

25. RAOB CSV data format & example.

```
RAOB/CSV, Example CSV Data Sounding Title
INFO:1, First line of freeform text
INFO:2, Another freeform text line
DTG, 2013-01-25 14:15:30
LAT, 25.12, N
LON, 123.45, W
ELEV, 50, M (F option available beginning with RAOB 6.8)
WMO, 12345
TEMPERATURE, C
MOISTURE, TD
WIND, kts
GPM, MSL, M (F option available beginning with RAOB 6.8)
MISSING, -999
SORT, YES
OZONE, mPa
EXTRA#1, Extra#1Name, Extra#1Units
EXTRA#2, Extra#2Name, Extra#2Units
SCALAR#1, Scalar#1Name, Scalar#1Value, Scalar#1Units
SCALAR#2, Scalar#2Name, Scalar#2Value, Scalar#2Units
RAOB/DATA
PRES, TEMP, TD, WIND, SPEED, GPM, OZONE, OMEGA, CFRL, VapDen, LiqWat, WSPEED, Extra1, Extra2
1000, 20, 10, 270, 10, 50, 3.21, -0.3, 0, 3.660, 0.000, 1, 13, 4.1
850, 15, 0, 290, 20, 1400, 3.31, -0.6, 10, 3.580, 0.000, 3, 14, 5.2
-999, -999, -999, 330, 5, 2500, 2.25, -0.3, -999, -999, -999, 2, 15, 6.3
700, 10, -5, 90, 10, -999, 6.90, 0.0, 5, 3.331, 0.000, -1, 16, 7.4
500, -999, -999, 240, 25, -999, 10.11, 0.4, -999, -999, -999, -2, 17, 8.5
```

FILE HEADER Descriptions . . .

Mandatory. "RAOB/CSV" is a required header line.

The following data fields are optional, but should be used if known.

INFO:1 and INFO:2 are both optional freeform text lines, and must not contain commas.

DTG is the "Date-Time-Group" field. It is in UTC (or universal) time. Example: 2013-01-25 14:15:30
Highly recommended if soundings are to be used for Time-Height diagramming.

LAT is required for cross-sections. Latitude is in "decimal degrees". Next data field is "N" or "S".

LON is required for cross-sections. Longitude is in "decimal degrees". Next data field is "E" or "W".

ELEV is optional, but highly recommended, with "M"eters or "F"eet units. "M" is the default value.

If the sounding is "elevated" like ACARS and Satellite-derived profiles, then use this header:
"ELEV, Elevated" and the 1st data line must then contain a height value in the GPM column.

WMO (5-digit identifier number) is optional. When used, and if this WMO number is listed in the RAOB.STN locator file, then the Lat/Lon & Elev data will automatically be accessed. If this number is listed in the RAOB.MTN file, the associated mountain data will be accessed.

TEMPERATURE. Optional Kelvin (K) units. Default is Celsius (C).

MOISTURE. Optional dewpoint (TD) or humidity (RH) input. Default is TD

GPM. Optional wind height type, "MSL" (default) or "AGL". Units are: "M"eters (default) or "F"eet.

MISSING. Optional missing data value. Default is -999. Value must be within +/-32000.

SORT. Optional data sorting option. Default is YES

OZONE. Flags the use of this optional data column. Units: nbar or mPa

WIND. Optional wind speed units, "kts" or "m/s". Default is kts

Note: Add "U/V" after the wind Units to flag data as having U/V wind components.

When using U/V component winds, change the data header from WIND to UU and SPEED to VV as shown in the below example header ...

PRES, TEMP, TD, UU, VV, GPM, WSPEED

The vertical wind data column (WSPEED) must use the same Wind Speed units as U/V data. The upward motion values are positive and downward motion values are negative.

Wind direction can reported in NATO Mills (vs degrees) units by adding "MILS" after wind speed units.

EXTRA DATA. Optional 1, 2 or 3 user-defined data types. Use any kind of data that can numerically represent a profile, such as Temperature. The ExtraData Names can be any alpha-numeric combination up to 15 characters long. The last field is the Units of the data values (7 character max), such as "dB".

Example: EXTRA#1, SNR, dB

Note: When "Units" with exponents are entered with a caret (^) symbol, such as "m^3", RAOB will automatically convert the units numeric value to superscript, like this: "m³".

SCALAR DATA. Optional 1 or 2 user-defined scalar Names (up to 10 characters) and their Units (up to 7 characters). Display on the Sounding's custom parameter List and plot on Cross-Section's Meteograms. The Note about "Units" (see above) also apply to the Units of SCALAR data.

Example: SCALAR#1, SeaTemp, 35, C

DATA HEADER Descriptions . . .

Mandatory. "RAOB/DATA" is a required header line.

Mandatory. Data column headers are required. The first 6 data columns are mandatory and they (PRES, TEMP, TD, WIND, SPEED, GPM) must be present in this exact sequence and spelling for each data file. The remaining 8 data items (OZONE, OMEGA, CFRL, VapDen, LiqWat, WSPEED, Extra1, Extra2) are optional and can be listed in any sequence or grouping. For example, after the required GPM column header, CFRL and OZONE can be listed if needed.

DATA COLUMN Descriptions . . .

There can be 6 to 15 columns of data (which must correspond to the above header data) . . .

PRES, TEMP, TD, WIND, SPEED, GPM, OZONE, OMEGA, CFRL, VapDen, LiqWat, WSPEED, Extra1, Extra2, Extra3

Pressure (mb or hPa). Precision: tenths.

Temperature (°C). Precision: tenths.

Moisture. Precision: tenths. TD (°C) or RH (%).

Wind direction. Degrees (default) or Mills. Precision: whole degrees or Mills.

Wind speed (kts or m/s). Precision: tenths.

GPM Wind height (meters, MSL or AGL).

OZONE (nbar or mPa). Precision: hundredths.

OMEGA (microbars/second). Precision: tenths.

CFRL (percentage of cloud cover). Precision: tenths.

VapDen (g/m³) and LiqWat (g/m³). Precision: thousandths.

Vertical Wind (W) speed (kts or m/s). Precision: tenths.

EXTRA#1 and EXTRA#2. User-defined data types. Precision is automatically determined.

NOTE 1: Maximum data levels are currently 10,000.

NOTE 2: There must be at least 2 levels of Pres/Temp data or 2 levels of Height/Wind data.