



Tarfala Research Station automatic weather station, 2000

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Contents

1	Instrumentation	3
2	Notes on the station data	3
3	Data coverage	3
4	Notes on data storage	4
5	Data files and content	5
5.1	Program valid 15 June 12:00 (SR50 removed)	8
5.2	Likely program from 15 June 12:00 (copy of fall 1999)	15

1 Instrumentation

The TRS met station consisted of the following instruments during 2000

Sensor	Serial number	Remark
Pt100		in Stevenson screen
Pt100		in Young screen
T/Rh		at 2 m (Young screen)
Young Wind Monitor		at 3 m
LiCor Li-200SB pyranometer		at 2 m
Tipping bucket precipitation gauge		at 2 m
SR50		at 1.5 m
Ventilated T/Rh		at 2 m
CR10 data logger		

2 Notes on the station data

- SR 50 in operation until 2000-06-15 12:00:00. No signs of documented program changes. SR50 data stored in place of precipitation until 2000-06-15 12:00:00.

3 Data coverage

- Radiation data missing from
2000-05-24 00:00:00
2000-07-31 15:00:00
- Relative humidity (only ventilated) data missing from
2000-05-24 00:00:00 to 2000-05-24 02:00:00
2000-07-31 15:00:00 to 2000-07-31 16:00:00
2000-10-03 09:00:00
2000-10-03 14:00:00 to 2000-10-03 19:00:00
- Temperature (concerns ventilated unless stated otherwise) data missing from
2000-03-30 10:00:00 to 2000-03-30 13:00:00
2000-04-09 06:00:00 to 2000-04-09 10:00:00
2000-04-09 19:00:00 to 2000-04-10 10:00:00
2000-04-11 08:00:00 to 2000-04-11 09:00:00
2000-04-13 08:00:00
2000-04-18 18:00:00
2000-05-04 18:00:00 to 2000-05-04 21:00:00
2000-05-09 02:00:00
2000-05-09 13:00:00
2000-05-13 14:00:00 to 2000-05-13 16:00:00
2000-05-24 00:00:00 to 2000-05-24 01:00:00 (2 Pt100 and ventilated)
) 2000-06-10 06:00:00
2000-06-12 11:00:00 to 2000-06-13 03:00:00
2000-06-14 00:00:00 to 2000-06-14 05:00:00
2000-06-15 07:00:00
2000-06-15 09:00:00
2000-06-16 13:00:00 to 2000-06-16 15:00:00
2000-06-25 09:00:00 to 2000-06-25 12:00:00
2000-07-31 15:00:00
- Daily data missing from
2000-05-24 00:00:00 to 2000-05-25 00:00:00 (2 Pt100, ventilated T, battery voltage)

2000-08-01 00:00:00 (2 Pt100, ventilated T, battery voltage)

4 Notes on data storage

Example of hourly data:

101,2000,185,1300,9.57,9.56,9.64,52.49,1.757,286.3,0.104,254.2,0,10.17,63.78

Column	Example data	Description
01:	101	ID
02:	2000	Year
03:	185	Day of Year
04:	1300	hour-minute (hhmm)
05:	9.57	2 Pt100 T in Stevenson screen)
06:	9.56	3 T in Young screen
07:	9.64	4 Pt100 in new Young screen
08:	52.49	5 Rh in Young screen
09:	1.757	6 Mean horizontal wind speed
10:	286.3	7 resultant mean wind direction
11:	0.104	8 Standard deviation of wind direction
12:	254.2	9 Global radiation
13:	0	10 Precipitation/SR50
14:	10.17	11 ventilated T
15:	63.87	12 ventilated Rh

Example of daily data summaries:

124,2000,185,2400,6.959,6.919,6.874,79.3,10.62,1144,3.884,2334,7.44,1555,1.783,306.1,124.2,6.24,13.92,7.6,83.8

Column	Example data	Description
01:	124	ID
02:	2000	Year
03:	185	Day of Year
04:	2400	hour-minute (hhmm)
05:	6.959	2 Daily average T in Stevenson screen)
06:	6.919	3 Daily T from T/Rh in Young screen
07:	6.874	4 Daily T from T/Rh in Young screen
08:	79.3	5 daily average humidity in Young screen
08:	10.62	6 Daily maximum temperature in Young screen
10:	1144	7 hhmm for maximum daily temperature
11:	3.884	8 Daily minimum temperature in Young screen
12:	2334	9 hhmm for minimum daily temperature
13:	7.44	10 Maximum wind speed
14:	1555	11 hhmm for maximum wind speed
15:	1.783	12 Average wind speed
16:	306.1	13 Average wind direction
17:	124.2	14 Incoming radiation
18:	6.24	15 Totalized precipitation
19:	13.92	16 Battery voltage
20:	7.6	17 Average ventilated temperature
21:	83.8	18 Average ventilated relative humidity

