regards to the current International Code Forms (as defined in Volume I.1) and inform the Secretariat of any necessary change.

Finally, side bars indicate where the current amendments affect code forms, regulations, symbolic letters, tables, procedures or practices.

Following the same pattern as in Volume I.1, Section B (Meaning of symbolic words, and groups for regional use) have been suppressed (redundancy with Section A and C).

The new A4 format with strong cardboard binders will make the publication less voluminous and more compatible with new computer media.

TABLE FOR NOTING SUPPLEMENTS RECEIVED

Supplement No.	Dated	Inserted in the publication	
		by	date
1		**February 2002**	
2		**October 2005**	
3			
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VOLUME II — REGIONAL CODES
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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 Meteorological 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, Spanish and Russian 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 Working Group on Antarctic Meteorology. 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 are 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 GTS. 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 Meteorological Service concerned.

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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).

Important note:

A simplification of the *Manual on Codes* and a better identification of the modifications generated by the amendments has been undertaken following recommendations by the CBS Working Group on Data Management.

The CBS session number does not appear anymore with the references to International Code Forms, unless specifically meaningful (i.e. reference to an old code form on purpose), since these references become rapidly obsolete. When the code form number is referenced in the *Manual*, the CBS number is not indicated with it. It is the responsibility of the regional association to establish the Regional Coding Procedures with regards to the use of the relevant parts of the current International Code Forms (as defined in Volume I.1) and, after agreement between its Members, to define by a Resolution any change which might be necessary. It is also the responsibility of the WMO Members to update their National Coding Procedures with regards to the current International Code Forms (as defined in Volume I.1) and inform the Secretariat of any necessary change.

Side bars indicate where the last amendments affect the sections of Volume II.

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*) S e c t i o n 1

1/12.1   *Groups* $3P_0P_0P_0P_0$, 4PPPP *or* $4a_3hhh$

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 $4a_3hhh$ 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 $4a_3hhh$ shall indicate the geopotential of the suitable pressure level expressed in geopotential metres.

1/12.1.3   The group $3P_0P_0P_0P_0$ 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.

N o t e s:

(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* $6RRRt_R$ (*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*) S e c t i o n 2

1/12.4   *Group* $(2P_wP_wH_wH_w)$

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

1/12.5   *Groups* $((3d_{w1}d_{w1}d_{w2}d_{w2}) (4P_{w1}P_{w1}H_{w1}H_{w1}) (5P_{w2}P_{w2}H_{w2}H_{w2}))$

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).

(c) S e c t i o n 3

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

1/12.6.1   This group shall be used in the form of $0T_gT_gR_cR_t$ at 0600 UTC and of $0//R_cR_t$ at 0000 and 1200 UTC.

1/12.6.2   The group $0T_gT_gR_cR_t$ 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 $0//R_cR_t$ shall be left to the discretion of individual Members of the regional association.

1/12.7   *Group* $(1s_nT_xT_xT_x)$

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

1/12.8   *Group* $(2s_nT_nT_nT_n)$

           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* $(5j_1j_2j_3j_4$ $(j_5j_6j_7j_8j_9))$

1/12.10.1 In the form $5EEEi_E$ and 55SSS $(j_5F_{24}F_{24}F_{24}F_{24})$, 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 $58p_{24}p_{24}p_{24}$ or $59p_{24}p_{24}p_{24}$ 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* $(6RRRt_R)$ (*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* $(9S_PS_Ps_ps_p)$

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_1, W_2, the group $9S_PS_Ps_ps_p$ (Code table 3778 — Supplementary information — *Manual on Codes*, Volume I.1) shall be included.

1/12.13.3   The group 943C_LD_p 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 ($0L_nL_cL_dL_g$ ($1s_Ld_LD_Lv_e$)) 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 ($0L_nL_cL_dL_g$) — 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 ($1s_Ld_LD_Lv_e$) — This group shall always be reported in association with group $0L_nL_cL_dL_g$ 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 $8N_sCh_sh_s$ and $9S_PS_Ps_ps_p$ 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*, S e c t i o n   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*, S e c t i o n   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*, S e c t i o n   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*, S e c t i o n   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.

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

1/35.1   *Part B*, S e c t i o n   9

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

$$51515 \qquad 77h_7h_7h_7 \qquad T_7T_7T_{a7}D_7D_7 \qquad d_7d_7f_7f_7f_7$$
$$60h_6h_6h_6 \qquad T_6T_6T_{a6}D_6D_6 \qquad d_6d_6f_6f_6f_6$$

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*, S e c t i o n   5

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

$$4S_fW_fC_aH_t \qquad QL_aL_aL_oL_o \qquad (9d_sd_sf_sf_s)$$

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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	$333x_1x_1$	$0YYG_cG_c$	88888	$00x_3x_3x_3$	
	49uuu	48uuu	yyyyy	yyyyy	. . . . .	$(00C_100)$
		48uuu	yyyyy	yyyyy	. . . . .	$(00C_100)$
	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
	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 $48L_oL_ok$, 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	$Q_cL_aL_aL_aL_a$	$L_oL_oL_oL_oL_o$	
Section 1	$(99R_iN_RN_R$		$(0R_nR_nR_nR_n))$	$(1t_ss_il_Eh_a)$	
			$(2s_nT_xT_xT_x)$	$(3s_nT_nT_nT_n)$	(4ssss)
			$(5E_pE_pE_pE_p)$	$(6f_rf_rf_rf_r)$	$(666n_{fr}n_{fr})$
Section 2	888		$(0Qi_fE_gS_s)$	$(1c\acute{c}\acute{v}\acute{v})$	$(2C_dkP_gP_g)$
			$(3F_oE_dE_{px}S_w)$	$(4I_{se}I_{se}R_sR_s)$	
Section 3	777		$(0L_nL_cL_dL_g)$	$(1s_Ld_LD_Lv_e)$	
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

R E G U L A T I O N S :

1/02.1 *General*

1/02.1.1 The code name AGRO and the groups yMMJJ $Q_cL_aL_aL_aL_a$ and $L_oL_oL_oL_oL_o$ 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 $Q_cL_aL_aL_aL_a$ $L_oL_oL_oL_oL_o$.

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 $99R_iN_RN_R$ and $0R_nR_nR_nR_n$ 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 $99R_iN_RN_R$ shall be used where R_i indicates whether the total rainfall $R_nR_nR_nR_n$ reported for the period in question is less than one millimetre or not (see Code table 166).

1/02.3.4 $R_nR_nR_nR_n$ 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_i is encoded 6-9 in the group $99R_iN_RN_R$.

1/02.3.5 When there is no precipitation recorded during the period, $99R_iN_RN_R$ shall be coded 99000 to indicate this, and in this case the group $0R_nR_nR_nR_n$ shall not be included in the report.

1/02.3.6 The group $1t_ss_ii_Eh_a$ 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 $2s_nT_xT_xT_x$ and $3s_nT_nT_nT_n$ with their sign of data indicator (s_n) 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 $5E_pE_pE_pE_p$ — This group, when included, shall contain information on the total potential evaporation in millimeters for the decadal period.

1/02.3.10 Groups $6f_rf_rf_rf_r$ $666n_{fr}n_{fr}$ — 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 6<u>1127</u>6663<u>3</u>, where $n_{fr}n_{fr}$ represents the hundredths digits of the run of wind reported by the $f_rf_rf_rf_r$ 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 $0Qi_fE_gS_s$, $1c'c'v'v'$, $2C_dkP_gP_g$, $3F_oE_dE_{px}S_w$, $4I_{se}I_{se}R_sR_s$. These groups shall be reported only when a station has conducted crop monitoring on at least one crop.

1/02.4.2 Group $0Qi_fE_gS_s$ — 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_f 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 $2C_dkP_gP_g$ — 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 $3F_oE_dE_{px}S_w$ — 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 $2C_dkP_gP_g$.

1/02.4.6 Group $4I_{se}I_{se}R_sR_s$ — 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 $0L_nL_cL_dL_g$ — 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 $1s_Ld_LD_Lv_e$ — This group shall always be reported in association with group $0L_nL_cL_dL_g$ 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.

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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 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)

D_7D_7
D_6D_6 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)

d_7d_7
d_6d_6 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)

$f_7f_7f_7$
$f_6f_6f_6$ 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).

$f_rf_rf_rf_r$ 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)

h_a Height of counting anemometer above the ground surface. (Code table 153)
             (RF 1/02)

$h_7h_7h_7$ Geopotential of the 775 and 600 hPa isobaric surfaces, respectively in standard geopotential
$h_6h_6h_6$ 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_RN_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 $f_rf_rf_rf_r$.
                 (RF 1/02)

P_gP_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)

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$_R$.

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$_R$.

$R_s R_s$ 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.

$\left.\begin{array}{l} T_7T_7 \\ T_6T_6 \end{array}\right\}$ Tens and units digits of the air temperature, not rounded off, in degrees Celsius, at 775 and 600 hPa, respectively.
   (FM 35, FM 36)

   (1)   The tenths of the temperature, which is measured in degrees and tenths, shall be indicated by means of T_{a7} and T_{a6}, respectively.

t_s Type of temperature sensor. (Code table 179)
   (RF 1/02)

v_e Extent of vegetation. (Code table 182)
   (FM 12, RF 1/02)

v´v´   Crop variety. (Code table 180)
   (RF 1/02)

W_f Mean width or mean diameter of the feature specified by S_f. (Code table 4536)
   (FM 85)

y   Period for which rainfall is reported (between morning readings). (Code table 192)
   (RF 1/02)

_____

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* $QL_aL_aL_oL_o$ ..... $QL_aL_aL_oL_o$

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

138

c´c´— Crop observed

Code
figure

01–09   Beverage and drug plants

01   Cocoa
02   Coffee
03   Tea
04–09   Reserved

10–19   Cultivated food crops

10   Apple
11   Avocado
12   Banana
13   Mango
14   Pineapple
15–19   Reserved

20–29   Cereal crops

20   Barley
21   Maize
22   Millet
23   Rice
24   Sorghum
25   Wheat
26–29   Reserved

30–39   Citrus fruits

30   Grapefruit
31   Lemon
32   Orange
33   Tangerine
34–39   Reserved

40–49   Leguminous crops

40   Beans
41   Peas
42–49   Reserved

50–59   Oil-seed crops

50   Cashewnut
51   Groundnut
52   Sunflower
53–59   Reserved

60–69   Root crops

60   Cassava
61   Potato
62–69   Reserved

(*Code table 138 — continued*)

Code
figure

70–74   Spice crops

70   Pepper
71–74   Reserved

75–79   Vegetable crops

75   Cabbage
76   Tomato
77–79   Reserved

80–89   Vegetable and leaf fibre

80   Cotton
81–89   Reserved

90–94   Saccharines

90   Sugarcane
91–94   Reserved

95–99   Pasture

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_f — *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_c — *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_d — *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_g — *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_n — *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

(*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 ⎬ Phenological phase in this report same as reported in the previous agrometeorological report
8	Good ⎪
9	Excellent ⎭

166

R_i — *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	⎬ In tenths of millimetres
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	⎬ In whole millimetres
8	Rainfall measured using a gauge installed with orifice more than 30 centimetres above ground	⎪
9	Rainfall derived from an automatic weather station	⎭

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^2
2	Area covered by isolated bands 10 – 100 m^2
3	Area covered by isolated bands 100 – 1 000 m^2
4	Area covered by isolated bands 1 000 – 10 000 m^2
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^2
8	Area covered by dispersed bands 100 – 1 000 km^2
9	Area covered by dispersed bands > 1 000 km^2

When L_g = 1 to 9

0	Small swarm less than 1 km^2 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^2 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^2 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

180

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 utilissima

25   Cashewnut
25   MT-LD

26   Cocoa
26   Ghana I

27–28   Coffee
27   Arabica
28   Robusta

(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

(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

(continued)

(*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 *lower than 750 metres*.
4E´sss	*This group is used*.
$54g_os_nd_T$	*This group is used*.
$9S_PS_Ps_ps_p$	*This Service uses the regional code for special phenomena established for Region VI and not that for Region I.*

CENTRAL AFRICAN REPUBLIC

4PPPP	This group is reported by stations with elevation *lower than 800 metres*.

CÔTE D'IVOIRE

$6RRRt_R$	This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.
$7wwW_1W_2$	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)

$7wwW_1W_2$	ww is coded 05 only when horizontal visibility is less than 5 kilometres.
$58p_{24}p_{24}p_{24}$ or $59p_{24}p_{24}p_{24}$	*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).*

GABON

$6RRRt_R$	This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.
$7wwW_1W_2$	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.

GUINEA-BISSAU

$6RRRt_R$ 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.

$7wwW_1W_2$ *If the period covered by* W_1 *and* W_2 *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_1 *and* W_2 *are used to code* W_1, *and* W_2 *is coded as* /;
  (ii) *If there are no sufficient and reliable indications of the past weather,* W_1 *is also coded as* /.

LIBYAN ARAB JAMAHIRIYA

$6RRRt_R$ When reported, this group is included in Section 1.

$7wwW_1W_2$ 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*.

$6RRRt_R$ 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// $2P_wP_wH_wH_w$.

$1s_nT_xT_xT_x$ 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.

$2s_nT_nT_nT_n$ 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.

MALAWI

$6RRRt_R$ *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.

$0T_gT_gR_cR_t$ *This group is used in the form* $0T_gT_g$//.
The group $0T_gT_g$// *is only reported at 0600 UTC from 1 May to 30 September.*

$943C_LD_p$ This group is used during the tropical cyclone season *only at station 67693 (Chileka).*

MALI

$6RRRt_R$ This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.

$7wwW_1W_2$ 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

$5EEEi_E$ 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.*

$6RRRt_R$ This group is only reported at 0600 and 1800 UTC in accordance with Regulation 12.2.5.4.

SENEGAL

$6RRRt_R$ 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.

$7wwW_1W_2$ 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.*

$7wwW_1W_2$ ww is coded 05 when visibility is less than 10 km and the relative humidity is less than 80 per cent.

$9S_PS_Ps_ps_p$ *The coding established for Region VI is used.*

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.*

GGgg**Z**   *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 **RE**w′w′*and* **WS TKOF RWY**$D_R D_R$ *and/or* **WS LDG RWY**$D_R D_R$*, 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   ddfff

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

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.*

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:

$$61616 \qquad 11PPP_{300} \qquad ddfff_{300}$$
$$22PPP_{600} \qquad ddfff_{600}$$

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	$0YYG_cG_c$	$000G_pG_p$	88888	$00x_3x_3x_3$

$\begin{bmatrix} \text{Isohypse} \\ \text{systems} \end{bmatrix}$ $\begin{bmatrix} 99900 \\ \ .\ .\ .\ .\ . \end{bmatrix}$ $\begin{matrix} 8h_th_ch_ah_a \\ .\ .\ .\ .\ . \end{matrix}$ $\begin{matrix} L_aL_aL_oL_ok \\ .\ .\ .\ .\ . \end{matrix}$ $\begin{matrix} (md_sd_sf_sf_s) \\ .\ .\ .\ .\ . \end{matrix}$ $\begin{bmatrix} (00C_100) \\ .\ .\ .\ .\ . \end{bmatrix}$

Streamlines or isohypses of the isobaric surface $x_3x_3x_3$ and wind speed along these streamlines or isohypses

	99922	$4e_1uuu$	48uuu	$L_aL_aL_oL_ok$	$L_aL_aL_oL_ok$	. . . . .
			00000	48uuu	$L_aL_aL_oL_ok$	$(00C_100)$
		$4e_1uuu$	48uuu	. . . . .	. . . . .	
	99977	$L_aL_aL_oL_ok$	x_3ddff			
		. . . . .	. . . . .			

End   19191

N o t e s :

(1) The $4e_1uuu$ 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 $4e_1uuu$ 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 $L_aL_aL_oL_ok$ 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 $L_aL_aL_oL_ok$ 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 $L_aL_aL_oL_ok$ position group in which $L_aL_a = 48$, 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 $L_aL_aL_oL_ok$ group of each isohypse (or streamline) should be preceded by the groups 00000 48uuu, where uuu indicates the wind speed at the last $L_aL_aL_oL_ok$ point. This is no longer mandatory when the isohypse (or streamline) is closed and the last $L_aL_aL_oL_ok$ 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_3 of the section 99977 is the first figure of the symbol $x_3x_3x_3$ of the $00x_3x_3x_3$ of the preamble.

Prognosis of significant weather

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

Preamble	TEMSI	65556	33300	$0YYG_cG_c$	$000G_pG_p$
Pressure systems	99900	$8P_tP_cPP$	$L_aL_aL_oL_ok$	$(md_sd_sf_sf_s)$	
		. . . . .	. . . . .	. . . . .	
Frontal systems	99911	$66F_tF_iF_c$	$L_aL_aL_oL_ok$	$L_aL_aL_oL_ok$	. . . . . $md_sd_sf_sf_s$
		. . . .	. . . . .	. . . . .	. . . . .
[Isopleths]	[99922]	$\lceil$ 40uuu	42000	$L_aL_aL_oL_ok$	$L_aL_aL_oL_ok$ $\rbrace$
		$\lfloor$	. . . . .	. . . . .	. . . . .
		$\lceil$ 44uuu	$L_aL_aL_oL_ok$	$L_aL_aL_oL_ok$	. . . . . $\rbrace$
		. . . . .	. . . . .	. . . . .	. . . . .
Weather areas	99944	$989w_ei$	$L_aL_aL_oL_ok$	$(L_aL_aL_oL_ok)$	(. . . . .)
		. . . . .	. . . . .	(. . . . .)	(. . . . .)
		988ww	$L_aL_aL_oL_ok$	$(L_aL_aL_oL_ok)$	(. . . . .)
		. . . . .	. . . . .	(. . . . .)	(. . . . .)
Clouds	99966	$2C_sS_1S_2Z_1$	$L_aL_aL_oL_ok$	$L_aL_aL_oL_ok$	. . . . .
		. . . . .	. . . . .	. . . . .	. . . . .
		$7CH_bH_bH_b$	$6NH_tH_tH_t$	$L_aL_aL_oL_ok$	$(L_aL_aL_oL_ok)$ (. . . . .)
	77744	$\lceil$ ISO ZERO DEGREE			
		ZZZZ	metres	$L_aL_aL_oL_ok$	$(L_aL_aL_oL_ok)$ (. . . . .) $\rbrace$
		. . . . .	. . . . .	. . . . .	. . . . .

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_pG_p

	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 **T**T_FT_F/G_FG_F**Z** *(temperature forecast),* $6I_ch_ih_ih_it_L$ *(icing forecast) and* $5Bh_Bh_Bh_Bt_L$ *(turbulence forecast) are not used.*

FM 71 CLIMAT

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

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

MADAGASCAR

$S_1S_1S_1k_sk_s$ *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* $S_1S_1S_1k_sk_s$).

RWANDA

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

$\overline{TTT}$ 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).

$\overline{eee}$ 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 $8N_sCh_sh_s$ $(0TTT_dT_d)$

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**

$0TTT_dT_d$ 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_dT_d Dew-point temperature, rounded off to the nearest whole degree Celsius.
          (1)   See (1) under TT above.

W   Past weather. (Code table 4561)

ALGERIA, CONGO, RWANDA, SUDAN

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

MMMMM ⎫
BBBBB ⎭ $GGggw_2$
            IIiii   Nddff   VVwwW $8N_sCh_sh_s$ $(0TTT_dT_d)$

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_dT_d ⎬   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 $YYGGi_w$ IIiii

41hVV   Nddff $(1s_nTTT)$ $(2s_nT_dT_dT_d)$ $(3P_0P_0P_0P_0)$

4PPPP   (5appp) $7wwW_1W_2$ $8N_hC_LC_MC_H$

$(222//$ $2P_wP_wH_wH_w)$

333   58
             or   } $p_{24}p_{24}p_{24}$ $(8N_sCh_sh_s)$ 911ff $943D_LD_L$
             59

555   6RRR1

N o t e s :

(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 $YYGGi_w$ IIiii.

(3) In Section 1, group i_Ri_xhVV 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_R 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_x equal to 1 has been chosen as it is useful to know the evolution of the weather, i.e. past and present weather. Group $7wwW_1W_2$ is therefore transmitted in all cases.

$3P_0P_0P_0P_0$ This group is always included by upper-air stations 67083, 67085, 67107, 67137 and 67152.

$7wwW_1W_2$ This group is always included.

$222//$
$2P_wP_wH_wH_w$ }   These groups are always included by coastal stations.

6RRR1   Precipitation in one hour.

———————

F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C_i) USED IN INTERNATIONAL HYDROLOGICAL CODES

Basin	Sub-basin	BB	Country*	C_i	Remarks
Mejerda		01	Algeria	1	
			Tunisia	2	
Ch. Melrhir and el Rharsa		02	Algeria	1	
			Tunisia	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	3	
			Algeria	1	
Moulouya		08	Morocco	3	
North-west coast		09	Morocco	3	
			Canary Islands	7	
			Mauritania	5	
Oued Guir Daoura Oued Dra		10	Morocco	3	
			Algeria	1	
Atui		11	Western Sahara	4	
			Mauritania	5	
Senegal		12	Guinea	6	
			Mali	1	
			Mauritania	5	
			Senegal	8	
Gambia		13	Guinea	6	
			Senegal	8	
			Gambia	9	
Geba		14	Senegal	8	
			Guinea-Bissau	1	
			Guinea	6	
Corubal		15	Guinea	6	
			Guinea-Bissau	1	
South-west coast		16	Senegal	8	For national river basins only
			Gambia	9	
			Cape Verde	5	
			Guinea-Bissau	1	
			Guinea	6	
			Sierra Leone	2	
			Liberia	3	
			Côte d'Ivoire	4	

(continued)

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

Basin	Sub-basin	BB	Country	C_i	Remarks
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	

Basin	Sub-basin	BB	Country	C_i	Remarks
Niger	Bénué	34 35	Guinea	6	
			Mali	1	
			Côte d'Ivoire	4	
			Burkina Faso	9	
			Niger	2	
			Benin	7	
			Nigeria	8	
			Cameroon	3	
			Chad	5	
Cross		36	Cameroon	3	
			Nigeria	8	
Chad		37	Central African Republic	7	
			Chad	5	
			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		47	Democratic Republic of the Congo	1	
	Sangha	48	Congo	4	
	Ubangi	49	Cameroon	3	
	Kasai	50	Central African Republic	7	
	Ruki	51	Rwanda	8	
	Lomami	52	Burundi	9	
	Lake Tanganyika	53	United Republic of Tanzania	2	
			Zambia	5	
			Angola	6	

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

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

(continued)

Basin	Sub-basin	BB	Country	C_i	Remarks
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, 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 — 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 71 — CLIMAT
FM 85 — SAREP

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

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A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

FM 12 SYNOP and **FM 13** SHIP

(*a*) S e c t i o n 1

2/12.1   *Group* $3P_0P_0P_0P_0$

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 $4a_3hhh$.

