

**MILEAGE MEASUREMENTS****A. V-H Coordinate System**

For the purpose of determining airline mileage a Vertical (V) and Horizontal (H) coordinate system is used. The V-H system consists of a series of coordinates which represents a theoretical grid of vertical and horizontal lines covering the State of Illinois. The spacing between these lines is about 1,670 feet and an intersection of any two grid lines represents the center of an area approximately 1/10 of a square mile designated by two coordinates.

A vertical (V) and a horizontal (H) coordinate is computed for each rate center in Illinois from its latitude and longitude location by use of appropriate map-projection equations. These coordinates (shown in C. following) permit calculation of the distance between any two rate centers as explained in B. following.

The rate centers are arranged to indicate those of the Company (shown in all capital letters, i.e., ALTON) and those of other companies (shown with initial capital letter, i.e., Belvidere).

**B. Determination of Airline Mileages**

To determine the rate distance between any two rate centers proceed as follows:

1. Obtain the "V" and "H" coordinates for each rate center.
2. Obtain the difference between the "V" coordinates of the two rate centers. Obtain the difference between the "H" coordinates.

Note: The difference is always obtained by subtracting the smaller coordinate from the larger coordinate.

3. Divide each of the differences obtained in 2. by three, rounding each quotient to the nearest integer.
4. Square these two integers and add the two squares.

If the sum of the squares is greater than 1777, divide the integers obtained in 3. by three and repeat step 4. Repeat this process until the sum of the squares obtained in 4. is less than 1778.

**MILEAGE MEASUREMENTS (cont'd)**

**B. Determination of Airline Mileage (cont'd)**

5. The number of successive divisions by three in steps 3. and 4. determines the value of "N". Multiply the final sum of the two squares obtained in step 4. by the multiplier specified in the following table for this value of "N" preceding.

<u>N</u>	<u>Multiplier Rate</u>	<u>Minimum Mileage</u>
1	.9	--
2	8.1	41
3	72.9	121
4	656.1	361

6. Obtain square root of product and, with any resulting fraction, round up to next higher integer. This is the message rate mileage except that when the mileage so obtained is less than the minimum rate mileage shown in the preceding, the minimum rate mileage corresponding to the "N" value is applicable.

7. Example: The message rate distance is required between Chicago and Kankakee

	<u>V</u>	<u>H</u>
a. Chicago	5906	3426
Kankakee	<u>6149</u>	<u>3381</u>
b. Difference	163	45

- c. Dividing each difference by three and rounding to nearer integer = 54 and 15

- d. Squaring integers and adding
- |           |            |
|-----------|------------|
| 54 x 54 = | 2,916      |
| 15 x 15 = | <u>225</u> |
|           | 3,141      |

Sum of squared integers  
Sum of squared integers is greater than 1,777, so divide integers in step c. preceding by three and repeat step d.

- e. Dividing integers in step c. preceding by three and rounding = 18 and 5.

- f. Squaring integers and adding.
- |           |           |
|-----------|-----------|
| 18 x 18 = | 324       |
| 5 x 5 =   | <u>25</u> |
|           | 349       |

- g. This sum of squared integers is less than 1,778 and was obtained after two successive divisions by three; therefore, "N" = 2 (From table shown in step 5. above).

- h. Multiply final sum of squared integers by factor 8.1 (corresponding to "N" = 2).
- |  |              |
|--|--------------|
|  | 349          |
|  | <u>x 8.1</u> |
|  | 2,826.9      |

- i. Square root of 2,826.9 = 53 and a fraction, which is rounded up to 54 miles (fractional miles being considered full miles). The 53 miles is larger than the minimum of 41 rate miles applicable when "N" = 2 so the message rate mileage is 54 miles.