Example of 'Synoptic' output:

103,2000,185,1300,8.91

Column	Example data	Description
01:	103	ID
02:	2000	Year
03:	185	Day of Year
04:	1300	hour-minute (hhmm)
05:	8.91	Pt100 in Young screen

5 Data files and content

TRSmets2000.csv Raw data file

TRS_met_2000_Precipitation.csv

Date-time, Precipitation

2000-12-31 23:00:00,0.00

TRS_met_2000_Radiation.csv

Date-time, Global radiation

2000-01-01 01:00:00,0.19

TRS_met_2000_Relative_humidity.csv

Date-time, hourly average Rh, ventilated Rh

2000-01-01 01:00:00,80.2,85.7

TRS_met_2000_Temperature.csv

Date-time, hourly average T (Stevenson), hourly average T (Young), hourly average T/Rh (Young), ventilated (T/Rh)

2000-01-01 01:00:00,-13.51,-13.16,-12.29,-12.65

TRS_met_2000_Wind.csv

Date-time, Mean horizontal wind speed, resultant mean wind direction

2000-01-01 01:00:00,2.5,337.7,0.0640

TRS_met_2000_Snow_depth.csv

Date-time, Snow depth

2000-01-01 01:00:00,0.193

TRS_met_2000_Daily_data.csv

Data columns follows description above

2000-01-02 00:00:00,-12.74,-12.70,-12.28,79.6,-10.18,516,-16.01,1242,6.5,
546,1.7,0.7,0.5,0.2,13.92

TRS_met_2000_Synop_data.csv

Date-time, sample temperature

2000-01-01 01:00:00,-14.07

The data collected during 2000 is summarized the figure 1 and Table 1.

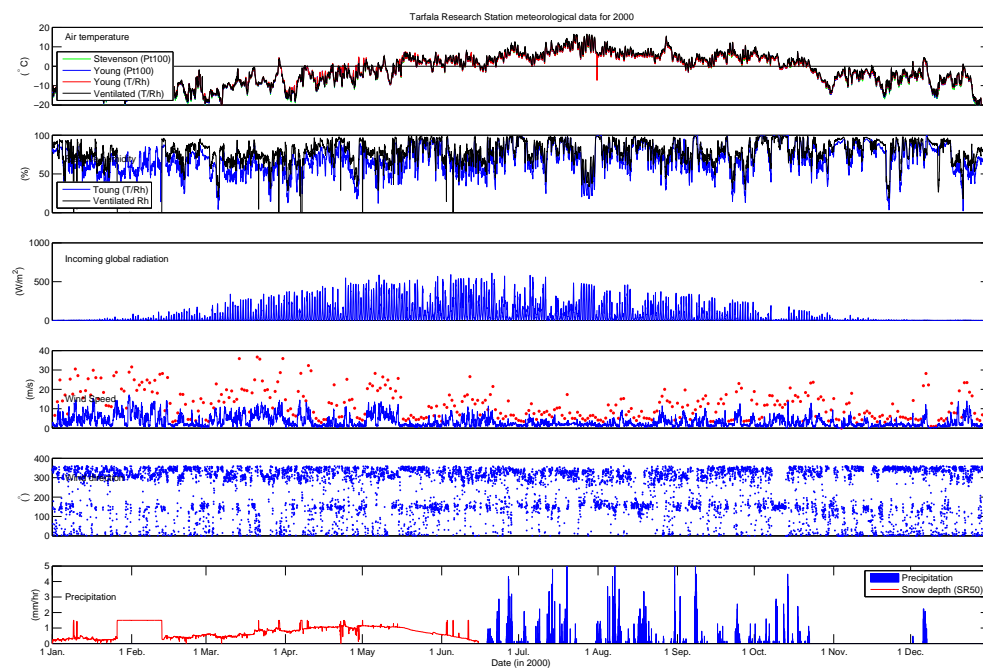


Figure. 1. Summary of meteorological data from Tarfala Research Station automatic weather station 2000.