N o t e : This group can be included at other observational times by the decision of individual Members.

2/12.2   *Groups* 4PPPP *or* $4a_3hhh$

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

N o t e : In this case group $4a_3hhh$ 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.

N o t e : See Regulation 2/12.11.3.

2/12.4   *Group* $6RRRt_R$ (*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 $6RRRt_R$ (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.

N o t e s :

(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.

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_R).

(*b*) S e c t i o n   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*) S e c t i o n   3

2/12.6   *Group* $(0Es_nT'_gT'_g)$

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 $3Es_nT_gT_g$.

2/12.9.3   If ice and/or snow data are available, this group shall be reported in the form $3Es_nT_gT_g$ = $3/s_nT_gT_g$.

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.

2/12.11   *Groups* $(5j_1j_2j_3j_4 \ (j_5j_6j_7j_8j_9))$

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 $5EEEi_E$ and $55SSS$ $(j_5F_{24}F_{24}F_{24}F_{24})$, 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), $j_5F_{24}F_{24}F_{24}F_{24}$ (amount of radiation) and SSS (duration of sunshine) shall refer to the 24 hours preceding the observation time of that report.

(*c*)   Groups $5EEEi_E$ and $55SSS$ $(j_5F_{24}F_{24}F_{24}F_{24})$ 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 $5j_1j_2j_3j_4$ $(j_5j_6j_7j_8j_9)$ in the form $553SS$ (j_5FFFF) 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 $5j_1j_2j_3j_4$ in the form $58p_{24}p_{24}p_{24}$ and $59p_{24}p_{24}p_{24}$ shall be used to report the surface pressure variations over the preceding 24 hours.

2/12.11.4   The inclusion of group $5j_1j_2j_3j_4$ in the form $54g_0s_nd_T$, $56D_LD_MD_H$ and $57CD_ae_C$ in the synoptic report shall be left to national decision.

2/12.12   *Group* $(6RRRt_R)$ (*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 $6RRRt_R$ (Section 3) may be used at both intermediate and main observation times.

2/12.12.3   The inclusion of group $6RRRt_R$ in Section 3 of the synoptic report shall be left to national decision.

2/12.13   *Group* $(7R_{24}R_{24}R_{24}R_{24})$

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 $R_{24}R_{24}R_{24}R_{24}$.   At 0000 UTC, this period shall correspond to the sum of the periods t_R for which the precipitation amount was reported in groups $6RRRt_R$ of Section 1 at the preceding 1200 UTC hour and the 0000 UTC hour in question.

2/12.14   *Group* $(8N_sCh_sh_s)$

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.

N o t e :   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_s shall be coded 0.

2/12.15   *Group* $(9S_PS_Ps_ps_p)$

2/12.15.1   Code table 3778 — $S_PS_Ps_ps_p$ — Supplementary information (*Manual on Codes*, Volume I.1) — shall be used for coding $S_PS_Ps_ps_p$.

2/12.15.2   The inclusion of group $9S_PS_Ps_ps_p$ in Section 3 of the synoptic report shall be left to national decision.

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

N o t e : 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

N o t e : For Section 2 of Part B no regional regulations have been developed.

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

2/32.1   *Part A*, S e c t i o n 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*, S e c t i o n 3

The inclusion of group $4v_bv_bv_av_a$ 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*, S e c t i o n 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*, S e c t i o n 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.

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

2/35.1   *Part A*, S e c t i o n   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*, S e c t i o n   4

The inclusion of group $4v_bv_bv_av_a$ 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*   AAAAA

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

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.

N o t e :   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* $8m_pm_pm_Tm_Tm_{Tx}m_{Tn}$

2/71.2.1   See Regulation 2/71.3.1

2/71.3   *Section 1, group* $9m_em_em_Rm_Rm_sm_s$

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_sm_s (or m_em_e or m_Rm_R in group 9 as well as m_pm_P or m_Tm_T in group 8), and the figure 9 should be reported for m_{Tx} or m_{Tn} in group 8.

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

2/71.4.1   If for the period $y_by_b - y_cy_c$ (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_py_P, y_Ty_T, 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.

2/71.5   *Section 4*

2/71.5.1   Group $7i_yG_xG_xG_nG_n$ (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_y – Indicator to specify type of reading
		G_xG_x	G_nG_n	(Code table 1857)
CHINA		1200	1200	
HONG KONG, CHINA	VIII	1200	0000	1
INDIA		1200	0300	1
JAPAN	IX	1500	1500	2
KAZAKSTAN	IV-V	All 8 synoptic hours	All 8 synoptic hours	1
KYRGYZ REPUBLIC	V	0300	1500	
MALDIVES	V	1200	0300	1
MONGOLIA	VIII	1200	0000	1
RUSSIAN FEDERATION	II-XII	All 8 synoptic hours	All 8 synoptic hours	1, 2, 3
SRI LANKA		1200	0300	
TURKMENISTAN	V	1500	0300	1
UNITED ARAB EMIRATES	IV	All 4 main synoptic hours	All 4 main synoptic hours	1 for 41217, 41216, 41184, 41198 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.
KAZAKSTAN	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

N o t e : 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, ISLAMIC STATE OF

$6RRRt_R$	When reported, this group is included in Section 1.
$1s_nT_xT_xT_x$	This group is reported at 1200 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0300 UTC.

BAHRAIN

$6RRRt_R$	When reported, this group is included in Section 1.
$1s_nT_xT_xT_x$	This group is reported at 1800 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0600 UTC.

BANGLADESH

$6RRRt_R$	When reported at standard main hours, this group is included in Section 1. When reported *at intermediate hours*, this group is included in Section 3 and RRR is the amount of precipitation *during the preceding three hours*; t_R *is encoded as / (solidus).*
$1s_nT_xT_xT_x$	This group is reported at 1200 UTC *or 1500 UTC*.
$2s_nT_nT_nT_n$	This group is reported at 0000 UTC *or 0300 UTC*.

CHINA

4PPPP	This group is reported by stations with elevation *lower* than *1 500 metres*.
$6RRRt_R$	This group is reported at 0000, *0600*,1200 and *1800* UTC in accordance with Regulation 12.2.5.4. *The duration of the period of reference is six hours* (t_R = 1).
333	*This group is used in the form* 333//.
$1s_nT_xT_xT_x$	This group is used at 1800 UTC to report the maximum temperature during the preceding *24 hours*.
$2s_nT_nT_nT_n$	This group is used at 0600 UTC to report the minimum temperature during the preceding *24 hours*.

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

$6RRRt_R$	When reported, this group is included in Section 3.
$1s_nT_xT_xT_x$	This group is reported at 1200 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0000 UTC.

HONG KONG, CHINA

5appp	This group is reported *in addition to* groups $58p_{24}p_{24}p_{24}$ or $59p_{24}p_{24}p_{24}$.
$6RRRt_R$	When reported, this group is included in Section 1.
$7wwW_1W_2$	ww is coded 04, 05 or 10 only when horizontal visibility is less than 5 km.
$1s_nT_xT_xT_x$	This group is reported at 1200 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0000 UTC.

INDIA

$6RRRt_R$	*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.
$1s_nT_xT_xT_x$	This group is reported at 1200 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0300 UTC.

IRAN, ISLAMIC REPUBLIC OF

$6RRRt_R$	This group is reported at 0000, *0600*, 1200 and *1800* UTC in accordance with Regulation 12.2.5.4.
$1s_nT_xT_xT_x$	This group is reported at 1500 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0300 UTC.

JAPAN

$1s_nT_xT_xT_x$	This group is reported at 1200 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0000 UTC.

KUWAIT

$6RRRt_R$	When reported, this group is included in Section 3.
$1s_nT_xT_xT_x$	This group is reported at 1800 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0600 UTC.

MYANMAR

$6RRRt_R$	When reported, this group is included in Section 3.
$1s_nT_xT_xT_x$	This group is reported at 1200 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0000 UTC.

REPUBLIC OF KOREA

$6RRRt_R$	When reported, this group is included in Section 1.
$1s_nT_xT_xT_x$	This group is reported at 1200 UTC.
$2s_nT_nT_nT_n$	This group is reported at 0000 UTC.

RUSSIAN FEDERATION

i_Ri_xhVV — i_R *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.*

$6RRRt_R$ — When reported, *at 08 and 20 hours (zone time)*, this group is included in Section 3.

$1s_nT_xT_xT_x$ — This group is reported *at 20 hours (zone time).*

$2s_nT_nT_nT_n$ — This group is reported *at 08 hours (zone time).*

$9S_PS_Ps_ps_p$ — When reported, this group is included in accordance with Regulation 2/12.15.1.

SAUDI ARABIA

$6RRRt_R$ — *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.

$1s_nT_xT_xT_x$ — This group is reported at 1800 UTC.

$2s_nT_nT_nT_n$ — This group is reported at 0600 UTC.

$8N_sCh_sh_s$ — This (these) group(s) is (are) included.

SRI LANKA

$6RRRt_R$ — *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, SOCIALIST REPUBLIC OF

$6RRRt_R$ — 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_R. When reported this group is included in Section 3.

$2s_nT_nT_nT_n$ — This group is reported at 0000 UTC.

YEMEN

$6RRRt_R$ — When reported, this group is included in Section 1.

$7wwW_1W_2$ — 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.

$1s_nT_xT_xT_x$ — This group is reported at 1800 UTC.

$2s_nT_nT_nT_n$ — This group is reported at 0600 UTC.

FM 15 METAR and **FM 16** SPECI

INDIA

REw´w´   *This group is not used.*

JAPAN

VVVVD$_v$ V$_x$V$_x$V$_x$V$_x$D$_v$ — *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 $11P_1P_1P_1$ $d_1d_1f_1f_1f_1$
                22800   ddfff
                33600   ddfff

$P_1P_1P_1$ *refers to the pressure (hPa) at 1 000 metres above the surface and* $d_1d_1f_1f_1f_1$ *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 $11P_1P_1P_1$ $d_1d_1f_1f_1f_1$
                22800   ddfff
                33600   ddfff

$P_1P_1P_1$ refers to the pressure (hPa) at 1 000 metres above the surface and $d_1d_1f_1f_1f_1$ 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

$0i_2zzz$ *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, ISLAMIC STATE OF

$R_1R_1R_1R_1R_d$ *Data concerning R_d are not given.*

FM 75 CLIMAT TEMP

AFGHANISTAN, ISLAMIC STATE OF

r_nr_n
$r_{f2}r_{f2}$
...
$r_{fn}r_{fn}$ Steadiness of wind is not given.

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

———————

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)	$Y_2Y_2G_2G_2g_2g_2$		
$XXL_aL_aL_a$	$Q_cL_oL_oL_oL_o$		
($XXL_aL_aL_a$	$Q_cL_oL_oL_oL_o$)		
(.	. . . . .	repeated as required)	
REPSN	$Y_cY_cG_cG_c$	$//L_aL_aL_a$	$Q_cL_oL_oL_oL_o$
REPSN	$Y_cY_cG_cG_c$	$//L_aL_aL_a$	$Q_cL_oL_oL_oL_o$
(REPSN	$Y_cY_cG_cG_c$	$//L_aL_aL_a$	$Q_cL_oL_oL_oL_o$)

Specifications of symbolic letters:

$Y_2Y_2G_2G_2g_2g_2$ 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)

$L_aL_aL_a$ Latitude, in tenths of degree, of either forecast or reference tropical cyclone centre position.

Q_c Quadrant of the globe. (Code table 3333)

$L_oL_oL_oL_o$ 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.

$Y_cY_cG_cG_c$ 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)

KAZAKSTAN, KYRGYZ REPUBLIC, TAJIKISTAN, TURKMENISTAN AND UZBEKISTAN

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

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F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C_i) USED IN INTERNATIONAL HYDROLOGICAL CODES

Basin	Sub-basin	BB	Country*	C_i	Remarks
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 Kazakstan China Mongolia	9 3 1 7	
Irtish		11	Russian Federation Kazakstan	9 3	
Lower Ob and Tobol		12	Russian Federation Kazakstan	9 3	
Kazakstan (Central)		13	Kazakstan	3	
Lakes Balkhash and Alakol´		14	Kazakstan China	3 1	
Chu, Talas, Asse and Lake Issyk-Kul´		15	Kazakstan Kyrgyz Republic	3 4	
Syr Darya		16	Kazakstan Kyrgyz Republic Tajikistan Uzbekistan	3 4 5 8	To be allocated as needed
Amu Darya		17	Tajikistan Turkmenistan Uzbekistan Afghanistan, Islamic State of	5 6 8 2	To be allocated as needed

(continued)

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

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

Basin	Sub-basin	BB	Country	C_i	Remarks
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	

(continued)

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

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A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

FM 12 SYNOP and **FM 13** SHIP

(*a*) S e c t i o n   1

3/12.1   *Groups* $3P_0P_0P_0P_0$, 4PPPP *or* $4a_3hhh$

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 $4a_3hhh$ 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 $4a_3hhh$ 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 $3_0P_0P_0P_0$ 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* $6RRRt_R$ (*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*) S e c t i o n   3

3/12.4   *Group* (0 . . . .)

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

3/12.5   *Group* $(1s_nT_xT_xT_x)$

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

3/12.6   *Group* $(2s_nT_nT_nT_n)$

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 $3Es_nT_gT_g$ 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 $3Es_nT_gT_g = 3/s_nT_gT_g$.

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* $(5j_1j_2j_3j_4$ $(j_5j_6j_7j_8j_9))$

3/12.9.1   These groups may be used in the Region in the form $5EEEi_E$, $55SSS$ $(j_5F_{24}F_{24}F_{24}F_{24})$, $56D_LD_MD_H$, $57CD_ae_C$ and $58p_{24}p_{24}p_{24}$ or $59p_{24}p_{24}p_{24}$, 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 $5EEEi_E$ and $55SSS$ $(j_5F_{24}F_{24}F_{24}F_{24})$ 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 $5j_1j_2j_3j_4$ shall be included in the form $56D_LD_MD_H$ and/or $57CD_ae_C$, 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 $5j_1j_2j_3j_4$ shall be included in the form $58p_{24}p_{24}p_{24}$ or $59p_{24}p_{24}p_{24}$ 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* $(6RRRt_R)$ (*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_R 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.

3/12.12   *Group* (8N$_s$Ch$_s$h$_s$)

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$_P$S$_P$s$_p$s$_p$) (*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*, S e c t i o n 2

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

3/32.2   *Part B*, S e c t i o n 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*, S e c t i o n 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*, S e c t i o n 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.

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)**

C O D E   F O R M :

Section 0	ERFEN	JJMMi$_w$	IIiii		
Section 1	YYRRR	s$_n$$\overline{T_aT_aT_a}$	$\overline{P_aP_aP_aP_a}$	d$_p$d$_p$$\overline{ff}$	s$_n$$\overline{T_oT_oT_o}$	$\overline{H_sH_sH_sH_s}$
	. . . . .	. . . . .			
	. . . . .	. . . . .			
	. . . . .	. . . . .			
	YYRRR	. . . . .			

N O T E S :

(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

R E G U L A T I O N S :

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$_w$ and IIiii 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.

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CHAPTER III

REGION III — SOUTH AMERICA

1998 edition

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)**

———————————

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)

$\overline{T_0T_0T_0}$ 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)

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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´$_H$P´$_H$P´$_H$P´$_H$ 2C$_V$C$_V$C$_V$C$_V$ 3F$_R$F$_R$F$_R$F$_R$ 4E$_V$E$_V$E$_V$E$_V$ 5d$_x$d$_x$f$_x$f$_x$

55f$_x$f$_x$f$_x$ 6H$_e$H$_e$H$_e$I$_v$ 64H$_h$H$_h$H$_h$ 65H$_h$H$_h$H$_h$ 66T$_s$T$_s$T$_s$ 67T$_s$T$_s$T$_s$ 68D$_v$h$_v$h$_v$

7d$_m$d$_m$f$_m$f$_m$ 74H$_h$H$_h$H$_h$ 77f$_m$f$_m$f$_m$ 8H$_m$H$_m$H$_n$H$_n$ 9R$_s$R$_s$R$_s$R$_s$

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´$_H$P´$_H$P´$_H$P´$_H$

2.2.1   P´$_H$P´$_H$P´$_H$P´$_H$ QNH, in tenths of a hectopascal, omitting the thousands digit of the pressure value.

2.3   *Group* 2C$_V$C$_V$C$_V$C$_V$

2.3.1   C$_V$C$_V$C$_V$C$_V$ Indicates the presence of volcanic dust.

2.3.2   This group shall indicate the presence of volcanic dust suspended in the atmosphere.

R E G U L A T I O N S :

(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$_R$F$_R$F$_R$F$_R$

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$_R$F$_R$F$_R$F$_R$ Groundwater recorded at 1200 UTC, in centimetres, e.g.:

Groundwater	Figures to be reported for F$_R$F$_R$F$_R$F$_R$
12.43 m	31243
6.58 m	30658
0.05 m	30005

ARGENTINA *(continued)*

R E G U L A T I O N S :

(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* $4E_VE_VE_VE_V$

2.5.1 $E_VE_VE_VE_V$ 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 $E_VE_VE_VE_V$
10.68 mm	40106
3.84 mm	40038
0.30 mm	40003
0.02 mm	40000

R E G U L A T I O N S :

(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 overflown owing to excess precipitation shall report 4////.

2.6   *Groups* $5d_xd_xf_xf_x$ and $55f_xf_xf_x$

2.6.1 d_xd_x True wind direction at the time when the reported value f_xf_x was obtained, in tenths of a degree.

2.6.2 f_xf_x Maximum gust speed recorded during the hour preceding the observation, in knots.

R E G U L A T I O N S :

(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_xf_x, to which an additional group $55f_xf_xf_x$ shall be added when the maximum gust speed shall be reported with all its figures in $f_xf_xf_x$.

ARGENTINA *(continued)*

2.7   *Group* $6H_eH_eH_eI_v$

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 $H_eH_eH_e$ 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 $H_eH_eH_e = 135$ and 0 hour 0 minute shall be coded as $H_eH_eH_e = 000$.

2.7.3 I_v Indicates the type of wind meter used.

1 – Anemograph

2 – Anemometer

/ – When group $7d_md_mf_mf_m$ is not used.

R E G U L A T I O N S :

(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 $6///I_v$.

(3)   Stations not using the group $7d_md_mf_mf_m$ for whatever reason shall encode the $H_eH_eH_e$ value and I_v shall be reported as /.

2.8   *Group* $64H_hH_hH_h$

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 $H_hH_hH_h$ 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* $65H_hH_hH_h$

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 $H_hH_hH_h$ 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* $66T_sT_sT_s$

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 $T_sT_sT_s$ Soil temperature greater than or equal to 0, reported in degrees and tenths of a degree Celsius.

(continued)

ARGENTINA *(continued)*

2.11   *Group* $67T_sT_sT_s$

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 $T_sT_sT_s$ Soil temperature in degrees and tenths of a degree Celsius.

2.12   *Group* $68D_vh_vh_v$

2.12.1   This group shall be included at all times when, at elevation h_vh_v, wind direction D_v 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_v Wind direction

2.12.5 h_vh_v Elevation at which the instrument used to determine D_v is located, in tens of metres.

2.13   *Groups* $7d_md_mf_mf_m$ and $77f_mf_mf_m$

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_md_m True direction of maximum gust f_mf_m, in tens of degrees.

2.13.3 f_mf_m Daily maximum gust speed (or, in the absence of gust, maximum wind speed), in knots.

R E G U L A T I O N S :

(1)   If the value to be reported exceeds 99 knots, 99 shall be reported in f_mf_m to which an additional group $77f_mf_mf_m$ shall be added when the daily maximum gust speed shall be reported with all its figures in $f_mf_mf_m$.

(2)   This group shall only be used by stations who meet the following conditions:
          (*a*)   They have an anemograph in operation $I_v = 1$;
          (*b*)   They undertake 24 daily observations with anemometer $I_v = 2$.

(3)   Stations reporting daily maximum wind data but not daily effective insolation shall include the group $6H_eH_eH_eI_v$ 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* $74H_hH_hH_h$

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 $7d_md_mf_mf_m$.

2.14.3 $H_hH_hH_h$ Time in hours and tenths of an hour at which maximum gust was recorded.

ARGENTINA (continued)

2.15   *Group* $8H_mH_mH_nH_n$

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_mH_m Daily maximum value of relative humidity, in percentage, selected from the 24 daily observations.

2.15.3 H_nH_n Daily minimum value of relative humidity, in percentage, selected from the 24 daily observations.

R E G U L A T I O N S :

(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* $9R_sR_sR_sR_s$

2.16.1 $R_sR_sR_sR_s$ 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.

R E G U L A T I O N S :

(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.

