



JULY 1999

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

KNOXVILLE, TN

MC GHEE TYSON AIRPORT (TYS)
 Lat: 35° 49' N Long: 83° 59' W Elev (Ground): 979 Feet
 Time Zone: EASTERN WBAN: 13891 ISSN #: 0198-4810

JULY 1999
KNOXVILLE, TN

DATE	TEMPERATURE °F						DEG DAYS BASE 65°		WEATHER	SNOW/ICE ON GND(IN)		PRECIPITATION (INCHES)		PRESSURE (INCHES OF HG)		WIND SPEED = MPH DIR = TENS OF DEGREES								DATE			
	MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	HEATING	COOLING		0700 LST	1300 LST	2400 LST	2400 LST	AVERAGE STATION	AVERAGE SEA LEVEL	RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM								
																			5-SEC		2-MIN						
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
01	84	68	76	0	70	72	0	11	BR	0	0.00	0.00	28.97	29.98	9.8	23	10.4	28	23	23	01						
02	83	71	77	1	70	72	0	12	TS TSRA RA BR	0	0.00	0.61	29.08	30.09	6.2	24	7.0	22	22	18	02						
03	90	69	80	4	70	73	0	15		0	0.00	0.00	29.16	30.17	1.7	23	3.3	14	01	10	03						
04	91	71	81	5	71	74	0	16		0	0.00	0.00	29.18	30.20	0.9	28	3.4	13	03	9	04						
05	92	74	83	7	73	76	0	18	TS BR HZ	0	0.00	0.00	29.12	30.13	1.7	24	4.0	14	17	11	05						
06	92	71	82	6	73	75	0	17	TS TSRA FG BR HZ	0	0.00	2.45	29.04	30.05	0.4	20	4.0	29	05	23	06						
07	90	69	80	4	71	73	0	15	TS TSRA RA FG+ BR HZ	0	0.00	2.36	28.97	29.99	0.9	29	4.8	59*	33	39*	32	07					
08	89	71	80	4	72	74	0	15	BR	0	0.00	0.00	29.00	30.01	4.9	23	5.7	13	23	11	08						
09	83	72	78	2	71	73	0	13	RA BR HZ	0	0.00	T	29.03	30.05	10.0	24	10.6	29	25	22	09						
10	81	69	75	-1	71	72	0	10	TS TSRA RA BR	0	0.00	2.04	29.00	30.02	8.0	23	9.0	31	23	26	10						
11	74	69	72	-4	69	70	0	7	RA BR	0	0.00	0.47	29.03	30.05	4.7	05	5.8	11	02	10	11						
12	71	65	68*	-8	65	66	0	3	RA BR	0	0.00	2.36	29.01	30.03	7.3	04	7.6	15	01	13	12						
13	77	64*	71	-6	65	67	0	6		0	0.00	0.00	29.04	30.06	1.9	31	4.6	11	24	9	13						
14	84	67	76	-1	66	69	0	11	BR	0	0.00	0.00	29.09	30.11	2.4	27	3.4	10	31	9	14						
15	86	68	77	0	68	71	0	12	BR HZ	0	0.00	0.00	29.13	30.15	1.0	34	3.4	11	33	8	15						
16	88	69	79	2	68	71	0	14	BR HZ	0	0.00	0.00	29.14	30.16	0.5	10	4.0	18	17	15	16						
17	88	68	78	1	67	70	0	13	TS BR HZ	0	0.00	0.00	29.16	30.18	1.4	20	3.2	16	15	13	17						
18	87	70	79	2	70	72	0	14	TS RA BR HZ	0	0.00	T	29.15	30.17	2.5	26	3.8	15	30	11	18						
19	89	69	79	2	70	73	0	14	BR HZ	0	0.00	0.00	29.10	30.12	3.4	24	4.3	20	29	16	19						
20	85	70	78	1	73	74	0	13	TS TSRA RA FG BR HZ	0	0.00	1.25	29.08	30.10	1.8	27	4.5	25	33	20	20						
21	89	73	81	4	74	75	0	16	TS RA BR HZ	0	0.00	T	29.10	30.11	3.2	24	4.8	17	27	15	21						
22	90	72	81	4	74	76	0	16	TS TSRA BR HZ	0	0.00	0.11	29.08	30.09	1.7	25	3.2	21	33	17	22						
23	93	72	83	6	74	76	0	18	BR HZ	0	0.00	0.00	28.99	30.00	1.2	25	2.0	11	25	9	23						
24	89	70	80	3	73	74	0	15	TS TSRA BR HZ	0	0.00	0.20	28.94	29.95	0.9	25	4.0	37	30	30	24						
25	88	71	80	3	72	74	0	15	BR HZ	0	0.00	0.00	28.96	29.99	0.8	01	3.4	14	06	11	25						
26	90	70	80	3	72	75	0	15	BR HZ	0	0.00	0.00	28.96	29.98	4.0	25	4.8	15	26	11	26						
27	92	70	81	4	72	74	0	16	TS TSRA BR HZ	0	0.00	0.81	28.98	30.00	1.0	25	5.5	34	09	28	27						
28	91	66	79	2	71	73	0	14	FG+ BR HZ	0	0.00	0.00	28.96	29.97	4.6	23	4.6	16	24	14	28						
29	89	75	82	5	72	74	0	17	TS RA HZ	0	0.00	T	28.86	29.86	5.7	24	6.6	22	25	17	29						
30	94	71	83	6	74	76	0	18	BR	0	0.00	0.00	28.84	29.84	5.0	24	5.5	15	24	11	30						
31	95*	75	85*	8	75	78	0	20	BR HZ	0	0.00	0.00	28.87	29.87	4.0	24	4.9	16	24	14	31						
< MONTHLY AVERAGES											TOTALS-->		0.0	12.66	29.03	30.05	0.6	11	5.0	<-- MONTHLY AVERAGES							
0.1				4.0				2.0				<----- DEPARTURE FROM NORMAL ----->				7.99				SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3							
DEGREE DAYS									GREATEST 24-HR PRECIPITATION: 2.45 DATE: 06				SEA LEVEL PRESSURE				DATE TIME										
MONTHLY									GREATEST 24-HR SNOWFALL: 0.0 DATE: :				MAXIMUM				: 30.26 04 0953										
TOTAL DEPARTURE									SEASON TO DATE				MINIMUM				: 29.79 30 1853										
HEATING: 0 0 0 0									NUMBER OF DAYS WITH =>				MAXIMUM TEMP ≥ 90: 12				MINIMUM TEMP ≤ 32: 0				PRECIPITATION ≥ 0.01 INCH: 10						
COOLING: 429 69 841 120													MAXIMUM TEMP ≤ 32: 0				MINIMUM TEMP ≤ 0: 0				PRECIPITATION ≥ 0.10 INCH: 10						
													THUNDERSTORMS: 13				HEAVY FOG: 2				SNOWFALL ≥ 1.0 INCH: 0						

HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

KNOXVILLE, TN

JULY 1999

TYS

WBAN # 13891

DATE	FOR HOUR (LST) ENDING AT												DATE	FOR HOUR (LST) ENDING AT												DATE	Sum if Different (See Note)	2400 LST	
	1	2	3	4	5	6	7	8	9	10	11	12		13	14	15	16	17	18	19	20	21	22	23	24			Water	Equiv.
01													01												01		0.00		
02								0.23	T	0.29	0.09	T	02												02		0.61		
03													03												03		0.00		
04													04												04		0.00		
05													05												05		0.00		
06													06						T	1.55			0.01	06	1.56	2.45			
07					0.01				0.02		0.01		07					T	T	1.55				07	2.37	2.36			
08													08								2.30	0.03		08		0.00			
09													09											09		T			
10	0.50	0.08			0.10				0.01		0.18	0.28	10	0.66	0.02			0.12	0.08				T	10	2.03	2.04			
11									0.01	0.16	0.12	0.06	0.03	11	0.07	T								11	0.46	0.47			
12	0.05	0.05	0.17	0.22	0.34	0.39	0.13	0.10	0.06	0.14	0.33	0.38	12	T	0.01								0.01	12	2.37	2.36			
13													13											13		0.00			
14													14											14		0.00			
15													15											15		0.00			
16													16											16		0.00			
17													17											17		0.00			
18													18			T	T							18		T			
19													19											19		0.00			
20							0.03	0.80	0.33	0.07	T	0.02	20	T										20		1.25			
21													21											T	21		T		
22													22				0.08							22	0.08	0.11			
23													23											23		0.00			
24													24		0.06	T		0.01						24	0.07	0.20			
25													25											25		0.00			
26													26											26		0.00			
27													27				0.44	0.18	0.19					27		0.81			
28													28											28		0.00			
29													29		T									29		T			
30													30											30		0.00			
31													31											31		0.00			

