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TABLES OF SOLAR ALTITUDE, AZIMUTH, INTENSITY AND
HEAT GAIN FACTORS FOR LATITUDES FROM 43 TO 55
DEGREES NORTH

BY

ANALYZED

D. G. STEPHENSON

TECHNICAL PAPER NO. 243

OF THE

DIVISION OF BUILDING RESEARCH

OTTAWA

APRIL 1967

PRICE 50 CENTS

NRC 9526

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D. G. Stephenson

Solar heat usually causes much of the cooling load for commercial and residential buildings. An accurate estimate of cooling load must, therefore, take account of the hourly and seasonal variations of solar beam intensity and of the angle of incidence of the beam at the outer surfaces of a building. The tables in this report give the solar data needed for designing an air conditioning system by either the traditional hand-calculating procedures or digital computer techniques. They have been prepared in exactly the same way as the tables in the ASHRAE Handbook of Fundamentals (1967), but are for the latitudes of particular relevance in Canada and for small enough increments of latitude that interpolation is unnecessary. The data are in the engineering units commonly used in North America ($\text{Btu/ft}^2 \text{ hr}$); and in the International System (watt/metre^2), which is coming into use throughout the world.

Solar Altitude and Azimuth Angles

The position of the sun in the sky can be expressed most conveniently by two angular co-ordinates: the solar altitude above

the horizon, and the solar azimuth measured from South. These angles are related to the time, date and latitude by:

$$\sin \text{Alt} = \cos L \cos \delta \cos h + \sin L \sin \delta$$

$$\sin \text{Az} = \cos \delta \sin h / \cos \text{Alt}$$

where $h = 0.25 \{\text{number of minutes from solar noon}\}$

$L = \text{latitude}$

$\delta = \text{solar declination}$

Values of solar altitude and azimuth angles have been computed for the 21st of each month and are tabulated in the first two columns of the tables.

Intensity of Direct Solar Beam

The intensity of the direct solar beam, I_{DN} , depends on the clarity of the atmosphere and the length of the solar beam's path through it. The value of I_{DN} at the surface of the earth on a clear day is well represented for solar altitudes greater than 15 degrees by

$$I_{\text{DN}} = A/e^{B/\sin \text{Alt}}$$

where A and B are functions of the date that take account of the seasonal variation of earth-sun distance and the dust, ozone and water vapour content of the atmosphere⁽¹⁾. Values of I_{DN} computed with this formula are given in the third column of the tables. The values of the A and B parameters that were used are given in Table I. They were selected so that the resulting values of I_{DN} would be in close agreement with the values given by Threlkeld and Jordan⁽²⁾ for average cloudless days at different times of the year. For very clear atmospheres, the value of I_{DN} can be as much as 20 per cent higher than the values given in these tables. The local atmospheric clearness

can be taken into account by multiplying the values of I_{DN} and the solar heat gain factors by a Clearness Number, which can vary from about 0.8 to 1.2. Reference 2 gives clearness numbers for the United States and the most southerly parts of Canada. Further work is required to provide clearness numbers for all parts of Canada. Until these are available, designers must use their discretion: a value of 1.2 being appropriate for very clear regions, 1.0 for average and 0.8 for smoggy industrial areas.

Solar Heat Gain Factors

The solar heat gain factors are the instantaneous rate of solar heat transfer through unit area of unshaded double-strength sheet glass in some specific situation. This is the solar power transmitted through the glass plus a fraction of the power absorbed by the glass. The rate of heat transfer through other fenestrations in a similar situation can be found by multiplying the tabulated value of the S.H.G.F. by a constant called the shading coefficient for the particular fenestration. Shading coefficients for many of the commonly used fenestrations are given in the ASHRAE Handbook of Fundamentals (1967), Chapter 28, as are tables of solar heat gain factors.

Equations and Data Used to Compute S.H.G.F.

The solar radiation falling on a window consists of:

- (a) direct rays from the sun;
- (b) scattered radiation from the sky;
- (c) radiation reflected from the ground and surrounding objects.

The power impinging on unit area of a window, I_D , due

to the direct rays from the sun depends on I_{DN} and the angle of incidence, θ , between the beam and a perpendicular to the window surface.

$$I_D = I_{DN} \cdot \cos \theta$$

The cosine of the incident angle is related to the solar altitude and azimuth and the surface orientation by:

$$\cos \theta = \cos \text{Alt} \cos \gamma \sin \Sigma + \sin \text{Alt} \cos \Sigma$$

where

Σ = slope angle of the surface
measured from horizontal

γ = difference between solar
azimuth and the azimuth of a
normal to the surface.

When the surface is horizontal, $\Sigma = 0$ degrees

so that $\cos \theta_H = \sin \text{Alt}$

and for a vertical surface $\Sigma = 90$ degrees

so that $\cos \theta_V = \cos \text{Alt} \cdot \cos \gamma$.

If $\gamma > 90$ degrees it means that the surface receives no direct beam radiation, i.e. $I_D = 0$.

The transmission and absorption factors for window glasses can be approximated by a polynomial with $\cos \theta$ as the argument. For the direct beam the factors are:

$$\text{Transmission } \tau_D = \sum_{j=0}^5 t_j \cos^j \theta$$

$$\text{Absorption } \alpha_D = \sum_{j=0}^5 a_j \cos^j \theta$$

and for diffuse radiation from the sky or ground

$$\tau_d = 2 \sum_{j=0}^5 \frac{t_j}{j+2}$$

$$\alpha_d = 2 \sum_{j=0}^5 \frac{a_j}{j+2}$$

Values of the coefficients t_j and a_j for some common types of glass have been computed from the data in Ref. 3 and are given in Appendix A.

The intensity of the diffuse radiation from a cloudless sky that falls on a horizontal surface can be approximated by:

$$I_{dH} = C \cdot I_{DN}$$

where C depends on the dust content of the atmosphere and varies from summer to winter. The values of C used for the computation of these tables are given in Table I.

The diffuse radiation from the sky that is incident on a vertical surface is the product of I_{dH} and Y, an empirical function of $\cos \theta$ that has been developed by Threlkeld⁽⁴⁾.

$$\text{If } \cos \theta > -0.2$$

$$Y = 0.55 + 0.437 \cos \theta + 0.313 \cos^2 \theta$$

otherwise

$$Y = 0.45$$

The radiation reflected from the ground that is incident on a vertical surface is:

$$\frac{1}{2} \rho_g I_{DN} \{ C + \sin \text{Alt} \}$$

where ρ_g is the reflectivity of the ground.

Thus the total diffuse radiation incident on a vertical surface is:

$$I_d = I_{DN} \left\{ C \cdot Y + \frac{\rho_g}{2} (C + \sin \text{Alt}) \right\}$$

The solar heat gain factor is given by:

$$S.H.G.F. = I_D (\tau_D + N_i \cdot \alpha_D) + I_d (\tau_d + N_i \cdot \alpha_d)$$

where N_i is the fraction of the absorbed radiation that is transferred to the inside of the building. These tables have been computed using $N_i = 0.3$.

The value of ρ_g has been taken as 0.2, which is an appropriate average for ground that has no snow cover, but when the ground is snow covered the reflection is greatly increased. The presence of snow can be allowed for by increasing the solar heat gain factors for vertical windows by about 20 per cent for the winter months.

Cooling Load Calculations

The solar heat gain factors multiplied by fenestration area and shading coefficient give the instantaneous rate of heat gain of a room from solar energy transfer through the fenestration. The room may also be gaining energy by heat conduction through the fenestration and through the opaque parts of the wall and roof, and from the energy being supplied to the lights and equipment located in the room. The sum of all these components is the total instantaneous heat gain for the room. The cooling load, i.e. the rate at which heat must be removed from the air in the room to keep the air temperature at a specified value, can be quite different from the total instantaneous heat gain at the same time. In particular, the maximum cooling load is significantly smaller than the maximum rate of heat gain if the floor and internal partitions have some heat storage capacity.

The simplest method of calculating cooling load is to find, first, the instantaneous heat gain and then apply a heat storage factor

that has a value less than one. The heat storage factor depends, on the heat storage capacity of the structure. Research is under way to determine appropriate heat storage factors for different types of buildings, but until these results are available designers must rely on experience.

The solar heat gain factors that were given in the ASHRAE Guides prior to 1967 were, in general, about 20 per cent smaller than the values in the 1967 Handbook of Fundamentals. There is no doubt that the new values are more accurate than the previous ones. Cooling loads were not usually under-estimated using the old values because it has been common practice to assume a heat storage factor of one, i.e. that the cooling load was equal to the instantaneous rate of heat gain. This assumption will give too-large cooling loads when the heat gains are calculated with these new tables. A heat storage factor of 0.90 is applicable to lightweight structures⁽⁵⁾, a factor 0.75 is reasonable for the type of buildings where the old Guide data have proved satisfactory⁽⁴⁾, and a factor of 0.60 or less might be appropriate for heavy structures with a lot of solar heat gain⁽⁶⁾.

Sol-Air Temperature

The calculation of heat transfer between the outside environment and the outer surface of a wall or roof is simplified by using the sol-air temperature concept. The S.A.T. is that temperature of the outdoor air that, in the absence of all radiation exchanges, would give the same rate of heat entry into the surface as would exist with the actual combination of incident solar radiation, radiant energy exchange with the sky and other outdoor surroundings, and convective heat exchange with the outdoor air.

$$S.A.T. = t_{air} + \frac{\alpha \cdot I}{h} - \frac{e \cdot \Delta R}{h}$$

- α = absorptance of surface for solar radiation
- ϵ = emittance of the surface
- I = total solar radiation incident on the surface = $I_D + I_d$
- h = coefficient of heat transfer by radiation and convection at the surface
- t_{air} = outdoor air temperature
- ΔR = the difference between the long-wave radiation incident on the surface from the sky and surroundings and the radiation emitted by a black body at outdoor air temperature. For horizontal surfaces that receive long-wave radiation only from a cloudless sky, an appropriate value of ΔR is about 60 w/m^2 ($20 \text{ Btu/ft}^2 \text{ hr}$). For vertical surfaces it is common to assume that $\Delta R = 0$.

The value of I can be approximated from the data in these tables; viz

$$I = 1.15 \text{ S.H.G.F.}$$

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5. Handbook of air conditioning system design. McGraw-Hill, 1965.
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Table I

Data for Calculation of Solar Radiation Intensity

Date	δ Degrees	A		B Air Mass ⁻¹	C Dimensionless
		$\frac{\text{Btu}}{\text{hr ft}^2}$	$\frac{W}{\text{m}^2}$		
Jan 21	-20.0	390	1230	0.142	0.058
Feb 21	-10.8	385	1215	0.144	0.060
Mar 21	0.0	376	1186	0.156	0.071
Apr 21	11.6	360	1136	0.180	0.097
May 21	20.0	350	1104	0.196	0.121
June 21	23.45	345	1088	0.205	0.134
July 21	20.6	344	1085	0.207	0.136
Aug 21	12.3	351	1107	0.201	0.122
Sept 21	0.0	365	1151	0.177	0.092
Oct 21	-10.5	378	1192	0.160	0.073
Nov 21	-19.8	387	1221	0.149	0.063
Dec 21	-23.45	391	1233	0.142	0.057

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR 43 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL WATTS/SQ. M.	SOLAR HEAT GAIN FACTORS, WATTS/SQ. M.								HOR.	TIME PM
					NORTH	NW	WEST	SW	SOUTH	SE	EAST	NE		
JAN 21	8	6.3	55.0	339	11	40	265	320	181	12	11	11	27	4
	9	14.6	43.4	701	32	35	450	662	477	37	32	32	135	3
	10	21.2	30.3	810	46	46	372	740	659	163	46	46	254	2
	11	25.5	15.6	884	54	54	184	690	764	374	54	54	336	1
	12	27.0	0.0	899	56	56	60	561	799	561	60	56	364	12
			HALF DAY TOTALS		171	194	1290	2696	2481	851	172	171	936	
FEB 21	7	3.3	71.9	102	3	41	93	87	25	3	3	3	5	5
	8	13.4	61.0	651	29	142	542	597	287	29	29	29	113	4
	9	22.3	48.7	831	48	61	569	762	499	51	48	48	272	3
	10	29.6	34.4	907	61	62	438	778	651	127	61	61	408	2
	11	34.5	18.0	941	68	68	218	697	745	340	68	68	492	1
	12	36.2	0.0	951	71	71	76	547	777	547	76	71	521	12
			HALF DAY TOTALS		242	386	1852	3160	2576	811	244	242	1546	
MAR 21	7	10.9	79.6	519	25	280	495	413	70	24	24	24	75	5
	8	21.4	68.5	773	47	269	673	663	243	47	47	47	248	4
	9	31.1	55.7	876	64	130	630	750	424	66	64	64	422	3
	10	39.3	40.2	926	77	81	475	735	564	94	77	77	554	2
	11	44.9	21.4	950	85	85	242	641	651	265	85	85	636	1
	12	47.0	0.0	957	87	87	93	480	680	480	93	87	664	12
			HALF DAY TOTALS		343	922	2619	3497	2291	727	344	342	2266	
APR 21	6	7.9	98.5	306	37	246	303	180	17	16	16	16	39	6
	7	18.8	88.4	652	50	435	635	460	52	45	45	45	193	5
	8	29.7	77.6	792	68	384	704	607	146	66	66	66	380	4
	9	40.1	64.8	861	82	230	635	660	291	82	82	82	542	3
	10	49.3	48.6	898	94	107	477	632	419	100	94	94	665	2
	11	56.0	27.0	917	101	104	253	534	501	183	101	101	743	1
	12	58.6	0.0	922	104	104	111	372	529	372	111	104	769	12
			HALF DAY TOTALS		678	1551	7057	3275	1689	658	458	456	2949	
MAY 21	5	3.2	114.6	32	13	31	30	10	1	1	1	1	3	7
	6	13.5	104.9	476	114	421	470	260	34	34	34	34	107	6
	7	24.3	95.3	685	82	514	664	427	64	60	60	60	281	5
	8	35.2	85.1	786	85	452	694	536	100	79	79	79	458	4
	9	46.0	73.0	841	94	303	618	573	195	94	94	94	607	3
	10	55.9	57.0	871	105	150	465	540	302	110	106	106	722	2
	11	63.8	33.4	887	113	118	254	441	376	144	113	113	794	1
	12	67.0	0.0	892	115	115	124	288	402	288	124	115	818	12
			HALF DAY TOTALS		644	2008	3215	2908	1272	643	544	541	3377	
JUNE 21	5	5.6	117.1	133	62	133	124	39	9	9	9	9	17	7
	6	15.7	107.6	510	150	467	501	238	41	41	41	41	139	6
	7	26.4	98.3	685	108	536	660	401	69	66	66	66	313	5
	8	37.4	88.4	775	92	473	680	499	95	84	84	84	483	4
	9	48.2	76.9	825	103	331	605	531	163	99	99	99	626	3
	10	58.5	61.3	854	110	174	455	496	255	114	110	110	737	2
	11	66.9	37.2	869	117	124	252	398	323	136	117	117	806	1
	12	70.4	0.0	874	119	119	129	254	347	254	129	119	828	12
			HALF DAY TOTALS		794	2281	3321	2732	1128	657	587	584	3531	
JULY 21	5	4.6	115.0	40	17	39	38	13	2	2	2	2	4	7
	6	13.9	105.4	458	117	413	458	232	36	36	36	36	111	6
	7	24.7	95.8	660	88	506	648	414	67	62	62	62	283	5
	8	35.6	85.6	760	88	450	680	522	101	82	82	82	457	4
	9	46.4	73.7	815	100	307	608	559	190	97	97	97	603	3
	10	56.4	57.7	846	109	156	459	527	293	113	109	109	715	2
	11	64.3	34.0	862	115	122	254	431	365	145	115	115	786	1
	12	67.6	0.0	867	118	118	127	282	391	282	127	118	809	12
			HALF DAY TOTALS		675	2017	3171	2837	1249	656	561	558	3359	
AUG 21	6	8.4	99.1	277	40	231	281	166	19	18	18	18	42	6
	7	19.3	89.0	601	54	418	601	433	55	49	49	49	195	5
	8	30.2	78.2	741	73	378	676	579	142	70	70	70	376	4
	9	40.6	65.5	811	87	235	616	633	279	87	87	87	533	3
	10	49.8	49.2	849	99	114	467	610	402	106	99	99	652	2
	11	56.7	27.4	869	106	109	253	517	482	182	106	106	727	1
	12	59.3	0.0	875	109	109	117	361	509	361	117	109	753	12
			HALF DAY TOTALS		507	1534	2948	3134	1633	673	486	483	2904	
SEP 21	7	10.9	79.6	452	26	251	441	369	67	25	25	25	73	5
	8	21.4	68.5	709	50	257	632	623	233	50	50	50	240	4
	9	31.1	55.7	817	68	131	603	717	409	70	68	68	408	3
	10	39.3	40.2	870	80	85	460	709	545	99	80	80	536	2
	11	44.9	21.4	896	88	88	240	621	630	263	88	88	615	1
	12	47.0	0.0	904	91	91	97	467	659	467	97	91	642	12
			HALF DAY TOTALS		359	885	2472	3319	2213	732	360	358	2192	
OCT 21	7	3.5	72.1	89	3	37	83	77	22	3	3	3	6	5
	8	13.6	61.2	603	31	138	510	560	270	31	31	31	113	4
	9	22.6	48.9	785	50	64	548	729	477	53	50	50	269	3
	10	29.9	34.5	863	63	65	427	750	627	126	63	63	401	2
	11	34.8	18.0	899	71	71	216	675	770	330	71	71	483	1
	12	36.5	0.0	909	73	73	79	531	752	531	79	73	511	12
			HALF DAY TOTALS		252	389	1780	4025	2474	796	254	252	1523	
NOV 21	8	6.5	55.1	326	12	40	257	309	175	12	12	12	27	4
	9	14.8	43.5	680	33	36	440	646	465	38	33	33	136	3
	10	21.4	30.4	810	46	46	366	726	646	160	46	46	254	2
	11	25.7	15.7	864	54	54	183	678	750	368	54	54	335	1
	12	27.2	0.0	879	57	57	62	551	785	551	62	57	363	12
			HALF DAY TOTALS		173	196	1266	2639	2429	839	175	173	936	
DEC 21	8	3.7	52.8	134	4	11	101	127	75	4	4	4	7	4
	9	11.7	41.5	617	25	27	380	581	433	35	25	25	89	3
	10	18.0	28.8	779	39	39	335	700	637	171	39	39	195	2
	11	22.1	14.9	845	47	47	167	668	749	375	47	47	272	1
	12	23.6	0.0	864	50	50	54	550	785	550	54	50	299	12
			HALF DAY TOTALS		141	148	1038	2400	2312	846	142	141	715	

