CHAPTER 12

CODING

12.1 General

The coding standards in this chapter conform to WMO Code Forms METAR FM 15-IX Ext. and SPECI FM 16-IX Ext. and the United States Exceptions filed with the WMO. These exceptions reflect national observing practices which differ from practices outlined in the WMO *Manual on Codes* No. 306.

12.2 Scope

This chapter contains the standards for coding a weather observation in either aviation routine weather report (METAR) and/or aviation selected special weather report (SPECI) format.

12.3 METAR/SPECI Code

METAR or SPECI_CCCC_YYGGggZ_AUTO or COR_dddff(f)G$f_m f_m(f_m)$KT_$d_n d_n d_n V d_x d_x d_x$_
VVVVVSM_[$RD_R D_R/V_R V_R V_R V_R$FT or $RD_R D_R/V_N V_N V_N V_N VV_X V_X V_X V_X$FT]_w'w'_[$N_s N_s N_s h_s h_s h_s$ or $VVh_s h_s h_s$
or SKC/CLR]_T'T'/T'$_d$T'$_d$_A$P_H P_H P_H P_H$ _RMK_(Automated, Manual, Plain Language)_
(Additive Data and Automated Maintenance Indicators)

METAR/SPECI has two major sections: the Body (consisting of a maximum of 11 groups) and the Remarks (consisting of 2 categories). Together, the body and remarks make up the complete METAR/SPECI. In general, the remarks are coded in the order depicted above and established in the remainder of this chapter.

12.4 Format and Content of the METAR/SPECI

a. **Body of report.**

(1) Type of Report - **METAR/SPECI**
(2) Station Identifier - **CCCC**
(3) Date and Time of Report - **YYGGggZ**
(4) Report Modifier - **AUTO/COR**
(5) Wind - **dddff(f)G$f_m f_m(f_m)$KT_$d_n d_n d_n V d_x d_x d_x$**
(6) Visibility - **VVVVVSM**
(7) Runway Visual Range - **$RD_R D_R/V_R V_R V_R V_R$FT or $RD_R D_R/V_N V_N V_N V_N VV_X V_X V_X V_X$FT**
(8) Present Weather - **w'w'**
(9) Sky Condition - **$N_s N_s N_s h_s h_s h_s$ or $VVh_s h_s h_s$ or SKC/CLR**
(10) Temperature and Dew Point - **T'T'/T'$_d$T'$_d$**
(11) Altimeter - **A$P_H P_H P_H P_H$**

b. **Remarks section of report--RMK**

(1) Automated, Manual, and Plain Language
(2) Additive and Maintenance Data

The underline character "_" indicates a required space between the groups. If a group is not reported, the preceding space is also not reported. In addition to the format given, agencies shall provide for the inclusion of any special Beginning-of-Message, End-of-Message, or End-of-Transmission signals required by their communications system.

The actual content of a METAR or SPECI depends on the observation program at the individual station. At designated stations, the 0000, 0600, 1200, and 1800 Coordinated Universal Time (UTC) METAR's include additional data specified by the responsible agency and are known as 6-hourly reports. At designated stations, the 0300, 0900, 1500, and 2100 UTC METAR's are known as 3-hourly reports and also contain additional information specified by the responsible agency.

12.5 Coding Missing Data in METAR/SPECI

When an element does not occur, or cannot be observed, the corresponding group and preceding space are omitted from that particular report.

12.6 Coding the Body of the METAR/SPECI

12.6.1 Type of Report (METAR and SPECI). The type, **METAR** or **SPECI**, shall be included in all reports. The type of report shall be separated from elements following it by a space. Whenever SPECI criteria are met at the time of the routine METAR, the type of report shall be METAR.

12.6.2 Station Identifier (CCCC). The station identifier, **CCCC**, shall be included in all reports to identify the station to which the coded report applies. The station identifier shall consist of four alphabetic-only characters if the METAR/SPECI is transmitted long-line. The agency with operational control when the station is first established shall be responsible for coordinating the location identifier with the FAA. A list of approved identifiers can be found in the FAA Manual 7350 Series, *Location Identifiers*.

12.6.3 Date and Time of Report (YYGGggZ). The date, **YY**, and time, **GGgg**, shall be included in all reports. The time shall be the actual time of the report or when the criteria for a SPECI is met or noted (see paragraph 2.6.4). If the report is a correction to a previously disseminated report, the time of the corrected report shall be the same time used in the report being corrected. The date and time group always ends with a **Z** indicating Zulu time (or UTC). For example, METAR KDCA 210855Z would be the 0900 scheduled report from station KDCA taken at 0855 UTC on the 21st of the month.

12.6.4 Report Modifier (AUTO or COR). The report modifier, **AUTO,** identifies the METAR/SPECI as a fully automated report with no human intervention or oversight. In the event of a corrected METAR or SPECI, the report modifier, **COR**, shall be substituted in place of **AUTO**.

12.6.5 Wind Group (dddff(f)G$f_m f_m(f_m)$KT_$d_n d_n d_n V d_x d_x d_x$). The standards for observing and reporting wind are described in Chapter 5.

The wind direction, **ddd**, shall be coded in tens of degrees using three figures. Directions less than 100 degrees shall be preceded with a "0". For example, a wind direction of 90° is coded as "090". The wind speed, **ff(f)**, shall be coded in two or three digits immediately following the wind direction. The wind speed shall be coded, in whole knots, using the units and tens digits and, if required, the hundreds digit. Speeds of less than 10 knots shall be coded using a leading zero. The wind group shall always end with **KT** to indicate that wind speeds are reported in knots. For example, a wind speed of 8 knots shall be coded "08KT"; a wind speed of 112 knots shall be coded "112KT".

a. **Gust.** Wind gusts shall be coded in the format, **G$f_m f_m(f_m)$** (see paragraphs 5.4.4 and 5.5.4). The wind gust shall be coded in two or three digits immediately following the wind speed. The wind gust shall be coded, in whole knots, using the units and tens digits and, if required, the hundreds digit. For example, a wind from due west at 20 knots with gusts to 35 knots would be coded "27020G35KT".

b. **Variable Wind Direction (Speeds 6 knots or less).** Variable wind direction with wind speed 6 knots or less may be coded as **VRB** in place of the **ddd** (see paragraphs 5.4.2 and 5.5.3). For example, if the wind is variable at three knots, it would be coded "VRB03KT".

c. **Variable Wind Direction (Speeds greater than 6 knots).** Variable wind direction with wind speed greater than 6 knots shall be coded in the format, **$d_n d_n d_n V d_x d_x d_x$**. The variable wind direction group shall immediately follow the wind group (see paragraphs 5.4.2 and 5.5.3). The directional variability shall be coded in a clockwise direction. For example, if the wind is variable from 180° to 240° at 10 knots, it would be coded "21010KT 180V240".

d. **Calm Wind.** Calm wind shall be coded as "00000KT" (see paragraph 5.5.2).