MAXIMUM SHORT DURATION PRECIPITATION (See Note)

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (Inches)												
Ending Date												
Ending Time (Hour/Min)												

Date and time are not entered for TRACE amounts.

Note : The sum of the hourly totals is given when it differs from the daily total. NWS does not edit ASOS hourly values but may edit daily and monthly totals. Hourly, daily, and monthly totals are printed as reported by the ASOS site.

REFERENCE NOTES & SUPPLEMENTAL SUMMARIES

* = Extreme for the month (last occurrence if more than one)

T = Trace precipitation amount

+ = also occurs on earlier date

FG+ = Heavy fog, visibility .25 miles or less
BLANK entries denote missing or unreported data

Resultant wind is the vector sum of the wind speeds and directions divided by the number of observations.

Wind direction is recorded in tens of degrees (2 digits) clockwise from true north. '00' = calm, 'VR' = variable.

Precipitation is for the 24-hour period ending at the time indicated in the column heading.

Water Equivalent of snow on the ground is reported only when the depth is 2 or more inches.

NORMALS ARE FOR THE YEARS 1961 – 1990

WEATHER NOTATIONS

QUALIFIER	WEATHER PHENOMENA		
	PRECIPITATION	OBSCURATION	OTHER
BC Patches	DZ Drizzle	BR Mist	DS Duststorm
BL Blowing	GR Hail	DU Widespread Dust	FC Funnel Cloud
DR Low Drifting	GS Small Hail and/or Snow Pellets	FG Fog	+FC Tornado Waterspout
FZ Freezing	IC Ice Crystals	FU Smoke	PO Well-Developed Dust/Sand Whirls
MI Shallow	PL Ice Pellets	HZ Haze	
PR Partial	RA Rain	PY Spray	SQ Squalls
SH Shower(s)	SG Snow Grains	SA Sand	SS Sandstorm
TS Thunderstorm	SN Snow	VA Volcanic Ash	GL Glaze
VC In the Vicinity	UP Unknown Precipitation		

Intensity (as indicated on pages 4 to 6):
'+' = Heavy ' ' = Moderate '- ' = Light

KNOXVILLE, TN JULY 1999

Ceilometer (30-second) data are used to derive cloudiness at or below 12,000 feet. This cloudiness is the mean cloud cover detected during sunrise to sunset (SR-SS), or midnight to midnight (MN-MN).

Satellite data are used to derive cloudiness above 12,000 feet. Effective Cloud Amount is based on the cloud cover and the transparency of the clouds within the satellite field of view (approx. 31x31 miles).

Sky Condition is based on the sum (not to exceed 8) of the sunrise to sunset cloud cover below and above 12,000 feet. Both ceilometer and satellite data must be present to compute Sky Condition. Clear = 0-2 oktas, Partly Cloudy = 3-6 oktas, Cloudy = 7-8 oktas.

A Heating (Cooling) Degree Day is the difference between the average daily temperature and 65 degrees F. The HDD season begins July 1, the CDD season begins January 1.

Dew Point is the temperature to which the air must be cooled to achieve 100% relative humidity. Wet Bulb is the temperature the air would have if cooled at constant pressure by evaporation of moisture into it, to 100% relative humidity.

