MoonIcon 1.0 - November 1st, 1994

What is MoonIcon?

MoonIcon is a shareware MicroSoft Windows 3.x program that displays the current phase of the Moon in an icon. The icon's title displays the current location of the Moon in the sky, or the last moonset/next moonrise time if the Moon is below the horizon. It also displays an analog clock, complete with numerous options such as hand and face color, and hand size and shape. Double-clicking on the icon displays the very-informative Sun and Moon info screen that shows today's Sun and Moon rise and set times, along with the current position of each body in the sky. The current *lunation cycle* is also displayed here, showing the dates and times of each lunar phase from one New Moon to the next.

You can specify the icon's title to display the current time and/or date in **many** different formats, as well as changing the icon's background color. **MoonIcon** even adjusts **automatically** for daylight savings/summer time for users in the United States, the UK, Australia and Europe.

Installing MoonIcon

- Simply use the Program Manager to create a New Program Icon in the group of your choice and set the ***Working Directory*** to the subdirectory where you installed the rest of the program files. You may place the files in the subdirectory of your choice, but the software **must** be able to find it's MOONICON.INI file there.

- If it cannot find the .INI file, then the *About* box will be displayed *each and every time* you start **MoonIcon**. See the Troubleshooting section for more information.

- I also recommend placing the Program Icon in the **Startup** group so it loads every time you start Windows.

- If you don't already have the file **BWCC.DLL**, make sure you copy it to your Windows system subdirectory and erase any other older copies of it. This file **must** be available for **MoonIcon** to run. See the file BWCC.TXT for more information.

Configuring MoonIcon

- Before you can use **MoonIcon**, you need to tell it where you live and how to adjust for daylight savings time. You can also select **many** different options as well. Select the following links for more information:

  Setting your Time Zone
  Adjusting for Daylight Savings/Summer Time
  Background/Text Colors/Hatch Styles
  "Always on top" feature
  "Preserve icon's screen position" feature

  Once you have set all the above options, you'll need to use the Your Location dialog box to set your latitude, longitude and altitude so the Sun and Moon info screen works correctly.

  You will also want to have a look at how you can change the icon's title.

Your Location dialog box

The **Your Location** dialog box allows you to enter your location's longitude, latitude, and altitude. This is necessary for the Sun and Moon info screen to work correctly. Type in your city's name in the *City* field, and enter your location in the *Longitude*, *Latitude*, and *Altitude* fields. Use the following links to see a table of these values, and find your city or use one that's nearby:

USA - Alabama to Montana
USA - Nebraska to Wyoming
European Cities
Australian Cities
Other World Cities

Note that all United States cities are located in the Northern and Western hemispheres, and that the tables list the altitudes in meters instead of feet.

- If you are on the Internet and have TelNet access, there is a weather server available that lists the latitude and longitude of most of the world's cities. It also displays a great deal of other information as well, and is an interesting and recommended site for "'Net surfers". The server is called **martini.eecs.umich.edu** and the port number is **3000**. It's IP address is **141.212.196.79**.

Next, you may want to use the *Horizon Obstruction Adjustment* fields if you have objects such as buildings or hills near your location. These prevent a clear view of the horizon and affect the exact time of Sun and Moon rise and set times. Normally you enter a positive number, say 30 or 45 seconds, in these fields, but if you are near the top of a very large hill and look down at either horizon, a negative number may be used.

The *Adjust for atmospheric refraction* check box is mainly for amateur astronomers who need precise sky locations for the Sun and Moon. Un-check this box if you require more accurate altitude determinations, but most people should just leave it checked **on**.

- The *Twilight Times* box of radio buttons determines how you wish to calculate the beginning of morning and the end of evening twilight. Since "dark" is a rather arbitrary term, twilight is officially determined as the time at which the center of the Sun is 18° below the horizon. The difference between this time and sunrise/sunset is then divided into 3 equal periods, with one period for each of three different purposes.

For most people, the default value of *Civil* should be used, since this is the time at which it's too dark for most ordinary outdoor activities to continue without artificial lighting. Civil twilight is the time at which the center of the Sun is

6° below the horizon.

Ocean-going vessels use the *Nautical* twilight time calculation to define darkness. When the Sun is 12° below the sea horizon, ship captains can no longer distinguish the night sky from the surface of the water.

It is still too light outside for taking photographs of the stars and planets at this point, so *Astronomical* twilight is used for astro-photographers. The Sun must be 18° degrees below the horizon for the night sky to be totally dark and ready for capturing the wonders of space on film.

- The *Background Effects* box of radio buttons determines how you wish to have the icon's background to change during twilight. *None* will simply use the background colors you have selected, but the *Twilight* setting will cause **MoonIcon** to have a blue background when the Sun is up, and a black background when the Sun is not in the sky. During evening twilight, however, the background color is gradually changed from blue to dark blue to purple and finally to black, one color change per minute. The background changes from black to blue during morning twilight as well.

The *In-the-sky* setting also shows twilight effects, but only when the Moon is in the sky. When the Moon is below the horizon, the icon is shown with a transparent background. This means that if the Moon is up during the day, **MoonIcon** will show a blue background, and if the Moon is up during the night, a black background is shown. If the Moon is up during morning or evening twilight, the appropriate twilight color is displayed.

- Finally, the *24-hour format* check box in the *Sun/Moon times* area lets you change the display of the time values on the Sun and Moon info screen. Click this **on** to show them in 24-hour (military) format, or leave it unchecked for 12-hour format.

Setting your Time Zone

MoonIcon must know the **time zone** in which you live to display the icon properly. The default is the Eastern Standard Time time zone, which is valid for cities in the United States such as New York City, Boston and Miami. If you live in another time zone, you must select it yourself.

When you first run **MoonIcon**, the program's *About* box appears. Here you'll find the list box *Your Time Zone* containing all of the world's time zones. Simply select the one in which you live.

If you live in an area that has a difference of 30 minutes from the surrounding time zone, click the *30 min* check box **on** and your time will be adjusted appropriately.

Adjusting for Daylight Savings/Summer Time

- There is a list box if you want the **Daylight Savings Time** (Summer Time) adjustment applied or not. Simply select the region in which you live. If you select *Manual*, the daylight savings time adjustment will be applied **regardless** of today's date. This means you must change this list box selection twice a year when the time changes. You also need to select this option if your region is not listed below. Tables that list the daylight savings time start/stop dates for the other regions follow below. If you select one of these, the daylight savings time adjustment will be applied or not-applied **automatically** based on today's date. All daylight savings time adjustments subtract 1 hour from the current time. Note that for some Australian cities, especially those in the Central Time Zone, the start and end dates of Daylight Savings Time are subject to change from year to year.

United States:
1994 - Start: April 3rd End: October 30th
1995 - Start: April 2nd End: October 29th
1996 - Start: April 7th End: October 27th
1997 - Start: April 6th End: October 26th

UK:
1994 - Start: March 27th End: October 23rd
1995 - Start: March 26th End: October 22nd
1996 - Start: March 24th End: October 27th
1997 - Start: March 23rd End: October 26th

Europe:
1994 - Start: March 27th End: September 25th
1995 - Start: March 26th End: September 24th
1996 - Start: March 24th End: September 22nd
1997 - Start: March 23rd End: September 28th

Australia:
1994 - Start: March 13th End: October 30th
1995 - Start: March 12th End: October 29th
1996 - Start: March 10th End: October 27th
1997 - Start: March 9th End: October 26th
1998 - Start: March 8th End: October 25th

- If you live in one of these regions and the above dates are incorrect, OR if you live in another region not listed above, please contact me with the correct dates so I can update my software.

Changing the icon's title

- You can change the **title** beneath the icon to whatever you like. More importantly, you can have the time and/or date displayed here as well.

The *About* box has the default icon title set to **~i**, which is a special "code" to display the current position of the Moon in the sky, or show the last moonset or next moonrise time if it's not visible.
You can add spaces between the various options to cause them to "wrap" down to the next icon title line, if desired.

- If you prefer, you can change the title to be just a simple word or two, like "Moon" or "Moon Phase". This may be necessary to work with some screen savers.