THIS TABLE APPLIES TO:
GUELPH, HAMILTON, KITCHENER, LONDON, NIAGARA FALLS, OSHAWA, SARNIA, STRATFORD, TORONTO, WATERLOO AND WINDSOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 45 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	SOLAR POSITION AZIMUTH	DIR. NORMAL WATTS/SQ. M.	NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW	HOR.	TIME PM
JAN 21	8	5.2	54.8	255	8	29	199	241	137	8	8	8	17	4
	9	13.2	43.0	659	29	32	422	625	454	35	29	29	111	3
	10	19.5	29.9	803	42	42	358	721	646	163	42	42	222	2
	11	23.6	15.4	862	50	50	177	679	756	372	50	50	299	1
	12	25.0	0.0	878	53	53	57	555	792	555	57	53	326	12
			HALF DAY TOTALS		156	174	1189	2565	2399	841	157	156	814	
FEB 21	7	7.7	71.8	57	1	23	52	49	14	1	1	1	3	5
	8	12.4	60.6	621	27	131	516	571	278	27	27	27	98	4
	9	21.0	48.1	813	45	56	555	750	497	48	45	45	247	3
	10	28.0	33.8	893	58	59	430	774	654	132	58	58	377	2
	11	32.6	17.6	929	65	65	213	699	751	347	65	65	460	1
	12	34.2	0.0	940	68	68	72	552	784	552	72	68	487	12
			HALF DAY TOTALS		227	341	1748	3078	2565	818	228	227	1425	
MAR 21	7	10.5	79.3	505	24	269	481	404	71	23	23	23	71	5
	8	20.7	67.8	762	46	257	662	659	250	46	46	46	235	4
	9	30.0	54.7	867	63	119	622	753	435	65	63	63	402	3
	10	37.8	39.2	918	75	78	469	742	578	98	75	75	531	2
	11	43.1	20.8	943	82	82	238	651	667	279	82	82	610	1
	12	45.0	0.0	950	85	85	90	493	698	493	90	85	637	12
			HALF DAY TOTALS		334	878	2572	3509	2348	749	334	334	2167	
APR 21	6	8.2	98.3	321	38	257	318	190	18	17	17	17	42	6
	7	18.8	87.8	650	49	429	634	464	53	45	45	45	192	5
	8	29.2	76.5	788	65	371	700	613	157	65	65	65	373	4
	9	39.2	63.4	857	81	214	631	669	310	81	81	81	529	3
	10	47.9	46.9	894	92	101	474	645	442	99	92	92	648	2
	11	54.2	25.7	912	100	102	250	550	526	197	100	100	723	1
	12	56.6	0.0	918	102	102	109	390	554	390	109	102	749	12
			HALF DAY TOTALS		470	1513	3051	3339	1781	681	453	451	2883	
MAY 21	5	4.0	114.5	66	27	64	62	22	4	4	4	4	7	7
	6	14.0	104.4	491	113	431	485	251	36	36	36	36	114	6
	7	24.4	94.4	687	78	508	666	436	65	60	60	60	284	5
	8	35.0	83.7	785	84	439	692	547	107	79	79	79	455	4
	9	45.4	71.1	838	94	286	616	586	214	94	94	94	599	3
	10	54.8	54.6	868	105	139	462	557	328	110	105	105	710	2
	11	62.1	31.3	884	111	116	252	461	405	153	111	111	780	1
	12	65.0	0.0	889	114	114	122	307	432	307	122	114	804	12
			HALF DAY TOTALS		652	2009	3261	3012	1375	667	546	543	3347	
JUNE 21	5	6.5	116.9	178	82	177	167	53	12	12	12	12	25	7
	6	16.3	107.1	524	149	476	515	249	43	43	43	43	148	6
	7	26.7	97.3	698	101	530	663	411	70	66	66	66	318	5
	8	37.3	86.9	774	91	460	679	511	98	84	84	84	482	4
	9	47.7	74.7	823	102	312	603	546	180	99	99	99	620	3
	10	57.5	58.6	852	109	160	453	514	280	114	109	109	727	2
	11	65.2	34.5	867	116	122	251	419	352	142	116	116	794	1
	12	68.4	0.0	871	118	118	128	274	378	274	128	118	816	12
			HALF DAY TOTALS		806	2291	3386	2846	1225	677	590	587	3519	
JULY 21	5	4.4	114.9	75	32	74	71	25	5	5	5	5	9	7
	6	14.4	104.9	472	117	423	472	243	38	38	38	38	119	6
	7	24.8	94.9	663	83	501	651	423	68	63	63	63	286	5
	8	35.4	84.2	759	87	437	679	533	107	82	82	82	454	4
	9	45.8	71.7	813	97	289	606	572	209	97	97	97	595	3
	10	55.3	55.3	843	107	145	457	544	318	113	107	107	704	2
	11	62.6	31.8	859	114	120	252	450	394	154	114	114	772	1
	12	65.6	0.0	864	116	116	126	301	420	301	126	116	795	12
			HALF DAY TOTALS		680	2020	3220	2940	1350	681	565	562	3332	
AUG 21	6	8.7	98.8	291	41	242	296	176	20	19	19	19	45	6
	7	19.2	88.3	600	54	412	600	437	57	49	49	49	194	5
	8	29.7	77.0	737	72	366	672	585	153	70	70	70	370	4
	9	39.7	63.9	807	86	219	612	643	297	86	86	86	521	3
	10	48.5	47.5	845	97	109	464	622	425	105	97	97	636	2
	11	54.9	26.1	864	104	107	251	532	506	195	104	104	708	1
	12	57.3	0.0	870	107	107	116	379	534	379	116	107	733	12
			HALF DAY TOTALS		501	1497	2944	3197	1723	695	481	478	2842	
SEP 21	7	10.5	79.3	437	25	240	427	359	67	24	24	24	69	5
	8	20.7	67.8	698	48	245	621	618	239	48	48	48	227	4
	9	30.0	54.7	808	66	121	595	718	418	68	66	66	389	3
	10	37.8	39.2	862	78	83	454	714	558	102	78	78	513	2
	11	43.1	20.8	888	86	86	236	630	645	275	86	86	590	1
	12	45.0	0.0	896	88	88	95	479	675	479	95	88	616	12
			HALF DAY TOTALS		349	844	2425	3323	2263	749	350	348	2096	
OCT 21	7	2.9	72.0	51	1	21	48	45	13	1	1	1	3	5
	8	12.6	60.8	573	28	127	484	534	260	28	28	28	99	4
	9	21.3	48.3	766	47	59	533	717	474	51	47	47	244	3
	10	28.2	33.9	849	60	62	418	746	629	130	60	60	371	2
	11	32.9	17.6	886	68	68	211	676	726	337	68	68	452	1
	12	34.5	0.0	897	70	70	76	535	758	535	76	70	479	12
			HALF DAY TOTALS		236	346	1682	2949	2462	802	238	236	1405	
NOV 21	8	5.3	54.9	246	8	29	193	233	132	9	8	8	18	4
	9	13.4	43.1	639	30	32	412	609	441	35	30	30	112	3
	10	19.7	30.0	782	43	43	352	706	632	160	43	43	222	2
	11	23.8	15.4	847	51	51	176	667	741	366	51	51	298	1
	12	25.2	0.0	858	54	54	58	546	777	546	58	54	325	12
			HALF DAY TOTALS		160	176	1166	2509	2344	829	161	160	815	
DEC 21	8	2.5	52.7	45	1	3	34	42	25	1	1	1	2	4
	9	10.2	41.2	553	22	24	342	526	394	31	22	22	69	3
	10	16.3	28.5	743	35	35	318	670	613	166	35	35	163	2
	11	20.2	14.7	817	43	43	159	650	732	368	43	43	235	1
	12	21.6	0.0	837	46	46	50	539	769	539	50	46	261	12
			HALF DAY TOTALS		126	130	919	2222	2183	823	127	126	602	

THIS TABLE APPLIES TO:
FREDERICTON, HALIFAX, MONTREAL, OTTAWA, ST. JOHN AND TRURO.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR 47 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL WATTS/SQ. M.	NORTH	NE	EAST	SOLAR SE	GAIN SOUTH	SW	WEST	NW	-----	TIME PM
													HOR.	
JAN 21	8	4.0	54.7	163	5	18	127	153	87	5	5	5	9	4
	9	11.7	42.7	610	26	28	390	580	423	31	26	26	89	3
	10	17.8	29.6	771	39	39	342	697	627	160	39	39	189	2
	11	21.6	15.2	836	46	46	170	665	743	368	46	46	262	1
	12	23.0	0.0	854	49	49	53	547	780	547	53	49	288	12
			HALF DAY TOTALS		141	153	1077	2409	2290	824	143	141	696	
FEB 21	7	2.1	71.7	23	0	9	21	19	5	0	0	0	1	5
	8	11.4	60.2	586	25	120	486	541	266	25	25	25	84	4
	9	19.7	47.5	792	43	51	539	736	492	46	43	43	222	3
	10	26.3	33.2	877	55	56	420	769	655	136	55	55	347	2
	11	30.7	17.2	915	62	62	208	698	755	353	62	62	426	1
	12	32.2	0.0	927	65	65	69	555	789	555	69	65	453	12
			HALF DAY TOTALS		215	301	1651	2995	2546	824	216	215	1303	
MAR 21	7	10.2	78.9	489	23	258	466	393	71	22	22	22	66	5
	8	19.9	67.1	750	44	245	651	654	255	44	44	44	221	4
	9	28.8	53.8	857	61	109	614	753	445	63	61	61	382	3
	10	36.2	38.3	910	72	76	463	747	591	102	72	72	506	2
	11	41.2	20.1	935	80	80	234	659	682	291	80	80	583	1
	12	43.0	0.0	943	82	82	87	504	714	504	87	82	609	12
			HALF DAY TOTALS		723	837	2523	3508	2399	766	323	322	2062	
APR 21	6	8.5	98.0	335	39	267	332	199	19	18	18	18	45	6
	7	18.7	87.1	649	49	422	632	469	55	45	45	45	190	5
	8	28.8	75.4	783	64	358	695	619	168	64	64	64	365	4
	9	38.3	61.9	852	80	199	627	678	328	80	80	80	516	3
	10	46.5	45.4	889	91	98	470	657	464	98	91	91	630	2
	11	52.4	24.6	907	98	98	247	565	549	211	98	98	702	1
	12	54.6	0.0	913	100	100	107	408	578	408	107	100	727	12
			HALF DAY TOTALS		465	1474	3041	3402	1869	704	448	446	2813	
MAY 21	5	4.8	114.4	107	43	104	101	36	6	6	6	6	12	7
	6	14.5	103.9	504	117	440	498	262	37	37	37	37	122	6
	7	24.6	93.5	689	75	502	668	445	66	60	60	60	286	5
	8	34.8	82.3	783	83	425	691	557	116	78	78	78	452	4
	9	44.7	69.2	835	93	268	614	599	234	93	93	93	591	3
	10	53.6	52.4	865	103	129	460	572	353	109	103	103	698	2
	11	60.4	29.5	881	110	114	250	479	434	164	110	110	765	1
	12	63.0	0.0	886	112	112	121	327	461	327	121	112	788	12
			HALF DAY TOTALS		664	2017	3317	3115	1477	689	544	541	3316	
JUNE 21	5	7.4	116.7	222	101	220	208	67	15	15	15	15	33	7
	6	16.9	106.5	537	147	484	528	260	45	45	45	45	157	6
	7	26.9	96.3	691	95	524	665	421	71	67	67	67	322	5
	8	37.1	85.4	773	90	446	678	523	104	84	84	84	480	4
	9	47.2	72.6	821	98	294	601	560	198	98	98	98	613	3
	10	56.4	56.0	849	108	147	451	531	306	114	108	108	717	2
	11	63.6	32.2	864	115	120	249	439	382	151	115	115	781	1
	12	66.4	0.0	869	117	117	126	293	408	293	126	117	803	12
			HALF DAY TOTALS		814	2301	3444	2956	1327	701	593	590	3502	
JULY 21	5	5.3	114.8	114	48	113	109	39	7	7	7	7	15	7
	6	14.9	104.4	485	116	432	486	254	39	39	39	39	126	6
	7	25.0	94.0	664	80	495	653	432	63	63	63	63	289	5
	8	35.2	82.8	757	86	423	677	543	115	81	81	81	451	4
	9	45.1	69.8	810	96	272	604	585	228	96	96	96	587	3
	10	54.1	53.0	840	106	134	455	560	343	112	106	106	692	2
	11	60.9	29.9	856	113	117	250	469	422	164	113	113	758	1
	12	63.6	0.0	861	115	115	124	320	449	320	124	115	780	12
			HALF DAY TOTALS		693	2027	3274	3044	1447	701	564	561	3304	
AUG 21	6	9.0	98.5	304	42	251	309	185	21	20	20	20	49	6
	7	19.2	87.6	599	53	406	599	442	58	48	48	48	193	5
	8	29.3	75.9	733	69	353	667	591	163	69	69	69	362	4
	9	38.8	62.5	802	84	205	607	651	315	84	84	84	508	3
	10	47.1	45.9	840	96	105	460	634	446	104	96	96	619	2
	11	53.1	24.9	859	103	103	248	547	529	208	103	103	689	1
	12	55.3	0.0	865	105	105	114	395	557	395	114	105	713	12
			HALF DAY TOTALS		493	1459	2934	3258	1808	713	474	471	2777	
SEP 21	7	10.2	78.9	422	24	230	412	348	66	23	23	23	64	5
	8	19.9	67.1	685	47	234	609	613	243	47	47	47	213	4
	9	28.8	54.8	797	64	111	586	718	427	67	64	64	369	3
	10	36.2	38.3	853	76	80	448	718	569	105	76	76	489	2
	11	41.2	20.1	880	83	83	232	637	659	287	83	83	563	1
	12	43.0	0.0	888	86	86	92	490	690	490	92	86	589	12
			HALF DAY TOTALS		338	803	2375	3321	2307	767	339	337	1992	
OCT 21	7	2.3	71.9	22	0	9	20	19	5	0	0	0	1	5
	8	11.7	60.4	539	26	116	455	505	249	26	26	26	85	4
	9	19.9	47.7	744	45	54	517	702	469	48	45	45	220	3
	10	26.6	33.3	832	57	59	408	740	629	134	57	57	342	2
	11	41.0	17.3	872	65	65	206	675	729	343	65	65	419	1
	12	32.5	0.0	884	67	67	72	538	762	538	72	67	445	12
			HALF DAY TOTALS		224	309	1590	2870	2443	807	226	224	1286	
NOV 21	8	4.2	54.8	158	5	18	124	150	85	5	5	5	10	4
	9	11.9	42.8	591	26	29	380	565	412	32	26	26	90	3
	10	17.9	29.6	751	40	40	336	682	613	158	40	40	190	2
	11	21.8	15.2	816	47	47	169	653	728	361	47	47	262	1
	12	23.2	0.0	834	50	50	54	537	765	537	54	50	288	12
			HALF DAY TOTALS		144	156	1056	2357	2240	811	145	144	698	
DEC 21	8	1.2	52.6	1	0	0	1	1	1	0	0	0	0	4
	9	8.7	41.0	482	18	19	297	459	345	27	18	18	50	3
	10	14.5	28.3	700	32	32	298	634	582	160	32	32	133	2
	11	18.3	14.5	783	40	40	150	628	708	358	40	40	199	1
	12	19.6	0.0	806	42	42	46	524	748	524	46	42	223	12
			HALF DAY TOTALS		112	114	810	2047	2042	794	114	112	495	