Snow Depth, Snowfall, and Sunshine data may come from nearby sites that the National Weather Service deems Climatologically representative of this site.

ADDITIONAL NOTES:

DATE	SUNSHINE		CLOUDINESS (OKTAS)				VISIBILITY (MILES)		RESERVED
	TOTAL MINUTES	PERCENT POSSIBLE	SR-SS		MN-MN		MINIMUM	MAXIMUM	
			CEILOMETER	SATELLITE	CEILOMETER	SATELLITE			
01	560	66					6.00	10.00	
02	486						3.00	10.00	
03	597						8.00	10.00	
04	729						7.00	10.00	
05	592						6.00	10.00	
06	600	69					1.00	8.00	
07	616	71					.75	10.00	
08	715	82					4.00	9.00	
09	724	83					6.00	10.00	
10	334						1.00	10.00	
11	214						1.75	10.00	
12	36						1.00	10.00	
13	590	72					10.00	10.00	
14	670	78					6.00	10.00	
15	660	77					5.00	10.00	
16	646						3.00	10.00	
17	670						5.00	10.00	
18	607						4.00	9.00	
19	681						3.00	10.00	
20	424	50					1.00	10.00	
21	375	44					2.00	10.00	
22	460	54					2.50	7.00	
23	663						1.00	6.00	
24	294						1.50	9.00	
25	640						.50	10.00	
26	709						4.00	8.00	
27	604						1.00	10.00	
28	615	73					<.25	10.00	
29	570	68					5.00	10.00	
30	720	86					4.00	10.00	
31	710	85					6.00	10.00	
MONTHLY AVGS							3.55	9.55	
SUNSHINE (MINUTES)									
Total: 17511 Possible: 26617 Percent Possible: 66									
NUMBER OF DAYS WITH:									
SKY CONDITION									
CLR PTLY CLDY CLOUDY MISSING 31									
MINIMUM VISIBILITY (MILES)									
<=0.25 <=3.0 >=7.0 1 16 3									

