

# Atomic Clock 6.0

## For Windows 95 and NT

### *Windows Clock Enhancement Utility*

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# Introduction

Atomic Clock was developed to provide users of the Microsoft Windows environment with a solution for accurately setting and maintaining their computer's date and time. Atomic Clock provides this service by using your modem to synchronize your system's internal clock via the Internet or directly with a cesium atomic clock at one of the following sites:

National Institute of Standards & Technology (NIST) in Boulder, Colorado  
United States Naval Observatory (USNO) in Washington, DC  
Telstra (Australia)  
Precision Timing (Sweden)  
National Electrotechnical Institute (Italy)  
Technical University of Graz (Austria)  
National Research Council (Canada)  
Federal Institute of Physics and Metrology (Germany)  
BBC Dial-In Time Service (United Kingdom)  
National Center for Metrology (Mexico)  
ONRJ, Rio de Janeiro (Brazil)  
Dutch Measuring Institute (Netherlands)  
Royal Observatory of Belgium (Belgium)

## Features:

Offers the most accurate synchronization possible with more atomic clocks than any other program. Time synchronizations can be performed using either direct modem connections or via WinSock-compliant connections to internet time services.

The DayMap section shows a world map displaying the areas of the world currently in sunlight and those in darkness.

The Events section displays the following items: Universal Time Coordinated (Greenwich Mean Time), the Local Apparent Sidereal Time, the current day of the year and the days remaining, the current DST starting and ending dates and detailed lunar phase information.

Displays the local/sunrise/sunset times for up to 15 (user-configurable) cities around the world.

The perpetual calendar can display and print a calendar for any year you specify.

Travelling users can easily change locale information without affecting the clock's accuracy.

View a map showing the world's standard time zones.

Determines the accuracy of your PC's internal clock. Atomic Clock can then make corrections to the system clock to compensate for its error rate, without the need for a telephone call.

Support for vocal time announcements in either twelve or 24-hour format. Time announcements can also be scheduled to occur at pre-defined intervals. Human male/female voice files are available which can be used for time announcements.

When minimized, Atomic Clock can optionally place the current system date and/or time in the title bar of the active window. The format of the of the title bar is highly user-configurable.

Contains a built-in scheduling utility can easily automate modem synchronizations, error

compensations, messages and programs.

See the time in any location, by specifying its area code.

Track time spent on projects, with detailed logging - just like a time clock.

Displays the estimated correct time and number of seconds the clock has deviated from the actual time, based on the internal clock's rated accuracy.

Support for automated Daylight Saving Time handling. Atomic Clock directly supports the DST rules for North America, United Kingdom, Continental Europe, New Zealand, Brazil, China and Australia. Users can also manually define DST starting/ending dates.

Atomic Clock will assist first time users to properly configure the program with a series of easy to understand questions.

Displays Universal Time Coordinated (UTC), sunrise/sunset times and a depiction of the current lunar phase.

Support for manual time adjustments.

Supports call logging. Any adjustment made to the internal clock is recorded, in detail, to a log file. This information can be printed or used to generate a graphical plot of historical accuracy readings.

Supports the international date/time settings as defined in the Windows Control Panel.

Support for local half-hour time zones.

Supports startup parameters which will allow Atomic Clock to automatically adjust the time by either synchronizing with the desired atomic clock or by adjusting the clock based on its rated accuracy and then optionally self-terminate.

Choose between using pre-defined or user-defined modem initialization strings. Hang-up strings are also user-configurable.

Displays the date and time of the last synchronization.

Supports a user-selectable digital or text interface.

Easy to use and configure - with automatic modem detection.

*Extremely low cost!*

# Configuration

When you select the **Configure...** button from the toolbar, the configuration dialog box will be displayed. The configuration dialog is divided into the following eight groups of related items, which can be accessed by either clicking on the desired tab or by pressing the desired hotkey accelerator combination:

## Hardware:

This section deals with hardware-related configuration options such as serial port selection and modem configuration.

[Detailed Hardware Section Help](#)

## Locale:

This section deals with the configuration of your locale information, such as [time zone](#) settings and [Daylight Saving Time](#) configuration.

[Detailed Locale Section Help](#)

## Dialing:

This section deals with the configuration of modem time service and miscellaneous items such as modem result codes, busy signal options, the synchronization time-out delay, and call waiting disabling.

[Detailed Dialing Section Help](#)

## Internet:

This section deals with the configuration of the Internet time synchronization options.

[Detailed Internet Section Help](#)

## Alerts:

This section deals with the configuration of system alerts.

[Detailed Alerts Section Help](#)

## Options:

This section deals with the configuration of various user interface elements and startup options.

[Detailed User Interface Help](#)

## Clock:

This section deals with the configuration of the title bar clock, voice clock and audio clock options.

[Detailed Clock Section Help](#)

## Display:

This section deals with the configuration of the digital/text displays.

[Detailed Display Section Help](#)

# Program Requirements

The following list displays the required hardware and software necessary to use Atomic Clock:

**Microsoft Windows 95/98 or NT 4.0**

**Hayes-compatible modem**

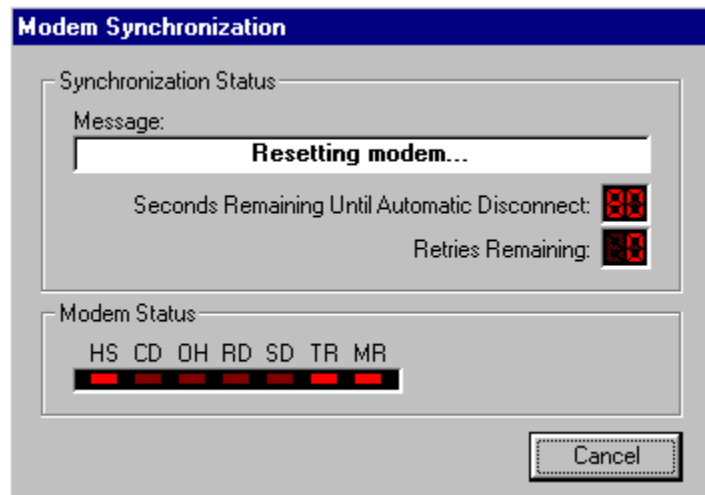
**10 MB hard disk space**

**Optional: Sound board (for playing time announcements)**

## Modem Synchronizations

Once the program has been properly configured, synchronizing your computer's date and time is very simple.

The dialing process can be initiated by either clicking on the **Synchronize Clock** toolbar button or the **Modem Synchronization** button in the Actions section. When you do, the following window will display the progress of the modem synchronization:



If the program has been configured correctly, the modem will dial the service you specified in the configuration section. Once connected, your internal clock will then be synchronized to atomic precision.

After the synchronization process is complete, Atomic Clock will automatically terminate the call.

*If at any time during the synchronization process you wish to abort, simply click on the **Cancel** button.*

If the selected service was busy, the call will automatically be disconnected.

**After the second synchronization is made, the program will have the necessary information to calculate the number of seconds (on average) your computer has either lost or gained per day since the last synchronization.**

## Adjustment Log

When you select the **Adjustment Log** button from the main program window, the detailed adjustment log will be displayed:

The screenshot shows the 'Adjustment Log' window with two tabs: 'Detailed Adjustment Log' (selected) and 'Accuracy Graph'. The table below lists adjustment entries. Below the table are radio buttons for 'Items to Display' and a section for 'Adjustment Totals (By Type)' with input fields for Time Synchronizations, Error Compensations, Manual Adjustments, and Adjustments Since Last Synchronization. At the bottom are buttons for OK, Print Log, Export Log Data..., Clear Log, and Help.

Date	Time	Service Used	Rated Accuracy	Seconds Adjusted
01/30/2000	12:02:07 PM	INTERNET	0.00	0
01/30/2000	01:08:45 PM	INTERNET	0.00	0
02/01/2000	05:42:30 AM	INTERNET	0.00	0
02/01/2000	05:47:38 AM	INTERNET	0.00	0
02/03/2000	05:03:52 AM	INTERNET	0.00	0
02/03/2000	06:35:06 AM	INTERNET	0.00	0
02/10/2000	01:13:08 PM	INTERNET	-0.27	2
02/24/2000	06:49:24 AM	INTERNET	-0.29	4
02/29/2000	08:11:15 AM	INTERNET	-0.79	4
02/29/2000	08:24:15 AM	INTERNET	0.00	0

Items to Display:  
☒ ALL ☐ Synchronizations ☐ Compensations ☐ Manual Adjustments

Adjustment Totals (By Type):  
Time Synchronizations: 90  
Error Compensations: 0  
Manual Adjustments: 40  
Adjustments Since Last Synchronization: 0

\* Denotes a manual adjustment which was used as a basis for computing accuracy.

Buttons: OK, Print Log, Export Log Data..., Clear Log, Help

Each adjustment (includes synchronizations with an external time service, manual adjustments (made using Atomic Clock) and adjustments made to compensate for the internal clock's error rate) Atomic Clock made to the system clock is displayed. The entries are sorted by the date and time each adjustment occurred. The following information is displayed:

### Date:

The date the synchronization/adjustment occurred.

### Time:

The time the synchronization/adjustment occurred.

### Service:

The service which was used to perform the synchronization. If Atomic Clock performed a correction to the system clock based on the internal clock's error rate, this field will contain "**ATOMIC**". If a manual clock adjustment was made, the word "**MANUAL**" will appear in this field.



If a time adjustment was performed manually and the **Use Adjustment as Basis for Computing Accuracy** option was selected, an asterisk will appear beside the word "MANUAL."

#### **Rated Accuracy:**

The internal clock's rated accuracy (calculated based on the time which was lost/gained since the last synchronization occurred). If Atomic Clock was used to perform a correction to the system's time, the most-recently calculated accuracy (obtained from the last synchronization with an atomic clock) is entered here.

#### **Seconds Adjusted:**

The number of seconds the internal clock was adjusted during the current operation.

*Running totals for each type of adjustment which occurred are also displayed.*

#### **Items to Display:**

You also have the option of filtering the log listing to display only synchronizations, error compensations, manual adjustments or all adjustment events.

If you wish to view a graphical plot of the accuracies calculated by Atomic Clock during each modem synchronization, select either the **Accuracy Graph** tab or press **Alt-G**. The accuracy readings will then be plotted in date order (up to seven of the most recent readings are displayed)

*Navigating the tab pages can also be accomplished by using the PgUp and PgDn keys.*

Select the **Print** button from this dialog to print a hard copy of the detailed adjustment log to the default Windows printer.

Select the **Export** button from this dialog to export the log to a text file.

If you wish to purge the contents of the synchronization log, select the **Clear Log** button. ***Once the log records have been removed, they cannot be recovered.***

## Compensating for Internal Clock Error Rate

Once the internal clock's accuracy has been determined, Atomic Clock can correct the system time to compensate for the amount of time it loses or gains - *without making a telephone call!*.

**Atomic Clock must first determine your internal clock's error rate (accuracy). This procedure is performed as follows:**

After two successful synchronizations with an external time service (such as the NIST or USNO), it knows two points in time where your clock's time was accurate.

After the second synchronization occurs, the amount of time which was lost or gained by the internal clock since the first synchronization was performed is computed.