FM 15 METAR and **FM 16** SPECI

BOLIVIA

CAVOK   *The code word* **CAVOK** *is not used in 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)	
	North of 40°S	*South of 40°S*
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

CAVOK   *The code word* **CAVOK** *is not used in 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$_i$) USED IN INTERNATIONAL HYDROLOGICAL CODES

Basin	Sub-basin	BB	Country*	C$_i$	Remarks
Juradó		01	Colombia	1	
			Panama		See RA IV
Caribbean Sea		02			
	Magdalena-Cauca	03	Colombia	1	
Catatumbo		04	Colombia	1	
			Venezuela	2	
Caribbean Sea		05	Venezuela	2	
Orinoco		06	Colombia	1	
	Meta	07	Venezuela	2	
Essequibo			Venezuela	2	System of
Amacuro		08	Guyana	3	various basins
Darima					
North Atlantic Ocean		09	Guyana	3	
Courantijn		10	Guyana	3	
			Suriname	4	
North Atlantic Ocean		11	Suriname	4	
Maroni		12	Suriname	4	
			French Guiana	5	
North Atlantic Ocean		13	French Guiana	5	
Oiapoque		14	French Guiana	5	
			Brazil	6	
Amazon		15	Bolivia	7	
			Brazil	6	
			Colombia	1	
			Ecuador	8	
			Guyana	3	
			Peru	9	
			Venezuela	2	
	Beni-Madre de Dios	16	Bolivia	7	
			Brazil	6	
			Peru	9	
	Mamoré (Guaporé)	17	Bolivia	7	
			Brazil	6	
	Negro	18	Brazil	6	
			Colombia	1	
	Napo	19	Ecuador	8	
			Peru	9	
	Putumayo (Ica)	20	Brazil	6	
			Colombia	1	
			Ecuador	8	
			Peru	9	

(continued)

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

Basin	Sub-basin	BB	Country	C_i	Remarks
Amazon *(continued)*	Caquetá (Japurá)	21	Brazil Colombia	6 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			Numbers reserved for other sub-basins of the Amazon
Pacific Ocean		41	Colombia	1	
Patía		42	Colombia Ecuador	1 8	
Mira		43	Colombia Ecuador	1 8	
Pacific Ocean		44	Ecuador	8	
Zarumilla		45	Ecuador Peru	8 9	
Tumbes		46	Ecuador Peru	8 9	

Basin	Sub-basin	BB	Country	C_i	Remarks
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 Chile Peru	7 1 9	
Laguna Blanca		55	Chile Peru	1 9	
Zapaleri		56	Argentina Bolivia Chile	2 7 1	
Cancosa Todos los Santos Lauca Cosapilla		57	Bolivia Chile	7 1	System of various basins
Plata	Río de la Plata	58	Argentina Uruguay	2 4	
	Paranaiba	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

(continued)

Basin	Sub-basin	BB	Country	C_i	Remarks
Plata (continued)	Paraná between Paraguay and Uruguay rivers	65	Argentina	2	
	Paraguay from headwaters up to the Río Negro	66	Bolivia	7	
			Brazil	6	
			Paraguay	3	
	Paraguay between Ríos Negro and Apa	67	Bolivia	7	
			Brazil	6	
			Paraguay	3	
	Paraguay between Apa and Paraná confluences	68	Argentina	2	
			Bolivia	7	
			Paraguay	3	
	Uruguay	69	Argentina	2	
			Brazil	6	
			Uruguay	4	
		70			Number reserved for another Plata sub-basin
Laguna Merín		71	Brazil	6	
			Uruguay	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

Basin	Sub-basin	BB	Country	C_i	Remarks
Pacific Ocean		78 79 80	Chile	1	
Lake Baker Buenos Aires		81	Argentina Chile	2 1	
Gallegos		82	Argentina Chile	2 1	
Lake Fagnano		83	Argentina Chile	2 1	
Vizcachas		84	Argentina Chile	2 1	
Lake San Martín		85	Argentina Chile	2 1	
Lake Pueyrredón		86	Argentina Chile	2 1	
Ríos Simpson, Huemules		87	Argentina Chile	2 1	
Ríos Pico, Cisnes		88	Argentina Chile	2 1	

Ríos Caleufu,
  Corcovado,
  Palena
		89	Argentina
			Chile
				2
				1	

Río Futaleufú		90	Argentina Chile	2 1	
Río Puelo		91	Argentina Chile	2 1	
Río Manso		92	Argentina Chile	2 1	
Río Hua-Hum		93	Argentina Chile	2 1	
Laguna del Bayo Laguna Escondida/ Salar del Pular Laguna Mucar Salina de Jama		94	Argentina Chile	2 1	System of various basins

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CHAPTER IV

REGION IV — NORTH AND CENTRAL AMERICA

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.

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A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

FM 12 SYNOP and **FM 13** SHIP

(*a*) S e c t i o n   1

4/12.1   *Group* $3P_0P_0P_0P_0$

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* $6RRRt_R$ *(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*) S e c t i o n   3

4/12.4   *Group* (0 . . . .)

4/12.4.1   This group shall be used in the form of $0C_sD_LD_MD_H$.

4/12.4.2   The group $0C_sD_LD_MD_H$ 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* $(1s_nT_xT_xT_x)$

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* $(2s_nT_nT_nT_n)$

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.

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* (5$j_1j_2j_3j_4$ ($j_5j_6j_7j_8j_9$))

4/12.9.1   In the form 5EEEi$_E$ and 55SSS ($j_5F_{24}F_{24}F_{24}$), these groups shall be included by all stations capable of doing so, when appropriate.

4/12.9.2   In the form 58$p_{24}p_{24}p_{24}$ or 59$p_{24}p_{24}p_{24}$, 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$_R$) *(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 7$R_{24}R_{24}R_{24}R_{24}$.

4/12.11.2 The group 7$R_{24}R_{24}R_{24}R_{24}$ 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$_s$Ch$_s$h$_s$)

Regulation 4/12.7.1 shall apply.

4/12.13   *Group* (9S$_P$S$_P$s$_p$s$_p$)

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 (/).

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*, S e c t i o n 2

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

4/32.2   *Part B,* S e c t i o n 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,* S e c t i o n 2

Regulation 4/32.1 shall apply.

4/32.4   *Part D*, S e c t i o n 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,* S e c t i o n 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 $101A_{df}A_{df}$.

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

4/35.2   *Part D,* S e c t i o n 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 $101A_{df}A_{df}$.

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.

———————

A.2 — REGIONAL CODE FORMS, NOTES AND REGULATIONS

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

_____

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)

—————

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

Code	Description
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)

(continued)

(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: $0P_nP_nP'_nP'_n$
66 Geopotential data are doubtful between the following levels: $0P_nP_nP'_nP'_n$
67 Temperature data are doubtful between the following levels: $0P_nP_nP'_nP'_n$
68 Dewpoint depression is missing for reasons other than "motor-boating" between the following levels: $0P_nP_nP'_nP'_n$ (not used when T_nT_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.

(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: $//P_nP_nP_n\ T_nT_nT_{an}D_nD_n$ or $P_nP_nP_nT_nT_n$

87   Corrected data for *surface* follow

88   Corrected *additional data* groups follow: $101A_{df}A_{df}$ . . . . . etc.

89

90–99

90   Extrapolated geopotential data follow: $P_nP_nh_nh_nh_n\ (d_nd_nd_nf_nf_n)$

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 rayer follow: ddfff ddfff

95   Early transmission of 850 and 500 hPa data and stability index follow: 85hhh TTT_aDD ddfff 50hhh TTT_aDD ddfff i_si_s

96   Early transmission of 850, 700 and 500 hPa data and stability index follow: 85hhh TTT_aDD ddfff 70hhh TTT_aDD ddfff   50hhh TTT_aDD ddfff i_si_s

97   Early transmission of 500 hPa data and stability index follow: 50hhh TTT_aDD ddfff i_si_s

98   Early transmission of 700 hPa data and stability index follow: 70hhh TTT_aDD ddfff i_si_s

99   Not to be allocated

_____

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

430

C$_s$ — *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$\frac{1}{2}$ 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$\frac{1}{2}$ 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

N o t e :   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, ST. LUCIA, ST. VINCENT, TRINIDAD AND TOBAGO

$9S_PS_Ps_ps_p$ The special phenomena group $909R_td_c$ shall be included in Section 3 of the report *on every occasion that the rainfall group* $6RRRt_R$ *is reported in Section 1.*

CANADA

i_Ri_xhVV *If the sky is completely obscured and clouds are visible below the limit of vertical visibility*, h *is reported as observed.*

$6RRRt_R$ *In reports from stations which do not make observations every six hours,* t_R *indicates the duration of the period of reference. If the coding of* t_R *is 2 or greater, the special phenomena group* $909R_td_c$ *is omitted.*

$8N_hC_LC_MC_H$ N_h *and* C_L *are reported when the sky is completely obscured and clouds are observed below the limit of vertical visibility.*

$8N_sCh_sh_s$ *Cloud amounts reported in second group and subsequent groups are summation amounts.*

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$_m$f$_m$KT T´T´/T´$_d$T´$_d$ AP$_H$P$_H$P$_H$P$_H$

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

(BBB)

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

dddffGf$_m$f$_m$**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 *shall not be used.*

d$_n$d$_n$d$_n$**V**d$_x$d$_x$d$_x$

15.5.3   *This group shall not be reported by* AUTO *stations.*

VVVVD$_v$

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, 11/8 statute mile shall be reported as 1 1/8SM.* D$_v$ *is not reported, but sector visibilities half (or less) of prevailing visibility are reported in supplementary information (manned sites only). The letters SM (statute miles) are appended, without a space, to each observation to identify the units.*

V$_x$V$_x$V$_x$V$_x$D$_v$

15.6.3   *The group* V$_x$V$_x$V$_x$V$_x$D$_v$ *is not used.*

RD$_R$D$_R$/V$_R$V$_R$V$_R$V$_R$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:* **R**D$_R$D$_R$/V$_R$V$_R$V$_R$V$_R$**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 *is not reported by* AUTO *stations.* 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, PE, SG, GS, BR, FG, FU, VA, SA, HZ, SS, DS, TS, MI, BC, PR, DR, BL, SH, VC, PO. AUTO stations will only report one group at a time, otherwise 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 terms VCFC and VCTS shall not be used in Canada. Automatic weather stations cannot report the qualifier VC.*

15.8.12   *Occurrences of IC (diamond dust) are reported whenever the visibility is reduced to six miles or less.*

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 5/8 mile and six miles, inclusive.*

15.8.19   *The letter abbreviation SQ is reported at manned 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 five knots.*

$N_sN_sN_sh_sh_sh_s$

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. Clouds above 10 000 feet cannot be reported by automatic weather stations.*

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.*

(continued)

CANADA *(continued)*

T´T´/T´$_d$T´$_d$

> 15.11   *This group is not reported in staffed* SPECI *reports.*

QP$_H$P$_H$P$_H$P$_H$

> 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$_R$D$_R$
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$_R$D$_R$/V$_R$V$_R$V$_R$V$_R$i	*These groups shall not be reported.*
N$_s$N$_s$N$_s$h$_s$h$_s$h$_s$	*All cloud layers shall be reported in ascending order. Convective-type clouds shall always be reported in the body of the report.*
QP$_H$P$_H$P$_H$P$_H$	*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$_L$C$_M$C$_H$D$_C$D$_L$ *Group of clouds (according to the international code tables and the* International Cloud Atlas*);*
>
> (*b*) P$_0$P$_0$P$_0$ *Pressure reduced to mean sea level, in hectopascals;*
>
> (*c*) 9P$_{24}$P$_{24}$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 $3/8$ statute mile, rounded down to the nearest $1/16$ statute mile;*

(b)   *From $3/8$ statute mile to 2 statute miles, rounded down to the nearest $1/8$ statute mile. (Statute miles and fractions of statute miles shall be encoded with a space; for example, $1^{1}/8$ statute mile shall be reported as $1^{1}/8$ SM.);*

(c)   *From 2 statute miles to 3 statute miles, rounded down to the nearest $1/4$ 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.*

(continued)

UNITED STATES OF AMERICA *(continued)*

15.7

Groups $\mathbf{R}D_RD_R/V_RV_RV_RV_RFT$ or $\mathbf{R}D_RD_R/V_NV_NV_NV_N\mathbf{V}V_XV_XV_XV_X\mathbf{FT}$

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 6 000 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).

N o t e :   *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 1 000 feet (1000FT) and the highest reportable value shall be 6 000 feet (6000FT). When the runway visual range is less than 1 000 feet, the group $V_RV_RV_RV_R$ shall be preceded by M as M1000FT; when the runway visual range is greater than 6 000 feet, the group $V_RV_RV_RV_R$ 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 $V_NV_NV_NV_N$. The highest reportable value in feet for the 10 minutes preceding the observation shall be reported as $V_XV_XV_XV_X$.

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 $^5/_8$ 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 SYNO*P. 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.

N o t e : 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)*

N o t e s :

(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. $H_mH_mH_mH_m$ 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 $H_mH_mH_mH_m$ by 30 (1 400 × 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 ⎤
                                              ⎬ *Code groups developed nationally*
                              62626 ⎦

2. *In Part C, add the following after SECTION 4*

          SECTION 10   61616 ⎤
                                              ⎬ *Code groups developed nationally*
                              62626 ⎦

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:

          $FIELD_1$ $FIELD_2$ $FIELD_3$ $FIELD_4$ $FIELD_5$ $FIELD_6$

          $FIELD_1$ 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$_2$ 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$_3$ 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$_4$ The string "OB" (short for "OBSERVATION").

FIELD$_5$ 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$_6$ 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

FM 51 TAF

CANADA

YYGGgg**Z**

> 51.1.2 *The date/time group will always be included after the international aerodrome identifier, followed by one space.*

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

VVVV

> 51.4.3 *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 $^5/_8$ mile and six miles, inclusive. Fog (FG) is forecast when the visibility is expected to be less than $^5/_8$ mile.*

N$_s$N$_s$N$_s$h$_s$h$_s$h$_s$

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

SKC

> 51.6.1.7 *This term, in addition to being used to replace the cloud or vertical visibility group after a change of the form TEMPO/BECMG GGG$_c$G$_c$, is also used to forecast the absence of cloud or vertical obscuration at the beginning of any self-contained part period.*

CANADA *(continued)*

NSC

    51.6.3   *The abbreviation* **NSC** *(No Significant Cloud) is not used.*

CAVOK

    51.7   *The abbreviation* **CAVOK** *is not used.*

$6I_Ch_ih_ih_it_L$

    51.8   *Icing, at the present time, is not forecast.*

$5Bh_Bh_Bh_Bt_L$

    51.9   *Turbulence, at the present time, is not forecast.*

FMGGggZ

    51.10.2   **Z** *will always be added at the end of this group. This practice will clarify the idea that GGgg is a* UTC *time in hours and minutes rather than a time range between GG and* gg.

TT_FT_F/G_FG_FZ

    51.12   *Temperature, at the present time, is not forecast.*

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

$dddffGf_mf_m$**KT**	*Wind speed shall be expressed in knots.*
VVVVSM	*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.
$N_sN_sN_sh_sh_sh_s$	*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.*
$PROBC_2C_2$ GGG_eG_e	*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_mf_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.*

N o t e : 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. $N_sN_sN_s$ *shall be the cumulative amount of sky cover forecast to be at the level* $h_sh_sh_s$ *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.*

FM 86 SATEM

UNITED STATES OF AMERICA

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

N o t e : Accuracy applies to the value given for the tropopause level $P_tP_tP_t$.

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

C O D E   F O R M :

SECTION 1 (Mandatory)	9XXX9 ddfff	$GGgg i_d$ TTT_dT_dw	$YQL_aL_aL_a$ /jHHH	$L_oL_oL_oBf_c$	$h_ah_ah_ad_td_a$
	(RMK ... Special text)				
SECTION 2 (Additional)	$1k_nN_sN_sN_s$ $7I_rI_tS_bS_e$	$Ch_sh_sH_tH_t$ $7h_ih_iH_iH_i$	$(Ch_sh_sH_tH_t)$ $8d_rd_rS_rO_e$	4ddff $8E_wE_lc_ei_e$	$6W_sS_sW_dd_w$ $9V_iT_wT_wT_w$
	(RMK ... Special text)				
SECTION 3 (Intermediate)	9XXX9 ddfff	$GGgg i_d$ TTT_dT_dw	$YQL_aL_aL_a$ /jHHH	$L_oL_oL_oBf_c$	$h_ah_ah_ad_td_a$
	(RMK ... Special text)				

N o t e s :

(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_e	Character of echo. (Code table 4–1) (1) The term [solid] is used when the individual echoes are not distinctly and widely separated.
d_a	Method of obtaining flight-level wind. (Code table 4–3)
d_t	Type of wind at flight altitude. (Code table 4–4)
d_w	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 $h_ah_ah_a$, or direction, in tens of degrees, from which the surface wind is blowing. (Code table 0877)
d_rd_r	Bearing of echo centre from aircraft, in tens of degrees. (Code table 0877) (1) Code figure 99 indicates echoes in all directions.
E_l	Length of echo axis, in tens of nautical miles.
E_w	Echo width or diameter, in tens of nautical miles.
f_c	Flight conditions. (Code table 4–5) (1) The most representative conditions experienced at flight level, along the route of flight, are reported for f_c.

(continued)

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.

UNITED STATES OF AMERICA *(continued)*

S_s	Distance of occurrence of W_s. (Code table 4–13)
TT	Air temperature at flight level $h_a h_a h_a$, 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_d. (Code table 4–8). Missing or unknown temperatures are reported as //.

$T_d T_d$ Dew point, in whole degrees Celsius.

(1) For negative values, see Note (1) under TT. A report of // for $T_d T_d$ when i_d is coded as 4 to 7 indicates a relative humidity less than 10 per cent or $T_d T_d$ below –49°C.

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

V_i In-flight horizontal visibility. (Code table 4–14)

W_d 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_d.

W_s 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_s.

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

(continued)

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

(continued)

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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 $1/4$ 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°C or colder
3	Dew point not measured/aircraft at or above 10 000 metres and flight-level temperature –50°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°C or colder
7	Dew point measured/aircraft at or above 10 000 metres and flight-level temperature –50°C or colder

N o t e : For code figures 4 to 7, see Note (1) under specification of T_dT_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 ± 30 m/4 hPa requirements

N o t e : When j = /, HHH is encoded as ///.

CODE TABLE 4–11

S_r — *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

(continued)

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 $^4/_8$ coverage)
2	Broken clouds ($^5/_8$ to $^7/_8$ coverage)
3	Overcast or undercast clouds (more than $^7/_8$ 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$_c$G$_c$ 000G$_p$G$_p$ 8x$_2$x$_2$x$_2$8   00x$_3$x$_3$x$_3$
            PART X   Geographical area

Analysis: I$_T$IIJJ   H$_1$H$_1$H$_1$H$_2$H$_2$ H$_1$H$_1$H$_1$H$_2$H$_2$ H$_1$H$_1$H$_1$H$_2$H$_2$ . . . . .
            I$_T$IIJJ   H$_1$H$_1$H$_1$H$_2$H$_2$ H$_1$H$_1$H$_1$H$_2$H$_2$ H$_1$H$_1$H$_1$H$_2$H$_2$ . . . . .
            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$_T$	Indicator for type of data. If heights are indicated, 1 is to be coded for I$_T$; if winds, 5.
II	First coordinate of the farthest left point in the line
JJ	Second coordinate of the farthest left point in the line

with reference to 1.1 origin, located lower-left corner of grid (see Figure 1).

Example: The coordinates of the North Pole are II = 33, JJ = 33.

H$_1$H$_1$H$_1$	Height of point in decametres.
H$_2$H$_2$	Height of the next alternate point to the right in the line, with its first figure omitted.

(continued)

UNITED STATES OF AMERICA (continued)
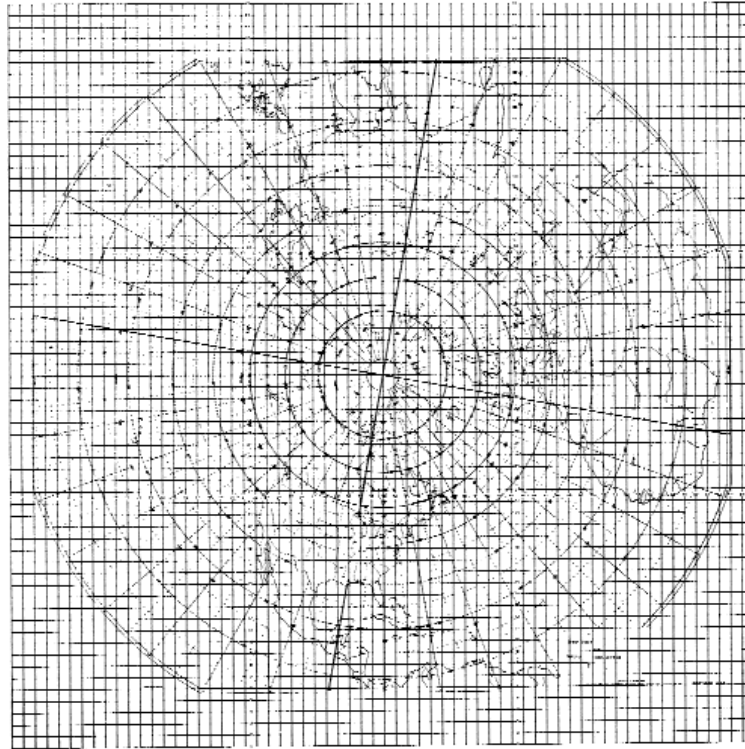
Figure 1

UNITED STATES OF AMERICA *(continued)*

Form of message for grid-point values of five-day means

C O D E   F O R M :

GRID PART X	MMDDN	$L_oL_oL_o$//	L_aL_aPPP	$QH_5H_5H'_5H'_5$
		$L_oL_oL_o$//	L_aL_aPPP	$QH_5H_5H'_5H'_5$
		. . . . .	. . . . .	. . . . . etc.

N o t e :   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).
$L_oL_oL_o$	Longitude of a grid point (005° to 360° west of Greenwich).
L_aL_a	Latitude of a grid point (15° to 90° N).
PPP	Sea-level pressure, in tenths of a hectopascal.
H_5H_5	Mean height of the 500 hPa level, in geopotential decametres.
$H'_5H'_5$	Mean thickness of the layer between the 500 hPa and 1 000 hPa levels, in geopotential decametres.

(continued)

UNITED STATES OF AMERICA *(continued)*

SEALEV — Form for exchange of information on local relative sea level

C O D E   F O R M / T A B U L A R   F O R M A T :

SEALEV

<u>LAT</u>	<u>LONG</u>	<u>TIME</u>	<u>STATION</u>
$L_aL_aL_aL_aA$	$L_oL_oL_oL_oL_oB$	DDDGGgg	D . . . . D

<u>LEVELS</u>

zzzz   zzzz   zzzz   . . .

N o t e s :

(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 realtive 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_i) USED IN INTERNATIONAL HYDROLOGICAL CODES

Basin	Sub-basin	BB	Country	C_i	Remarks
Arctic Ocean		01	USA (Alaska)	1	
Pacific Ocean		02	USA (Alaska)	1	
Yukon		03	USA	1	
			Canada	2	
Stikine		04	USA	1	
			Canada	2	
Pacific Ocean		05 06	Canada	2	
Fraser		07	Canada	2	
			USA	1	
Arctic Ocean		08 to 12	Canada	2	Including islands
Nelson-Saskatchewan		13	Canada	2	
			USA	1	
Hudson Bay		14	Canada	2	
Columbia		15	Canada	2	
			USA	1	
Columbia		16 to 18			Reserve numbers for sub-basins of Columbia River as needed
Mississippi		19	Canada	2	
			USA	1	
		20 to 30			Reserve numbers for sub-basins of Mississippi-Missouri as needed
St. John		31	Canada	2	
			USA	1	
Great Lakes		32 to 42	Canada	2	To be allocated as needed
			USA	1	
St. Lawrence		43	Canada	2	
			USA	1	
Atlantic Ocean		44	Canada	2	
Pacific Ocean		45 46	USA	1	
Atlantic Ocean		47 48	USA	1	

(continued)

Basin	Sub-basin	BB	Country	C_i	Remarks
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	
Choluteca-Negro		70	Honduras Nicaragua	5 7	
Pacific Ocean		71	Nicaragua	7	
Caribbean Sea		72	Nicaragua	7	
San Juan		73	Nicaragua Costa Rica	7 8	

Basin	Sub-basin	BB	Country	C_i	Remarks
Pacific Ocean		74	Costa Rica	8	
Caribbean Sea		75	Costa Rica	8	
Sixaola-Teribe		76	Costa Rica	8	
			Panama	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	2	
			Guatemala	4	
Changuinola		97	Panama	9	
			Costa Rica	8	

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CHAPTER V

REGION V — SOUTH-WEST PACIFIC

1998 edition

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*) S e c t i o n   1

5/12.1   *Groups* $3P_0P_0P_0P_0$, 4PPPP *or* $4a_3hhh$

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 $4a_3hhh$ 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 $4a_3hhh$ 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 $3P_0P_0P_0P_0$ 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* $6RRRt_R$ *(Section 1)*

5/12.3.1   The group $6RRRt_R$ 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 $6RRRt_R$ 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*) S e c t i o n   2

5/12.4   *Groups* $(1P_{wa}P_{wa}H_{wa}H_{wa})$ $(2P_wP_wH_wH_w)$ $((3d_{w1}d_{w1}d_{w2}d_{w2})$ $(4P_{w1}P_{w1}H_{w1}H_{w1})$ $(5P_{w2}P_{w2}H_{w2}H_{w2}))$

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*) S e c t i o n   3

5/12.5   *Group* (0 . . . .)