OBSERVATIONS AT 3-HOURLY INTERVALS

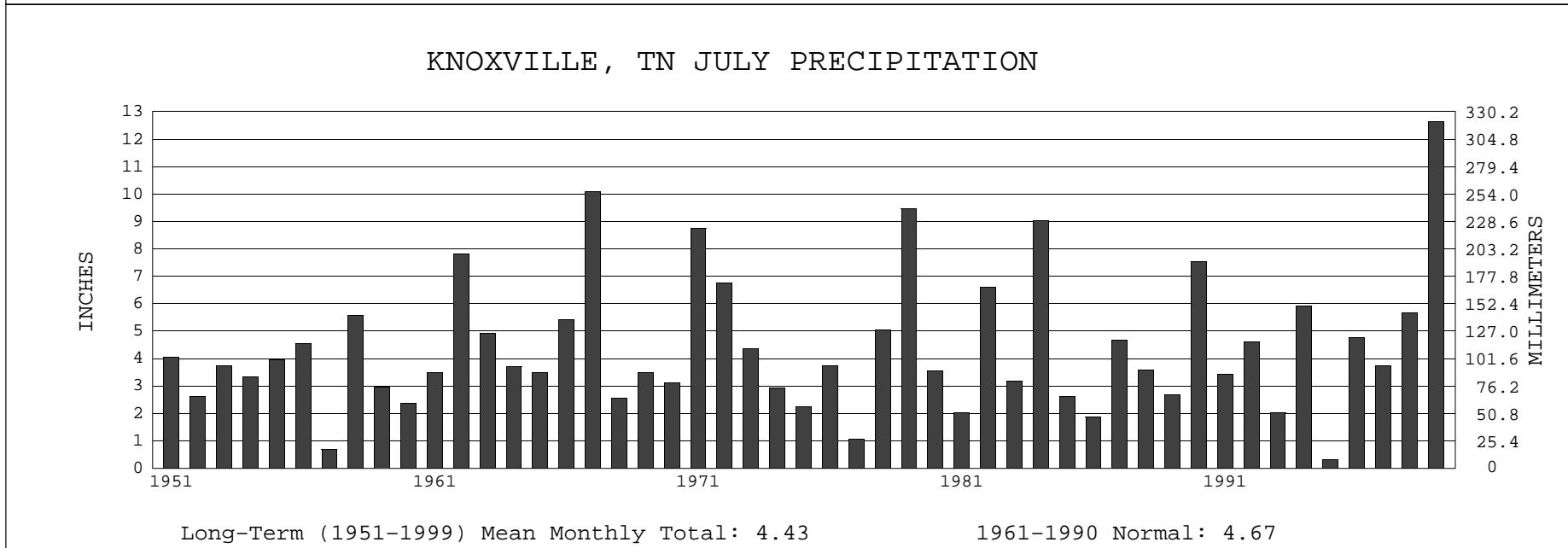
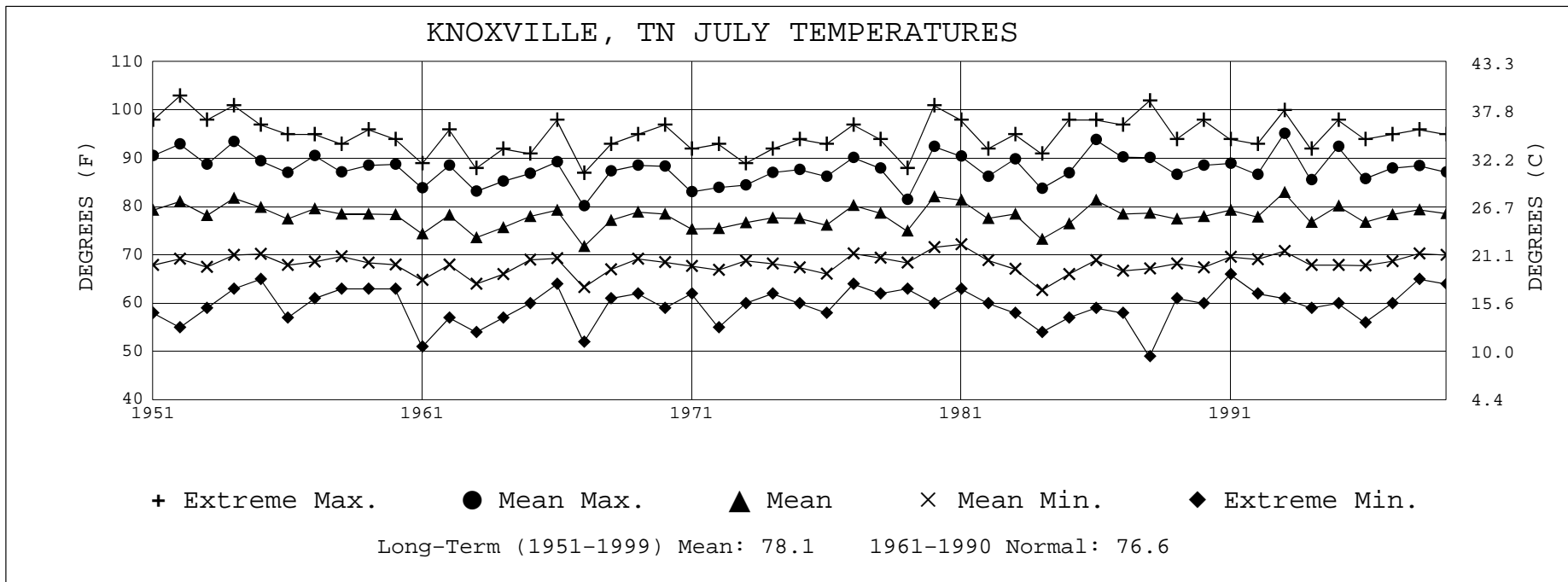
KNOXVILLE, TN