The amount of time which has elapsed between the two synchronizations is determined. The accuracy is then calculated by dividing the amount of time which was lost or gained by the amount of time which has elapsed between the two synchronizations (taking into account any adjustments made to the system clock via this program). *This result is then converted to seconds per day.*

### **NOTE:**

**Ideally, the accuracy of your internal clock is best determined when the two synchronizations occur at least one or more days apart. This will give your internal clock the necessary time to show its "true colors."**

With this information, the program can make adjustments to your internal clock which correct for its error rate. This process can be initiated by selecting **Error Compensation...** from the Status tab

### **NOTE:**

**Some PC clocks are not only inaccurate, but inconsistent with their error rates as well. If you discover that the computed error rate fluctuates wildly from synchronization to synchronization, it is recommended that you do not use the error compensation feature. It is considered normal, however, for the computed accuracy to vary slightly.**

# Startup Options

Atomic Clock provides the ability to automate the following functions when the application is started:

**Synchronizing the clock via modem**  
**Synchronizing the clock via the Internet**

**Adjusting the system time, based upon the internal clock's calculated error rate (accuracy).**

**Starting the application minimized.**

## Startup Options:

### Perform Startup Operation:

When this option is selected, you can choose to have one of the following operations performed when the application is started:

Modem Synchronization  
Internet Synchronization  
Error Compensation

### Run Silent

If this option is selected, no progress/error messages will be displayed.

### Run Minimized

If this option is selected, the application will start in the minimized state.

## NOTE:

**Previous versions utilized startup parameters, which are no longer available in this version.**

**synchronize**

To accurately match the date and time of the PC's internal clock with an outside source (i.e., the cesium atomic clocks located at either the USNO, NIST, Italy, Austria, Sweden, Australia, Canada, Germany or the UK) via a direct modem connection or the Internet.

## **USNO**

The United States Naval Observatory atomic clock located in Washington, DC.

The USNO is an official source, along with the NIST, for standard time in the USA. The positional measurement of celestial objects for purpose of time keeping and navigation has been the main work of the observatory since its beginning. In 1833 the first small observatory building was constructed near the Capitol. Time signals for the public were first given in 1844 by the dropping of a ball from a staff on an observatory building. In 1904 the observatory broadcast the world's first radio time signals.

The USNO is specifically responsible for standard time, time interval, and radio-frequency standards for use by the U.S. Department of Defense and its contractors. Both the USNO and the NIST maintain independent time standards, but since October 1968 they have been coordinated to maintain synchronization to approximately one microsecond. Both agencies cooperate with the Bureau International de l'Heure in Paris.

This service has less phone lines than the NIST and is generally quite busy. Modem connections can only be made at 1200 baud.

## **NIST**

The National Institute of Standards and Technology atomic clock located in Boulder, CO. This service has more available phone lines than the USNO and is generally the preferred service to use. Modem connections can be made at either 300, 1200 or 9600 baud. If you are using a high-speed (14.4 or 28.8K) modem, connecting with the NIST at 9600 baud tends to produce the best results.

**daylight saving time (DST)**

The time observed when clocks and other timepieces are set ahead, usually by one hour, so that the sun will rise and set later in the day. DST conserves lighting power and provides more usable daylight hours for afternoon and evening activities.

First adopted during World War I by the U.S. and other countries, DST in the U.S. currently extends from the first Sunday in April to the last Sunday in October.

If you wish, Atomic Clock can be configured to automatically handle DST transitions.

**accuracy**

The calculated error rate of your computer's internal clock, measured in the number of seconds it loses (or gains) per day.

Atomic Clock can calculate your clock's accuracy after two successful synchronizations have occurred.



# International Calling

Atomic Clock has the ability to synchronize your PC's internal clock with time services spanning three continents. This ability also introduces the inherent complexities of international dialing.

## Synchronizing with foreign time services from the United States:

**To enable Atomic Clock to dial a remote service from the United States, you must modify the phone number for each foreign service in the following manner:**

### European Services:

*Insert the international access code (011) and remove the plus sign (+) from the telephone number, for example:*

**Austria** - 011 43 316472366

## Synchronizing with foreign time services from outside the United States:

Depending on your physical location, your telephone service may have special requirements for calling certain countries. Consult your telephone operator for assistance.

**Please note that the European time services have a suffix for the country/city codes which may need to be removed to enable local calling access.**

# Common Problems and Solutions

The following is a list of common problems and their solutions.

## Difficulties are encountered after dialing has completed:

**The modems connect (screeching sound, followed by silence), but the countdown delay is reached without a successful synchronization.** There are many possible causes for this type of problem. The time service could be busy, or your modem was unable to properly "handshake" with the time service modem. Try selecting an alternate modem initialization string from the Configuration section, or using one of the following:

```
AT &F N S37=5
AT &F &C1 &D2 &K4 S7=90 S95=44
AT &F &C1 &D2
AT &F &C1 &D2 R1
```

If the same problem occurs, consult your modem reference manual for the necessary commands to disable error correction and data compression.

This is perhaps the most common first-time error, because there are a variety of likely causes: *(To assist in determining the cause of the problem, make sure that SILENCE MODEM option has not been selected in the configuration dialog. This will enable you to hear the progress of the connection)*

Likely causes:

**The phone number (or dialing prefix) is incorrect.** Select RESTORE DEFAULTS from the configuration dialog. Ensure that the time zone, daylight saving time and COM port options are properly configured. Edit the phone number of the service to include any necessary dialing prefix (such as 8 for WATTS). If calling to a time service located in another country, refer to the International Calling help topic.

**An improper COM port was selected in the configuration section.** Select the configuration dialog and choose **Auto-Detect Modem**. Atomic Clock will then determine the proper communications port to which your modem is attached.

## After performing a synchronization, the time is incorrect:

This is most-likely the result of an improperly configured time zone. Most time services report the time using UTC (Universal Time Coordinated) format. Atomic Clock automatically converts this time to that which is appropriate for your time zone. Depending on your physical location, ensure that the proper time zone has been selected. Another problem may be caused by Daylight Saving Time. Some countries, including the United States, move their clocks forward one hour in the summer months. If your area is currently using Daylight Saving Time, ensure that this option is checked.

## You encounter difficulty connecting to the BBC time service:

The BBC Dial-In Time service is most difficult service with which to make a successful connection. You may want to try connecting at a different baud rate and/or selecting the "Use CCITT V.21/V.22 Connection Protocol" option. Other alternate modem initialization strings to use include:

```
AT &F N S37=5
```

```
AT &F &C1 &D2 &K4 S7=90 S95=44  
AT &F &C1 &D2  
AT &F &C1 &D2 R1
```

If the difficulty persists, you may wish to consider trying a different time service, such as the ones in Germany or Austria. Many UK users have reported that since the BBC service is a premium number, it is less expensive and easier to use the other services instead.

#### **The modem will not pick up the phone:**

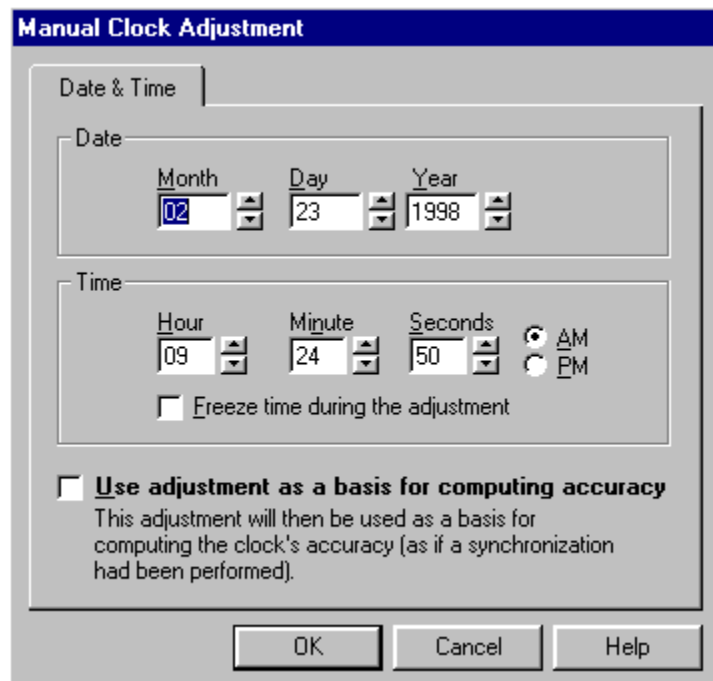
This may be caused by many factors (like a modem which is not turned on). Other factors which may cause this problem are: Improper communications port selection (select CONFIGURE and use Atomic Clock's AUTO-DETECT MODEM feature) or an incompatibility with Atomic Clock's modem initialization string. If the problem is being caused by an initialization string incompatibility, try the following: Select USE ALTERNATE INITIALIZATION STRING from the configuration dialog. Do not enter any initialization codes. Next, reset the modem (power off the modem, if external; if internal, power down your machine and restart).

**BBC Dial-In Time Service**

The BBC's broadcast time signals are derived from a highly accurate time standard maintained at the Broadcasting House, London. It should be noted that this service is only available to those users who are calling from within the United Kingdom.

## Manual Clock Adjustments

If you so desire, you can adjust the system clock manually. Atomic Clock performs this function in a manner similar to the Windows Control Panel. To perform a manual adjustment to the system date/time, select **Manual Adjustment** button from the toolbar. The following dialog box will be displayed:

The image shows a 'Manual Clock Adjustment' dialog box. It has a title bar with the text 'Manual Clock Adjustment'. Inside, there are two main sections: 'Date & Time' and 'Time'. The 'Date & Time' section contains three spinners for 'Month' (02), 'Day' (23), and 'Year' (1998). The 'Time' section contains three spinners for 'Hour' (09), 'Minute' (24), and 'Seconds' (50), followed by radio buttons for 'AM' and 'PM'. Below these is a checkbox labeled 'Freeze time during the adjustment'. At the bottom, there is a checkbox labeled 'Use adjustment as a basis for computing accuracy' with a descriptive text below it: 'This adjustment will then be used as a basis for computing the clock's accuracy (as if a synchronization had been performed)'. At the very bottom are three buttons: 'OK', 'Cancel', and 'Help'.

The formats of the date and time are displayed using the Short Date and Time formats specified in the International Settings of the Control Panel.

### To change the date and time:

Select the part of the date or time you want to change, and then enter the new value.

or

Click the up or down arrow to increase or decrease the number by one.

Choose the OK button.

### Options:

#### Freeze Time During the Adjustment:

Select this option to keep the seconds counter from continuing to count (as does the Control Panel).

#### Use Adjustment as a Basis For Computing Accuracy:

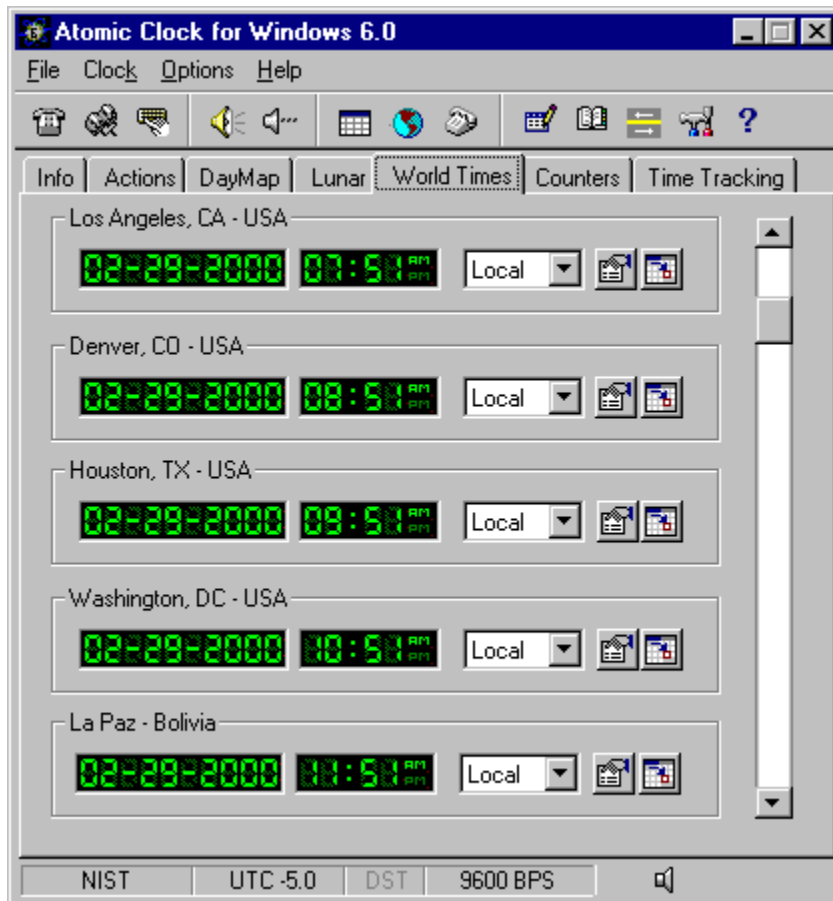
Select this option in order to treat the current manual adjustment in a manner similar to a modem

synchronization. This adjustment will then be used as a basis for computing the accuracy.