THIS TABLE APPLIES TO: NORTH NW WEST SW SOUTH SE EAST NE HOR.
CHARLOTTETOWN, MONCTON, NORTH BAY, QUEBEC, S. ST. MARIE, ST. JOHN'S, SUDBURY AND SYDNEY.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 49 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR POSITION		DIR. NORMAL WATTS/SQ. M.	SOLAR HEAT GAIN FACTORS, WATTS/SQ. M.								HOR.	TIME PM
		ALT.	AZIMUTH		NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW		
JAN 21	8	2.9	54.6	72	2	7	56	68	38	2	2	2	3	4
	9	10.2	42.5	553	22	24	352	527	386	28	22	22	69	3
	10	16.0	29.3	734	35	35	324	667	603	156	35	35	158	2
	11	19.7	15.0	807	43	43	162	647	724	361	43	43	226	1
	12	21.0	0.0	827	45	45	49	535	763	535	49	45	250	12
HALF DAY TOTALS					126	132	955	2233	2161	802	127	126	584	
FEB 21	7	1.5	71.6	4	0	1	3	3	1	0	0	0	0	5
	8	10.4	59.9	547	22	108	453	507	252	22	22	22	71	4
	9	18.3	47.0	768	40	47	522	718	485	43	40	40	197	3
	10	24.6	32.7	859	52	53	410	760	653	139	52	52	315	2
	11	28.8	16.9	900	59	59	202	696	756	357	59	59	392	1
	12	30.2	0.0	912	61	61	66	556	791	556	66	61	418	12
HALF DAY TOTALS					201	270	1566	2919	2523	826	203	201	1182	
MAR 21	7	9.8	78.6	473	22	247	450	382	71	21	21	21	61	5
	8	19.1	66.5	736	43	233	638	648	259	43	43	43	207	4
	9	27.6	53.0	846	58	100	605	753	453	61	58	58	361	3
	10	34.6	37.4	900	70	73	457	751	602	106	70	70	481	2
	11	39.3	19.5	926	77	77	230	666	695	303	77	77	555	1
	12	41.0	0.0	934	79	79	85	514	728	514	85	79	580	12
HALF DAY TOTALS					311	795	2471	3505	2442	784	311	309	1954	
APR 21	6	8.7	97.7	347	39	276	345	208	20	19	19	19	48	6
	7	18.5	86.4	647	48	416	630	472	57	44	44	44	188	5
	8	28.2	74.3	778	63	345	690	624	180	63	63	63	356	4
	9	37.3	60.6	846	78	184	622	686	345	78	78	78	502	3
	10	45.1	43.9	883	89	96	466	668	484	97	89	89	612	2
MAY 21	11	50.6	23.5	902	96	96	245	579	571	225	96	96	681	1
	12	52.6	0.0	908	98	98	105	424	600	424	105	98	705	12
HALF DAY TOTALS					456	1438	3031	3457	1953	723	439	437	2740	
JUNE 21	5	5.7	114.2	151	61	146	142	51	9	9	9	9	18	7
	6	15.0	103.4	516	111	447	511	272	38	38	38	38	129	6
	7	24.7	92.6	690	72	495	669	453	66	61	61	61	288	5
	8	34.5	80.9	781	82	412	689	567	125	78	78	78	447	4
	9	44.0	67.4	832	92	251	611	612	254	92	92	92	581	3
JULY 21	10	52.4	50.3	862	102	120	457	587	379	108	102	102	684	2
	11	58.6	27.8	877	108	112	248	497	461	176	108	108	749	1
	12	61.0	0.0	882	110	110	119	346	489	346	119	110	771	12
HALF DAY TOTALS					677	2028	3371	3216	1577	715	545	542	3276	
AUG 21	5	8.3	116.4	263	119	261	246	81	18	18	18	18	42	7
	6	17.5	105.9	549	145	491	540	271	46	46	46	46	166	6
	7	27.1	95.3	693	90	518	668	431	72	67	67	67	325	5
	8	37.0	83.9	772	89	433	677	535	111	84	84	84	477	4
	9	46.5	70.6	819	97	277	599	574	217	97	97	97	606	3
SEP 21	10	55.2	53.6	846	107	137	448	548	332	113	107	107	705	2
	11	61.8	30.2	861	113	118	247	458	410	161	113	113	767	1
	12	64.4	0.0	865	115	115	125	312	437	312	125	115	788	12
HALF DAY TOTALS					824	2311	3498	3065	1427	723	593	589	3481	
OCT 21	5	6.1	114.6	155	65	153	148	53	10	10	10	10	21	7
	6	15.4	103.9	497	115	440	498	264	41	41	41	41	134	6
	7	25.1	93.0	666	76	489	654	441	69	63	63	63	291	5
	8	34.9	81.4	755	85	410	675	553	124	81	81	81	447	4
	9	44.4	67.9	807	95	255	601	597	247	95	95	95	578	3
NOV 21	10	52.9	50.9	837	105	126	452	574	368	112	105	105	678	2
	11	59.2	28.2	852	111	115	248	486	449	175	111	111	742	1
	12	61.6	0.0	857	113	113	123	339	476	339	123	113	764	12
HALF DAY TOTALS					703	2037	3325	3143	1547	726	564	561	3270	
DEC 21	6	9.3	98.1	316	42	260	322	194	22	21	21	21	52	6
	7	19.1	86.9	597	53	400	597	445	60	48	48	48	191	5
	8	28.8	74.9	728	68	340	663	596	173	68	68	68	354	4
	9	37.9	61.1	797	83	190	602	659	331	83	83	83	495	3
	10	45.7	44.4	835	94	102	456	644	465	103	94	94	601	2
JAN 21	11	51.3	23.8	854	101	101	245	560	550	222	101	101	668	1
	12	53.3	0.0	860	103	103	111	411	578	411	111	103	691	12
HALF DAY TOTALS					486	1423	2923	3311	1887	735	468	465	2707	
FEB 21	7	9.8	78.6	406	23	219	395	336	66	22	22	22	59	5
	8	19.1	66.5	671	45	222	596	605	246	45	45	45	200	4
	9	27.6	53.0	786	62	102	577	716	434	65	62	62	348	3
	10	34.6	37.4	843	73	77	441	721	579	109	73	73	464	2
	11	39.3	19.5	871	80	80	228	643	671	297	80	80	536	1
MAR 21	12	41.0	0.0	879	83	83	89	499	702	499	89	83	560	12
HALF DAY TOTALS					326	761	2321	3310	2345	781	327	325	1886	
APR 21	7	1.7	71.8	5	0	2	4	4	1	0	0	0	0	5
	8	10.7	60.1	501	23	105	422	471	234	23	23	23	72	4
	9	18.6	47.2	720	42	49	499	683	461	45	42	42	196	3
	10	24.9	32.8	814	54	55	397	730	626	137	54	54	311	2
	11	29.0	16.9	856	61	61	200	671	729	346	61	61	386	1
MAY 21	12	30.5	0.0	868	64	64	69	538	763	538	69	64	411	12
HALF DAY TOTALS					210	277	1506	2790	2415	807	211	210	1168	
JUNE 21	8	3.0	54.7	73	2	8	57	69	39	2	2	2	4	4
	9	10.4	42.6	534	22	25	343	512	375	28	22	22	70	3
	10	16.2	29.3	714	36	36	318	652	589	153	36	36	159	2
	11	19.9	15.0	786	44	44	160	634	709	354	44	44	226	1
	12	21.2	0.0	807	46	46	50	524	748	524	50	46	250	12
HALF DAY TOTALS					128	136	937	2183	2113	787	130	128	586	
JULY 21	9	7.2	40.8	396	14	15	244	377	285	22	14	14	34	3
	10	12.8	28.1	648	28	28	274	589	543	150	28	28	105	2
	11	16.3	14.3	743	36	36	141	600	678	343	36	36	164	1
	12	17.6	0.0	769	38	38	42	504	720	504	42	38	186	12
HALF DAY TOTALS					98	99	710	1863	1886	754	99	98	396	

THIS TABLE APPLIES TO: NORTH NW WEST SW SOUTH SE EAST NE HOR.
CHICOUTIMI, FORT WILLIAM, GANDER, LETHBRIDGE, NORANDA, PORT ARTHUR, TIMMINS, VANCOUVER, VICTORIA AND WINNIPEG.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 51 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL WATTS/SQ. M.	SOLAR HEAT GAIN FACTORS, WATTS/SQ. M.								-----	TIME PM
					NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW	HOR.	
JAN 21	8	1.7	54.5	10	0	1	8	10	5	0	0	0	0	4
	9	8.8	42.2	484	18	20	307	461	340	24	18	18	51	3
	10	14.3	29.0	690	31	31	303	629	572	150	31	31	129	2
	11	17.8	14.8	772	39	39	153	623	699	350	39	39	190	1
	12	19.0	0.0	794	41	41	45	518	740	518	45	41	212	12
			HALF DAY TOTALS		110	113	835	2044	2016	771	111	110	478	
FEB 21	8	9.4	59.6	503	20	97	416	467	234	20	20	20	58	4
	9	16.9	46.6	741	37	42	502	697	474	40	37	37	173	3
	10	22.9	32.2	839	49	49	398	749	647	141	49	49	283	2
	11	26.8	16.6	883	56	56	196	690	754	359	56	56	357	1
	12	28.2	0.0	895	58	58	62	555	790	555	62	58	382	12
			HALF DAY TOTALS		189	247	1494	2845	2483	824	190	189	1061	
MAR 21	7	9.4	78.2	454	20	235	432	369	70	20	20	20	56	5
	8	18.3	65.8	722	41	221	625	640	262	41	41	41	192	4
	9	26.4	52.1	834	56	91	595	750	459	59	56	56	339	3
	10	33.0	36.6	890	67	70	450	753	611	111	67	67	454	2
	11	37.4	19.0	917	74	74	226	672	707	313	74	74	525	1
	12	39.0	0.0	925	76	76	82	523	740	523	82	76	550	12
			HALF DAY TOTALS		297	752	2414	3491	2476	798	299	297	1840	
APR 21	6	9.0	97.4	360	39	285	357	217	21	20	20	20	50	6
	7	18.4	85.7	644	48	409	627	475	60	44	44	44	186	5
	8	27.7	73.3	773	62	332	685	629	190	62	62	62	346	4
	9	36.3	59.3	840	77	171	616	694	362	77	77	77	486	3
	10	43.6	42.6	877	87	93	462	678	503	97	87	87	592	2
	11	48.7	22.6	896	93	93	241	592	591	239	93	93	658	1
	12	50.6	0.0	902	96	96	103	440	621	440	103	96	681	12
			HALF DAY TOTALS		448	1402	3015	3510	2033	747	432	430	2659	
MAY 21	5	6.5	114.0	194	77	187	183	67	12	12	12	12	25	7
	6	15.4	102.9	528	109	454	522	282	40	40	40	40	136	6
	7	24.8	91.7	691	70	489	670	461	67	61	61	61	290	5
	8	34.2	79.6	779	81	398	686	577	136	77	77	77	442	4
	9	43.2	65.6	829	91	234	607	623	274	91	91	91	570	3
	10	51.1	48.4	858	101	114	454	602	403	108	101	101	669	2
	11	56.8	26.4	873	107	109	245	514	486	189	107	107	731	1
	12	59.0	0.0	878	109	109	117	365	515	365	117	109	753	12
			HALF DAY TOTALS		690	2039	3420	3315	1676	742	545	543	3237	
JUNE 21	4	1.2	127.4	0	0	0	0	0	0	0	0	0	0	8
	5	9.2	116.1	301	135	298	283	95	22	22	22	22	52	7
	6	18.0	105.3	560	142	496	551	281	47	47	47	47	175	6
	7	27.3	94.3	695	85	511	670	441	73	67	67	67	328	5
	8	36.7	82.4	771	88	419	676	546	119	83	83	83	474	4
	9	45.8	68.6	816	96	259	596	587	237	96	96	96	597	3
	10	54.0	51.3	843	106	127	446	563	357	113	106	106	692	2
	11	60.1	28.4	857	112	116	245	476	438	172	112	112	752	1
	12	62.4	0.0	862	114	114	123	331	465	331	123	114	772	12
			HALF DAY TOTALS		832	2311	3548	3169	1530	748	594	591	3456	
JULY 21	5	6.9	114.4	196	82	192	187	68	13	13	13	13	29	7
	6	15.9	103.3	509	113	446	510	274	42	42	42	42	141	6
	7	25.2	92.1	667	74	482	655	449	70	63	63	63	293	5
	8	34.6	80.0	753	84	397	673	562	134	80	80	80	442	4
	9	43.6	66.1	803	94	238	598	609	266	94	94	94	568	3
	10	51.6	48.9	833	104	119	449	588	392	111	104	104	664	2
	11	57.4	26.7	848	110	113	246	503	474	188	110	110	725	1
	12	59.6	0.0	853	112	112	121	357	502	357	121	112	746	12
			HALF DAY TOTALS		718	2045	3376	3240	1643	751	564	561	3233	
AUG 21	6	9.5	97.8	328	43	269	334	203	23	22	22	22	55	6
	7	18.9	86.2	595	52	393	595	449	62	48	48	48	189	5
	8	28.2	73.8	722	67	328	657	600	184	67	67	67	345	4
	9	36.9	59.8	791	82	177	597	666	347	82	82	82	480	3
	10	44.3	43.0	829	92	99	451	654	483	103	92	92	582	2
	11	49.4	22.9	848	98	98	242	572	569	235	98	98	647	1
	12	51.3	0.0	854	101	101	109	426	598	426	109	101	669	12
			HALF DAY TOTALS		477	1388	2909	3362	1963	756	461	458	2632	
SEP 21	7	9.4	78.2	388	21	207	378	323	65	21	21	21	55	5
	8	18.3	65.8	656	43	210	582	596	248	43	43	43	186	4
	9	26.4	52.1	773	59	94	566	712	439	63	59	59	327	3
	10	33.0	36.6	832	71	74	434	722	586	113	71	71	439	2
	11	37.4	19.0	860	78	78	224	647	680	407	78	78	508	1
	12	39.0	0.0	869	80	80	86	506	712	506	86	80	531	12
			HALF DAY TOTALS		313	721	2263	3290	2372	794	315	313	1780	
OCT 21	7	1.1	71.8	0	0	0	0	0	0	0	0	0	0	5
	8	9.7	59.7	458	21	93	385	432	217	21	21	21	59	4
	9	17.2	46.7	693	39	45	479	661	450	43	39	39	172	3
	10	23.7	32.3	793	51	51	385	718	620	139	51	51	280	2
	11	27.1	16.6	838	58	58	194	665	725	348	58	58	352	1
	12	28.5	0.0	851	61	61	66	536	761	536	66	61	376	12
			HALF DAY TOTALS		197	253	1432	2713	2378	806	199	197	1050	
NOV 21	8	1.9	54.6	12	0	1	10	12	7	0	0	0	0	4
	9	8.9	42.3	467	19	21	298	448	329	24	19	19	52	3
	10	14.5	29.1	670	32	32	297	614	559	147	32	32	130	2
	11	18.0	14.8	752	40	40	151	610	684	343	40	40	191	1
	12	19.2	0.0	774	42	42	46	508	775	508	46	42	213	12
			HALF DAY TOTALS		114	117	818	1997	1969	756	115	114	481	
DEC 21	9	5.7	40.7	293	9	10	180	279	211	16	9	9	21	3
	10	11.0	27.4	585	24	24	246	534	493	137	24	24	79	2
	11	14.4	14.2	696	31	31	130	564	639	324	31	31	131	1
	12	15.6	0.0	726	34	34	37	479	683	479	37	34	150	12
			HALF DAY TOTALS		80	82	589	1639	1689	704	81	80	305	