All the available options are listed below:

Time options:

~1 = 12-hour format
~2 = 24-hour format
~a = "am" or "pm"
~A = "AM" or "PM"
~p = "a" or "p"
~P = "A" or "P"
~w = Weekday name as "Mon", "Tue", etc.
~W = Weekday name as "Monday", "Tuesday", etc.
~m = Month name as "Jan", "Feb", etc.
~M = Month name as "January", "February", etc.
~h = Month number (1-12)
~d = Day of the month number (1-31)
~y = Year as "94", etc. (Year without the century)
~Y = Year as "1994", etc. (Year with the century)
~o = Ordinal suffix of "Day of the month" as "st", "nd", "rd", "th", etc. (as in 1st, 2nd, 3rd, 4th, etc.)

Moon options:

~i = (**default**) Moon Visibility.
~I =Moon position in sky
~r = Sunrise time in hh:mm:ss format
~s =Sunset time in hh:mm:ss format
~z = Moon Phase ("Full Moon")
~v = Moon is visible now/later/earlier
~V = Moon is visible at these times: ("Evening to Dawn")
~g = Moon's Age ("2 days, 3 hours, 42 minutes")

NOTE: See the Sun and Moon info screen for more detailed solar and lunar information.

Example icon titles:

Title:	**Displays as:**
~i	Rising in the East
~2 ~W ~m ~d~o	21:05 Saturday February 5th
~1~A	9:05PM
~w ~M ~d ~Y	Sat February 5 1994
~y.~h.~d	94.02.05
~z - ~V	Full Moon - Evening to Dawn
Moon Phase	Moon Phase

- Feel free to experiment with different combinations!

Background/Text Colors and Hatching

- You can select one of 16 different **background colors**. The default is black, but you can select another color if you prefer. Also, the "transparent" color allows you to display the icon with no background, appearing on top of whatever is beneath it.

You can also select the color of the text that the Sun and Moon info screen uses. By selecting the proper background and text colors, you can make this screen very easy to read. Note that "transparent" selections default the background to black and the text to light gray.

The *Hatch Style* list box allows you to specify different "cross-hatch" styles for the background. Normally, the background is one solid color, but you may choose one of six hatch patterns if you like.

"Always On Top" feature

- You can click the *Icon is always on top of windows* button **on** to have the **MoonIcon** icon stay visible when other windows are covering it. When on, the icon will always appear "on top of" the other windows instead of being "hidden" beneath them.

"Preserve icon's screen position" feature

- You can click the *Preserve icon's screen position* button **on** to have the **MoonIcon** icon remain in the same position on the screen the next time you start Windows. Usually, icons appear beside each other on the bottom of the screen in the order that they are listed in the Startup group. This option, however, lets you move the icon to any place on the screen and it will appear there instead of with the other icons.

Sun and Moon info window

- When you double-click the **MoonIcon** icon, or select the **Sun and Moon info** window, the current date, time and icon are displayed in a full-screen window and updated once a second. More importantly, however, a great deal of information about the Sun and Moon rise, transit, and set times for your location are displayed. Make sure you have used the Your Location dialog box before examining this screen.

Among the values displayed are the twilight start, end and length times, and the amount of available daylight and the difference in daylight from yesterday. The *azimuth* (location on the horizon) and *altitude* (height above the horizon) for the rise, *transit* (time of highest altitude), and set times for both the Sun and the Moon are shown as well. If the Sun or Moon is above the horizon (in the sky), it's current location is displayed.

Detailed information about the Moon is provided, showing the current phase and when to look for the Moon in the sky. The *moon fraction*, or percentage of the Moon that is lit by the Sun as seen from Earth, is displayed, as is the Moon's age (amount of time since the last New Moon) and the orbit position in degrees (zero degrees represents a New Moon). Finally, the current *lunation cycle* is shown, displaying the dates and times of each lunar phase from the previous New Moon to the next.

When you are finished reading, press the Minimize button in the upper right corner to shrink the window back to the **MoonIcon** icon.

MoonIcon and Screen Savers

In the default configuration, **MoonIcon** displays the Moon's current position. Since this will automatically update the icon's title every half-hour or so, this may cause some **screen savers**, which can sense such activity, to not activate. I've had reports that the *After Dark*TM screen savers work fine with **MoonIcon**'s defaults, but the Windows built-in screen savers are known to be a problem.

A simple solution is to change the *Icon Title* field in the *About* box to a simple word or group of words, such as "Moon" or "Moon Phase". You will not be able to show the time in **MoonIcon**'s title (although you could still display the date), but your screen savers should work again. Consider using the clock feature if you want to show the time in the icon.

Other related programs

- If you enjoy **MoonIcon**, look for these other icon-programs:

EarthSun: Filename EARTHSxx.ZIP; a Windows icon that shows the current sunlit-side of Earth. Over 100 options, recommendations by 3 shareware magazines and a review in a full-page newspaper article in Switzerland make this a fine addition to your Windows desktop!

MarsIcon: Filename MARSICxx.ZIP; a Windows icon that shows the current view of the planet Mars.

GRedSpot: Filename GREDSPxx.ZIP; a Windows icon that shows the current view of the planet Jupiter, it's Great Red Spot, and the 4 Galilean moons Io, Europa, Ganymede and Callisto.

SolSys: Filename SOLSYSxx.ZIP; a Windows icon that shows the current relative position of the nine planets in our Solar System.

All four have been released and are available at the Internet FTP sites **oak.oakland.edu**, **ftp.cica.indiana.edu**, and their mirrors around the world, the Software Creations BBS, **(508) 365-2359** (2400,N,8,1), and in the Ziff Davis Interactive (**GO ZDI**) area of CompuServe. All users receive the shareware versions of these programs when they register **MoonIcon**. The current versions are **EARTHS43.ZIP**, **MARSIC27.ZIP**, **GREDSP37.ZIP**, and **SOLSYS11.ZIP**.

Registering MoonIcon

Print out the file ORDER.FRM to get a quick order form for registering **MoonIcon**. Remember, you can use **File|Print Topic** directly from that window's menu, or send the file ORDER.FRM, included with the rest of the program files, to your printer from the DOS prompt. This shareware version is not cripple-ware, nag-ware or free-ware, although it will remind you every 5 times to register until the evaluation period expires. When you do register, you will receive the latest executable version that allows **UNLIMITED** use of the program with no reminder box and no expiration.

- All future versions/upgrades of this program are **FREE** to registered users. When a new shareware version becomes available, just download it and copy the new **MoonIcon** files to the registered version's subdirectory. It's that simple!

The cost of the diskette and the mailing charges are all included in the **US $10** registration fee. Personal checks, money orders and AmEx, Visa, etc. traveler's checks are all accepted (sorry, I do not yet accept credit card orders). You will also receive the shareware versions of **4** similar icon-programs for Earth, the planets Mars and Jupiter, and the Solar System. In addition, you'll receive an impressive Windows wallpaper .BMP file.

If you are a Windows/C programmer, you may also purchase the full Borland C++ 3.1 source code and Windows resource files used to make **MoonIcon** for **US $25**. The source code for each future version will also be available at a discount, and, needless to say, many programming tips and tricks can be learned by studying this program.

- If you find **MoonIcon** useful, please upload it to other bulletin boards and Internet FTP sites so other people can enjoy it, too!

License Agreement

DISCLAIMER - LICENSE AGREEMENT

Users of **MoonIcon** must accept this disclaimer of warranty:

"**MoonIcon** is supplied "as is". W. Scott Thoman disclaims all warranties, either expressed or implied, including, without limitation, the warranties of merchantability and of fitness for any purpose. W. Scott Thoman assumes no liability for damages, direct or consequential, which may result from the use of **MoonIcon**."

MoonIcon is a shareware program and is provided at no charge to the user for evaluation. Feel free to share it with your friends, but please do not give it away altered or as part of another system. The essence of "user-supported" software is to provide personal computer users with quality software without high prices, and yet to provide incentive for programmers to continue to develop new products. If you find this program useful and find that you enjoy **MoonIcon**, you must register it. The registration fee will license one copy for use on any one computer at any one time. You must treat this software just like a book. An example is that this software may be used by any number of people and may be freely moved from one computer location to another, so long as there is **no** possibility of it being used at one location while it's being used at another. It is just like a book which cannot be read by two different people at the same time.

