

SURFACE HOURLY ABBREVIATED FORMAT

ONE HEADER RECORD FOLLOWED BY DATA RECORDS:

COLUMN DATA DESCRIPTION

01-06 USAF = AIR FORCE CATALOG STATION NUMBER
 08-12 WBAN = NCDC WBAN NUMBER
 14-25 YR--MODAHRMN = YEAR-MONTH-DAY-HOUR-MINUTE IN GREENWICH MEAN TIME (GMT)
 27-29 DIR = WIND DIRECTION IN COMPASS DEGREES, 990 = VARIABLE, REPORTED AS
 '***' WHEN AIR IS CALM (SPD WILL THEN BE 000)
 31-37 SPD & GUS = WIND SPEED & GUST IN MILES PER HOUR
 39-41 CLG = CLOUD CEILING--LOWEST OPAQUE LAYER
 WITH 5/8 OR GREATER COVERAGE, IN HUNDREDS OF FEET,
 722 = UNLIMITED
 43-45 SKC = SKY COVER -- CLR-CLEAR, SCT-SCATTERED-1/8 TO 4/8,
 BKN-BROKEN-5/8 TO 7/8, OVC-OVERCAST,
 OBS-OBSCURED, POB-PARTIAL OBSCURATION
 47-47 L = LOW CLOUD TYPE, SEE BELOW
 49-49 M = MIDDLE CLOUD TYPE, SEE BELOW
 51-51 H = HIGH CLOUD TYPE, SEE BELOW
 53-56 VSB = VISIBILITY IN STATUTE MILES TO NEAREST TENTH
 NOTE: FOR SOME STATIONS, VISIBILITY IS REPORTED ONLY UP TO A
 MAXIMUM OF 7 OR 10 MILES IN METAR OBSERVATIONS, BUT TO HIGHER
 VALUES IN SYNOPTIC OBSERVATIONS, WHICH CAUSES THE VALUES TO
 FLUCTUATE FROM ONE DATA RECORD TO THE NEXT. ALSO, VALUES
 ORIGINALLY REPORTED AS '10' MAY APPEAR AS '10.1' DUE TO DATA
 BEING ARCHIVED IN METRIC UNITS AND CONVERTED BACK TO ENGLISH.
 58-68 MW MW MW MW = MANUALLY OBSERVED PRESENT WEATHER--LISTED BELOW IN MANUALLY
 OBSERVED PRESENT WEATHER TABLE
 70-80 AW AW AW AW = AUTO-OBSERVED PRESENT WEATHER--LISTED BELOW IN AUTO-OBSERVED
 PRESENT WEATHER TABLE
 82-82 W = PAST WEATHER INDICATOR, SEE BELOW
 84-92 TEMP & DEWP = TEMPERATURE & DEW POINT IN FAHRENHEIT
 94-99 SLP = SEA LEVEL PRESSURE IN MILLIBARS TO NEAREST TENTH
 101-105 ALT = ALTIMETER SETTING IN INCHES TO NEAREST HUNDREDTH
 107-112 STP = STATION PRESSURE IN MILLIBARS TO NEAREST TENTH
 114-116 MAX = MAXIMUM TEMPERATURE IN FAHRENHEIT (TIME PERIOD VARIES)
 118-120 MIN = MINIMUM TEMPERATURE IN FAHRENHEIT (TIME PERIOD VARIES)
 122-126 PCP01 = 1-HOUR LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS --
 THAT IS, THE PRECIP FOR THE PRECEDING 1 HOUR PERIOD
 128-132 PCP06 = 6-HOUR LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS --
 THAT IS, THE PRECIP FOR THE PRECEDING 6 HOUR PERIOD
 134-138 PCP24 = 24-HOUR LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS
 THAT IS, THE PRECIP FOR THE PRECEDING 24 HOUR PERIOD
 140-144 PCPXX = LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS, FOR
 A PERIOD OTHER THAN 1, 6, OR 24 HOURS (USUALLY FOR 12 HOUR PERIOD
 FOR STATIONS OUTSIDE THE U.S., AND FOR 3 HOUR PERIOD FOR THE U.S.)
 T = TRACE FOR ANY PRECIP FIELD
 146-147 SD = SNOW DEPTH IN INCHES

NOTES:

- *'s IN FIELD INDICATES ELEMENT NOT REPORTED.
- SOME VALUES WERE CONVERTED FROM METRIC TO ENGLISH UNITS. THIS WILL
OCCASIONALLY RESULT IN MINOR DIFFERENCES VS ORIGINAL DATA DUE TO ROUNDING.
- COLUMN POSITION REFERS TO ASCII TEXT DATA.
- THIS FORMAT CAN BE EASILY IMPORTED INTO A SPREADSHEET OR A DATABASE
MANAGEMENT SYSTEM SINCE FIELDS ARE SPACE-DELIMITED.

