WEATHERGRAPH *Observation and Plotting*

TIME ZONES

This chart shows how to convert a UTC hour to a local hour.

Eastern : subtract 5 (4 for daylight saving)
Central: subtract 6 (5 for daylight saving)
Mountain: subtract 7 (6 for daylight saving)
Pacific: subtract 8 (7 for daylight saving)

HAILSTONE SIZES

Size	Equivalent	Freefall Velocity	Freefall Energy
1/4"	Pea	25 mph	0.02 ft-lbs
1/2"	Marble	35 mph	0.09 ft-lbs
3/4"	Dime	43 mph	0.44 ft-lbs
1"	Quarter	50 mph	1.43 ft-lbs
1 1/4"	Half Dollar	56 mph	3.53 ft-lbs
1 1/2"	Walnut	61 mph	7.35 ft-lbs
1 3/4"	Golfball	66 mph	13.56 ft-lbs
2"	Hen Egg	72 mph	23.71 ft-lbs
2 1/2"	Tennis Ball	80 mph	57.48 ft-lbs
2 3/4"	Baseball	85 mph	85.95 ft-lbs
3"	Tea Cup	89 mph	122.66 ft-lbs
4"	Grapefruit	106 mph	413.31 ft-lbs
4 1/2"	Softball	117 mph	724.85 ft-lbs

FUJITA SCALE

A scale of tornado damage.

F0: 40-72 mph. Twigs and branches snap off trees. Some windows break.
F1: 73-112 mph. Pushes moving cars off road. Flips mobile homes.
F2: 113-157 mph. Uproots large trees and rips roofs off frame houses.
F3: 158-206 mph. Severe damage. Cars lifted and thrown. Trains overturned.
F4: 207-260 mph. Levels well-built homes.
F5: 261-318 mph. Incredible damage. Foundations swept clean.

BEAUFORT WIND SCALE

No	Mph	Kts	Description
0	0-1	0-1	Smoke rises vertically
1	1-3	1-3	Wind moves smoke but not wind vanes
2	4-7	4-6	Wind felt on face; leaves rustle; wind vane moved
3	8-12	7-10	Leaves and small twigs in constant motion; wind extends light flag
4	13-18	11-16	Dust and loose paper raised; small branches moved
5	19-24	17-21	Small trees with leaves begin to sway
6	25-31	22-27	Large branches in motion; whistling in telephone wires
7	32-38	28-33	Whole trees in motion; resistance felt walking against wind
8	39-46	34-40	Twigs broken off trees; wind generally impedes progress
9	47-54	41-47	Slight structural damage occurs (chimney pots and slate removed)
10	55-63	48-55	Trees uprooted

METAR OBSERVATION FORMAT

```
KLEX 162354Z 20004KT 1 1/2SM -RA BR FEW004 BKN030
OVC050 22/21 A3006 RMK AO2 RAE05B34 SLP173 P0002
60007 70112 T02221011 51006=
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KLEX, Lexington, Kentucky; 16th day of month; 2354 UTC; wind from 200 deg at 04 knots; visibility 1 1/2 statute mile in light rain and fog; few clouds at 400 ft; broken layer at 3000 ft; overcast layer at 5000 ft; temperature 22 deg C; dewpoint 21 deg C; altimeter setting (pressure) 30.06 inches; A02 (automated station, type 2 which reports precip); rain ended at 05 minutes past hour and began at 34 minutes past hour; sea level pressure 1017.3 mb; 0.02" of precip in past hour; 0.07" of precip in past 6 hours; 1.12" in past 12 hours; exact temp 22.2 deg C; exact dewpoint -1.1 deg C; pressure rising by 0.06 mb.

SYNOPTIC OBSERVATION FORMAT

```
68842 11682 72516 10176 20145 30126 40199 51010
69903 72052 875// 555 91020=
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Port Elizabeth, South Africa (68842); precipitation data will be included (1); station type is manned and weather is included (1); lowest cloud height is 1000 to 1500m above ground (6); visibility is 40 km (82); sky cover 7/8ths (7); wind direction 250 deg (250); wind speed 16 kt (16); temperature 17.6 deg C (10176); dewpoint 14.5 deg C (20145); station pressure is 1012.6 mb (0126); sea level pressure 1019.9 mb (0199); pressure tendency rising then steady (1) changing by 1.0 mb (10); precipitation amount is trace (990) over a time period of 18 hours (3); weather is recent drizzle (20); previous weather had been drizzle (5) and clouds covering more than half of sky (2); low or middle cloud amount is 7/ 8ths (7); low cloud is stratocumulus (5); middle cloud is not visible (/); high cloud is not visible (/). Everything after the triple-digit group consists of regionally-defined data groups.