*This option is useful if you do not wish to call an atomic time service, but instead use a radio time signal as a basis for obtaining an accurate time reference.*

## World Times

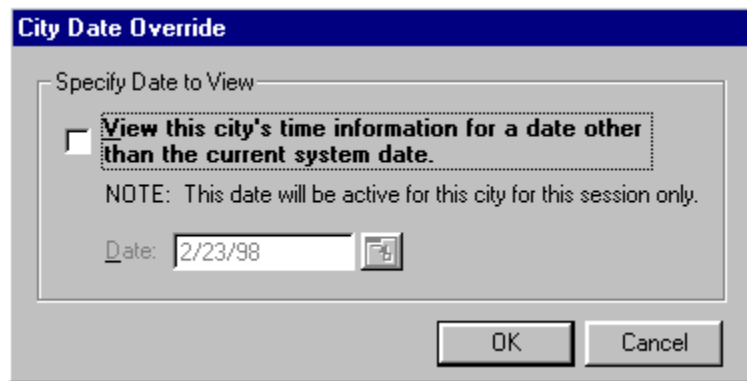
Atomic Clock can display the dates/times for fifteen (user-configurable) cities around the world at one time. You can also optionally view the sunrise or sunset times for each location:



Each city can be configured by selecting its associated Setup button.

When viewing the cities, only five can be displayed at once. To view other pages of cities, use the vertical scroll bar.

If you would like to view the sunrise/sunset times for a particular city for a date other than the current, select the **Override** button beside the city. The following dialog will be displayed:



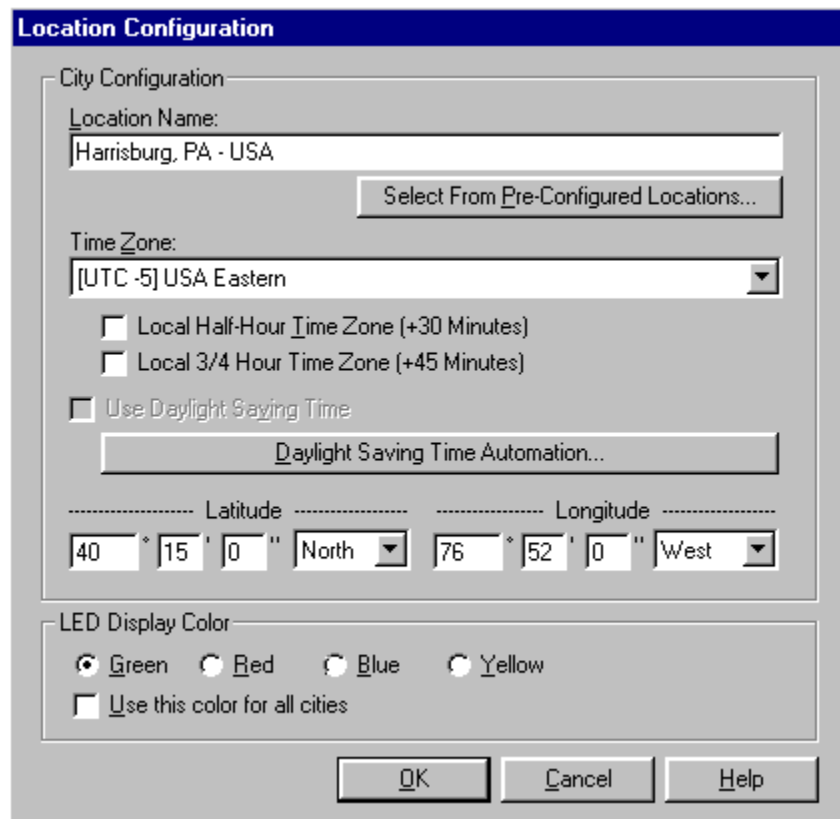
Enter the date you wish to view and click OK.

The city whose date that was just overridden will display the sunrise/sunset times for the new date. The overridden date will remain active until you disable the override function or the program is restarted.



## City Configuration

This section is used to define the properties of the city you selected from the Times in Cities Around the World dialog window. This section is also used to define your physical location in the Configuration section:



The screenshot shows a dialog box titled "Location Configuration". It contains several sections: "City Configuration" with a "Location Name" text field (containing "Harrisburg, PA - USA") and a "Select From Pre-Configured Locations..." button; "Time Zone" with a dropdown menu (showing "[UTC -5] USA Eastern") and three checkboxes for "Local Half-Hour Time Zone (+30 Minutes)", "Local 3/4 Hour Time Zone (+45 Minutes)", and "Use Daylight Saving Time", along with a "Daylight Saving Time Automation..." button; "Latitude" and "Longitude" fields with dropdowns for direction (North, West); and "LED Display Color" with radio buttons for Green, Red, Blue, and Yellow, and a checkbox for "Use this color for all cities". At the bottom are "OK", "Cancel", and "Help" buttons.

### Location Name:

Enter the name of the city as it should appear in the frame.

### Select from Pre-Configured Locations:

If you prefer, you can select from a pre-defined list of cities around the world. Atomic Clock will then automatically configure the name, time zone and (if available) the automated daylight saving time rules for the location you select.

### Time Zone:

Select the time zone in which the city is located. *This information is used to determine the city's current time in relation to yours.*

### Local Half-Hour Time Zone:

Specify whether or not this city is located in a local half-hour time zone (in which case Atomic Clock will add thirty minutes to its time, relative to Universal Time Coordinated). *This information is used to*

*determine the city's current time in relation to yours.*

#### **Local 3/4-Hour Time Zone:**

Specify whether or not this city is located in a local 3/4-hour time zone (in which case Atomic Clock will add forty five minutes to its time, relative to Universal Time Coordinated). *This information is used to determine the city's current time in relation to yours.*

#### **Use Daylight Saving Time:**

Specify whether or not this city is currently using Daylight Saving Time. *This information is used to determine the city's current time in relation to yours.*

If you did not select a pre-defined location for which Atomic Clock automatically supports DST, you can select the **Daylight Saving Time Automation** button. You then have the option of selecting from a list of pre-configured DST rules or define the DST start/end dates manually.

#### **Latitude:**

The latitude of the physical location defined above. Entries must be entered in degrees, minutes, seconds north or south of the equator. This information is necessary to properly compute sunrise/sunset times.

#### **Longitude:**

The longitude of the physical location defined above. Entries must be entered in degrees, minutes, seconds east or west of the prime meridian. This information is necessary to properly compute sunrise/sunset times.

#### **LED Display Color:**

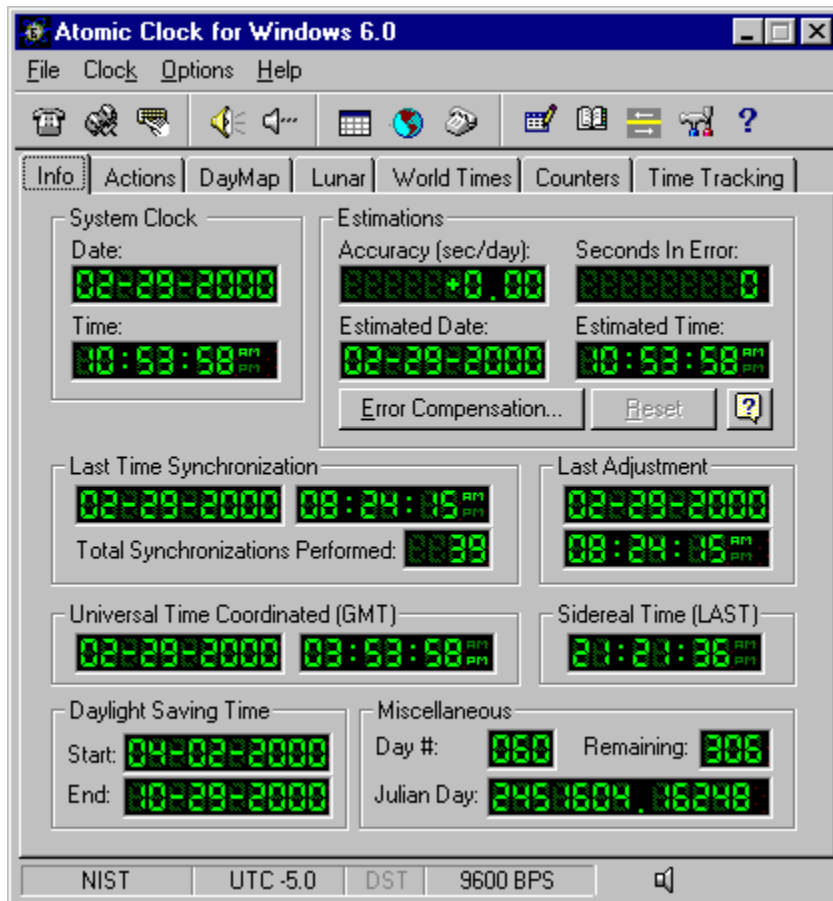
Select the color of the display LEDs (available only if the digital display was selected in the main configuration section. If you wish to have all cities display using this color, select the **Use this color for all cities** check box.

If you prefer, you can select a city from a list of pre-defined locations.

To save any changes that you have made, select **OK**. If you wish to abort the changes you have made, select **Cancel**.

## Information Section

This section displays the current system date and time as reported by your computer's internal clock, as well as other useful information:



### Estimations Section:

#### Accuracy:

The estimated amount of time your system clock will deviate from real time in one day (measured in seconds per day).

This value is determined by the amount of time the internal clock loses or gains between modem synchronizations. The best accuracy calculations are made when at least one or more days has elapsed between modem synchronizations.

#### Seconds in Error:

Based upon the internal clock's rated accuracy, the estimated number of seconds your internal clock has deviated from real time since the adjustment to the system clock was performed.

#### Estimated Date/Time:

Based upon the internal clock's rated accuracy, the estimated correct date and time.

**NOTE:**

**This section is only enabled after two modem synchronizations have been performed (so that an accuracy reading could be obtained).**

The following functions are also included within this section:

**Error Compensation:**

This option is used to adjust the system clock to reflect the estimated correct date/time.

**Reset:**

This option is used to reset the calculated accuracy to 0 (zero), in the event an abnormally large value was reported during the last modem synchronization. If the estimated accuracy is currently 0 (zero), this option will be disabled.

**Universal Time Coordinated (UTC):**

Universal Time Coordinated or Greenwich Mean Time (GMT) is the time on the Greenwich meridian, used as the zero for longitudinal measurement, according to the Mean Sun. The Mean Sun is an imaginary body that moves around the celestial equator with constant angular speed, making a complete circuit with respect to the vernal equinox in one tropical year. GMT was established as the world standard in 1884. In 1928 it was also given the name Universal Time Coordinated; the International Time Bureau in Paris now coordinates astronomical measurements and atomic clock readings from around the world to arrive at Universal Time Coordinated.