**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers**

<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>	<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>
Addieville	6799	3351	BELLWOOD	6003	3459
Albany	6196	3791	Belvidere	6005	3637
Albers	6779	3385	Bement	6432	3365
Aledo	6348	3812	BENSENVILLE	5995	3477
Alexis	6361	3770	Benson	6296	3538
ALGONQUIN	5981	3549	BERWYN	6004	3445
Alhambra	6721	3437	BETHALTO	6742	3486
Alpha	6323	3756	Bethany	6500	3362
Altamont	6614	3306	BIG ROCK	6077	3545
ALTON	6755	3506	Bismarck	6294	3257
Alvin	6285	3261	BLUE ISLAND	6033	3409
Andover	6297	3753	Blue Mound	6518	3425
Annawan	6250	3707	BLUFORD	6754	3232
ANTIOCH	5907	3553	Bondville	6382	3353
Apple River	6050	3842	Bradford	6273	3650
Argenta	6440	3408	BRAIDWOOD	6149	3447
ARLINGTON HEIGHTS	5973	3497	BREESE	6759	3379
Armstrong	6306	3301	BRIGHTON	6723	3514
Ashkum	6203	3370	Brimfield	6356	3649
Ashland	6549	3576	Broadlands	6391	3278
Ashley	6789	3300	BROOKFIELD	6014	3450
ATHENS	6513	3541	Brownstown	6641	3329
Atkinson	6252	3725	Brussels	6774	3574
Auburn	6586	3508	Buckley	6263	3354
AURORA	6062	3511	Buda	6247	3667
AVISTON	6765	3391	BUFFALO	6511	3482
BARRINGTON	5972	3525	Bunker Hill	6708	3485
Bartelso	6769	3362	Bureau	6230	3617
BARTLETT	6007	3517	BURTON	6637	3764
BATAVIA	6042	3520	Byron	6060	3685
Batchown	6763	3592	Cabery	6199	3418
Bath	6499	3625	CAIRO	7041	3169
BEARDSTOWN	6555	3652	CALUMET CITY	6029	3384
Beaverville	6165	3335	Cambridge	6287	3740
BECKEMEYER	6753	3365	Camp Grove	6291	3636
BEECHER	6090	3370	Campus	6202	3436
Beecher City	6591	3323	CANTON	6420	3644
BELLEVILLE	6812	3438	CANTRALL	6515	3531

**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers (cont'd)**

<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>	<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>
Capron	5970	3637	Dalton City	6492	3378
CARLYLE	6747	3355	Danforth	6215	3368
CARY	5969	3547	DANVILLE	6322	3245
Castleton	6288	3651	Davis	6015	3736
CATLIN	6339	3251	DECATUR	6478	3413
Cedar Point	6218	3580	Deer Creek	6355	3547
Cedarville	6040	3762	DEERFIELD	5947	3486
CENTRALIA	6744	3311	De Land	6401	3396
Cerro Gordo	6453	3386	DELAVAN	6421	3553
CHAMPAIGN-URBANA	6371	3336	Depue	6219	3613
Chandlerville	6527	3613	Des Plaines	5976	3479
Chatham	6567	3509	Divernon	6585	3491
Chebanse	6175	3376	Dix	6747	3273
Cheneyville	6253	3274	Donovan	6176	3321
Cherry Valley	6017	3651	Dorchester	6695	3479
Chesterfield	6676	3523	Dover	6204	3636
Chestnut	6454	3469	Dow	6741	3538
CHICAGO	5986	3426	DOWNERS GROVE	6031	3469
CHICAGO HEIGHTS	6058	3387	Dubois	6810	3294
Chillicothe	6311	3599	DUNDEE	5993	3540
CICERO	6002	3439	Dunlap	6335	3621
Cisco	6428	3397	Dupo	6830	3475
Cissna Park	6258	3330	Durand	6006	3725
Clifton	6190	3372	DWIGHT	6196	3460
COAL CITY	6150	3459	Earlville	6139	3584
COLLINSVILLE	6781	3455	East Dubuque	6089	3920
Collison	6316	3282	East Lynn	6270	3306
Columbia	6844	3467	EAST MOLINE	6265	3797
COLUMBUS	6612	3757	Easton	6470	3587
Compton	6131	3617	EAST ST. LOUIS	6805	3477
Congerville	6348	3527	Edelstein	6317	3623
Cordova	6224	3795	EDGEMONT	6804	3460
CRESCENT CITY	6216	3345	Edgewood	6634	3279
CRETE	6071	3381	EDGINGTON	6313	3832
CRYSTAL LAKE	5969	3561	EDWARDSVILLE	6753	3464
Cuba	6444	3662	ELBURN	6047	3548
Cullom	6227	3416	ELGIN	6005	3535
Dakota	6030	3748			