THIS TABLE APPLIES TO:
CALGARY AND REGINA.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 53 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL WATTS/SQ. M.	SOLAR HEAT				GAIN FACTORS, WATTS/SQ. M.				TIME PM
					NORTH	NE	EAST	SE	SOUTH	SW	WEST	NM	
JAN 21	9	7.3	42.1	401	14	16	253	382	282	19	14	14	35
	10	12.5	28.8	638	27	27	278	583	532	141	27	27	101
	11	15.8	14.6	731	35	35	143	593	667	335	35	35	156
	12	17.0	0.0	756	37	37	41	497	710	497	41	37	176
			HALF DAY TOTALS		95	98	727	1854	1856	731	97	95	380
FEB 21	8	8.4	59.3	452	17	85	373	421	212	17	17	17	46
	9	15.6	46.1	710	34	39	480	671	460	37	34	34	149
	10	21.2	31.8	816	46	46	385	734	639	142	46	46	252
	11	24.9	16.3	863	52	52	189	682	748	359	52	52	321
	12	26.2	0.0	876	55	55	59	551	785	551	59	55	345
			HALF DAY TOTALS		175	227	1417	2757	2439	817	176	175	940
MAR 21	7	9.0	77.9	435	19	223	413	354	69	19	19	19	52
	8	17.5	65.2	705	39	210	610	630	264	39	39	39	178
	9	25.2	51.4	821	54	83	984	746	464	57	54	54	316
	10	31.4	35.9	878	65	67	442	754	618	115	65	65	427
	11	35.5	18.5	906	71	71	221	676	716	323	71	71	495
	12	37.0	0.0	914	74	74	79	529	749	529	79	74	519
			HALF DAY TOTALS		286	712	2351	3467	2503	811	287	286	1727
APR 21	6	9.2	97.0	371	39	292	368	226	22	21	21	21	53
	7	18.3	85.1	641	47	401	624	478	62	44	44	44	183
	8	27.1	72.3	767	61	319	679	633	201	61	61	61	336
	9	35.3	58.0	834	75	158	611	700	377	77	75	75	470
	10	42.2	41.4	871	85	91	457	687	520	99	85	85	572
	11	46.9	21.8	890	91	91	238	603	609	253	91	91	635
	12	48.6	0.0	896	93	93	100	454	640	454	100	93	657
			HALF DAY TOTALS		438	1365	3000	3556	2106	770	424	422	2577
MAY 21	5	7.3	113.8	235	93	226	222	82	15	15	15	15	33
	6	15.9	102.4	538	107	460	533	292	41	41	41	41	142
	7	24.8	90.7	692	68	481	671	469	67	61	61	61	290
	8	33.8	78.2	776	79	384	684	586	147	77	77	77	436
	9	42.3	63.9	825	90	218	604	634	293	90	90	90	559
	10	49.7	46.6	854	99	109	451	615	426	107	99	99	653
	11	55.0	25.1	869	105	107	243	530	511	203	105	105	713
	12	57.0	0.0	874	107	107	115	382	539	382	115	107	733
			HALF DAY TOTALS		700	2047	3470	3409	1770	769	544	541	3191
JUNE 21	4	2.4	127.3	8	5	8	6	1	0	0	0	0	8
	5	10.1	115.8	336	149	332	316	108	25	25	25	25	62
	6	18.5	104.6	570	138	501	561	292	49	49	49	49	183
	7	27.4	93.2	696	82	503	671	451	74	68	68	68	330
	8	36.4	80.9	769	87	405	674	556	129	83	83	83	470
	9	45.1	66.8	813	95	242	593	599	257	95	95	95	587
	10	52.7	49.3	840	104	120	443	578	382	112	104	104	678
	11	58.3	26.9	854	110	114	243	493	464	184	110	110	736
	12	60.4	0.0	858	112	112	121	350	492	350	121	112	755
			HALF DAY TOTALS		839	2312	3591	3269	1630	775	595	592	3425
JULY 21	5	7.8	114.1	234	97	230	225	83	16	16	16	16	37
	6	16.3	102.7	519	111	452	521	284	43	43	43	43	148
	7	25.3	91.2	668	72	475	656	457	70	63	63	63	293
	8	34.2	78.7	751	83	383	670	571	145	80	80	80	436
	9	42.8	64.4	800	93	223	594	620	286	93	93	93	557
	10	50.3	47.1	829	102	113	446	601	415	110	102	102	649
	11	55.6	25.4	844	108	110	244	518	498	201	108	108	707
	12	57.6	0.0	849	110	110	119	375	526	375	119	110	727
			HALF DAY TOTALS		727	2052	3423	3333	1737	777	563	560	3189
AUG 21	6	9.8	97.5	339	43	276	345	211	24	23	23	23	58
	7	18.8	85.5	592	52	386	592	451	64	47	47	47	187
	8	27.7	72.8	717	66	315	652	603	194	66	66	66	335
	9	35.9	58.5	784	80	164	591	672	362	82	80	80	465
	10	42.8	41.7	822	90	97	446	662	500	104	90	90	563
	11	47.6	22.0	842	96	96	239	583	587	248	96	96	624
	12	49.3	0.0	848	98	98	107	439	616	439	107	98	645
			HALF DAY TOTALS		469	1352	2893	3405	2034	777	452	449	2553
SEP 21	7	9.0	77.9	369	19	195	360	308	63	19	19	19	50
	8	17.5	65.2	639	42	199	566	585	249	42	42	42	172
	9	25.2	51.4	759	57	86	555	707	442	61	57	57	306
	10	31.4	35.9	820	68	71	426	721	592	117	68	68	412
	11	35.5	18.5	849	75	75	219	650	688	315	75	75	479
	12	37.0	0.0	858	77	77	83	511	721	511	83	77	501
			HALF DAY TOTALS		300	680	2201	3261	2391	803	302	300	1669
OCT 21	8	8.6	59.5	410	18	81	344	387	196	18	18	18	48
	9	15.8	46.3	662	36	41	456	635	435	40	36	36	149
	10	21.5	31.9	769	48	48	372	702	610	139	48	48	249
	11	25.2	16.3	817	55	55	187	656	719	347	55	55	317
	12	26.5	0.0	831	57	57	62	531	755	531	62	57	340
			HALF DAY TOTALS		184	233	1355	2624	2327	797	186	184	932
NOV 21	9	7.5	42.1	386	15	16	246	371	274	20	15	15	36
	10	12.7	28.8	618	28	28	272	569	518	138	28	28	102
	11	16.0	14.7	710	36	36	141	580	652	328	36	36	157
	12	17.2	0.0	736	38	38	42	487	694	487	42	38	177
			HALF DAY TOTALS		99	100	711	1809	1811	718	100	99	384
DEC 21	9	4.2	40.6	174	5	6	106	165	125	9	5	5	10
	10	9.2	27.7	508	19	19	212	464	430	120	19	19	56
	11	12.4	14.1	637	27	27	117	519	588	299	27	27	100
	12	13.6	0.0	672	30	30	33	446	636	446	33	30	117
			HALF DAY TOTALS		65	66	449	1370	1449	639	66	65	223

THIS TABLE APPLIES TO:
EDMONTON, GOOSE BAY, PRINCE ALBERT AND SASKATOON.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 55 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	SOLAR POSITION AZIMUTH	DIR. NORMAL WATTS/SQ. M.	SOLAR HEAT GAIN FACTORS, WATTS/SQ. M.								HOR.	TIME PM
					NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW		
JAN 21	9	5.8	41.9	301	10	11	189	287	212	14	10	10	22	3
	10	10.8	28.6	574	23	23	249	526	481	128	23	23	76	2
	11	13.9	14.5	681	31	31	131	555	626	315	31	31	123	1
	12	15.0	0.0	710	33	33	36	470	670	470	36	33	141	12
			HALF DAY TOTALS		81	82	604	1630	1661	680	82	81	291	
FEB 21	8	7.4	59.1	395	14	72	325	368	187	14	14	14	36	4
	9	14.2	45.8	674	31	35	454	640	442	34	31	31	126	3
	10	19.5	31.4	789	42	42	371	715	626	142	42	42	220	2
	11	23.0	16.0	840	49	49	182	671	739	357	49	49	285	1
	12	24.2	0.0	854	51	51	55	544	776	544	55	51	307	12
			HALF DAY TOTALS		161	205	1330	2651	2375	806	162	161	821	
MAR 21	7	8.5	77.6	414	18	210	393	339	67	18	18	18	47	5
	8	16.7	64.7	688	37	198	594	619	264	37	37	37	163	4
	9	23.9	50.7	806	52	76	572	740	466	55	52	52	293	3
	10	29.8	35.2	865	62	64	434	752	623	119	62	62	399	2
	11	33.6	18.1	894	68	68	216	678	723	330	68	68	464	1
	12	35.0	0.0	903	70	70	76	534	757	534	76	70	487	12
			HALF DAY TOTALS		273	670	2285	3434	2518	819	275	273	1609	
APR 21	5	1.1	108.8	0	0	0	0	0	0	0	0	0	0	7
	6	9.5	96.7	382	39	299	379	234	23	21	21	21	56	6
	7	18.1	84.4	637	47	394	620	480	65	43	43	43	180	5
	8	26.5	71.4	760	60	306	673	635	212	60	60	60	325	4
	9	34.2	56.9	827	73	145	604	705	392	76	73	73	454	3
	10	40.6	40.2	864	83	88	452	695	536	101	83	83	550	2
	11	45.0	21.0	883	89	89	235	613	626	266	89	89	611	1
	12	46.6	0.0	889	91	91	98	466	657	466	98	91	631	12
			HALF DAY TOTALS		430	1329	2980	3595	2177	790	415	413	2491	
MAY 21	5	8.1	113.5	274	107	263	259	97	18	18	18	18	41	7
	6	16.3	101.8	548	104	464	543	302	43	42	42	42	149	6
	7	24.8	89.8	692	67	474	671	477	68	61	61	61	290	5
	8	33.3	76.9	773	78	370	680	594	159	76	76	76	429	4
	9	41.4	62.3	821	88	203	600	645	313	88	88	88	547	3
	10	48.3	45.0	849	97	106	447	627	448	106	97	97	636	2
	11	53.2	24.0	864	103	103	240	544	533	216	103	103	693	1
	12	55.0	0.0	869	105	105	113	399	562	399	113	105	712	12
			HALF DAY TOTALS		707	2052	3511	3499	1863	793	541	538	3141	
JUNE 21	4	3.6	127.2	41	26	43	34	5	2	2	2	2	5	8
	5	10.9	115.5	369	161	362	347	121	27	27	27	27	72	7
	6	19.0	104.0	579	134	504	571	302	50	50	50	50	191	6
	7	27.5	92.2	697	79	496	672	460	74	68	68	68	332	5
	8	36.1	79.5	767	86	391	672	566	140	82	82	82	465	4
	9	44.3	65.0	810	94	226	590	611	277	94	94	94	577	3
	10	51.4	47.3	836	103	115	440	592	406	111	103	103	663	2
	11	56.5	25.5	850	108	111	241	509	488	197	108	108	718	1
	12	58.4	0.0	854	110	110	120	368	517	368	120	110	737	12
			HALF DAY TOTALS		850	2317	3640	3365	1725	800	593	590	3392	
JULY 21	4	1.1	125.8	0	0	0	0	0	0	0	0	0	0	8
	5	8.6	113.9	271	111	265	260	97	19	19	19	19	45	7
	6	16.8	102.2	529	108	457	531	294	44	44	44	44	154	6
	7	25.3	90.2	668	71	468	656	465	71	64	64	64	294	5
	8	33.8	77.4	748	82	369	667	580	156	79	79	79	430	4
	9	41.9	62.8	796	91	207	590	630	305	91	91	91	545	3
	10	48.9	45.4	824	100	110	442	614	437	109	100	100	633	2
	11	53.8	24.2	839	106	106	241	533	520	214	106	106	688	1
	12	55.6	0.0	844	108	108	117	391	549	391	117	108	707	12
			HALF DAY TOTALS		734	2054	3461	3422	1827	802	561	558	3143	
AUG 21	5	1.7	109.2	1	0	1	1	0	0	0	0	0	0	7
	6	10.0	97.1	349	43	283	356	219	25	24	24	24	61	6
	7	18.6	84.9	589	51	379	589	454	67	47	47	47	184	5
	8	27.0	71.8	710	65	303	645	606	204	65	65	65	325	4
	9	34.8	57.3	777	78	152	585	677	376	81	78	78	449	3
	10	41.3	40.6	815	88	94	441	669	515	106	88	88	542	2
	11	45.7	21.2	835	94	94	235	592	603	260	94	94	601	1
	12	47.3	0.0	841	96	96	104	452	633	452	104	96	621	12
			HALF DAY TOTALS		460	1320	2876	3444	2101	798	444	442	2471	
SEP 21	7	8.5	77.6	349	18	183	340	293	61	18	18	18	45	5
	8	16.7	64.7	621	40	188	549	572	248	40	40	40	158	4
	9	23.9	50.7	744	55	79	542	699	443	58	55	55	283	3
	10	29.8	35.2	806	65	68	417	718	595	121	65	65	385	2
	11	33.6	18.1	836	72	72	214	650	693	321	72	72	449	1
	12	35.0	0.0	845	74	74	80	515	727	515	80	74	470	12
			HALF DAY TOTALS		288	640	2132	3221	2400	808	290	288	1554	
OCT 21	8	7.6	59.2	356	15	69	298	337	171	15	15	15	37	4
	9	14.4	45.9	627	33	37	430	603	417	36	33	33	126	3
	10	19.8	31.5	742	44	44	357	682	597	139	44	44	218	2
	11	23.3	16.1	794	51	51	179	643	708	344	51	51	282	1
	12	24.5	0.0	809	53	53	58	524	745	524	58	53	304	12
			HALF DAY TOTALS		169	210	1268	2515	2260	784	170	169	815	
NOV 21	9	6.0	42.0	291	10	11	185	279	207	14	10	10	23	3
	10	10.9	28.6	555	24	24	243	512	468	125	24	24	77	2
	11	14.1	14.5	661	31	31	130	542	610	308	31	31	124	1
	12	15.2	0.0	690	34	34	37	459	655	459	37	34	142	12
			HALF DAY TOTALS		82	83	594	1589	1619	665	83	82	294	
DEC 21	9	2.6	40.5	56	1	1	34	53	40	2	1	1	2	3
	10	7.5	27.6	412	14	14	171	377	350	98	14	14	37	2
	11	10.5	14.0	565	22	22	102	462	524	267	22	22	72	1
	12	11.6	0.0	606	25	25	28	404	576	404	28	25	87	12
			HALF DAY TOTALS		48	48	304	1072	1177	558	49	48	152	