**Local Apparent Sidereal Time:**

Sidereal, or stellar, time is a system of time reckoning based on the rotation of the Earth with respect to the celestial sphere, the imaginary sphere of the heavens surrounding us. As the Earth rotates, one sidereal day is the time that it takes for a star again to pass directly above a given observation point. Sidereal time is used in astronomical work. The sidereal day is about four minutes shorter than the solar day. More precisely, 1 mean solar day = 1.0027379093 sidereal days.

**Daylight Saving Time:**

If you configured Atomic Clock to automate the process of DST, the current DST starting and ending dates will be displayed.

**Date Information:**

**Day of Year:**

The current day of the year.

**Days Remaining:**

The number of days remaining in the current year.

**Greenwich Julian Day:**

Astronomers use the Julian day to compute the number of days between two dates by simply

subtracting one Julian date from another. The Julian day shown is the Julian day at the Greenwich meridian.

The Julian day of a given day is equal to the number of days since noon, January 1, 4713 BCE, the start of the Julian period. This is the most recent time that three calendar cycles began on the same day:

The 28-year solar cycle, after which dates in the Julian calendar return to the same day of the week.

The 19-year lunar cycle, after which the phases of the moon return to the same dates in the year.

The 15-year indiction cycle, used in ancient Rome to regulate taxes.

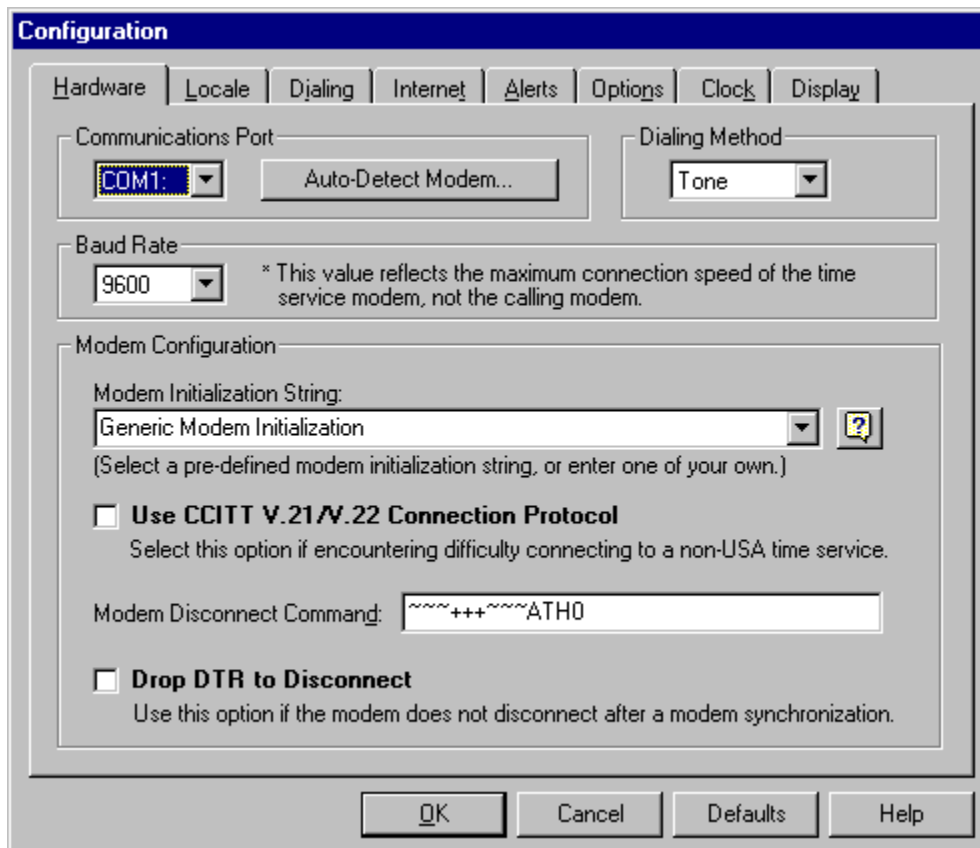
The Julian period will take 7,980 years to repeat ( $28 \times 19 \times 15$ ).

Joseph Scaliger conceived of the Julian period in 1582 - naming it after his father, Julius.

**Telstra**

The Australian time service, Telstra (formerly known as Telecom Australia), has local access numbers in the following cities: Adelaide, Brisbane, Darwin, Hobart, Melbourne, Perth and Sydney. Since these services report the local time for the state in which they are located, they should only be used if you are calling from within the state in which the service is located.

## Hardware Configuration Options



The following is an explanation of each available option:

### Communications Port:

Specify the COM port to which your modem is attached. Atomic Clock will inform you if you should make the wrong selection, or if it encounters difficulty during initialization.

*If you desire to have Atomic Clock automatically determine the port to which your modem is attached, select the **Auto-Detect Modem...** button. If an active modem is detected, Atomic Clock will automatically make the correct port choice.*

### Dialing Method:

If your telephone service does not support tone dialing capabilities, select pulse.

### Baud Rate:

The NIST supports connections at either 300, 1200 or 9600 baud. The USNO only supports 1200 baud connections.

*As of the time Atomic Clock was released, the atomic clock modems will only support connection speeds at 1200 BPS (the NIST can also connect at 300/9600 BPS).*

**If you're using a 28.8K or faster modem, the time service which is easiest to use is the NIST at 9600 BPS.**

#### **Modem Configuration:**

You can choose to either use one of Atomic Clock's default generic modem initialization strings, or you can enter one of your own. Atomic Clock's initialization strings work with most Hayes-compatible modems. If you are not encountering difficulties, use the generic initialization string.

**If Atomic Clock times out before a synchronization occurs, try selecting another initialization string from the combo box; if that does not work, consult your modem reference manual for the necessary commands to disable error correction and data compression.**

#### **Use CCITT V.21/V.22 Connection Protocol:**

If you are encountering difficulty connecting with a non-U.S. time service, select this option.

#### **Modem Disconnect Command:**

If the default modem hang-up command "**~~~+++~~~ATH0**", does not cause your modem to hang up the telephone, consult your modem's reference manual and insert the necessary command.

#### **Drop DTR to Disconnect:**

Select this option if Atomic Clock fails to disconnect (hang up) the phone after performing a modem synchronization.



## Locale Configuration Options

The screenshot shows a 'Configuration' dialog box with a blue title bar. It has several tabs: 'Hardware', 'Locale' (which is selected), 'Dialing', 'Internet', 'Alerts', 'Options', 'Clock', and 'Display'. The 'Locale' tab contains the following elements:

- A section titled 'Your Physical Location' with a text box for 'Location Name' containing 'Harrisburg, PA - USA' and a 'Pre-Defined Locations...' button.
- Latitude and Longitude fields. Latitude is set to 40° 15' 0" North. Longitude is set to 76° 52' 0" West.
- A 'Your Physical Time Zone:' dropdown menu set to '[UTC -5] USA Eastern'.
- Two checkboxes: 'Local Half Hour Time Zone (+30 Minutes)' and 'Local 3/4 Hour Time Zone (+45 Minutes)', both of which are unchecked.
- An unchecked checkbox labeled 'Is Daylight Saving Time Currently In Effect?'. Below it is a text box with the instruction: 'Select this option to manually set your locale's current DST status. If you wish to automate this process, select the "DST Automation" button.'
- A 'Daylight Saving Time Automation...' button.

At the bottom of the dialog are four buttons: 'OK', 'Cancel', 'Defaults', and 'Help'.

The following is an explanation of each available option:

### Your Physical Location:

This information is necessary for Atomic Clock to properly adjust the time received from the selected time service into your local time. This information is also used to calculate information in the [Events Section](#).

You can choose to either define your physical location manually or select your location from a list of [pre-defined cities](#). If you select your location from the pre-defined cities list (by clicking on the **Select from Pre-Configured Locations** button), the following information will automatically be completed for you. If you opt to complete the following information manually, please be as accurate as possible, since Atomic Clock uses this information extensively to perform its calculations.

### Location Name:

The name of your physical location. (Example: Washington, DC - USA)

### Latitude:

The [latitude](#) of the physical location defined above. Entries must be entered in degrees, minutes, seconds north or south of the [equator](#).

### Longitude:

The longitude of the physical location defined above. Entries must be entered in degrees, minutes, seconds east or west of the prime meridian.

### Time Zone:

Select the time zone in which you reside. Atomic Clock receives the date/time stamp from the atomic clocks of most services in the Universal Time Coordinated (UTC) format. Adjustments are then made to accurately reflect the correct time for your time zone.

#### NOTE:

**The Telstra branches report the local time for the state in which they are located. For these services only, Atomic Clock will set your system clock to the date/time received from the selected Telstra branch.**

### Local Half-Hour Time Zone:

Select this option if you live in a half-hour time zone. If this option is selected, Atomic Clock will add thirty minutes to the time received from the selected time source during the next modem synchronization.

#### NOTE:

**The Telstra branches report the local time for the state in which they are located. For these services only, Atomic Clock will set your system clock to the date/time received from the selected Telstra branch.**

### Local 3/4 Time Zone:

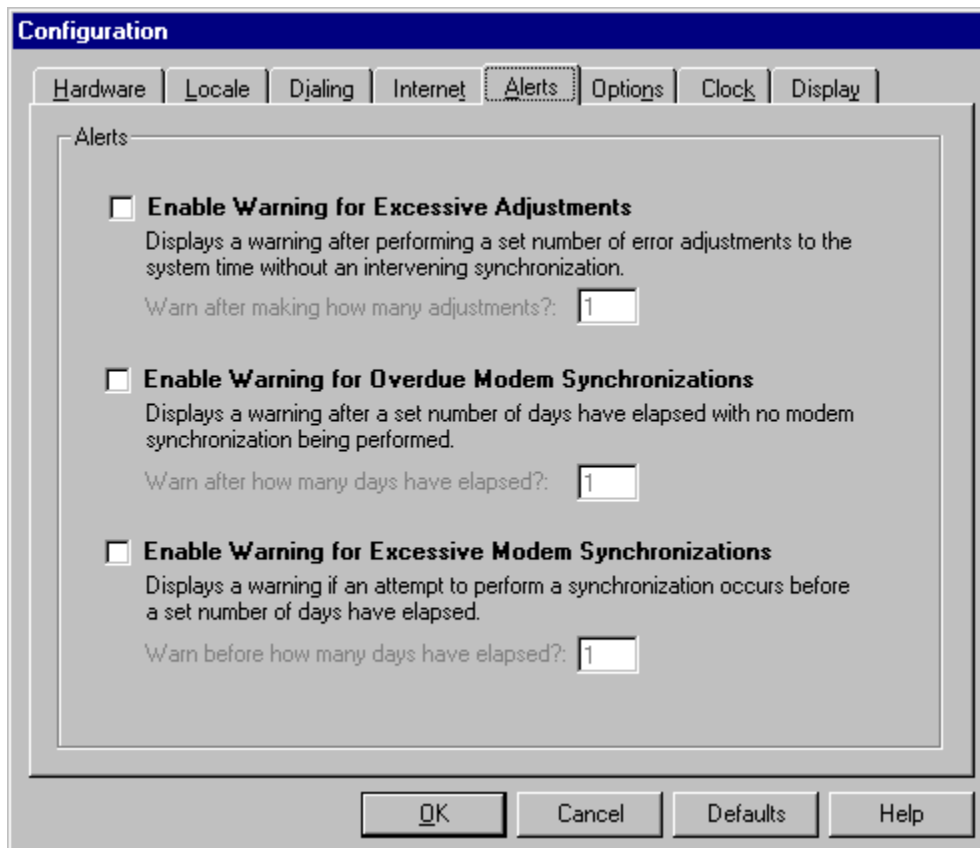
Only select this option if you live in Nepal.

### Use Daylight Saving Time:

If the time zone in which you reside is currently utilizing daylight saving time, check this box. If the area in which you live does not utilize DST at all, make sure this box is **not** checked.

If you should wish Atomic Clock to automate the process of DST start/end dates, select the **Daylight Saving Time Automation** option.

