Tarfala Research Station automatic weather station, 2003

Peter Jansson
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1 Instrumentation

The TRS met station consisted of the following instruments during 2003

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Serial number</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100 in Stevenson screen</td>
<td></td>
<td>in Stevenson screen</td>
</tr>
<tr>
<td>Pt100 in Young screen</td>
<td></td>
<td>in Young screen</td>
</tr>
<tr>
<td>T/Rh at 2 m (Young screen)</td>
<td></td>
<td>at 2 m (Young screen)</td>
</tr>
<tr>
<td>Young Wind Monitor</td>
<td></td>
<td>at 3 m</td>
</tr>
<tr>
<td>LiCor Li-200SB pyranometer</td>
<td></td>
<td>at 2 m</td>
</tr>
<tr>
<td>Tipping bucket precipitation gauge</td>
<td></td>
<td>at 2 m</td>
</tr>
<tr>
<td>Ventilated T/Rh</td>
<td></td>
<td>at 2 m</td>
</tr>
<tr>
<td>CR10 data logger</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 Notes on the station data

- Problems with ventilated T/Rh throughout the year. Although less NaN values in ventilated Rh many unrealistic values exist in the series.

- Problems (unknown) with Pt100 sensors in Young and Stevenson screens in the period 2002-09-11 17:00:00 to 2002-11-23 15:00:00. Bad data (but not NaN exist beyond the period.

- Based on the graph, it is evident that the Young shield Pt100 is not working well in December. This can be a program constants, reference resistor or zero offset calibration issue.

3 Data coverage

- Radiation data missing from
  2003-02-19 05:00:00 to 2003-02-19 16:00:00
Relative humidity (ventilated) data missing from
2003-02-18 10:00:00 to 2003-02-18 18:00:00
2003-02-18 22:00:00 to 2003-02-20 01:00:00
2003-11-07 05:00:00 (unventilated Rh)

Temperature (ventilated unless stated otherwise) data missing from
2003-02-18 05:00:00 to 2003-02-19 04:00:00
2003-02-19 17:00:00 to 2003-02-22 04:00:00
2003-02-22 06:00:00 to 2003-02-23 21:00:00
2003-02-27 09:00:00 to 2003-02-27 15:00:00
2003-04-02 17:00:00 (Rotronic and vent T)
2003-04-02 18:00:00 to 2003-04-04 13:00:00
2003-04-04 18:00:00
2003-04-06 14:00:00
2003-04-07 10:00:00 to 2003-04-07 16:00:00
2003-04-08 08:00:00 to 2003-04-08 16:00:00
2003-04-08 18:00:00 to 2003-04-09 03:00:00
2003-04-09 05:00:00
2003-04-09 08:00:00 to 2003-04-09 17:00:00
2003-04-10 08:00:00 to 2003-04-12 13:00:00
2003-04-13 08:00:00 to 2003-04-13 20:00:00
2003-04-14 08:00:00 to 2003-04-14 16:00:00
2003-04-15 08:00:00 to 2003-04-15 20:00:00
2003-04-15 23:00:00 to 2003-04-22 16:00:00
2003-04-23 07:00:00 to 2003-04-23 08:00:00
2003-04-23 10:00:00
2003-04-23 12:00:00
2003-04-23 14:00:00
2003-04-24 08:00:00
2003-04-24 10:00:00

Daily data missing from
2003-02-20 00:00:00
2003-04-19 06:00:00
2003-11-08 00:00:00

