

**Global Solar Radiation on a Horizontal Surface**  
**Hourly Integrated and Daily Totals**  
**Watt-Hours per Square Meter**  
**Bluefield State College - July 1997**

Field: GHI

Hour Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily		
1	*	*	*	*	*	*	*	*	151	227	264	600	756	901	663	573	240	119	100	15	0	0	0	0	4608 *		
2	0	0	0	0	0	9	87	164	387	571	933	876	852	838	712	748	550	341	132	6	0	0	0	0	7207		
3	0	0	0	0	0	12	110	167	362	561	871	1014	1051	1004	926	771	576	368	138	10	0	0	0	0	7941		
4	0	0	0	0	0	22	115	221	286	403	791	891	1015	832	766	670	549	49	36	7	0	0	0	0	6654		
5	0	0	0	0	0	4	44	109	253	325	646	735	847	788	548	687	517	343	132	10	0	0	0	0	5987		
6	0	0	0	0	0	18	94	253	541	749	733	648	606	618	753	523	443	376	102	14	0	0	0	0	6471		
7	0	0	0	0	0	17	140	250	438	625	795	846	956	1007	854	682	526	325	159	15	0	0	0	0	7634		
8	0	0	0	0	0	26	98	?	?	582	?	750	898	992	1026	638	781	777	561	349	129	8	0	0	0	7616	
9	0	0	0	0	0	34	118	211	504	722	561	531	561	890	711	559	196	17	18	13	?	0	0	0	0	5645	
10	0	0	0	0	0	15	42	143	269	590	833	1057	886	651	826	539	202	281	120	12	0	0	0	0	0	6466	
11	0	0	0	0	0	14	153	354	566	747	895	976	974	848	618	758	539	333	129	11	0	0	0	0	0	7915	
12	0	0	0	0	0	20	133	?	308	506	649	786	703	954	741	739	623	447	208	93	11	0	0	0	0	6922	
13	0	0	0	0	0	13	108	205	?	495	704	853	931	987	938	850	740	532	328	123	10	0	0	0	0	7816	
14	0	0	0	0	0	18	117	231	490	669	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1524 *	
15	*	*	*	*	*	*	*	*	622	682	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1304 *	
16	*	*	*	*	*	*	*	*	619	622	745	726	655	654	525	306	371	209	99	13	0	0	0	0	0	5544 *	
17	0	0	0	0	0	18	118	?	298	?	446	698	716	855	838	678	640	587	394	298	110	12	0	0	0	6705	
18	0	0	0	0	0	18	87	?	386	?	532	725	930	911	887	864	533	681	499	310	117	5	0	0	0	7486	
19	0	0	0	0	0	13	76	283	440	409	350	458	586	528	718	560	467	269	85	11	0	0	0	0	0	5252	
20	0	0	0	0	0	9	105	284	492	654	834	906	805	767	819	635	312	333	76	11	0	0	0	0	0	7042	
21	0	0	0	0	0	12	110	279	465	446	584	694	732	892	727	296	304	145	53	5	0	0	0	0	0	5744	
22	0	0	0	0	0	11	96	230	360	493	131	129	715	805	603	176	114	78	21	1	0	0	0	0	0	3964	
23	0	0	0	0	0	9	59	150	162	256	206	217	260	314	236	298	123	32	15	4	0	0	0	0	0	2341	
24	0	0	0	0	0	9	55	142	305	298	288	335	834	420	227	392	335	275	101	6	0	0	0	0	0	4019	
25	0	0	0	0	0	6	54	100	170	313	438	605	840	993	844	639	429	282	95	10	0	0	0	0	0	5819	
26	0	0	0	0	0	8	76	174	395	602	664	730	737	725	753	387	279	282	98	6	0	0	0	0	0	5916	
27	0	0	0	0	0	2	35	88	373	521	464	681	824	460	694	564	396	306	75	6	0	0	0	0	0	5489	
28	0	0	0	0	0	6	99	263	471	678	763	939	955	789	762	688	444	269	47	3	0	0	0	0	0	7175	
29	0	0	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
30	*	*	*	*	*	*	*	*	18	32	63	84	116	141	329	310	411	306	111	10	0	0	0	0	0	1931 *	
31	0	0	0	0	0	11	130	?	346	561	750	905	998	1029	989	893	739	545	334	105	3	0	0	0	0	8337	
Avg	0	0	0	0	0	14	95	226	409	549	641	717	796	740	680	568	404	256	94	9	0	0	0	0	0	5628	
SD	0	0	0	0	0	7	31	80	149	186	258	265	217	211	177	168	135	105	38	4	0	0	0	0	0	2161	
S/A	0	0	0	0	0	0.51	0.33	0.35	0.36	0.34	0.4	0.37	0.27	0.28	0.26	0.3	0.33	0.41	0.4	0.43	0	0	0	0	0	0.38	
Min	0	0	0	0	0	2	35	88	18	32	63	84	116	141	227	176	114	17	15	1	0	0	0	0	0	0	
Max	0	0	0	0	0	34	153	386	622	750	933	1057	1051	1007	926	777	576	376	159	15	0	0	0	0	0	8337	