## Alerts



The following is an explanation of each available option:

### Enable "Excessive Adjustment" Warnings:

This option, when enabled, will have Atomic Clock inform you when a specified number of adjustments (error compensations / manual adjustments) have been made to the system clock without an intervening modem synchronization.

*This alert is useful in maintaining accurate time by ensuring that the current accuracy of the clock is calculated on a regular basis.*

### Enable Overdue Modem Synchronization Warnings:

This option, when enabled, will have Atomic Clock inform you when a specified number of days have elapsed since you last performed a modem synchronization.

*This alert is useful in maintaining accurate time by ensuring that modem synchronization occur on a regular basis.*

### Enable "Excessive Modem Synchronization" Warnings:

This option, when enabled, will have Atomic Clock alert you in the event you try to perform a modem

synchronization before a specified number of days has elapsed.

*Performing synchronizations closer than one day apart severely limits Atomic Clock's ability to compute your internal clock's accuracy.*

## Dialing Options

The screenshot shows a 'Configuration' dialog box with a blue title bar. It has several tabs: Hardware, Locale, Dialing (selected), Internet, Alerts, Options, Clock, and Display. The 'Dialing' tab is active, showing three sections: 'Modem Time Synchronization Source', 'Dialing Options', and 'Modem Result Codes'. In the 'Modem Time Synchronization Source' section, 'Time Service to Use:' is set to '[USA] - National Institute of Standards & Technology (Boulder, CO)' and 'Telephone Number (add/adjust dialing prefix, if necessary):' is '1 (303) 494-4774'. The 'Dialing Options' section has three checkboxes: 'Retry synchronization if the selected service is busy' (unchecked), 'Disable Call Waiting (ONLY use if you have call waiting installed)' (unchecked), and 'Silence Modem' (unchecked). There are also numeric input fields for 'Number of retries to attempt before aborting the modem synchronization:' (set to 1), 'Disable Command:' (set to 1170), and 'Seconds To Wait Until Automatic Timeout:' (set to 80). The 'Modem Result Codes' section has 'Busy Signal:' set to 'BUSY' and 'Connection:' set to 'CONNECT'. At the bottom are buttons for OK, Cancel, Defaults, and Help.

The following is an explanation of each available option:

### Time Service To Use:

#### NOTE:

**The BBC Dial-In Time Service can only be used if you are calling from within the United Kingdom.**

**Australian users should use the Telstra branch that is located within their state.**

**The Italy and Sweden services can only be used if you are calling from within their respective countries.**

### Telephone Number:

When you specify a time service, its telephone number will appear in this field. It may be necessary to alter the prefix of the numbers for one or more of the following reasons:

**In the event your telephone system requires connecting to outside line (e.g.: WATTS).** If so, change the first character "1" to whatever numbers you have to dial to get access to an outside line.

**Example:**

You wish to connect to the NIST time service, but you need to dial 9 to get an outside line. Change the telephone number to the following:

9, (303) 494-4774

*The comma is used to enter a slight pause.*

**In the event you need to dial internationally to access a foreign time service.** See International Calling.

**Dialing Options:****Retry Synchronization if Selected Service is Busy:**

Select this option if you wish Atomic Clock to automatically make further attempts at performing a modem synchronization, in the event the selected service is currently busy.

**Maximum Number of Retries:**

Enter the maximum number of attempts you wish Atomic Clock to make if the selected time service is busy.

**Disable Call Waiting:**

If you wish to disable call waiting during the synchronization process, select this option. You will also be given the option of modifying the dialing command which is used to disable call waiting.

**NOTE:**

**Only select this option if you have call waiting installed on the telephone line connected to the modem; otherwise, the program will not be able to dial.**

**Silence Modem:**

If you do not wish to hear the modem during the call, check this box.

**Seconds to Wait Until Automatic Timeout:**

This field contains the number of seconds Atomic Clock will wait before automatically disconnecting the call. If Atomic Clock automatically disconnects the call before the synchronization process has completed, increase this value.

**Modem Result Codes:****Busy Signal Modem Result Code:**

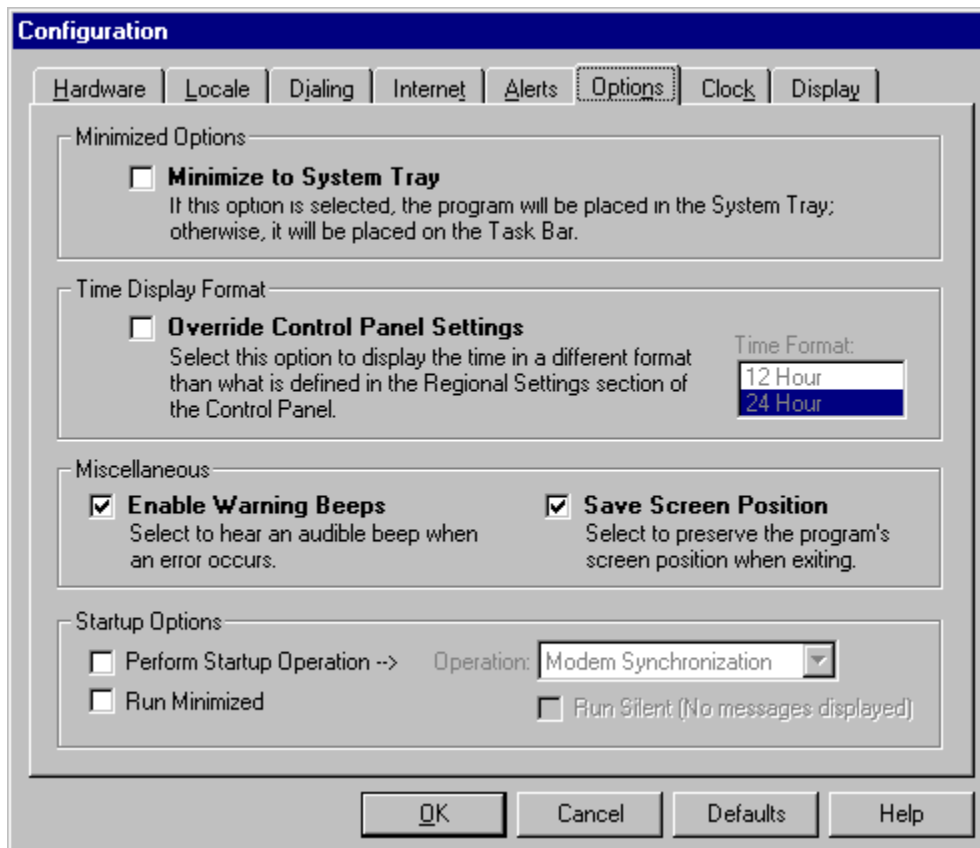
Enter the result string the modem sends when a busy signal is encountered. This field will default to BUSY.

**Modem Connection Result Code:**

Enter the result string the modem sends when a connection has been made. This field will default to CONNECT.



## General Options



The following is an explanation of each available option you have in order to customize the user interface:

### Minimized Options:

If you wish Atomic Clock to be minimized to the System Tray, select this option; otherwise, Atomic Clock will be minimized to the TaskBar.

To restore Atomic Clock when it is minimized to the System Tray, simply double-click on the icon. Alternatively, you can right-click on the icon to access common program operations.

### Time Display Format:

#### Override Control Panel Settings:

Atomic Clock will use the international settings (as defined in the Windows Control Panel) to determine the display format of the time displays.

Select this option if you wish to override those settings and force Atomic Clock to display all time items in a particular format.

#### 12 Hour/24 Hour Format:



This option, which is only enabled if the Override Control Panel Settings option was selected, is used to specify the format (12 or 24 hour) of the time displays used by Atomic Clock.

#### **Miscellaneous:**

##### **Enable Warning Beeps:**

If you wish to enable beeps Atomic Clock uses to draw attention to a particular event (such as an error or warning message), ensure that the **Enable Warning Beeps** check box is selected.

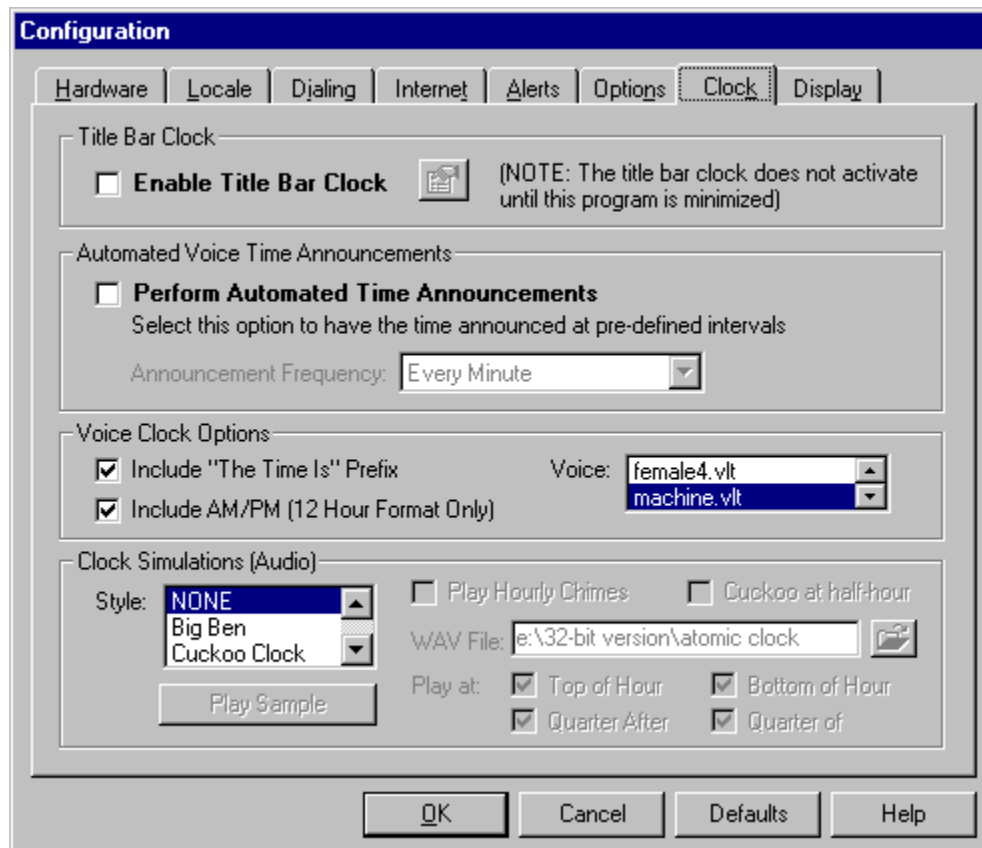
##### **Save Screen Position:**

Select this option to preserve Atomic Clock's screen location for each session. If this option is not selected, Atomic Clock will be centered on your screen.

#### **Startup Options:**

Click here for detailed [startup option](#) information.

## Clock Options



The following is an explanation of each available option you have in order to customize how Atomic Clock controls various clock operations.

### Title Bar Clock:

This section deals with the configuration of Atomic Clock's title bar clock options.

### Automated Voice Time Announcements:

#### Perform Automated Time Announcements:

Select this option if you wish to have the time announced at pre-defined intervals (defined below). Automated announcements will continue until this option is de-selected or the program is closed.

#### Announcement Frequency:

Specify the amount of time between each successive time announcement.

### Voice Clock Options:

#### Include "The Time Is" Prefix:

Select this option to have the phrase, "The time is", precede the time when it is being announced.

**Include AM/PM Indicator:**

Select this option to the AM or PM spoken after the time is announced. *This option is only available when a 12 hour time format is in effect.*

**Voice:**

If you would like to change the voice used by the voice clock, select a different voice file from the list. Voice files have an extension of .VLT.

**Clock Simulations (Audio):**

**Style:**

Select the clock simulation you wish to activate.