12.6.6 Visibility Group (VVVVVSM). The standards for observing and reporting visibility are described in Chapter 6.

The surface visibility, **VVVVVSM**, shall be coded in statute miles using the values listed in Table 12-1. A space shall be coded between whole numbers and fractions of reportable visibility values. The visibility group shall always end with **SM** to indicate that the visibility is in statute miles. For example, a visibility of one and a half statute miles would be coded "1 1/2SM".

Automated stations shall use an **M** to indicate "less than" when reporting visibility. For example, "M1/4SM" means a visibility of less than one-quarter statute mile.

Table 12-1. Reportable Visibility Values

Source of Visibility Report							
Automated			Manual				
M1/4	2	9[a]	0	5/8	1 5/8	4	12
1/4	2 1/2	10	1/16	3/4	1 3/4	5	13
1/2	3		1/8	7/8	1 7/8	6	14
3/4	4		3/16	1	2	7	15
1	5		1/4	1 1/8	2 1/4	8	20
1 1/4	6[a]		5/16	1 1/4	2 1/2	9	25
1 1/2	7		3/8	1 3/8	2 3/4	10	30
1 3/4	8[a]		1/2	1 1/2	3	11	35[b]

a. These values may not be reported by some automated stations.
b. Further values in increments of 5 statute miles may be reported, i.e., 40, 45, 50, etc

12.6.7. Runway Visual Range Group ($RD_RD_R/V_RV_RV_RV_RFT$ or $RD_RD_R/V_nV_nV_nV_nVV_xV_xV_xV_xFT$). The standards for observing and reporting Runway Visual Range (RVR) are described in Chapter 7.

a. RVR shall be coded in the format $\mathbf{RD_RD_R/V_RV_RV_RV_RFT}$, where **R** indicates that the runway number follows, $\mathbf{D_RD_R}$ is the runway number (an additional $\mathbf{D_R}$ may be used for runway approach directions, such as **R** for right, **L** for left, and **C** for center), $\mathbf{V_RV_RV_RV_R}$ is the constant reportable value, and **FT** indicates that units of measurement are feet. A solidus "/" without spaces separates the runway number from the constant reportable value. For example, an RVR value for runway 01L of 800 feet would be coded "R01L/0800FT".

b. RVR that is varying shall be coded in the format, $\mathbf{RD_RD_R/V_nV_nV_nV_nVV_xV_xV_xV_xFT}$, where **R** indicates that the runway number follows, $\mathbf{D_RD_R}$ is the runway number (an additional $\mathbf{D_R}$ may be used for runway approach directions, such as **R** for right, **L** for left, and **C** for center), $\mathbf{V_nV_nV_nV_n}$ is the lowest reportable value in feet, **V** separates lowest and highest visual range values, $\mathbf{V_xV_xV_xV_x}$ is the highest reportable value, and **FT** indicates that units of measurement are feet. A solidus "/" without spaces separates the runway number from the reportable values. For example, the 10-minute RVR for runway 01L varying between 600 and 1,000 feet would be coded "R01L/0600V1000FT".

c. The values shall be based on light setting 5 at manual stations regardless of the light setting actually in use (see Appendix D). RVR values shall be coded in increments of 100 feet up to 1,000 feet, increments of 200 feet from 1,000 feet to 3,000 feet, and increments of 500 feet from 3,000 feet to 6,000 feet. Manual RVR shall not be reported below 600 feet. For automated stations, RVR may be reported from up to four designated runways.

d. If the RVR is less than its lowest reportable value, the $\mathbf{V_RV_RV_RV_R}$ or $\mathbf{V_nV_nV_nV_n}$ groups shall be preceded by **M**. If the RVR is greater than its highest reportable value, the $\mathbf{V_RV_RV_RV_R}$ or $\mathbf{V_xV_xV_xV_x}$ groups shall be preceded by a **P**. For example, an RVR for runway 01L of less than 600 feet will be coded "R01L/M0600FT"; an RVR for runway 27 of greater than 6,000 feet will be coded "R27/P6000FT".

12.6.8 <u>Present Weather Group</u> (w'w'). The standards for observing and reporting present weather are described in Chapter 8.

The appropriate notations found in Table 12-2 shall be used to code present weather.

Table 12-2. Notations for Reporting Present Weather[1]

QUALIFIER		WEATHER PHENOMENA		
INTENSITY OR PROXIMITY 1	**DESCRIPTOR** 2	**PRECIPITATION** 3	**OBSCURATION** 4	**OTHER** 5
- Light	**MI** Shallow	**DZ** Drizzle	**BR** Mist	**PO** Well-Developed Dust/Sand Whirls
Moderate[2]	**PR** Partial	**RA** Rain	**FG** Fog	
+ Heavy	**BC** Patches	**SN** Snow	**FU** Smoke	**SQ** Squalls
VC In the Vicinity[3]	**DR** Low Drifting	**SG** Snow Grains	**VA** Volcanic Ash	**FC** Funnel Cloud Tornado Waterspout[4]
	BL Blowing	**IC** Ice Crystals	**DU** Widespread Dust	
	SH Shower(s)	**PL** Ice Pellets	**SA** Sand	**SS** Sandstorm
	TS Thunderstorm	**GR** Hail	**HZ** Haze	**DS** Duststorm
	FZ Freezing	**GS** Small Hail and/or Snow Pellets	**PY** Spray	
		UP Unknown Precipitation		

1. The weather groups shall be constructed by considering columns 1 to 5 in the table above in sequence, i.e., intensity, followed by description, followed by weather phenomena, e.g., heavy rain shower(s) is coded as +SHRA
2. To denote moderate intensity no entry or symbol is used.
3. See paragraph 8.4.1.a.(2), 8.5, and 8.5.1 for vicinity definitions.
4. Tornadoes and waterspouts shall be coded as +FC.

The following general rules apply when coding present weather for a METAR or SPECI:

- Weather occurring at the point of observation (at the station) or in the vicinity of the station shall be coded in the body of the report; weather observed but not occurring at the point of observation (at the station) or in the vicinity of the station shall be coded in Remarks.
- With the exceptions of volcanic ash, low drifting dust, low drifting sand, low drifting snow, shallow fog, partial fog, and patches (of) fog, an obscuration shall be coded in the body of the report if the surface visibility is less than 7 miles or considered operationally significant. Volcanic ash shall always be coded when observed.
- Separate groups shall be used for each type of present weather. Each group shall be separated from the other by a space. METAR/SPECI shall contain no more than three present weather groups.
- The weather groups shall be constructed by considering columns 1 to 5 in Table 12-2 in sequence, i.e., intensity, followed by description, followed by weather phenomena, e.g., heavy rain shower(s) is coded as +SHRA.

a. **Intensity or Proximity Qualifier**.

(1) Intensity shall be coded with precipitation types, except ice crystals (**IC**), hail (**GR** or **GS**), and unknown precipitation (**UP**) including those associated with a thunderstorm (**TS**) and those of a showery nature (**SH**). Tornadoes and waterspouts shall be coded as **+FC**. No intensity shall be ascribed to the obscurations of blowing dust (**BLDU**), blowing sand **(BLSA**), and blowing snow (**BLSN**). Only moderate or heavy intensity shall be ascribed to sandstorm (**SS**) and duststorm (**DS**).