Anyone distributing **MoonIcon** for any kind of renumeration must first contact W. Scott Thoman for authorization. W. Scott Thoman should be advised so that the distributor can be kept up-to-date with the latest version.

Disk Vendors, Shareware Distributors and BBS(s) may charge a nominal fee for distribution of the program. The recipient of **MoonIcon** must be informed, in advance, that the fee paid to acquire **MoonIcon** does not relieve the recipient from paying the Registration Fee if the recipient uses **MoonIcon**.

- You are encouraged to pass a copy of **MoonIcon** along to your friends for evaluation. Please encourage them to register their copy if they find that they can use it, too. Of course, all registered users will receive a copy of the latest version of **MoonIcon**.

MoonIcon 1.0 - Order Form

Return this registration form along with US $10 to:

W. Scott Thoman
41 Lee Road
Dryden, New York 13053 -USA-

or send US $25 to receive the Registered version PLUS the Borland C++ 3.1 source code and Windows resource files.

Registered users are entitled to ALL upgrades AT NO EXTRA COST! When a new shareware version becomes available, just download it and copy the new MoonIcon files to your registered version's subdirectory. It's that simple!

Personal checks, money orders and AmEx, Visa, etc. traveler's checks are all accepted. (Sorry, I don't yet accept credit card orders). You will also receive the shareware version of 4 other icon-programs, one for our planet Earth (EarthSun), the planets Mars (MarsIcon) and Jupiter (GRedSpot), and one for the Solar System (SolSys).

Name _____

Address _____

_____

_____

_____

Internet/CompuServe Address: _____

Can I e-mail it to you? ___ .ZIP file ___ UUENCODEd ___ No

Where did you hear about MoonIcon? _____

_____

Disk size: ___ 5.25" ___ 3.5"

Comments: _____

THANK YOU!

New Ideas

If you have any ideas, please send them to me! Any ideas for new features or capabilities are always welcome!

- If I use your contributions, you will receive my thanks in the Acknowledgements section and the latest registered version of **MoonIcon** **free**.

Troubleshooting

- If you get the *About* box each and every time you start the program, make **sure** you have the program icon's ***Working Directory*** set to the directory where you have the MOONICON.EXE file. This allows the program to properly find it's .INI file. Make sure your MOONICON.INI file is in the same subdirectory as the MOONICON.EXE file; if it isn't, move it to that subdirectory. This is the recommended way to keep all of **MoonIcon**'s files together.

- If you prefer, you may also set the ***Working Directory*** to your Windows subdirectory explicitly, or just leave it blank to have it default to your Windows subdirectory. Again, just make **sure** that MOONICON.INI is, indeed, located there.

- Finally, make sure the .INI file is marked as read/write (this is the default); do **NOT** mark this file as read-only.

Acknowledgements

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- Thanks to my long-time friend **Brian Knapp** in Jamesville, NY for proof-reading this help file, beta-testing many pre-release versions, offering various Windows tips, and generally struggling with me over the last 12+ years to learn how to make computers do what we want them to do.

- Finally, many thanks to **William B. Phelps** (wbp@vnet.ibm.com) in California for his Sun and Moon rise/transit/set time algorithms. He sent me the source code, initially in Pascal, and tirelessly worked with me for over two months to improve the accuracy and make it work within **MoonIcon**.

Dedication

- Hi Mom and Dad, Linda, Grandma and Grandpa Cruver, Grandma and Grandpa Thoman, Brian Knapp, Joe Harmon, and especially my wife, Robin.

MoonIcon - Revision History

11/01/94 Version 1.0 - Initial version. Derived from EarthSun.

Author Information

Any suggestions, bugs, ideas, complaints? Let me know what you think of this program so I can improve it! Please include the version number you are using in all correspondence; this is version 1.0. If you want to be on **MoonIcon**'s e-mail list so you can be notified of new versions, indicate this as well.

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Thank you for using **MoonIcon**!

What is ShareWare?

If you're familiar with the idea behind Shareware, then you know that Shareware is the ultimate in **money-back guarantees**.

Most money-back guarantees work like this: You pay for the product and then have some period of time to try it out and see whether or not you like it. If you don't like it or find that it doesn't do what you need, you return it (undamaged) and at some point - which might take months - you get your money back. Some software companies won't even let you try their product! In order to qualify for a refund, the diskette envelope must have an unbroken seal. With these "licensing" agreements, you only qualify for your money back if you haven't tried the product. How absurd!

Shareware is very different. With Shareware, you get to **try it** for a limited time, **without spending a penny**. If you decide not to continue using it, you throw it away and forget all about it. No paperwork, phone calls, or correspondence to waste your valuable time.

Software authors who use the Shareware method of distribution feel that Shareware is the **best** way to try a product. You are able to try it on your own system(s), in your own special work environment, with no sales people looking over your shoulder. Have you ever purchased a car and realized that if you could have test driven it for 30 days your purchase decision might have been different? With Shareware, these problems can be avoided - you **do** have a 30 day test-drive!

After trying a Shareware product and deciding to continue to use it, then - and only then - do you pay for it. Not only that, but Shareware is traditionally **much less expensive** simply because you are paying for the software, not the advertising and marketing that comprises the majority of the cost of most software (a one-page ad in PC Magazine, one time, can cost upwards of $20,000). If the try-before-you-buy concept sounds like an ideal way to make your purchase decisions, you're right!

Some companies burden their products with annoying copy protection schemes because they don't trust their users. Shareware developers not only don't use copy protection, they **freely distribute** their products because they trust their users.

Someone once said that you should never trust software which doesn't trust you. This makes a lot of sense - no wonder Shareware

is becoming so popular among users and developers.

Shareware is a distribution method, **not** a type of software. Shareware is produced by accomplished programmers, just like retail software. There is good and bad Shareware, just as there is good and bad retail software. The primary difference between Shareware and retail software is that with Shareware you know if it's good or bad **before** you pay for it. Registration of Shareware products, in addition to being required, is also an incentive for programmers to continue to produce quality software for the Shareware market.

There is another significant advantage to Shareware - it allows small companies to make software available without the hundreds of thousands of dollars in expenses that it takes to launch a traditional retail software product. There are many programs on the market today which would never have become available without the Shareware marketing method. Please show your support for Shareware by registering those programs you actually use and by passing them on to others.

Thank you for your support!

Clock features

A great feature is the ability of **MoonIcon** to be an analog **clock**, or a clock with hour and minute "hands". You can control the size, shape, and color of the hands as well as the clock face. Markers for the hour positions can also be set any way you prefer.

Use the *Clock options* selection from **MoonIcon**'s system menu to bring up the *Clock Options* dialog box. Note how the various settings are disabled (grayed-out) and enabled based on the selections you choose.

MoonIcon defaults to not showing the clock at all. To use it, you first need to check either the *Only show the clock* or the *Show clock on top of icon* radio button. I recommend 'Showing the clock on top of the icon' so you can see the phase and the time at once.

You can change the color of the hands by using the *Hand Colors|Minute* and *Hour* list boxes. Next, the *Hand Style* check box lets you select whether you wish to have the hands partially "filled" with the hand color. NOTE: This is only used when the hand "width" is more than zero; see below for more details. The check box beneath called *Face Size* controls the size of the clock face. When checked, the clock face will be drawn to encompass the hour markers and is slightly larger than the size of the Moon icon. Un-check this box to have the face hidden when the icon is displayed.

The size and shape of the hands can be changed by using the *Hand Size* box. This box is organized into two rows of fields; the first row is for the hour hand and the second is for the minute hand. The *Width* fields in each row control the width of the hand on either side of the clock's center point. For the smallest hand possible, enter **0** in this field. This will create a hand that is only 1 pixel wide. For more stylish hands, however, try values such as **1**, **2** or **4**. These give the hands "width" and create a triangular shape. Try different values until you find a width that looks good to you.