Big Ben will play a tune at 15, 30, 45 minutes after the hour and at the top of the hour. You can optionally select to play hourly chimes.

The cuckoo clock will sound hourly chimes (cuckoos) at the top of the hour. Optionally, you can have a chime (cuckoo) at the half-hour mark.

This ships bells simulation follows the US Navy standard.

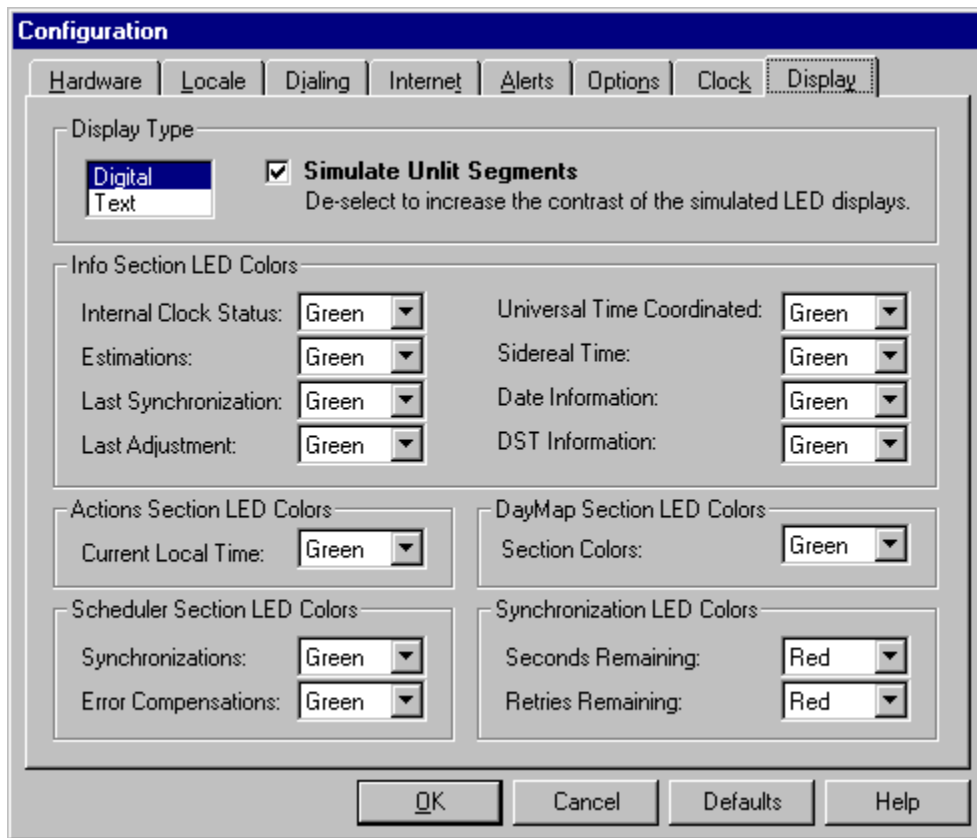
Custom:

If this option is selected, you will be able to specify a WAV file to play, as well as the time(s) it should play.

**Play Sample:**

Select this option to play a sample of the desired clock.

## Display Options



The following is an explanation of each available option you have in order to customize how Atomic Clock will display information.

### Display Type:

Select the type of display format (digital or text) you prefer. The selection you make will be used throughout the entire program.

If you opt to use the digital display, you can also change the colors of each display to reflect your personal preference. The colors from which you can choose are green, red, blue and yellow.

### NOTE:

**The format and color of the LED displays used in the World Times and Counters sections are controlled through each city's/counters property option.**

### Simulate Unlit Segments:

Select this option if you wish to have Atomic Clock "simulate" the unlit segments of the simulated LED displays. If you find the LEDs difficult to read, you can improve the contrast between the lit and unlit segments by choosing to disable this option.

**LED Colors:**

The LED Color Display options are available only if the digital display option was selected. Use the combo box located beside the entry you wish to change in order to select the desired color.

## Title Bar Clock Configuration

Atomic Clock has the ability to optionally place the current system date and/or time in the title bar of the currently-active window when Atomic Clock is minimized.

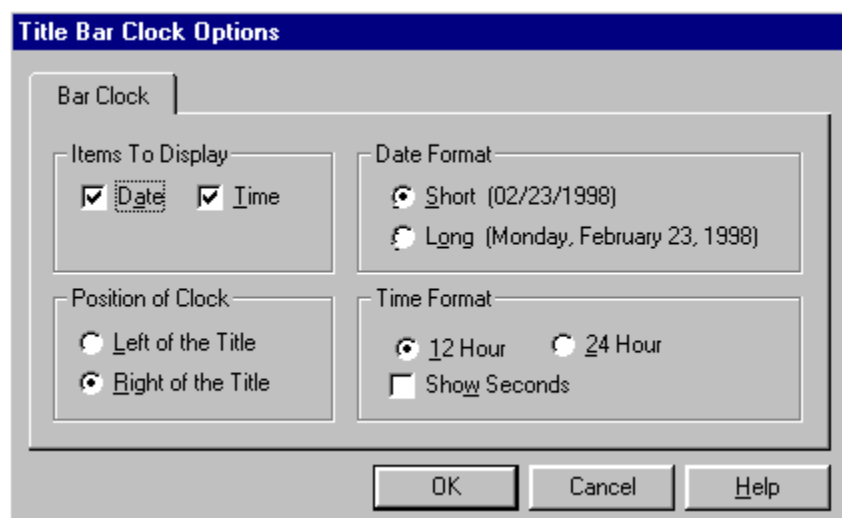
The following configuration options are available when selecting **Options** from the Interface page of the Configuration Section.

### Enable Title Bar Clock:

Select this option to enable/disable Atomic Clock's title bar clock functionality. If this option is selected, Atomic Clock (when minimized) will display the date and/or time in the currently-active window's title bar.

### Options:

When the **Options** button is selected, the following dialog box will be displayed from which you can specify the format of the title bar clock:



The following configuration options are available:

### Items to Display:

#### Date:

Select this option to include the date in the title bar of the active window.

#### Time:

Select this option to include the time in the title bar of the active window.

### Position of Clock:

Select the appropriate radio button to specify if the clock information should be displayed to the

left or right of the window's existing title.

#### **Date Format:**

The following options (which are only available if the **Date** option was selected from the **Items To Display** section) are used to specify how the date text will be displayed on the title bar of the active window:

##### **Short Format:**

If this option is selected, the date will be displayed using the short date format, as defined in the international section of the Windows Control Panel.

Example: 10/31/95

##### **Long Format:**

If this option is selected, the date will be displayed using the long date format, as defined in the international section of the Windows Control Panel.

Example: October 31, 1995

#### **Time Format:**

The following options (which are only available if the **Time** option was selected from the **Items To Display** section) are used to specify how the time text will be displayed on the title bar of the active window:

##### **12 Hour / 24 Hour:**

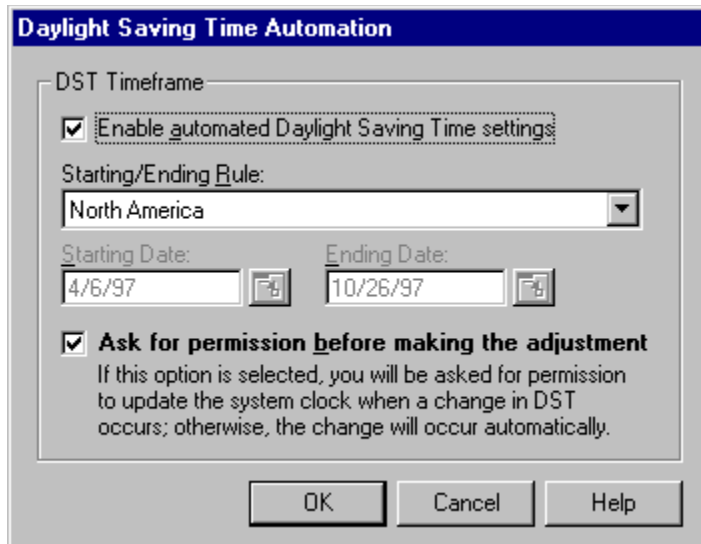
Select the desired time format (12 or 24 hour) you wish to use. The format will initially default to the time format settings as defined in the international section of the Windows Control Panel.

##### **Show Seconds:**

Select this option if you wish to include the seconds in the time display.

## Daylight Saving Time Automation

Atomic Clock can be easily configured to automate the transition between Daylight Saving Time (DST) and Standard Time. When configured for automatic DST operation, Atomic Clock will automatically inform you of the change and add/subtract an hour to/from the current time.



Atomic Clock has built-in DST rules for the following areas of the world:

- North America**
- British Isles**
- Continental Europe**
- China**
- Brazil**
- New Zealand**
- Australia (in the states where DST is utilized)**

You can also manually enter the DST start and end dates.

### NOTE:

Although Windows has built-in support for DST, it is best that you disable it in order to prevent the time from being changed twice (by Atomic Clock and Windows) during a change in DST. Letting Atomic Clock take care of the change will ensure that the times contained in the Cities section remain accurate.

### Ask for Permission Before Making The Adjustment:

Select this option if you wish to have Atomic Clock ask for permission before making any DST-related time change to your system clock. If this option is not select, Atomic Clock will automatically make the adjustment without user intervention.

### Automating Daylight Saving Time Handling:

Select **Configure** from the main window.



Select the **Time Service** index tab (by either clicking on the tab, pressing the Alt-T hotkey or using PgUp and PgDn to move to it).

Select the **Daylight Saving Time Automation** button. The Daylight Saving Time Automation dialog will be displayed.

Select the DST rule you wish to use from the **Starting/Ending Rule** combo box. If you select anything other than "Enter Starting/Ending Dates Manually", the DST start and end dates for the current point in time will be displayed. You will not be able to change the dates, they will be maintained by Atomic Clock.

If you selected Enter Starting/Ending Dates Manually, enter the DST start and end dates for the current point in time. You will also need to update these dates after DST ends.

If you wish to have the system clock updated automatically when a change in DST occurs, select the "Ask for permission before making the adjustment" option; otherwise, you will be asked to confirm the adjustment.

Select OK to save your changes.

# Modem Initialization

Although Atomic Clock's default modem initialization string works flawlessly with the vast majority of the installed base of modems, you may find that yours does not.

Symptoms of a modem initialization problem may include the following:

**The modem does not respond.**

**The modem dials, but no connection is made.**

**The modem dials, a connection seems to be made, but Atomic Clock times out.**

**NOTE:**

**Some of these symptoms can also be caused by a variety of other reasons (such as an incorrect telephone number, incorrect serial port selection, call waiting being disabled when call waiting has not been installed on your telephone line, etc.). Verify that your configuration selections are accurate before proceeding.**

If Atomic Clock's default modem initialization string fails to work with your modem, select one of the pre-defined alternate modem initialization strings from the Modem Initialization String combo box. This string should contain the necessary commands to disable error correction and data compression features found on high speed modems. Consult your modem reference manual for these commands if you try each pre-defined initialization string without success. Other strings to try are:

```
AT &F N S37=5
AT &F &C1 &D2 &K4 S7=90 S95=44
AT &F &C1 &D2
AT &F &C1 &D2 R1
```

If you should need to enter a modem initialization string not found in the Modem Initialization String combo box's pre-defined list, perform the following steps:

## Procedures to Enter an Alternate Modem Initialization String:

Select **Configure** from the main window.

If the **Hardware** index tab is not already selected, either click on it with the mouse or press Alt-H.

In the Modem Initialization String combo box, enter the desired initialization string. *Do **not** end the command with ^M or any other character commonly used to represent a carriage return/line feed (Atomic Clock will automatically insert this for you).*

## Daylight Saving Time

The time observed when clocks and other timepieces are set ahead, usually by one hour, so that the sun will rise and set later in the day. DST conserves lighting power and provides more usable daylight hours for afternoon and evening activities.

