METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR AUGUST 1949

AEROLOGICAL OBSERVATIONS

[For description of change in Table 1 and charts, see REVIEW, January 1946, p. 6]

TABLE 1.—*Mean dynamic height (geopotential) in units of 0.98 dynamic meters, temperature in degrees centigrade, and relative humidity in percent, for standard pressures, as obtained by radiosondes during August 1949*

STATIONS AND MEAN SURFACE PRESSURES

Standard pressure surface (mb.)	Albany, N. Y. (1,005.1 mb.)				Albuquerque, N. Mex. (839.7 mb.)				Atlanta, Ga. (982.0 mb.)				Big Spring, Tex. (927.3 mb.)				Bismarck, N. Dak. (954.6 mb.)				Boise, Idaho (912.8 mb.)				Brownsville, Tex. (1,012.3 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	86	19.5	78	31	1,620	25.1	39	31	300	23.9	81	31	774	26.5	51	31	505	22.0	62	31	868	25.7	34	30	6	27.3	81
1,000	31	130	20.7	74	31	49	(*)	----	31	140	(*)	----	31	100	(*)	----	31	96	(*)	----	31	54	(*)	----	30	114	26.7	80
950	31	578	20.4	63	31	518	(*)	----	31	590	23.8	74	31	562	(*)	----	31	551	22.6	57	31	517	(*)	----	30	572	24.3	73
900	31	1,041	17.5	63	31	1,006	(*)	----	31	1,063	20.9	76	31	1,038	26.2	48	31	1,020	22.5	44	31	993	27.4	25	30	1,041	22.9	54
850	31	1,527	14.0	65	31	1,513	(*)	----	31	1,556	17.7	77	31	1,539	22.9	50	31	1,514	19.0	46	31	1,495	24.2	23	28	1,537	20.2	48
800	31	2,036	10.6	67	31	2,043	22.8	37	31	2,073	14.4	75	31	2,064	18.5	56	31	2,031	15.3	47	31	2,020	19.7	27	28	2,058	17.1	45
750	31	2,575	7.4	59	31	2,606	18.4	41	31	2,621	11.2	70	31	2,614	14.1	61	31	2,583	11.4	48	31	2,574	15.1	31	28	2,606	13.4	47
700	31	3,136	4.6	50	31	3,188	13.5	47	31	3,189	7.9	65	31	3,193	9.8	64	31	3,148	7.6	48	31	3,150	10.3	35	28	3,182	9.6	48
650	31	3,741	1.6	43	31	3,814	8.4	53	31	3,803	4.5	62	31	3,808	5.6	61	31	3,761	3.2	46	31	3,762	5.1	40	28	3,797	5.7	48
600	31	4,378	−1.7	34	31	4,462	3.0	61	31	4,446	1.0	57	31	4,456	1.6	56	31	4,399	−1.4	43	31	4,409	−.1	42	28	4,444	2.0	42
550	31	5,068	−5.9	----	31	5,165	−2.5	64	31	5,142	−2.7	48	31	5,154	−2.4	50	31	5,090	−6.1	43	31	5,099	−5.4	43	28	5,141	−2.0	38
500	31	5,806	−10.7	----	31	5,910	−7.5	61	31	5,891	−7.0	44	31	5,904	−6.7	44	30	5,825	−10.3	33	31	5,839	−10.9	46	27	5,891	−6.6	36
450	31	6,617	−15.8	----	31	6,734	−12.1	47	31	6,714	−12.0	44	31	6,727	−11.6	40	30	6,638	−16.1	35	31	6,647	−16.7	46	27	6,715	−11.6	33
400	31	7,486	−22.1	----	31	7,616	−17.8	38	31	7,598	−17.6	40	31	7,613	−17.9	38	29	7,501	−22.8	----	31	7,514	−22.8	----	27	7,600	−17.8	34
350	30	8,457	−28.8	----	31	8,600	−24.8	----	31	8,584	−24.3	----	31	8,598	−24.8	----	29	8,465	−30.2	----	29	8,479	−29.9	----	26	8,586	−24.8	----
300	29	9,541	−36.7	----	30	9,703	−33.4	----	31	9,688	−32.6	----	31	9,699	−33.2	----	29	9,543	−38.6	----	28	9,557	−38.0	----	25	9,687	−33.2	----
250	29	10,779	−45.9	----	29	10,957	−43.4	----	31	10,946	−42.5	----	31	10,955	−43.0	----	28	10,780	−47.5	----	28	10,788	−46.8	----	22	10,939	−43.2	----
200	29	12,233	−54.2	----	27	12,421	−54.5	----	31	12,415	−54.3	----	29	12,419	−54.1	----	27	12,226	−54.2	----	26	12,233	−53.9	----	20	12,401	−53.6	----
175	29	13,083	−57.3	----	23	13,267	−60.2	----	30	13,256	−60.5	----	26	13,273	−59.5	----	26	13,082	−56.0	----	21	13,090	−55.2	----	19	13,243	−59.2	----
150	29	14,049	−60.4	----	20	14,225	−65.4	----	29	14,204	−65.4	----	26	14,224	−64.8	----	24	14,061	−57.9	----	15	14,063	−57.2	----	14	14,207	−64.8	----
125	27	15,176	−62.0	----	12	15,333	−69.4	----	25	15,298	−68.9	----	24	15,328	−68.7	----	20	15,202	−60.2	----	10	15,234	−60.2	----	9	15,323	−70.2	----
100	22	16,558	−62.5	----	6	16,667	−70.5	----	18	16,630	−68.5	----	14	16,661	−69.0	----	11	16,589	−61.3	----	----	----	----	----	----	----	----	----
80	15	17,939	−61.1	----	----	----	----	----	7	17,969	−66.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
60	5	19,740	−56.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Buffalo, N. Y. (990.5 mb.)				Camaguey, Cuba [1] (—— mb.)				Caribou, Maine (990.7 mb.)				Charleston, S. C.[2] (1,015.5 mb.)				Ciudad Victoria, Mex. 973.4 mb.)				Columbia, Mo. (987.4 mb.)				Dodge City, Kans. (925.6 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	221	20.1	75	----	----	----	----	31	191	15.8	84	17	13	24.2	93	26	335	30.2	50	31	239	22.9	78	31	792	23.7	61
1,000	31	137	(*)	----	----	----	----	----	31	110	(*)	----	31	136	24.7	88	26	91	(*)	----	31	128	(*)	----	31	108	(*)	----
950	31	588	20.6	59	----	----	----	----	31	552	17.2	66	31	590	23.4	79	26	552	28.3	51	31	579	23.8	65	31	565	(*)	----
900	31	1,049	17.6	60	----	----	----	----	31	1,010	14.5	64	31	1,059	20.7	74	26	1,030	24.1	55	31	1,049	20.4	66	31	1,039	24.7	54
850	31	1,535	14.2	61	----	----	----	----	31	1,491	11.2	67	31	1,551	17.7	71	26	1,528	19.9	61	31	1,541	17.2	62	31	1,538	21.4	56
800	31	2,044	10.8	62	----	----	----	----	31	1,994	7.9	67	31	2,069	14.6	68	26	2,048	15.8	66	31	2,056	14.2	57	31	2,060	17.7	58
750	31	2,582	7.9	49	----	----	----	----	31	2,529	4.7	66	31	2,619	11.7	64	26	2,595	12.0	66	31	2,605	10.9	57	31	2,611	14.2	57
700	31	3,146	5.0	45	----	----	----	----	31	3,084	2.1	58	31	3,188	8.5	62	26	3,168	8.4	62	31	3,171	8.0	46	31	3,188	10.2	55
650	31	3,754	2.1	41	----	----	----	----	31	3,681	−1.2	54	31	3,803	4.9	62	25	3,781	4.5	62	31	3,785	4.5	43	31	3,804	6.1	52
600	31	4,389	−1.2	36	----	----	----	----	31	4,314	−4.4	44	31	4,448	1.2	63	24	4,428	.7	55	31	4,426	.8	40	31	4,452	1.8	46
550	30	5,079	−5.6	----	----	----	----	----	30	4,998	−8.0	40	31	5,148	−1.2	58	23	5,121	−3.6	52	31	5,122	−3.5	41	31	5,148	−3.1	45
500	28	5,821	−10.3	----	----	----	----	----	30	5,731	−12.4	37	31	5,894	−6.9	55	21	5,871	−7.8	44	31	5,867	−8.0	39	31	5,896	−7.6	40
450	27	6,636	−15.5	----	----	----	----	----	29	6,534	−17.7	35	30	6,722	−11.9	50	20	6,698	−12.8	----	31	6,687	−13.5	36	31	6,715	−13.0	34
400	27	7,509	−21.9	----	----	----	----	----	29	7,402	−23.9	----	30	7,603	−17.3	49	19	7,574	−19.2	----	31	7,563	−19.9	----	30	7,597	−19.2	32
350	27	8,476	−29.3	----	----	----	----	----	29	8,362	−31.2	----	29	8,591	−24.0	----	17	8,554	−26.0	----	31	8,539	−27.1	----	30	8,577	−26.1	----
300	27	9,558	−37.4	----	----	----	----	----	27	9,431	−39.1	----	28	9,696	−32.0	----	16	9,653	−34.1	----	31	9,631	−35.5	----	29	9,672	−34.5	----
250	26	10,801	−46.6	----	----	----	----	----	27	10,660	−46.6	----	25	10,956	−42.0	----	15	10,903	−44.1	----	29	10,883	−44.1	----	29	10,921	−43.8	----
200	24	12,251	−54.6	----	----	----	----	----	27	12,119	−52.5	----	23	12,428	−54.0	----	12	12,372	−55.4	----	26	12,350	−52.6	----	28	12,388	−53.7	----
175	19	13,098	−57.9	----	----	----	----	----	27	12,978	−53.9	----	24	13,274	−60.1	----	12	13,211	−61.3	----	23	13,217	−56.8	----	28	13,236	−58.5	----
150	15	14,063	−60.2	----	----	----	----	----	23	13,967	−56.1	----	23	14,223	−65.7	----	11	14,149	−67.4	----	22	14,179	−61.8	----	28	14,191	−64.1	----
125	14	15,196	−62.7	----	----	----	----	----	20	15,139	−57.9	----	21	15,322	−69.1	----	6	15,248	−70.6	----	16	15,305	−65.0	----	24	15,297	−68.2	----
100	7	16,563	−62.0	----	----	----	----	----	18	16,546	−56.8	----	13	16,657	−68.3	----	----	----	----	----	14	16,644	−66.6	----	17	16,634	−67.4	----
80	----	----	----	----	----	----	----	----	7	17,973	−56.3	----	6	17,977	−66.7	----	----	----	----	----	6	18,012	−65.0	----	11	17,995	−64.9	----
60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	19,764	−60.4	----