Next, the *Length* fields control the length, in pixels, of the hour and minute hands starting from the clock's center point and moving outward to the tip. Normally, the default values are appropriate, but feel free to change them. Finally, the *Back* fields specify the length of the part of the hand that extends behind the clock's center point. A value of **0** means to have no back portion of the hand, but a much more interesting value is, say, **4**.

In addition, you can also tell **MoonIcon** to draw **markers** at the

12 "hour points" along the clock face's edge. Click the *None* button to hide the markers, select the *3-hour* button to show only the 12-, 3-, 6-, and 9-hour markers, or choose *All* to show all twelve. Also, don't forget to try the two marker color list boxes to change the color of each type of marker!

Finally, the *Face Color* list box allows you to change the color of the clock's face. Be sure to try many different combinations of background colors, face colors, hand colors, and hand sizes and shapes. There is no "correct" combination of **MoonIcon** options; use your imagination and keep trying new ones! One of my personal favorites is setting transparent background and face colors, so the only part of the clock that is visible are the hands and (maybe) the markers...

USA - Alabama to Montana

Location/ City Name	North Latitude Deg	Min	West Longitude Deg	Min	Alt m
ALABAMA					
Anniston	33	39.0	85	47.0	-
Birmingham	33	31.8	86	48.6	203
Gadsden	34	00.6	86	00.6	182
Huntsville	34	43.9	86	35.2	210
Mobile	30	40.8	88	06.6	2
Montgomery	32	21.6	86	18.0	52
Tuscaloosa	33	12.0	87	32.4	-
ALASKA					
Anchorage	61	12.0	149	48.0	28
Fairbanks	64	50.0	147	48.0	143
Juneau	58	18.2	134	24.5	4
ARIZONA					
Flagstaff	35	12.6	111	37.2	2264
Glendale	33	30.0	112	15.0	-
Mesa	33	25.0	111	50.0	-
Phoenix	33	30.0	112	04.8	366
Scottsdale	33	30.0	111	53.0	-
Tempe	33	24.0	111	54.0	-
Tucson	32	13.2	110	55.2	784
Yuma	32	42.0	114	37.8	52
ARKANSAS					
Fort Smith	35	22.8	94	24.0	144
Little Rock	34	44.4	92	19.2	94
N Little Rock	34	46.0	92	13.0	-
Pine Bluff	34	13.2	92	01.2	-
CALIFORNIA					
Alameda	37	46.0	122	15.0	-
Alhambra	34	05.0	118	08.0	-
Anaheim	33	50.0	117	55.0	-
Bakersfield	35	23.0	119	00.0	131
Baldwin Park	34	05.0	117	58.0	-
Bellflower	33	53.0	118	08.0	-
Berkeley	37	52.0	122	17.0	13
Buena Park	33	52.0	118	00.0	-
Burbank	34	11.0	118	19.0	-
Carson	33	49.0	118	16.0	-

Cerritos	33	52.0	118	05.0	-
Chula Vista	32	38.0	117	05.0	-
Compton	33	54.0	118	14.0	-
Concord	37	58.0	122	02.0	-
Cosa Mesa	33	39.0	118	54.0	-
Daly City	37	43.0	122	31.0	-
Downey	33	56.0	118	08.0	-
El Cajon	32	48.0	116	58.0	-
El Monte	34	04.0	118	02.0	-
Escondido	33	07.0	117	00.0	-
Eureka	40	45.0	124	10.0	-
Fairfield	38	14.0	122	02.0	-
Fountain Valley	33	42.0	117	57.0	-
Fremont	37	33.0	122	00.0	-
Fresno	36	46.2	119	46.8	94
Fullerton	33	53.0	117	56.0	-
Garden Grove	33	47.0	117	56.0	-
Glendale	34	09.0	118	15.0	-
Hawthorne	33	55.0	118	22.0	-
Hayward	37	40.0	122	06.0	-
Huntington Beach	33	39.0	118	00.0	-
Inglewood	33	57.0	118	22.0	-
Irvine	33	40.0	117	45.0	-
Lakewood	33	50.0	118	09.0	-
La Mesa	32	46.0	117	01.0	-
Long Beach	33	46.0	118	12.0	-
Los Angeles	34	04.8	118	22.2	32
Modesto	37	39.0	121	00.0	-
Montebello	34	01.0	118	06.0	-
Monterey Park	34	04.0	118	08.0	-
Mountain View	37	25.0	122	07.0	-
Napa	38	20.0	122	17.0	-
Newport Beach	33	36.0	117	55.0	-
Norwalk	33	54.0	118	05.0	-
Oakland	37	48.0	122	16.0	8
Oceanside	33	11.0	117	22.0	-
Ontario	34	04.0	117	39.0	-
Orange	33	48.0	117	51.0	-
Oxnard	34	08.0	119	12.0	-
Palo Alto	37	27.0	122	09.0	-
Pasadena	34	09.0	118	09.0	272
Pico Rivera	34	01.0	118	05.0	-
Pomona	34	04.0	117	45.0	-
Rancho Cucamonga	34	05.0	117	35.0	-
Redondo Beach	33	50.0	118	23.0	-
Redwood City	37	29.0	122	13.0	-
Richmond	37	56.0	122	21.0	-

Riverside	33	59.0	117	21.0	-
Sacramento	38	35.0	121	30.0	10
Salinas	36	41.0	121	40.0	-
San Bernardino	34	07.0	117	19.0	354
San Buenaventura	34	18.0	119	18.0	-
San Diego	32	45.0	117	08.4	7
San Francisco	37	45.6	122	26.4	21
San Jose	37	20.0	121	54.0	30
San Leandro	37	43.0	122	10.0	-
San Mateo	37	34.0	122	20.0	-
Santa Ana	33	41.0	117	57.0	-
Santa Barbara	34	26.0	119	43.0	33
Santa Clara	37	21.0	121	56.0	-
Santa Monica	34	01.0	118	29.0	-
Santa Rosa	38	27.0	122	42.0	-
Simi Valley	34	16.0	118	47.0	-
South Gate	33	57.0	118	13.0	-
Stockton	37	57.5	121	17.3	7
Sunnyvale	37	23.0	122	02.0	-
Thousand Oaks	34	10.0	118	50.0	-
Torrance	33	50.0	118	20.0	-
Vallejo	38	06.0	122	15.0	-
Visalia	36	20.0	119	18.0	-
Walnut Creek	37	54.0	122	04.0	-
West Covina	34	04.0	117	55.0	-
Westminster	33	45.0	117	59.0	-
Whittier	33	58.0	118	02.0	-
COLORADO					
Arvada	39	48.0	105	05.0	-
Aurora	39	43.0	104	49.0	-
Boulder	40	00.2	105	15.7	-
Colorado Springs	38	49.0	104	48.0	1932
Denver	39	43.2	104	58.8	1732
Durango	37	15.0	107	55.0	-
Fort Collins	40	36.0	105	04.0	-
Grand Junction	39	04.2	108	33.0	1506
Greeley	40	25.0	104	41.0	-
Lakewood	39	44.0	105	06.0	-
Pueblo	38	17.4	104	38.4	1539
Westminster	39	50.0	105	02.0	-
CONNECTICUT					
Bridgeport	41	11.4	73	11.4	3
Bristol	41	40.0	72	55.0	-
Danbury	41	23.0	73	27.0	-
East Hartford	41	45.0	72	35.0	-