(2) The proximity qualifier for vicinity, **VC**, (weather phenomena observed in the vicinity of but not at the point(s) of observation) shall be coded in combination with thunderstorm (**TS**), fog (**FG**), shower(s) (**SH**), well-developed dust/sand whirls (**PO**), blowing dust (**BLDU**), blowing sand (**BLSA**), blowing snow (**BLSN**), sandstorm (**SS**), and duststorm (**DS**). Intensity qualifiers shall not be coded with **VC**.

VCFG shall be coded to report any type of fog in the vicinity of the point(s) of observation.

Precipitation not occurring at the point of observation but within 10 statute miles shall be coded as showers in the vicinity (**VCSH**).

b. **Descriptor Qualifier.** Only one descriptor shall be coded for each weather phenomena group, e.g., "-FZDZ". Mist (**BR**) shall not be coded with any descriptor.

(1) The descriptors shallow (**MI**), partial (**PR**), and patches (**BC**) shall only be coded with **FG**, e.g., "MIFG".

(2) The descriptors low drifting (**DR**) and blowing (**BL**) shall only be coded with dust (**DU**), sand (**SA**), and snow (**SN**), e.g., "BLSN" or "DRSN". **DR** shall be coded for **DU**, **SA**, or **SN** raised by the wind to less than six feet above the ground.

When blowing snow is observed with snow falling from clouds, both phenomena are reported, e.g., "SN BLSN". If there is blowing snow and the observer cannot determine whether or not snow is also falling, then **BLSN** shall be reported. **PY** shall be coded only with blowing (**BL**).

(3) The descriptor shower(s) (**SH**) shall be coded only with one or more of the precipitation types of rain (**RA**), snow (**SN**), ice pellets (**PL**), small hail (**GS**), or large hail (**GR**). The **SH** descriptor indicates showery-type precipitation. When any type of precipitation is coded with **VC**, the intensity and type of precipitation shall not be coded.

(4) The descriptor thunderstorm (**TS**) may be coded by itself, i.e., a thunderstorm without associated precipitation, or it may be coded with the precipitation types of rain (**RA)**, snow (**SN**), ice pellets (**PL**), small hail and/or snow pellets (**GS**), or hail (**GR**). For example, a thunderstorm with snow and small hail and/or snow pellets would be coded as "TSSNGS". **TS** shall not be coded with **SH**.

(5) The descriptor freezing (**FZ**) shall only be coded in combination with fog (**FG)**, drizzle (**DZ**), or rain (**RA**), e.g., "FZRA". **FZ** shall not be coded with **SH**.

c. **Precipitation.** Up to three types of precipitation may be coded in a single present weather group. They shall be coded in order of decreasing dominance based on intensity.

(1) Drizzle shall be coded as **DZ**; rain shall be coded as **RA**; snow shall be coded as **SN**; snow grains shall be coded as **SG**; ice crystals shall be coded as **IC**; ice pellets shall be coded as **PL**, hail shall be coded as **GR**, and small hail and/or snow pellets shall be coded as **GS**.

(2) At automated stations, precipitation of unknown type shall be coded as **UP**.

d. **Obscuration.**

(1) Mist shall be coded as **BR**; fog shall be coded as **FG**; smoke shall be coded as **FU**; volcanic ash shall be coded as **VA**; widespread dust shall be coded as **DU**; sand shall be coded as **SA**; and haze shall be coded as **HZ**.

(2) Shallow fog (**MIFG)**, patches (of) fog (**BCFG**), and partial fog (**PRFG**) may be coded with prevailing visibility of 7 statute miles or greater.

(3) Spray (**PY**) shall be coded only as **BLPY**.

e. **Other Weather Phenomena**

(1) Well-developed dust/sand whirls shall be coded as **PO**; squalls shall be coded as **SQ**; sandstorm shall be coded as **SS**; and duststorm shall be coded as **DS**.

(2) Tornadoes and waterspouts shall be coded as +**FC.** Funnel clouds shall be coded as **FC**.

12.6.9 Sky Condition Group ($N_sN_sN_sh_sh_sh_s$ or $VVh_sh_sh_s$ or SKC/CLR). The standards for observing and reporting sky condition are described in Chapter 9.

a. Sky condition shall be coded in the format, $N_sN_sN_sh_sh_sh_s$, where $N_sN_sN_s$ is the amount of sky cover and $h_sh_sh_s$ is the height of the layer. There shall be no space between the amount of sky cover and the height of the layer. Sky condition shall be coded in an ascending order up to the first overcast layer. At mountain stations, if the layer is below station level, the height of the layer shall be coded as ///.

b. Vertical visibility shall be coded in the format, $VVh_sh_sh_s$, where **VV** identifies an indefinite ceiling and $h_sh_sh_s$ is the vertical visibility into the indefinite ceiling (see paragraphs 9.4.4, 9.4.7, and 9.5.5). There shall be no space between the group identifier and the vertical visibility.

c. Clear skies shall be coded in the format, **SKC** or **CLR**, where **SKC** is the abbreviation used by manual stations to indicate no layers are present and **CLR** is the abbreviation used by automated stations to indicate no layers are detected at or below 12,000 feet (see paragraph 9.5.4).

Each layer shall be separated from other layers by a space. The sky cover for each layer reported shall be coded by using the appropriate reportable contraction from Table 12-3. The report of clear skies (**SKC** or **CLR**) are complete layer reports within themselves. The abbreviations **FEW**, **SCT**, **BKN**, and **OVC** shall be followed, without a space, by the height of the layer.

Table 12-3. Contractions for Sky Cover

Reportable Contraction	Meaning	Summation Amount of Layer
VV	Vertical Visibility	8/8
SKC or **CLR**[1]	Clear	0
FEW[2]	Few	1/8 - 2/8
SCT	Scattered	3/8 - 4/8
BKN	Broken	5/8 - 7/8
OVC	Overcast	8/8

1. The abbreviation **CLR** shall be used at automated stations when no layers at or below 12,000 feet are reported; the abbreviation **SKC** shall be used at manual stations when no layers are reported.
2. Any layer amount less than 1/8 is reported as FEW.

The height of the base of each layer, $\mathbf{h_s h_s h_s}$, shall be coded in hundreds of feet above the surface using three digits in accordance with Table 12-4.

Table 12-4. Increments of Reportable Values of Sky Cover Height

Range of Height Values (feet)	Reportable Increment (feet)
#5,000	To nearest 100
>5,000 but #10,000	To nearest 500
>10,000	To nearest 1,000

At manual stations, cumulonimbus (**CB**) or towering cumulus (**TCU**) shall be appended to the associated layer. For example, a scattered layer of towering cumulus at 1,500 feet would be coded "SCT015TCU" and would be followed by a space if there were additional higher layers to code.

12.6.10 Temperature/Dew Point Group ($\mathbf{T'T'/T'_dT'_d}$). The standards for observing and reporting temperature and dew point are given in Chapter 10. The temperature shall be separated from the dew point with a solidus "/".