**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers (cont'd)**

<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>	<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>
Eliza	6345	3853	GALENA	6089	3882
Elizabeth	6094	3842	Galva	6303	3704
ELK GROVE	5985	3491	Garden Prairie	5997	3620
Elliott	6306	3375	GARDNER	6171	3452
Ellisville	6427	3691	Geneseo	6255	3749
ELMHURST	6006	3472	GENEVA	6036	3524
Elmira	6286	3676	GEORGETOWN	6350	3232
Elmwood	6374	3655	GERMANTOWN	6771	3376
Elwin	6492	3411	Germantown Hills	6340	3583
ELWOOD	6114	3446	German Valley	6059	3724
Emington	6216	3439	GIBSON CITY	6314	3389
Erie	6210	3757	Gifford	6318	3321
Eureka	6332	3547	GILMAN	6227	3364
EVANSTON	5959	3450	Girard	6617	3498
FAIRMOUNT	6353	3268	Glasford	6401	3613
Fairview (Fulton Co.)	6415	3671	GLEN CARBON	6767	3461
Farina	6658	3286	GLENCOE	5947	3470
Farmington	6391	3654	GLEN ELLYN	6020	3487
Fayetteville	6824	3397	GLENVIEW	5963	3470
FIATT	6431	3666	Goodfield	6350	3540
Fieldon	6737	3576	Grafton	6758	3552
Fisher	6342	3371	GRANITE CITY	6789	3483
FITHIAN	6343	3281	Grantfork	6727	3422
Flatville	6333	3321	GRANT PARK	6109	3362
Foosland	6339	3387	Granville	6226	3595
FOREST(Cook Co.)	6000	3451	GRAYS LAKE	5928	3530
Forest City	6442	3595	Green River	6263	3775
FORREST(Livingston Co.)	6263	3425	Green Valley	6421	3572
Forreston	6084	3730	GREENVIEW	6491	3555
FOWLER	6617	3776	Greenville	6697	3388
FOX LAKE	5929	3557	Groveland	6377	3574
Frankfort	6076	3417	HALF DAY	5950	3504
FRANKLIN PARK	5994	3465	Hamburg	6730	3620
FREEBURG	6825	3419	Hamel	6730	3454
Freeport	6055	3753	Hammond	6459	3354
			HAMPSHIRE	6012	3576
			Hampton	6253	3793
			HANNA CITY	6377	3622

**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers (cont'd)**

<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>	<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>
Hanover	6110	3845	JOLIET	6088	3454
Hardin	6737	3599	Joy	6358	3831
HARDING	6149	3564	Kampsville	6708	3610
HARMONY(Jefferson Co.)	6741	3247	KANEVILLE	6062	3549
HARRISTOWN	6485	3434	KANKAKEE	6149	3381
HARVARD	5956	3620	KASKASKIA	6923	3372
HARVEY	6038	3400	Keithsburg	6381	3830
Havana	6473	3623	KELL	6735	3273
Hebron	5934	3600	Kempton	6213	3416
Hecker	6854	3422	Kewanee	6281	3694
Hennepin	6236	3610	Keyesport	6715	3354
Henning	6292	3274	Kilbourne	6497	3602
Henry	6263	3599	KINMUNDY	6676	3292
Herrick	6600	3356	Kinsman	6190	3492
HERSCHER	6181	3408	Kirksville	6509	3344
Hettick	6654	3529	Lacon	6285	3597
Highland	6745	3415	Ladd	6202	3605
HIGHLAND PARK	5940	3480	LA GRANGE	6017	3453
Hillsdale	6226	3767	LAKE FORREST	5930	3493
HINSDALE	6023	3461	LAKE VILLA	5917	3544
Hoffman	6753	3332	LAKE ZURICH	5961	3524
Homer	6364	3286	La Moille	6177	3629
HOMEWOOD	6050	3397	LANSING	6040	3381
Hoopeston	6259	3287	La Place	6468	3373
Hopedale	6401	3539	La Rose	6280	3569
Hoyleton	6772	3323	La Salle	6202	3582
HUNTLEY	5991	3569	Latham	6469	3457
ILLINOIS CITY	6321	3853	LEBANON	6781	3422
Illioopolis	6498	3457	Leland	6125	3568
Ina	6800	3239	LEMONT	6054	3455
INDIANOLA	6368	3242	Lena	6053	3790
IPAVA	6481	3668	LEWISTOWN	6460	3647
Irvington	6764	3307	LIBERTY	6631	3741
ITASCA	5998	3490	LIBERTYVILLE	5933	3512
IUKA	6701	3267	LISBON	6127	3508
Ivesdale	6421	3350	Little York	6385	3794
Jerseyville	6721	3550	Livingston	6708	3450
			Loami	6578	3530