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

5/12.6   *Group* $(1s_nT_xT_xT_x)$

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* $(2s_nT_nT_nT_n)$

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* $(5j_1j_2j_3j_4$ $(j_5j_6j_7j_8j_9))$

5/12.9.1   In the form $5EEEi_E$ and $55SSS$ $(j_5F_{24}F_{24}F_{24}F_{24})$, 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 $56D_{LD}{}_MD_H$, 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 $58p_{24}p_{24}p_{24}$ or $59p_{24}p_{24}p_{24}$, 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* $(6RRRt_R)$ (*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* $(7R_{24}R_{24}R_{24}R_{24})$

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 $7R_{24}R_{24}R_{24}R_{24}$ in Section 3 of the synoptic report shall be left to national decision.

5/12.12   *Group* $(8N_sCh_sh_s)$

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 $N_s = 0$.

5/12.13   *Group* $(9S_PS_Ps_ps_p)$

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_1, W_2, the group $9S_PS_Ps_ps_p$ (Code table 3778 — Supplementary information — *Manual on Codes*, Volume I.1) shall be used.

5/12.13.2   The inclusion of this group shall be left to national decision.

5/12.14   *Groups* (80000 (0 . . . .) (1 . . . .) . . . . .)

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

(*d*) *Requirements for international exchange*

5/12.15   Use of groups $YYGGi_w$, i_Ri_xhVV, $Nddff$, $1s_nTTT$, $2s_nT_dT_dT_d$, $4PPPP$, $5appp$, $6RRRt_R$, $7wwW_1W_2$
             and $8N_hC_LC_MC_H$ 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*, S e c t i o n   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*, S e c t i o n   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^{-1}.

5/32.3   *Part B*, S e c t i o n   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, 2 100 and
             4 200 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.

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 $L_aL_aL_oL_ok$.

FM 85 SAREP

5/85.1   *Part B*, S e c t i o n   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.

_____

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* C_f

Code
figure

   1   Intensifying

   2   No change

   3   Dissipating

   /   Undetermined

———————

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$_R$ *In reports from stations which do not make observations every six hours,* t$_R$ *indicates the duration of the period of reference*.

MALAYSIA

6RRRt$_R$ When reported, this group is included in Section 1.

NEW CALEDONIA

7wwW$_1$W$_2$ ww is coded 05 *only when haze reduces visibility to less than 5 kilometres.*

S$_P$S$_P$s$_p$s$_p$ This group is used in SYNOP reports from automatic stations 91570 and 91574. It is used in the form 911f$_x$f$_x$, f$_x$f$_x$ indicating maximum wind peaks, in knots, during the preceding three hours.

NEW ZEALAND

7wwW$_1$W$_2$ 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$_1$ *describes the type of weather which occurred prior to that described by* W$_2$.

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.* $RD_RD_R/V_RV_RV_RV_Ri$ *or* $RD_RD_R/V_RV_RV_RV_RVV_RV_RV_RV_Ri$, *shall not be reported as the stations are located quite a distance from the runways and* RVR *equipments are not installed at the airports.*

2. *Wind shear group, i.e.* **WS TKOF RWY**D_RD_R *and/or* **WS LDG RWY**D_RD_R, *shall not be reported.*

NEW ZEALAND

National deviations from the following global regulations:

15.1

The criteria governing the issue of SPECI *are described in the table on page II – 5 – D — 3.*

15.1.1

Routine reports are identified as SPECI *reports when the observed conditions meet the criteria used for special observations.*

15.5

Wind speed will be reported in knots.

15.5.2

Wind speed may be coded as VRB *for wind speeds of 5 knots or less.*

15.6.4

When the horizontal visibility is 10 kilometres or more, it will be coded as whole kilometres followed immediately by the letters KM, *e.g.* 15KM.

NEW ZEALAND *(continued)*

CHANGE CRITERIA

ELEMENT	SPECI	TTL	TAF
WIND DIRECTION A change of 60 degrees or more provided 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	yes	no
(*b*) An expected change of 10 knots or more:	no	no	yes
(*c*) A change of crosswind of 5 knots or more provided the crosswind is 10 knots or more before and/or after the change:	yes	no	no
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 km 5 000 m 1 500 m 800 m	8 km 5 000 m 1 500 m 800 m	8 km 5 000 m 1 500 m 800 m
CLOUD Provided cloud amount is more than 4 oktas before and/or after the change, when the height changes to or passes through:	1 500 ft 1 000 ft 500 ft 200 ft*	1 500 ft 1 000 ft 500 ft 200 ft*	1 500 ft 1 000 ft 500 ft 200 ft*
Provided the height of base is below 1 500 feet:	When the amount is observed or forecast to change from SCT or SKC to BKN or OVC or vice versa		
When CB are forecast to develop or dissipate:	no	yes	yes
WEATHER PHENOMENA When onset, cessation or change in intensity of any of the following occurs:	freezing precipitation moderate or heavy: rain, snow, ice pellets, hail, small hail and/or snow pellets, rain and snow mixed low drifting dust, sand and snow blowing dust, sand and snow (including snowstorm) duststorm sandstorm thunderstorm (with rain, ice pellets, hail, small hail and/or snow pellets, snow or combinations thereof) squall funnel cloud (tornado or waterspout) other phenomena that are expected to cause a significant change in visibility		

* Auckland and Christchurch only.

(continued)

NEW ZEALAND *(continued)*

15.6.5 and 15.10

CAVOK *is not used.*

15.7

Runway visual range (RVR) is not reported.

15.8

The group ww *will be reported.*

15.9

Clouds will be reported in the form $N_sCCh_sh_sh_s$ *where the symbols have the same meaning as in old code form FM 15-VIII Ext.*

15.9.2

Vertical visibility is not reported.

15.12

The value of QNH *is given in tenths of a hectopascal.*

15.14

The criteria governing the issue of TREND *forecasts are described in the table on page II – 5 – D — 3.*

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

(continued)

AUSTRALIA *(continued)*

E — MACQUARIE ISLAND (94998)

Pressure	January	February	March	April	May	June	July	August	September	October	November	December
1000	-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	1306	1322	1309	1308	1307	1308	1334	1319	1300	1285	1264	1303
750	2298	2314	2299	2293	2288	2290	2312	2296	2279	2265	2243	2288
700	2841	2855	2839	2830	2824	2824	2845	2828	2813	2797	2779	2829
600	4030	4046	4019	4007	3995	3990	4011	3989	3979	3967	3947	4012
500	5392	5410	5385	5359	5334	5326	5344	5320	5313	5305	5293	5373
400	7001	7018	6980	6936	6907	6894	6900	6882	6878	6878	6871	6978
300	8962	8990	8940	8886	8828	8801	8802	8783	8791	8808	8811	8914
250	10170	10201	10143	10074	10003	9966	9961	9942	9962	9992	10009	10114
200	11631	11653	11590	11500	11411	11354	11343	11318	11367	11417	11462	11565
150	13516	13538	13465	13350	13236	13171	13152	13108	13205	13281	13360	13449
100	16184	16185	16097	15968	15828	15755	15719	15657	15816	15923	16030	16121
80	17654	17641	17535	17410	17252	17178	17126	17056	17264	17390	17504	17583
70	18545	18522	18419	18279	18119	18016	17995	17899	18153	18282	18389	18545
60	19559	19526	19409	19256	19095	18994	18969	18839	19157	19287	19389	19559
50	20781	20740	20615	20407	20269	20130	20100	20018	20382	20472	20568	20781
40	22271	22228	22073	21808	21753	21508	21505	21442	21922	21993	22100	22271
30	24199	24133	24050	23550	23583	23233	23295	23259	23869	24023	24000	24199
25	25430	25348	25255	24697	24733	24352	24425	24393	25079	25259	25231	25420
20	26956	26846	26750	26400	26137	25710	25804	25763	26548	26828	26800	26956
15	28949	28798	28700	28300	27940	27567	27591	27655	28473	28796	28700	28949
10	31815	31614	31400	31000	30680	30050	30046	30212	31153	31587	31700	31815
8	33423	33188	32936	32474	32113	31469	31429	31648	32676	33138	33299	33420
7	34395	34140	33868	33372	32988	32336	32276	32525	33600	34078	34265	34389
6	35525	35250	34956	34423	34015	33355	33273	33554	34680	35174	35389	35517
5	36873	36576	36258	35686	35252	34582	34478	34793	35973	36485	36731	36863
4	38540	38219	37876	37261	36799	36119	35991	36342	37581	38112	38391	38527
3	40716	40370	39999	39339	38847	38157	38002	38392	39695	40246	40580	40701
2.5	42112	41752	41368	40684	40176	39481	39313	39723	41058	41620	41951	42095
2	43836	43464	43066	42359	41837	41136	40954	41384	42751	43323	43672	43818
1.5	46087	45703	45293	44567	44031	43326	43132	43579	44974	45556	45920	46068
1	49312	48923	48506	47769	47227	46519	46319	46775	48185	48771	49144	49292

Note: The figures above can be taken as the altitude in metres.

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 m s^{-1} or more from the wind speed at the nearest lower level reported;

           (ii)   Wind direction differs by 45° or more from the nearest lower level reported when the wind speed at the level under consideration is 10 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*

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

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 m s^{-1} or more from the wind speed at the nearest lower level reported;

(ii)   Wind direction differs by 45° or more from the nearest lower level reported when the wind speed at the level under consideration is 10 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.*

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_nD_n *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 WINTEM

NEW ZEALAND

In the WINTEM 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 $N_sCCh_sh_sh_s$ *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

$\overline{D_nD_nD_n}$ 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.

——————

F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C_i) USED IN INTERNATIONAL HYDROLOGICAL CODES*

Basin	Sub-basin	BB	State or Country	C_i	Remarks
AUSTRALIA					
North-east coast		01	Queensland	1	
South-east coast		02	New South Wales	2	
			Victoria	3	
Tasmania		03			
Murray-Darling		04	Queensland	1	
			New South Wales	2	
			Victoria	3	
			South Australia	4	
			Capital Territory	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	6	
			Northern Territory	7	
Gulf of Carpentaria		09	Queensland	1	
			Northern Territory	7	
Lake Eyre		10	Queensland	1	
			Northern Territory	7	
			South Australia	4	
			New South Wales	2	
Bulloo-Bancannia		11	Queensland	1	
			New South Wales	2	
Western Plateau		12	Western Australia	6	
			Northern Territory	7	
			South Australia	4	
		13 to 20			To be allocated as needed
REST OF RA V					
Golok		21	Thailand	1	See also RA II
			Malaysia	2	
Malaysia (Peninsular, Sarawak and Sabah)		22 to 31	Malaysia	2	To be allocated as needed

(continued)

_____
*N o t e s :

(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_i has been made separately for Australian basins bearing in mind the existing national system.

Basin	Sub-basin	BB	State or Country	C_i	Remarks
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 Palawan Mindoro Panay Negros Samar Mindanao		54 55 56 57 58 59 60 61	Philippines	6	To be allocated as needed
New Caledonia		62	(France)	7	
North Island		63 to 65	New Zealand	8	To be allocated as needed
South Island		66 to 70	New Zealand	8	To be allocated as needed
Hawaii		71	USA	9	

CHAPTER VI

REGION VI — EUROPE

1998 edition

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.**

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A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

FM 12 SYNOP and **FM 13** SHIP

(*a*) S e c t i o n   1

6/12.1   *Groups* $3P_0P_0P_0P_0$, 4PPPP *or* $4a_3hhh$

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 $4a_3hhh$ 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 $4a_3hhh$ shall indicate the geopotential of the suitable pressure level expressed in geopotential metres, omitting the thousands digit.

6/12.1.3   The group $3P_0P_0P_0P_0$ shall be included in the synoptic report in accordance with Regulation 12.2.4.

6/12.2   *Group* $6RRRt_R$ *(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.

(*b*) S e c t i o n 3

6/12.3 *Group* (0 . . . .)

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

6/12.4 *Group* ($1s_nT_xT_xT_x$)

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* ($2s_nT_nT_nT_n$)

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.

N o t e : This group may be added in all seasons.

6/12.6.2 This group shall be used in the form $3Es_nT_gT_g$.

6/12.6.3 When used, the group $3Es_nT_gT_g$ 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 $3Es_nT_gT_g = 3Es_nT_gT_g$.

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* ($5j_1j_2j_3j_4$ ($j_5j_6j_7j_8j_9$))

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 $5EEEi_E$ and 55SSS ($j_5F_{24}F_{24}F_{24}$), 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 $j_5F_{24}F_{24}F_{24}F_{24}$ (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 $5EEEi_E$ and 55SSS ($j_5F_{24}F_{24}F_{24}F_{24}$) 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).

6/12.8.3   In the form $54g_os_nd_T$, $56D_LD_MD_H$, $57CD_ae_C$, $58p_{24}p_{24}p_{24}$ and $59p_{24}p_{24}p_{24}$, the group $5j_1j_2j_3j_4$ shall be included by national decision (see Regulation 12.4.7.1.2(*b*), (*e*), (*f*), (*g*) and (*h*)).

6/12.9   *Group* ($6RRRt_R$) *(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 $7R_{24}R_{24}R_{24}R_{24}$, this group shall be included in Section 3 at 0600 UTC.

6/12.10.2   The inclusion of group $7R_{24}R_{24}R_{24}R_{24}$ 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 $R_{24}R_{24}R_{24}R_{24}$.

6/12.11   *Group* ($8N_sCh_sh_s$)

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

6/12.12   *Group* ($9S_PS_Ps_ps_p$)

6/12.12.1   Code table 3778 — $S_PS_Ps_ps_p$ — Supplementary information (*Manual on Codes*, Volume I.1) — shall be used to code $S_PS_Ps_ps_p$.

6/12.12.2   Groups $9S_PS_Ps_ps_p$, 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 $9S_PS_Ps_ps_p$ 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 $8N_sCh_sh_s$ and $9S_PS_Ps_ps_p$ 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.

Annex to Regulation 6/12.12.2

Groups $9S_PS_Ps_ps_p$ to be used for regional exchange of data on dangerous weather phenomena

No.	Phenomenon		Time of observation	$9S_PS_Ps_ps_p$
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_w), and direction from which they approach the station (D_a)		Between observation times	$919M_wD_a$
3	Nature and/or type of squall (s_q), and direction from which it approaches the station (D_p)		Between observation times	$918s_qD_p$
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*, S e c t i o n   2

6/20.1.1   The section shall be used in the following form:

51515 n_1REEE   (/$h_e h_e H_e H_e$) n_2REEE   (/$h_e h_e H_e H_e$)   . . . . .

n_nREEE   (/$h_e h_e H_e H_e$)

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_1REEE

This group shall refer to the first system of echoes described.

6/20.1.4   *Group* n_2REEE

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*, S e c t i o n   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*, S e c t i o n   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*, S e c t i o n   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 $8/9t_n u_1 u_2 u_3$ ddfff), 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);

(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*, S e c t i o n 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*, S e c t i o n 3

Regulation 6/32.2 shall apply.

6/32.6 *Part D*, S e c t i o n 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*, S e c t i o n 4

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.

6/35.2 *Part B*, S e c t i o n 9

6/35.2.1 This section shall be used in the following form:

51515	$11P_1P_1P_1$	$d_1 d_1 f_1 f_1 f_1$
	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 $11P_1P_1P_1$ $d_1 d_1 f_1 f_1 f_1$ in which $P_1P_1P_1$ 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.

6/35.3   *Part C*, S e c t i o n 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* $ts_nT_tT_tT_t$

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

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 6/01 EXFOR — **Forecast of extreme temperatures**

C O D E   F O R M :

EXFOR   IIiii $T_{x1}T_{x1}T_{n1}T_{n1}T_{x2}$ $(T_{x2}T_{n2}T_{n2}C_1C_1)$

N O T E S :

(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.

R E G U L A T I O N S :

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**

C O D E   F O R M :

GAFOR	CCCC	$G_1G_1G_2G_2$		
	AAAA	(zone number(s))	$w_gw_gw_g$	
	or			
	BBBB	(zone number(s))	$w_g(k)$ $(/w_g(k))$	$(w'w')$
	TTTTT	$G'_1G'_1G'_2G'_2$	$w_g(k)$ $(/w_g(k))$	$(w'w')$
	LLL	$w_g(k)$	$(w'w')$	

R E G U L A T I O N S :

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 $w_g(k)/w_g(k)$.

N o t e : 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_ga_g for sub-area or route segment; a_ga_g/a_ga_g for continuous series of sub-areas/route segments (example: 61/67 means 61, 62, 63, 64, 65, 66 and 67); or a_ga_g . . . . a_ga_g for non-continuous sequence of sub-areas (example: 61, 63, 66, 67).

RF 6/03 WAFOR — **Warning forecast of hazardous weather phenomena**

C O D E   F O R M :

WAFOR	$YYGGi_W$	$IIi_Ci_Ni_N$	$G_1G_1G_2G_2$	$(C_wC_w$	$1d_1d_1d_2d_2$	$2f_1f_1f_2f_2)$
				$(C_wC_w$	$33R_1R_1R_1$	$44R_2R_2R_2)$
				$(C_wC_w$	$55s_1s_1s_1$	$66s_2s_2s_2)$
				$(C_wC_w$	$7T_1T_1T_2T_2$	and/or
						$8T_{m1}T_{m1}T_{m2}T_{m2})$
				(C_wC_w)	—	—
				(. . .)		
				etc.		

N O T E S :

(1) WAFOR is the name of the code for a warning forecast of hazardous weather phenomena expected over an agreed land area ($i_Ci_Ni_N$) of a neighbouring partner country.

(2) 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.

(3) Each code figure in Code table 642 (C_wC_w) is defined as *one* or *one combined* phenomenon and/or threshold value.

(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.

R E G U L A T I O N S :

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 ll 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. . .

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 $i_Ci_Ni_N$.

6/03.5.6 If a C_wC_w phenomenon and/or threshold value is expected for a selected area $i_Ci_Ni_N$ (Code tables 644 and 646), this very same C_wC_w shall be reported again for the same $i_Ci_Ni_N$ 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 //(/).

$$\text{Examples:} \quad 1d_1d_1// \quad \text{or} \quad 1//d_2d_2, \quad 2f_1f_1// \quad \text{or} \quad 2//f_2f_2$$
$$33R_1R_1R_1 \quad 44///, \quad \text{or} \quad 33/// \quad 44R_2R_2R_2$$
$$7T_1T_1// \quad \text{or} \quad 7//T_2T_2$$
$$8T_{m1}T_{m1}// \quad \text{or} \quad 8//T_{m2}T_{m2}$$

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 $i_Ci_Ni_N$ 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**

C O D E   F O R M :

WAREP	YYGGi$_W$	IIiii	(C$_W$C$_W$	1ddff)
			(C$_W$C$_W$	3RRRt$_r$t$_r$)
			(C$_W$C$_W$	55sss)
			(C$_W$C$_W$	–
			(. . .)	–

N O T E S :

(1) WAREP is the name of the code for a report on hazardous weather phenomena actually observed at the agreed stations IIiii 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$_W$C$_W$ group which indicates the type of the observed phenomenon and/or threshold value;
   or

   (*b*) Individual C$_W$C$_W$ 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$_W$C$_W$) 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$_W$C$_W$) is defined as *one* or *one combined* phenomenon and/or threshold value which may release a WAREP report.

R E G U L A T I O N S :

6/04.1 The code name WAREP shall always be included in the report.

6/04.2 *Group* YYGGi$_W$
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* IIiii
The selection of IIiii stations to be exchanged shall be agreed upon by partner countries.

6/04.4 *Group* C$_W$C$_W$
Based on agreements between partner countries, the selection of C$_W$C$_W$ 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$_W$C$_W$ threshold value.

6/04.6 *Group* 3RRRt$_r$t$_r$
This group shall always be preceded by the agreed C$_W$C$_W$ threshold group, with t$_r$t$_r$ 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$_W$C$_W$ threshold value.

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° to 90.0° are expressed by the numbers 000 to 900.

(2) For negative angles, from –00.1° to –09.9°, 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)

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 TTTTT. (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)
n_1 n_2 . . . n_n	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_rt_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)

$R_{24}R_{24}R_{24}R_{24}$ 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_rt_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)

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 $\begin{cases} k \\ w_g \end{cases}$

642

$C_w C_w$ — *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 ≥ 20 m s^{-1}					≥ 25 mm/6 h	≥ 15 cm/12 h		Hail
1		Gusts ≥ 25 m s^{-1}					≥ 50 mm/6 h			
2			T_{max} decreasing in 24 h by ≥ 10 K down to below −10°C				≥ 25 mm/24 h			
3			Mean value decreasing in 24 h by ≥ 10 K					Blowing snow, depth of loose snow = 15 cm; mean wind speed > 8 m s^{-1}		
4					Widespread < 200 m					
5										
6			T_{max} increasing to ≥ 5°C with snow cover ≥ 15 cm and rain							
7					Widespread < 100 m with snow/dust-storm		With glaze on ground and/or structures	Snowstorm and snowfall (mean wind speed > 8 m s^{-1})		
8		Squalls; gusts ≥ 25 m s^{-1}								
9		Squalls, gusts ≥ 25 m s^{-1} thunderstorm or tornado	Decreasing with frontal passage by ≥ 10 K in 3 h		Widespread < 50 m					

N o t e : ☐ 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

$i_N i_N$ — *Specification of sub-areas of a country*

Derivation of $i_C i_N i_N$ 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*) $i_N i_N$ = two digits indicating the areal subdivision within the country i_C.