‘Synoptic’ data missing from:
2003-02-19 07:00:00 to 2003-02-19 13:00:00

4 Notes on data storage

Example of hourly data:
101,2003,185,1300,13.59,13.21,13.21,59.82,1.978,175.4,0.219,405.6,0,13.56,69.19,3.763,1240
<table>
<thead>
<tr>
<th>Column</th>
<th>Example data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:</td>
<td>101</td>
<td>ID</td>
</tr>
<tr>
<td>02:</td>
<td>2003</td>
<td>Year</td>
</tr>
<tr>
<td>03:</td>
<td>185</td>
<td>Day of Year</td>
</tr>
<tr>
<td>04:</td>
<td>1300</td>
<td>hour-minute (hhmm)</td>
</tr>
<tr>
<td>05:</td>
<td>13.59</td>
<td>2 Pt100 T in Stevenson screen</td>
</tr>
<tr>
<td>06:</td>
<td>13.21</td>
<td>3 T in Young screen</td>
</tr>
<tr>
<td>07:</td>
<td>13.21</td>
<td>4 Pt100 in new Young screen</td>
</tr>
<tr>
<td>08:</td>
<td>59.82</td>
<td>5 Rh in Young screen</td>
</tr>
<tr>
<td>09:</td>
<td>1.978</td>
<td>6 Mean horizontal wind speed</td>
</tr>
<tr>
<td>10:</td>
<td>175.4</td>
<td>7 resultant mean wind direction</td>
</tr>
<tr>
<td>11:</td>
<td>0.219</td>
<td>8 Standard deviation of wind direction</td>
</tr>
<tr>
<td>12:</td>
<td>405.6</td>
<td>9 Global radiation</td>
</tr>
<tr>
<td>13:</td>
<td>0</td>
<td>10 Precipitation/SR50</td>
</tr>
<tr>
<td>14:</td>
<td>13.56</td>
<td>11 ventilated T</td>
</tr>
<tr>
<td>15:</td>
<td>69.19</td>
<td>12 ventilated Rh</td>
</tr>
<tr>
<td>16:</td>
<td>3.763</td>
<td>13 hourly max wind speed</td>
</tr>
<tr>
<td>17:</td>
<td>1240</td>
<td>14 time for max wind speed</td>
</tr>
</tbody>
</table>

Example of daily data summaries:
124,2003,185,2400,10.76,10.52,10.67,70.8,16.04,1510,6.896,2348,6.615,1840,1.884,170.9, 185,0.32,13.92,10.96,78

<table>
<thead>
<tr>
<th>Column</th>
<th>Example data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:</td>
<td>124</td>
<td>ID</td>
</tr>
<tr>
<td>02:</td>
<td>2003</td>
<td>Year</td>
</tr>
<tr>
<td>03:</td>
<td>185</td>
<td>Day of Year</td>
</tr>
<tr>
<td>04:</td>
<td>2400</td>
<td>hour-minute (hhmm)</td>
</tr>
<tr>
<td>05:</td>
<td>10.76</td>
<td>2 Daily average T in Stevenson screen</td>
</tr>
<tr>
<td>06:</td>
<td>10.52</td>
<td>3 Daily T from T/Rh in Young screen</td>
</tr>
<tr>
<td>07:</td>
<td>10.67</td>
<td>4 Daily T from T/Rh in Young screen</td>
</tr>
<tr>
<td>08:</td>
<td>70.8</td>
<td>5 daily average humidity in Young screen</td>
</tr>
<tr>
<td>09:</td>
<td>16.04</td>
<td>6 Daily maximum temperature in Young screen</td>
</tr>
<tr>
<td>10:</td>
<td>1510</td>
<td>7 hhmm for maximum daily temperature</td>
</tr>
<tr>
<td>11:</td>
<td>6.896</td>
<td>8 Daily minimum temperature in Young screen</td>
</tr>
<tr>
<td>12:</td>
<td>2348</td>
<td>9 hhmm for minimum daily temperature</td>
</tr>
<tr>
<td>13:</td>
<td>6.615</td>
<td>10 Maximum wind speed</td>
</tr>
<tr>
<td>14:</td>
<td>1840</td>
<td>11 hhmm for maximum wind speed</td>
</tr>
<tr>
<td>15:</td>
<td>1.884</td>
<td>12 Average wind speed</td>
</tr>
<tr>
<td>16:</td>
<td>170.9</td>
<td>13 Average wind direction</td>
</tr>
<tr>
<td>17:</td>
<td>185</td>
<td>14 Incoming radiation</td>
</tr>
<tr>
<td>18:</td>
<td>0.32</td>
<td>15 Totalized precipitation</td>
</tr>
<tr>
<td>19:</td>
<td>13.92</td>
<td>16 Battery voltage</td>
</tr>
<tr>
<td>20:</td>
<td>10.96</td>
<td>17 Average ventilated temperature</td>
</tr>
<tr>
<td>21:</td>
<td>78</td>
<td>18 Average ventilated relative humidity</td>
</tr>
</tbody>
</table>