THIS TABLE APPLIES TO:
FORT ST. JOHN, GRANDE PRAIRIE AND PRINCE RUPERT.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR 43 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR POSITION		DIR. NORMAL BTU/SQ. FT.-HR.	SOLAR HEAT GAIN FACTORS, BTU/SQ. FT.-HR.								TIME PM	
		ALT.	AZIMUTH		NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW		HOR.
JAN 21	8	6.3	55.0	107	3	12	84	101	57	3	3	3	8	4
	9	14.6	43.4	222	10	11	142	210	151	11	10	10	42	3
	10	21.2	30.3	263	14	14	118	234	209	51	14	14	80	2
	11	25.5	15.6	280	17	17	58	218	242	118	17	17	106	1
	12	27.0	0.0	285	17	17	19	178	253	178	19	17	115	12
			HALF DAY TOTALS		53	60	407	853	785	267	53	53	294	
FEB 21	7	3.3	71.9	32	1	13	29	27	8	1	1	1	1	5
	8	13.4	61.0	206	9	45	172	189	91	9	9	9	36	4
	9	22.3	48.7	263	15	19	180	241	158	16	15	15	86	3
	10	29.6	34.6	288	19	19	139	246	206	40	19	19	129	2
	11	34.5	18.0	298	21	21	69	221	236	107	21	21	156	1
	12	36.2	0.0	302	22	22	24	173	246	173	24	22	165	12
			HALF DAY TOTALS		75	120	586	999	816	255	76	75	489	
MAR 21	7	10.9	79.6	164	8	88	157	131	22	7	7	7	24	5
	8	21.4	68.5	245	15	85	213	210	77	15	15	15	78	4
	9	31.1	55.7	278	20	41	200	238	134	21	20	20	134	3
	10	39.3	40.2	293	24	25	150	233	179	30	24	24	175	2
	11	44.9	21.4	301	26	26	76	203	206	84	26	26	201	1
	12	47.0	0.0	303	27	27	29	152	216	152	29	27	210	12
			HALF DAY TOTALS		107	289	829	1108	725	230	106	105	717	
APR 21	6	7.9	98.5	97	12	78	96	57	5	5	5	5	12	6
	7	18.8	88.4	206	15	138	201	146	16	14	14	14	61	5
	8	29.7	77.6	251	21	122	223	192	46	21	21	21	120	4
	9	40.1	64.8	273	26	73	201	209	92	26	26	26	172	3
	10	49.3	48.6	285	30	34	151	200	133	31	30	30	211	2
	11	56.0	27.0	290	32	33	80	169	159	58	32	32	235	1
	12	58.6	0.0	292	33	33	35	118	168	118	35	33	244	12
			HALF DAY TOTALS		150	492	967	1037	534	208	145	144	934	
MAY 21	5	3.2	114.6	10	4	9	9	3	0	0	0	0	1	7
	6	13.5	104.9	151	36	133	149	76	11	11	11	11	34	6
	7	24.3	95.3	217	26	163	210	135	20	19	19	19	89	5
	8	35.2	85.1	249	27	143	220	170	31	25	25	25	145	4
	9	46.0	73.0	266	30	96	196	181	62	30	30	30	192	3
	10	55.9	57.0	276	33	47	147	171	95	35	33	33	229	2
	11	63.8	33.4	281	35	37	80	140	119	45	35	35	252	1
	12	67.0	0.0	283	36	36	39	91	127	91	39	36	259	12
			HALF DAY TOTALS		202	634	1017	920	401	203	171	170	1070	
JUNE 21	5	5.6	117.1	42	19	42	39	12	2	2	2	2	5	7
	6	15.7	107.6	162	47	148	159	75	13	13	13	13	44	6
	7	26.4	98.3	217	34	170	209	127	22	20	20	20	99	5
	8	37.4	88.4	245	29	150	215	158	30	26	26	26	153	4
	9	48.2	76.9	261	32	105	191	168	51	31	31	31	198	3
	10	58.5	61.3	271	35	55	144	157	80	36	35	35	233	2
	11	66.9	37.2	275	37	39	80	126	102	43	37	37	255	1
	12	70.4	0.0	277	37	37	41	80	110	80	41	37	262	12
			HALF DAY TOTALS		249	722	1051	864	354	204	183	181	1116	
JULY 21	5	3.6	115.0	12	5	12	12	4	0	0	0	0	1	7
	6	13.9	105.4	145	37	131	145	73	11	11	11	11	35	6
	7	24.7	95.8	209	28	160	205	131	21	19	19	19	90	5
	8	35.6	85.6	241	28	142	215	165	32	26	26	26	145	4
	9	46.4	73.7	258	31	97	193	177	60	31	31	31	191	3
	10	56.4	57.7	268	34	49	145	167	93	36	34	34	227	2
	11	64.3	34.0	273	36	38	80	136	116	46	36	36	249	1
	12	67.6	0.0	275	37	37	40	89	124	89	40	37	256	12
			HALF DAY TOTALS		211	636	1003	897	394	206	175	174	1064	
AUG 21	6	8.4	99.1	87	12	73	89	52	6	5	5	5	13	6
	7	19.3	89.0	190	17	132	190	137	17	15	15	15	62	5
	8	30.2	78.2	235	23	120	214	183	45	22	22	22	119	4
	9	40.6	65.5	257	27	74	195	201	88	27	27	27	169	3
	10	49.8	49.2	269	31	36	148	193	127	33	31	31	206	2
	11	56.7	27.4	275	33	34	80	164	153	58	33	33	230	1
	12	59.3	0.0	277	34	34	37	114	161	114	37	34	238	12
			HALF DAY TOTALS		158	484	933	992	516	211	151	150	919	
SEP 21	7	10.9	79.6	143	8	79	140	117	21	8	8	8	23	5
	8	21.4	68.5	225	16	81	200	197	74	16	16	16	76	4
	9	31.1	55.7	259	21	41	191	227	129	22	21	21	129	3
	10	39.3	40.2	276	25	27	146	224	173	31	25	25	170	2
	11	44.9	21.4	284	28	28	76	197	200	83	28	28	195	1
	12	47.0	0.0	286	28	28	31	148	209	148	31	28	203	12
			HALF DAY TOTALS		112	278	783	1051	701	231	113	112	694	
OCT 21	7	3.5	72.1	28	1	11	26	24	7	1	1	1	1	5
	8	13.6	61.2	191	9	44	161	177	85	9	9	9	36	4
	9	22.6	48.9	249	15	20	173	231	151	17	15	15	85	3
	10	29.9	34.5	274	20	20	135	238	199	40	20	20	127	2
	11	34.8	18.0	285	22	22	68	214	228	104	22	22	153	1
	12	36.5	0.0	288	23	23	25	168	238	168	25	23	162	12
			HALF DAY TOTALS		77	121	561	958	783	251	78	77	481	
NOV 21	8	6.5	55.1	103	3	12	81	98	55	4	3	3	8	4
	9	14.8	43.5	215	10	11	139	205	147	12	10	10	43	3
	10	21.4	30.4	256	14	14	116	230	204	51	14	14	80	2
	11	25.7	15.7	274	17	17	58	215	238	116	17	17	106	1
	12	27.2	0.0	279	18	18	19	175	249	175	19	18	115	12
			HALF DAY TOTALS		53	60	400	837	769	265	53	53	295	
DEC 21	8	3.7	52.8	42	1	3	32	40	24	1	1	1	2	4
	9	11.7	41.5	194	8	8	120	184	137	11	8	8	28	3
	10	18.0	28.8	247	12	12	106	222	202	54	12	12	61	2
	11	22.1	14.9	268	15	15	53	212	237	119	15	15	86	1
	12	23.6	0.0	274	15	15	17	174	249	174	17	15	94	12
			HALF DAY TOTALS		44	45	328	760	732	268	45	44	225	
					NORTH	NW	WEST	SW	SOUTH	SE	EAST	NE	HOR.	

THIS TABLE APPLIES TO:
GUELPH, HAMILTON, KITCHENER, LONDON, NIAGARA FALLS, OSHAWA, SARNIA, STRATFORD, TORONTO, WATERLOO AND WINDSOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 45 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	SOLAR AZIMUTH	DIR. NORMAL BTU/SQ. FT.-HR.	NORTH	NE	EAST	SOLAR SE	HEAT SOUTH	GAIN FACTORS, BTU/SQ. FT.-HR.	SW	WEST	NW	HOR.	TIME PM
JAN 21	8	5.2	54.8	81	2	9	63	76	43	2	2	2	5	4	
	9	13.2	43.0	209	9	10	134	198	144	11	9	9	35	3	
	10	19.5	29.9	254	13	13	113	228	204	51	13	13	70	2	
	11	23.6	15.4	273	16	16	56	215	239	118	16	16	95	1	
	12	25.0	0.0	278	16	16	18	176	251	176	18	16	103	12	
			HALF DAY TOTALS		48	54	376	812	759	266	49	48	257		
FEB 21	7	2.7	71.8	18	0	7	16	15	4	0	0	0	1	5	
	8	12.4	60.6	197	8	41	163	181	88	8	8	8	31	4	
	9	21.0	48.1	257	14	17	176	238	157	15	14	14	78	3	
	10	28.0	33.8	283	18	18	136	245	207	41	18	18	119	2	
	11	32.6	17.6	294	20	20	67	221	238	110	20	20	145	1	
	12	34.2	0.0	298	21	21	23	175	249	175	23	21	154	12	
			HALF DAY TOTALS		69	105	552	974	811	257	70	69	450		
MAR 21	7	10.5	79.3	160	7	85	152	128	22	7	7	7	22	5	
	8	20.7	67.8	241	14	81	210	209	79	14	14	14	74	4	
	9	30.0	54.7	275	19	37	197	238	138	20	19	19	127	3	
	10	37.8	39.2	291	23	24	149	235	183	31	23	23	168	2	
	11	43.1	20.8	299	26	26	75	206	211	88	26	26	193	1	
	12	45.0	0.0	301	26	26	28	156	221	156	28	26	202	12	
			HALF DAY TOTALS		102	276	814	1110	743	235	103	102	684		
APR 21	6	8.2	98.3	101	12	81	100	60	5	5	5	5	13	6	
	7	18.8	87.8	206	15	136	201	147	17	14	14	14	60	5	
	8	29.2	76.5	250	20	117	222	194	50	20	20	20	118	4	
	9	39.2	63.4	271	25	68	200	212	98	25	25	25	168	3	
	10	47.9	46.9	283	29	32	150	204	140	31	29	29	205	2	
	11	54.2	25.7	289	31	32	79	174	167	62	31	31	229	1	
	12	56.6	0.0	291	32	32	34	123	176	123	34	32	237	12	
			HALF DAY TOTALS		146	478	966	1057	564	213	140	140	912		
MAY 21	5	4.0	114.5	21	8	20	19	7	1	1	1	1	2	7	
	6	14.0	104.4	155	36	136	153	79	11	11	11	11	36	6	
	7	24.4	94.4	218	24	161	211	138	20	19	19	19	90	5	
	8	35.0	83.7	249	26	139	219	173	34	25	25	25	144	4	
	9	45.4	71.1	266	29	90	195	186	68	29	29	29	190	3	
	10	54.8	54.6	275	33	44	146	176	104	34	33	33	225	2	
	11	62.1	31.3	280	35	36	80	146	128	48	35	35	247	1	
	12	65.0	0.0	282	36	36	38	97	137	97	38	36	255	12	
			HALF DAY TOTALS		203	634	1031	953	434	208	170	170	1060		
JUNE 21	5	6.5	116.9	56	26	56	53	17	3	3	3	3	8	7	
	6	16.3	107.1	166	47	151	163	79	13	13	13	13	47	6	
	7	26.7	97.3	218	32	168	210	130	22	21	21	21	101	5	
	8	37.3	86.9	245	29	146	215	162	31	26	26	26	153	4	
	9	47.7	74.7	261	32	99	191	173	57	31	31	31	196	3	
	10	57.5	58.6	270	34	50	143	163	89	36	34	34	230	2	
	11	65.2	34.5	275	36	38	79	133	111	45	36	36	252	1	
	12	68.4	0.0	276	37	37	40	86	120	86	40	37	259	12	
			HALF DAY TOTALS		253	725	1071	902	386	212	183	182	1115		
JULY 21	5	4.4	114.9	23	10	23	22	8	1	1	1	1	3	7	
	6	14.4	104.9	149	37	134	149	77	12	12	12	12	37	6	
	7	24.8	94.9	210	26	159	206	134	21	20	20	20	91	5	
	8	35.4	84.2	240	27	138	215	169	34	26	26	26	144	4	
	9	45.8	71.7	257	30	91	192	181	66	30	30	30	188	3	
	10	55.3	55.3	267	34	46	145	172	101	36	34	34	223	2	
	11	62.6	31.8	272	36	38	80	142	125	48	36	36	245	1	
	12	65.6	0.0	274	37	37	40	95	133	95	40	37	252	12	
			HALF DAY TOTALS		213	639	1019	930	426	213	177	176	1056		
AUG 21	6	8.7	98.8	92	13	76	93	55	6	6	6	6	14	6	
	7	19.2	88.3	190	17	130	190	138	18	15	15	15	61	5	
	8	29.7	77.0	233	22	116	213	185	48	22	22	22	117	4	
	9	39.7	63.9	256	27	69	194	204	94	27	27	27	165	3	
	10	48.5	47.5	268	31	34	147	197	134	33	31	31	201	2	
	11	54.9	26.1	274	33	34	79	169	160	62	33	33	224	1	
	12	57.3	0.0	276	34	34	36	120	169	120	36	34	232	12	
			HALF DAY TOTALS		158	472	931	1012	544	219	151	150	898		
SEP 21	7	10.5	79.3	138	8	76	135	113	21	7	7	7	21	5	
	8	20.7	67.8	221	15	78	197	196	75	15	15	15	72	4	
	9	30.0	54.7	256	21	38	188	228	132	21	21	21	123	3	
	10	37.8	39.2	273	24	26	144	226	177	32	24	24	162	2	
	11	43.1	20.8	281	27	27	75	199	204	87	27	27	187	1	
	12	45.0	0.0	284	28	28	30	152	214	152	30	28	195	12	
			HALF DAY TOTALS		110	266	768	1052	715	235	109	108	662		
OCT 21	7	2.9	72.0	16	0	6	15	14	4	0	0	0	1	5	
	8	12.6	60.8	181	9	40	153	169	82	9	9	9	31	4	
	9	21.3	48.3	243	15	18	169	227	150	16	15	15	77	3	
	10	28.2	33.9	269	19	19	132	236	199	41	19	19	118	2	
	11	32.9	17.6	281	21	21	67	214	230	107	21	21	143	1	
	12	34.5	0.0	284	22	22	24	170	240	170	24	22	152	12	
			HALF DAY TOTALS		74	106	532	933	779	254	74	74	444		
NOV 21	8	5.3	54.9	78	2	9	61	74	42	2	2	2	5	4	
	9	13.4	43.1	202	9	10	131	193	140	11	9	9	35	3	
	10	19.7	30.0	248	13	13	111	224	200	50	13	13	70	2	
	11	23.8	15.4	267	16	16	56	211	235	116	16	16	94	1	
	12	25.2	0.0	272	17	17	18	173	246	173	18	17	103	12	
			HALF DAY TOTALS		49	55	370	795	743	261	49	49	256		
DEC 21	8	2.5	52.7	14	0	1	10	13	8	0	0	0	0	4	
	9	10.2	41.2	175	7	7	108	166	125	10	7	7	21	3	
	10	16.3	28.5	235	11	11	101	212	194	52	11	11	51	2	
	11	20.2	14.7	259	13	13	50	206	232	116	13	13	74	1	
	12	21.6	0.0	265	14	14	15	171	244	171	15	14	82	12	
			HALF DAY TOTALS		38	39	289	703	692	259	39	38	188		