IIiiii			Country	III$_C i_N i_N$ (sub-area)
02000	–	02699	Sweden	020. .
800	–	999	Finland	028. .
03000	–	03949	United Kingdom	030. .
950	–	999	Ireland	039. .
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	–	13599	Yugoslavia	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	Syria	400. .
100	–	149	Lebanon	401. .
150	–	199	Israel	402. .
250	–	349	Jordan	403. .

N o t e : Groups of the immediate neighbouring countries "Netherlands, Belgium, Luxembourg", "Switzerland, Liechtenstein", "Spain, Gibraltar", "Bosnia and Herzegovina, Croatia, Slovenia, the former Yugoslav Republic of Macedonia, Yugoslavia, Albania" and "Syria, Lebanon, Israel, Jordan" are invited to examine the usefulness of their individual countries being combined into *one* integrated $i_N i_N$ sub-area numbering system ($i_N i_N$ = 01, 02, 03, . . .), with i_C still serving as the (issuing) country indicator.

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$i_N i_N$ — *Specification of sub-areas of a country*

Sub-areas within *one* country (or a group of countries):

E x a m p l e of two Region VI (Europe) countries, neighbouring or not, both with the same imaginary block number $II = 99$

Country A

$II i_C i_N i_N = 99000 \ldots 990..$

001 + 002	= 003
004 + 005	= 006
001 + 004	= 007
002 + 005	= 008
001 + 004	
002 + 005	
or	= 009
003 + 006	
or	
007 + 008	

Country B

$II i_C i_N i_N = 99200 \ldots 992..$

201 + 202	= 203
204 + 205	= 206
201 + 204	= 207
202 + 205	= 208
201 + 204	
202 + 205	
or	= 209
203 + 206	
or	
207 + 208	

Country A ($i_C i_N i_N = 0..$)
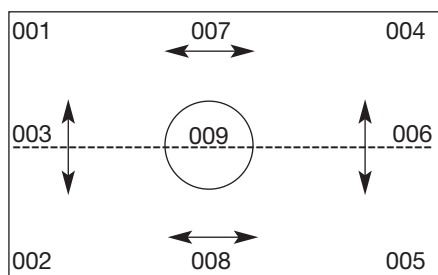
Country B ($i_C i_N i_N = 2..$)
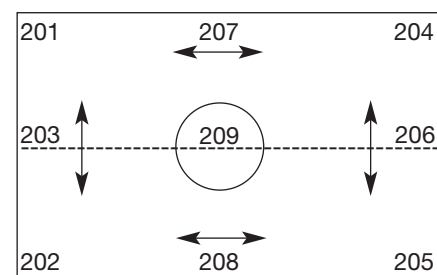
691

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

$i_R i_x hVV$ — Prevailing visibility is reported instead of minimum visibility.

$7wwW_1W_2$ — ww is coded 05 when the visibility is 5 kilometres or less and the relative humidity is less than 80 per cent.

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.

553SS — In Section 3, this group is used for automated stations to report duration of sunshine in the past hour. *The group is included only for whole hours of possible sunshine between sunrise and sunset.*
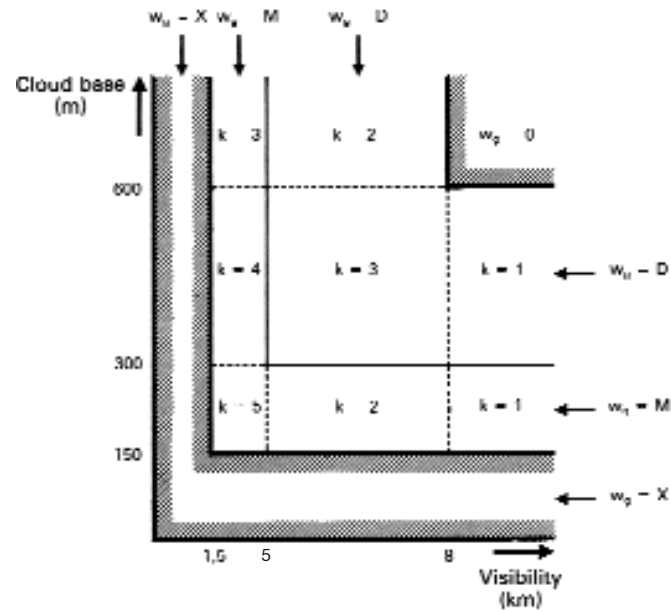
$9S_PS_Ps_ps_p$ — The group 931ss is used to report at 0600 UTC the depth of fresh snow fallen *during the preceding 24 hours*. (No time-group is used together with this group. The possible group 90768 = more than 18 hours is less significant.)

ss is coded as given in Code table 3870 with the following exceptions: 00 and 91 to 96 *are not used, 97 = less than 5 millimetres*.

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 $1s_nT_xT_xT_x$ 6RRR/.

BELGIUM

$6RRRt_R$ — When reported, this group is included in Section 3.

$7wwW_1W_2$ — ww is coded 05 when horizontal visibility is between 1 and 5 kilometres and the relative humidity is less than 80 per cent.

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.

CYPRUS

$6RRRt_R$ — When reported, this group is included in Section 1.

$7wwW_1W_2$ — ww is coded 04, 05, 06 or 07 when horizontal visibility is less than 10 kilometres.

ww is coded 09 when horizontal visibility is between 1 000 metres and 5 kilometres.

ww is coded 10 when horizontal visibility is 1 000 metres or more and less than 10 kilometres.

ww is coded 30, 31 or 32 only when horizontal visibility is 200 metres or more and less than 1 000 metres.

ww is coded 33, 34 or 35 only when horizontal visibility is less than 200 metres.

CZECH REPUBLIC

4PPPP   This group is reported by all stations with elevation *lower than or equal to 550 metres*.

$6RRRt_R$ 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.

$3Es_nT_gT_g$ 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.

$9S_PS_Ps_ps_p$ This group is used in the following forms:

    910ff, 911ff, $919M_wD_a$, 9298S′$_8$, 9299S′$_8$, 931ss, 932RR, 934RR, 935RR, 936RR, 937RR, $951N_vn_4$, 96048 and 96049.

    The group 911ff is used to report the highest gust during the period covered by W_1W_2 if ff is equal to or greater than 20 m s^{-1}.

    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

$6RRRt_R$ When reported, this group is included in Section 1 and, for certain stations, in Section 3.

    t_R = 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))

$7wwW_1W_2$ 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_1W_2, 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.

$7w_aw_aW_{a1}W_{a2}$ w_aw_a, 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_{a1}/W_{a2}, 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.

DENMARK *(continued)*

$3Es_nT_gT_g$ ⎤ When reported, these groups are included at 0600 UTC, except that stations in Greenland
$4E'sss$ ⎦ (II = 04) observe and include them at 1200 UTC.

$8N_sC_hh_s$ This group is included.

$9S_PS_Ps_ps_p$ This group is included.

N o t e s :

(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 $W_{a1}W_{a2}$ 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_{a1} and the next highest for W_{a2} 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_{a1} and W_{a2}. 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_s of the highest of these layers, and no genus of cloud is reported.

FRANCE

FM 12 SYNOP

$7wwW_1W_2$ 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.

N o t e : 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.

$9S_PS_Ps_ps_p$ 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 in centimetres (99 means 99 cm or more).

FM 13 SHIP

$7wwW_1W_2$ 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.

N o t e : 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

$3P_0P_0P_0P_0$ *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*.

$6RRRt_R$ When reported, this group is included in Section 1.

$7wwW_1W_2$ 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.

(continued)

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 /.*

$3Es_nT_gT_g$ *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_aw_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

$6RRRt_R$	When reported, this group is included in Section 1.
$7w_aw_aW_{a1}W_{a2}$	When this group is included, Code tables 4680 and 4531 are used for w_aw_a and $W_{a1}W_{a2}$.
$8N_hC_LC_MC_H$	When included, this group is encoded as 8////.

Section 3

$1s_nT_xT_xT_x$	When reported, this group is included at 1800 UTC.
$2s_nT_nT_nT_n$	When reported, this group is included at 0600 UTC.
$3/s_nT_gT_g$	When reported, this group is included at 0600 UTC, T_gT_g being given in whole degrees Celsius.
$7R_{24}R_{24}R_{24}R_{24}$	When reported, this group is included at 0600 UTC.
$8N_sCh_sh_s$	When included, the symbolic form $8N_s/h_sh_s$ is used.
$9S_PS_Ps_ps_p$	This group is used in the following forms:

910ff ⎫
911ff ⎬ These 3 groups are always included in reports from land stations as well as in reports from fixed sea stations.
912ff ⎭

Section 5

Nationally developed groups

$2s_nT_nT_nT_n$	Minimum temperature in tenths of a degree Celsius, during the preceding 14 hours.
$4s_nT_gT_gT_g$	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.

NETHERLANDS *(continued)*

51722	Snow grains during the preceding hour
$518w_aw_a$	The precipitation reported by w_aw_a in groups $7w_aw_aW_{a1}W_{a2}$ and $518w_aw_a$ is very light.
$53Q_hQ_hQ_h$	Global radiation, $Q_hQ_hQ_h$ being reported in Joules per cm^2
$5975V_m$	Visibility in tens of metres, included when visibility, reported in the group i_Ri_xhVV, is less than 100 m.

PORTUGAL

$6RRRt_R$	When reported, this group is included in Section 1.
$3Es_nT_gT_g$	This group is reported at 0600 UTC.
4E´sss	When reported, this group is included in 0600 UTC reports.
$8N_sCh_sh_s$	This (these) group(s) is (are) included.

RUSSIAN FEDERATION

i_Ri_xhVV	i_R *is coded as / (solidus) when precipitation is included in Section 5* at intermediate synoptic hours.
4PPPP	This group is repeated by stations with elevation *lower than or equal to 1 000 metres*.
$6RRRt_R$	When reported, *at 08 and 20 hours (zone time)*, this group is included in Section 3.
$1s_nT_xT_xT_x$	This group is reported *at 20 hours (zone time)*.
$2s_nT_nT_nT_n$	This group is reported *at 08 hours (zone time)*.
$9S_PS_Ps_ps_p$	This group is included in accordance with Regulation 6/12.12.2.

SLOVAKIA

4PPPP	This group is reported by all stations with elevation *lower than or equal to 550 metres*.
$6RRRt_R$	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.
$9S_PS_Ps_ps_p$	This group is used in the following forms:
	$910f_mf_m$, $911f_xf_x$, $919M_wD_a$, $9298S´_8$, $9299S´_8$, 931ss, 932RR, 934RR, 935RR, 936RR, 937RR, $951N_v/$, 96048 and 96049.
	The group $911f_xf_x$ is used to report the highest gust during the period covered by W_1W_2 if f_xf_x is equal to or greater than 20 m s^{-1}.
	The group 931ss (or the groups 90730 931ss) is (are) used to report the depth of newly fallen snow *during the preceding three hours if this depth of newly fallen snow is equal to or greater than 5 centimetres*.

SPAIN

4PPPP — This group is reported by stations with elevation *equal to 750 metres or lower*.

$6RRRt_R$ — When reported, this group is included in Section 1.

$7wwW_1W_2$ — ww is coded 05 when horizontal visibility is less than 10 kilometres and the relative humidity is less than 80 per cent.

SWITZERLAND

$3P_0P_0P_0P_0$ — *This group is reported by all stations in addition to group 4PPPP.*

$3Es_nT_gT_g$ — *This group is reported in the following form:*
    (*a*) 3E/// *at 0600 UTC; and*
    (*b*) $3/s_nT_gT_g$ *at 0900 UTC*, T_gT_g *is measured at 0900 UTC.*

$6RRRt_R$ — When reported, this group is included in Section 1.

$7wwW_1W_2$ — 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_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, W_1 and W_2 are coded as //.*

$9S_PS_Ps_ps_p$ — 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

$6RRRt_R$ — When reported, this group is included in Section 1.

$7wwW_1W_2$ — 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

$6RRRt_R$ When reported, this group is included in Section 1.

This group is not used at present in reports from British ships.

$7wwW_1W_2$ 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.

$8N_sCh_sh_s$ When the sky is obscured and the vertical visibility cannot be estimated, this group is omitted.

YUGOSLAVIA

$7wwW_1W_2$ ww is coded 07 for drifting and blowing spray at the time of observation.

ww is coded 09 for drifting and blowing spray in the preceding hour but not at the time of observation.

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.*

$VVVVD_v$ $V_xV_xV_xV_xD_v$ — *All stations:*

For the group VVVV *the prevailing visibility is used instead of the minimum visibility.*

The group D_v $V_xV_xV_xV_xD_v$ *will not be reported.*

AUSTRIA *(continued)*

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.

$N_sN_sN_sh_sh_sh_s$ ***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.

$h_sh_sh_s$ = *not reported if only the top but not the cloud base of a convective cloud is visible in a mountainous region, e.g. FEWCB.*

Supplementary information — ***Other stations:***

The indicator "RMK" is not used.

All supplementary information available is added and distributed internationally.

BELGIUM

ww   This group is not used.

WS TKOF RWYD_RD_R ⎫
WS LDG RWYD_RD_R ⎬ *These groups are not used.*

Additional deviations from the global regulations on the part of the *AIR FORCE STATIONS*:

1.   ***Group*** $d_nd_nd_n\mathbf{V}d_xd_xd_x$:

     — *This group is not used*.

2.   ***Groups*** $VVVVD_v$, $V_xV_xV_xV_xD_v$ ***and*** $\mathbf{R}D_RD_R/V_RV_RV_RV_R\mathbf{V}V_RV_RV_RV_R$i:

     — D_v *in the group* $VVVVD_v$ *is not used.*

     — *The group* $V_xV_xV_xV_xD_v$ *is not used.*

     — *The group* $\mathbf{R}D_RD_R/V_RV_RV_RV_R\mathbf{V}V_RV_RV_RV_R$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*** $N_sN_sN_sh_sh_sh_s$:

     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	

N o t e :   The significant cloud base is 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.

$RD_RD_R/V_RV_RV_RV_Ri$ *Except Praha/Ruzyne aerodrome, civil aerodromes continue to report instantaneous values of RVR without tendencies.*

$RD_RD_R/V_RV_RV_RV_RVV_RV_RV_RV_Ri$ *Except Praha/Ruzyne aerodrome, this group is not used.*

WS TKOF RWYD_RD_R
and/or   *These groups are not used.*
WS LDG RWYD_RD_R

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 $d_nd_nd_nVd_xd_xd_x$ 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 **VV**$h_sh_sh_s$, *information on vertical visibility is always based on estimation of vertical visibility.*

National deviation from the regulations of ICAO:

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.

VV$h_sh_sh_s$ *This group is used in the form* **VV**/// *when the group* $N_sN_sN_sh_sh_sh_s$ *is not coded due to invisible sky (fog, drift snow, etc.).*

WS TKOF RWYD_RD_R
and/or   *The groups related to wind shear are not used*.
WS LDG RWYD_RD_R

Group Mw_2 or Bw_2 —   *France continues to use the supplementary group* Mw_2 *or* Bw_2 *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_2 *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* $RD_RD_R/V_RV_RV_RV_R V V_RV_RV_RV_Ri$ *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 RWY**D_RD_R *or* **WS ALL RWY** *is not inlcuded.*

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.*

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 $RD_RD_R/V_RV_RV_RV_R V V_RV_RV_RV_Ri$ *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.*

GGgg**Z**   *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 **RE**w´w´*and* **WS TKOF RWY**D_RD_R *and/or* **WS LDG RWY**D_RD_R*, 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:

$N_sN_sN_s$	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, **VV**/// will be reported or forecast.

Supplementary groups

Information on wind shear will not be reported.

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* $4v_bv_bv_av_a$ *is coded as* $4v_bv_b//$.

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 $ddfff_{500}$ $ddfff_{800}$

FRANCE

$ddfff$
$d_md_mf_mf_mf_m$ *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 2 500 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 $n_0A_0A_0A_0A_0$ $d_0d_0F_0F_0F_0$ . . . . .
                     $n_nA_nA_nA_nA_n$ $d_nd_nF_nF_nF_n$

n_0
n_1
. . .   Sequential number of significant levels.
n_n N o t e : 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 . . . 9, 1, 2, 3 . . .

$A_0A_0A_0A_0$
$A_1A_1A_1A_1$ Altitude of significant level, in decametres.
. . .
$A_nA_nA_nA_n$

d_0d_0
d_1d_1 True direction, in tens of degrees, from which wind is blowing at specified levels, starting with station level (Code table 0877).
. . .
d_nd_n

$F_0F_0F_0$
$F_1F_1F_1$ Wind speed, in knots, at specified levels, starting with station level.
. . .
$F_nF_nF_n$

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 $4v_bv_bv_av_a$ 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	$/V_bV_bV_aV_a$	
Part D	51515	$/V_bV_bV_aV_a$	$H_eH_ed_ed_ef_e$

$/V_bV_bV_aV_a$ 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_bV_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_aV_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 m s^{-1} the first figure of V_bV_b or V_aV_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.

RUSSIAN FEDERATION *(continued)*

$H_eH_ed_ed_ef_e$ 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_eH_e Height, in kilometres, of the lower boundary of the layer, where a steady wind of an easterly direction is observed.

         d_ed_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^{-1} and greater is reported by 0.

     N o t e :   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 $4v_bv_bv_av_a$ 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* $4v_bv_bv_av_a$ *is coded as* $4v_bv_b//$.

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:

$$61616 \qquad 11PPP_{500} \qquad ddfff_{500}$$
$$22PPP_{800} \qquad ddfff_{800}$$

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:

$$51515 \qquad 11P_1P_1P_1 \qquad d_1d_1f_1f_1f_1$$
$$22800 \qquad d_8d_8f_8f_8f_8$$
$$33600 \qquad d_6d_6f_6f_6f_6$$

$P_1P_1P_1$	Pressure, in hPa, at 1 000 metres above the surface.
$d_1d_1f_1f_1f_1$	Direction and speed of wind at 1 000 metres above the surface.
$d_8d_8f_8f_8f_8$	Direction and speed of wind at the 800 hPa level.
$d_6d_6f_6f_6f_6$	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^{-1}, the wind direction is not considered for the determination of the significant levels of wind.

$ddfff$
$d_0d_0f_0f_0f_0$
$d_1d_1f_1f_1f_1$
. . . . .
$d_nd_nf_nf_nf_n$
$d_md_mf_mf_mf_m$
$d_td_tf_tf_tf_t$

The direction from which wind is blowing is always indicated in tens of degrees by means of Code table 0877.

(continued)

GERMANY

Parts A and C,
Section 4   The group $4v_bv_bv_av_a$ 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 $11PPP_{300}$ $ddfff_{300}$
                  $22PPP_{600}$ $ddfff_{600}$

RUSSIAN FEDERATION

Part B,
Section 9   *This section is used in the following symbolic form:*

              51515 $/V_bV_bV_aV_a$

The specifications and the use of group $/V_bV_bV_aV_a$ 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 $/V_bV_bV_aV_a$ $H_eH_ed_ed_ef_e$

The specifications and the use of groups $/V_bV_bV_aV_a$ and $H_eH_ed_ed_ef_e$ 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 $4v_bv_bv_av_a$ shall be reported for each maximum wind.

Part B,
Section 9   Groups $11P_1P_1P_1$ and $d_1d_1f_1f_1f_1$ 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_sf_s Speed of system, front or area is given *in kilometres per hour and not in knots*.

G_cG_c *Synoptic hour of observation of data from which chart is prepared is given for* G_cG_c *in Moscow time and not in UTC.*

PP   *In the group* $8P_tP_cPP$, PP *is given for one point on the axis of the ridge (trough).*

$4e_1uuu$ When the group 40uuu is used, 500 is added for minus values of isallohypses.
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 $8d_pd_pf_pf_p$ $7d_pd_pf_pf_p$ $5d_pd_pf_pf_p$ $4d_pd_pf_pf_p$
                     $3d_pd_pf_pf_p$ $2d_pd_pf_pf_p$ $1d_pd_pf_pf_p$

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_pd_p Forecast direction, in tens of degrees.

f_pf_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.

BELGIUM

$TT_FT_F/G_FG_F\textbf{Z}$
$6I_ch_ih_it_L$ These groups are not used.
$5Bh_Bh_Bh_Bt_L$

Additional deviation from the global regulations on the part of the *AIR FORCE STATIONS*:

Groups $N_sN_sN_sh_sh_sh_s$ *or* $\textbf{VV}h_sh_sh_s$ *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.*

$\textbf{VV}h_sh_sh_s$ 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.*

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 and 51.12

The additional groups $TT_FT_F/G_FG_F\textbf{Z}$ $6I_ch_ih_ih_it_L$ *and* $5Bh_Bh_Bh_Bt_L$ *are not used.*

SPAIN

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).

By regional air navigation agreement, the abbreviation **NSC** *is used as provided for in Regulation 51.6.3 of the* TAF code form.

Groups $TT_FT_F/G_FG_F\textbf{Z}$ *(temperature forecast),* $6I_ch_ih_ih_it_L$ *(icing forecast) and* $5Bh_Bh_Bh_Bt_L$ *(turbulence forecast) are not used.*

SWEDEN

National deviations from the following global regulations:

51.1.2

The group YYGGgg**Z** *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* $h_s h_s h_s$*"* (in alignment with Annex 3 (1/7/93), paragraph 4.9.5).

51.6.3
51.7   } See Regulation 15.10 — FM 15 METAR and FM 16 SPECI.

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."*

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

See FM 15 METAR and FM 16 SPECI.

_____

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:

N o t e 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 $YYGGggi_w$ or $GGggi_w$. In the existing practice, storm reports in CIS countries are transmitted with the time group $GGggi_w$ (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).

(continued)

ARMENIA, AZERBAIJAN, BELARUS, GEORGIA, REPUBLIC OF MOLDOVA, RUSSIAN FEDERATION AND UKRAINE *(continued)*

6/04.10   Group $4T_xT_xT_nT_n$

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_nT_n and the sign of the temperature shall be given by C_wC_w (if $C_wC_w = 21$ it is positive and if $C_wC_w = 24$ it is negative).

6/04.11   Group $5f_xf_x$

This group shall be transmitted after group 1ddff if it is necessary to report f_xf_x in addition to ff.