Example of 'Synoptic' output:
103,2003,185,1300,12.85

<table>
<thead>
<tr>
<th>Column</th>
<th>Example data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:</td>
<td>103</td>
<td>ID</td>
</tr>
<tr>
<td>02:</td>
<td>2003</td>
<td>Year</td>
</tr>
<tr>
<td>03:</td>
<td>185</td>
<td>Day of Year</td>
</tr>
<tr>
<td>04:</td>
<td>1300</td>
<td>hour-minute (hhmm)</td>
</tr>
<tr>
<td>05:</td>
<td>12.85</td>
<td>Pt100 in Young screen</td>
</tr>
</tbody>
</table>
5 Data files and content

TRSmet2003.csv Raw data file

TRS_met_2003_Precipitation.csv
Date-time, Precipitation
2003-01-01 01:00:00,0.00

TRS_met_2003_Radiation.csv
Date-time, Global radiation
2003-01-01 01:00:00,1.47

TRS_met_2003_Relative_humidity.csv
Date-time, hourly average Rh, ventilated Rh
2003-01-01 01:00:00,50.1,67.1

TRS_met_2003_Temperature.csv
Date-time, hourly average T (Stevenson), hourly average T (Young), hourly average T/Rh (Young), ventilated (T/Rh)
2003-01-01 01:00:00,-44.58,-44.54,-16.46,-16.20

TRS_met_2003_Wind.csv
Date-time, Mean horizontal wind speed, resultant mean wind direction, hourly max wind speed, time of max wind spd
2003-01-01 01:00:00,2.9,306.5,0.1600,10.91,50

TRS_met_2003_Daily_data.csv
Data columns follows description above
2003-01-02 00:00:00,-22.26,-22.27,-13.69,49.1,31.23,133,-63.82,122,19.2,
948,6.7,304.2,0.8,0.0,13.92

TRS_met_2003_Synop_data.csv
Date-time, sample temperature
2003-01-01 01:00:00,-44.62