THIS TABLE APPLIES TO:
FREDERICTON, HALIFAX, MONTREAL, OTTAWA, ST. JOHN AND TRURO.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 47 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR POSITION		DIR. NORMAL BTU/SQ. FT.-HR.	SOLAR HEAT GAIN FACTORS, BTU/SQ. FT.-HR.								TIME PM
		ALT.	AZIMUTH		NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW	
JAN 21	8	4.0	54.7	51	1	5	40	48	27	1	1	1	4
	9	11.7	42.7	193	8	9	123	184	134	10	8	8	3
	10	17.8	29.6	244	12	12	108	221	199	51	12	12	2
	11	21.6	15.2	265	14	14	54	211	235	116	14	14	1
	12	23.0	0.0	271	15	15	16	173	247	173	16	15	12
HALF DAY TOTALS					43	47	340	763	725	260	43	43	220
FEB 21	7	2.1	71.7	7	0	2	6	6	1	0	0	0	5
	8	11.4	60.2	186	8	38	154	171	84	8	8	8	4
	9	19.7	47.5	251	13	16	171	233	156	14	13	13	3
	10	26.3	33.2	278	17	17	133	244	207	43	17	17	2
	11	30.7	17.2	290	19	19	66	221	239	112	19	19	1
	12	32.2	0.0	294	20	20	22	176	250	176	22	20	12
HALF DAY TOTALS					66	92	522	948	805	260	66	66	411
MAR 21	7	10.2	78.9	155	7	82	147	124	22	7	7	7	5
	8	19.9	67.1	238	14	77	206	207	81	14	14	14	4
	9	28.8	53.8	272	19	34	194	239	141	20	19	19	3
	10	36.2	38.3	288	23	24	147	237	187	32	23	23	2
	11	41.2	20.1	296	25	25	74	209	216	92	25	25	1
	12	43.0	0.0	299	26	26	27	160	226	160	27	26	12
HALF DAY TOTALS					101	264	797	1112	759	242	101	101	652
APR 21	6	8.5	98.0	106	12	84	105	63	6	5	5	5	6
	7	18.7	87.1	205	15	134	200	148	17	14	14	14	5
	8	28.8	75.4	248	20	113	220	196	53	20	20	20	4
	9	38.3	61.9	270	25	63	198	215	104	25	25	25	3
	10	46.5	45.4	282	28	31	149	208	147	31	28	28	2
	11	52.4	24.6	288	31	31	78	179	174	67	31	31	1
	12	54.6	0.0	289	31	31	34	129	183	129	34	31	12
HALF DAY TOTALS					145	466	962	1077	591	221	140	139	890
MAY 21	5	4.8	114.4	34	13	33	32	11	2	2	2	2	7
	6	14.5	103.9	160	35	139	158	83	11	11	11	11	6
	7	24.6	93.5	218	23	159	212	141	20	19	19	19	5
	8	34.8	82.3	248	26	135	219	176	36	25	25	25	4
	9	44.7	69.2	265	29	85	194	190	74	29	29	29	3
	10	53.6	52.4	274	32	40	146	181	112	34	32	32	2
	11	60.4	29.5	279	34	36	79	152	137	52	34	34	1
	12	63.0	0.0	281	35	35	38	103	146	103	38	35	12
HALF DAY TOTALS					205	638	1050	986	465	217	170	169	1050
JUNE 21	5	7.4	116.7	70	32	70	66	21	4	4	4	4	7
	6	16.9	106.5	170	46	153	167	82	14	14	14	14	6
	7	26.9	96.3	219	30	166	211	133	22	21	21	21	5
	8	37.1	85.4	245	28	141	215	166	33	26	26	26	4
	9	47.2	72.6	260	31	93	190	177	63	31	31	31	3
	10	56.4	56.0	269	34	46	143	168	97	36	34	34	2
	11	63.6	32.2	274	36	38	79	139	121	47	36	36	1
	12	66.4	0.0	275	37	37	40	93	129	93	40	37	12
HALF DAY TOTALS					256	728	1091	935	419	219	185	184	1109
JULY 21	5	5.3	114.8	36	15	35	34	12	2	2	2	2	7
	6	14.9	104.4	154	37	137	154	80	12	12	12	12	6
	7	25.0	94.0	210	25	157	207	137	21	20	20	20	5
	8	35.2	82.8	240	27	134	215	172	36	25	25	25	4
	9	45.1	69.8	257	30	86	191	185	72	30	30	30	3
	10	54.1	53.0	266	33	42	144	177	109	35	33	33	2
	11	60.9	29.9	271	35	37	79	148	133	52	35	35	1
	12	63.6	0.0	273	36	36	39	101	142	101	39	36	12
HALF DAY TOTALS					216	640	1036	962	456	220	175	174	1045
AUG 21	6	9.0	98.5	96	13	79	98	58	6	6	6	6	6
	7	19.2	87.6	190	17	128	190	140	18	15	15	15	5
	8	29.3	75.9	232	21	112	211	187	51	21	21	21	4
	9	38.8	62.5	254	26	65	192	206	99	26	26	26	3
	10	47.1	45.9	266	30	33	146	201	141	33	30	30	2
	11	53.1	24.9	272	32	32	78	173	167	66	32	32	1
	12	55.3	0.0	274	33	33	36	125	176	125	36	33	12
HALF DAY TOTALS					153	460	928	1031	569	224	147	146	878
SEP 21	7	10.2	78.9	134	7	73	130	110	21	7	7	7	5
	8	19.9	67.1	217	15	74	193	194	77	15	15	15	4
	9	28.8	53.8	253	20	35	186	227	135	21	20	20	3
	10	36.2	38.3	270	24	25	142	228	180	33	24	24	2
	11	41.2	20.1	279	26	26	73	202	209	91	26	26	1
	12	43.0	0.0	281	27	27	29	155	218	155	29	27	12
HALF DAY TOTALS					105	253	751	1051	730	242	106	105	630
OCT 21	7	2.3	71.9	7	0	2	6	6	1	0	0	0	5
	8	11.7	60.4	171	8	37	144	160	79	8	8	8	4
	9	19.9	47.7	236	14	17	164	222	148	15	14	14	3
	10	26.6	33.3	264	18	18	129	234	199	42	18	18	2
	11	31.0	17.3	276	20	20	65	214	231	108	20	20	1
	12	32.5	0.0	280	21	21	23	170	241	170	23	21	12
HALF DAY TOTALS					69	95	503	908	772	254	70	69	407
NOV 21	8	4.2	54.8	50	1	5	39	47	27	1	1	1	4
	9	11.9	42.8	187	8	9	120	179	130	10	8	8	3
	10	17.9	29.6	239	12	12	106	216	194	50	12	12	2
	11	21.8	15.2	259	15	15	53	207	231	114	15	15	1
	12	23.2	0.0	264	15	15	17	170	242	170	17	15	12
HALF DAY TOTALS					44	48	333	746	709	256	45	44	220
DEC 21	8	1.2	52.6	0	0	0	0	0	0	0	0	0	4
	9	8.7	41.0	153	5	6	94	145	109	8	5	5	3
	10	14.5	28.3	222	10	10	94	201	184	50	10	10	2
	11	18.3	14.5	248	12	12	47	199	224	113	12	12	1
	12	19.6	0.0	255	13	13	14	166	237	166	14	13	12
HALF DAY TOTALS					33	35	255	648	645	250	34	33	156

THIS TABLE APPLIES TO: NORTH NW WEST SW SOUTH SE EAST NE HOR.
CHARLOTTETOWN, MONCTON, NORTH BAY, QUEBEC, S. ST. MARIE, ST. JOHN'S, SUDBURY AND SYDNEY.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 49 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL BTU/SQ. FT.-HR.	NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW	HOR.	TIME PM
JAN 21	8	2.9	54.6	22	0	2	17	21	12	0	0	0	1	4
	9	10.2	42.5	175	7	7	111	167	122	9	7	7	22	3
	10	16.0	29.3	233	11	11	102	211	191	49	11	11	50	2
	11	19.7	15.0	256	13	13	51	205	229	114	13	13	71	1
	12	21.0	0.0	262	14	14	15	169	242	169	15	14	79	12
			HALF DAY TOTALS		38	40	300	707	684	253	39	38	184	
FEB 21	7	1.5	71.6	1	0	0	1	1	0	0	0	0	0	5
	8	10.4	59.9	173	7	34	143	160	80	7	7	7	22	4
	9	18.3	47.0	243	12	14	165	228	153	13	12	12	62	3
	10	24.6	32.7	272	16	16	130	241	207	44	16	16	100	2
	11	28.8	16.9	285	18	18	64	220	240	113	18	18	124	1
	12	30.2	0.0	289	19	19	21	176	251	176	21	19	132	12
			HALF DAY TOTALS		61	82	495	924	799	260	62	61	373	
MAR 21	7	9.8	78.6	150	7	78	142	121	22	6	6	6	19	5
	8	19.1	66.5	233	13	74	202	205	82	13	13	13	65	4
	9	27.6	53.0	268	18	31	192	238	143	19	18	18	114	3
	10	34.6	37.4	285	22	23	145	238	191	33	22	22	152	2
	11	39.3	19.5	294	24	24	73	211	220	96	24	24	176	1
	12	41.0	0.0	296	25	25	27	163	230	163	27	25	184	12
			HALF DAY TOTALS		97	250	783	1109	772	246	96	95	618	
APR 21	6	8.7	97.7	110	12	87	109	66	6	6	6	6	15	6
	7	18.5	86.4	205	15	132	199	149	18	14	14	14	59	5
	8	28.2	74.3	247	20	109	219	198	57	20	20	20	113	4
	9	37.3	60.6	268	24	58	197	217	109	24	24	24	159	3
	10	45.1	43.9	280	28	30	147	212	153	30	28	28	194	2
	11	50.6	23.5	286	30	30	77	183	181	71	30	30	216	1
	12	52.6	0.0	288	31	31	33	134	190	134	33	31	223	12
			HALF DAY TOTALS		142	454	958	1094	618	227	137	137	867	
MAY 21	5	5.7	114.2	47	19	46	45	16	2	2	2	2	5	7
	6	15.0	103.4	163	35	142	162	86	12	12	12	12	40	6
	7	24.7	92.6	219	22	157	212	143	21	19	19	19	91	5
	8	34.5	80.9	247	26	130	218	180	39	24	24	24	142	4
	9	44.0	67.4	264	29	79	193	194	80	29	29	29	184	3
	10	52.4	50.3	273	32	38	145	186	120	34	32	32	217	2
	11	58.6	27.8	278	34	35	78	157	146	56	34	34	237	1
	12	61.0	0.0	280	35	35	37	109	155	109	37	35	244	12
			HALF DAY TOTALS		212	641	1066	1017	497	224	169	169	1036	
JUNE 21	5	8.3	116.4	83	37	82	78	25	6	6	6	6	13	7
	6	17.5	105.9	174	46	155	171	86	14	14	14	14	52	6
	7	27.1	95.3	219	28	164	211	137	22	21	21	21	103	5
	8	37.0	83.9	245	28	137	214	169	35	26	26	26	151	4
	9	46.5	70.6	259	31	87	190	182	69	31	31	31	192	3
	10	55.2	53.6	268	34	43	142	173	105	36	34	34	223	2
	11	61.8	30.2	273	36	37	78	145	130	51	36	36	243	1
	12	64.4	0.0	274	36	36	39	99	138	99	39	36	250	12
			HALF DAY TOTALS		260	728	1107	970	451	229	187	186	1102	
JULY 21	5	6.1	114.6	49	20	48	47	17	3	3	3	3	6	7
	6	15.4	103.9	157	36	139	158	83	13	13	13	13	42	6
	7	25.1	93.0	211	24	155	207	139	22	20	20	20	92	5
	8	34.9	81.4	239	27	130	214	175	39	25	25	25	141	4
	9	44.4	67.9	256	30	81	190	189	78	30	30	30	183	3
	10	52.9	50.9	265	33	39	143	182	116	35	33	33	215	2
	11	59.2	28.2	270	35	36	78	154	142	55	35	35	235	1
	12	61.6	0.0	272	36	36	39	107	151	107	39	36	242	12
			HALF DAY TOTALS		221	644	1052	994	489	228	177	176	1034	
AUG 21	6	9.3	98.1	100	13	82	102	61	7	6	6	6	16	6
	7	19.1	86.9	189	16	126	189	141	19	15	15	15	60	5
	8	28.8	74.9	231	21	108	210	189	55	21	21	21	112	4
	9	37.9	61.1	252	26	60	191	209	105	26	26	26	157	3
	10	45.7	44.4	264	29	32	144	204	147	32	29	29	190	2
	11	51.3	23.8	271	32	32	77	177	174	70	32	32	212	1
	12	53.3	0.0	273	32	32	35	130	183	130	35	32	219	12
			HALF DAY TOTALS		151	449	925	1048	597	230	146	145	857	
SEP 21	7	9.8	78.6	128	7	69	125	106	21	7	7	7	18	5
	8	19.1	66.5	213	14	70	189	192	78	14	14	14	63	4
	9	27.6	53.0	249	19	32	183	227	137	20	19	19	110	3
	10	34.6	37.4	267	23	24	140	228	183	34	23	23	147	2
	11	39.3	19.5	276	25	25	72	204	212	94	25	25	170	1
	12	41.0	0.0	278	26	26	28	158	222	158	28	26	177	12
			HALF DAY TOTALS		101	239	735	1048	741	246	102	101	596	
OCT 21	7	1.7	71.8	1	0	0	1	1	0	0	0	0	0	5
	8	10.7	60.1	159	7	33	134	149	74	7	7	7	22	4
	9	18.6	47.2	228	13	15	158	216	146	14	13	13	62	3
	10	24.9	32.8	258	17	17	126	231	198	43	17	17	98	2
	11	29.0	16.9	271	19	19	63	213	231	109	19	19	122	1
	12	30.5	0.0	275	20	20	22	170	242	170	22	20	130	12
			HALF DAY TOTALS		65	85	476	883	764	254	66	65	368	
NOV 21	8	3.0	54.7	23	0	2	18	22	12	0	0	0	1	4
	9	10.4	42.6	169	7	8	108	162	119	9	7	7	22	3
	10	16.2	29.3	226	11	11	101	206	186	48	11	11	50	2
	11	19.9	15.0	249	13	13	51	201	225	112	13	13	71	1
	12	21.2	0.0	256	14	14	16	166	237	166	16	14	79	12
			HALF DAY TOTALS		38	41	296	691	669	248	39	38	184	
DEC 21	9	7.2	40.8	125	4	4	77	119	90	7	4	4	11	3
	10	12.8	28.1	205	8	8	87	187	172	47	8	8	33	2
	11	16.3	14.3	236	11	11	44	190	215	109	11	11	52	1
	12	17.6	0.0	244	12	12	13	160	228	160	13	12	59	12
			HALF DAY TOTALS		29	29	223	590	597	239	29	29	125	