Standard pressure surface (mb.)	El Paso, Tex. (881.7 mb.)				Ely, Nev. (810.5 mb.)				Glasgow, Mont. (938.1 mb.)				Grand Junction, Colo. (852.5 mb.)				Great Falls, Mont. (887.3 mb.)				Greensboro, N. C. (985.1 mb.)				Hatteras, N. C. (1,016.0 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	1,195	27.4	41	31	1,908	18.9	31	31	648	24.3	39	31	1,474	25.3	28	30	1,128	23.0	32	31	273	22.2	90	31	3	25.0	91
1,000	31	61	(*)	----	31	49	(*)	----	31	80	(*)	----	31	43	(*)	----	30	67	(*)	----	31	141	(*)	----	31	143	24.8	87
950	31	533	(*)	----	31	512	(*)	----	31	540	(*)	----	31	514	(*)	----	30	531	(*)	----	31	592	23.0	76	31	594	22.8	76
900	31	1,018	(*)	----	31	992	(*)	----	31	1,011	24.2	34	31	999	(*)	----	30	1,007	(*)	----	31	1,061	20.3	76	31	1,063	20.1	74
850	31	1,520	26.2	40	31	1,492	(*)	----	31	1,508	20.3	37	31	1,501	26.8	26	30	1,501	21.5	30	31	1,553	17.0	77	31	1,555	17.1	71
800	31	2,050	21.7	46	31	2,020	22.3	25	31	2,027	16.2	41	31	2,034	24.2	27	30	2,022	17.4	33	31	2,069	13.9	76	31	2,070	14.2	66
750	31	2,609	17.1	52	31	2,578	18.1	26	31	2,575	11.9	45	31	2,596	19.5	31	30	2,574	12.9	39	31	2,617	10.7	73	31	2,614	11.2	63
700	31	3,191	12.1	59	31	3,162	13.1	29	31	3,145	7.4	47	31	3,183	14.5	36	30	3,143	8.2	45	31	3,183	7.4	71	31	3,186	8.1	61
650	31	3,808	7.2	63	31	3,779	7.5	35	31	3,754	3.0	47	31	3,804	9.1	42	30	3,752	3.2	51	30	3,795	4.1	65	30	3,799	4.8	59
600	31	4,461	2.3	64	31	4,430	1.6	42	31	4,394	−2.0	48	31	4,459	3.3	49	30	4,392	−2.2	58	30	4,437	.5	57	29	4,447	1.0	59
550	31	5,160	−2.4	65	31	5,123	−4.4	50	30	5,075	−6.8	46	31	5,159	−2.5	56	30	5,077	−7.5	59	30	5,135	−3.0	52	29	5,143	−2.6	55
500	29	5,909	−7.0	60	31	5,868	−9.8	46	29	5,816	−11.9	40	31	5,906	−7.9	45	29	5,809	−12.6	47	30	5,881	−7.1	47	29	5,892	−7.1	53
450	29	6,734	−11.9	54	31	6,679	−15.0	36	29	6,618	−17.7	36	31	6,728	−13.0	36	29	6,614	−18.1	40	30	6,703	−12.2	44	29	6,715	−12.1	49
400	24	7,615	−17.8	----	31	7,554	−21.3	----	28	7,486	−24.1	----	30	7,607	−19.1	----	29	7,474	−24.8	----	29	7,585	−18.3	47	28	7,597	−17.9	47
350	22	8,604	−24.9	----	31	8,525	−28.3	----	28	8,446	−31.3	----	30	8,586	−26.0	----	29	8,430	−32.1	----	29	8,572	−25.1	----	26	8,583	−25.0	----
300	20	9,703	−33.7	----	31	9,613	−35.9	----	27	9,519	−39.7	----	30	9,683	−34.1	----	29	9,500	−40.3	----	29	9,670	−33.1	----	24	9,683	−33.3	----
250	18	10,955	−43.7	----	31	10,856	−45.0	----	25	10,737	−48.9	----	29	10,933	−43.4	----	29	10,718	−49.0	----	27	10,924	−42.6	----	23	10,933	−42.8	----
200	15	12,424	−55.0	----	31	12,317	−53.7	----	24	12,179	−54.6	----	27	12,402	−53.3	----	27	12,159	−54.9	----	26	12,395	−53.8	----	21	12,448	−54.1	----
175	11	13,273	−60.6	----	30	13,164	−57.5	----	24	13,032	−55.1	----	25	13,245	−58.2	----	26	13,009	−55.8	----	25	13,241	−59.4	----	16	13,250	−60.1	----
150	9	14,219	−66.2	----	29	14,124	−61.1	----	21	14,014	−57.2	----	22	14,204	−61.9	----	22	13,997	−57.2	----	18	14,199	−64.4	----	9	14,194	−64.3	----
125	5	15,294	−70.9	----	22	15,240	−65.1	----	18	15,161	−59.2	----	18	15,318	−65.1	----	16	15,152	−60.0	----	12	15,298	−66.6	----	----	----	----	----
100	----	----	----	----	16	16,582	−65.2	----	11	16,556	−59.4	----	7	16,680	−64.5	----	10	16,551	−60.1	----	6	16,640	−65.8	----	----	----	----	----
80	----	----	----	----	13	17,950	−62.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