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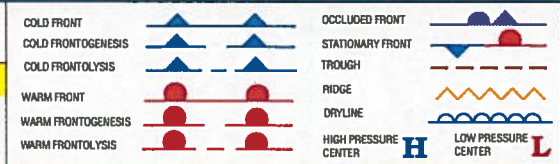
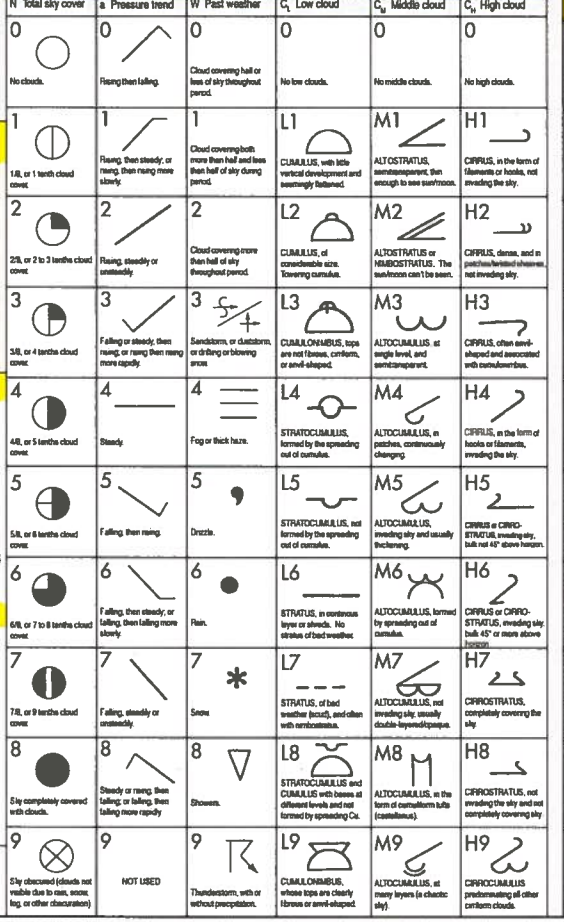


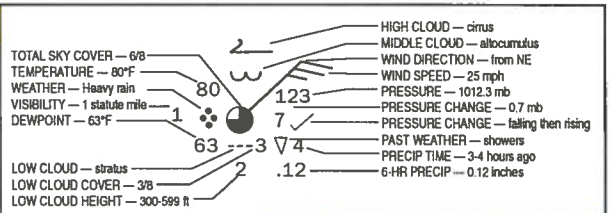
MISCELLANEOUS SYMBOLS

The numbers pertain to code representations used in transmitted reports, and the pictograms are used as part of a station plot.



CONVERSIONS

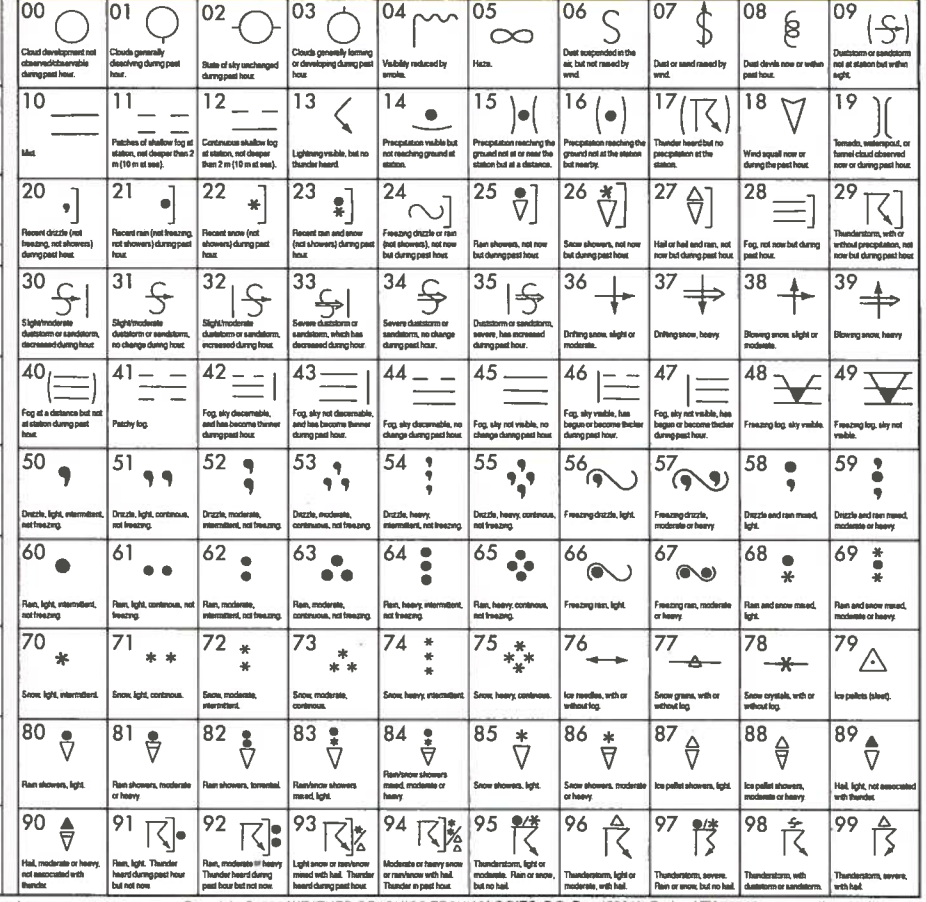
MPH =	knots x 1.15 m/s x 2.235e
Knots =	MPH x 0.8696 m/s x 1.944
m/s =	knots x 0.5144 MPH x 0.4473
Deg F =	(Deg C x 1.8) + 32 ((Deg K - 273.16) x 1.8) + 32
Deg C =	(Deg F - 32) x 0.555 Deg K - 273.16
Deg K =	Deg C + 273.16 ((Deg F - 32) x 0.555) + 273.16
mb =	Inches x 33.8636
inches =	mb x 0.029530233



SURFACE STATION PLOT

WEATHER SYMBOLS

Numbers indicate the weather code as used in synoptic weather reports (ww, present weather reported from a manned weather station, as defined in WMO Pub. No. 306-A).



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