The temperature and dew point shall be coded as two digits rounded to the nearest whole degree Celsius (see paragraph 2.6.3). For example, a temperature of 0.3°C would be coded as "00". Sub-zero temperatures and dew points shall be prefixed with an **M**. For example, a temperature of 4°C with a dew point of -2°C would be coded as "04/M02"; a temperature of -0.5°C would be coded as "M00".

If the temperature is not available, the entire temperature/dew point group shall not be coded. If the dew point is not available, the temperature shall be coded followed by a solidus "/" and no entry made for dew point. For example, a temperature of 1.5°C and a missing dew point would be coded as "02/".

12.6.11 Altimeter ($AP_HP_HP_HP_H$). The standards for observing and reporting altimeter are described in Chapter 11.

The altimeter group always starts with an **A** (the international indicator for altimeter in inches of mercury). The altimeter shall be coded as a four digit group immediately following the **A** using the tens, units, tenths, and hundredths of inches of mercury. The decimal point is not coded.

12.7 Remarks (RMK)

Remarks shall be included in all METAR and SPECI, if appropriate.

Remarks shall be separated from the body of the report by a space and the contraction **RMK**. If there are no remarks, the contraction **RMK** is not required.

METAR/SPECI remarks fall into 2 categories: (1) Automated, Manual, and Plain Language (see paragraph 12.7.1), and (2) Additive and Maintenance Data (see paragraph 12.7.2).

Remarks shall be made in accordance with the following:

a. Where plain language is called for, authorized contractions, abbreviations, and symbols should be used to conserve time and space. However, in no case should an essential remark, of which the observer is aware, be omitted for the lack of readily available contractions. In such cases, the only requirement is that the remark be clear. For a detailed list of authorized contractions, see FAA Order 7340 Series, *Contractions*.

b. Time entries shall be made in minutes past the hour if the time reported occurs during the same hour the observation is taken. Hours and minutes shall be used if the hour is different, or this Handbook prescribes the use of the hour and minutes.

c. Present weather coded in the body of the report as **VC** may be further described, i.e., direction from the station, if known. Weather phenomena beyond 10 statute miles of the point(s) of observation shall be coded as distant (**DSNT**) followed by the direction from the station. For example, precipitation of unknown intensity within 10 statute miles east of the station would be coded as "VCSH E"; lightning 25 statute miles west of the station would be coded as "LTG DSNT W".

d. Distance remarks shall be statute miles except for automated lightning remarks which are in nautical miles.

e. Movement of clouds or weather, if known, shall be coded with respect to the direction toward which the phenomena is moving. For example, a thunderstorm moving toward the northeast would be coded as "TS MOV NE".

f. Directions shall use the eight points of the compass coded in a clockwise order.

g. Insofar as possible, remarks shall be entered in the order they are presented in the following paragraphs.

12.7.1 Automated, Manual, and Plain Language Remarks. These remarks generally elaborate on parameters reported in the body of the report. Automated and manual remarks may be generated either by an automated or manual station. Plain language remarks are only provided from manual stations.

a. **Volcanic Eruptions (Plain Language).** Volcanic eruptions shall be coded.

The remark shall be plain language and contain the following, if known:

(1) **Name** of volcano.

(2) **Latitude and longitude** or the direction and the approximate distance from the station.

(3) **Date/Time** (UTC) of the eruption.

(4) Size **description**, approximate height, and direction of movement **of the ash cloud**.

(5) Any **other pertinent data** about the eruption.

For example, a remark on a volcanic eruption would look like the following:

MT. AUGUSTINE VOLCANO 70 MILES SW ERUPTED 231505 LARGE ASH CLOUD EXTENDING TO APRX 30000 FEET MOVING NE.

Pre-eruption volcanic activity shall not be coded. Pre-eruption refers to unusual and/or increasing volcanic activity which could presage a volcanic eruption.

b. **Funnel Cloud (Tornadic activity_B/E(hh)mm_LOC/DIR_(MOV)).** At manual stations, tornadoes, funnel clouds, or waterspouts shall be coded in the format, **Tornadic activity_B/E(hh)mm_LOC/DIR_(MOV)**, where **TORNADO, FUNNEL CLOUD,** or **WATERSPOUT** identifies the specific tornadic activity, **B/E** denotes the beginning and/or ending time, **(hh)mm** is the time of occurrence (only the minutes are required if the hour can be inferred from the report time), **LOC/DIR** is the location and/or direction of the phenomena from the station, and **MOV** is the movement, if known (see paragraphs 8.3.3.c, 8.5.3.c, and 8.5.5.b). Tornadic activity shall be coded as the first remark after the "RMK" entry. For example, "TORNADO B13 6 NE" would indicate that a tornado, which began at 13 minutes past the hour, was 6 statute miles northeast of the station.

c. **Type of Automated Station (AO1 or AO2). AO1** or **AO2** shall be coded in all METAR/SPECI from automated stations. Automated stations without a precipitation discriminator shall be identified as **AO1**; automated station with a precipitation discriminator shall be identified as **AO2**.

d. **Peak Wind (PK_WND_dddff(f)/(hh)mm).** The peak wind shall be coded in the format, **PK_WND dddff(f)/(hh)mm** of the next METAR, where **PK_WND** is the remark identifier, **ddd** is the direction of the peak wind, **ff(f)** is the peak wind speed since the last METAR, and **(hh)mm** is the time of occurrence (only the minutes are required if the hour can be inferred from the report time) (see paragraphs 5.4.5 and 5.5.5). There shall be a space between the two elements of the remark identifier and the wind direction/speed group; a solidus "/" (without spaces) shall separate the wind direction/speed group and the time. For example, a peak wind of 45 knots from 280 degrees that occurred at 15 minutes past the hour would be coded "PK WND 28045/15".

e. **Wind Shift (WSHFT_(hh)mm).** A wind shift shall be coded in the format, **WSHFT**_(hh)mm, where **WSHFT** is the remark identifier and **(hh)mm** is the time the wind shift began (only the minutes are required if the hour can be inferred from the report time) (see paragraphs 5.4.6 and 5.5.6). The contraction **FROPA** may be entered following the time if it is reasonably certain that the wind shift was the result of a frontal passage. There shall be a space between the remark identifier and the time and, if applicable, between the time and the frontal passage contraction. For example, a remark reporting a wind shift accompanied by a frontal passage that began at 30 minutes after the hour would be coded as "WSHFT 30 FROPA".

f. **Tower or Surface Visibility (TWR_VIS_vvvvv or SFC_VIS_vvvvv).** Tower visibility or surface visibility (see paragraphs 6.5.4 and 6.5.5) shall be coded in the formats, **TWR_VIS_vvvvv** or **SFC_VIS_vvvvv,** respectively, where **vvvvv** is the observed tower/surface visibility value. A space shall be coded between each of the remark elements. For example, the control tower visibility of 1 1/2 statute miles would be coded "TWR VIS 1 1/2".