Daylight Data Recovery: 11% missing; 2% exceed the 15% QC threshold -- 5379 total daylight 5-minute measurements.

Note: Fractional values that do not appear in the hour columns are included in the calculation for daily values.

Data and Flag	Hour Column	Day Column
<value>*	20% < Missing < 100%	10% < Missing < 100%
<value>?	20% < Fail QC < 100%	10% < Fail QC < 100%
<blank>*	100% Missing	100% Missing
<blank>?	100% Fail QC	100% Fail QC

Station: BS
Latitude: 37.27° N
Longitude: 81.24° W
Elevation: 803 Meters AMSL
Time Zone: -5

Instrument: PSP
Calibration Constant: 8.99 uV/Wm-2
Serial Number: 25765F3
Calibration Date: 9/13/96

**Direct Normal Solar Radiation  
Hourly Integrated and Daily Totals  
Watt-Hours per Square Meter  
Bluefield State College - July 1997**

Field: DNI

Hour Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily	
1	*	*	*	*	*	*	*	*	1	3	1	110	327	600	335	460	50	9	55	0	0	0	0	0	1952	
2	0	0	0	0	0	0	1	12	194	368	700	616	424	492	420	789	731	606	321	0	0	0	0	0	5673	
3	0	0	0	0	0	2	20	9	141	307	725	906	959	926	960	924	863	764	323	0	0	0	0	0	7829	
4	0	0	0	0	0	8	82	87	41	129	518	616	889	617	549	614	623	6	2	0	0	0	0	0	4780	
5	0	0	0	0	0	0	0	2	17	35	281	211	387	517	280	590	627	573	319	0	0	0	0	0	3839	
6	0	0	0	0	0	15	38	144	530	699	309	222	249	266	504	286	300	479	76	0	0	0	0	0	4118	
7	0	0	0	0	0	1	114	126	280	368	503	451	624	827	681	501	601	539	312	0	0	0	0	0	5928	
8	0	0	0	0	0	61	299	?	?	831	?	890	902	926	918	403	661	843	794	689	393	0	0	0	8611	
9	0	0	0	0	0	53	63	98	456	609	171	165	198	536	413	312	57	0	0	0	0	0	0	0	3130	
10	0	0	0	0	0	0	0	8	25	391	680	809	574	355	597	320	8	357	187	0	0	0	0	0	4312	
11	0	0	0	0	0	3	314	607	724	808	851	849	704	578	365	664	633	545	300	0	0	0	0	0	7946	
12	0	0	0	0	0	59	328	?	404	470	422	427	306	513	298	330	354	349	187	127	0	0	0	0	4573	
13	0	0	0	0	0	0	39	295	?	589	664	680	674	689	702	694	718	643	551	275	0	0	0	0	7214	
14	0	0	0	0	0	17	169	183	549	613	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1530	
15	*	*	*	*	*	*	*	*	634	587	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1221
16	*	*	*	*	*	*	*	*	526	423	440	325	292	228	69	9	65	39	43	0	0	0	0	0	2459	
17	0	0	0	0	0	14	218	?	439	?	551	718	447	590	553	368	368	408	293	296	129	0	0	0	5392	
18	0	0	0	0	0	32	227	?	656	?	726	780	798	677	625	604	220	602	520	479	255	0	0	0	7201	
19	0	0	0	0	0	0	16	226	313	94	3	13	36	68	339	304	435	291	42	0	0	0	0	0	2180	
20	0	0	0	0	0	0	129	324	520	563	672	661	418	451	564	452	155	443	82	0	0	0	0	0	5433	
21	0	0	0	0	0	19	168	307	366	128	210	274	322	473	346	26	48	1	0	0	0	0	0	0	2689	
22	0	0	0	0	0	3	17	53	100	125	0	0	283	291	137	11	0	0	0	0	0	0	0	0	1020	
23	0	0	0	0	0	2	4	1	1	2	1	11	7	20	1	105	18	0	0	0	0	0	0	0	172	
24	0	0	0	0	0	8	30	3	77	49	11	15	311	162	1	103	134	235	96	0	0	0	0	0	1236	
25	0	0	0	0	0	0	0	0	1	26	104	180	370	560	546	403	381	309	94	0	0	0	0	0	2977	
26	0	0	0	0	0	0	1	13	126	275	312	324	256	310	351	30	160	348	148	0	0	0	0	0	2652	
27	0	0	0	0	0	0	0	1	105	121	29	154	275	20	355	355	298	340	85	0	0	0	0	0	2139	
28	0	0	0	0	0	0	99	255	529	689	589	773	768	558	605	627	360	289	13	0	0	0	0	0	6153	
29	0	0	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
30	*	*	*	*	*	*	*	*	*	0	0	0	0	0	2	14	252	518	268	0	0	0	0	0	1054	
31	0	0	0	0	0	95	565	?	799	897	945	974	987	985	974	959	929	879	786	368	0	0	0	0	11142	
Avg	0	0	0	0	0	15	113	202	344	394	405	423	463	436	416	420	367	346	154	0	0	0	0	0	4082	
S D	0	0	0	0	0	24	138	225	277	296	312	319	275	254	249	280	276	243	129	0	0	0	0	0	2709	
S/A	0	0	0	0	0	1.62	1.22	1.11	0.8	0.75	0.77	0.75	0.6	0.58	0.6	0.67	0.75	0.7	0.84	5.16	0	0	0	0	0.66	
Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9	0	0	0	0	0	0	0	0	0	
Max	0	0	0	0	0	95	565	799	897	945	974	987	985	974	960	929	879	786	393	0	0	0	0	0	11142	