Table. 1. Monthly averages of meteorological parameters from the Tarfala Research Station automatic weather station 2000.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Average air temperature (Stevenson)												
(°C)	−9.3	−10.0	−9.8	−6.7	0.4	3.2	8.2	6.6	3.9	−0.0	−6.4	−9.0
<i>n</i>	743	695	767	743	741	743	742	766	743	767	743	767
Average air temperature (Young)												
(°C)	−9.2	−9.9	−9.8	−6.6	0.5	3.2	8.1	6.5	3.9	−0.0	−6.2	−8.8
<i>n</i>	743	695	767	743	741	743	742	766	743	767	743	767
Average air temperature												
(°C)	−9.0	−9.7	−9.5	−6.3	0.5	3.3	8.1	6.5	3.9	−0.0	−6.0	−8.6
<i>n</i>	743	695	767	743	743	743	743	767	743	767	743	767
Positive degree sum												
(°C)	0	0	39	24	—	2524	—	—	2964	1608	0	97
<i>n</i>	0	0	16	31	—	639	—	—	690	471	0	46
Average relative humidity												
(%)	62.5	63.9	55.9	62.4	70.6	67.6	71.3	77.3	65.1	80.1	77.8	70.7
<i>n</i>	743	695	767	743	743	743	743	767	743	767	743	767
Average incoming global radiation												
(W m ^{−2})	3.1	14.8	53.6	103.6	134.5	145.0	111.2	71.4	55.0	15.3	2.6	1.5
<i>n</i>	743	695	767	743	742	743	742	766	743	767	743	767
Global incoming energy sum												
(W m ^{−2})	2277	10319	41089	76994	—	107701	—	—	40884	11714	1968	1128
<i>n</i>	736	685	760	743	—	743	—	—	708	756	733	761
Totalized precipitation												
(mm)	—	—	—	—	—	—	107.84	193.44	106.40	68.80	0.00	31.20
<i>n</i>	—	—	—	—	—	—	743	767	743	767	743	767
Average wind speed												
(m s ^{−1})	5.4	4.6	5.5	2.9	3.7	3.1	2.2	2.5	3.1	3.2	1.8	2.7
<i>n</i>	743	695	767	743	743	743	743	767	743	767	743	767

Logger program

5.1 Program valid 15 June 12:00 (SR50 removed)

```
;{CR10}
;=====
; TARFALA MET STATION
; downloaded 6. August 1998, 15:21 wintertime
; NEW: VENTILATED TEMPERATURE SENSOR
; WINTER PROGRAM: SR50 (SNOW DEPTH METER) INSTEAD OF PRECIPITATION !!!
; 28. Nov 1999
; Regine Hock
;=====
;{CR10}
```

*Table 1 Program

01: 10.0000 Execution Interval (seconds)

1: Batt Voltage (P10)

1: 10 Loc [Batteri_V]

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

1: 10 X Loc [Batteri_V]

2: 4 <

3: 9.7 F

4: 0 Go to end of Program Table

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

3: 3W Half Bridge (P7)

1: 1 Reps

2: 33 25 mV 50 Hz Rejection Range

3: 1 SE Channel

4: 2 Excite all reps w/Exchan 2

5: 2100 mV Excitation

6: 21 Loc [Rs_Ro_T1]

7: 100 Mult

8: 0.0000 Offset

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

4: 3W Half Bridge (P7)

1: 1 Reps

2: 33 25 mV 50 Hz Rejection Range

3: 3 SE Channel

4: 2 Excite all reps w/Exchan 2

5: 2100 mV Excitation

6: 22 Loc [Rs_Ro_T2]

7: 100.00 Mult

8: 0.0000 Offset

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

5: Temperature RTD (P16)

1: 2 Reps

2: 21 R/R0 Loc [Rs_Ro_T1]

3: 1 Loc [T1_bur__C]

4: 1 Mult

5: 0.0000 Offset

6: Do (P86)


```

1: 41      Set Port 1 High

;===== Temperature Rotronic =====

7: Volt (Diff) (P2)
1: 1      Repts
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      Repts
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      Repts
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      Repts
2: 23      R/R0 Loc [ Rs_Ro_ven ]
3: 11      Loc [ TempVent ]
4: 1      Mult
5: 0.0000  Offset

;===== RELATIVE HUMITY (VENTILATED SENSOR) =====

11: Volts (SE) (P1)
1: 1      Repts
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      Repts
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

;===== 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

;===== SR50 SNOW DEPTH METER (INSTEAD OF PRECIPITATION) =====

18: Do (P86)
  1: 47     Set Port 7 High

19: Excitation with Delay (P22)
  1: 1      Ex Channel
  2: 1      Delay W/Ex (units = 0.01 sec)
  3: 0      Delay After Ex (units = 0.01 sec)
  4: 0      mV Excitation

20: Do (P86)
  1: 57     Set Port 7 Low

21: Pulse (P3)
  1: 1      Reps
  2: 2      Pulse Input Channel
  3: 1      Low Level AC, All Counts
  4: 8      Loc [ Nederb_mm ]
  5: 0.0025 Mult
  6: 0.0    Offset