THIS TABLE APPLIES TO: NORTH NW WEST SW SOUTH SE EAST NE HOR.
CHICOUTIMI, FORT WILLIAM, GANDER, LETHBRIDGE, NORANDA, PORT ARTHUR, TIMMINS, VANCOUVER, VICTORIA AND WINNIPEG.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 51 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL BTU/SQ. FT.-HR.	SOLAR HEAT GAIN FACTORS, BTU/SQ. FT.-HR.								TIME PM
					NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW	
JAN 21	8	1.7	54.5	3	0	0	2	3	1	0	0	0	4
	9	8.8	42.2	153	5	6	97	146	107	7	5	5	3
	10	14.3	29.0	219	10	10	96	199	181	47	10	10	2
	11	17.8	14.8	245	12	12	48	197	222	111	12	12	1
	12	19.0	0.0	252	13	13	14	164	234	164	14	13	12
HALF DAY TOTALS					33	35	263	646	638	243	34	33	151
FEB 21	8	9.4	59.6	159	6	30	131	148	74	6	6	6	4
	9	16.9	46.6	235	11	13	159	221	150	12	11	11	3
	10	22.9	32.2	266	15	15	126	237	205	44	15	15	2
	11	26.8	16.6	280	17	17	62	219	239	114	17	17	1
	12	28.2	0.0	284	18	18	19	176	250	176	19	18	12
HALF DAY TOTALS					57	76	472	902	788	260	57	57	335
MAR 21	7	9.4	78.2	144	6	74	137	117	22	6	6	6	5
	8	18.3	65.8	229	13	70	198	203	83	13	13	13	4
	9	26.4	52.1	264	18	29	188	238	145	18	18	18	3
	10	33.0	36.6	282	21	22	142	239	193	35	21	21	2
	11	37.4	19.0	290	23	23	71	213	224	99	23	23	1
	12	39.0	0.0	293	24	24	26	165	234	165	26	24	12
HALF DAY TOTALS					93	237	763	1107	783	251	94	93	582
APR 21	6	9.0	97.4	114	12	90	113	69	6	6	6	6	6
	7	18.4	85.7	204	15	129	199	150	19	14	14	14	5
	8	27.7	73.3	245	19	105	217	199	60	19	19	19	4
	9	36.3	59.3	266	24	54	195	220	114	25	24	24	3
	10	43.6	42.6	278	27	29	146	215	159	30	27	27	2
MAY 21	11	48.7	22.6	284	29	29	76	187	187	76	29	29	1
	12	50.6	0.0	286	30	30	32	139	197	139	32	30	12
HALF DAY TOTALS					139	442	954	1111	642	236	134	134	843
JUNE 21	5	6.5	114.0	61	24	59	58	21	3	3	3	3	7
	6	15.4	102.9	167	34	144	165	89	12	12	12	12	6
	7	24.8	91.7	219	22	155	212	146	21	19	19	19	5
	8	34.2	79.6	247	25	126	217	183	43	24	24	24	4
	9	43.2	65.6	263	28	74	192	197	86	28	28	28	3
JULY 21	10	51.1	48.4	272	32	36	144	190	127	34	32	32	2
	11	56.8	26.4	277	33	34	78	163	154	60	33	33	1
	12	59.0	0.0	278	34	34	37	115	163	115	37	34	12
HALF DAY TOTALS					214	644	1083	1049	527	231	168	167	1026
AUG 21	4	1.2	127.4	0	0	0	0	0	0	0	0	0	8
	5	9.2	116.1	95	42	94	89	30	6	6	6	6	7
	6	18.0	105.3	177	45	157	174	89	15	15	15	15	6
	7	27.3	94.3	220	27	162	212	140	23	21	21	21	5
	8	36.7	82.4	244	28	133	214	173	37	26	26	26	4
SEP 21	9	45.8	68.6	259	30	82	189	186	75	30	30	30	3
	10	54.0	51.3	267	33	40	141	178	113	35	33	33	2
	11	60.1	28.4	272	35	36	77	151	138	54	35	35	1
	12	62.4	0.0	273	36	36	39	105	147	105	39	36	12
HALF DAY TOTALS					261	730	1121	1004	481	233	185	184	1093
OCT 21	5	6.9	114.4	62	26	61	59	21	4	4	4	4	7
	6	15.9	103.3	161	36	141	161	87	13	13	13	13	6
	7	25.2	92.1	211	23	153	208	142	22	20	20	20	5
	8	34.6	80.0	239	26	125	213	178	42	25	25	25	4
	9	43.6	66.1	255	29	75	189	193	84	29	29	29	3
NOV 21	10	51.6	48.9	264	33	37	142	186	124	35	33	33	2
	11	57.4	26.7	269	34	35	78	159	150	59	34	34	1
	12	59.6	0.0	270	35	35	38	113	159	113	38	35	12
HALF DAY TOTALS					224	645	1068	1025	519	235	176	175	1022
DEC 21	6	9.5	97.8	104	13	85	106	64	7	7	7	7	6
	7	18.9	86.2	188	16	124	188	142	19	15	15	15	5
	8	28.2	73.8	229	21	104	208	190	58	21	21	21	4
	9	36.9	59.8	250	26	56	189	211	110	26	26	26	3
	10	44.3	43.0	263	29	31	143	207	153	32	29	29	2
JAN 22	11	49.4	22.9	269	31	31	76	181	180	74	31	31	1
	12	51.3	0.0	271	32	32	34	135	189	135	34	32	12
HALF DAY TOTALS					150	438	920	1064	620	238	145	144	833
FEB 22	7	9.4	78.2	123	6	65	120	102	20	6	6	6	5
	8	18.3	65.8	208	13	66	184	189	78	13	13	13	4
	9	26.4	52.1	245	19	29	179	226	139	20	19	19	3
	10	33.0	36.6	264	22	23	137	229	186	36	22	22	2
	11	37.4	19.0	273	24	24	71	205	215	97	24	24	1
MAR 22	12	39.0	0.0	275	25	25	27	160	226	160	27	25	12
HALF DAY TOTALS					97	225	716	1042	750	250	97	97	562
APR 22	7	1.1	71.8	0	0	0	0	0	0	0	0	0	5
	8	9.7	59.7	145	6	29	122	137	68	6	6	6	4
	9	17.2	46.7	220	12	14	151	209	142	13	12	12	3
	10	23.2	32.3	251	16	16	122	227	196	44	16	16	2
	11	27.1	16.6	266	18	18	61	211	230	110	18	18	1
MAY 22	12	28.5	0.0	270	19	19	20	170	241	170	20	19	12
HALF DAY TOTALS					61	79	452	859	752	254	61	61	331
JUNE 22	8	1.9	54.6	4	0	0	3	3	2	0	0	0	4
	9	8.9	42.3	148	6	6	94	142	104	7	6	6	3
	10	14.5	29.1	212	10	10	94	195	177	46	10	10	2
	11	18.0	14.8	238	12	12	48	193	217	108	12	12	1
	12	19.2	0.0	245	13	13	14	161	230	161	14	13	12
HALF DAY TOTALS					35	35	258	632	624	237	35	35	151
JULY 22	9	5.7	40.7	93	3	3	57	88	67	5	3	3	3
	10	11.0	27.9	185	7	7	78	169	156	43	7	7	2
	11	14.4	14.2	220	10	10	41	179	202	103	10	10	1
	12	15.6	0.0	230	10	10	11	151	216	151	11	10	12
HALF DAY TOTALS					25	25	186	519	534	223	25	25	95

THIS TABLE APPLIES TO:
CALGARY AND REGINA.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 53 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL BTU/SQ. FT.-HR.	NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW	HOR.	TIME PM
JAN 21	9	7.3	42.1	127	4	5	80	121	89	6	4	4	11	3
	10	12.5	28.8	202	8	8	88	185	168	44	8	8	32	2
	11	15.8	14.6	231	11	11	45	188	211	106	11	11	49	1
	12	17.0	0.0	240	11	11	13	157	225	157	13	11	55	12
			HALF DAY TOTALS		29	30	229	587	587	231	29	29	119	
FEB 21	8	8.4	59.3	143	5	26	118	133	67	5	5	5	14	4
	9	15.6	46.1	225	10	12	152	212	146	12	10	10	47	3
	10	21.2	31.8	258	14	14	122	233	202	45	14	14	79	2
	11	24.9	16.3	273	16	16	60	216	237	114	16	16	101	1
	12	26.2	0.0	278	17	17	18	174	249	174	18	17	109	12
			HALF DAY TOTALS		53	69	448	872	773	259	53	53	295	
MAR 21	7	9.0	77.9	138	6	70	131	112	22	6	6	6	16	5
	8	17.5	65.2	223	12	66	193	200	83	12	12	12	56	4
	9	25.2	51.4	260	17	26	185	236	147	18	17	17	100	3
	10	31.4	35.9	278	20	21	140	239	196	36	20	20	135	2
	11	35.5	18.5	287	22	22	70	214	227	102	22	22	157	1
	12	37.0	0.0	290	23	23	25	168	237	168	25	23	164	12
			HALF DAY TOTALS		89	223	745	1098	793	256	89	89	546	
APR 21	6	9.2	97.0	117	12	92	116	71	7	6	6	6	17	6
	7	18.3	85.1	203	15	127	198	151	19	14	14	14	58	5
	8	27.1	72.3	243	19	101	215	200	64	19	19	19	106	4
	9	35.3	58.0	264	23	50	193	222	119	24	23	23	149	3
	10	42.2	41.4	276	27	28	145	218	165	31	27	27	181	2
	11	46.9	21.8	282	29	29	75	191	193	80	29	29	201	1
	12	48.6	0.0	284	29	29	32	144	203	144	32	29	208	12
			HALF DAY TOTALS		137	431	949	1126	666	242	133	132	816	
MAY 21	5	7.3	113.8	74	29	71	70	26	4	4	4	4	10	7
	6	15.9	102.4	170	34	145	169	92	13	13	13	13	45	6
	7	24.8	90.7	219	21	152	212	149	21	19	19	19	92	5
	8	33.8	78.2	246	25	121	217	185	46	24	24	24	138	4
	9	42.3	63.9	261	28	69	191	201	93	28	28	28	177	3
	10	49.7	46.6	271	31	34	143	195	135	34	31	31	207	2
	11	55.0	25.1	275	33	34	77	168	162	64	33	33	226	1
	12	57.0	0.0	277	34	34	36	121	171	121	36	34	232	12
			HALF DAY TOTALS		219	646	1098	1080	559	241	169	168	1010	
JUNE 21	4	2.4	127.3	2	1	2	2	0	0	0	0	0	0	8
	5	10.1	115.8	106	47	105	100	34	7	7	7	7	19	7
	6	18.5	104.6	180	44	159	178	92	15	15	15	15	58	6
	7	27.4	93.2	220	26	159	213	143	23	21	21	21	104	5
	8	36.4	80.9	244	27	128	213	176	41	26	26	26	149	4
	9	45.1	66.8	258	30	77	188	190	81	30	30	30	186	3
	10	52.7	49.3	266	33	38	140	183	121	35	33	33	215	2
	11	58.3	26.9	270	35	36	77	156	147	58	35	35	233	1
	12	60.4	0.0	272	35	35	38	111	156	111	38	35	239	12
			HALF DAY TOTALS		265	731	1138	1035	514	242	186	185	1083	
JULY 21	5	7.8	114.1	74	30	73	71	26	5	5	5	5	11	7
	6	16.3	102.7	164	35	143	165	90	13	13	13	13	46	6
	7	25.3	91.2	211	23	150	208	145	22	20	20	20	93	5
	8	34.2	78.7	238	26	121	212	181	46	25	25	25	138	4
	9	42.8	64.4	253	29	70	188	196	90	29	29	29	176	3
	10	50.3	47.1	263	32	36	141	190	131	35	32	32	205	2
	11	55.6	25.4	267	34	35	77	164	158	63	34	34	224	1
	12	57.6	0.0	269	34	34	37	119	167	119	37	34	230	12
			HALF DAY TOTALS		228	648	1083	1055	549	244	176	175	1008	
AUG 21	6	9.8	97.5	107	13	87	109	67	7	7	7	7	18	6
	7	18.8	85.5	188	16	122	187	143	20	15	15	15	59	5
	8	27.7	72.8	227	21	100	206	191	61	21	21	21	106	4
	9	35.9	58.5	248	25	52	187	213	115	26	25	25	147	3
	10	42.8	41.7	260	28	30	141	210	158	33	28	28	178	2
	11	47.6	22.0	267	30	30	75	184	186	78	30	30	198	1
	12	49.3	0.0	269	31	31	34	139	195	139	34	31	204	12
			HALF DAY TOTALS		146	427	914	1078	643	245	142	141	808	
SEP 21	7	9.0	77.9	117	6	62	114	98	20	6	6	6	16	5
	8	17.5	65.2	202	13	63	179	185	79	13	13	13	54	4
	9	25.2	51.4	241	18	27	176	224	140	19	18	18	97	3
	10	31.4	35.9	260	21	22	135	228	187	37	21	21	130	2
	11	35.5	18.5	269	23	23	69	206	218	99	23	23	152	1
	12	37.0	0.0	272	24	24	26	162	228	162	26	24	159	12
			HALF DAY TOTALS		93	214	696	1033	757	252	94	93	529	
OCT 21	8	8.6	59.5	130	5	25	109	123	62	5	5	5	15	4
	9	15.8	46.3	210	11	13	144	201	138	12	11	11	47	3
	10	21.5	31.9	244	15	15	118	222	193	44	15	15	79	2
	11	25.2	16.3	259	17	17	59	208	228	110	17	17	100	1
	12	26.5	0.0	263	18	18	19	168	239	168	19	18	108	12
			HALF DAY TOTALS		56	72	428	831	737	251	57	56	294	
NOV 21	9	7.5	42.1	122	4	5	78	117	86	6	4	4	11	3
	10	12.7	28.8	196	9	9	86	180	164	43	9	9	32	2
	11	16.0	14.7	225	11	11	44	184	206	104	11	11	49	1
	12	17.2	0.0	233	12	12	13	154	220	154	13	12	56	12
			HALF DAY TOTALS		30	31	224	572	572	226	30	30	120	
DEC 21	9	4.2	40.6	55	1	1	33	52	39	2	1	1	3	3
	10	9.2	27.7	161	6	6	67	147	136	38	6	6	18	2
	11	12.4	14.1	202	8	8	37	164	186	95	8	8	31	1
	12	13.6	0.0	213	9	9	10	141	202	141	10	9	37	12
			HALF DAY TOTALS		19	19	141	433	458	201	19	19	69	

THIS TABLE APPLIES TO:
EDMONTON, GOOSE BAY, PRINCE ALBERT AND SASKATOON.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