Daylight Data Recovery: 11% missing; 2% exceed the 15% QC threshold -- 5379 total daylight 5-minute measurements.

Note: Fractional values that do not appear in the hour columns are included in the calculation for daily values.

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<value>*	20% < Missing < 100%	10% < Missing < 100%
<value>?	20% < Fail QC < 100%	10% < Fail QC < 100%
<blank>*	100% Missing	100% Missing
<blank>?	100% Fail QC	100% Fail QC

Station: BS  
Latitude: 37.27° N  
Longitude: 81.24° W  
Elevation: 803 Meters AMSL  
Time Zone: -5

Instrument: NIP  
Calibration Constant: 8.52 uV/Wm-2  
Serial Number: 19791E6  
Calibration Date: 9/13/96

**Diffuse Solar Radiation on a Horizontal Surface**  
**Hourly Integrated and Daily Totals**  
**Watt-Hours per Square Meter**  
**Bluefield State College - July 1997**

Field: DHI

Hour Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily		
1	*	*	*	*	*	*	*	*	131	197	229	447	418	326	357	219	200	106	88	13	0	0	0	0	2729		
2	0	0	0	0	0	8	76	146	280	302	314	283	437	357	337	165	130	108	68	6	0	0	0	0	3017		
3	0	0	0	0	0	10	100	150	274	328	230	144	103	113	84	81	75	69	69	9	0	0	0	0	1839		
4	0	0	0	0	0	19	87	191	244	282	314	267	138	230	292	209	190	44	33	6	0	0	0	0	2546		
5	0	0	0	0	0	3	38	97	223	286	405	533	464	301	309	251	164	123	70	8	0	0	0	0	3275		
6	0	0	0	0	0	16	81	196	236	234	454	436	355	354	325	306	274	193	87	12	0	0	0	0	3559		
7	0	0	0	0	0	15	122	217	285	344	345	393	327	219	252	302	184	112	98	13	0	0	0	0	3228		
8	0	0	0	0	0	20	58	? ?	89	93	113	110	126	246	210	150	103	83	50	7	0	0	0	0	1458		
9	0	0	0	0	0	31	109	168	241	278	403	360	355	379	357	332	148	16	16	12	? ?	0	0	0	0	3205	
10	0	0	0	0	0	13	37	127	233	307	242	294	316	303	307	294	187	155	82	10	0	0	0	0	2908		
11	0	0	0	0	0	13	93	121	152	152	157	177	288	297	285	271	183	128	72	9	0	0	0	0	2398		
12	0	0	0	0	0	16	86	? 164	235	339	415	413	453	452	453	366	246	143	68	10	0	0	0	0	3860		
13	0	0	0	0	0	13	90	133	? 203	219	263	294	310	277	250	213	169	123	71	9	0	0	0	0	2635		
14	0	0	0	0	0	17	94	175	213	244	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	743	
15	*	*	*	*	*	*	*	*	207	276	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	483
16	*	*	*	*	*	*	*	*	253	319	367	416	370	440	455	280	337	194	88	11	0	0	0	0	0	3530	
