DETERMINING RELATIVE HUMIDITY
WITH A SLING PSYCHROMETER

GENERAL

This method describes how to determine the relative humidity with a sling psychrometer. A psychrometer measures the ambient air temperature (dry bulb temperature) and the wet bulb temperature. From these temperature measurements, the percent relative humidity is determined.

APPARATUS

1. Sling psychrometer

PROCEDURE

1. Before using, take the end cap off the psychrometer and fill the reservoir with water. Be sure that the wick is saturated with water and covers the mercury reservoir on the wet bulb thermometer. Also, be sure that the mercury reservoir on the dry bulb thermometer is dry.

2. Pull the tube clear of the body so that the body can swivel.

3. Hold the tube and whirl the body two to three revolutions per second.

4. Continue whirling until the temperatures stabilize (should take 1-2 minutes).

5. Stop whirling and immediately read temperature of the wet bulb thermometer and then the dry thermometer.

6. Figure the temperature difference between the two thermometers.

7. Use the attached table to determine the relative humidity.

EXAMPLE

After following the above procedure, a dry bulb temperature of 86°F and a wet bulb temperature of 71°F were obtained. Thus, the temperature difference is 15°F.

From the "Relative Humidity" table, locate the column at the top headed with 15. Follow this column down to the row headed with dry bulb temperature of 86°F. The intersection of the column and the row gives the number 47. This number is the percent relative humidity.

REPORTING RESULTS

Record the time, date, dry bulb temperature, wet bulb temperature, and relative humidity.

Table 1 – Relative Humidity, %
Difference Between Readings of Wet & Dry Bulbs in °F