**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers (cont'd)**

<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>	<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>
LOCKPORT	6074	3456	MINOOKA	6115	3473
Loda	6281	3351	MODESTO	6626	3531
LOMBARD	6015	3481	MOKENA	6072	3426
Lovington	6478	3353	MOLINE	6272	3807
Low Point	6307	3569	MOMENCE	6124	3357
Ludlow	6311	3346	MONEE	6084	3395
Mackinaw	6375	3541	Monticello	6414	3375
Macon	6507	3407	MORRIS	6146	3488
Mahomet	6369	3368	Morton	6368	3565
MANHATTAN	6101	3429	Mossville	6336	3601
Manito	6428	3593	MOUND CITY	7025	3174
Manlius	6220	3678	MOUNDS	7023	3183
Mansfield	6373	3384	Mount Auburn	6517	3451
MANTENO	6122	3390	Mount Pulaski	6471	3480
MARENGO	5988	3603	MOUNT VERNON	6769	3255
Marietta	6457	3693	Mount Zion	6486	3395
MARINE	6743	3435	Moweaqua	6524	3402
Maroa	6440	3433	Mulberry Grove	6679	3370
Marseilles	6173	3525	MUNDELEIN	5940	3518
Martinton	6178	3341	NAPERVILLE	6046	3489
Mascoutah	6803	3408	Nashville	6799	3331
Mason City	6465	3559	Neponset	6259	3681
Massbach	6102	3821	NEWARK	6123	3527
Matherville	6326	3796	NEW ATHENS	6841	3405
MAYWOOD	6001	3455	New Baden	6788	3398
MAZON	6169	3474	New Berlin	6573	3545
MCCLURE	7002	3238	New Boston	6372	3846
McConnell	6036	3783	NEW LENOX	6081	3436
MCHENRY	5946	3564	Newman	6411	3266
Mcnabb	6240	3583	New Milford	6035	3663
Medora	6697	3527	New Minden	6781	3338
Melvin	6285	3382	New Windsor	6326	3767
Mendota	6162	3607	Niantic	6492	3446
Metamora	6326	3567	NORTHBROOK	5954	3479
Milford	6230	3307	North Henderson	6350	3761
Millstadt	6833	3452	North Pekin	6378	3589
Mineral	6248	3695	Oakdale	6824	3340
Minonk	6280	3531	OAKFORD	6504	3590

**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers (cont'd)**

<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>	<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>
OAK FOREST SOUTH	6045	3412	Philo	6385	3312
OAK LAWN	6026	3426	PISTAKEE		
OAK PARK	5998	3450	HIGHLANDS	5929	3562
OAKWOOD	6335	3267	Pittsburg		
Odin	6721	3308	(Fayette Co.)	6686	3356
O'FALLON	6792	3435	PLAINFIELD	6081	3480
Ogden	6350	3294	PLANO	6096	3534
OGLESBY	6206	3574	PLATO CENTER	6018	3555
Ohio	6185	3658	PLATTVILLE	6110	3498
Okawville	6795	3366	Pleasant Plains	6545	3560
OLIVE BRANCH	7024	3212	Pocahontas	6718	3403
ONARGA	6238	3361	Poplar Grove	5982	3645
Oquawka	6414	3816	Port Byron	6239	3789
Orangeville	6024	3774	Potomac	6301	3289
Oreana	6453	3409	Prairie-Du-		
Orion	6292	3772	Rocher	6906	3417
ORLAND	6051	3432	Prairietown	6721	3473
Osco	6285	3757	Preemption	6314	3798
OSWEGO	6079	3509	Princeton	6222	3640
OTTAWA	6180	3547	Princeville	6328	3640
PALATINE	5973	3509	Putnam	6253	3612
Palmyra	6635	3530	QUINCY	6642	3790
PALOS PARK	6042	3432	Ramsey	6626	3367
Park Ridge	5978	3467	Rankin	6277	3320
Patoka	6698	3327	Rantoul	6327	3342
Pawnee	6573	3483	Red Bud	6873	3413
Paw Paw	6124	3601	Reddick	6183	3435
Paxton	6294	3349	Renault	6896	3429
PAYSON	6653	3755	Reynolds	6317	3813
Pearl City	6075	3780	Rice	6827	3316
Pecatonica	6033	3717	Richmond	5923	3583
Pekin	6391	3587	RIDGE FARM	6367	3226
Penfield	6313	3311	Rio	6341	3751
PEORIA	6362	3592	RIVERDALE	6030	3399
PEOTONE	6104	3392	RIVER GROVE	5993	3459
Pesotum	6412	3319	RIVERSIDE	6010	3447
PETERSBURG	6513	3564			