g. **Variable Prevailing Visibility (VIS_$v_nv_nv_nv_nv_n$V$v_xv_xv_xv_xv_x$).** Variable prevailing visibility shall be coded in the format **VIS_$v_nv_nv_nv_nv_n$V$v_xv_xv_xv_xv_x$**, where **VIS** is the remark identifier, **$v_nv_nv_nv_nv_n$** is the lowest visibility evaluated, **V** denotes variability between two values, and **$v_xv_xv_xv_xv_x$** is the highest visibility evaluated. There shall be one space following the remark identifier; no spaces between the letter **V** and the lowest/highest values. For example, a visibility that was varying between 1/2 and 2 statute miles would be coded "VIS 1/2V2" (see paragraphs 6.4.5 and 6.5.3).

h. **Sector Visibility (VIS_[DIR]_vvvvv) [Plain Language].** The sector visibility shall be coded in the format, **VIS_[DIR]_vvvvv,** where **VIS** is the remark identifier, [**DIR]** defines the sector to 8 points of the compass, and **vvvvv** is the sector visibility in statute miles, using the appropriate set of values in Table 12-1 (see paragraphs 6.4.6 and 6.5.7). For example, a visibility of 2 1/2 statute miles in the northeastern octant would be coded "VIS NE 2 1/2".

i. **Visibility At Second Location (VIS_vvvvv_[LOC]).** At designated automated stations, the visibility at a second location shall be coded in the format **VIS_vvvvv_[LOC]**, where **VIS** is the remark identifier, **vvvvv** is the measured visibility value, and **[LOC]** is the specific location of the visibility sensor(s) at the station (see paragraph 6.5.6). This remark shall only be generated when the condition is lower than that contained in the body of the report. For example, a visibility of 2 1/2 statute miles measured by a second sensor located at runway 11 would be coded "VIS 2 1/2 RWY11".

j. **Lightning (Frequency_LTG(type)_[LOC]).**

(1) When lightning is observed at a manual station, the frequency, type of lightning, and location shall be reported. The remark shall be coded in the format **Frequency_LTG(type)_[LOC]**. The contractions for the type and frequency of lightning shall be based on Table 12-5. The location and direction shall be coded in accordance with paragraph 12.7.c. For example, "OCNL LTGICCG OHD", "FRQ LTG VC", or "LTG DSNT W".

(2) When lightning is detected by an automated system:

(a) Within 5 nautical miles of the Airport Location Point (ALP), it will be reported as **TS** in the body of the report with no remark;

(b) Between 5 and 10 nautical miles of the ALP, it will be reported as **VCTS** in the body of the report with no remark;

(c) Beyond 10 but less than 30 nautical miles of the ALP, it will be reported in remarks only as **LTG DSNT** followed by the direction from the ALP.

Table 12-5. Type and Frequency of Lightning

Type of Lightning		
Type	**Contraction**	**Definition**
Cloud-ground	CG	Lightning occurring between cloud and ground.
In-cloud	IC	Lightning which takes place within the cloud.
Cloud-cloud	CC	Streaks of lightning reaching from one cloud to another.
Cloud-air	CA	Streaks of lightning which pass from a cloud to the air, but do not strike the ground.
Frequency of Lightning		
Frequency	**Contraction**	**Definition**
Occasional	OCNL	Less than 1 flash/minute.
Frequent	FRQ	About 1 to 6 flashes/minute.
Continuous	CONS	More than 6 flashes/minute.

k. **Beginning and Ending of Precipitation (w'w'B(hh)mmE(hh)mm).** At designated stations, the beginning and ending of precipitation shall be coded in the format, **w'w'B(hh)mmE(hh)mm**, where **w'w'** is the type of precipitation, **B** denotes the beginning, **E** denotes the ending, and **(hh)mm** is the time of occurrence (only the minutes are required if the hour can be inferred from the report time) (see paragraph 8.5.5.a). There shall be no spaces between the elements. The coded remarks are not required in SPECI and should be reported in the next METAR. Intensity qualifiers shall not be coded. For example, if rain began at 0005, ended at 0030, and snow began at 0020, and ended at 0055, the remarks would be coded "RAB05E30SNB20E55". If the precipitation were showery, the remark would be coded "SHRAB05E30SHSNB20E55".

l. **Beginning and Ending of Thunderstorms (TSB(hh)mmE(hh)mm).** The beginning and ending of thunderstorm(s) shall be coded in the format, **TSB(hh)mmE(hh)mm**, where **TS** indicates thunderstorm, **B** denotes the beginning, **E** denotes the ending, and **(hh)mm** is the time of occurrence (only the minutes are required if the hour can be inferred from the report time) (see paragraph 8.5.4). There shall be no spaces between the elements. For example, if a thunderstorm began at 0159 and ended at 0230, the remark would be coded "TSB0159E30".

m. **Thunderstorm Location (TS_LOC_(MOV_DIR)) [Plain Language].** Thunderstorm(s) shall be coded in the format, **TS_LOC_(MOV_DIR)**, where **TS** identifies the thunderstorm activity, **LOC** is the location of the thunderstorm(s) from the station, and **MOV_DIR** is the movement with direction, if known (see paragraph 8.4.1.b(5) and 8.5.4). For example, a thunderstorm southeast of the station and moving toward the northeast would be coded "TS SE MOV NE".

n. **Hailstone Size (GR_[size]) [Plain Language].** At designated stations, the hailstone size shall be coded in the format, **GR_[size]**, where **GR** is the remark identifier and **[size]** is the diameter of the largest hailstone. The hailstone size shall be coded in 1/4 inch increments (see paragraph 8.5.1.c(8)). For example, "GR 1 3/4" would indicate that the largest hailstones were 1 3/4 inches in diameter. If **GS** is coded in the body of the report, no hailstone size remark is required.

o. **Virga (VIRGA_(DIR)) [Plain Language].** Virga shall be coded in the format, **VIRGA_(DIR)**, where **VIRGA** is the remark identifier and **DIR** is the direction from the station. The direction of the phenomena from the station is optional, e.g., "VIRGA" or "VIRGA SW".

p. **Variable Ceiling Height (CIG_$h_nh_nh_n$V$h_xh_xh_x$).** The variable ceiling height shall be coded in the format, **CIG_$h_nh_nh_n$V$h_xh_xh_x$**, where **CIG** is the remark identifier, **$h_nh_nh_n$** is the lowest ceiling height evaluated, **V** denotes variability between two values, and **$h_xh_xh_x$** is the highest ceiling height evaluated (see paragraph 9.5.7 and Table 9-1). There shall be one space following the remark identifier; no spaces between the letter **V** and the lowest/highest ceiling values. For example, "CIG 005V010" would indicate a ceiling that was varying between 500 and 1,000 feet.