The data collected during 2003 is summarized the figure 1 and Table 1.
Figure 1: Summary of meteorological data from Tarfala Research Station automatic weather station 2003.
Table 1: Monthly averages of meteorological parameters from the Tarfala Research Station automatic weather station 2003.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average air temp. (Stevenson) (°C)</td>
<td>−45.1</td>
<td>−23.5</td>
<td>−</td>
<td>−</td>
<td>−0.2</td>
<td>4.7</td>
<td>11.7</td>
<td>7.5</td>
<td>1.8</td>
<td>−4.5</td>
<td>−4.4</td>
<td>−9.6</td>
</tr>
<tr>
<td></td>
<td>n 743</td>
<td>659</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average air temp. (Young) (°C)</td>
<td>−44.9</td>
<td>−23.3</td>
<td>−</td>
<td>−</td>
<td>−0.1</td>
<td>4.6</td>
<td>11.6</td>
<td>7.4</td>
<td>1.9</td>
<td>−4.3</td>
<td>−4.2</td>
<td>−9.4</td>
</tr>
<tr>
<td></td>
<td>n 743</td>
<td>659</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average air temp. (°C)</td>
<td>−13.8</td>
<td>−5.1</td>
<td>−</td>
<td>−</td>
<td>0.0</td>
<td>4.6</td>
<td>11.7</td>
<td>7.5</td>
<td>2.0</td>
<td>−4.1</td>
<td>−3.9</td>
<td>−9.0</td>
</tr>
<tr>
<td></td>
<td>n 743</td>
<td>671</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Positive degree sum</td>
<td>0</td>
<td>158</td>
<td>−</td>
<td>−</td>
<td>1186</td>
<td>3543</td>
<td>8665</td>
<td>5802</td>
<td>2422</td>
<td>156</td>
<td>668</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>n 0</td>
<td>108</td>
<td>−</td>
<td>−</td>
<td>443</td>
<td>632</td>
<td>743</td>
<td>730</td>
<td>483</td>
<td>108</td>
<td>190</td>
<td>15</td>
</tr>
<tr>
<td>Average relative humidity (%)</td>
<td>50.8</td>
<td>55.6</td>
<td>−</td>
<td>−</td>
<td>66.8</td>
<td>63.7</td>
<td>58.4</td>
<td>70.6</td>
<td>64.3</td>
<td>68.2</td>
<td>65.4</td>
<td>62.0</td>
</tr>
<tr>
<td></td>
<td>n 743</td>
<td>671</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average incoming global radiation (W m⁻²)</td>
<td>1.4</td>
<td>11.9</td>
<td>−</td>
<td>−</td>
<td>141.3</td>
<td>152.4</td>
<td>135.1</td>
<td>87.0</td>
<td>52.5</td>
<td>28.4</td>
<td>5.0</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>n 743</td>
<td>659</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Global incoming energy sum (W m⁻²)</td>
<td>1071</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>105098</td>
<td>113249</td>
<td>100349</td>
<td>66712</td>
<td>39032</td>
<td>21780</td>
<td>3750</td>
<td>1033</td>
</tr>
<tr>
<td></td>
<td>n 527</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>750</td>
<td>728</td>
<td>705</td>
<td>743</td>
<td>589</td>
</tr>
<tr>
<td>Totalized precipitations (mm)</td>
<td>0.00</td>
<td>0.00</td>
<td>−</td>
<td>−</td>
<td>0.00</td>
<td>2.98</td>
<td>116.16</td>
<td>169.76</td>
<td>165.60</td>
<td>54.08</td>
<td>30.88</td>
<td>6.72</td>
</tr>
<tr>
<td></td>
<td>n 743</td>
<td>671</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
</tr>
<tr>
<td>Average wind speed (m s⁻¹)</td>
<td>3.7</td>
<td>6.0</td>
<td>−</td>
<td>−</td>
<td>2.8</td>
<td>2.5</td>
<td>2.5</td>
<td>2.2</td>
<td>3.5</td>
<td>3.8</td>
<td>3.2</td>
<td>4.8</td>
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<td></td>
<td>n 743</td>
<td>671</td>
<td>−</td>
<td>−</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
<td>743</td>
<td>767</td>
</tr>
</tbody>
</table>
Logger program

5.1 Program valid for the year (copy from 2001 and 2002)

; {CR10}
;=================================================================
; TARFALA MET STATION
; based on program tarm0898 from 6. August 1998
; NEW: output hourly max wind
; Regine Hock, 5 May 2001
;=================================================================
;{CR10}

*Table 1 Program

<table>
<thead>
<tr>
<th>Execution Interval (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Batt Voltage (P10)</td>
</tr>
<tr>
<td>1: 10 Loc [ Batteri_V ]</td>
</tr>
</tbody>
</table>

2: IF (X<>F) (P89)

<table>
<thead>
<tr>
<th>X Loc [ Batteri_V ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2: 4 &lt;</td>
</tr>
<tr>
<td>3: 9.7 F</td>
</tr>
<tr>
<td>4: 0 Go to end of Program Table</td>
</tr>
</tbody>
</table>

;========== TEMPERATURE 1 - PT100 in weather hut ===============

3: 3W Half Bridge (P7)