JULY 1999

TYS

WBAN # 13891

HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		VISIBILITY (MILES)	WEATHER	TEMPERATURE ° F				WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		VISIBILITY (MILES)	WEATHER	TEMPERATURE ° F				WIND		PRESSURE (INCHES, HG)																	
	DRY BULB	DEW POINT		WET BULB	RELATIVE HUMIDITY (PCT)			SPEED (MPH)	DIRECTION TENS OF DEG	STATION	SEA LEVEL	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)		SPEED (MPH)	DIRECTION TENS OF DEG		STATION	SEA LEVEL																										
SUNRISE: 0538								JUL 25								SUNSET: 1947								SUNRISE: 0543								JUL 31								SUNSET: 1942							
01	BKN	008				2.00	BR	71	70	70	96	0	00	28.96	29.98	01	CLR	NC					10.00				78	74	75	87	5	23	28.84	29.83													
04	OVC	008				2.50	BR	72	70	71	94	5	22	28.94	29.97	04	CLR	NC				8.00				77	73	74	88	0	00	28.86	29.86														
07	BKN	012				5.00	BR	72	70	71	94	0	00	28.95	29.98	07	CLR	NC				6.00	BR			77	74	75	90	0	00	28.87	29.87														
10	OVC	010				5.00	HZ	76	71	73	85	3	34	28.98	30.01	10	CLR	NC				9.00				86	76	79	72	7	23	28.90	29.91														
13	SCT	NC				6.00	HZ	83	73	76	72	3	VR	28.99	30.02	13	FEW	NC				8.00				92	76	80	60	9	28	28.88	29.88														
16	FEW	NC				10.00		86	73	77	65	7	05	28.95	29.97	16	FEW	NC				10.00				95	74	80	51	7	VR	28.85	29.85														
19	FEW	NC				10.00		85	73	77	68	3	13	28.92	29.94	19	CLR	NC				10.00				89	77	80	68	6	23	28.85	29.85														
22	CLR	NC				9.00		78	74	75	87	0	00	28.95	29.98	22	CLR	NC				8.00				83	78	79	85	5	22	28.88	29.89														
SUNRISE: 0539								JUL 26								SUNSET: 1946								3-HOURLY OBSERVATION NOTES																							
01	CLR	NC				6.00	BR	74	72	73	94	6	21	28.95	29.98	Sky Cover is the amount of the sky obscured. CLR or SKC = 0, FEW = 1/8-2/8, SCT = 3/8-4/8, BKN = 5/8-7/8, OVC = 8/8, VV = Vertical Visibility = 8/8.																															
04	CLR	NC				8.00		74	70	71	88	0	00	28.93	29.96	Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet.																															
07	CLR	NC				6.00	BR	73	69	70	87	6	24	28.96	29.98	NC = No ceiling detected.																															
10	CLR	NC				6.00	HZ	82	74	76	77	7	23	29.00	30.03	& = Original observation contained additional weather elements.																															
13	SCT	NC				5.00	HZ	88	74	78	63	7	23	28.98	30.01	See page 3 for additional notes.																															
16	FEW	NC				4.00	HZ	89	73	78	59	8	23	28.95	29.97																																
19	CLR	NC				4.00	HZ	87	73	77	63	7	27	28.90	29.92																																
22	CLR	NC				6.00	HZ	80	72	74	76	0	00	28.95	29.98																																
SUNRISE: 0540								JUL 27								SUNSET: 1946								SUMMARY BY HOUR																							
01	CLR	NC				3.00	BR	75	72	73	90	5	21	28.95	29.97	AVERAGES																															
04	CLR	NC				2.50	BR	74	72	73	94	3	15	28.94	29.96	RESULTANT WIND (MPH)																															
07	CLR	NC				1.50	BR	74	73	73	97	5	23	28.96	29.98	HOUR (LST)																															
10	CLR	NC				5.00	HZ	83	73	76	72	7	26	29.01	30.03	CEILOMETER																															
13	SCT	NC				6.00	HZ	91	73	78	56	6	01	28.99	30.01	EFF CLD AMT																															
16	SCT	NC				5.00	HZ	91	73	78	56	6	28	28.94	29.96	DRY BULB																															
19	OVC	030				3.00	TS BR	74	72	73	94	6	21	29.00	30.03	DEW POINT																															
22	CLR	NC				7.00		73	70	71	90	0	00	28.98	30.01	WET BULB																															