q. **Obscurations (w'w'_[$N_sN_sN_s$]$h_sh_sh_s$). [Plain Language]** Obscurations (surface-based or aloft) shall be coded in the format, **w'w'_[$N_sN_sN_s$]$h_sh_sh_s$**, where **w'w'** is the weather causing the obscuration at the surface or aloft, **$N_sN_sN_s$** is the applicable sky cover amount of the obscuration aloft (FEW, SCT, BKN, OVC) or at the surface (FEW, SCT, BKN), and **$h_sh_sh_s$** is the applicable height (see paragraphs 9.4.3 and 9.5.6). Surface-based obscurations shall have a height of "000". There shall be a space separating the weather causing the obscuration and the sky cover amount; there shall be no space between the sky cover amount and the height. For example, fog hiding 3-4 oktas of the sky would be coded "FG SCT000"; a broken layer at 2,000 feet composed of smoke would be coded "FU BKN020".

r. **Variable Sky Condition ($N_sN_sN_s$($h_sh_sh_s$)_V_$N_sN_sN_s$). [Plain Language]** The variable sky condition remark shall be coded in the format, **$N_sN_sN_s$($h_sh_sh_s$)_V_$N_sN_sN_s$**, where **$N_sN_sN_s$($h_sh_sh_s$)** and **$N_sN_sN_s$** identifies the two operationally significant sky conditions and **V** denotes the variability between the two ranges (see paragraphs 9.4.2.d and 9.5.9). If there are several layers with the same sky condition amount, the layer height **($h_sh_sh_s$)** of the variable layer shall be coded. For example, a cloud layer at 1,400 feet that is varying between broken and overcast would be coded "BKN014 V OVC".

s. **Significant Cloud Types [Plain Language].** The significant cloud type remark shall be coded in all reports in the following manner (see paragraphs 9.4.6 and 9.5.10):

(1) **Cumulonimbus or Cumulonimbus Mammatus (CB or CBMAM_LOC_(MOV_DIR).** Cumulonimbus or cumulonimbus mammatus, as appropriate, (for which no thunderstorm is being reported) shall be coded in the format, **CB** or **CBMAM_LOC_(MOV_DIR)**, where **CB** or **CBMAM** is the cloud type, **LOC** is the direction from the station, and **MOV_DIR** is the movement with direction (if known). The cloud type, location, movement, and direction entries shall be separated from each other with a space. For example, a CB up to 10 statute miles west of the station moving toward the east would be coded "CB W MOV E". If the CB was more than 10 statute miles to the west, the remark would be coded "CB DSNT W".

(2) **Towering cumulus (TCU_[DIR])**. Towering cumulus clouds shall be coded in the format, **TCU_[DIR]**, where **TCU** is the cloud type and **DIR** is the direction from the station. The cloud type and direction entries shall be separated by a space. For example, a towering cumulus cloud up to 10 statute miles west of the station would be coded "TCU W".

(3) **Altocumulus castellanus (ACC_[DIR])**. Altocumulus castellanus shall be coded in the format, **ACC_[DIR]**, where **ACC** is the cloud type and **DIR** is the direction from the station. The cloud type and direction entries shall be separated by a space. For example, an altocumulus cloud 5 to 10 statute miles northwest of the station would be coded "ACC NW".

(4) **Standing lenticular or Rotor clouds (CLD_[DIR]).** Stratocumulus (SCSL), altocumulus (ACSL), or cirrocumulus (CCSL), or rotor clouds shall be coded in the format, **CLD_[DIR]**, where **CLD** is the cloud type and **DIR** is the direction from the station. The cloud type and direction entries shall be separated by a space. For example, altocumulus standing lenticular clouds observed southwest through west of the station would be coded "ACSL SW–W"; an apparent rotor cloud 5 to 10 statute miles northeast of the station would be coded "APRNT ROTOR CLD NE"; and cirrocumulus clouds south of the station would be coded "CCSL S".

t. **Ceiling Height at Second Location (CIG_hhh_[LOC]).** At designated stations, the ceiling height at a second location shall be coded in the format, **CIG_hhh_[LOC]**, where **CIG** is the remark identifier, **hhh** is the measured height of the ceiling, and **[LOC]** is the specific location of the ceilometer(s) at the station (see paragraph 9.5.8). This remark shall only be generated when the ceiling is lower than that contained in the body of the report. For example, if the ceiling measured by a second sensor located at runway 11 is broken at 200 feet, the remark would be "CIG 002 RWY11".

u. **Pressure Rising or Falling Rapidly (PRESRR/PRESFR).** At designated stations, when the pressure is rising or falling rapidly at the time of observation (see paragraphs 11.4.6 and 11.5.5), the remark **PRESRR** (pressure rising rapidly) or **PRESFR** (pressure falling rapidly) shall be included in the report.

v. **Sea-Level Pressure (SLPppp).** At designated stations, the sea-level pressure shall be coded in the format **SLPppp**, where **SLP** is the remark identifier and **ppp** is the sea-level pressure in hectopascals (see paragraphs 11.4.4 and 11.5.4). For example, a sea-level pressure of 998.2 hectopascals would be coded as "SLP982". For a METAR, if sea-level pressure is not available, it is coded as "**SLPNO**".

w. **Aircraft Mishap (ACFT_MSHP) [Plain Language].** If a report is taken to document weather conditions when notified of an aircraft mishap, the remark **ACFT_MSHP** shall be coded in the report but not transmitted. The act of non-transmission shall be indicated by enclosing the remark in parentheses in the record, i.e., "(ACFT MSHP)".

x. **No SPECI Reports Taken (NOSPECI) [Plain Language].** At manual stations where SPECI's are not taken, the remark **NOSPECI** shall be coded to indicate that no changes in weather conditions will be reported until the next METAR.

y. **Snow Increasing Rapidly (SNINCR_[inches-hour/inches on ground]).** At designated stations, the snow increasing rapidly remark shall be reported, in the next METAR, whenever the snow depth increases by 1 inch or more in the past hour. The remark shall be coded in the format, **SNINCR [inches-hour/inches on ground]**, where **SNINCR** is the remark indicator, **inches-hour** is the depth increase in the past hour, and **inches on ground** is the total depth of snow on the ground at the time of the report. The depth increase in the past hour and the total depth on the ground are separated from each other by a solidus "/". For example, a snow depth increase of 2 inches in the past hour with a total depth on the ground of 10 inches would be coded "SNINCR 2/10".

z. **Other Significant Information [Plain Language].** Agencies may add to a report other information significant to their operations, such as information on fog dispersal operations, runway conditions, "FIRST" or "LAST" report from station, etc.

12.7.2 Additive and Automated Maintenance Data. Additive data groups are only reported at designated stations. The maintenance data groups are only reported from automated stations.

a. **Precipitation**

(1) **Amount of Precipitation.** The amount of liquid precipitation shall be coded as the depth of precipitation that accumulates in an exposed vessel during the time period being evaluated. The amount of freezing or frozen precipitation shall be the water equivalent of the solid precipitation accumulated during the appropriate time period.

(2) **Units of Measure for Precipitation.** Precipitation measurements shall be in inches, tenths of inches, or hundredths of inches depending on the precipitation being measured (see Table 12-6).