See footnotes at end of table

TABLE 1.—*Mean dynamic height (geopotential) in units of 0.98 dynamic meters, temperature in degrees centigrade, and relative humidity in percent, for standard pressures, as obtained by radiosondes during August 1949*—Continued

Standard pressure surface (mb.)	Havana, Cuba [1] (—— mb.)				Honolulu, T. H. (1,015.8 mb.)				International Falls, Minn. (972.7 mb.)				Joliet, Ill. (995.3 mb.)				Lake Charles, La. (1,014.1 mb.)				Lander, Wyo. (830.9 mb.)				Las Vegas, Nev. (934.0 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	----	----	----	----	31	3	27.0	61	30	360	17.7	85	31	178	20.3	84	31	5	25.3	85	31	1,696	21.8	32	31	660	31.7	16
1,000	----	----	----	----	31	142	24.9	64	30	120	(*)	----	31	196	(*)	----	31	123	26.5	77	31	47	(*)	----	31	38	(*)	----
950	----	----	----	----	31	591	21.1	70	30	565	20.6	70	31	587	21.8	65	31	585	24.1	72	31	518	(*)	----	31	509	(*)	----
900	----	----	----	----	31	1,057	17.7	76	30	1,029	18.0	64	31	1,051	18.7	66	31	1,053	21.1	71	31	998	(*)	----	31	994	31.9	19
850	----	----	----	----	31	1,544	14.5	77	30	1,517	14.8	63	31	1,539	15.1	69	31	1,547	18.0	67	31	1,496	(*)	----	31	1,502	27.5	21
800	----	----	----	----	31	2,056	13.3	60	30	2,027	11.5	60	31	2,051	12.4	60	31	2,064	15.0	60	31	2,026	22.5	25	31	2,033	22.7	23
750	----	----	----	----	31	2,603	12.9	31	30	2,659	8.1	55	31	2,594	9.3	57	31	2,614	12.0	57	31	2,588	17.8	28	31	2,591	17.6	26
700	----	----	----	----	31	3,175	9.9	27	30	3,130	5.1	44	31	3,159	6.3	47	31	3,183	8.7	55	31	3,166	12.9	33	31	3,173	12.3	30
650	----	----	----	----	31	3,791	6.5	26	30	3,736	1.7	40	31	3,771	3.3	41	31	3,796	5.0	53	31	3,788	7.5	40	31	3,790	6.9	35
600	----	----	----	----	31	4,439	2.6	----	30	4,373	−2.0	38	31	4,409	−.4	36	31	4,442	1.3	47	31	4,436	1.9	48	31	4,441	2.0	35
550	----	----	----	----	31	5,134	−1.7	----	30	5,058	−6.6	40	31	5,102	−4.5	29	31	5,139	−2.8	42	31	5,131	−3.9	53	31	5,137	−2.7	34
500	----	----	----	----	31	5,888	−6.8	----	30	5,796	−11.5	36	31	5,843	−9.1	----	31	5,887	−7.4	40	31	5,876	−9.6	54	30	5,888	−7.6	----
450	----	----	----	----	31	6,706	−12.7	----	30	6,604	−16.8	33	31	6,656	−14.5	----	31	6,710	−12.4	39	31	6,692	−15.5	50	30	6,706	−13.3	----
400	----	----	----	----	31	7,591	−19.3	----	29	7,468	−23.1	----	31	7,532	−20.9	----	31	7,591	−18.4	35	31	7,560	−21.7	----	30	7,586	−19.9	----
350	----	----	----	----	31	8,569	−26.8	----	29	8,431	−30.3	----	31	8,505	−28.4	----	31	8,573	−25.5	----	30	8,527	−29.2	----	30	8,562	−26.9	----
300	----	----	----	----	31	9,663	−34.6	----	29	9,508	−38.6	----	31	9,590	−36.8	----	31	9,672	−33.9	----	30	9,610	−37.0	----	30	9,655	−35.1	----
250	----	----	----	----	30	10,913	−44.5	----	28	10,731	−47.6	----	31	10,828	−45.9	----	31	10,924	−43.7	----	30	10,848	−45.7	----	30	10,902	−44.2	----
200	----	----	----	----	30	12,370	−55.9	----	27	12,188	−53.7	----	31	12,284	−54.0	----	31	12,387	−54.7	----	29	12,304	−53.3	----	26	12,372	−54.0	----
175	----	----	----	----	29	13,209	−61.4	----	23	13,042	−54.3	----	31	13,134	−57.2	----	30	13,227	−60.5	----	28	13,157	−56.5	----	24	13,216	−58.7	----
150	----	----	----	----	27	14,158	−64.7	----	22	14,023	−56.3	----	28	14,098	−60.3	----	30	14,174	−65.9	----	28	14,126	−60.1	----	20	14,173	−63.4	----
125	----	----	----	----	25	15,263	−67.3	----	18	15,163	−57.5	----	24	15,228	−63.8	----	25	15,268	−69.9	----	25	15,253	−63.3	----	16	15,265	−66.8	----
100	----	----	----	----	20	16,602	−63.6	----	10	16,593	−60.0	----	22	16,593	−64.1	----	22	16,588	−70.1	----	15	16,626	−64.5	----	10	16,598	−67.0	----
80	----	----	----	----	13	17,945	−66.6	----	----	----	----	----	17	17,960	−61.6	----	14	17,930	−67.8	----	8	17,988	−62.6	----	----	----	----	----
60	----	----	----	----	9	19,710	−61.3	----	----	----	----	----	----	----	----	----	10	19,668	−62.8	----	----	----	----	----	----	----	----	----
50	----	----	----	----	9	20,848	−58.4	----	----	----	----	----	----	----	----	----	9	20,800	−60.8	----	----	----	----	----	----	----	----	----
40	----	----	----	----	9	22,262	−54.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
30	----	----	----	----	8	24,108	−51.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Little Rock, Ark. (1,005.7 mb.)				Mazatlan, Mex. (1,008.6 mb.)				Medford, Oreg. (967.8 mb.)				Merida, Mex. (1,011.4 mb.)				Miami, Fla. (1,016.1 mb.)				Nantucket, Mass. (1,014.3 mb.)				Nashville, Tenn. (995.1 mb.)			
Surface	31	79	24.7	82	31	14	29.8	74	31	401	23.7	38	31	27	27.2	76	31	4	26.5	82	30	14	19.5	92	31	177	23.3	84
1,000	31	129	25.2	78	31	91	29.1	75	31	112	(*)	----	31	128	26.9	75	31	146	26.3	79	30	137	20.5	83	31	134	(*)	----
950	31	586	24.7	66	31	553	25.6	79	31	566	22.9	39	31	580	25.2	71	31	600	24.0	76	30	583	19.7	66	31	585	23.1	72
900	31	1,054	21.3	70	31	1,023	23.3	76	31	1,030	19.3	45	31	1,056	21.9	73	31	1,070	21.2	73	30	1,045	17.1	64	31	1,054	20.0	73
850	31	1,547	17.9	69	31	1,521	20.5	73	31	1,519	15.3	52	31	1,550	18.6	74	31	1,563	18.3	68	30	1,531	14.3	61	31	1,545	16.8	73
800	31	2,064	14.8	65	31	2,043	17.8	65	31	2,029	11.2	59	31	2,069	15.2	73	31	2,081	15.2	64	30	2,041	11.4	59	31	2,060	13.8	68
750	31	2,613	11.8	62	31	2,599	14.9	57	31	2,571	7.9	58	31	2,615	12.1	68	31	2,626	12.1	60	30	2,581	8.4	58	31	2,606	10.8	65
700	31	3,182	8.3	62	31	3,175	11.0	59	31	3,132	5.3	45	31	3,190	9.0	61	31	3,201	8.7	57	30	3,145	5.4	53	31	3,175	7.2	64
650	31	3,796	4.7	61	31	3,791	6.6	66	31	3,732	1.0	41	31	3,804	5.7	54	31	3,814	5.3	52	30	3,750	2.2	48	31	3,786	3.7	62
600	31	4,440	1.2	56	30	4,442	2.1	66	31	4,372	−3.0	32	31	4,451	1.9	54	31	4,462	1.7	51	29	4,390	−1.3	41	31	4,428	.1	58