<table>
<thead>
<tr>
<th>Reps</th>
</tr>
</thead>
<tbody>
<tr>
<td>2: 33 25 mV 50 Hz Rejection Range</td>
</tr>
<tr>
<td>3: 1 SE Channel</td>
</tr>
<tr>
<td>4: 2 Excite all reps w/Exchan 2</td>
</tr>
<tr>
<td>5: 2100 mV Excitation</td>
</tr>
<tr>
<td>6: 21 Loc [ Rs_Ro_T1 ]</td>
</tr>
<tr>
<td>7: 100 Mult</td>
</tr>
<tr>
<td>8: 0.0000 Offset</td>
</tr>
</tbody>
</table>

;========== TEMPERATURE 2 - PT100 in radiation shield =============

4: 3W Half Bridge (P7)

<table>
<thead>
<tr>
<th>Reps</th>
</tr>
</thead>
<tbody>
<tr>
<td>2: 33 25 mV 50 Hz Rejection Range</td>
</tr>
<tr>
<td>3: 3 SE Channel</td>
</tr>
<tr>
<td>4: 2 Excite all reps w/Exchan 2</td>
</tr>
<tr>
<td>5: 2100 mV Excitation</td>
</tr>
<tr>
<td>6: 22 Loc [ Rs_Ro_T2 ]</td>
</tr>
<tr>
<td>7: 100.00 Mult</td>
</tr>
<tr>
<td>8: 0.0000 Offset</td>
</tr>
</tbody>
</table>

;== calculate Temp 1 and Temp 2 from Rs/Ro ================

5: Temperature RTD (P16)

<table>
<thead>
<tr>
<th>Reps</th>
</tr>
</thead>
<tbody>
<tr>
<td>2: 21 R/R0 Loc [ Rs_Ro_T1 ]</td>
</tr>
<tr>
<td>3: 1 Loc [ T1_bur__C ]</td>
</tr>
<tr>
<td>4: 1 Mult</td>
</tr>
<tr>
<td>5: 0.0000 Offset</td>
</tr>
</tbody>
</table>

6: Do (P86)

<table>
<thead>
<tr>
<th>Set Port 1 High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: 41</td>
</tr>
</tbody>
</table>
;======= Temperature Rotronic =========================

7: Volt (Diff) (P2)
  1: 1 Reps
  2: 35 2500 mV 50 Hz Rejection Range
  3: 3 DIFF Channel
  4: 3 Loc [ T3_Rot__C ]
  5: 0.1 Mult
  6: 0.0000 Offset

;======= RELATIVE HUMIDITY Rotronic ===============

8: Volts (SE) (P1)
  1: 1 Reps
  2: 35 2500 mV 50 Hz Rejection Range
  3: 7 SE Channel
  4: 4 Loc [ rH_Rot___ ]
  5: 0.1 Mult
  6: 0.0 Offset

;======= VENTILATED TEMPERATURE SENSOR (Vaisala PT100) ==========

9: 3W Half Bridge (P7)
  1: 1 Reps
  2: 33 25 mV 50 Hz Rejection Range
  3: 11 SE Channel
  4: 3 Excite all reps w/Exchan 3
  5: 2100 mV Excitation
  6: 23 Loc [ Rs_Ro_ven ]
  7: 100 Mult
  8: 0.0000 Offset

10: Temperature RTD (P16)
    1: 1 Reps
    2: 23 R/R0 Loc [ Rs_Ro_ven ]
    3: 11 Loc [ TempVent ]
    4: 1 Mult
    5: 0.0000 Offset

;======= RELATIVE HUMIDITY (VENTILATED SENSOR) =============

11: Volts (SE) (P1)
    1: 1 Reps
    2: 35 2500 mV 50 Hz Rejection Range
    3: 8 SE Channel
    4: 12 Loc [ HumVent ]
    5: 0.1 Mult
    6: 0.0 Offset

;============= WIND SPEED ==================

12: Pulse (P3)
    1: 1 Reps
    2: 1 Pulse Input Channel
    3: 21 Low Level AC, Output Hz
    4: 5 Loc [ Vhast_m_s ]
    5: 0.098 Mult
    6: 0 Offset