Table 12.6. Units of Measure for Precipitation

Type of Measurement	Unit of Measure
Liquid Precipitation	0.01 inch
Water Equivalent of Solid Precipitation	0.01 inch
Solid Precipitation	0.1 inch
Snow Depth	1.0 inch

(3) **Depth of Freezing or Frozen Precipitation.** The depth of freezing and/or frozen precipitation shall be the actual vertical depth of the precipitation accumulated on a horizontal surface during the appropriate time period (see paragraphs 12.7.2.a(3)(b) and 12.7.2.a(3)(c). If snow falls, melts, and refreezes, the depth of ice formed shall be included in the measurement.

(a) **Hourly Precipitation Amount (Prrrr).** At designated automated stations, the hourly precipitation amount shall be coded in the format, **Prrrr**, where **P** is the group indicator and **rrrr** is the water equivalent of all precipitation that has occurred since the last METAR (see paragraph 12.7.2.a(1)). The amount shall be coded in hundredths of an inch. For example, "P0009" would indicate 9/100 of an inch of precipitation fell in the past hour; "P0000" would indicate that less than 1/100 of an inch of precipitation fell in the past hour.

The group shall be omitted if no precipitation occurred since the last METAR.

(b) **3- and 6-Hour Precipitation Amount (6RRRR).** At designated stations, the 3- and 6-hourly precipitation group shall be coded in the format, **6RRRR**, where **6** is the group indicator and **RRRR** is the amount of precipitation. The amount of precipitation (water equivalent) accumulated in the past 3 hours shall be reported in the 3-hourly report; the amount accumulated in the past 6 hours shall be reported in the 6-hourly report. The amount of precipitation shall be coded in inches, using the tens, units, tenths and hundredths digits of the amount. When an indeterminable amount of precipitation has occurred during the period, **RRRR** shall be coded 6////. For example, 2.17 inches of precipitation would be coded "60217". A trace shall be coded "60000".

(c) **24-Hour Precipitation Amount ($7R_{24}R_{24}R_{24}R_{24}$).** At designated stations, the 24-hour precipitation amount shall be coded in the format, $7R_{24}R_{24}R_{24}R_{24}$, where **7** is the group indicator and $R_{24}R_{24}R_{24}R_{24}$ is the 24-hour precipitation amount. The 24-hour precipitation amount shall be included in the 1200 UTC (or other agency designated time) report whenever more than a trace of precipitation (water equivalent) has fallen in the preceding 24 hours. The amount of precipitation shall be coded by using the tens, units, tenths, and hundredths of inches (water equivalent) for the 24-hour period. If more than a trace (water equivalent) has occurred and the amount cannot be determined, the group shall be coded

7////. For example, 1.25 inches of precipitation (water equivalent) in the past 24 hours shall be coded "70125".

(d) **Snow Depth on Ground (4/sss).** At designated stations, the total snow depth on the ground group shall be coded in the 0000, 0600, 1200, and 1800 UTC observations whenever there is more than a trace of snow on the ground. The remark shall be coded in the format, **4/sss**, where **4/** is the group indicator and **sss** is the snow depth in whole inches using three digits. For example, a snow depth of 21 inches shall be coded as "4/021".

(e) **Water Equivalent of Snow on Ground (933RRR).** At designated stations, the water equivalent of snow on the ground shall be coded each day, in the 1800 UTC report, if the average snow depth is 2 inches or more. The remark shall be coded in the format, **933RRR**, where **933** is the group indicator and **RRR** is the water equivalent of snow, i.e., snow, snow pellets, snow grains, ice pellets, ice crystals, and hail, on the ground. The water equivalent shall be coded in tens, units, and tenths of inches, using three digits. If the water equivalent of snow consists entirely of hail, the group shall not be coded. A water equivalent of 3.6 inches of snow would be coded as "933036"; a water equivalent of 12.5 would be coded as "933125". This value is never estimated, ratios (e.g., 10 to 1) or temperature/snow water equivalent tables are not to be used to determine water equivalency of snow for this group.

b. **Cloud Types ($8/C_LC_MC_H$).** At designated stations, the group, $8/C_LC_MC_H$, shall be reported and coded in 3- and 6-hourly reports when clouds are observed. The predominant low cloud (C_L), middle cloud (C_M), and high cloud (C_H), shall be identified in accordance with the WMO *International Cloud Atlas*, Volumes I and II, or the WMO *Abridged International Cloud Atlas* or agency observing aids for cloud identification. A **0** shall be coded for the low, middle, or high cloud type if no cloud is present in that classification. A solidus "/" shall be coded for layers above an overcast. If no clouds are observed due to clear skies, the cloud type group shall not be coded. For example, a report of "8/6//" would indicate an overcast layer of stratus clouds; a report of "8/903" would indicate cumulonimbus type low clouds, no middle clouds, and dense cirrus high clouds.

c. **Duration of Sunshine (98mmm).** The duration of sunshine that occurred the previous calendar day shall be coded in the 0800 UTC report. If the station is closed at 0800 UTC, the group shall be coded in the first 6-hourly METAR after the station opens. The duration of sunshine shall be coded in the format, **98mmm**, where **98** is the group indicator and **mmm** is the total minutes of sunshine. The minutes of sunshine shall be coded by using the hundreds, tens, and units digits. For example, 96 minutes of sunshine would be coded "98096". If no sunshine occurred, the group would be coded "98000".

d. **Hourly Temperature and Dew Point ($Ts_nT'T'T's_nT'_dT'_dT'_d$).** At designated stations, the hourly temperature and dew point group shall be coded to the tenth of a degree Celsius in the format, $Ts_nT'T'T's_nT'_dT'_dT'_d$, where **T** is the group indicator, s_n is the sign of the temperature, **T'T'T'** is the temperature, and $T'_dT'_dT'_d$ is the dew point (see paragraphs 10.5.1 and 10.5.3). The sign of the temperature and dew point shall be coded as 1 if the value is below 0°C and 0 if the value is 0°C or higher. The temperature and dew point shall be reported in tens, units, and tenths of degrees Celsius. There shall be no spaces between the entries. For example, a temperature of 2.6°C and dew point of -1.5°C would be reported in the body of the report as "03/M01" and the $Ts_nT'T'T's_nT'_dT'_dT'_d$ group as "T00261015". If dew point is missing report the temperature; if the temperature is missing do not report the temperature/dew point group.

e. **6-Hourly Maximum Temperature ($1s_nT_xT_xT_x$).** At designated stations, the 6-hourly maximum temperature group shall be coded in the format, $1s_nT_xT_xT_x$, where **1** is the group indicator, s_n is the sign of the temperature, $T_xT_xT_x$ is the maximum temperature in tenths of degrees Celsius using three digits (see paragraphs 10.4.4, 10.5.2, and 10.5.3). The sign of the maximum temperature shall be coded as 1 if the maximum temperature is below 0°C and 0 if the maximum temperature is 0°C or higher. For example, a maximum temperature of −2.1°C would be coded "11021"; 14.2°C would be coded "10142".

f. **6-Hourly Minimum Temperature ($2s_nT_nT_nT_n$).** At designated stations, the 6-hourly minimum temperature group shall be coded in the format, $2s_nT_nT_nT_n$, where **2** is the group indicator, s_n is the sign of the temperature, and $T_nT_nT_n$ is the minimum temperature in tenths of degrees Celsius using three digits (see paragraphs 10.4.4, 10.5.2, and 10.5.3). The sign of the minimum temperature shall be coded as 1 if the minimum temperature is below 0°C and 0 if the minimum temperature is 0°C or higher. For example, a minimum temperature of −0.1°C would be coded "21001"; 1.2°C would be coded "20012".