550	31	5,137	−2.7	50	28	5,140	−2.1	67	31	5,051	−6.9	28	31	5,147	−2.3	54	31	5,166	−2.2	47	29	5,078	−5.5	40	31	5,123	−3.7	54
500	31	5,886	−7.1	43	28	5,895	−6.5	61	31	5,793	−11.6	29	30	5,898	−6.7	54	31	5,910	−6.7	47	29	5,819	−10.0	----	31	5,868	−8.1	49
450	31	6,710	−12.3	40	28	6,721	−11.3	51	30	6,593	−17.3	----	30	6,720	−11.7	54	31	6,736	−11.7	43	27	6,629	−15.0	----	31	6,686	−13.1	43
400	31	7,590	−18.5	40	28	7,607	−17.1	47	30	7,464	−24.1	----	30	7,608	−17.5	52	30	7,619	−17.5	40	26	7,503	−20.8	----	31	7,567	−19.0	38
350	30	8,573	−25.1	----	26	8,593	−24.3	----	29	8,424	−31.5	----	29	8,591	−24.7	----	29	8,606	−24.0	----	25	8,479	−27.4	----	31	8,548	−25.8	----
300	30	9,675	−33.2	----	24	9,697	−32.6	----	29	9,497	−39.7	----	29	9,693	−33.1	----	28	9,712	−32.3	----	25	9,571	−35.2	----	31	9,646	−33.7	----
250	29	10,933	−42.4	----	23	10,956	−42.6	----	28	10,722	−48.0	----	27	10,948	−43.2	----	27	10,971	−42.0	----	24	10,819	−44.3	----	31	10,901	−42.6	----
200	28	12,410	−52.3	----	22	12,425	−54.3	----	27	12,173	−54.5	----	27	12,410	−55.3	----	24	12,446	−53.9	----	22	12,276	−54.0	----	31	12,372	−53.4	----
175	28	13,261	−57.5	----	22	13,268	−60.6	----	24	13,019	−55.9	----	27	13,249	−62.1	----	23	13,288	−60.3	----	22	13,124	−58.1	----	27	13,220	−59.5	----
150	27	14,222	−62.8	----	22	14,214	−66.8	----	17	13,980	−57.2	----	24	14,184	−69.3	----	19	14,236	−65.9	----	21	14,091	−61.4	----	18	14,183	−64.6	----
125	25	15,336	−67.3	----	20	15,299	−72.2	----	11	15,135	−59.0	----	19	15,258	−72.6	----	11	15,348	−70.5	----	16	15,225	−63.5	----	10	15,283	−68.6	----
100	23	16,676	−68.1	----	17	16,611	−74.2	----	----	----	----	----	12	16,574	−74.2	----	5	16,702	−72.9	----	9	16,576	−61.9	----	----	----	----	----
80	11	18,032	−64.3	----	8	17,934	−71.0	----	----	----	----	----	7	17,875	−71.4	----	----	----	----	----	----	----	----	----	----	----	----	----
60	----	----	----	----	6	19,670	−64.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
50	----	----	----	----	5	20,781	−61.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	New Orleans, La. (1,014.8 mb.)				North Platte, Nebr. (918.5 mb.)				Oakland, Calif. (1,014.9 mb.)				Oklahoma City, Okla. (969.5 mb.)				Omaha, Nebr. (979.7 mb.)				Phoenix, Ariz. (969.8 mb.)				Pittsburgh, Pa. (972.5 mb.)			
Surface	31	2	25.3	86	31	849	21.1	73	31	6	16.3	79	31	391	24.8	64	31	308	23.8	73	31	339	32.0	30	30	382	21.6	70
18,000	31	132	25.9	80	31	100	(*)	----	31	131	15.2	80	31	116	(*)	----	31	126	(*)	----	31	61	(*)	----	30	138	(*)	----
950	31	585	24.3	74	31	555	(*)	----	31	575	16.7	62	31	571	26.0	56	31	580	23.9	59	31	527	34.7	24	30	592	21.3	66
900	31	1,057	21.5	70	31	1,026	23.1	58	31	1,029	18.5	38	31	1,045	23.3	55	31	1,049	20.9	59	31	1,012	30.9	24	30	1,053	18.7	67
850	31	1,550	18.3	68	31	1,524	21.0	54	31	1,518	17.5	29	31	1,541	19.7	56	31	1,541	17.7	60	31	1,520	26.7	27	29	1,541	15.4	65
800	31	2,068	15.2	65	31	2,045	17.5	56	31	2,033	14.9	27	31	2,061	16.2	56	31	2,057	14.4	59	31	2,050	22.1	31	29	2,053	12.1	65
750	31	2,615	12.2	58	31	2,597	13.3	58	31	2,578	12.0	25	31	2,609	12.7	51	31	2,603	11.2	49	31	2,609	17.4	35	29	2,598	9.3	59
700	31	3,188	9.0	54	31	3,171	9.5	53	31	3,150	9.0	24	31	3,183	9.4	45	31	3,173	8.1	41	31	3,190	12.5	41	29	3,162	6.4	52
650	30	3,801	5.4	50	31	3,785	5.2	50	31	3,760	5.3	24	31	3,798	5.7	44	31	3,783	4.1	41	31	3,815	7.7	40	29	3,773	3.1	47
600	30	4,449	1.9	46	30	4,431	.7	51	31	4,408	1.1	25	31	4,445	1.5	44	31	4,427	−.2	45	31	4,460	3.1	40	28	4,409	−.3	38
550	30	5,145	−2.1	40	29	5,123	−4.2	47	31	5,102	−3.5	----	31	5,143	−2.7	43	31	5,119	−4.4	45	31	5,165	−1.7	40	28	5,101	−4.0	32
500	28	5,896	−6.9	39	29	5,868	−8.9	41	30	5,844	−8.9	----	31	5,890	−7.4	37	31	5,863	−8.9	38	31	5,911	−6.5	37	27	5,844	−8.8	29
450	26	6,716	−12.0	40	27	6,685	−14.0	----	30	6,655	−14.9	----	31	6,714	−12.6	33	31	6,679	−14.3	37	31	6,737	−11.4	31	27	6,662	−14.2	----
400	26	7,600	−17.7	42	27	7,559	−20.2	----	30	7,531	−21.6	----	30	7,590	−18.9	30	31	7,555	−20.8	----	30	7,620	−17.6	31	27	7,536	−20.6	----
350	23	8,582	−24.5	----	25	8,536	−27.8	----	30	8,499	−29.2	----	29	8,571	−25.9	----	31	8,527	−28.2	----	30	8,605	−24.9	----	27	8,510	−27.7	----
300	23	9,685	−32.7	----	25	9,624	−36.1	----	30	9,581	−37.4	----	29	9,667	−34.4	----	31	9,614	−36.7	----	30	9,707	−33.2	----	27	9,600	−35.7	----
250	22	10,949	−41.9	----	24	10,861	−45.4	----	30	10,816	−46.0	----	28	10,920	−43.5	----	30	10,855	−45.5	----	30	10,962	−42.9	----	23	10,865	−44.5	----
200	22	12,424	−53.1	----	24	12,317	−54.4	----	29	12,265	−54.0	----	25	12,377	−54.0	----	30	12,315	−53.8	----	29	12,425	−54.3	----	17	12,337	−53.9	----
175	21	13,270	−59.1	----	23	13,165	−58.8	----	28	13,111	−56.7	----	24	13,226	−58.8	----	30	13,165	−57.6	----	27	13,270	−60.0	----	15	13,192	−58.1	----
150	19	14,223	−65.0	----	21	14,119	−62.6	----	27	14,079	−59.5	----	23	14,182	−63.8	----	30	14,128	−61.7	----	26	14,222	−65.0	----	14	14,151	−61.7	----
125	14	15,318	−69.3	----	18	15,235	−65.9	----	26	15,208	−62.0	----	16	15,282	−67.5	----	30	15,246	−65.0	----	23	15,326	−69.4	----	13	15,266	−64.3	----
100	6	16,612	−69.4	----	16	16,588	−65.9	----	19	16,579	−61.8	----	11	16,636	−68.2	----	23	16,607	−65.3	----	15	16,658	−69.0	----	11	16,632	−64.4	----
80	----	----	----	----	13	17,953	−63.6	----	12	17,972	−60.6	----	6	18,002	−64.6	----	15	17,967	−62.8	----	7	17,998	−66.1	----	6	17,991	−61.6	----
60	----	----	----	----	----	----	----	----	7	19,780	−57.9	----	----	----	----	----	7	19,755	−59.2	----	----	----	----	----	----	----	----	----

See footnotes at end of table.