```

```

; subtract measured distance from initial value =====
22: Z=F (P30)
  1: 1.5      F
  2: 00       Exponent of 10
  3: 30       Z Loc [ SR50level ]

23: Z=X-Y (P35)
  1: 30       X Loc [ SR50level ]
  2: 8        Y Loc [ Nederb_mm ]
  3: 8        Z Loc [ Nederb_mm ]

;===== SR50 SNOW DEPTH METER (INSTEAD OF PRECIPITATION) END =====

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

; ===== OUTPUT =====

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

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

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

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

29: Wind Vector (P69)
  1: 1        Reps
  2: 1        Samples per Sub-Interval
  3: 0        S, é1, & â(é1) Polar
  4: 5        Wind Speed/East Loc [ Vhast_m_s ]
  5: 6        Wind Direction/North Loc [ Vrikt____ ]

; CHANGE FOR SR50 - NO LONGER TOTALIZE FOR LOCATION 8 =====
30: Average (P71)
  1: 2        Reps
  2: 7        Loc [ Sol__W_m_ ]

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

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

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

33: If time is (P92)

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

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

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

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

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

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

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

40: Wind Vector (P69)
1: 1      Reps
2: 1      Samples per Sub-Interval
3: 1      S, é1 Polar
4: 5      Wind Speed/East Loc [ Vhast_m_s ]
5: 6      Wind Direction/North Loc [ Vrikt____ ]

; CHANGE FOR SR50 - NO LONGER TOTALIZE FOR LOCATION 8 =====
41: Average (P71)
1: 2      Reps
2: 7      Loc [ Sol__W_m_ ]

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

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

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

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

```

```

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```

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

76: Sample (P70)
 1: 1 Repts
 2: 2 Loc [T2_skyd_C]

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

*Table 3 Subroutines

End Program

1	[T1_bur__C]	RW--	2	1	Start	-----	---
2	[T2_skyd_C]	RW--	12	1	-----	-----	End
3	[T3_Rot__C]	RW--	2	1	Start	-----	---
4	[rH_Rot___]	RW--	2	1	-----	-----	---
5	[Vhast_m_s]	RW--	3	1	-----	-----	---
6	[Vrikt_____]	RW--	4	2	-----	-----	---
7	[Sol__W_m_]	RW--	2	1	-----	-----	---
8	[Nederb_mm]	RW--	3	2	-----	-----	---
9	[Logtemp_C]	-W--	0	1	-----	-----	---
10	[Batteri_V]	RW--	2	1	-----	-----	---
11	[TempVent]	RW--	2	1	-----	-----	---
12	[HumVent]	RW--	2	1	-----	-----	---
13	[_____]	----	0	0	-----	-----	---
14	[_____]	----	0	0	-----	-----	---
15	[_____]	R----	1	0	-----	-----	---
16	[_____]	----	0	0	-----	-----	---
17	[_____]	----	0	0	-----	-----	---
18	[_____]	----	0	0	-----	-----	---
19	[_____]	----	0	0	-----	-----	---
20	[_____]	----	0	0	-----	-----	---
21	[Rs_Ro_T1]	RW--	1	1	-----	-----	---
22	[Rs_Ro_T2]	RW--	1	1	-----	-----	---
23	[Rs_Ro_ven]	RW--	1	1	-----	-----	---
24	[_____]	----	0	0	-----	-----	---
25	[_____]	----	0	0	-----	-----	---
26	[_]	----	0	0	-----	-----	---
27	[Rs_lo2]	----	0	0	-----	-----	---
28	[Temp2m]	----	0	0	-----	-----	---
29	[RelHum2m]	----	0	0	-----	-----	---
101	[_____]	----	0	0	-----	-----	---
103	[_____]	----	0	0	-----	-----	---
124	[_____]	----	0	0	-----	-----	---
30	[SR50level]	RW--	1	1	-----	-----	---

5.2 Likely program from 15 June 12:00 (copy of fall 1999)