Fairfield	41 08.0	73 22.0	-
Greenwich	41 01.0	73 37.0	-
Hamden	41 20.0	72 55.0	-
Hartford	41 45.6	72 41.4	13
Manchester	41 45.0	72 30.0	-
Meriden	41 30.0	72 50.0	62
Milford	41 15.0	73 05.0	-
New Britain	41 40.0	72 45.0	66
New Haven	41 18.6	72 55.8	13
Norwalk	41 06.0	73 25.0	-
Stamford	41 03.0	73 32.0	11
Stratford	41 10.0	73 05.0	-
Waterbury	41 30.0	73 00.0	85
West Hartford	41 45.0	72 45.0	-
West Haven	41 16.0	72 57.0	-
DELAWARE			
Dover	39 09.6	75 31.8	-
Wilmington	39 45.0	75 33.0	44
DISTRICT OF COLUMBIA			
Washington	38 52.8	77 01.2	5
FLORIDA			
Boca Raton	26 21.0	80 05.0	-
Clearwater	27 43.0	82 45.0	-
Daytona Beach	29 11.0	81 02.0	2
Fort Lauderdale	26 07.0	80 09.0	-
Gainesville	29 39.6	82 19.8	57
Hialeah	25 49.0	80 18.0	-
Hollywood	26 00.0	80 11.0	-
Jacksonville	30 19.2	81 39.0	7
Largo	27 54.0	82 47.0	-
Miami	25 46.8	80 13.2	2
Orlando	28 32.4	81 22.8	23
Pensacola	30 25.0	87 13.0	5
Pompano Beach	26 12.0	80 07.0	-
St. Petersburg	27 47.0	82 38.0	7
Sarasota	27 20.0	82 32.0	7
Tallahassee	30 26.4	84 17.4	-
Tampa	27 57.6	82 28.2	-
West Palm Beach	26 43.0	80 03.2	-
GEORGIA			
Albany	31 34.8	84 09.6	-
Atlanta	33 45.6	84 24.6	331
Augusta	33 28.2	81 59.4	47
Columbus	32 28.8	84 57.0	87

Macon	32	49.8	83	39.6	110
Savannah	32	03.0	81	05.4	7
HAWAII					
Hilo	19	44.0	155	01.0	13
Honolulu	21	18.6	157	50.4	7
IDAHO					
Boise	43	36.6	116	13.2	931
Coeur D'Alene	47	40.8	116	46.2	-
Lewiston	46	24.0	116	59.0	-
Pocatello	42	52.8	112	27.0	1463
Twin Falls	42	33.0	114	29.0	-
ILLINOIS					
Arlington Heights	42	05.0	87	59.0	-
Aurora	41	45.0	88	18.0	-
Bloomington	40	29.0	89	00.0	262
Champaign	40	06.6	88	15.0	243
Chicago	41	51.0	87	40.8	199
Cicero	41	50.0	87	46.0	-
Decatur	39	50.0	88	59.0	224
Des Plaines	42	02.0	87	54.0	-
East St. Louis	38	38.0	90	10.0	-
Elgin	42	03.0	88	16.0	-
Evanston	42	02.0	87	41.0	-
Joliet	41	37.0	88	05.0	-
Mount Prospect	42	03.0	87	56.0	-
Oak Lawn	41	43.0	87	45.0	-
Oak Park	41	53.0	87	48.0	-
Peoria	40	42.6	89	36.6	154
Rockford	42	16.2	89	04.2	235
Schaumburg	42	02.0	88	05.0	-
Skokie	42	02.0	87	45.0	-
Springfield	39	48.0	89	39.0	200
Urbana	40	06.3	88	13.5	238
INDIANA					
Anderson	40	05.0	85	50.0	-
Bloomington	39	12.6	86	34.8	-
Evansville	37	58.8	87	33.0	126
Fort Wayne	41	04.2	85	09.0	259
Gary	41	35.0	87	21.0	194
Hammond	41	37.0	87	31.0	-
Indianapolis	39	47.4	86	08.4	260
Muncie	40	11.5	85	23.3	312
South Bend	41	40.0	86	20.0	233
Terre Haute	39	28.1	87	24.4	163

IOWA			
Ames	42 02.4	93 36.6	-
Cedar Rapids	41 58.0	91 39.9	240
Council Bluffs	41 16.0	95 53.0	-
Davenport	41 32.4	90 35.4	194
Des Moines	41 36.0	93 37.8	308
Dubuque	42 30.0	90 43.0	269
Iowa City	41 40.2	91 31.8	225
Sioux City	42 30.0	96 24.0	331
Waterloo	42 30.0	92 22.0	279
KANSAS			
Dodge City	37 45.6	100 01.2	847
Independence	37 13.0	95 42.0	-
Kansas City	39 06.0	94 39.0	246
Lawrence	38 57.6	95 15.0	-
Overland Park	38 59.0	94 40.0	-
Parsons	37 20.0	95 16.0	-
Salina	38 50.1	97 36.5	403
Topeka	39 02.4	95 41.4	305
Wichita	37 40.8	97 19.8	423
KENTUCKY			
Ashland	38 28.6	82 38.4	176
Bowling Green	36 59.0	86 27.0	167
Corbin	36 56.4	84 06.0	-
Frankfort	38 12.0	84 51.6	-
Lexington	38 03.6	84 29.4	313
Louisville	38 13.2	85 45.0	156
Owensboro	37 45.0	87 05.0	-
Paducah	37 05.0	88 36.0	113
LOUISIANA			
Alexandria	31 18.0	92 28.0	-
Baton Rouge	30 27.0	91 08.4	19
Bossier City	32 31.0	93 42.0	-
Kenner	29 58.0	90 15.0	-
Lafayette	30 13.2	92 01.2	-
Lake Charles	30 12.6	93 12.0	-
Monroe	32 30.6	92 06.0	-
New Orleans	29 58.2	90 04.8	2
Shreveport	32 28.2	93 46.2	67
MAINE			
Augusta	44 19.2	69 46.2	15
Bangor	44 47.0	68 47.0	7
Eastport	44 54.0	67 00.0	-

Portland	43	40.2	70	16.8	15
MARYLAND					
Annapolis	38	58.2	76	30.0	-
Baltimore	39	18.6	76	37.2	7
Bethesda	39	00.0	77	10.0	-
College Park	39	00.1	76	57.3	-
Dundalk	39	16.0	76	31.0	-
Greenbelt	39	01.2	76	49.6	-
Ocean City	38	23.4	75	04.8	-
Silver Spring	39	00.0	77	00.0	-
Wheaton	39	05.0	77	05.0	-
MASSACHUSETTS					
Boston	42	19.2	71	05.4	7
Brockton	42	04.0	71	01.0	43
Brookline	42	20.0	71	08.0	-
Cambridge	42	22.8	71	07.8	7
Chicopee	42	10.0	72	35.0	-
Fall River	41	42.0	71	07.0	13
Framingham	42	16.0	71	25.0	-
Holyoke	42	10.0	72	40.0	38
Lawrence	42	42.0	71	09.0	21
Lowell	42	38.0	71	18.0	33
Lynn	42	28.0	70	57.0	-
Malden	42	26.0	71	04.0	-
Medford	42	25.0	71	07.0	-
New Bedford	41	38.2	70	55.7	5
Newton	42	21.0	71	13.0	-
Pittsfield	42	25.0	73	15.0	333
Quincy	42	15.0	71	00.0	-
Somerville	42	23.0	71	06.0	5
Springfield	42	06.6	72	33.0	28
Waltham	42	22.0	71	14.0	-
Weymouth	42	44.0	70	57.0	-
Worcester	42	16.2	71	48.6	156
MICHIGAN					
Ann Arbor	42	17.00	83	44.75	289
Battle Creek	42	19.0	85	11.0	269
Clinton	42	04.0	83	58.0	-
Dearborn	42	18.0	83	15.0	-
Dearborn Heights	41	43.0	87	48.0	-
Detroit	42	22.8	83	05.4	192
Farmington Hills	42	28.0	83	23.0	-
Flint	43	01.8	83	41.4	246
Grand Rapids	42	57.6	85	39.6	200
Kalamazoo	42	35.0	86	00.0	248