TABLE 1,—*Mean dynamic height (geopotential) in units of 0.98 dynamic meters, temperature in degrees centigrade, and relative humidity in percent, for standard pressures, as obtained by radiosondes during August 1949*—Continued

Standard pressure surface (mb.)	Portland, Maine (1,012.6 mb.)				Rapid City, S. Dak. (903.3 mb.)				St. Cloud, Minn. (977.7 mb.)				San Antonio, Tex. (986.0 mb.)				San Juan, P. R. (1,014.5 mb.)				Santa Maria, Calif. (1,006.3 mb.)				Sault Ste. Marie, Mich. (990.4 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	20	18.3	84	31	980	22.0	45	31	317	20.6	78	31	240	26.3	69	31	15	26.4	83	31	71	14.9	83	31	221	16.1	85
1,000	31	128	20.4	72	31	78	(*)	----	31	120	(*)	----	31	115	(*)	----	31	143	25.9	82	31	124	14.5	83	31	137	(*)	----
950	31	574	19.7	59	31	540	(*)	----	31	573	22.1	64	31	575	26.7	60	31	599	22.8	84	31	573	18.0	61	31	581	17.8	66
900	31	1,035	16.8	61	31	1,012	(*)	----	31	1,036	19.7	62	31	1,046	23.6	62	31	1,064	19.8	81	31	1,026	20.8	35	31	1,038	15.8	62
850	31	1,520	13.4	64	31	1,512	23.1	35	31	1,526	16.5	61	31	1,543	20.1	65	31	1,556	17.2	73	31	1,518	19.3	32	31	1,522	12.7	62
800	31	2,028	10.0	66	31	2,037	19.3	39	31	2,040	13.5	53	31	2,063	16.6	63	31	2,072	14.8	62	31	2,037	16.3	33	31	2,029	10.0	57
750	31	2,568	6.9	60	31	2,592	14.9	43	31	2,586	10.2	50	31	2,612	13.1	62	31	2,623	12.0	53	31	2,589	13.6	----	31	2,568	7.6	46
700	31	3,126	3.9	57	31	3,168	10.5	46	31	3,152	6.9	44	31	3,188	9.7	54	31	3,192	8.6	52	31	3,159	10.3	----	31	3,128	4.3	49
650	31	3,729	.5	49	31	3,784	5.7	48	31	3,759	3.0	40	31	3,805	6.1	52	31	3,804	5.1	47	31	3,775	6.5	----	31	3,732	.7	45
600	31	4,364	−2.9	39	31	4,430	.6	51	31	4,400	−1.1	37	31	4,452	2.1	48	30	4,452	1.4	41	31	4,423	2.2	----	31	4,367	−2.9	36
550	30	5,052	−6.7	37	31	5,123	−4.6	49	31	5,091	−5.4	36	31	5,156	−1.9	43	29	5,150	−2.5	35	30	5,125	−2.2	----	31	5,053	−6.8	35
500	29	5,786	−11.3	34	31	5,866	−9.4	39	31	5,831	−10.1	----	29	5,902	−6.2	37	28	5,899	−6.7	32	30	5,874	−7.5	----	31	5,790	−11.3	----
450	29	6,593	−16.6	----	31	6,681	−14.7	----	31	6,642	−15.3	----	29	6,730	−11.6	33	27	6,720	−11.8	35	30	6,697	−13.3	----	31	6,598	−16.9	----
400	29	7,460	−22.8	----	31	7,554	−21.3	----	31	7,516	−21.5	----	29	7,611	−17.7	33	27	7,606	−17.9	----	30	7,571	−20.0	----	31	7,465	−22.9	----
350	29	8,424	−30.2	----	31	8,525	−28.6	----	30	8,483	−28.8	----	29	8,597	−24.5	----	27	8,590	−25.3	----	30	8,547	−27.1	----	30	8,430	−30.5	----
300	27	9,497	−38.2	----	31	9,610	−36.9	----	30	9,568	−37.2	----	29	9,701	−32.9	----	27	9,690	−33.9	----	28	9,637	−35.3	----	29	9,505	−39.0	----
250	26	10,744	−47.1	----	31	10,847	−45.7	----	29	10,801	−46.7	----	29	10,959	−42.6	----	26	10,942	−44.0	----	28	10,885	−43.8	----	28	10,728	−47.9	----
200	26	12,192	−55.1	----	29	12,306	−53.1	----	29	12,255	−53.4	----	26	12,430	−53.2	----	24	12,403	−55.8	----	25	12,366	−53.1	----	28	12,174	−54.3	----
175	24	13,044	−58.3	----	27	13,159	−56.3	----	28	13,122	−55.3	----	24	13,280	−58.4	----	24	13,241	−61.4	----	24	13,210	−57.8	----	24	13,031	−54.9	----
150	20	14,010	−60.9	----	25	14,132	−59.1	----	27	14,099	−57.7	----	20	14,238	−63.3	----	23	14,186	−66.5	----	23	14,173	−62.1	----	20	14,007	−56.9	----
125	16	15,131	−62.4	----	17	15,260	−62.2	----	27	15,241	−60.6	----	17	15,345	−67.5	----	20	15,276	−71.2	----	14	15,292	−65.1	----	18	15,154	−58.5	----
100	8	16,507	−60.1	----	8	16,628	−62.7	----	24	16,632	−62.0	----	11	16,683	−68.0	----	18	16,586	−74.4	----	6	16,662	−68.3	----	12	16,545	−59.5	----
80	----	----	----	----	----	----	----	----	16	18,020	−60.2	----	----	----	----	----	6	17,918	−72.9	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Spokane, Wash. (931.2 mb.)				Swan Island, W. I.[1] (---- mb.)				Tacubaya, Mex. (774.9 mb.)				Tampa, Fla. (1,015.5 mb.)				Tatoosh Island, Wash. (1,014.0 mb.)				Toledo, Ohio (993.7 mb.)				Washington, D. C. (1,013.6 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	721	23.5	31	----	----	----	----	30	2,306	16.5	68	31	9	25.5	87	31	31	13.5	91	31	191	20.9	81	31	25	24.1	78
1,000	31	92	(*)	----	----	----	----	----	30	68	(*)	----	31	145	25.5	82	31	148	13.5	88	31	135	(*)	----	31	144	24.2	71
950	31	549	(*)	----	----	----	----	----	30	530	(*)	----	31	594	23.0	80	31	587	12.7	74	31	585	21.3	65	31	594	22.0	67
900	31	1,018	22.4	31	----	----	----	----	30	1,009	(*)	----	31	1,067	20.4	77	31	1,033	11.0	66	31	1,048	18.2	67	31	1,060	18.7	69
850	31	1,511	18.1	34	----	----	----	----	30	1,506	(*)	----	31	1,559	17.5	74	31	1,508	8.4	66	31	1,536	14.9	65	31	1,549	15.8	68
800	31	2,025	13.5	40	----	----	----	----	30	2,035	(*)	----	31	2,076	14.6	70	31	2,007	5.6	65	31	2,047	12.0	57	31	2,062	12.7	65
750	31	2,570	9.1	41	----	----	----	----	30	2,589	14.8	66	31	2,623	11.5	67	31	2,538	3.0	57	31	2,590	9.3	50	31	2,605	9.7	60
700	31	3,132	5.1	42	----	----	----	----	30	3,165	10.5	71	31	3,195	8.3	63	30	3,088	.2	52	31	3,155	6.2	45	31	3,172	6.8	53
650	31	3,735	.9	40	----	----	----	----	30	3,783	6.1	78	30	3,806	4.7	62	30	3,683	−3.0	48	31	3,763	2.9	40	31	3,783	3.6	47
600	31	4,371	−3.5	40	----	----	----	----	30	4,431	1.7	82	30	4,453	.9	63	30	4,308	−6.7	46	31	4,402	−.8	41	31	4,424	.1	46
550	31	5,054	−8.2	43	----	----	----	----	28	5,130	−3.0	80	30	5,148	−2.9	59	29	4,989	−10.9	43	31	5,095	−4.5	31	31	5,120	−3.6	39
500	31	5,786	−13.2	42	----	----	----	----	28	5,879	−6.9	63	30	5,897	−7.0	54	29	5,711	−15.8	38	30	5,837	−9.2	----	31	5,864	−8.2	37
450	30	6,584	−19.2	45	----	----	----	----	28	6,706	−11.4	54	30	6,723	−11.8	53	29	6,502	−21.2	----	30	6,652	−14.9	----	30	6,683	−13.5	----
400	30	7,442	−25.6	----	----	----	----	----	28	7,590	−17.3	52	30	7,605	−17.5	51	28	7,355	−27.3	----	29	7,523	−21.3	----	30	7,560	−19.6	----
350	30	8,396	−32.9	----	----	----	----	----	28	8,577	−24.5	----	29	8,593	−24.6	----	28	8,302	−34.3	----	29	8,494	−28.3	----	29	8,539	−26.5	----
300	29	9,461	−40.7	----	----	----	----	----	28	9,680	−33.2	----	28	9,695	−33.2	----	28	9,363	−41.5	----	29	9,579	−36.7	----	28	9,632	−34.5	----
250	28	10,686	−48.7	----	----	----	----	----	28	10,935	−43.4	----	27	10,947	−43.5	----	25	10,578	−48.4	----	29	10,816	−46.0	----	28	10,881	−43.8	----
200	27	12,136	−53.1	----	----	----	----	----	24	12,403	−55.5	----	24	12,406	−55.7	----	22	12,024	−51.2	----	28	12,265	−54.8	----	27	12,349	−54.1	----
175	24	12,999	−53.1	----	----	----	----	----	20	13,244	−62.0	----	22	13,247	−62.0	----	21	12,894	−51.2	----	27	13,113	−58.0	----	26	13,195	−59.1	----
150	20	13,999	−54.6	----	----	----	----	----	13	14,188	−67.9	----	20	14,184	−67.5	----	15	13,882	−50.9	----	27	14,076	−61.2	----	26	14,150	−63.5	----
125	12	15,175	−56.9	----	----	----	----	----	5	15,328	−74.7	----	15	15,271	−72.1	----	8	15,056	−51.5	----	23	15,202	−64.6	----	23	15,258	−65.2	----
100	----	----	----	----	----	----	----	----	----	----	----	----	8	16,582	−71.0	----	----	----	----	----	13	16,563	−66.1	----	20	16,619	−65.2	----
80	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9	17,937	−63.1	----	11	17,971	−62.1	----
60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6	19,740	−58.6	----	5	19,760	−58.1	----