6/04.12   Group $6RRRt_R$

This group may, by bilateral agreement, be reported instead of group $3RRRt_rt_r$ 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 $8N_sCh_sh_s$

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 RRs_nTT

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_w.
f_xf_x	Highest gust wind speed, in metres per second.
gg	Minutes.
h_sh_s	Height of cloud base. (Code table 1677)
N_s	Amount of individual cloud layer whose height is indicated by h_sh_s. (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_rt_r or by t_R (Code table 4019). (Code table 3590)
s_n	Sign (+ or –) of the air temperature.
TT	Air temperature.
T_nT_n	Minimum night-time temperature, in whole degrees Celsius.
T_xT_x	Maximum diurnal temperature, in whole degrees Celsius.
t_R	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)

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* 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_wC_w	Additional groups
Wind speed (mean value greater than 25 m s^{-1})	10	1ddff
* Wind speed (thresholds determined by the partners)	11	1ddff 577f_xf_x
	12	
	13	
	14	
	15	
	16	
* Squall (gusts less than 25 m s^{-1})	17	1ddff 577f_xf_x
Squall (gusts greater than 25 m s^{-1})	18	1ddff 577f_xf_x
Squall (gusts greater than 25 m s^{-1} and thunderstorm) and/or spout	19	1ddff 577f_xf_x 2ddww
	20	
* Intense heat	21	4$T_xT_xT_nT_n$
Sharp drop in T_{max} compared with T_{max} in preceding 24 hours	22	
Sharp drop in mean daily T	23	
* Severe frost	24	4$T_xT_xT_nT_n$
Sharp drop in T_{min} compared with T_{min} in preceding 24 hours	25	
T_{max} 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) 8$N_sCh_sh_s$
	31	
	32	
	33	
	34	
* Duststorm or sandstorm	35	1ddff 577f_xf_x 7VVww
	36	
	37	
	38	
	39	

_____

* Phenomena (and their C_wC_w code figures) recommended for inclusion in exchanges of information between CIS countries in addition to those recommended in the main code.

(continued)

D. CODE TABLE 642 *(continued)*

Phenomenon		C_wC_w	Additional groups
*	Visibility (less than 3 000 m)	40	$7VVww$ $(8N_sC_hh_s)$
			$(1ddff\ 577f_xf_x)$
		41	
		42	
		43	
	Visibility less than 200 m	44	
		45	
		46	
	Visibility less than 100 m with snowstorm/duststorm	47	
		48	
	Visibility less than 50 m	49	
		50	
		51	
		52	
*	Glaze	53	RRs_nTT
*	Rime	54	RRs_nTT
*	Mixed deposits	55	RRs_nTT
*	Wet snow deposits	56	RRs_nTT
*	Glazed frost	57	
		58	
		59	
	Rain more than 25 mm h^{-1}	60	$3RRRt_rt_r$ or $6RRRt_R$
		61	$3RRRt_rt_r$ or $6RRRt_R$
		62	$3RRRt_rt_r$ or $6RRRt_R$
		63	
		64	
*	Intense (heavy) rain	65	$3RRRt_rt_r$ or $6RRRt_R$
		66	
	Rain with glaze on ground and/or structures	67	$3RRRt_rt_r$ or $6RRRt_R$
*	Ice storm	68	
	Heavy mixed precipitation	69	$3RRRt_rt_r$ or $6RRRt_R$
	Increase in the depth of snow by more than 5 cm in 12 hours	70	$3RRRt_rt_r$ or $6RRRt_R$
			$55sss$
		71	
		72	

‾‾‾‾‾

* Phenomena (and their C_wC_w code figures) recommended for inclusion in exchanges of information between CIS countries in addition to those recommended in the main code.

D. CODE TABLE 642 *(continued)*

Phenomenon	C_wC_w	Additional groups
Blowing snow, depth of loose snow greater than 15 cm, mean wind speed greater than 8 m s^{-1}	73	
	74	
* Heavy snowfall	75	$3RRRt_rt_r$ or $6RRRt_R$
* Blowing snow	76	$1ddff\ 577f_xf_x\ 7VVww$
Snowstorm and snowfall, mean wind speed greater than 8 m s^{-1}	77	55sss
	78	
	79	
	80	
	81	
	82	
	83	
	84	
	85	
	86	
	87	
	88	
	89	
Hail	90	932RR
* Thunderstorm	91	$1ddff\ 577f_xf_x\ 2ddww$
	92	
	93	
	94	
	95	
	96	
	97	
	98	
	99	

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* Phenomena (and their C_wC_w 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)

              IIiii   Nddff   VVwwW $8N_sC_hh_s$ $(0TTT_dT_d)$

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_dT_d 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 ⎬ $GGggw_2$

              IIiii   Nddff   VVwwW $8N_sC_hh_s$ $(0TTT_dT_d)$

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_dT_d ⎬   See under code form AERO above (Belgium, Switzerland).
W ⎭

w_2 — *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

$\left.\begin{array}{l}MMMMw_2 \\ BBBBw_2\end{array}\right\}$ YYGGg′

IIiii $\quad$ $i_R i_x hVV$ $\quad$ Nddff $\quad$ $7wwW_1W_2$

333 $\quad$ $8N_sCh_sh_s$ $\quad$ $9S_PS_Ps_ps_p$

The indicator $MMMMw_2$ denotes a sudden deterioration, $BBBBw_2$ a sudden improvement of the weather element indicated by w_2.

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′ $\qquad$ Tenths of an hour which have passed since the time of the last regular hourly weather report.

w_2 $\qquad$ See under MMMMM/BBBBB above (Belgium, Poland, Romania, Switzerland).

The group $9S_PS_Ps_ps_p$ is used only in the form 910ff.

FRANCE, SPAIN

NIVOMET — Code form for the transmission of NIVO-METEOROLOGICAL observations

CODE FORM:

Section 1 $\quad$ IIiii $\quad$ $i_R 1hVV$ $\quad$ Nddff $\quad$ $s_n TTT$ $\quad$ $7wwW_1W_2$ $\quad$ $8N_hC_LC_MC_H$

Section 3 $\quad$ 333 $\quad$ $(1s_nT_xT_xT_x$ $\quad$ $2s_nT_nT_nT_n)$ $\quad$ 4/sss $\quad$ $7R_{24}R_{24}R_{24}R_{24}$ $\quad$ 931s′s′

Section 5 $\quad$ 555 $\quad$ $1s_nT_sT_sT_s$ $\quad$ $E_nP_sP_sN_vC_n$ $\quad$ $L_1L_2L_3L_4L_5$ $\quad$ $(2ddff \quad ssss′s′)$

$\quad$ $(3UUT_LT_L)$ $\quad$ $(4F_1F_2D_mD_m)$ $\quad$ $(5IM_VM_VM_V)$

Note:

Section number	Symbolic figure group	Contents
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_n $\qquad$ Blowing snow at altitude (the direction of the blowing snow depends on the direction of the wind). (Code table 6–1)

D_mD_m $\qquad$ Average diameter of the grains, in tenths of a millimetre. (Code table 6–2)

E_n $\qquad$ State of snow. (Code table 6–3)

F_1F_2 $\qquad$ Type of grain on the surface. (Code table 6–4)

ff $\qquad$ Wind speed, in knots.

I $\qquad$ Indicator on the homogeneity of the snow layer (10 centimetres from the surface). (Code table 6–5)

L_1 $\qquad$ Description of avalanche(s) observed. (Code table 6–6)

L_2 $\qquad$ Type of avalanche. (Code table 6–6)

L_3 $\qquad$ Altitude of avalanche release. (Code table 6–6)

L_4 $\qquad$ Orientation of avalanche. (Code table 6–6)

(continued)

FRANCE, SPAIN *(continued)*

L_5	Evaluation of the avalanche risk. (Code table 6–6)
$M_V M_V M_V$	Density of snow, in kg m^{-3}. (Code table 6–7)
N_v	Clouds in the valley(s). (Code table 6–8)
$P_s P_s$	Depth of penetration of ramsonde, in centimetres. (Code table 6–9)
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.
$T_L T_L$	Liquid water content of snow. (Code table 6–10)
$T_s T_s T_s$	Temperature of the surface snow, in tenths of a degree Celsius.
UU	Relative humidity of the air, in percentage.

Code tables:

CODE TABLE 6–1

C_n — *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)

CODE TABLE 6–2

$D_m D_m$ — *Average diameter of the grains, in tenths of a millimetre*

N o t e s :

(1) The average diameter of the grain is measured in tenths of a millimetre.

Examples:

Code figure	Average diameter
05	0.5 millimetre
16	1.6 millimetre

(2) The / is coded twice: $D_m D_m$ = // in the following cases:

(*a*) A crust of ice coded $F_1 F_2$ = 77;

(*b*) Recently fallen snow of dendritic type (fresh snow, recognizable particles) made up of a group of particles with extremely varied dimensions.

FRANCE, SPAIN *(continued)*

CODE TABLE 6–3

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 6–4

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

N o t e s :

(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: $F_1F_2 = 67$.

(continued)

FRANCE, SPAIN *(continued)*

CODE TABLE 6–5

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´ >= 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 6–7)

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 6–7)

CODE TABLE 6–6

L_1 — *Description of avalanche(s) observed*

Code
figure

0	Nothing to signal	
1	Accidental release	
2	Artificial release	no natural avalanches
3	Fissure in the mantle of snow	
4	Artificial flow (one or several)	
5	Only one avalanche seen	
6	Two avalanches seen	
7	Three to five avalanches seen	natural avalanches
8	Five to 10 avalanches seen	
9	More than 10 avalanches seen	
/	Unknown (observation impossible: fog, storm, etc.)	

L_2 — *Type of avalanche*

Code
figure

0	Nothing to signal (even if $L_1 = 3$)
1	Avalanche of recently fallen dry snow, specific starting point
2	Avalanche of recently fallen moist snow, specific starting point
3	Avalanche of recently fallen snow, with crowned fracture
4	Surface slab avalanche
5	Wind slab avalanche
6	Deep slab avalanche
7	Wet surface avalanche
8	Wet deep avalanche
9	Several different types of avalanches
/	Unknown

FRANCE, SPAIN *(continued)*

L_3 — *Altitude of avalanche release*

Code
figure

0	Nothing to signal
1	Below 1 750 metres
2	Between 1 750 and 2 000 metres
3	Between 2 000 and 2 250 metres
4	Between 2 250 and 2 500 metres
5	Between 2 500 and 2 750 metres
6	Between 2 750 and 3 000 metres
7	Between 3 000 and 3 500 metres
8	Above 3 500 metres
9	Starting from different altitudes
/	Unknown

L_4 — *Orientation of avalanche*

Code
figure

0	Nothing to signal
1	North-east
2	East
3	South-east
4	South
5	South-west
6	West
7	North-west
8	North
9	Starting from different altitudes
/	Unknown

L_5 — *Evaluation of the avalanche risk*

Code
figure

1	Low
2	Moderate
3	Considerable
4	High
5	Very high
/	Unknown

(continued)

FRANCE, SPAIN *(continued)*

CODE TABLE 6–7

$M_V M_V M_V$ — *Density of snow, in kg m^{-3}*

N o t e s :

(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 6–8

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)

N o t e :   The cloud base is below the level of the station.

CODE TABLE 6–9

$P_s P_s$ — *Depth of penetration of ramsonde, in centimetres*

N o t e s :

(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.

FRANCE, SPAIN *(continued)*

CODE TABLE 6–10

$T_L T_L$ — *Liquid water content of snow*

N o t e s :

(1) $T_L T_L$ is coded when the surface temperature of the snow is equal to 0°C ($T_s T_s T_s$ = 000).

(2) $T_L T_L$ is coded as // when the surface temperature of the snow is negative ($T_L T_L$ = //).

(3) The water content of the volume of snow is expressed in tenths of a percentage.
Values equal to or above 9.9 per cent are coded 99.

Examples:

Code figure	Water content
25	2.5 per cent
99	9.9 per cent
99	10.8 per cent
//	Measure not calculated

(4) The drill has to be pushed horizontally (between the surface of the snow and at the level – 10 centimetres).

GERMANY

Report of surface observations from an auxiliary station

WEHI

CCCC	GGgg	dddffGf$_m$f$_m$**KT**	VVVV	w´w´	N$_s$N$_s$N$_s$h$_s$h$_s$h$_s$
(T´T´/T´$_d$T´$_d$)	(**Q**P$_H$P$_H$P$_H$P$_H$)	(**RE**w´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

IIiii	MMMMM	GGggi$_w$	w$_2$i$_x$/VV	(1s$_n$TTT)	(7wwW$_1$/)
(333)	(8N$_s$Ch$_s$h$_s$)	(910ff)	(9S$_P$S$_P$s$_P$s$_P$)		

Symbolic letters are used with their international specifications with regard to FM 12/FM 13 SYNOP/SHIP.

w_2 in the group w$_2$i$_x$/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

MMMMM ⎤
BBBBB ⎦   GGggi$_w$

IIiii   w$_2$i$_x$hVV   Nddff   7wwW$_1$W$_2$ (8N$_s$Ch$_s$h$_s$)

The indicator MMMMM denotes a sudden deterioration, BBBBB 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$_2$ See under MMMMM/BBBBB 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: $M'_iM'_iM'_jM'_j$ $YYGGw_i$

Section 1: IIiii $1f_xf_xf_hf_h$ $2w_{a1}w_{a2}w_{a3}w_{a4}$ $3w_{a5}w_{a6}w_{a7}i_{Rh}$ $(4D_RR_hR_hR_h)$

Section 2: (222 $1s_nT_{x6}T_{x6}T_{x6}$ $2s_nT_{n6}T_{n6}T_{n6}$ $3h_{Tx6}h_{Tx6}h_{Tn6}h_{Tn6}$ $4s_nT_{g6}T_{g6}T_{g6})$

Section 3: (333 $1s_nT_{b1}T_{b1}T_{b1}$ $2s_nT_{b2}T_{b2}T_{b2}$ $3s_nT_{b3}T_{b3}T_{b3}$
              $4s_nT_{b4}T_{b4}T_{b4}$ $5s_nT_{b5}T_{b5}T_{b5}$ $6s_nT_{xb1}T_{xb1}T_{xb1}$
              $7s_nT_{nb1}T_{nb1}T_{nb1}$ $8s_nT_{xb2}T_{xb2}T_{xb2}$ $9s_nT_{nb2}T_{nb2}T_{nb2})$

Wherein:

Section 0

$M'_iM'_iM'_jM'_j$ A KLIM report is identified by the symbolic letters $M'_iM'_iM'_jM'_i$ = KLIM

$YYGGw_i$ Date and time group and indicator of type of observation

Section 1

IIiii   Block and station number

$1f_xf_xf_hf_h$ 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

$4D_RR_hR_hR_h$ Duration and total amount of precipitation during the last hour

Section 2

222   Indicator group for Section 2

$1s_nT_{x6}T_{x6}T_{x6}$ Maximum temperature recorded during the preceding 6 hours, in tenths of a degree C

$2s_nT_{n6}T_{n6}T_{n6}$ 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

$4s_nT_{g6}T_{g6}T_{g6}$ Ground (grass) minimum temperature, in the preceding 6 hours, in tenths of a degrees C

(continued)

NETHERLANDS *(continued)*

Section 3

333	Indicator group for Section 3
$1s_nT_{b1}T_{b1}T_{b1}$	Soil temperature at a depth of 5 cm
$2s_nT_{b2}T_{b2}T_{b2}$	Soil temperature at a depth of 10 cm
$3s_nT_{b3}T_{b3}T_{b3}$	Soil temperature at a depth of 20 cm
$4s_nT_{b4}T_{b4}T_{b4}$	Soil temperature at a depth of 50 cm
$5s_nT_{b5}T_{b5}T_{b5}$	Soil temperature at a depth of 100 cm
$6s_nT_{xb1}T_{xb1}T_{xb}$	Maximum soil temperature at a depth of 5 cm
$7s_nT_{nb1}T_{nb1}T_{nb1}$	Minimum soil temperature at a depth of 5 cm
$8s_nT_{xb2}T_{xb2}T_{xb2}$	Maximum soil temperature at a depth of 10 cm
$9s_nT_{nb2}T_{nb2}T_{nb2}$	Minimum soil temperature at a depth of 10 cm

Temperatures recorded during the 6 hours preceding the time of observation

N o t e : Temperatures are given in tenths of a degree Celsius

Code tables:

CODE TABLE 10418

D_R — *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_{Rh} — *Indicator for hourly precipitation data*

Code
figure

0	No precipitation mesured; group $4D_RR_hR_hR_h$ omitted
1	Duration and total amount of precipitation obtained from equipment
2	Duration and total amount of precipitation not obtained from equipment; group $4D_RR_hR_hR_h$ 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

$R_hR_hR_h$ — *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	
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	Occurred during the preceding hour, a part of that hour and/or at the time of observation
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

$0St_zf_xf_x$ This group is used to report state of sea (S — Code table 3700) and maximum wind speed.

t_z — *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 ⎫
2	1– 2 hours before observation time
3	2– 3 hours before observation time
4	3– 6 hours before observation time ⎬ time indication of maximum mean wind speed
5	6– 9 hours before observation time
6	9–12 hours before observation time ⎭
7	Wind speed decreasing ⎫
8	Wind speed unchanged ⎬ not possible to indicate time for maximum wind speed
9	Wind speed increasing ⎭
x	Maximum wind speed or changes in wind speed cannot be indicated

f_xf_x 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.

$1s_nT'_xT'_xT'_x$ This group is included at 0600 UTC to report maximum night temperature during the last 12 hours.

$2s_nT'_nT'_nT'_n$ This group is included at 1800 UTC to report minimum day temperature during the last 12 hours.

$3s_nT_gT_gT_g$ This group is included at 0600 UTC to report minimum temperature just above the ground during last night.

$4R_TW_dW_dW_d$ This group gives additional information on weather phenomena reported in other sections. R_T is used to report tenths of millimetres precipitation. This group is also included when precipitation amount is under 1 millimetre.

        $W_dW_dW_d$ gives additional information on past weather which cannot be reported under W_1W_2, 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_1W_2.

W_d — *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$_s$T$_s$ (1d$_w$d$_w$P$_w$H^1_w)   (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^1_w — *Mean maximum height of waves*

			50 added to d$_w$d$_w$		
Code figure	m	ft	Code figure	m	ft
0	0.25	1	0	5	16
1	0.5	1^1/$_2$	1	5.5	17^1/$_2$
2	1	3	2	6	19
3	1.5	5	3	6.5	21
4	2	6^1/$_2$	4	7	22^1/$_2$
5	2.5	8	5	7.5	24
6	3	9^1/$_2$	6	8	25^1/$_2$
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				

N o t e s :

(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 5^3/$_4$ feet).

(2) Waves whose heights are greater than 9.75 metres (32 feet) are reported by coding H^1_w 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$_w$d$_w$ 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$_s$T$_s$ Sea-surface temperature, rounded off to the nearest degree Celsius.

_____

F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C_i) USED IN INTERNATIONAL HYDROLOGICAL CODES

Basin	Sub-basin	BB	Country	C_i	Remarks
(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	

(continued)

Basin	Sub-basin	BB	Country	C_i	Remarks
English Channel coast		18	France	1	
			Belgium	2	
Atlantic coast		19	France	1	
Schelde		20	France	1	
			Belgium	2	
			Netherlands	4	
Meuse		21	France	1	
			Belgium	2	
			Germany	3	
			Netherlands	4	
Seine		22	France	1	
Loire		23	France	1	
Dordogne		24	France	1	
Garonne		25	France	1	
			Spain	2	
Ebro		26	Spain	2	
			France	1	
			Andorra	3	
South-east coast		27	Spain	2	
Languedoc coast		28	France	1	
Common to Norway-Sweden		29	Norway	7	
			Sweden	2	
Common to Norway-Finland-Russian Federation		30	Norway	7	
			Finland	8	
			Russian Federation	9	
Norway only		31	Norway	7	
Common to Sweden-Finland		32	Sweden	2	
			Finland	8	
(Sweden)		33	Sweden	2	
(Denmark)		34	Denmark	9	
Rhine		35	Switzerland	9	
	Moselle	36	Austria	2	
			Germany	3	
			France	1	
			Netherlands	4	
			Luxembourg	8	

Basin	Sub-basin	BB	Country	C_i	Remarks
Weser		37	Germany	3	
North Sea coast (including Ems)		38	Netherlands	4	
			Germany	3	
Rhone		39	Switzerland	9	
			France	1	
Elbe		40	Czech Republic	1	
			Germany	3	
Baltic Sea coast		41	Germany	3	
			Poland	4	
Danube		42	Germany	3	
	Inn	43	Switzerland	9	
	Tisza-Mures	44	Austria	2	
	Sava	45	Czech Republic	1	
	Drava	46	Hungary	4	To be allocated as needed
	Vel Morova	47	Yugoslavia	5	
			(Albania)	6	
			Croatia		
			Republic of Moldova		
			Romania	7	
			Slovakia		
			Bulgaria	8	
Po		48	Italy	3	
			Switzerland	9	
Venetian coast		49	Italy	3	
			Switzerland	9	
Corsica Sardinia		50	France	1	
			Italy	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	1	
			Poland	4	
			Germany	3	
Wista		58	Slovakia	1	
			Poland	4	

(continued)

Basin	Sub-basin	BB	Country	C_i	Remarks
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 Yugoslavia Greece	 5 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	

Basin	Sub-basin	BB	Country	C_i	Remarks
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	

(continued)

Basin	Sub-basin	BB	Country	C_i	Remarks
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

$a_g a_g$	Identification group of the specific routes	Reference height above mean sea level
10	Kempten - 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 - Brünn	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