First adopted during World War I by the U.S. and other countries, DST in the U.S. currently extends from the first Sunday in April to the last Sunday in October.

If you wish, Atomic Clock can be configured to automatically handle DST transitions.

### NOTE:

**Allow Atomic Clock to handle DST transitions. Although both Windows and Atomic Clock handle the transition in a similar manner, Windows cannot alter Atomic Clock's internal DST settings (which would affect the accuracy of the City section's times).**

## **atomic clocks**

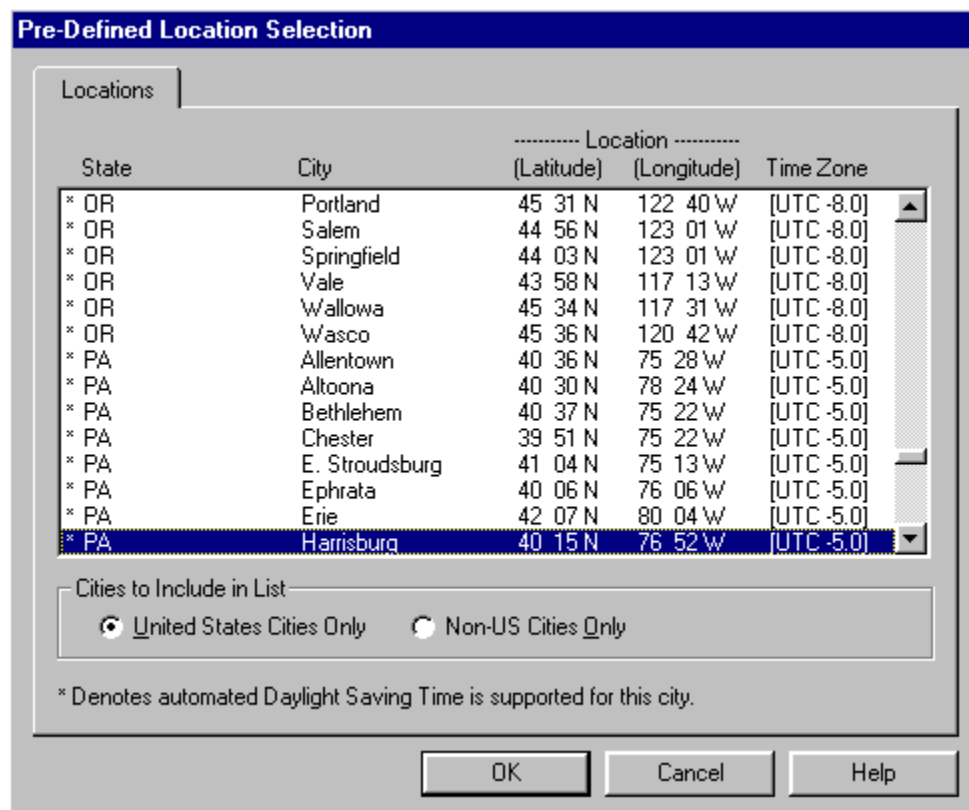
Today, the length of a second as defined in the International System of Units is based on a specific number of transitions, or vibrations, in a particular kind of cesium atom. These transitions produce extremely regular waves of electromagnetic radiation that can be counted to produce a highly accurate time scale. Coordinated Universal Time is based on this second, called the SI second.

The cesium-beam clock is the most accurate standard of atomic time currently in use, but scientists are working on using other kinds of atoms for atomic clocks. Such clocks - based on hydrogen or beryllium atoms, for example - could be thousands of times more accurate than even today's cesium clocks.

Many of the world's nations maintain very accurate cesium clocks. The time kept by these clocks is averaged together to produce what is called international atomic time (IAT). Time signals from the world's national-standards laboratories are broadcast around the globe by shortwave-radio broadcast stations or by artificial satellites. Highly accurate time signals are used for, among other things, tracking space vehicles and studying the motions of the Earth's crust.

## Pre-Defined Locations

As an alternative to defining locations manually, Atomic Clock comes with a vast pre-configured list of locations from which to choose.



The dialog box titled "Pre-Defined Location Selection" features a "Locations" tab. It contains a table with columns for State, City, Location (Latitude and Longitude), and Time Zone. A list of cities is shown, with "Harrisburg" selected. Below the table, there are radio buttons for "United States Cities Only" (selected) and "Non-US Cities Only". A note at the bottom states: "\* Denotes automated Daylight Saving Time is supported for this city." At the bottom of the dialog are "OK", "Cancel", and "Help" buttons.

State	City	Location (Latitude)	Location (Longitude)	Time Zone
* OR	Portland	45 31 N	122 40 W	[UTC -8.0]
* OR	Salem	44 56 N	123 01 W	[UTC -8.0]
* OR	Springfield	44 03 N	123 01 W	[UTC -8.0]
* OR	Vale	43 58 N	117 13 W	[UTC -8.0]
* OR	Wallowa	45 34 N	117 31 W	[UTC -8.0]
* OR	Wasco	45 36 N	120 42 W	[UTC -8.0]
* PA	Allentown	40 36 N	75 28 W	[UTC -5.0]
* PA	Altoona	40 30 N	78 24 W	[UTC -5.0]
* PA	Bethlehem	40 37 N	75 22 W	[UTC -5.0]
* PA	Chester	39 51 N	75 22 W	[UTC -5.0]
* PA	E. Stroudsburg	41 04 N	75 13 W	[UTC -5.0]
* PA	Ephrata	40 06 N	76 06 W	[UTC -5.0]
* PA	Erie	42 07 N	80 04 W	[UTC -5.0]
* PA	Harrisburg	40 15 N	76 52 W	[UTC -5.0]

Cities to Include in List

☒ United States Cities Only ☐ Non-US Cities Only

\* Denotes automated Daylight Saving Time is supported for this city.

OK Cancel Help

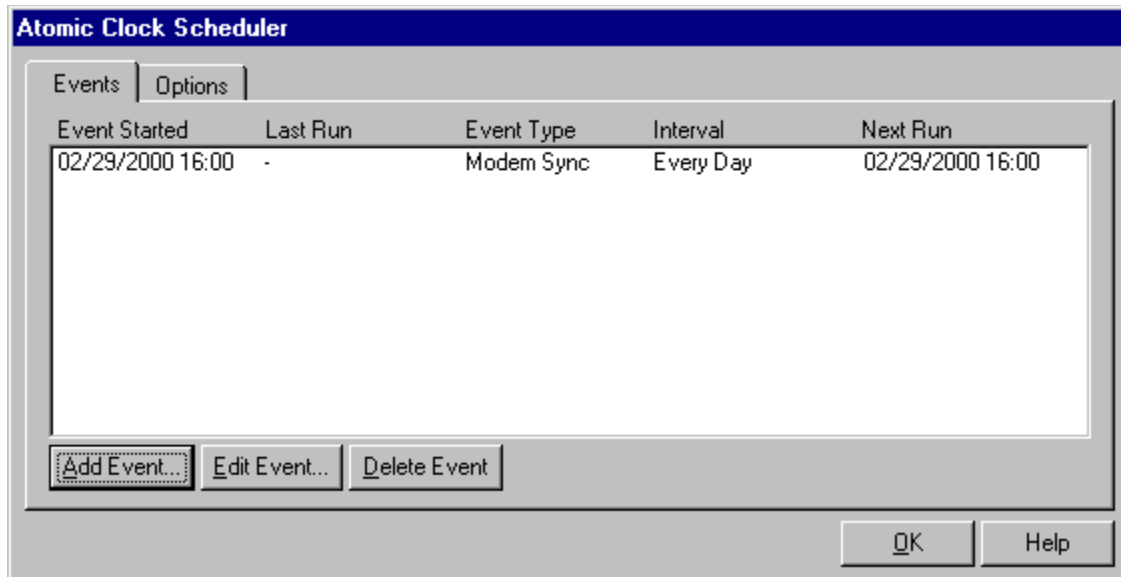
Simply select the location from the list and the applicable configuration information (location name, time zone, latitude, longitude and (if available) the Daylight Saving Time rules) will be entered automatically.

### NOTE:

**To speed the process of selecting a state/country from the pre-defined cities list, press the first letter of the state or country.**

## Scheduler

Atomic Clock has the built-in ability to schedule modem synchronizations, error compensations, and many other types of events to occur at pre-defined dates and times without any user intervention or third-party scheduling programs.



### Scheduling an Event:

To schedule an event, select the **Add...** button. The event dialog will be displayed for you to enter the specifics of the event.

When you have completed the scheduling process, the date and time of the next scheduled event will be displayed.

#### NOTE:

**If you are automating an alarm, you must also specify which type of alarm (message, the playing of a WAV file or the activation of another program). You will also need to specify all required information for the type of alarm you specified (such as the message text, WAV file to play or program to activate).**

#### NOTE:

**Automated error compensation events can only be scheduled when the accuracy has been determined (after at least two modem synchronizations have been performed). If the accuracy has not yet been determined, the Enable Error Compensations button will be disabled.**

### Options:

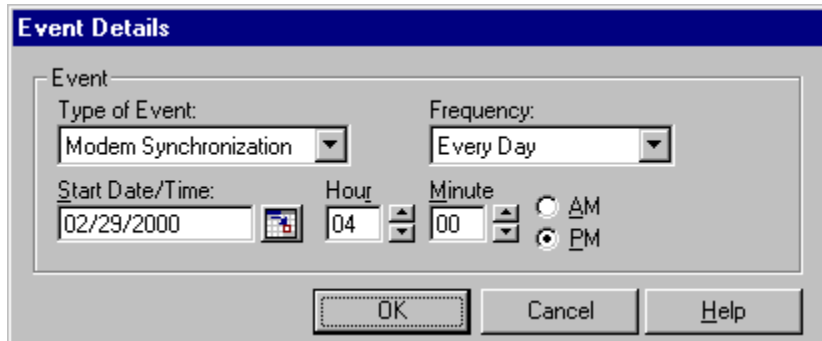
You can further customize Atomic Clock's handling of scheduled events by selecting the Options button.

**NOTE:**

**Atomic Clock must continue to run for scheduled events to occur. If not currently in use, simply minimize Atomic Clock. The type of event (AutoSync or AutoComp) and the date and time of the next event to occur will be displayed in the program's icon title.**

## Event Scheduling

When scheduling an event, the following dialog is displayed:

The image shows a Windows-style dialog box titled "Event Details". It has a tab labeled "Event". Inside the tab, there are two dropdown menus: "Type of Event:" with "Modem Synchronization" selected, and "Frequency:" with "Every Day" selected. Below these, there is a "Start Date/Time:" section. It includes a date field showing "02/29/2000", a small calendar icon, an "Hour:" spinner set to "04", a "Minute:" spinner set to "00", and radio buttons for "AM" and "PM", with "PM" selected. At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

To enable/disable an event, select either the **Enable Modem Synchronizations**, **Enable Error Compensations**, or **Enable Automated Alarms** check box.

When enabled, modem synchronization, error compensation and alarm events can be scheduled to occur with the following frequencies:

### One Time:

This type of event will only occur one time. Upon completion, the event will automatically be removed from the list of scheduled events. You will be asked to specify the date and time of the event.

### Every Hour:

This type of event will occur at the top of every hour (5:00, 6:00, et cetera.). No further information is required.

### Same Time Every Day:

This type of event will occur at the time you specify every day. You will be asked to specify the time of the event.

### Same Time Every Week:

This type of event will occur once per week on the day and time you specify each week. You will be asked to specify the day of the week and the time the event is to occur.

When you have completed the necessary information, select **OK** to continue. The date and time of the event will be calculated and displayed on the main scheduler screen.