SUNRISE: 0540								JUL 28								SUNSET: 1945								PRESSURE (INCHES, HG)																							
01	CLR	NC				4.00	BR	71	70	70	96	0	00	28.98	30.01	STATION																															
04	BKN	001				1.00	BR	68	68	68	100	0	00	28.97	29.99	SEA LEVEL																															
07	BKN	110				0.25	FG	68	68	68	100	0	00	29.00	30.03	VISIBILITY (MILES)																															
10	BKN	120				5.00	HZ	77	71	73	82	5	23	29.02	30.04	WIND SPEED (MPH)																															
13	CLR	NC				9.00		88	71	76	57	8	23	28.98	29.99	SPEED																															
16	FEW	NC				10.00		89	70	76	53	13	23	28.91	29.93	DIRECTION																															
19	SCT	NC				8.00		85	73	77	68	7	23	28.90	29.91																																
22	CLR	NC				7.00		78	73	75	85	3	23	28.91	29.93																																
SUNRISE: 0541								JUL 29								SUNSET: 1944																															
01	CLR	NC				8.00		77	70	72	79	6	23	28.89	29.90																																
04	CLR	NC				7.00		76	69	71	79	7	23	28.87	29.88																																
07	SCT	NC				5.00	HZ	76	70	72	82	8	24	28.90	29.91																																
10	FEW	NC				6.00	HZ	84	74	77	72	9	21	28.88	29.89																																
13	SCT	NC				7.00	TS	87	76	79	70	8	27	28.87	29.86																																
16	SCT	NC				10.00	TS	83	70	74	65	12	19	28.84	29.84																																
19	FEW	NC				10.00		82	73	76	74	8	24	28.81	29.81																																
22	CLR	NC				10.00		76	73	74	91	0	00	28.84	29.84																																
SUNRISE: 0542								JUL 30								SUNSET: 1943																															
01	CLR	NC				9.00		73	72	72	96	3	19	28.85	29.85																																
04	CLR	NC				7.00		71	70	70	96	3	24	28.83	29.83																																
07	CLR	NC				4.00	BR	74	72	73	94	0	00	28.87	29.87																																
10	CLR	NC				8.00		84	75	78	74	7	23	28.88	29.89																																
13	FEW	NC				10.00		91	77	81	64	8	26	28.86	29.85																																
16	FEW	NC				10.00		94	73	79	51	10	25	28.81	29.81																																
19	CLR	NC				10.00		89	75	79	63	8	24	28.79	29.79																																
22	CLR	NC				10.00		83	75	77	77	5	19	28.84	29.84																																





JULY 1999
KNOXVILLE, TN

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

I certify that this is an official publication of the National Oceanic and Atmospheric Administration (NOAA). It is compiled using information from weather observing sites operated by NOAA – National Weather Service / Department Of Transportation – Federal Aviation Administration and received at the National Climatic Data Center (NCDC), Asheville, North Carolina 28801.

DIRECTOR

NOTICE

Effective July 1, 1996, the National Weather Service & Federal Aviation Administration began using the METAR format for Hourly Observations.

We welcome your questions or comments, please contact us at
 828–271–4800 (voice), 828–271–4876 (fax),
 828–271–4010(TDD)
 or orders@ncdc.noaa.gov
 Local Climatological Data is available at www.ncdc.noaa.gov

For address correction, please return a photocopy of this page to Subscription Services indicating changes

NATIONAL CLIMATIC DATA CENTER
 151 PATTON AVE RM 120
 ASHEVILLE, NC 28801 –5001

OFFICIAL BUSINESS. PENALTY FOR PRIVATE USE \$300

FIRST CLASS
 POSTAGE AND FEES PAID
 NOAA
 PERMIT G–19