Dry Bulb °F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Dry Bulb °F
40	92	83	75	68	60	52	45	37	29	22	15	7	0																		40
41	92	84	76	69	61	54	46	39	31	24	17	10	3																		41
42	92	85	77	69	62	55	47	40	33	26	19	12	5																		42
43	92	85	77	70	63	55	48	42	35	28	21	14	8																		43
44	93	85	78	71	63	56	49	43	36	30	23	16	10																		44
45	93	86	78	71	64	57	51	44	38	31	25	18	12	6																	45
46	93	86	79	72	65	58	52	45	39	32	26	20	14	8	2																46
47	93	86	79	72	66	59	53	46	40	34	28	22	16	10	5																47
48	93	86	79	73	66	60	54	47	41	35	29	23	18	12	7	1															48
49	93	86	80	73	67	61	54	48	42	36	31	25	19	14	9	3															49
50	93	87	80	74	67	61	55	49	43	38	32	27	21	16	10	5	0														50
51	94	87	81	75	68	62	56	50	45	39	34	28	23	17	12	7	2														51
52	94	87	81	75	69	63	57	51	46	40	35	29	24	19	14	9	4														52
53	94	87	81	75	69	63	58	52	47	41	36	31	26	20	16	10	6	1													53
54	94	88	82	76	70	64	59	53	48	42	37	32	27	22	17	12	8	3													54
55	94	88	82	76	70	65	59	54	49	43	38	33	28	23	19	14	9	5	0												55
56	94	88	82	76	71	65	60	55	50	44	39	34	30	25	20	16	11	7	2												56
57	94	88	82	77	71	66	61	55	50	45	40	35	31	26	22	17	13	8	4	0											57
58	94	88	83	77	72	66	61	56	51	46	41	37	32	27	23	18	14	10	6	1											58
59	94	89	83	78	72	67	62	57	52	47	42	38	33	29	24	20	16	11	7	3											59
60	94	89	83	78	73	68	63	58	53	48	43	39	34	30	26	21	17	13	9	5	1										60
61	94	89	84	78	73	68	63	58	54	49	44	40	35	31	27	22	18	14	10	7	3										61
62	94	89	84	79	74	69	64	59	54	50	45	41	36	32	28	24	20	16	12	8	4	1									62
63	95	89	84	79	74	69	64	60	55	50	46	42	37	33	29	25	21	17	13	10	6	2									63
64	95	90	84	79	74	70	65	60	56	51	47	43	38	34	30	26	22	18	15	11	7	4	0								64
65	95	90	85	80	75	70	66	61	56	52	48	44	39	35	31	27	24	20	16	12	9	5	2								65
66	95	90	85	80	75	71	66	61	57	53	48	44	40	36	32	29	25	21	17	14	10	7	3	0							66
67	95	90	85	80	75	71	66	62	58	53	49	45	41	37	33	30	26	22	19	15	12	8	5	2							67
68	95	90	85	80	76	71	67	62	58	54	50	46	42	38	34	31	27	23	20	16	13	10	6	3							68
69	95	90	85	81	76	72	67	63	59	55	51	47	43	39	35	32	28	24	21	18	15	11	7	4	1						69
70	95	90	86	81	77	72	68	64	59	55	51	48	44	40	36	33	29	25	22	19	15	12	9	6	3						70
71	95	90	86	81	77	72	68	64	60	56	52	48	45	41	37	33	30	27	23	20	17	13	10	7	4	1					71
72	95	91	86	82	77	73	69	65	61	57	53	49	45	42	38	34	31	28	24	21	18	15	12	9	6	3	1				72
73	95	91	86	82	78	73	69	65	61	57	53	50	46	42	39	35	32	29	25	22	19	16	13	10	7	4	3				73
74	95	91	86	82	78	74	69	65	61	58	54	50	47	43	39	36	33	29	26	23	20	17	14	11	8	5	3				74
75	96	91	86	82	78	74	70	66	62	58	54	51	47	44	40	37	34	30	27	24	21	18	15	12	9	7	4	1			75
76	96	91	87	82	78	74	70	66	62	59	55	51	48	44	41	38	34	31	28	25	22	19	16	13	11	8	5	3			76
77	96	91	87	83	79	74	71	67	63	59	56	52	48	45	42	39	35	32	29	26	23	20	17	14	12	9	6	4			77
78	96	91	87	83	79	75	71	68	64	60	57	53	49	46	43	39	36	33	30	27	24	21	18	16	13	10	8	5			78
79	96	91	87	83	79	75	71	68	64	60	57	53	50	46	43	40	37	34	31	28	25	22	19	17	14	11	9	6			79
80	96	91	87	83	79	75	72	68	64	61	57	54	50	47	44	41	38	35	32	29	26	23	20	18	15	12	10	7	5	3	80
82	96	92	88	84	80	76	72	69	65	61	58	55	51	48	45	42	39	36	33	30	28	25	22	20	17	14	12	10	7	5	82
84	96	92	88	84	80	76	73	69	66	62	59	56	52	49	46	43	40	37	35	32	29	26	24	21	19	16	14	12	9	7	84
86	96	92	88	84	81	77	73	70	66	63	60	57	53	50	47	44	42	39	36	33	31	28	26	23	21	18	16	14	11	9	86
88	96	92	88	85	81	77	74	70	67	64	61	57	54	51	48	46	43	40	37	35	32	30	27	25	22	20	18	15	13	11	88
90	96	92	89	85	81	78	74	71	68	65	61	58	55	52	49	47	44	41	39	36	34	31	29	26	24	22	19	17	15	13	90
92	96	92	89	85	82	78	75	72	68	65	62	59	56	53	50	48	45	42	40	37	35	32	30	28	25	23	21	19	17	15	92
94	96	93	89	85	82	79	75	72	69	66	63	60	57	54	51	49	46	43	41	38	36	33	31	29	27	24	22	20	18	16	94
96	96	93	89	86	82	79	76	73	69	66	63	61	58	55	52	50	47	44	42	39	37	35	32	30	28	26	24	22	20	18	96
98	96	93	89	86	83	79	76	73	70	67	64	61	58	56	53	50	48	45	43	40	38	36	34	32	29	27	25	23	21	19	98
100	96	93	89	86	83	80	77	73	70	68	65	62	59	56	54	51	49	46	44	41	39	37	35	33	30	28	26	24	22	21	100
102	96	93	90	86	83	80	77	74	71	68	65	62	60	57	55	52	49	47	45	42	40	38	36	34	32	30	28	26	24	22	102
104	97	93	90	87	83	80	77	74	71	69	66	63	60	58	55	53	50	48	46	43	41	39	37	35	33	31	29	27	26	24	104
106	97	93	90	87	84	81	78	75	72	69	66	64	61	58	56	53	51	49	46	44	42	40	38	36	34	32	30	28	26	24	106
108	97	93	90	87	84	81	78	75	72	70	67	64	62	59	57	54	52	49	47	45	43	41	39	37	35	33	31	29	27	25	108
110	97	93	90	87	84	81	78	75	73	70	67	65	62	60	57	55	52	50	48	46	44	42	40	38	36	34	32	30	28	26	110
112	97	94	90	87	84	81	79	76	73	70	68	65	63	60	58	55	53	51	49	47	44	42	40	38	36	35	33	31	29	27	112
114	97	94	91	88	85	82	79	76	74	71	68	66	63	61	58	56	54	52	50	48	46	43	41	39	37	35	34	32	30	28	114
116	97	94	91	88	85	82	79	76	74	71	69	66	64	61	59	57	54	52	50	48	46	44	42	40	38	36	34	33	31	29	116
118	97	94	91	88	85	82	79	77	74	72	69	67	64	62	59	57	55	53	51	49	47	45	43	41	39	37	35	34	32	30	118
120	97	94	91	88	85	82	80	77	74	72	69	67	65	62	60	58	55	53	51	49	47	45	43	41	40	38	36	34	33	31	120