[1] Data not yet received.
[2] Elevation changed from 13 meters to 18 meters on Aug. 17, 1949.
*Temperature and relative humidity data for this level are not available or are available only for certain days. See note entitled "Change in Summarization of Radiosonde Data," p. 6, in the January 1946 issue of the MONTHLY WEATHER REVIEW.

NOTE.—All observations scheduled between 0300 and 0500, G. C. T., except at Ciudad Victoria, Mazatlan, and Merida, where they are taken near 0200, G. C. T. "Number of observations" refers to those of dynamic height only. (In a few cases temperature or humidity data may be missing for one or more standard pressure surfaces of some observations.) Relative humidity data are not published for standard pressure surfaces having a corresponding mean temperature below −20° C. Relative humidity data beginning with Oct. 1, 1948, were computed, and expressed in these tables, on the basis of vapor pressure over water. Upper air values of relative humidity at levels with temperatures less than 0° C. have formerly been computed and expressed on the basis of the vapor pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the values occurring below the operating range of the humidity element. For explanation of the adjustment see article entitled "Curve Method for Obtaining Monthly Means of Relative Humidity," p. 241, MONTHLY WEATHER REVIEW, December 1944.

None of the means included in these tables are based on less than 15 observations at the surface or 5 observations at a standard pressure level.

DELAYED REPORT FOR JULY 1949

TABLE 1

Standard pressure surface (mb.)	Swan Island, W. I. (1,013.5 mb.) Number of observations	Dynamic height	Temperature	Relative humidity	Standard pressure surface (mb.)	Swan Island, W. I. (1,013.5 mb.) Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	10	26.7	82	450	30	6,708	−11.9	38
1,000	31	129	26.0	83	400	30	7,598	−17.8	34
950	31	584	23.0	85	350	29	8,583	−24.7	----
900	31	1,051	20.3	78	300	29	9,685	−33.1	----
850	31	1,544	17.7	72	250	29	10,943	−43.3	----
800	31	2,061	15.1	61	200	29	12,401	−55.2	----
750	31	2,607	12.5	52	175	29	13,240	−61.9	----
700	31	3,123	9.1	49	150	29	14,172	−68.1	----
650	31	3,789	5.4	49	125	25	15,262	−72.1	----
600	30	4,444	1.4	46	100	18	16,581	−72.4	----
550	30	5,135	−2.5	42	80	9	17,901	−70.2	----
500	30	5,891	−6.9	40	60	6	19,640	−63.9	----