Lansing	42 43.2	84 33.6	272
Livonia	42 25.0	83 23.0	-
Mount Pleasant	43 36.0	84 46.2	-
Pontiac	42 37.0	83 17.0	-
Redford	42 25.0	83 16.0	-
Roseville	42 30.0	82 55.0	-
Royal Oak	42 29.0	83 09.0	-
Saginaw	43 25.0	84 00.0	195
St. Clair Shores	42 30.0	82 54.0	-
Sault Ste. Marie	46 28.0	84 22.0	237
Southfield	42 28.0	83 13.0	-
Sterling Heights	42 34.0	83 01.0	-
Taylor	42 14.0	83 16.0	-
Troy	42 34.0	83 09.0	-
Warren	42 33.0	83 03.0	-
Westland	42 19.0	83 24.0	-
Wyoming	42 54.0	85 42.0	-
MINNESOTA			
Bloomington	44 50.0	93 18.0	-
Duluth	46 47.4	92 06.6	200
Hibbing	47 25.2	92 55.2	-
Internat'l Falls	48 36.0	93 24.6	-
Mankato	44 09.6	94 00.0	-
Minneapolis	44 57.6	93 16.2	274
Northfield	44 27.6	93 09.6	-
Rochester	44 01.0	92 30.0	-
St. Cloud	45 34.0	94 10.4	341
St. Paul	44 57.0	93 05.0	256
MISSISSIPPI			
Aberdeen	33 49.0	88 33.0	-
Biloxi	30 24.6	88 55.2	7
Greenville	33 25.0	91 00.0	-
Jackson	32 19.2	90 12.0	98
Meridian	32 21.0	88 41.0	-
Vicksburg	32 20.0	90 50.0	-
MISSOURI			
Cape Girardeau	37 18.6	89 31.8	-
Columbia	38 55.0	92 19.0	240
Fayette	39 09.0	92 42.0	-
Florissant	38 47.0	90 20.0	-
Independence	39 06.0	94 26.0	-
Jefferson City	38 34.2	92 10.8	-
Kansas City	39 05.0	94 35.0	243
Mexico	39 10.0	91 53.0	-
Nevada	37 51.0	94 22.0	-

St. Joseph	39	44.0	94	49.0	279
St. Louis	38	37.8	90	15.0	149
Sedalia	38	42.0	93	14.0	-
Springfield	37	12.0	93	17.4	427
MONTANA					
Billings	45	46.8	108	32.4	1024
Bozeman	45	41.0	111	00.0	-
Butte	46	00.0	112	31.0	1891
Great Falls	47	30.0	111	15.0	1096
Helena	46	35.4	112	01.8	1363
Missoula	46	51.6	114	00.0	1047

USA - Nebraska to Wyoming

Location/ City Name	North Latitude Deg	Min	West Longitude Deg	Min	Alt m
NEBRASKA					
Grand Island	40	55.8	98	21.0	-
Lincoln	40	48.6	96	40.2	377
North Platte	41	08.0	100	45.0	-
Omaha	41	18.0	95	57.0	341
Scottsbluff	41	51.6	103	39.6	-
NEVADA					
Carson City	39	09.0	119	46.8	1535
Las Vegas	36	10.2	115	10.2	709
Reno	39	31.5	119	48.7	1445
NEW HAMPSHIRE					
Concord	43	10.0	71	30.0	95
Hanover	43	42.3	72	17.0	-
Manchester	42	59.4	71	27.6	57
Nashua	42	47.0	71	23.0	-
NEW JERSEY					
Atlantic City	39	21.6	74	26.4	3
Bayonne	40	40.0	74	07.0	-
Camden	39	56.0	75	06.0	10
Cape May	38	56.4	74	54.6	-
Cherry Hill	39	56.0	75	01.0	-
Clifton	40	35.0	74	09.0	-
East Orange	40	46.0	74	12.0	-
Edison	40	27.0	74	18.0	-
Elizabeth	40	40.0	74	13.0	7
Irvington	40	43.0	74	15.0	-
Jersey City	40	43.0	74	05.0	7
Newark	40	44.4	74	11.4	-
Passaic	40	52.0	74	08.0	-
Paterson	40	55.0	74	10.0	33
Princeton	40	21.0	74	39.6	-
Trenton	40	13.2	74	45.6	11
Union	40	41.0	74	15.0	-
Union City	40	46.0	74	01.0	-
Vineland	39	30.0	75	00.0	-
NEW MEXICO					
Alamagordo	32	54.0	105	57.0	-

Albuquerque	35	05.0	106	40.0	1742
Clovis	34	24.0	103	12.0	-
Deming	32	16.0	107	45.0	-
Las Cruces	32	20.4	106	43.8	-
Portales	34	11.0	103	20.0	-
Roswell	33	23.0	104	32.0	-
Santa Fe	35	40.2	105	57.0	2280
Sunspot	32	47.2	105	49.2	-
NEW YORK					
Albany	42	39.6	73	46.8	7
Auburn					
(New York Central RR)	42	56.0	76	34.0	677 feet
Binghamton	42	05.0	75	55.0	284
Brooktondale	42	23.0	76	24.0	-
Buffalo	42	54.6	78	51.0	231
Cheektowaga	42	54.0	78	46.0	-
Corning (DL&WRR)	42	09.0	77	04.0	957 feet
Cortland					
LVRR Marker	42	36.0	76	10.0	1130 feet
D.L.&W. R.R. Marker	42	36.0	76	10.0	1113 feet
Dewitt	43	02.0	76	04.0	413 feet
Dryden					
LVRR S. Street Xing	42	29.45	76	17.85	1101 feet
Southworth Library	42	29.45	76	17.85	1098 feet
Fireplug S. & Main	42	29.45	76	17.85	1093 feet
Dryden Lake	42	29.45	76	17.85	1156 feet
Elmira (E.R.R.)	42	06.0	76	49.0	857 feet
Etna (LVRR)	42	29.0	76	23.0	1025 feet
Fayetteville	43	02.0	76	01.0	543 feet
Fredonia	42	27.0	79	20.0	-
Freeville					
LVRR Xing	42	32.0	76	20.0	1046 feet
Freeville Junction	42	32.0	76	20.0	1045 feet
Groton					
LVRR	42	35.0	76	22.0	995 feet
Fall Creek bridge	42	35.0	76	22.0	1273 feet
McLean Road	42	35.0	76	22.0	1288 feet
Homer					
DL&W R.R./James St.	42	38.0	76	11.0	1133 feet
East Homer, LVRR	42	38.0	76	11.0	1132 feet

Horseheads (DL&WRR)	42	10.0	76	50.0	915 feet
Irondequoit	43	12.0	77	36.0	-
Ithaca					
Cornell University					
Engineering Building					
Hollister Hall	42	26.4	76	29.4	814 feet
Cayuga Lake	42	26.4	76	30.0	381 feet
Jamestown	42	06.6	79	14.4	-
Jamesville (DL&WRR)	42	59.0	76	04.0	597 feet
Killawog (DL&WRR)	42	24.0	76	01.0	1001 feet
Marathon (DL&WRR)	42	26.0	76	02.0	1043 feet
McGraw (E&CNYRR)	42	36.0	76	06.0	1150 feet
McLean (LVRR)	42	33.0	76	17.0	1116 feet
Moravia	42	43.0	76	25.0	-
Mount Vernon	40	55.0	73	51.0	-
Newark Valley	42	14.0	76	11.0	1076 feet
New Rochelle	40	55.0	73	47.0	-
New York	40	43.8	73	55.2	43
Niagara Falls	43	06.0	79	02.0	187
Poughkeepsie	41	42.0	73	55.2	-
Rochester	43	09.6	77	36.6	169
Schenectady	42	47.0	73	53.0	80
Sodus	43	14.0	77	04.0	428 feet
Sodus Point (NYCRR)	43	16.0	76	59.0	267 feet
Syracuse	43	05.0	76	10.0	131
Tonawanda	43	01.0	78	53.0	-
Troy	42	45.0	73	45.0	11
Utica	43	06.2	75	13.6	136
West Seneca	42	50.0	78	45.0	-
Whitney Point (DL&W)	42	20.0	75	58.0	958 feet
Yonkers	40	57.0	73	54.0	3
NORTH CAROLINA					
Asheville	35	35.4	82	33.6	702
Charlotte	35	13.2	80	49.8	236
Durham	36	00.0	78	54.6	133
Fayetteville	35	02.0	78	54.0	-
Greensboro	36	04.2	79	48.6	275
High Point	35	55.0	80	00.0	-
Raleigh	35	47.4	78	39.0	120
Wilmington	34	13.2	77	55.8	9
Winston-Salem	36	06.0	80	15.6	282
NORTH DAKOTA					
Bismarck	46	48.6	100	46.8	540