8
;================================== WIND DIRECTION =================================
13: Excite-Delay (SE) (P4)
1: 1 Reps
2: 5 2500 mV Slow Range
3: 9 SE Channel
4: 1 Excite all reps w/Exchan 1
5: 2 Delay (units 0.01 sec)
6: 2500 mV Excitation
7: 6 Loc [ Vrikt____ ]
8: 0.142 Mult
9: -135 Offset

14: IF (X<>F) (P89)
1: 6 X Loc [ Vrikt____ ]
2: 4 <
3: 0 F
4: 30 Then Do

15: Z=X+F (P34)
1: 6 X Loc [ Vrikt____ ]
2: 360 F
3: 6 Z Loc [ Vrikt____ ]

16: End (P95)

;================================== GLOBAL RADIATION ==================================
17: Volts (SE) (P1)
1: 1 Reps
2: 33 25 mV 50 Hz Rejection Range
3: 10 SE Channel
4: 7 Loc [ Sol__W_m_ ]
5: 116.55 Mult
6: 0.0000 Offset

;================================== PRECIPITATION =====================================
18: Pulse (P3)
1: 1 Reps
2: 2 Pulse Input Channel
3: 2 Switch Closure, All Counts
4: 8 Loc [ Nederb_mm ]
5: 0.16 Mult
6: 0.0 Offset

19: Internal Temperature (P17)
1: 9 Loc [ Logtemp_C ]

;================================== OUTPUT ===============================================
20: If time is (P92)
1: 0 Minutes (Seconds --) into a
2: 60 Interval (same units as above)
3: 10 Set Output Flag High

21: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 101 Array ID

22: Real Time (P77)
1: 1220 Year,Day,Hour/Minute (midnight = 2400)

23: Average (P71)
1: 4 Reps
2: 1 Loc [ T1_bur__C ]

24: Wind Vector (P69)
1: 1 Reps
2: 1 Samples per Sub-Interval
3: 0 S, 1, & (1) Polar
4: 5 Wind Speed/East Loc [ Vhast_m_s ]
5: 6 Wind Direction/North Loc [ Vrikt___ ]

25: Average (P71)
1: 1 Reps
2: 7 Loc [ Sol__W_m_ ]

26: Totalize (P72)
1: 1 Reps
2: 8 Loc [ Nederb_mm ]

27: Average (P71)
1: 2 Reps
2: 11 Loc [ TempVent ]

28: Maximize (P73)
1: 1 Reps
2: 10 Value with Hr-Min
3: 5 Loc [ Vhast_m_s ]

29: Serial Out (P96)
1: 71 SM192/SM716/CSM1

; ======== STORAGE DAILY MEANS AT MIDNIGHT ===============

30: If time is (P92)
1: 0 Minutes (Seconds --) into a
2: 1440 Interval (same units as above)
3: 10 Set Output Flag High

31: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 124 Array ID

32: Real Time (P77)
1: 1220 Year,Day,Hour/Minute (midnight = 2400)

33: Average (P71)
1: 4 Reps
2: 1 Loc [ T1_bur__C ]

34: Maximize (P73)
1: 1 Reps
2: 10 Value with Hr-Min
3: 2 Loc [ T2_skyd_C ]

35: Minimize (P74)
1: 1 Reps
2: 10 Value with Hr-Min
3: 2 Loc [ T2_skyd_C ]

36: Maximize (P73)
  1: 1 Reps
  2: 10 Value with Hr-Min
  3: 5 Loc [ Vhast_m_s ]

37: Wind Vector (P69)
  1: 1 Reps
  2: 1 Samples per Sub-Interval
  3: 1 S, 1 Polar
  4: 5 Wind Speed/East Loc [ Vhast_m_s ]
  5: 6 Wind Direction/North Loc [ Vrikt___ ]

38: Average (P71)
  1: 1 Reps
  2: 7 Loc [ Sol__W_m_ ]

39: Totalize (P72)
  1: 1 Reps
  2: 8 Loc [ Nederb_mm ]

40: Sample (P70)
  1: 1 Reps
  2: 10 Loc [ Batteri_V ]