- THIS FORMAT DOES NOT INCLUDE QUALITY CONTROL FLAGS, WHICH ARE AVAILABLE
IN THE ADVANCED FORMAT THROUGH THE CLIMATE DATA ONLINE SYSTEM.

MANUALLY OBSERVED PRESENT WEATHER CODE TABLE

The code that denotes a specific type of weather observed.

00-49 No precipitation at the station at the time of observation

00-19 No precipitation, fog, ice fog (except for 11 and 12),
duststorm, sandstorm, drifting or blowing snow at the station at the
time of observation or, except for 09 and 17, during the preceding
hour

00: Cloud development not observed or not observable

01: Clouds generally dissolving or becoming less developed

02: State of sky on the whole unchanged

03: Clouds generally forming or developing

04: Visibility reduced by smoke, e.g. veldt or forest fires,
industrial smoke or volcanic ashes

05: Haze

06: Widespread dust in suspension in the air, not raised by wind at
or near the station at the time of observation

07: Dust or sand raised by wind at or near the station at the time of
observation, but no well-developed dust whirl(s) or sand whirl(s),
and no duststorm or sandstorm seen or, in the case
of ships, blowing spray at the station

08: Well developed dust whirl(s) or sand whirl(s) seen at or near the
station during the preceding hour or at the time of observation, but
no duststorm or sandstorm

09: Duststorm or sandstorm within sight at the time of observation,
or at the station during the preceding hour

10: Mist

11: Patches of shallow fog or ice fog at the station, whether on land
or sea, not deeper than about 2 meters on land or 10 meters at sea

12: More or less continuous shallow fog or ice fog at the station,
whether on land or sea, not deeper than about 2 meters on land or 10
meters at sea

13: Lightning visible, no thunder heard

14: Precipitation within sight, not reaching the ground or the
surface of the sea

15: Precipitation within sight, reaching the ground or the surface of
the sea, but distant, i.e., estimated to be more than 5 km from the
station

16: Precipitation within sight, reaching the ground or the surface of
the sea, near to, but not at the station

17: Thunderstorm, but no precipitation at the time of observation

18: Squalls at or within sight of the station during the preceding
hour or at the time of observation

19: Funnel cloud(s) (Tornado cloud or waterspout) at or within sight
of the station during the preceding hour or at the time of
observation

20-29 Precipitation, fog, ice fog or thunderstorm at the station
during the preceding hour, but not at the time of observation

20: Drizzle (not freezing) or snow grains not falling as shower(s)

21: Rain (not freezing) not falling as shower(s)

22: Snow not falling as shower(s)

23: Rain and snow or ice pellets not falling as shower(s)

24: Freezing drizzle or freezing rain not falling as shower(s)