**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers (cont'd)**

<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>	<u>Exchange Rate Center</u>	<u>V</u>	<u>H</u>
RIVERTON	6521	3502	Sheridan	6133	3541
Roanoke	6312	3545	Sherman	6517	3515
Roberts	6271	3377	Sherrard	6307	3787
ROCHESTER	6540	3491	Shipman	6701	3507
Rockbridge	6683	3546	Shirland	5996	3707
Rock Cut	5996	3662	Shobonier	6676	3337
ROCKFORD	6022	3675	Sibley	6291	3403
ROCK ISLAND	6276	3816	Sidell	6378	3253
Rockton	5984	3690	Sidney	6375	3301
Roscoe	5986	3677	SKOKIE	5968	3458
ROSELLE	6001	3501	Smithfield	6456	3675
Rossville	6276	3277	Somonauk	6112	3552
ROUND LAKE	5929	3537	SOUTH BELOIT	5972	3690
Royal	6334	3303	South Pekin	6405	3582
Sadorus	6408	3334	Sparland	6286	3603
ST. ANNE	6157	3351	SPRING BAY	6331	3595
ST. CHARLES	6032	3527	SPRINGFIELD	6539	3513
St. Elmo	6627	3317	Spring Grove	5925	3569
ST. JACOB	6757	3426	Spring Valley	6211	3598
St. Joseph	6355	3305	Staunton	6701	3457
St. Libory	6821	3384	Stelle	6204	3406
St. Peter	6658	3302	STERLING	6157	3715
SALEM	6711	3292	Stillman Valley	6058	3671
Sandoval	6727	3318	Stockland	6228	3289
Sandwich	6105	3545	Stockton	6072	3814
SAN JOSE	6439	3556	SUGAR GROVE	6071	3531
Saunemin	6234	3438	Sullivan	6498	3338
Scales Mound	6065	3862	Summerfield	6779	3412
Scottville	6635	3551	SUMMIT	6020	3440
Seaton	6371	3810	Summum	6495	3653
Secor	6319	3530	Sunnyland	6353	3575
Sefton	6627	3336	Table Grove	6486	3684
SENECA	6169	3509	Talbott	6412	3603
Seward	6046	3709	TALLULA	6532	3570
Seymour	6386	3362	Tamaroa	6828	3287
Shattuc	6734	3328	TAMMS	7005	3205
Sheffield	6245	3679	Thawville	6253	3373
Sheldon	6193	3302	THEBES	7023	3233

**MILEAGE MEASUREMENTS (cont'd)****C. V and H Coordinates of Exchange Rate Centers (cont'd)**

Exchange Rate Center	V	H	Exchange Rate Center	V	H
Thomasboro	6342	3340	WEST CHICAGO	6030	3507
THORNTON	6044	3391	WEST DANA	6375	3199
TINLEY PARK	6056	3416	WESTERN SPRINGS	6020	3456
Tiskilwa	6240	3638	Westview	6827	3458
Tolono	6397	3324	WESTVILLE	6338	3239
Tonica	6222	3567	WHEATON	6025	3492
Topeka	6458	3607	WHEELING	5958	3492
Toulon	6304	3672	Williamsville	6502	3513
Tremont	6387	3561	WILLOW SPRINGS	6033	3445
TRENTON	6773	3402	WILMETTE	5955	3457
TRIVOLI	6384	3637	WILMINGTON	6135	3441
TROY	6763	3445	Winnebago	6033	3696
Tuscola	6435	3308	WINNETKA	5951	3462
UNION	5987	3592	Winslow	6029	3797
UTICA	6193	3570	Wonder Lake	5942	3578
Valmeyer	6881	3469	Woodburn	6712	3495
VANDALIA	6659	3348	Woodhull	6321	3745
Varna	6268	3573	Woodland	6217	3321
Venedy	6810	3377	Woodlawn	6776	3276
VERONA	6180	3484	WOOD RIVER	6754	3490
Villa Grove	6416	3297	WOODSTOCK	5964	3587
Viola	6336	3788	Worden	6721	3458
Virden	6606	3502	Wyandot	6233	3656
Virginia	6552	3612	Wyoming	6304	3655
Walnut	6195	3676	Yates City	6376	3662
Waltonville	6799	3266	YORKVILLE	6094	3519
Warren	6043	3826	ZION	5893	3513
Warrensburg	6469	3438			
WARRENVILLE	6039	3497			
Washburn	6295	3570			
Washington	6346	3565			
Waterloo	6861	3448			
WATSEKA	6206	3327			
WAUCONDA	5953	3536			
WAUKEGAN	5909	3503			
Waverly	6602	3538			
Wellington	6246	3296			
West Brooklyn	6136	3626			