Fargo	46	52.2	96	47.4	295
Grand Forks	47	55.0	97	05.0	-
Minot	48	14.4	101	18.0	509
OHIO					
Akron	41	05.0	81	30.7	287
Canton	40	50.0	81	25.0	338
Cincinnati	39	08.4	84	30.6	180
Cleveland	41	28.8	81	39.6	217
Cleveland Heights	41	30.0	81	35.0	-
Columbus	39	58.8	82	59.4	256
Dayton	39	45.0	84	15.0	188
Elyria	41	22.0	82	07.0	-
Euclid	41	34.0	81	32.0	-
Hamilton	39	22.0	84	33.0	197
OHIO					
Kettering	39	40.0	84	15.0	-
Lakewood	41	29.0	81	48.0	-
Lima	40	45.0	84	06.0	284
Lorain	41	28.0	82	10.0	200
Mansfield	40	45.0	82	30.0	-
Parma	41	23.0	81	44.0	-
Springfield	39	55.0	83	50.0	322
Steubenville	40	22.0	80	37.0	217
Toledo	41	40.2	83	34.2	192
Warren	41	15.0	80	50.0	-
Youngstown	41	05.4	80	39.0	276
OKLAHOMA					
Clinton	35	31.0	98	59.0	-
Enid	36	23.7	97	52.5	407
Lawton	34	36.0	98	25.0	-
Midwest City	35	26.0	97	23.0	-
Norman	35	13.0	97	25.0	-
Muskogee	35	44.0	95	21.0	-
Oklahoma City	35	28.8	97	31.8	422
Ponca City	36	42.0	97	05.0	-
Tulsa	36	08.4	95	56.4	264
OREGON					
Burns	43	35.0	119	05.0	-
Corvallis	44	34.0	123	16.0	-
Eugene	44	03.0	123	06.0	138
Medford	42	19.0	122	52.0	-
Pendleton	45	40.2	118	48.0	-
Portland	45	31.2	122	39.0	7
Salem	44	55.8	123	01.8	51

PENNSYLVANIA					
Allentown	40	35.0	75	30.0	84
Altoona	40	25.0	78	25.0	387
Bethlehem	40	40.0	75	25.0	77
Erie	42	07.2	80	04.8	225
Harrisburg	40	16.2	76	52.8	120
Lancaster	40	05.0	76	20.0	116
Penn Hills	40	28.0	79	51.0	-
Philadelphia	40	00.0	75	09.0	33
Pittsburgh	40	26.4	79	58.2	245
Reading	40	20.0	75	55.0	87
Scranton	41	24.6	75	40.2	238
Upper Darby	39	58.0	75	16.0	-
Whitehall	40	22.0	79	59.0	-
Wilkes-Barre	41	14.5	75	53.3	210
RHODE ISLAND					
Cranston	41	46.0	71	25.0	-
East Providence	41	49.0	71	22.0	-
Pawtucket	41	53.0	71	23.0	-
Providence	41	49.2	71	25.8	-
Warwick	41	42.0	71	27.0	26
SOUTH CAROLINA					
Charleston	32	48.6	79	57.6	3
Columbia	34	00.6	81	00.0	62
Greenville	34	51.0	82	23.4	317
North Charleston	32	49.0	79	57.0	-
Spartanburg	34	56.4	81	55.8	287
SOUTH DAKOTA					
Pierre	44	22.2	100	20.4	486
Rapid City	44	04.2	103	13.8	1060
Sioux Falls	43	32.4	96	42.6	364
TENNESSEE					
Chattanooga	35	02.4	85	16.8	221
Clarksville	36	30.0	87	23.0	-
Knoxville	35	58.8	83	56.4	292
Memphis	35	07.2	89	59.4	90
Nashville	36	09.6	86	46.2	194
TEXAS					
Abilene	32	25.0	99	45.0	561
Amarillo	35	12.0	101	51.0	1209
Arlington	32	44.0	97	07.0	-
Austin	30	17.4	97	43.8	196

Baytown	29	44.0	95	01.0	-
Beaumont	30	04.8	94	07.2	7
Brownsville	25	54.6	97	29.4	5
Corpus Christi	27	45.0	97	24.6	11
Dallas	32	47.4	96	47.4	143
El Paso	31	47.4	106	25.2	1285
Fort Worth	32	44.9	97	19.7	220
Galveston	29	18.0	94	48.6	2
Garland	32	55.0	96	39.0	-
Grand Prairie	32	45.0	97	00.0	-
Houston	29	45.0	95	23.4	13
Irving	32	49.0	96	57.0	-
Laredo	27	31.0	99	29.0	144
Longview	32	29.0	94	44.0	-
Lubbock	33	35.0	101	51.0	1048
McAllen	26	12.0	98	13.0	-
Mesquite	32	46.0	96	35.0	-
Midland	32	05.0	102	05.0	-
Odessa	31	51.0	102	22.0	-
Pasadena	29	43.0	95	13.0	-
Plano	33	01.0	96	42.0	-
Port Arthur	29	52.0	93	59.0	3
Plainsview	34	11.0	101	43.0	-
Richardson	32	56.0	96	44.0	-
San Angelo	31	28.0	100	22.0	605
San Antonio	29	25.8	98	30.0	213
Tyler	32	21.0	95	19.0	-
Victoria	28	48.0	97	00.0	-
Waco	31	33.2	97	08.0	133
Wichita Falls	33	54.0	98	30.0	310
UTAH					
Logan	41	46.0	111	51.0	-
Ogden	41	13.5	111	58.4	1409
Orem	40	15.0	111	50.0	-
Provo	40	15.0	111	40.0	1493
Salt Lake City	40	45.6	111	52.2	1385
Sandy City	40	36.0	111	53.0	-
VERMONT					
Brattleboro	42	51.1	72	33.8	98
Burlington	44	28.8	73	13.2	36
Montpelier	44	15.6	72	34.2	159
VIRGINIA					
Alexandria	38	49.2	77	04.8	-
Arlington	38	55.0	77	10.0	-
Bristol	36	36.6	82	10.8	-

Charlottesville	38 02.4	78 29.4	-
Chesapeake	38 48.0	76 16.0	-
Danville	36 35.4	79 24.0	-
Hampton	37 02.0	76 21.0	-
Lynchburg	37 24.6	79 09.6	-
Newport News	37 03.0	76 28.8	-
Norfolk	36 54.0	76 16.2	3
Petersburg	37 13.2	77 24.0	-
Portsmouth	36 50.0	76 19.0	3
Richmond	37 32.4	77 27.6	52
Roanoke	37 16.8	79 57.6	297
Virginia Beach	36 50.0	75 58.0	-
WASHINGTON			
Bellevue	47 37.0	122 12.0	-
Billingham	48 45.0	122 28.6	-
Everett	47 59.0	122 11.0	-
Mt. Rainier	46 50.0	121 45.0	-
Olympia	47 03.0	122 53.0	-
Pullman	46 46.0	117 09.0	-
Richland	46 17.0	119 17.0	-
Seattle	47 37.8	122 19.8	131
Spokane	47 40.2	117 24.6	773
Tacoma	47 16.0	122 30.0	36
Walla Walla	46 05.0	118 18.0	-
Yakima	46 35.7	120 30.8	348
WEST VIRGINIA			
Charleston	38 21.0	81 37.8	197
Greenbank	38 26.3	79 50.2	-
Huntington	38 24.6	82 25.8	185
Wheeling	40 04.2	80 42.0	213
WISCONSIN			
Appleton	44 14.0	88 27.0	-
Eau Claire	44 48.6	91 30.0	-
Green Bay	44 30.0	88 04.0	194
Janesville	42 41.0	89 03.0	-
Kenosha	42 34.0	87 50.0	-
La Crosse	43 48.6	91 13.8	-
Madison	43 05.4	89 23.4	282
Milwaukee	43 03.0	87 57.0	208
Oshkosh	44 01.0	88 35.0	-
Racine	42 43.0	87 49.0	207
Sheboygan	43 45.6	87 44.9	207
Waukesha	43 01.0	88 13.0	-
Wauwatosa	43 03.0	88 00.0	-
West Allis	43 01.0	88 01.0	-