25: Shower(s) of rain

26: Shower(s) of snow or of rain and snow

27: Shower(s) of hail (Hail, small hail, snow pellets), or rain and
hail

131 28: Fog or ice fog
132 29: Thunderstorm (with or without precipitation)
133 -----
134 30-39 Duststorm, sandstorm, or blowing snow
135 -----
136 30: Slight or moderate duststorm or sandstorm has decreased during
137 the preceding hour
138 31: Slight or moderate duststorm or sandstorm no appreciable change
139 during the preceding hour
140 32: Slight or moderate duststorm or sandstorm has begun or has
141 increased during the preceding hour
142 33: Severe duststorm or sandstorm has decreased during the preceding
143 hour
144 34: Severe duststorm or sandstorm no appreciable change during the
145 preceding hour
146 35: Severe duststorm or sandstorm has begun or has increased during
147 the preceding hour
148 36: Slight or moderate drifting snow generally low (below eye level)
149 37: Heavy drifting snow generally low (below eye level)
150 38: Slight or moderate blowing snow generally high (above eye level)
151 39: Heavy blowing snow generally high (above eye level)
152 -----
153 40-49 Fog or ice fog at the time of observation
154 -----
155 40: Fog or ice fog at a distance at the time of observation, but not
156 at the station during the preceding hour, the fog or ice fog
157 extending to a level above that of the observer
158 41: Fog or ice fog in patches
159 42: Fog or ice fog, sky visible, has become thinner during the
160 preceding hour
161 43: Fog or ice fog, sky invisible, has become thinner during the
162 preceding hour
163 44: Fog or ice fog, sky visible, no appreciable change during the
164 preceding hour
165 45: Fog or ice fog, sky invisible, no appreciable change during the
166 preceding hour
167 46: Fog or ice fog, sky invisible, has begun or has become thicker
168 during the preceding hour
169 47: Fog or ice fog, sky invisible, has begun or has become thicker
170 during the preceding hour
171 48: Fog, depositing rime, sky visible
172 49: Fog, depositing rime, sky invisible
173 -----
174 50-99 Precipitation at the station at the time of observation
175 -----
176 50-59 Drizzle
177 -----
178 50: Drizzle, not freezing, intermittent, slight at time of
179 observation
180 51: Drizzle, not freezing, continuous, slight at time of observation
181 52: Drizzle, not freezing, intermittent, moderate at time of
182 observation
183 53: Drizzle, not freezing, continuous, moderate at time of
184 observation
185 54: Drizzle, not freezing, intermittent, heavy (dense) at time of
186 observation
187 55: Drizzle, not freezing, continuous, heavy (dense) at time of
188 observation
189 56: Drizzle, freezing, slight
190 57: Drizzle, freezing, moderate or heavy (dense)
191 58: Drizzle and rain, slight
192 59: Drizzle and rain, moderate or heavy
193 -----
194 60-69 Rain
195 -----
196 60: Rain, not freezing, intermittent, slight at time of observation

197 61: Rain, not freezing, continuous, slight at time of observation
198 62: Rain, not freezing, intermittent, moderate at time of observation
199 63: Rain, not freezing, continuous, moderate at time of observation
200 64: Rain, not freezing, intermittent, heavy at time of observation
201 65: Rain, not freezing, continuous, heavy at time of observation
202 66: Rain, freezing, slight
203 67: Rain, freezing, moderate or heavy
204 68: Rain or drizzle and snow, slight
205 69: Rain or drizzle and snow, moderate or heavy
206 -----
207 70-79 Solid precipitation not in showers
208 -----
209 70: Intermittent fall of snowflakes, slight at time of observation
210 71: Continuous fall of snowflakes, slight at time of observation
211 72: Intermittent fall of snowflakes, moderate at time of observation
212 73: Continuous fall of snowflakes, moderate at time of observation
213 74: Intermittent fall of snowflakes, heavy at time of observation
214 75: Continuous fall of snowflakes, heavy at time of observation
215 76: Diamond dust (with or without fog)
216 77: Snow grains (with or without fog)
217 78: Isolated star-like snow crystals (with or without fog)
218 79: Ice pellets
219 -----
220 80-99 Showery precipitation, or precipitation with current or recent
221 thunderstorm
222 -----
223 80: Rain shower(s), slight
224 81: Rain shower(s), moderate or heavy
225 82: Rain shower(s), violent
226 83: Shower(s) of rain and snow mixed, slight
227 84: Shower(s) of rain and snow mixed, moderate or heavy
228 85: Show shower(s), slight
229 86: Snow shower(s), moderate or heavy
230 87: Shower(s) of snow pellets or small hail, with or without rain or
231 rain and snow mixed, slight
232 88: Shower(s) of snow pellets or small hail, with or without rain or
233 rain and snow mixed, moderate or heavy
234 89: Shower(s) of hail (hail, small hail, snow pellets) , with or
235 without rain or rain and snow mixed, not associated with thunder,
236 slight
237 90: Shower(s) of hail (hail, small hail, snow pellets), with or
238 without rain or rain and snow mixed, not associated with thunder,
239 moderate or heavy
240 91: Slight rain at time of observation, thunderstorm during the
241 preceding hour but not at time of observation
242 92: Moderate or heavy rain at time of observation, thunderstorm
243 during the preceding hour but not at time of observation
244 93: Slight snow, or rain and snow mixed or hail (Hail, small hail,
245 snow pellets), at time of observation, thunderstorm during the
246 preceding hour but not at time of observation
247 94: Moderate or heavy snow, or rain and snow mixed or hail(Hail,
248 small hail, snow pellets) at time of observation, thunderstorm during
249 the preceding hour but not at time of observation
250 95: Thunderstorm, slight or moderate, without hail (Hail, small hail,
251 snow pellets), but with rain and/or snow at time of observation,
252 thunderstorm at time of observation
253 96: Thunderstorm, slight or moderate, with hail (hail, small hail,
254 snow pellets) at time of observation, thunderstorm at time of
255 observation
256 97: Thunderstorm, heavy, without hail (Hail, small hail, snow
257 pellets), but with rain and/or snow at time of observation,
258 thunderstorm at time of observation
259 98: Thunderstorm combined with duststorm or sandstorm at time of
260 observation, thunderstorm at time of observation
261 99: Thunderstorm, heavy, with hail (Hail, small hail, snow pellets)
262 at time of observation, thunderstorm at time of observation