SOLAR POSITION AND INTENSITY AND SOLAR HEAT GAIN FACTORS FOR, 55 DEG. NORTH LATITUDE

DATE	TIME AM	SOLAR ALT.	POSITION AZIMUTH	DIR. NORMAL BTU/SQ. FT.-HR.	SOLAR HEAT GAIN FACTORS, RTU/SQ. FT.-HR.								TIME PM	
					NORTH	NE	EAST	SE	SOUTH	SW	WEST	NW	HOR.	
JAN 21	9	5.8	41.9	95	3	3	60	91	67	4	3	3	7	3
	10	10.8	28.6	182	7	7	79	167	152	40	7	7	24	2
	11	13.9	14.5	216	9	9	41	176	198	99	9	9	39	1
	12	15.0	0.0	225	10	10	11	149	212	149	11	10	44	12
			HALF DAY TOTALS		24	24	191	517	525	213	24	24	92	
FEB 21	8	7.4	59.1	125	4	22	103	116	59	4	4	4	11	4
	9	14.2	45.8	214	10	11	144	203	140	11	10	10	40	3
	10	19.5	31.4	250	13	13	117	226	198	45	13	13	69	2
	11	23.0	16.0	266	15	15	57	212	234	113	15	15	90	1
	12	24.2	0.0	271	16	16	17	172	246	172	17	16	97	12
			HALF DAY TOTALS		50	63	420	838	752	255	50	50	259	
MAR 21	7	8.5	77.6	131	5	66	124	107	21	5	5	5	15	5
	8	16.7	64.7	218	12	62	188	196	84	12	12	12	51	4
	9	23.9	50.7	256	16	24	181	234	148	17	16	16	93	3
	10	29.8	35.2	274	19	20	137	238	197	38	19	19	126	2
	11	33.6	18.1	283	21	21	68	215	229	104	21	21	147	1
	12	35.0	0.0	286	22	22	24	169	240	169	24	22	154	12
			HALF DAY TOTALS		84	210	722	1087	798	257	84	84	509	
APR 21	5	1.1	108.8	0	0	0	0	0	0	0	0	0	0	7
	6	9.5	96.7	121	12	94	120	74	7	6	6	6	17	6
	7	18.1	84.4	202	14	125	196	152	20	13	13	13	57	5
	8	26.5	71.4	241	19	97	213	201	67	19	19	19	103	4
	9	34.2	56.9	262	23	46	191	223	124	24	23	23	144	3
	10	40.6	40.2	274	26	28	143	220	170	32	26	26	174	2
	11	45.0	21.0	280	28	28	74	194	198	84	28	28	193	1
	12	46.6	0.0	282	28	28	31	148	208	148	31	28	200	12
			HALF DAY TOTALS		134	420	942	1138	688	248	129	128	788	
MAY 21	5	8.1	113.5	86	34	83	82	30	5	5	5	5	13	7
	6	16.3	101.8	174	33	147	172	95	13	13	13	13	47	6
	7	24.8	89.8	219	21	150	212	151	21	19	19	19	92	5
	8	33.3	76.9	245	24	117	216	188	50	24	24	24	136	4
	9	41.4	62.3	260	28	64	190	204	99	28	28	28	173	3
	10	48.3	45.0	269	31	33	142	199	142	33	31	31	202	2
	11	53.2	24.0	274	32	32	76	172	169	68	32	32	220	1
	12	55.0	0.0	275	33	33	36	126	178	126	36	33	226	12
			HALF DAY TOTALS		223	647	1112	1106	588	248	169	168	996	
JUNE 21	4	3.6	127.2	13	8	13	11	1	0	0	0	0	1	8
	5	10.9	115.5	117	51	115	110	38	8	8	8	8	23	7
	6	19.0	104.0	183	42	160	181	95	15	15	15	15	60	6
	7	27.5	92.2	221	25	157	213	146	23	21	21	21	105	5
	8	36.1	79.5	243	27	124	213	179	44	26	26	26	147	4
	9	44.3	65.0	257	30	71	187	194	88	30	30	30	183	3
	10	51.4	47.3	265	32	36	139	187	128	35	32	32	210	2
	11	56.5	25.5	269	34	35	76	161	155	62	34	34	227	1
	12	58.4	0.0	271	35	35	38	116	164	116	38	35	233	12
			HALF DAY TOTALS		268	733	1153	1065	544	250	185	184	1073	
JULY 21	4	1.1	125.8	0	0	0	0	0	0	0	0	0	0	8
	5	8.6	113.9	86	35	84	82	30	6	6	6	6	14	7
	6	16.8	102.2	167	34	145	168	93	14	14	14	14	49	6
	7	25.3	90.2	212	22	148	208	147	22	20	20	20	93	5
	8	33.8	77.4	237	26	117	211	184	49	25	25	25	136	4
	9	41.9	62.8	252	29	65	187	200	96	29	29	29	173	3
	10	48.9	45.4	261	32	34	140	194	138	34	32	32	200	2
	11	53.8	24.2	266	33	33	76	169	165	67	33	33	218	1
	12	55.6	0.0	267	34	34	37	124	174	124	37	34	224	12
			HALF DAY TOTALS		231	648	1095	1083	577	252	177	176	995	
AUG 21	5	1.7	109.2	0	0	0	0	0	0	0	0	0	0	7
	6	10.0	97.1	110	13	90	112	69	8	7	7	7	19	6
	7	18.6	84.9	187	16	120	186	144	21	15	15	15	58	5
	8	27.0	71.8	225	20	96	204	192	64	20	20	20	103	4
	9	34.8	57.3	246	24	48	185	214	119	25	24	24	142	3
	10	41.3	40.6	258	28	30	140	212	163	33	28	28	172	2
	11	45.7	21.2	264	29	29	74	187	191	82	29	29	190	1
	12	47.3	0.0	266	30	30	33	143	200	143	33	30	197	12
			HALF DAY TOTALS		142	416	908	1089	664	250	138	137	781	
SEP 21	7	8.5	77.6	110	5	58	107	93	19	5	5	5	14	5
	8	16.7	64.7	197	12	59	174	181	78	12	12	12	50	4
	9	23.9	50.7	236	17	25	172	221	140	18	17	17	90	3
	10	29.8	35.2	255	20	21	132	227	189	38	20	20	122	2
	11	33.6	18.1	265	22	22	67	206	219	102	22	22	142	1
	12	35.0	0.0	268	23	23	25	163	230	163	25	23	149	12
			HALF DAY TOTALS		87	201	673	1019	758	254	88	87	492	
OCT 21	8	7.6	59.2	113	4	21	94	107	54	4	4	4	11	4
	9	14.4	45.9	198	10	11	136	191	132	11	10	10	40	3
	10	19.8	31.5	235	14	14	113	216	189	44	14	14	69	2
	11	23.3	16.1	252	16	16	57	204	224	109	16	16	89	1
	12	24.5	0.0	256	17	17	18	166	236	166	18	17	96	12
			HALF DAY TOTALS		52	65	401	797	715	247	52	52	257	
NOV 21	9	6.0	42.0	92	3	3	58	88	65	4	3	3	7	3
	10	10.9	28.6	176	7	7	77	162	148	39	7	7	24	2
	11	14.1	14.5	209	10	10	41	172	193	97	10	10	39	1
	12	15.2	0.0	219	10	10	11	145	207	145	11	10	45	12
			HALF DAY TOTALS		25	25	187	503	511	209	25	25	92	
DEC 21	9	2.6	40.5	17	0	0	10	17	12	0	0	0	0	3
	10	7.5	27.6	130	4	4	54	119	111	31	4	4	11	2
	11	10.5	14.0	179	7	7	32	146	166	84	7	7	23	1
	12	11.6	0.0	192	8	8	8	178	182	128	8	8	27	12
			HALF DAY TOTALS		14	14	94	339	372	175	14	14	47	

THIS TABLE APPLIES TO:
FORT ST. JOHN, GRANDE PRAIRIE AND PRINCE RUPERT.

NORTH NW WEST SW SOUTH SE EAST NE HOR.

APPENDIX A

TRANSMISSION AND ABSORPTION DATA FOR SINGLE- AND DOUBLE-GLAZED WINDOWS

The transmission and absorption factors for windows depend on the angle of incidence of the radiation, index of refraction, extinction coefficient and thickness of the glass. The variation with incident angle can be approximated by using a polynomial with cosine of incident angle as the argument. The coefficients in such a polynomial depend on the glass characteristics. The data in Table A-I are for windows using glass with a refractive index of 1.52.

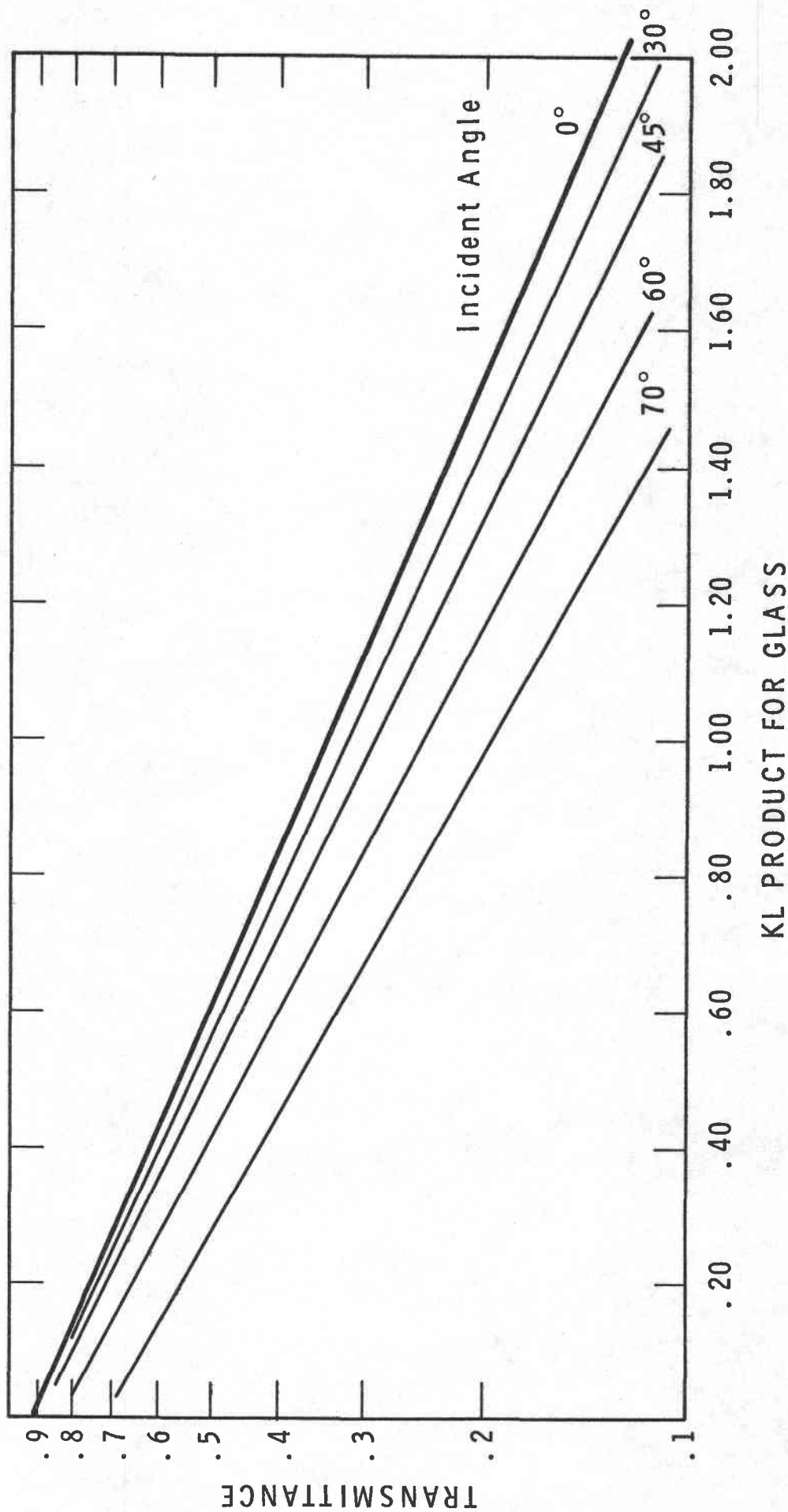
The extinction coefficient and glass thickness always appear as a product, so that these two parameters are combined in a single parameter commonly represented as $k\ell$. A value of $k\ell = 0.05$ is typical of double-strength sheet glass produced in North America, whereas similar glass manufactured in England has a higher absorption and is better classified as $k\ell = 0.10$. Figure A-1 gives the relation between transmission, incident angle and the $k\ell$ product for glass. Table A-I gives the coefficients for absorption and transmission polynomials for single- and double-glazed windows. In double glazing, the inside pane is assumed to have $k\ell = 0.05$ and the outer pane to have the value given in the left column.

$$\text{Transmission } \tau_D = \sum_{j=0}^5 t_j \cos^j \theta$$

$$\text{Absorption } \alpha_j = \sum_{j=0}^5 a_j \cos^j \theta$$

Table A-I
Coefficients for Use in Calculation
of Transmittance and Absorptance of Glass

k_{ℓ}	j	Single Glazing		Double Glazing		
		a_j	t_j	a_j (outer)	a_j (inner)	t_j
0.05	0	0.01154	-0.00885	0.01407	0.00228	-0.00401
	1	0.77674	2.71235	1.06226	0.34559	0.74050
	2	-3.94657	-0.62062	-5.59131	-1.19908	7.20350
	3	8.57881	-7.07329	12.15034	2.22366	-20.11763
	4	-8.38135	9.75995	-11.78092	-2.05287	19.68824
	5	3.01188	-3.89922	4.20070	0.72376	-6.74585
0.10	0	0.01636	-0.01114	0.01819	0.00123	-0.00438
	1	1.40783	2.39371	1.86277	0.29788	0.57818
	2	-6.79030	0.42978	-9.24831	-0.92256	7.42065
	3	14.37378	-8.98262	19.49443	1.58171	-20.26848
	4	-13.83357	11.51798	-18.56094	-1.40040	19.79706
	5	4.92439	-4.52064	6.53940	0.48316	-6.79619
0.15	0	0.01837	-0.01200	0.01905	0.00067	-0.00428
	1	1.92497	2.13036	2.47900	0.26017	0.45797
	2	-8.89134	1.13833	-11.74266	-0.72713	7.41367
	3	18.40197	-10.07925	24.14037	1.14950	-19.92004
	4	-17.48648	12.44161	-22.64299	-0.97138	19.40969
	5	6.17544	-4.83285	7.89954	0.32705	-6.66603
0.20	0	0.01902	-0.01218	0.01862	0.00035	-0.00401
	1	2.35417	1.90950	2.96400	0.22974	0.36698
	2	-10.47151	1.61391	-13.48701	-0.58381	7.27324
	3	21.24322	-10.64872	27.13020	0.84626	-19.29364
	4	-19.95978	12.83698	-25.11877	-0.67666	18.75408
	5	6.99964	-4.95199	8.68895	0.22102	-6.43968
0.40	0	0.01712	-0.01056	0.01423	-0.00009	-0.00279
	1	3.50839	1.29711	4.14384	0.15049	0.16468
	2	-13.86390	2.28615	-16.66709	-0.27590	6.17715
	3	26.34330	-10.37132	31.30484	0.25618	-15.84811
	4	-23.84846	11.95884	-27.81955	-0.12919	15.28302
	5	8.17372	-4.54880	9.36959	0.02859	-5.23666
0.60	0	0.01406	-0.00835	0.01056	-0.00016	-0.00192
	1	4.15958	0.92766	4.71447	0.10579	0.08180
	2	-15.06279	2.15721	-17.33454	-0.15035	4.94753
	3	27.18492	-8.71429	30.91781	0.06487	-12.43481
	4	-23.88518	9.87152	-26.63898	0.02759	11.92495
	5	8.03650	-3.73328	8.79495	-0.02317	-4.07787
0.80	0	0.01153	-0.00646	0.00819	-0.00015	-0.00136
	1	4.55946	0.68256	5.01768	0.07717	0.04419
	2	-15.43294	1.82499	-17.21228	-0.09059	3.87529
	3	26.70568	-6.95325	29.46388	0.00050	-9.59069
	4	-22.87993	7.80647	-24.76915	0.06711	9.16022
	5	7.57795	-2.94454	8.05040	-0.03394	-3.12776
1.00	0	0.00962	-0.00496	0.00670	-0.00012	-0.00098
	1	4.81911	0.51043	5.18781	0.05746	0.02576
	2	-15.47137	1.47607	-16.84820	-0.05878	3.00400
	3	25.86516	-5.41985	27.90292	-0.01855	-7.33834
	4	-21.69106	6.05546	-22.99619	0.06837	6.98747
	5	7.08714	-2.28162	7.38140	-0.03191	-2.38328



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FIGURE A-1
SOLAR TRANSMITTANCE FOR DIFFERENT TYPES OF GLASS