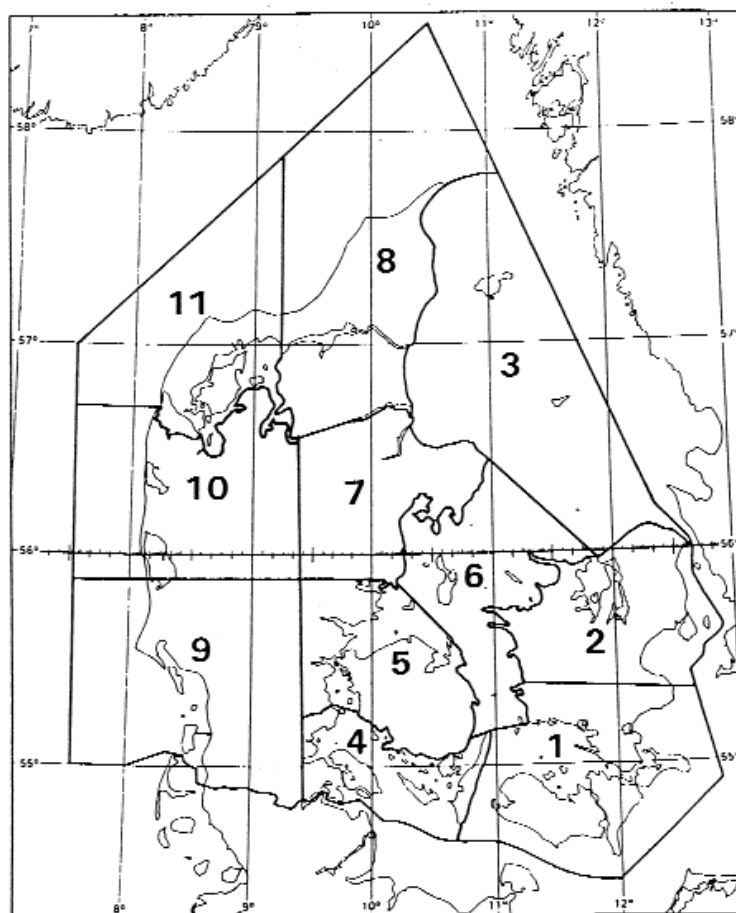**AUSTRIA** *(continued)*

Specification of route segments
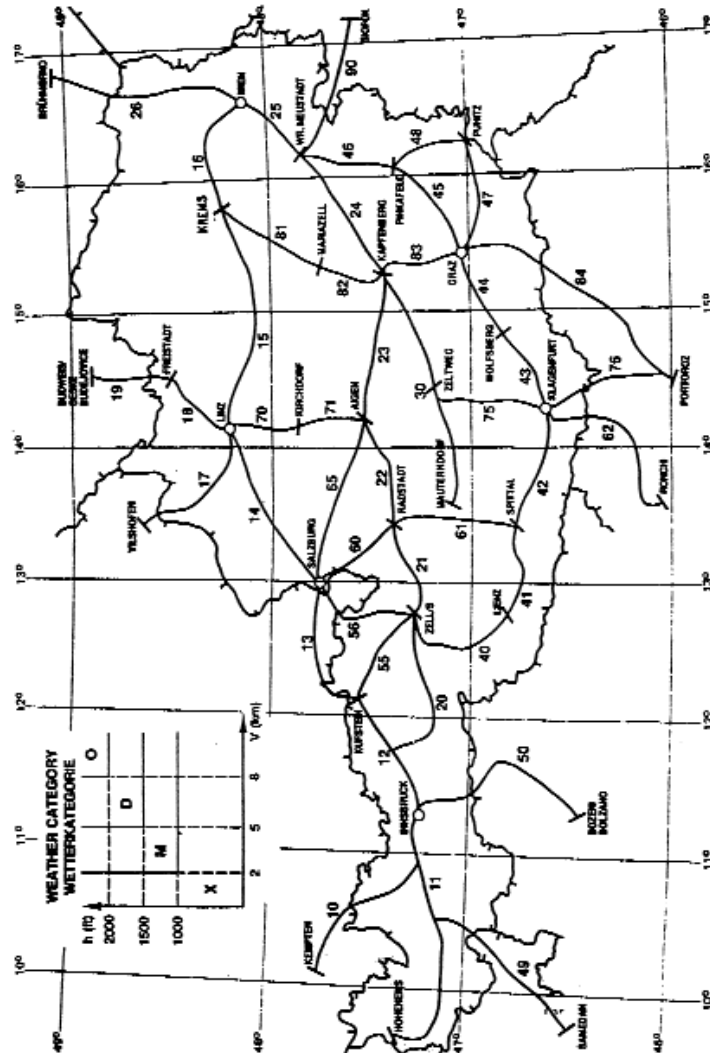
DENMARK

Specification of sub-areas

The eleven sub-areas for which the GAFOR is provided

FINLAND

Specification of sub-areas

FRANCE

Specification of sub-areas
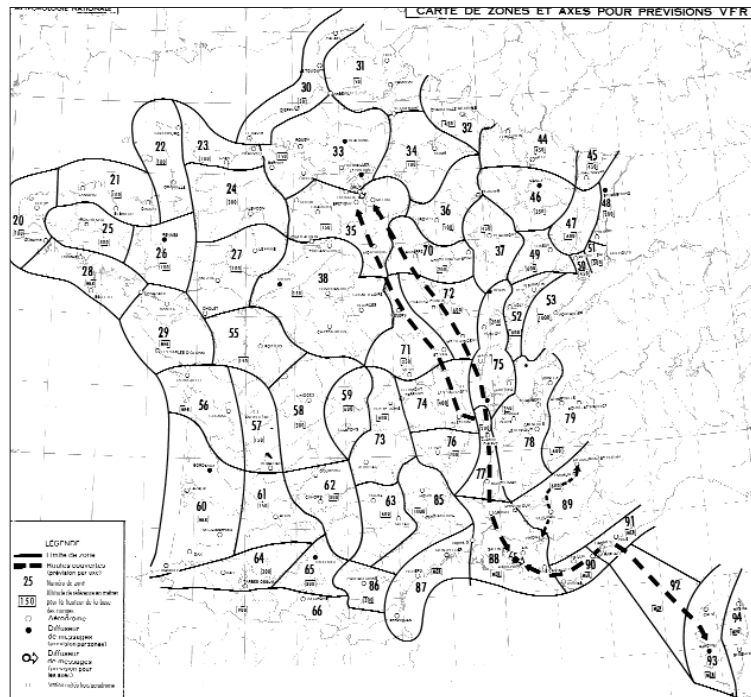
N o t e :   Sub-areas 32, 47 and 53 are not covered by GAFOR forecasts due to lack of observations.

GERMANY

Specification of sub-areas

| Area No.	Geographical designation	Reference height above mean sea level
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

GERMANY *(continued)*

Specification of sub-areas *(continued)*

Area No.	Geographical designation	Reference height above mean sea level
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

GERMANY *(continued)*
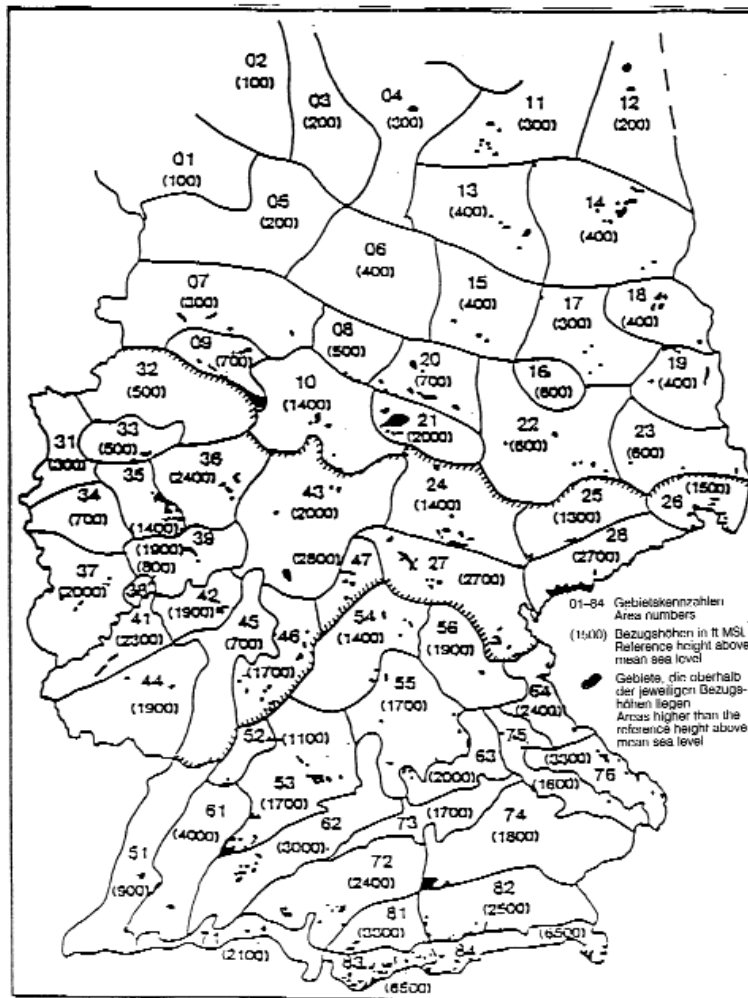
ITALY

Specification of route segments

a_g a_g   *Route segments*

10
- 11   Torino - Milano/Linate
- 12   Milano/Linate – Verona Villafranca
- 13   Verona Villafranca – Venezia Tessera
- 14   Venezia Tessera – Ronchi dei Legionari

20
- 22   Milano/Linate – Parma
- 23   Parma – Bologna
- 24   Bologna – Rimini

30
- 31   Monte Bisbino – Milano/Linate
- 32   Milano/Linate – Voghera
- 33   Voghera – Genova Sestri

40
- 42   Bolzano – Garda
- 43   Garda – Milano/Linate

50
- 51   Voghera – Albenga
- 52   Albenga – Ventimiglia

60
- 61   Voghera – Passo della Cisa
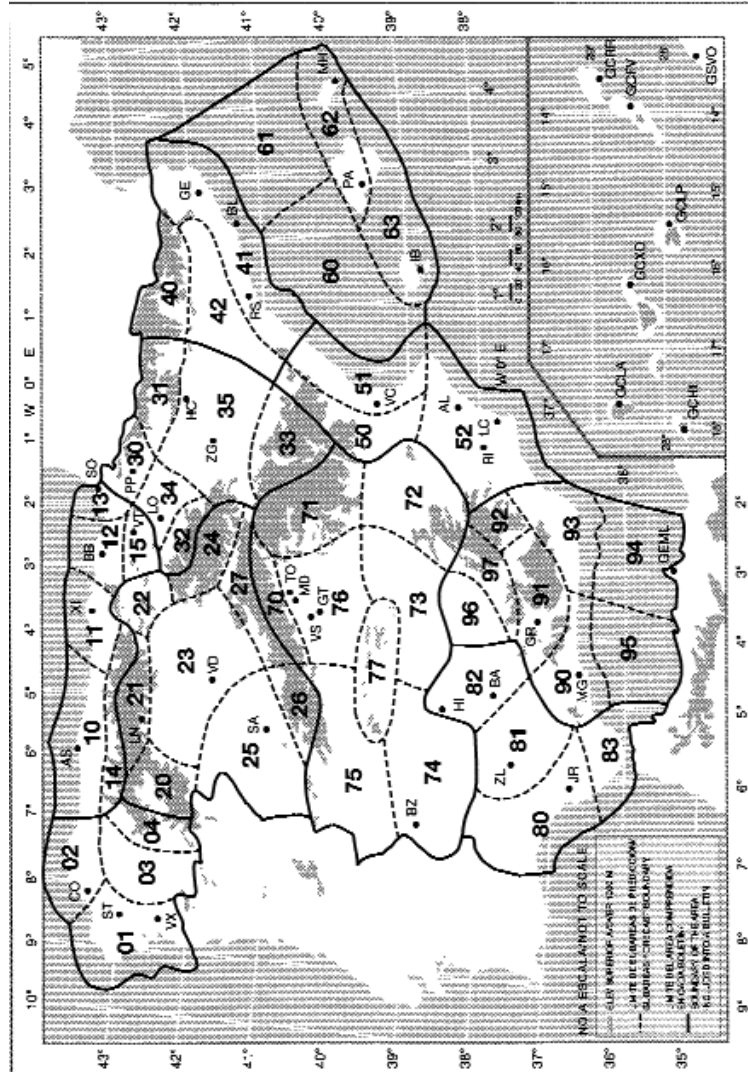- 62   Passo della Cisa – Pisa

NETHERLANDS

Specification of sub-areas
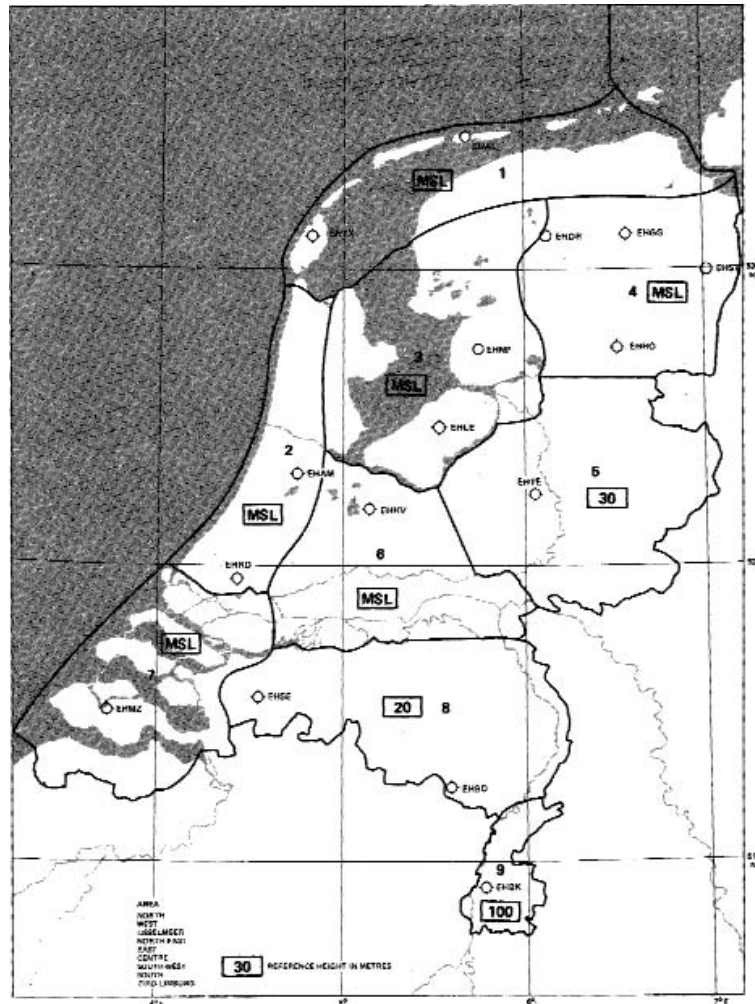
SPAIN

Specification of sub-areas

SWITZERLAND

Specification of route segments

$a_g a_g$	*Routes*	*Reference height above mean sea level*
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
	Groups of routes	
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)*
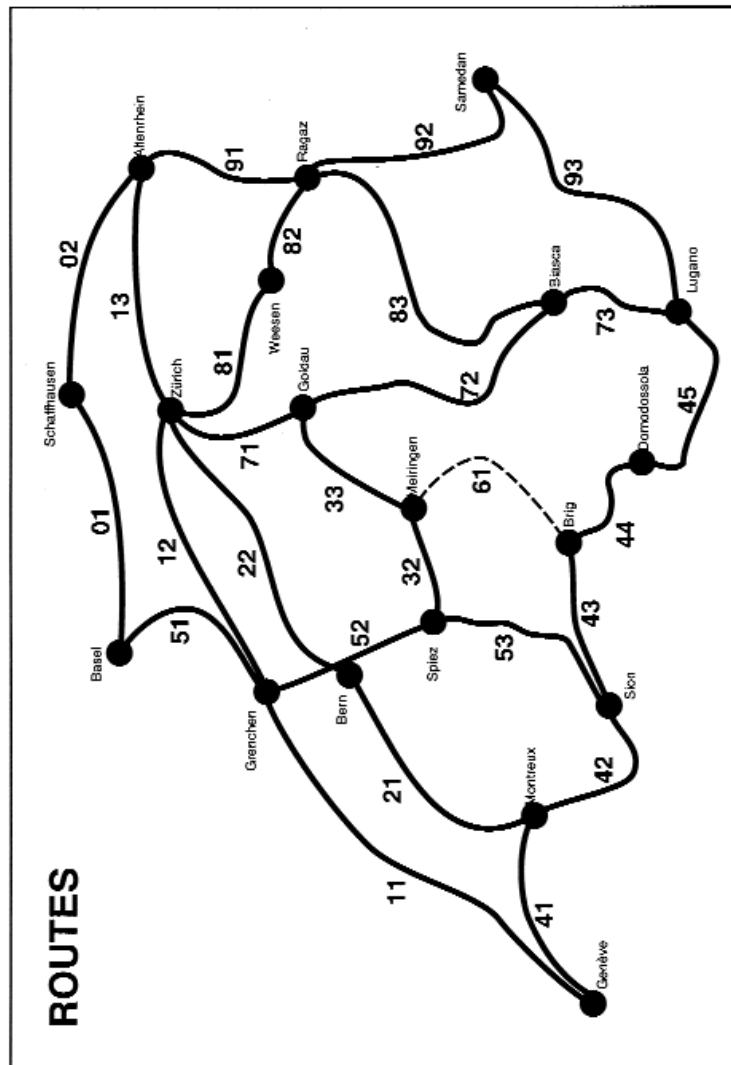
ROUTES

BOSNIA AND HERZEGOVINA
CROATIA
SLOVENIA
THE FORMER YUGOSLAV REPUBLIC
OF MACEDONIA
YUGOSLAVIA

Specification of route segments

$a_g a_g$	*Route segments*	*Reference height – m (ft)*
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 – Vrlika	60 (200)
47	Split – Livno	120 (400) Split, 730 (2400) 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)

BOSNIA AND HERZEGOVINA
CROATIA
SLOVENIA
THE FORMER YUGOSLAV REPUBLIC
OF MACEDONIA
YUGOSLAVIA *(continued)*

Route segments
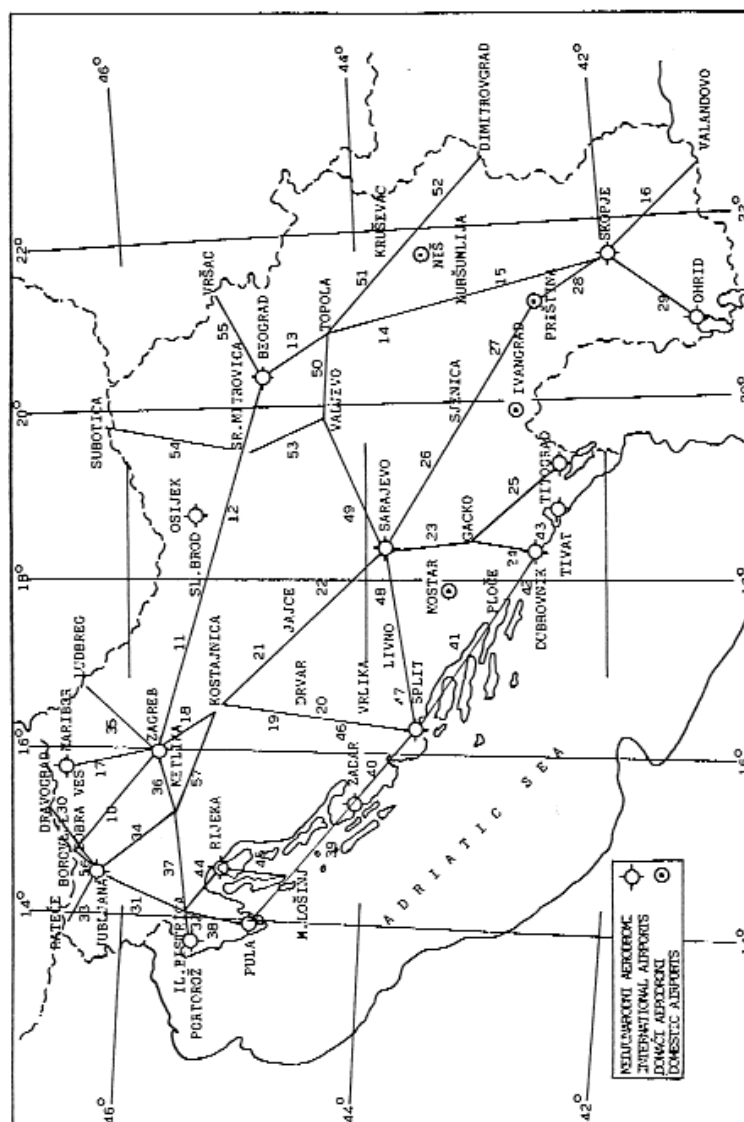
CHAPTER VII

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**

————————

A.1 — INTERNATIONAL CODE FORMS, NOTES AND REGULATIONS

FM 12 SYNOP and **FM 14** SYNOP MOBIL

(*a*) S e c t i o n   1

7/12.1   *Groups* $3P_0P_0P_0P_0$, 4PPPP *or* $4a_3hhh$

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 $4a_3hhh$ 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 $4a_3hhh$ 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 $3P_0P_0P_0P_0$ shall be included in the synoptic report in accordance with Regulation 12.2.4.

7/12.2   *Group* $6RRRt_R$ (*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_R shall be coded 4 in the group i_Ri_xhVV and the group $6RRRt_R$ shall be omitted.

(*b*) S e c t i o n   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*) S e c t i o n   3

7/12.4   *Group* (0 . . . .)

7/12.4.1   This group shall be used in the form $0d_md_mf_mf_m$.

7/12.4.2   The group $0d_md_mf_mf_m$ 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.

7/12.5   *Group* $(1s_nT_xT_xT_x)$

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* $(2s_nT_nT_nT_n)$

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* $(5j_1j_2j_3j_4 \ (j_5j_6j_7j_8j_9))$

7/12.8.1   In the form 5EEEi_E and 55SSS $(j_5F_{24}F_{24}F_{24}F_{24})$, these groups shall be included at 0600 UTC by all stations capable of doing so.

7/12.8.2   In the form $56D_LD_MD_H$, this group shall be included whenever the direction of movement of clouds reported for C_L, C_M and/or C_H can be determined.

7/12.9   *Group* $(6RRRt_R)$ *(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 $7D_mD_LD_MD_H$.

7/12.10.2   The group $7D_mD_LD_MD_H$ 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_L, C_M and/or C_H can be determined.

7/12.11   *Group* $(8N_sCh_sh_s)$

One or more of these groups shall be reported when appropriate.

7/12.12   *Group* $(9S_PS_Ps_ps_p)$

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.

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 $9S_PS_Pw_1w_1$ 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* $(T'T'/T'_dT'_d)$

This group shall be included in the report whenever possible.

FM 32 PILOT and FM 34 PILOT MOBIL

7/32.1   *Part A*, S e c t i o n 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)
either	*or*	
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*, S e c t i o n 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.

7/32.3   *Part C*, S e c t i o n 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)
either	*or*	
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 Prevailing wind direction during the preceding six hours. (Code table 0700)
(7-group in Section 3 of FM 12)

(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.

$d_m d_m$ Direction of maximum wind (from which it blew) during the preceding six hours. (Code table 0877)
(0-group in Section 3 of FM 12)

(1) See Notes (1), (2), (3) under $f_m f_m$.

(2) See Note (1) under dd (Volume I.1 — Section B).

$f_m f_m$ Speed of maximum wind, in knots, observed during the preceding six hours.
(0-group in Section 3 of FM 12)

(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).

(2) For wind speeds of 100–199 knots inclusive, 50 is added to $d_m d_m$ meaning that 100 knots are to be added to the number of knots shown by $f_m f_m$.