AUTO-OBSERVED PRESENT WEATHER CODE TABLE

The code that denotes a specific type of weather reported by an automated device

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00: No significant weather reported
01: Clouds generally dissolving or becoming less developed
02: State of sky on the whole unchanged during the past hour
03: Clouds generally forming or developing during the last hour
04: Haze, smoke or dust in suspension in the air, visibility equal to or greater than 1km
05: Smoke
07: Dust or sand raised by wind at or near the station at the time of observation, but
no
well-developed dust whirl(s) or sand whirl(s) and no duststorm or sandstorm seen or,
in
the case of ships, blowing spray at the station
10: Mist
11: Diamond dust
12: Distant lightning
18: Squalls

20-26: Codes 20-26 are used to report precipitation, fog, or thunderstorms at the
station during
the preceding hour, but not at the time of observation

20: Fog
21: Precipitation
22: Drizzle: (not freezing) or snow grains
23: Rain (not freezing)
24: Snow
25: Freezing drizzle or freezing rain
26: Thunderstorms (with or without precipitation)
27: Blowing or drifting snow or sand
28: Blowing or drifting snow or sand, visibility equal to or greater than 1km
29: Blowing or drifting snow or sand, visibility less than than 1km
30: Fog
31: Fog or ice fog in patches
32: Fog or ice fog, has become thinner during the past hour
33: Fog or ice fog, no appreciable change during the last hour
34: Fog or ice fog, has begun or become thicker during the last hour
35: Fog, depositing rime
40: Precipitation
41: Precipitation, slight or moderate
42: Precipitation, heavy
43: Liquid precipitation, slight or moderate
44: Liquid precipitation, heavy
45: Solid precipitation, slight or moderate
46: Solid precipitation, heavy
47: Freezing precipitaion, slight or moderate
48: Freezing precipitation, heavy
50: Drizzle
51: Drizzle, not freezing, slight
52: Drizzle, not freezing, moderate
53: Drizzle, not freezing, heavy
54: Drizzle, freezing, slight
55: Drizzle, freezing, moderate
56: Drizzle, freezing, heavy
57: Drizzle and rain, slight
58: Drizzle and rain, moderate or heavy
60: Rain
61: Rain, not freezing, slight
62: Rain, not freezing, moderate

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326 63: Rain, not freezing, heavy
327 64: Rain, freezing, slight
328 65: Rain, freezing, moderate
329 66: Rain, freezing, heavy
330 67: Rain or drizzle and snow, slight
331 68: Rain or drizzle and snow, moderate or heavy
332 70: Snow
333 71: Snow, slight
334 72: Snow, moderate
335 73: Snow, heavy
336 74: Ice pellets, slight
337 75: Ice pellets, moderate
338 76: ice pellets, heavy
339 77: Snow grains
340 78: Ice crystals
341 80: Showers or intermittent precipitation
342 81: Rain showers or intermittent rain, slight
343 82: Rain showers or intermittent rain, moderate
344 83: Rain showers or intermittent rain, heavy
345 84: Rain showers or intermittent rain, violent
346 85: Snow showers or intermittent rain, slight
347 86: Snow showers or intermittent rain, moderate
348 87: Snow showers or intermittent rain, heavy
349 89: Hail
350 90: Thunderstorm
351 91: Thunderstorm, slight or moderate, with no precipitation
352 92: Thunderstorm, slight or moderate, with rain showers and/or snow showers
353 93: Thunderstorm, slight or moderate, with hail
354 94: Thunderstorm, heavy, with no precipitation
355 95: Thunderstorm, heavy, with rain showers and/or snow
356 96: Thunderstorm, heavy, with hail
357 99: Tornado
358
359
360