17	0	0	0	0	0	16	87	? 153	? 163	169	337	303	299	337	330	303	239	190	86	10	0	0	0	0	3021		
18	0	0	0	0	0	15	57	? 109	? 120	151	239	266	283	305	332	241	211	133	68	5	0	0	0	0	2534		
19	0	0	0	0	0	12	70	200	268	325	309	418	530	440	437	346	211	156	77	10	0	0	0	0	3807		
20	0	0	0	0	0	8	84	169	201	241	253	283	392	345	335	305	225	173	57	10	0	0	0	0	3081		
21	0	0	0	0	0	11	88	177	266	355	401	444	420	467	444	264	282	127	47	4	0	0	0	0	3797		
22	0	0	0	0	0	10	86	201	293	395	116	112	435	517	479	157	100	68	19	1	0	0	0	0	2990		
23	0	0	0	0	0	8	52	133	144	226	185	192	230	269	209	218	105	29	13	4	0	0	0	0	2018		
24	0	0	0	0	0	8	48	126	243	238	260	297	534	269	201	304	243	192	82	5	0	0	0	0	3051		
25	0	0	0	0	0	5	47	87	149	279	337	429	491	486	386	344	224	172	80	8	0	0	0	0	3526		
26	0	0	0	0	0	7	66	153	328	386	400	429	484	434	457	341	187	158	72	6	0	0	0	0	3908		
27	0	0	0	0	0	2	31	78	301	422	419	507	553	421	393	305	228	187	59	5	0	0	0	0	3908		
28	0	0	0	0	0	6	86	191	191	183	234	210	212	263	245	227	233	159	41	3	0	0	0	0	2482		
29	0	0	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	
30	*	*	*	*	*	*	*	*	15	28	57	76	105	128	286	267	277	126	63	9	0	0	0	0	1436		
31	0	0	0	0	0	9	50	? 64	69	72	76	78	79	78	75	69	61	52	32	3	0	0	0	0	867		
Avg	0	0	0	0	0	12	74	149	208	256	281	308	339	323	317	255	194	126	63	8	0	0	0	0	2640		
S D	0	0	0	0	0	6	23	40	73	94	109	130	137	110	103	76	65	51	23	3	0	0	0	0	1049		
S/A	0	0	0	0	0	0.5	0.31	0.27	0.35	0.37	0.39	0.42	0.41	0.34	0.32	0.3	0.34	0.41	0.37	0.43	0	0	0	0	0.4		
Min	0	0	0	0	0	2	31	64	15	28	57	76	79	78	75	69	61	16	13	1	0	0	0	0	0		
Max	0	0	0	0	0	31	122	217	328	422	454	533	553	517	479	366	337	194	98	13	0	0	0	0	3908		

Daylight Data Recovery: 11% missing; 2% exceed the 15% QC threshold -- 5379 total daylight 5-minute measurements.

Note: Fractional values that do not appear in the hour columns are included in the calculation for daily values.

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<value>?	20% < Fail QC < 100%	10% < Fail QC < 100%
<blank>*	100% Missing	100% Missing
<blank>?	100% Fail QC	100% Fail QC

Station: BS  
Latitude: 37.27° N  
Longitude: 81.24° W  
Elevation: 803 Meters AMSL  
Time Zone: -5

Instrument: PSP  
Calibration Constant: 8.27 uV/Wm-2  
Serial Number: 17880F3  
Calibration Date: 9/13/96