TABLE 2.—*Free-air resultant winds based on pilot balloon observations made near 2200 G. C. T. during August 1949. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Speeds in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	31	119	2.1	31	262	1.5	29	180	0.8	31	94	1.0	30	190	0.8	31	322	3.6
500	---	---	---	---	---	---	29	217	.5	---	---	---	---	---	---	---	---	---
1,000	31	123	2.1	---	---	---	29	225	.5	---	---	---	30	194	.8	31	322	3.2
1,500	31	149	1.7	---	---	---	27	283	.5	31	118	.9	30	221	1.2	31	339	1.6
2,000	30	161	1.0	31	245	2.1	26	285	1.3	31	175	1.0	30	234	2.4	31	261	1.4
2,500	30	250	.7	31	227	2.2	24	299	2.1	31	216	1.7	30	269	4.1	31	224	3.0
3,000	28	330	1.1	31	227	1.6	23	287	2.6	30	239	3.2	30	277	4.9	31	215	4.9
4,000	24	355	3.4	31	288	1.9	19	270	4.3	30	253	5.9	29	274	6.3	31	218	8.1
5,000	16	343	5.1	31	292	2.1	14	263	5.7	27	262	9.4	25	274	8.3	28	222	11.2
6,000	12	345	6.0	26	281	2.5	10	285	6.0	26	264	11.4	21	272	9.0	24	226	11.7
8,000	---	---	---	22	278	3.4	---	---	---	20	261	14.1	14	263	12.3	19	230	13.9
10,000	---	---	---	18	286	7.2	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			Denver, Colo. (1,618 m.)			El Paso, Tex. (1,198 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	31	128	5.7	31	256	2.4	30	346	0.6	29	188	2.9	31	326	0.9	31	33	0.5	31	178	1.9
500	31	139	7.3	31	253	3.5	30	278	1.2	29	199	4.5	31	331	.9	---	---	---	---	---	---
1,000	30	151	5.4	30	260	4.6	30	283	2.6	28	214	4.5	31	306	.8	---	---	---	---	---	---
1,500	29	159	3.0	30	252	4.7	30	281	4.5	26	232	3.5	31	260	.9	---	---	---	31	179	1.8
2,000	27	166	2.1	28	256	4.7	26	277	6.0	24	236	4.0	29	260	1.9	31	13	1.3	31	175	1.4
2,500	26	176	1.2	27	261	5.5	25	281	7.8	23	236	3.9	26	259	2.6	31	36	1.1	31	114	.8
3,000	25	40	.3	27	271	6.9	24	282	9.2	21	242	3.8	23	278	2.6	31	60	.7	31	49	1.1
4,000	22	67	.9	22	278	7.7	18	293	11.8	18	234	4.2	17	306	1.1	29	290	2.4	27	22	1.9
5,000	20	73	1.2	20	278	9.4	14	298	13.2	15	243	4.4	13	314	2.3	23	284	5.2	24	38	2.3
6,000	18	69	.8	17	273	10.9	---	---	---	10	212	5.5	10	266	3.2	17	286	7.1	18	15	4.3
8,000	10	112	.5	12	289	16.3	---	---	---	---	---	---	---	---	---	12	288	10.0	14	352	5.4
10,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joilet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	31	188	4.1	31	259	1.2	28	180	0.0	31	45	0.4	26	146	2.3	31	209	1.1	31	198	2.5
500	---	---	---	---	---	---	28	315	.1	---	---	---	26	177	3.4	31	221	.7	---	---	---
1,000	---	---	---	---	---	---	26	239	1.5	31	277	.5	26	205	2.6	31	273	1.3	31	192	3.6
1,500	---	---	---	31	270	1.8	25	261	2.4	31	221	.9	25	219	2.7	29	273	2.4	31	196	3.7
2,000	31	193	4.4	31	282	2.2	25	270	2.4	31	235	1.8	21	221	1.6	26	295	2.6	31	199	4.7
2,500	31	200	4.5	31	263	2.0	22	288	2.7	31	234	3.6	21	243	1.7	22	295	3.4	31	203	5.4
3,000	31	199	4.7	31	249	2.2	21	296	2.9	30	244	5.0	19	251	2.6	21	296	3.8	31	213	6.4
4,000	30	206	5.2	31	231	3.7	19	277	3.8	27	250	8.5	12	244	2.5	19	298	3.9	30	217	6.5
5,000	29	211	6.7	31	235	5.0	18	275	4.8	25	252	10.5	---	---	---	15	307	4.3	29	221	7.9
6 000	23	224	7.7	24	249	5.4	18	284	6.6	20	255	13.6	---	---	---	---	---	---	28	230	9.3
8 000	15	244	12.8	21	268	7.7	10	268	9.2	---	---	---	---	---	---	---	---	---	25	229	11.6
10,000	10	259	20.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14	233	16.5

Altitude (meters) m. s. l.	Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	31	135	0.5	31	303	2.0	29	133	2.9	31	209	0.9	30	324	0.9	31	157	1.6
500	31	34	.1	31	311	2.3	29	143	3.5	31	255	1.0	30	333	1.2	31	202	2.4
1,000	29	288	.9	31	317	2.6	28	159	3.0	29	298	.9	29	280	.8	30	267	3.2
1,500	28	294	1.2	31	272	2.1	28	161	2.2	26	346	1.5	29	275	1.7	28	279	3.9
2,000	25	285	2.1	31	222	4.1	26	162	1.9	20	258	1.2	27	271	2.0	22	284	4.6
2,500	24	267	1.7	30	207	5.4	24	173	2.7	13	357	1.5	25	276	2.5	21	290	5.7
3,000	22	299	1.7	30	207	6.6	23	169	2.6	12	275	.9	24	276	3.3	21	286	5.8
4,000	14	277	4.2	29	219	8.0	22	176	3.5	---	---	---	23	274	4.6	13	287	5.1
5,000	11	277	4.7	28	228	10.1	16	165	3.1	---	---	---	20	262	5.4	11	278	5.6
6 000	---	---	---	28	226	12.4	15	157	3.1	---	---	---	17	256	6.8	---	---	---
8 000	---	---	---	22	233	17.3	---	---	---	---	---	---	10	246	10.7	---	---	---
10,000	---	---	---	10	239	15.2	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	30	267	5.6	31	124	2.1	31	159	1.2	31	232	1.2	31	39	0.9	31	231	1.3	31	19	0.7
500	30	268	3.8	31	124	2.1	31	170	1.8	31	230	1.6	---	---	---	31	216	1.6	31	24	1.3
1,000	29	260	3.2	31	139	1.2	30	188	2.3	31	227	2.3	31	42	.8	30	218	2.6	31	352	1.2
1,500	29	243	2.6	31	173	1.1	30	213	2.3	31	231	2.5	31	114	.3	28	229	3.6	30	331	1.9
2,000	29	228	2.9	31	275	.7	30	244	2.9	31	231	2.7	31	298	1.2	27	253	4.9	30	312	2.0
2,500	28	232	3.8	30	320	1.5	30	271	2.9	31	235	3.1	31	279	2.9	25	272	6.2	29	296	2.2
3,000	27	230	4.8	28	321	3.4	27	314	2.3	31	225	4.1	31	280	3.2	25	276	6.9	26	312	3.1
4,000	27	230	6.6	25	327	3.7	22	312	4.3	31	210	3.5	29	278	6.2	22	284	6.9	21	321	3.6
5,000	26	226	8.1	23	326	5.4	21	314	5.8	29	202	3.8	20	285	8.3	19	300	8.4	15	319	4.6
6,000	26	229	9.8	18	309	4.9	19	317	8.0	28	209	4.9	17	276	9.2	13	292	6.7	14	312	3.6
8,000	18	231	13.1	13	348	10.2	15	325	9.7	16	250	2.6	12	257	10.9	---	---	---	---	---	---
10,000	12	231	19.0	---	---	---	10	329	15.6	10	280	1.8	---	---	---	---	---	---	---	---	---
12,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	30	134	2.0	31	279	3.7	30	267	2.3	31	248	2.2	31	222	1.9	31	80	0.4
500	30	121	2.3	31	279	2.6	30	271	3.1	31	248	2.5	---	---	---	31	243	.6
1,000	30	115	2.1	30	283	1.3	29	274	2.6	29	231	2.7	31	217	2.5	30	256	.9
1,500	30	102	1.5	30	273	1.3	28	280	3.0	27	210	3.3	31	217	2.8	30	260	1.6
2,000	30	83	1.1	30	248	2.2	28	283	4.4	27	200	4.1	31	213	3.6	27	266	2.9
2,500	30	65	1.5	30	230	3.5	23	298	4.0	22	213	5.1	31	215	5.2	25	267	3.7
3,000	28	30	1.4	30	221	4.3	21	305	5.3	18	216	6.5	30	218	7.2	24	263	3.8
4,000	27	38	1.7	30	215	5.3	16	307	6.3	16	227	8.3	28	226	9.5	22	264	5.0
5,000	22	4	1.4	28	205	6.5	15	302	7.9	12	235	8.8	24	227	12.7	16	287	3.0
6,000	16	37	1.3	26	205	7.6	11	297	9.5	10	243	9.6	23	231	14.0	13	280	4.7
8,000	12	19	6.0	22	222	9.8	---	---	---	---	---	---	13	236	16.0	---	---	---
10,000	---	---	---	16	224	13.5	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	11	234	19.9	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 3.—*Free-air resultant winds based on rawin observations made near 0300 G. C. T. during August 1949. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Speeds in meters per second.*