WYOMING					
Casper	42	50.4	106	19.2	-
Cheyenne	41	08.4	104	48.0	2010
Sheridan	44	47.8	106	57.7	1301

European Cities

Location Name	Latitude Deg	Min	Longitude Deg	Min	Alt m
ANDORRA					
Andorra la Vella	42	30.0N	1	31.0E	1162
AUSTRIA					
Vienna	48	13.0N	16	20.0E	218
BELGIUM					
Antwerp	51	13.0N	4	25.0E	-
Brussels	50	50.0N	4	20.0E	-
Liege	50	38.0N	5	34.0E	-
BYELARUS					
Minsk	53	54.0N	27	35.0E	242
CZECHOSLOVAKIA					
Ostrava	49	50.0N	18	17.0E	-
Prague	50	05.0N	14	28.0E	217
DENMARK					
Copenhagen	55	40.0N	12	35.0E	14
ESTONIA					
Tallinn	59	26.0N	24	44.0E	-
FINLAND					
Helsinki	60	10.0N	24	58.0E	10
FRANCE					
Bordeaux	44	50.0N	0	34.0W	52
Lille	50	38.0N	3	04.0E	46
Lyon	45	43.0N	5	04.0E	308
Marseille	43	18.0N	5	24.0E	81
Paris	48	52.0N	2	20.0E	54
Toulouse	43	36.0N	1	26.0E	177
GERMANY					
Aachen	50	47.0N	6	05.0E	-
Berlin	52	31.0N	13	24.0E	61
Bielefeld	52	01.0N	8	31.0E	-
Bonn	50	44.0N	7	05.0E	-
Bremen	53	04.0N	8	49.0E	17
Dortmund	51	31.0N	7	28.0E	-
Dresden	51	03.0N	13	44.0E	-
Duisburg	51	25.0N	6	46.0E	-

Dusseldorf	51 12.0N	6 47.0E	-
Essen	52 43.0N	7 57.0E	-
Frankfurt	50 07.0N	8 40.0E	111
Hamburg	53 33.0N	9 59.0E	22
Hannover	52 24.0N	9 44.0E	-
Koln	50 56.0N	6 59.0E	-
Leipzig	51 19.0N	12 20.0E	-
Mannheim	49 29.0N	8 29.0E	-
Munich	48 08.0N	11 35.0E	571
Nurnberg	49 27.0N	11 04.0E	344
Stuttgart	48 46.0N	9 11.0E	-
Wiesbaden	50 05.0N	8 14.0E	-
Wuppertal	51 16.0N	7 11.0E	-
HUNGARY			
Budapest	47 30.0N	19 05.0E	129
IRELAND			
Dublin	53 20.0N	6 15.0W	51
ITALY			
Bologna	44 29.0N	11 20.0E	-
Catania	37 30.0N	15 06.0E	-
Florence	43 46.0N	11 15.0E	-
Genova	44 25.0N	8 57.0E	104
Milano	45 28.0N	9 12.0E	-
Napoli	40 51.0N	14 17.0E	27
Palermo	38 07.0N	13 21.0E	116
Rome	41 54.0N	12 29.0E	124
Torino	45 03.0N	7 40.0E	-
LATVIA			
Riga	56 57.0N	24 06.0E	-
LIECHTENSTEIN			
Vaduz	47 09.0N	9 31.0E	-
LITHUANIA			
Vilnius	54 40.0N	25 26.0E	-
LUXEMBOURG			
Luxembourg	49 36.0N	6 09.0E	360
MALTA			
Valletta	35 54.0N	14 31.0E	76
MONACO			
Monaco	43 44.0N	7 25.0E	59

NETHERLANDS					
Amsterdam	52	22.0N	4	54.0E	2
Rotterdam	51	55.0N	4	28.0E	-
S'Gravenhage	52	06.0N	4	18.0E	-
Utrecht	52	05.0N	5	08.0E	-
NORWAY					
Oslo	59	55.0N	10	45.0E	101
POLAND					
Gdansk	54	23.0N	18	40.0E	12
Krakow	50	03.0N	19	58.0E	237
Lodz	51	46.0N	19	30.0E	-
Lukanowice	50	00.0N	20	33.6E	-
Poznan	52	25.0N	16	55.0E	-
Warsaw	52	15.0N	21	00.0E	96
Wroclaw	51	06.0N	17	00.0E	158
PORTUGAL					
Lisbon	38	43.0N	9	08.0W	103
Porto	41	10.0N	8	36.0W	-
SAN MARINO					
San Marino	43	55.0N	12	28.0E	-
SPAIN					
Barcelona	41	23.0N	2	11.0E	102
Bilbao	43	15.0N	2	58.0W	-
Madrid	40	24.0N	3	41.0W	718
Malaga	36	34.0N	4	25.0W	-
Seville	37	23.0N	5	59.0W	32
Valencia	39	28.0N	0	22.0E	26
Zaragoza	41	38.0N	0	53.0E	-
SWEDEN					
Goteborg	57	43.0N	11	58.0E	18
Stockholm	59	20.0N	18	03.0E	48
SWITZERLAND					
Basel	47	33.0N	7	35.0E	-
Bern	46	57.0N	7	26.0E	616
Zurich	47	23.0N	8	32.0E	531
UKRAINE					
L'vov	49	50.0N	24	00.0E	321
UNITED KINGDOM					
Belfast	54	35.0N	5	55.0W	19

Birmingham	52	29.0N	1	55.0W	176
Bristol	51	27.0N	2	35.0W	-
Cardiff	51	29.0N	3	13.0W	67
Coventry	52	25.0N	1	30.0W	-
Edinburgh	55	57.0N	3	13.0W	145
Glasgow	55	53.0N	5	15.0W	-
Leeds	53	50.0N	1	35.0W	-
Liverpool	53	25.0N	2	55.0W	65
London	51	30.0N	0	10.0E	49
Manchester	53	28.0N	2	15.0W	-
Middlesbrough	54	35.0N	1	14.0W	-
Newcastle	52	26.0N	3	06.0W	-
Nottingham	52	58.0N	1	10.0W	-
Sheffield	53	23.0N	1	28.0W	-
YUGOSLAVIA					
Belgrade	44	50.0N	20	30.0E	149
Zagreb	45	48.0N	15	58.0E	-

Australian Cities

Location Name	Latitude Deg	Min	Longitude Deg	Min	Alt m
Adelaide	34	55.0S	138	35.0E	-
Brisbane	27	28.0S	153	02.0E	-
Broken Hill	31	57.0S	141	27.0E	-
Canberra	35	17.0S	149	08.0E	-
Darwin	12	28.0S	130	50.0E	-
Fremantle	32	03.0S	115	45.0E	-
Marathon	20	49.0S	143	34.0E	-
Melbourne	37	49.0S	144	58.0E	-
New Castle	32	56.0S	151	46.0E	-
Perth	31	56.0S	115	50.0E	-
Sydney	33	52.0S	151	13.0E	-
Townsville	19	16.0S	146	48.0E	-
Wollongong	34	25.0S	150	54.0E	-

Other World Cities

Location Name	Latitude Deg	Min	Longitude Deg	Min	Alt m
AFRICA					
Cape of Good Hope	31	00.0S	23	00.0E	-
Cape Town	33	55.0S	18	22.0E	-
Johannesburg	26	15.0S	28	00.0E	-
EGYPT					
Cairo	30	08.0N	31	24.0E	-
HONG KONG					
Hong Kong	22	15.0N	114	11.0E	-
JAPAN					
Tokyo	35	45.0N	139	30.0E	-
NEW ZEALAND					
Auckland	36	53.0S	174	45.0E	-
Dunedin	45	53.0S	170	30.0E	-
Wellington	41	18.0S	174	46.0E	-
RUSSIA					
Moscow	55	45.0N	37	35.0E	-
SWEDEN					
Stockholm	59	20.0N	18	03.0E	-
TAZMANIA					
Hobart	43	00S	147	10.0E	-