41: Average (P71)
  1: 2 Reps
  2: 11 Loc [ TempVent ]

42: Serial Out (P96)
  1: 71 SM192/SM716/CSM1

43: If time is (P92)
  1: 60 Minutes (Seconds --) into a
  2: 1440 Interval (same units as above)
  3: 10 Set Output Flag High

44: Set Active Storage Area (P80)
  1: 1 Final Storage Area 1
  2: 103 Array ID

45: Real Time (P77)
  1: 1220 Year,Day,Hour/Minute (midnight = 2400)

; SAMPLE TEMP FOR COMPARISON WITH 3-HOURLY DATA OF OTHER STATIONS ======

46: Sample (P70)
  1: 1 Reps
  2: 2 Loc [ T2_skyd_C ]

47: If time is (P92)
  1: 240 Minutes (Seconds --) into a
  2: 1440 Interval (same units as above)
  3: 10 Set Output Flag High

48: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 103 Array ID

49: Real Time (P77)
   1: 1220 Year,Day,Hour/Minute (midnight = 2400)

50: Sample (P70)
   1: 1 Reps
   2: 2 Loc [ T2_skyd_C ]

51: If time is (P92)
   1: 420 Minutes (Seconds --) into a
   2: 1440 Interval (same units as above)
   3: 10 Set Output Flag High

52: Set Active Storage Area (P80)
   1: 1 Final Storage Area 1
   2: 103 Array ID

53: Real Time (P77)
   1: 1220 Year,Day,Hour/Minute (midnight = 2400)

54: Sample (P70)
   1: 1 Reps
   2: 2 Loc [ T2_skyd_C ]

; 3-HOURLY TEMP VALUES TO FILE

55: If time is (P92)
   1: 600 Minutes (Seconds --) into a
   2: 1440 Interval (same units as above)
   3: 10 Set Output Flag High

56: Set Active Storage Area (P80)
   1: 1 Final Storage Area 1
   2: 103 Array ID

57: Real Time (P77)
   1: 1220 Year,Day,Hour/Minute (midnight = 2400)

58: Sample (P70)
   1: 1 Reps
   2: 2 Loc [ T2_skyd_C ]

59: If time is (P92)
   1: 780 Minutes (Seconds --) into a
   2: 1440 Interval (same units as above)
   3: 10 Set Output Flag High

60: Set Active Storage Area (P80)
   1: 1 Final Storage Area 1
   2: 103 Array ID

61: Real Time (P77)
   1: 1220 Year,Day,Hour/Minute (midnight = 2400)

62: Sample (P70)
   1: 1 Reps
2: 2 Loc [ T2_skyd_C ]

63: If time is (P92)
1: 960 Minutes (Seconds --) into a
2: 1440 Interval (same units as above)
3: 10 Set Output Flag High

64: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 103 Array ID

65: Real Time (P77)
1: 1220 Year,Day,Hour/Minute (midnight = 2400)

66: Sample (P70)
1: 1 Reps
2: 2 Loc [ T2_skyd_C ]

67: If time is (P92)
1: 1140 Minutes (Seconds --) into a
2: 1440 Interval (same units as above)
3: 10 Set Output Flag High

68: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 103 Array ID

69: Real Time (P77)
1: 1220 Year,Day,Hour/Minute (midnight = 2400)

70: Sample (P70)
1: 1 Reps
2: 2 Loc [ T2_skyd_C ]

71: If time is (P92)
1: 1320 Minutes (Seconds --) into a
2: 1440 Interval (same units as above)
3: 10 Set Output Flag High

72: Set Active Storage Area (P80)
1: 1 Final Storage Area 1
2: 103 Array ID

73: Real Time (P77)
1: 1220 Year,Day,Hour/Minute (midnight = 2400)

74: Sample (P70)
1: 1 Reps
2: 2 Loc [ T2_skyd_C ]

*Table 2 Program
 01: 0.0000 Execution Interval (seconds)

*Table 3 Subroutines

End Program
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