```
;{CR10}
;=====
; TARFALA MET STATION
; downloaded 6. August 1998, 15:21 wintertime
; NEW: VENTILATED TEMPERATURE SENSOR
; Regine Hock
;=====
```

```
;{CR10}

*Table 1 Program
  01: 10.0000   Execution Interval (seconds)

1:  Batt Voltage (P10)
  1: 10        Loc [ Batteri_V ]

2:  IF (X<=>F) (P89)
  1: 10        X Loc [ Batteri_V ]
  2: 4         <
  3: 9.7       F
  4: 0         Go to end of Program Table

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

3:  3W Half Bridge (P7)
  1: 1         Reps
  2: 33        25 mV 50 Hz Rejection Range
  3: 1         SE Channel
  4: 2         Excite all reps w/Exchan 2
  5: 2100      mV Excitation
  6: 21        Loc [ Rs_Ro_T1 ]
  7: 100       Mult
  8: 0.0000    Offset

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

4:  3W Half Bridge (P7)
  1: 1         Reps
  2: 33        25 mV 50 Hz Rejection Range
  3: 3         SE Channel
  4: 2         Excite all reps w/Exchan 2
  5: 2100      mV Excitation
  6: 22        Loc [ Rs_Ro_T2 ]
  7: 100.00    Mult
  8: 0.0000    Offset

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

5:  Temperature RTD (P16)
  1: 2         Reps
  2: 21        R/R0 Loc [ Rs_Ro_T1 ]
  3: 1         Loc [ T1_bur__C ]
  4: 1         Mult
  5: 0.0000    Offset

6:  Do (P86)
  1: 41        Set Port 1 High

;===== 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
```



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

8:  Volts (SE) (P1)
  1: 1      Repts
  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      Repts
  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      Repts
  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      Repts
  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      Repts
  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

;===== WIND DIRECTION =====

13: Excite-Delay (SE) (P4)
  1: 1      Repts
  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

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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, é1, & â(é1) Polar

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

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

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

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

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

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

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

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

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

36: Wind Vector (P69)
1: 1      Reps
2: 1      Samples per Sub-Interval
3: 1      S, é1 Polar
4: 5      Wind Speed/East Loc [ Vhast_m_s ]
5: 6      Wind Direction/North Loc [ Vrikt_---- ]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

; 3-HOURLY TEMP VALUES TO FILE =====0

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

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

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

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

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

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

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

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

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

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

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

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```

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

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

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

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

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

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

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

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

73: 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

```

1	[T1_bur__C]	RW--	2	1	Start	-----	---
2	[T2_skyd_C]	RW--	12	1	-----	-----	End
3	[T3_Rot__C]	RW--	2	1	Start	-----	---
4	[rH_Rot___]	RW--	2	1	-----	-----	---
5	[Vhast_m_s]	RW--	3	1	-----	-----	---
6	[Vrikt_____]	RW--	4	2	-----	-----	---
7	[Sol__W_m_]	RW--	2	1	-----	-----	---
8	[Nederb_mm]	RW--	2	1	-----	-----	---
9	[Logtemp_C]	-W--	0	1	-----	-----	---
10	[Batteri_V]	RW--	2	1	-----	-----	---
11	[TempVent]	RW--	2	1	-----	-----	---
12	[HumVent]	RW--	2	1	-----	-----	---
13	[_____]	----	0	0	-----	-----	---
14	[_____]	----	0	0	-----	-----	---

15	[_____]	----	0	0	-----	-----	---
16	[_____]	----	0	0	-----	-----	---
17	[_____]	----	0	0	-----	-----	---
18	[_____]	----	0	0	-----	-----	---
19	[_____]	----	0	0	-----	-----	---
20	[_____]	----	0	0	-----	-----	---
21	[Rs_Ro_T1]	RW--	1	1	-----	-----	---
22	[Rs_Ro_T2]	RW--	1	1	-----	-----	---
23	[Rs_Ro_ven]	RW--	1	1	-----	-----	---
24	[_____]	----	0	0	-----	-----	---
25	[_____]	----	0	0	-----	-----	---
26	[_]	----	0	0	-----	-----	---
27	[Rs_lo2]	----	0	0	-----	-----	---
28	[Temp2m]	----	0	0	-----	-----	---
29	[RelHum2m]	----	0	0	-----	-----	---