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Caribou, Maine (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			International Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	31	143	2.4	31	138	3.1	31	74	2.3	31	132	3.8	31	268	1.6	31	188	0.9	31	97	1.5	31	39	0.2	31	153	0.5	31	210	1.7	31	176	1.0	31	172	0.5	31	325	4.8
500	---	---	---	---	---	---	---	---	---	31	138	7.8	31	273	4.4	31	213	4.3	31	126	2.0	---	---	---	30	185	1.6	31	208	4.1	31	202	2.2	30	129	1.9	31	325	5.3
1,000	---	---	---	31	152	5.0	30	93	3.0	31	132	5.3	31	280	6.2	30	213	4.3	31	123	1.9	---	---	---	29	206	2.2	31	216	4.0	31	244	2.6	30	121	1.1	31	320	6.0
1,500	---	---	---	31	156	5.6	30	155	.8	31	119	3.0	31	280	7.4	30	218	4.7	31	133	1.2	31	31	.2	29	218	1.9	31	225	3.8	31	286	2.8	30	162	.2	31	304	4.3
2,000	30	179	3.3	31	151	4.5	30	277	1.2	31	85	1.5	29	288	8.1	30	214	3.8	31	90	.1	31	236	.8	29	220	1.8	30	239	3.4	31	298	3.7	31	307	.2	31	269	2.7
2,500	30	194	2.5	31	149	3.0	30	289	2.7	31	111	.4	29	289	9.1	29	228	3.8	31	346	1.2	31	237	1.1	29	223	2.0	30	247	3.6	31	297	4.5	31	340	.7	31	227	4.5
3,000	30	209	1.6	31	128	1.3	30	289	4.3	30	77	.3	28	281	9.5	29	231	4.5	31	353	1.8	31	250	1.6	30	223	2.6	29	241	4.3	31	302	5.7	30	313	1.7	31	206	7.2
4,000	30	332	2.0	31	16	3.8	31	288	6.2	30	192	.3	28	277	11.3	29	233	4.5	31	1	2.5	31	261	2.4	28	238	3.2	26	242	4.9	29	292	7.4	30	307	2.2	31	213	8.6
5,000	31	338	3.9	31	18	4.2	31	291	7.8	30	51	.7	27	275	13.6	28	230	4.5	31	330	3.3	31	233	3.8	29	242	4.4	25	250	5.0	29	295	9.8	30	304	3.1	31	226	10.0
6,000	31	319	3.6	31	22	5.0	30	286	10.4	30	29	1.2	26	274	16.1	28	234	4.5	31	331	3.6	31	256	5.6	29	259	5.5	24	249	3.5	29	289	11.2	30	297	3.3	30	228	12.8
8,000	31	305	3.9	31	19	4.9	27	279	12.4	28	347	2.8	26	271	20.0	25	245	5.6	31	308	6.2	30	255	9.2	29	268	9.1	22	276	4.1	29	292	13.9	28	268	6.7	28	232	16.6
10,000	30	293	6.4	31	359	5.5	26	269	15.0	24	351	3.6	22	268	24.2	24	250	6.4	31	302	7.2	28	262	14.6	28	257	13.1	20	266	8.3	27	291	17.6	26	266	8.8	23	232	21.1
12,000	27	285	6.5	29	1	6.8	26	265	19.3	21	340	2.9	20	267	27.3	21	247	7.2	26	276	10.2	23	258	14.9	27	251	16.2	18	286	11.5	21	286	18.3	23	234	11.2	15	233	27.3
14,000	18	305	5.2	25	29	4.8	22	268	16.1	13	36	3.0	15	273	23.0	20	256	4.5	18	270	9.1	18	268	10.3	19	264	13.0	10	286	8.6	16	289	18.2	19	236	8.8	---	---	---
16,000	---	---	---	14	47	5.6	16	260	10.7	---	---	---	11	274	22.4	15	207	1.8	10	319	4.3	---	---	---	---	---	---	---	---	---	---	---	---	14	242	2.0	---	---	---

Altitude (meters) m. s. l.	Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			New Orleans, La. (6 m.)			Oakland Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	31	150	0.8	31	201	1.0	31	270	0.3	31	237	0.7	31	268	5.1	31	115	3.1	31	115	1.3	31	97	2.8	31	102	3.4	31	145	0.9	31	270	3.4	31	321	0.4	31	230	1.2
500	31	153	2.7	31	256	4.0	31	70	.9	31	301	.4	31	278	5.0	29	125	4.0	---	---	---	31	129	5.2	30	90	8.1	31	163	1.9	31	314	3.5	31	281	1.3	---	---	---
1,000	31	162	2.5	31	272	3.7	31	110	.8	31	19	.8	31	266	5.1	29	150	4.2	31	120	1.3	31	142	4.8	30	91	8.2	31	212	3.4	31	333	3.1	31	269	2.6	31	240	2.0
1,500	31	157	2.5	31	278	4.3	31	114	.3	31	47	1.8	31	249	3.3	29	169	2.1	31	150	2.4	31	137	2.4	30	94	8.3	31	239	3.7	31	40	1.7	31	280	3.5	31	250	2.5
2,000	31	161	2.8	31	279	5.0	31	241	.7	31	54	1.5	31	231	2.8	30	252	1.1	31	185	1.8	31	96	1.0	30	95	8.3	31	268	3.3	31	115	1.4	31	290	4.2	31	239	3.7
2,500	31	168	2.9	31	272	6.0	31	240	1.2	30	80	1.4	31	227	3.1	30	323	2.1	31	236	1.6	30	28	1.7	30	93	8.0	30	287	3.6	31	184	2.0	31	294	5.5	31	229	5.6
3,000	31	172	2.8	31	270	6.5	31	256	1.7	30	121	1.0	31	220	3.9	30	341	3.9	31	275	3.7	29	14	2.6	30	100	7.8	30	279	4.1	31	220	3.2	31	294	6.3	31	228	7.9
4,000	31	157	2.6	31	267	8.9	31	260	2.0	30	254	.9	31	226	5.3	31	350	4.9	31	299	7.1	28	25	3.2	29	96	7.9	30	288	5.1	31	234	5.5	30	292	7.7	30	231	10.7
5,000	31	147	2.4	30	267	9.3	31	262	3.1	30	250	1.8	30	225	6.9	31	348	6.2	31	299	9.0	29	32	3.0	27	95	7.1	30	295	6.0	31	229	6.7	30	292	9.6	30	232	13.0
6,000	31	149	2.7	29	263	10.0	31	264	4.8	27	243	3.1	30	231	8.0	31	345	5.7	31	291	10.5	29	25	3.1	27	97	5.9	31	294	6.7	30	228	7.6	30	293	10.1	30	231	14.2
8,000	30	107	2.5	18	270	16.3	31	259	7.8	21	234	5.4	28	229	11.1	29	344	8.1	31	275	13.9	29	21	3.4	26	119	1.8	30	284	11.1	30	225	9.8	27	295	12.0	28	231	18.7
10,000	27	79	4.8	---	---	---	31	243	14.3	20	213	7.5	25	228	16.3	28	326	10.3	29	263	15.8	28	6	4.1	26	156	2.0	27	283	14.2	27	222	15.0	27	289	16.1	22	237	21.4
12,000	24	64	6.0	---	---	---	30	239	15.3	18	210	10.6	19	253	18.3	24	325	10.3	23	261	18.9	25	8	4.2	23	259	3.9	25	283	17.8	25	230	21.6	23	286	21.0	14	256	25.3
14,000	20	62	8.4	---	---	---	20	276	10.8	17	189	6.4	11	228	13.0	20	350	5.8	17	262	15.7	20	39	5.8	22	309	1.3	25	275	14.7	18	231	15.9	14	285	15.4	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	10	233	10.4	12	37	2.2	---	---	---	12	32	9.0	18	107	8.7	24	281	10.1	11	227	13.4	---	---	---	---	---	---
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	15	299	2.9	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	Tatoosh Island, Wash. (33 m.)		
	Observations	Direction	Speed
Surface	31	188	2.7
500	31	234	2.9
1,000	31	223	3.3
1,500	31	206	4.1
2,000	31	200	4.7
2,000	30	209	4.8
3,000	30	222	5.6

Altitude (meters) m. s. l.	Tatoosh Island, Wash. (33 m.)		
	Observations	Direction	Speed
4,000	29	223	7.6
5,000	28	225	8.6
6,000	28	229	10.6
8,000	26	231	12.4
10,000	24	237	14.6
12,000	18	239	16.6
14,000	12	238	12.7

NOTE.—Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following Table III in the June 1948 issue of the MONTHLY WEATHER REVIEW.