RAOB CSV data format & example.

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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
WMO, 12345
TEMPERATURE, C
MOISTURE, TD
WIND, kts
GPM, MSL
MISSING, -999
SORT, YES
OZONE, mPa
#1, Extra1, units-1
#2, Extra2, units-2
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 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. Elevation is always meters.
If the sounding is "elevated" like ACARS and Satellite-derived" profiles, then use this header:
"ELEV, Elevated" and the 1[st] 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 Celcius (C).

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

GPM. Optional wind height type, "MSL" or "AGL". Default is MSL (meters)

MISSING. Optional missing data value. Default is –999

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 …

```
RAOB/DATA
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.

#1 & #2. Identify special user-defined data types. They can be any kind of data that can be numerically measured. The field which follows the "#1 or #2" is the data Name, which can be any alpha-numeric combination up 15 characters long. The last field is the Units of the data values, such as "dB".

Example: #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: "m^3".

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 14 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
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Pressure (mb or hPa). Precision: tenths.
Temperature (°C). Precision: tenths.
Moisture. Precision: tenths. TD (°C) or RH (%).
Wind direction (degrees). Precision: whole degrees.
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/m^3). Precision: thousandths.
LiqWat (g/m^3). Precision: thousandths.
Vertical Wind (W) speed (kts or m/s). Precision: tenths.
Extra1. User-defined data type. Precision is automatically determined.
Extra2. User-defined data type. Precision is automatically determined.

NOTE: Maximum data levels are currently 10,000.