PAST WEATHER CODE TABLE

361
362 The code that denotes a specific type of past weather observed.
363
364 0: Cloud covering 1/2 or less of the sky throughout the appropriate
365 period
366 1: Cloud covering more than 1/2 of the sky during part of the
367 appropriate period and covering 1/2 or less during part of the period
368 2: Cloud covering more than 1/2 of the sky throughout the appropriate
369 period
370 3: Sandstorm, duststorm or blowing snow
371 4: Fog or ice fog or thick haze
372 5: Drizzle
373 6: Rain
374 7: Snow, or rain and snow mixed
375 8: Shower(s)
376 9: Thunderstorm(s) with or without precipitation
377
378

LOW CLOUD TYPE

379
380
381 0: No low clouds
382 1: Cumulus humulis or Cumulus fractus other than of bad weather or
383 both
384 2: Cumulus mediocris or congestus, with or without Cumulus of
385 species fractus or humulis or Stratocumulus all having bases at the
386 same level
387 3: Cumulonimbus calvus, with or without Cumulus, Stratocumulus or
388 Stratus
389 4: Stratocumulus cumulogenitus
390 5: Stratocumulus other than Stratocumulus cumulogenitus
391 6: Stratus nebulosus or Stratus fractus other than of bad weather,

392 or both
393 7: Stratus fractus or Cumulus fractus of bad weather, or both
394 (pannus) usually below Altostratus or Nimbostratus
395 8: Cumulus and Stratocumulus other than Stratocumulus cumulogenitus,
396 with bases at different levels
397 9: Cumulonimbus capillatus (often with an anvil), with or without
398 Cumulonimbus calvus, Cumulus, Stratocumulus, Stratus or pannus
399

400
401 MIDDLE CLOUD TYPE
402

403 0: No middle clouds
404 1: Altostratus translucidus
405 2: Altostratus opacus or Nimbostratus
406 3: Altocumulus translucidus at a single level
407 4: Patches (often lenticular) of Altocumulus translucidus,
408 continually changing and occurring at one or more levels
409 5: Altocumulus translucidus in bands, or one or more layers of
410 Altocumulus translucidus or opacus, progressively invading the sky;
411 these Altocumulus clouds generally thicken as a whole
412 6: Altocumulus cumulogentis (or cumulonimbogentus)
413 7: Altocumulus translucidus or opacus in two or more layers, or
414 Altocumulus opacus in a single layer, not progressively invading the
415 sky, or Altocumulus with Altostratus or Nimbostratus
416 8: Altocumulus castellanus or floccus
417 9: Altocumulus of a chaotic sky; generally at several levels
418
419

420 HIGH CLOUD TYPE
421

422 0: No High Clouds
423 1: Cirrus fibratus, sometimes uncinus, not progressively invading
424 the sky
425 2: Cirrus spissatus, in patches or entangled sheaves, which usually
426 do not increase and sometimes seem to be the remains of the upper
427 part of a Cumulonimbus; or Cirrus castellanus or floccus
428 3: Cirrus spissatus cumulonimbogenitus
429 4: Cirrus uncinus or fibratus, or both, progressively invading the
430 sky; they generally thicken as a whole
431 5: Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone,
432 progressively invading the sky; they generally thicken as a whole,
433 but the continuous veil does not reach 45 degrees above the horizon
434 6: Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone,
435 progressively invading the sky; they generally thicken as a whole;
436 the continuous veil extends more than 45 degrees above the horizon,
437 without the sky being totally covered
438 7: Cirrostratus covering the whole sky
439 8: Cirrostratus not progressively invading the sky and not entirely
440 covering it
441 9: Cirrocumulus alone, or Cirrocumulus predominant among the High
442 clouds
443