g. **24-Hour Maximum and Minimum Temperature ($4s_nT_xT_xT_xs_nT_nT_nT_n$).** At designated stations, the 24-hour maximum temperature and the 24-hour minimum temperature shall be coded in the format, $4s_nT_xT_xT_xs_nT_nT_nT_n$, where **4** is the group indicator, s_n is the sign of the temperature, $T_xT_xT_x$ is the maximum 24-hour temperature, and $T_nT_nT_n$ is the 24-hour minimum temperature (see paragraphs 10.4.4, 10.5.2, and 10.5.3). $T_xT_xT_x$ and $T_nT_nT_n$ shall be coded in tenths of degrees Celsius using three digits. The sign of the maximum or minimum temperature shall be coded as 1 if it is below 0°C and 0 if it is 0°C or higher. For example, a 24-hour maximum temperature of 10.0°C and a 24-hour minimum temperature of −1.5°C would be coded "401001015"; a 24-hour maximum temperature of 11.2°C and a 24-hour minimum temperature of 8.4°C would be coded as "401120084".

h. **3-Hourly Pressure Tendency (5appp).** At designated stations, the 3-hourly pressure tendency group shall be coded in the format, **5appp**, where **5** is the group indicator, **a** is the character of pressure change over the past 3 hours (see Table 12-7), and **ppp** is the amount of barometric change in tenths of hectopascals (see Table 12-8). The amount of barometric change shall be coded using the tens, units, and tenths digits (see paragraphs 11.4.7 and 11.5.4). For example, a steady increase of 3.2 hectopascals in the past three hours would be coded "52032".

Table 12-7 Characteristics of Barometer Tendency

Primary Requirement	Description	Code Figure
Atmospheric pressure now higher than 3 hours ago.	Increasing, then decreasing.	0
	Increasing, then steady, or increasing then increasing more slowly.	1
	Increasing steadily or unsteadily.	2
	Decreasing or steady, then increasing; or increasing then increasing more rapidly.	3
Atmospheric pressure now same as 3 hours ago.	Increasing, then decreasing.	0
	Steady.	4
	Decreasing, then increasing.	5
Atmospheric pressure now lower than 3 hours ago.	Decreasing, then increasing.	5
	Decreasing then steady; or decreasing then decreasing more slowly.	6
	Decreasing steadily or unsteadily.	7
	Steady or increasing, then decreasing; or decreasing then decreasing more rapidly.	8

Table 12-8. 3-Hour Pressure Change

Amount of Barometric Change (Rise or Fall) in the Past 3 Hours "ppp"								
Code Figure	Inches of Mercury	Hectopascals	Code Figure	Inches of Mercury	Hectopascals	Code Figure	Inches of Mercury	Hectopascals
000	0.000	0.0	068	0.200	6.8	135	0.400	13.5
002	0.005	0.2	069	0.205	6.9	137	0.405	13.7
003	0.010	0.3	071	0.210	7.1	139	0.410	13.9
005	0.015	0.5	073	0.215	7.3	141	0.415	14.1
007	0.020	0.7	075	0.220	7.5	142	0.420	14.2
008	0.025	0.8	076	0.225	7.6	144	0.425	14.4
010	0.030	1.0	078	0.230	7.8	146	0.430	14.6
012	0.035	1.2	080	0.235	8.0	147	0.435	14.7
014	0.040	1.4	081	0.240	8.1	149	0.440	14.9
015	0.045	1.5	083	0.245	8.3	151	0.445	15.1
017	0.050	1.7	085	0.250	8.5	152	0.450	15.2
019	0.055	1.9	086	0.255	8.6	154	0.455	15.4
020	0.060	2.0	088	0.260	8.8	156	0.460	15.6
022	0.065	2.2	090	0.265	9.0	157	0.465	15.7
024	0.070	2.4	091	0.270	9.1	159	0.470	15.9
025	0.075	2.5	093	0.275	9.3	161	0.475	16.1
027	0.080	2.7	095	0.280	9.5	163	0.480	16.3
029	0.085	2.9	097	0.285	9.7	164	0.485	16.4
030	0.090	3.0	098	0.290	9.8	166	0.490	16.6
032	0.095	3.2	100	0.295	10.0	168	0.495	16.8
034	0.100	3.4	102	0.300	10.2	169	0.500	16.9
036	0.105	3.6	103	0.305	10.3	171	0.505	17.1
037	0.110	3.7	105	0.310	10.5	173	0.510	17.3
039	0.115	3.9	107	0.315	10.7	174	0.515	17.4
041	0.120	4.1	108	0.320	10.8	176	0.520	17.6
042	0.125	4.2	110	0.325	11.0	178	0.525	17.8
044	0.130	4.4	112	0.330	11.2	179	0.530	17.9
046	0.135	4.6	113	0.335	11.3	181	0.535	18.1
047	0.140	4.7	115	0.340	11.5	183	0.540	18.3
049	0.145	4.9	117	0.345	11.7	185	0.545	18.5
051	0.150	5.1	119	0.350	11.9	186	0.550	18.6
052	0.155	5.2	120	0.355	12.0	188	0.555	18.8
054	0.160	5.4	122	0.360	12.2	190	0.560	19.0
056	0.165	5.6	124	0.365	12.4	191	0.565	19.1
058	0.170	5.8	125	0.370	12.5	193	0.570	19.3
059	0.175	5.9	127	0.375	12.7	195	0.575	19.5
061	0.180	6.1	129	0.380	12.9	196	0.580	19.6
063	0.185	6.3	130	0.385	13.0	198	0.585	19.8
064	0.190	6.4	132	0.390	13.2	200	0.590	20.0
066	0.195	6.6	134	0.395	13.4	201	0.595	20.1

i. **Sensor Status Indicators.** Sensor status indicators should be reported as indicated below:

(1) if the Runway Visual Range should be reported but is missing, **RVRNO** shall be coded.

(2) when automated stations are equipped with a present weather identifier and that sensor is not operating, the remark **PWINO** shall be coded.

(3) when automated stations are equipped with a tipping bucket rain gauge and that sensor is not operating, **PNO** shall be coded.

(4) when automated stations are equipped with a freezing rain sensor and that sensor is not operating, the remark **FZRANO** shall be coded.

(5) when automated stations are equipped with a lightning detection system and that sensor is not operating, the remark **TSNO** shall be coded.

(6) when automated stations are equipped with a secondary visibility sensor and that sensor is not operating, the remark **VISNO_LOC** shall be coded.

(7) when automated stations are equipped with a secondary ceiling height indicator and that sensor is not operating, the remark **CHINO_LOC** shall be coded.

j. **Maintenance Indicator.** A maintenance indicator sign, **$**, shall be coded when an automated system detects that maintenance is needed on the system.