(3) For wind speeds of 200–299 knots inclusive, the code group 00200 is added after the group $0 d_m d_m f_m f_m$ indicating that 200 knots are to be added to the number of knots shown by $f_m f_m$ in the 4-group. 50 is *not* added to $d_m d_m$.

HHHH   Elevation (exact or approximate), in metres, of the MOBIL station at the time of observation.
(RF 7/01)

I_5 Indicator of the accuracy of elevation indication. (Code table 746)
(RF 7/01)

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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_5

746

I_5 — *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

$6RRRt_R$

In reports from stations which do not make observations every six hours, t_R indicates the duration of the period of reference.

$7wwW_1W_2$

The period normally covered by W_1, W_2 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:

(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

(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.

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E — NATIONAL CODE FORMS

No information available.

F — LIST OF BASIN INDICATORS (BB) AND INDICATORS OF COUNTRIES (C_i) USED IN INTERNATIONAL HYDROLOGICAL CODES

No list of indicators used in international hydrological codes has been established for use in the Antarctic.

APPENDIX

ICE AND SATELLITE EPHEMERIS CODES

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	$1A_BS_BT_BK_B$	$2A_BS_BT_BK_B$	.....	$nA_BS_BT_BK_B$
	BB	$1A_BS_BT_BK_B$	$2A_BS_BT_BK_B$	.....	$nA_BS_BT_BK_B$
	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_B — *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

N o t e : The higher code figure has greater priority in reporting.

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* 9+/10 means 10/10 ice concentration with small openings.

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

N o t e : 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 – 500-2000 metres across
4	Vast or giant ice floes – more than 2000 metres across – *or level ice*
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

N o t e s :

(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.

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

N o t e s :

(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.

N o t e s :

(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

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.*

APPENDIX

ICE AND SATELLITE EPHEMERIS CODES

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

$0N_rN_rN_rN_r$	$0Y_rY_rG_rG_r$	$0g_rg_rs_rs_r$	$Q_rL_oL_oL_oL_o$	$Tggss$
$N_4N_4N_4N_4G_4$	$G_4g_4g_4s_4s_4$	$Q_4L_oL_oL_oL_o$	$LL_oL_oL_oL_o$
$N_8N_8N_8N_8G_8$	$G_8g_8g_8s_8s_8$	$Q_8L_oL_oL_oL_o$
$N_{12}N_{12}N_{12}N_{12}G_{12}$	$G_{12}g_{12}g_{12}s_{12}s_{12}$	$Q_{12}L_oL_oL_oL_o$

NIGHT PART II

$02Z_{02}Z_{02}Q_{02}$	$04Z_{04}Z_{04}Q_{04}$	$L_aL_aL_oL_o$
$06Z_{06}Z_{06}Q_{06}$	$08Z_{08}Z_{08}Q_{08}$	$L_aL_aL_oL_o$
$10Z_{10}Z_{10}Q_{10}$	. . . . . to terminator (near North Pole)	$L_aL_aL_oL_o$

NIGHT PART III

$02Z_{02}Z_{02}Q_{02}$	$04Z_{04}Z_{04}Q_{04}$	$L_aL_aL_oL_o$
$06Z_{06}Z_{06}Q_{06}$	$08Z_{08}Z_{08}Q_{08}$	$L_aL_aL_oL_o$
$10Z_{10}Z_{10}Q_{10}$	. . . . . to terminator (near South Pole)	$L_aL_aL_oL_o$

DAY PART II

$28Z_{28}Z_{28}Q_{28}$	$30Z_{30}Z_{30}Q_{30}$	$L_aL_aL_oL_o$
$32Z_{32}Z_{32}Q_{32}$	. . . . . to last point north of Equator	$L_aL_aL_oL_o$

DAY PART III

$56Z_{56}Z_{56}Q_{56}$	$58Z_{58}Z_{58}Q_{58}$	$L_aL_aL_oL_o$
$60Z_{60}Z_{60}Q_{60}$	. . . . . to terminator (near South Pole)	$L_aL_aL_oL_o$

PART IV

AAAAAAAA   BBBBB   CCCCCCCCCC   DDEEFFGGHHIIIII   JJJJJJ   KKKKKKK   LLLLLLL
MMMMMMMM   NNNNNNNN   00000000   PPPPPPP   QQQQQQQ   RRRRRRR   SSSSSSSSS
TTTTTTTTT   UUUUUUUU   VVVVVVV   WWWWWWW   XXXXXXXX   YYYYYYYY   ZZZaaabbb
cccc dddddddd   eeeeeee   ffffffff   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 XXXXX.XXX
(ADDITIONAL PLAIN-LANGUAGE REMARKS WHEN NEEDED)

For daylight ascending satellites the code form is the following:

TBUS 2 KWBC
APT PREDICT
MMYYSS

PART I

$0N_rN_rN_rN_r$ $0g_rg_rs_rs_r$ $Q_rL_oL_oL_oL_o$ Tggss $LL_oL_oL_oL_o$
$N_4N_4N_4N_4G_4$ $G_4G_4G_4s_4s_4$ $Q_4L_oL_oL_oL_o$
$N_8N_8N_8N_8G_8$ $G_8G_8G_8s_8s_8$ $Q_8L_oL_oL_oL_o$
$N_{12}N_{12}N_{12}N_{12}G_{12}$ $G_{12}G_{12}G_{12}s_{12}s_{12}$ $Q_{12}L_oL_oL_oL_o$

NIGHT PART II

$28Z_{28}Z_{28}Q_{28}$ $30Z_{30}Z_{30}Q_{30}$ $L_aL_aL_oL_oL_o$
$32Z_{32}Z_{32}Q_{32}$ $L_aL_aL_oL_oL_o$ . . . . . to last point north of Equator

NIGHT PART III

$56Z_{56}Z_{56}Q_{56}$ $58Z_{58}Z_{58}Q_{58}$ $L_aL_aL_oL_oL_o$
$60Z_{60}Z_{60}Q_{60}$ $L_aL_aL_oL_oL_o$ . . . . . to terminator (near South Pole)

DAY PART II

$02Z_{02}Z_{02}Q_{02}$ $04Z_{04}Z_{04}Q_{04}$ $L_aL_aL_oL_oL_o$
$06Z_{06}Z_{06}Q_{06}$ $08Z_{08}Z_{08}Q_{08}$ $L_aL_aL_oL_oL_o$
$10Z_{10}Z_{10}Q_{10}$ $L_aL_aL_oL_oL_o$ . . . . . to terminator (near North Pole)

DAY PART III

$02Z_{02}Z_{02}Q_{02}$ $04Z_{04}Z_{04}Q_{04}$ $L_aL_aL_oL_oL_o$
$06Z_{06}Z_{06}Q_{06}$ $08Z_{08}Z_{08}Q_{08}$ $L_aL_aL_oL_oL_o$
$10Z_{10}Z_{10}Q_{10}$ $L_aL_aL_oL_oL_o$ . . . . . to terminator (near South Pole)

PART IV

```
AAAAAAAA   BBBBB   CCCCCCCCCC   DDEEFFGGHHIIIII   JJJJJJ   KKKKKKKK   LLLLLLLL
MMMMMMMM   NNNNNNNN   00000000   PPPPPPPP   QQQQQQQQ   RRRRRRRR   SSSSSSSSSS
TTTTTTTT   UUUUUUUU   VVVVVVV   WWWWWWWWW   XXXXXXXXX   YYYYYYYY   ZZZaaabbb
cccc dddddddd   eeeeeeee   fffffff   ggggggg   hh......zz
```

APT TRANSMISSION FREQUENCY XXX.XX MHz
HRPT TRANSMISSION FREQUENCY XXXX.XX MHz
BEACON (DSB) TRANSMISSION FREQUENCY XXXX.XX MHz
APT DAY X/X APT NIGHT X/X
DCS TIME DDD XXXXX.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.
$N_rN_rN_rN_r$	Number of reference orbit. (N o t e : Information in Parts II and III is also related to this reference orbit.)
Y_rY_r	Reference orbit Equator-crossing time (UTC), satellite northbound:
G_rG_r	Day of month.
g_rg_r	Hour.
	Minutes.
s_rs_r	Seconds.
	N o t e : In TBUS-1, northbound Equator crossing takes place on *night* side of orbit. In TBUS-2, northbound Equator crossing takes place on *day* side of orbit.
Q_r	Octant satellite is entering after crossing Equator on reference orbit. (Code table 3300)
$L_oL_oL_oL_o$	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").

$L_oL_oL_oL_o$ — Degrees and hundredths of degrees longitude between successive Equator crossings.

$N_4N_4N_4N_4$ — Orbit number of fourth orbit following reference orbit.

G_4G_4
g_4g_4
s_4s_4
Hour
Minutes } Time of fourth orbit following reference orbit.
Seconds

Q_4 — Octant satellite is entering after crossing Equator on fourth orbit after reference orbit.

$L_oL_oL_oL_o$ — Equator-crossing longitude of fourth orbit after reference orbit.

(Above information is repeated for eighth ($N_8N_8N_8N_8$) 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.

$L_aL_aL_a$ — Latitude of satellite sub-point, in degrees and tenths of a degree, at two minutes after Equator crossing.

$L_oL_oL_o$ — 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.

$L_aL_aL_a$ — Latitude of satellite sub-point, in degrees and tenths of a degree, at two minutes before Equator crossing.

$L_oL_oL_o$ — 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.)

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.

$L_aL_aL_a$ Latitude of satellite sub-point, in degrees and tenths of a degree, at 28 minutes after Equator crossing.

$L_oL_oL_o$ 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.)

N o t e : 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.

AAAAAAAAA   Spacecraft identification (international designator — see *COSPAR Guide to Rocket and Satellite Information and Data Exchange*, Information Bulletin No. 9, July 1962).

BBBBB   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.

IIIII   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.

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.

SSSSSSSS — Sign and epoch X position component (kilometres), to four decimal places.

TTTTTTTT — Sign and epoch Y position component (kilometres), to four decimal places.

UUUUUUUU — Sign and epoch Z position component (kilometres), to four decimal places.

VVVVVVVV — Sign and epoch X velocity (Xdot) component (km s^{-1}), to six decimal places.

WWWWWWWW — Sign and epoch Y velocity (Ydot) component (km s^{-1}), to six decimal places.

XXXXXXXX — Sign and epoch Z velocity (Zdot) component (km s^{-1}), to six decimal places.

YYYYYYYY — Ballistics coefficient CD-A/M (m^2 kg^{-1}), to eight decimal places.

ZZZ — Daily solar flux value (10.7 centimetres) [10^{-7} W m^{-2}].

aaa — 90-day running mean of solar flux [10^{-7} W m^{-2}].

bbb — Planetary magnetic index [2 x 10^{-5} gauss].

cccc — Drag modulation coefficient, to four decimal places.

dddddddd — Radiation pressure coefficient, to 10 decimal places.

eeeeeeee — Sign and perigee motion day/day, to five decimal places.

ffffffff — Sign and motion of right ascension of the ascending node, in degrees per day, to five decimal places.

gggggggg — 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:

hhhhhhhh — Equator crossing longitude of the epoch reference orbit, measured as East longitude, to five decimal places.

iiiiiiii — Month, day, and year (MMDDYY) of the last TIP* clock correction.

jjjjjjjj — 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**.

mmmmmmmm — Month, day, and year (MMDDYY) of the measured clock error rate.

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).

_____

*   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 $g_s g_s g_s g_s g_s$ $L_o L_o III$ $Y_1 Y_1 n_1 G_1 G_1$ $g_1 g_1 s_1 s_1 s_1$ $QL_o L_o II$ $Y_1 Y_1 n_7 G_7 G_7$

$g_7 g_7 s_7 s_7 s_7$ $QL_o L_o II$ $Y_2 Y_2 n_1 G_1 G_1$ $g_1 g_1 s_1 s_1 s_1$ $QL_o L_o II$ $Y_2 Y_2 n_7 G_7 G_7$

$g_7 g_7 s_7 s_7 s_7$ $QL_o L_o II$ ....

$Y_n Y_n n_1 G_1 G_1$ $g_1 g_1 s_1 s_1 s_1$ $QL_o L_o II$ $Y_n Y_n n_7 G_7 G_7$ $g_7 g_7 s_7 s_7 s_7$ $QL_o L_o II$

Section 2   222   NNNNN   JUMMY $YG_1 G_1 g_1 g_1$ $s_1 s_1 s_1 s_1 s_1$ $s_1 L_o L_o L_o L_o$ $L_o L_o L_o L_o L_o$

$P_d P_d P_d P_d P_d$ $P_d P_d P_d P_d P_d$ $e_s e_s e_s e_s e_s$ $e_s e_s e_s e_s e_s$ $A_p A_p A_p A_p A_p$

$A_p A_p A_p A_p A_p$ $K_a K_a K_a K_a K_a$ $K_a K_a K_a K_a K_a$ $i_o i_o i_o i_o i_o$ $i_o i_o i_o i_o i_o$

$b_a b_a b_a b_a b_a$ $b_a b_a b_a b_a b_a$ $X_c s_r xxx$ xxxxx $i_o i_o i_o i_o i_o$

$Z_c s_r ZZZ$ ZZZZZ $s_r V_x V_x V_x V_x$ $V_x V_x V_x V_x V_x$ $Y_c s_r yyy$ yyyyy

$s_r V_z V_z V_z V_z$ $V_z V_z V_z V_z V_z$ $b_c b_c b_c b_c b_c$ $b_c b_c b_c b_c b_c$ $s_r V_y V_y V_y V_y$ $V_y V_y V_y V_y V_y$

$S_m P_m P_m P_m P_m$ $C_m C_m C_m C_m C_m$ $r_p r_p r_p r_p r_p$ $r_p r_p r_p r_p r_p$ $(S_s S_s S_s S_s S_s$

$m_p m_p m_p m_p m_p$ $s_r m_u m_u m_u m_u$ $m_u m_u m_u m_u m_u)$ $s_r m_p m_p m_p m_p$

Section 3   333 $g_f g_f H_s H_s H_s$ $QL_a L_a II$ $L_o L_o II0$ $g_f g_f H_s H_s H_s$ $QL_a L_a II$

$g_f g_f H_s H_s H_s$ $QL_a L_a II$ $L_o L_o II0$ ....

Section 4   (444 $I_3 I_4 I_4 g_d g_d$ $8MMY_1 Y_1$ $G_s G_s g_s g_s g_s$ ...... $8MMY_2 Y_2$

$G_s G_s g_s g_s g_s$ $8MMY_n Y_n$ $G_s G_s g_s g_s g_s$ ....

...... $8MMY_n Y_n$ $G_s G_s g_s g_s g_s$ ...... $I_3 I_4 I_4 g_d g_d$

$8MMY_1 Y_1$ $G_s G_s g_s g_s g_s$ $G_s G_s g_s g_s g_s$ $8MMY_2 Y_2$ $G_s G_s g_s g_s g_s$

...... $G_s G_s g_s g_s g_s$ ....

$8MMY_n Y_n$ $G_s G_s g_s g_s g_s$ ....

...... $G_s G_s g_s g_s g_s$ ....)

Section 5   555   Plain language

SATELLITE EPHEMERIS CODES

N O T E S :

(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:

Section number	Symbolic figure group	Content
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 0UJMM 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 0UJMM 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 $g_s g_s s_s s_s s_s$ indicates the satellite's period and group $L_o L_o III$ the longitude increment.

1.2.2.3   Groups $Y_1 Y_1 n_1 G_1 G_1$ $g_1 g_1 s_1 s_1 s_1$ $QL_o L_o II$ — $Y_n Y_n n_1 G_1 G_1$ $g_1 g_1 s_1 s_1 s_1$ $QL_o L_o II$ indicate daily data on the ascending node for the first daily pass, an groups $Y_1 Y_1 n_7 G_7 G_7$ $g_7 g_7 s_7 s_7 s_7$ $QL_o L_o II$ — $Y_n Y_n n_7 G_7 G_7$ $g_7 g_7 s_7 s_7 s_7$ $QL_o L_o II$ 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 $YG_1 G_1 g_1 g_1$ $s_1 s_1 s_1 s_1 s_1$ $L_o L_o L_o L_o L_o$ and $L_o L_o L_o L_o L_o$ 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 $YG_1 G_1 g_1 g_1$.

1.2.3.3   Groups $P_d P_d P_d P_d P_d$ and $P_d P_d P_d P_d P_d$ indicate the satellite's nodal period.

1.2.3.4   Groups $e_s e_s e_s e_s e_s$ and $e_s e_s e_s e_s e_s$ indicate the orbit's eccentricity, and groups $A_p A_p A_p A_p A_p$ and $A_p A_p A_p A_p A_p$ the argument of perigee.

1.2.3.5   Groups $K_a K_a K_a K_a K_a$ and $K_a K_a K_a K_a K_a$ indicate the right ascension of the ascending node, and groups $i_o i_o i_o i_o i_o$ and $i_o i_o i_o i_o i_o$ the orbit's inclination.

1.2.3.6   Groups $b_a b_a b_a b_a b_a$ and $b_a b_a b_a b_a b_a$ indicate the orbit's semi-major axis.

1.2.3.7   Groups $X_c s_r xxx$ $xxxxx$ $Y_c s_r yyy$ $yyyyy$ $Z_c s_r zzz$ and $zzzzz$ indicate the coordinates of the centre of the satellite's mass.

1.2.3.8   Groups $s_r V_x V_x V_x V_x$ $V_x V_x V_x V_x V_x$ $s_r V_y V_y V_y V_y$ $V_y V_y V_y V_y V_y$ $s_r V_z V_z V_z V_z$ and $V_z V_z V_z V_z V_z$ indicate the values of the velocity components on the x, y and z-axes.

1.2.3.9   Groups $b_c b_c b_c b_c b_c$ and $b_c b_c b_c b_c b_c$ indicate the ballistics coefficient.

1.2.3.10   If used, groups $(S_r S_r S_r S_r S_m S_m$ S_m $P_m P_m P_m P_m$ and $C_m C_m C_m C_m C_m)$ 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 $(r_p r_p r_p r_p r_p$ and $r_p r_p r_p r_p r_p)$ indicate the radiation pressure coefficient.

1.2.3.12   If used, groups $(s_r m_p m_p m_p m_p$ $m_p m_p m_p m_p m_p$ $s_r m_u m_u m_u m_u$ and $m_u m_u m_u m_u m_u)$ 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 $g_f g_f H_s H_s H_s$ $QL_a L_a II$ and $L_o L_o II0$ 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.

1.2.5.2   Group $I_3I_4I_9g_9g_d$ 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 $G_sG_sg_sg_sg_sg_s$ 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)*

N o t e : 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

0	Identifier figure
MM	Month of the year
JJ	Tens and units of the year
n_dn_d	Number of days covered by the forecast
I_1	Satellite-owning country (Code table 1)
I_2I_2	Number (series) of the satellite (for oceanographic satellites, 50 shall be added to the satellite number)
g_sg_s	Minutes of the satellite's nodal period (the hundreds figure shall be omitted)
$s_ss_ss_s$	Seconds and tenths of the satellite's nodal period
L_oL_o	Longitude increment, in whole degrees
lll	Thousandths of a degree
YY	Number of the month
n_1	First daily pass
G_1G_1	Time, in whole hours UTC, of the satellite's ascending node on the first daily pass
g_1g_1	Minutes of the time of the ascending node
$s_1s_1s_1$	Seconds and tenths of the time of the ascending node
n_7	Seventh daily pass
G_7G_7	Time, in whole hours UTC, of the satellite's ascending node on the seventh daily pass
g_7g_7	Minutes of the time of the ascending node
$s_7s_7s_7$	Seconds and tenths of the time of the ascending node
NNNNN	Number of the pass for which the orbital elements are being forecast

Symbol	Description
G_1G_1	Time, in whole hours UTC, of the ascending node of the orbit for which the orbital elements are being forecast
g_1g_1	Minutes of the ascending node
$s_1s_1s_1s_1s_1$	Seconds and thousandths of the ascending node
s_r	Sign of orbital element values (Code table 2)
$L_oL_oL_oL_o$ $L_oL_oL_oL_o$	Longitude of the ascending node of the orbit whose elements are being reported, to six decimal places
$P_dP_dP_dP_d$ $P_dP_dP_dP_d$	Nodal period (minutes), to seven decimal places
$e_se_se_se_se_s$ $e_se_se_se_se_s$	Eccentricity, to 10 decimal places
$A_pA_pA_pA_pA_p$ $A_pA_pA_pA_pA_p$	Argument of perigee (degrees), to seven decimal places
$K_aK_aK_aK_aK_a$ $K_aK_aK_aK_aK_a$	Right ascension of the ascending node (degrees), to seven decimal places
$i_oi_oi_oi_o$ $i_oi_oi_oi_o$	Inclination (degrees), to seven decimal places
$b_ab_ab_ab_a$ $b_ab_ab_ab_a$	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
$V_xV_xV_xV_x$ $V_xV_xV_xV_xV_x$	Sign of the X velocity component (km s^{-1}), to seven decimal places
$V_yV_yV_yV_y$ $V_yV_yV_yV_yV_y$	Sign of the Y velocity component (km s^{-1}), to seven decimal places
$V_zV_zV_zV_z$ $V_zV_zV_zV_zV_z$	Sign of the Z velocity component (km s^{-1}), to seven decimal places
$b_cb_cb_cb_cb_c$ $b_cb_cb_cb_cb_c$	Ballistics coefficient (m^3 kg^{-1} s^{-2}), to nine decimal places
$S_rS_rS_r$	Daily solar radiation flux value (10.7 centimetres) (10^{-22} W m^{-2} Hz^{-1})
$S_mS_mS_m$	90-day running mean of solar radiation flux (10^{-22} W m^{-2} Hz^{-1})
$P_mP_mP_m$	Planetary magnetic index (Kp)
$C_mC_mC_mC_m$	Drag modulation coefficient, to five decimal places
$r_pr_pr_pr_p$ $r_pr_pr_pr_p$	Radiation pressure coefficient, to 10 decimal places
$m_pm_pm_pm_p$ $m_pm_pm_pm_p$	Perigee motion day/day, in degrees per day, to five decimal places
$m_um_um_um_u$ $m_um_um_um_u$	Motion of the right ascension of the ascending node in degrees per day, to five decimal places

$g_f g_f$ — 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

= — Hundredths of a degree

$L_o L_o$ — Longitude of satellite sub-point (the hundreds figure shall be omitted)

= — 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_3 — *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_4I_4 — *Payload operating mode*

Code figure	Set	Channel	
11	1	1	
12	1	2	
13	1	3	
14	1	4	
15	1	5	
21	2	1	
22	2	2	
23	2	3	
24	2	4	
25	2	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

SATELLITE EPHEMERIS CODES

CODE TABLE 5

g_dg_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