### NOTE:

**If you are automating an alarm, you must also specify the type of the alarm and any other required information.**

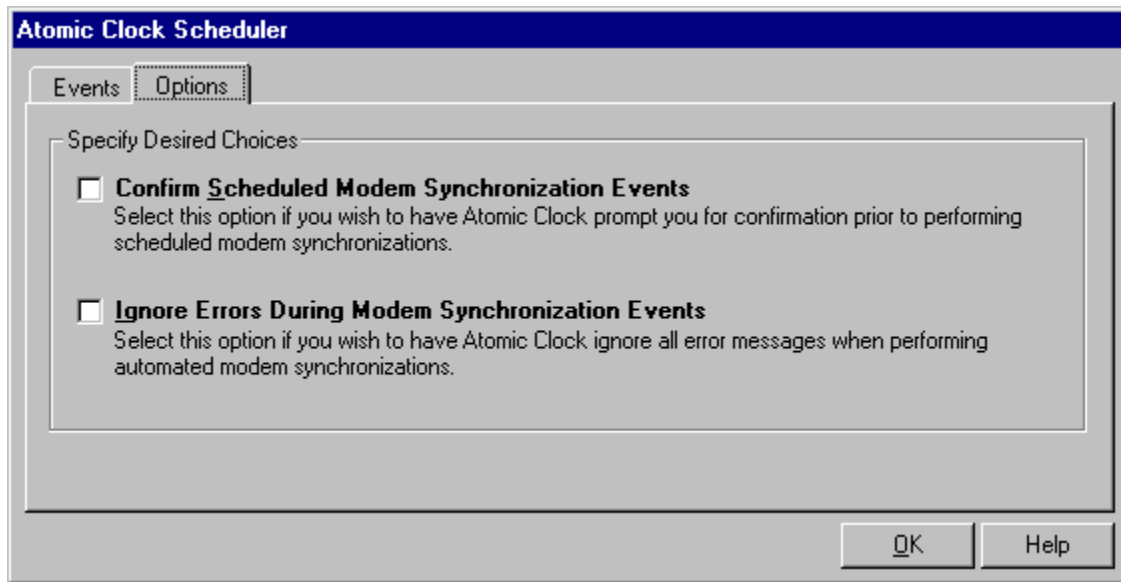
For Atomic Clock to execute scheduled events, it must be running at all times. If not currently in use,



simply minimize Atomic Clock. The type of event (AutoSync or AutoComp) and the date and time of the next event to occur will be displayed in the program's icon title.

## Automation Options

The following options have been provided to further customize Atomic Clock's handling of scheduled events:



### Confirm Scheduled Synchronization Events:

Select this option to have Atomic Clock prompt you for confirmation prior to performing any scheduled modem synchronizations.

*This option is useful in the event you do not want to interrupt any currently running applications.*

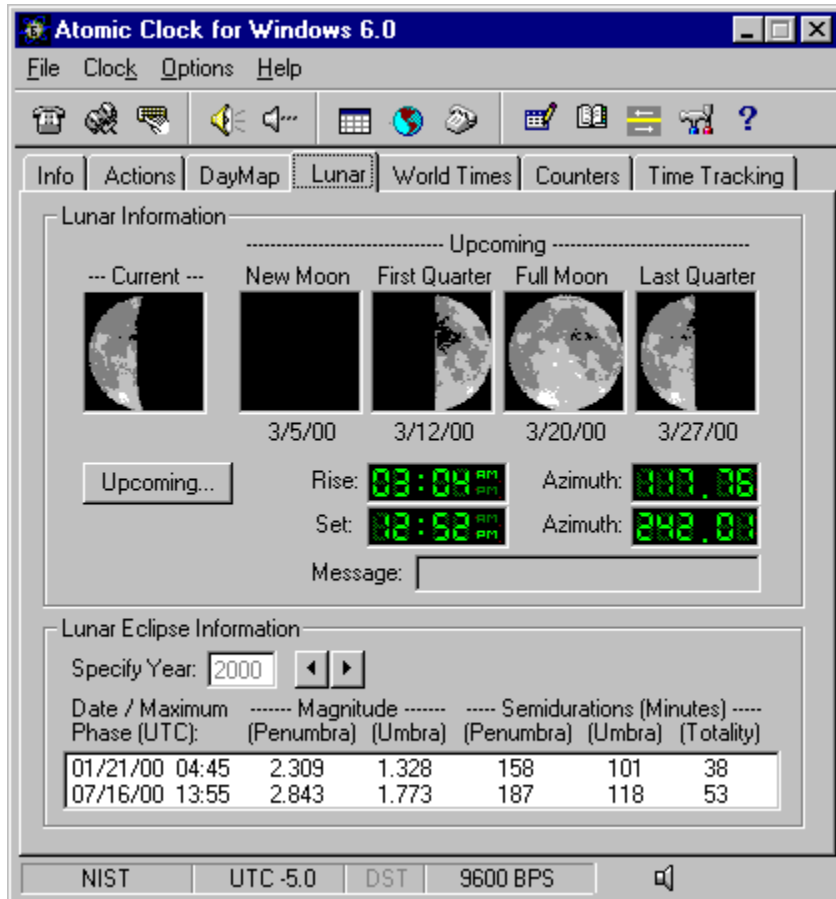
### Ignore Errors During Synchronization Events:

Select this option if you wish to have Atomic Clock ignore all error messages when performing automated modem synchronizations.

*This option is useful when running the scheduler unattended.*

## Lunar Section

This section will display the following items:



### Current Lunar Phase:

Atomic Clock will display an approximate representation of the current lunar phase. To view the dates of upcoming lunar phases, select the **Upcoming...** button. Also shown are the lunar rise/set times and azimuths for the current date.

### Lunar Eclipse Information:

Lunar eclipses are automatically calculated for any year you specify. Use the left and right arrow keys to change the year.

**latitude**

The angular distance from the equator of any point on the Earth's surface. The equator is latitude 0 degrees, and the poles are 90 degrees north (N) and south (S), respectively. One degree of latitude is about 69 miles (110 km), increasing slightly poleward as a result of the Earth's polar flattening. Meridians of longitude (imaginary lines drawn from pole to pole) and parallels of latitude form a grid by which any position on the Earth's surface can be specified.

**longitude**

The angular distance on the Earth's surface measured along the equator west (W) of the prime meridian, which is at 0 degrees. All other points have longitudes from 0 to 180 degrees east of west. Meridians of longitude (imaginary lines drawn from pole to pole) and parallels of latitude form a grid by which any position on the Earth's surface can be specified.

**equator**

The equator is an imaginary great circle drawn around the Earth equidistant from the two poles. It divides the globe into northern and southern hemispheres. Latitudes are measured north and south of this line. See also prime meridian.

**prime meridian**

The prime, or Greenwich, meridian is the longitude line designated 0 deg 00' 00". It passes through the old Greenwich Observatory in London and was agreed upon by international treaty in 1884 as the line on which global time zones are based.

## **time zone**

A time zone is a longitudinal strip of the Earth's surface, stretching from pole to pole and sharing the same time of day or night. The Earth requires 24 hours to make one complete rotation on its axis. Thus the direct rays of the Sun pass through one degree of longitude every 4 minutes. Therefore, to allow for time changes on an hourly basis, each time zone covers 15 degrees of longitude in width ( $15 \times 24 = 360$  degrees). In practice, however, the zone boundary lines are drawn to accommodate political units. Also, for various reasons, a number of countries differ considerably from international practice in time designation. Because the time zones extend around the world, the 24th zone has to lie next to the first one. The International Date Line, drawn roughly along the 180 degree meridian in the Pacific Ocean, has been designated as this meeting place. The time zones on either side of this line are 24 hours apart. This means that a person who moves from east to west across the line immediately "loses" a day--is at the same clock time but of the next calendar day. The 0 degree meridian on the opposite side of the Earth has been established as the reference line for setting standard, or universal, time (see Universal Time Coordinated).



## **Universal Time Coordinated (UTC) or Greenwich Mean Time (GMT)**

Universal Time Coordinated or Greenwich Mean Time (GMT) is the time on the Greenwich meridian, used as the zero for longitudinal measurement, according to the Mean Sun. The Mean Sun is an imaginary body that moves around the celestial equator with constant angular speed, making a complete circuit with respect to the vernal equinox in one tropical year. GMT was established as the world standard in 1884. In 1928 it was also given the name Universal Time Coordinated; the International Time Bureau in Paris now coordinates astronomical measurements and atomic clock readings from around the world to arrive at Universal Time Coordinated.

**international date line**

The international date line is an imaginary line that runs approximately along the 180 deg meridian in the Pacific Ocean. By an 1884 international agreement, the earth day is considered to begin immediately west of the line and ends immediately east of it. Therefore, the time zones on each side are 24 hours apart. Those who cross the line from west to east repeat one day, while those traveling the reverse course omit one. In the few places where the 180 deg meridian crosses land the international date line deviates so as not to disrupt the pattern of life within a political union.

## **lunar phase**

The Moon moves around the Earth in an elliptical orbit of small eccentricity, inclined by  $5^{\circ} 8' 43''.4$  to the plane in which the Earth revolves around the Sun. Its distance from the Earth varies between 356,000 and 407,000 km (221,000 and 253,000 miles) in the course of each month; the average distance is 384,400 km (238,900 miles), less than 1% of the distance to Venus and Mars, even at the time of their closest approach. The lunar globe appears in the sky as a disc of a little over half a degree ( $31' 5''.2$ ) in apparent diameter.

The period in which the Moon completes an orbit around the Earth and returns to the same position in the sky--the sidereal month--is 27 days, 7 h, 43 min, and 11.6 sec. Because the Earth is moving in its orbit around the Sun in the same direction as the Moon, the time needed to return to the same phase--the synodic month--is longer: 29 days, 12 hours, 44 minutes, and 2.8 seconds. This period is the time interval that, for example, elapses between two successive full moons, a period that was known within a second even in ancient times. The Moon's average velocity is 1.023 km/sec (0.635 mi/sec), corresponding to a mean angular velocity in the sky of about 33 minutes of arc per hour, a little greater than the apparent diameter of the Moon.

## Specifying a Date

The purpose of this dialog window is to allow for the easy selection of a specific date, using a mouse. The month and year is displayed in calendar format:



To select a date, select the desired month and year from the combo boxes. Next, either double-click on the desired day - or click on the desired day, and press **OK** to accept the date.

If you wish to abort this operation, select the **Cancel** button.

## Internet Options

**Configuration**

Hardware | Locale | Dialing | **Internet** | Alerts | Options | Clock | Display

Internet Time Servers (Primary/Secondary)

	Country	Name	Address
(Pri):	USA	Microsoft Corporation	utcnist.microsoft.com
	USA	MIT Information Systems	mit.edu
(Sec):	USA	NASA Ames Research Center	norad.arc.nasa.gov
	USA	NASA Lewis Research Center	lerc-dns.lerc.nasa.gov

Add New Site... Edit Selected Site... Remove Selected Site

Options

☐ **Perform Automatic Internet Time Synchronizations**  
Select this option to perform automated Internet time synchronizations at specified intervals when a WinSock connection is active.  
Update Interval (Minutes): 5

☐ **Ignore Received Time If Correction Value Exceeds Preset Limit**  
Select this option to abort the clock adjustment when the difference between the time received from the host and your system clock exceeds the preset limit.  
Preset Limit (Seconds): 3600

OK Cancel Defaults Help

The following is an explanation of each available option you have in order to customize Atomic Clock's Internet time synchronization features:

### Internet Time Server:

Select the desired Internet time server you wish to use. For the most accurate synchronization possible, select a time server from the country in which you reside.

#### NOTE:

**If you wish to add a new site, you will need to specify it's name, country and Internet address.**

If you wish to specify a backup time server, select the server from the Secondary Server list box.

### Options:

#### Perform Automatic Internet Time Synchronizations:

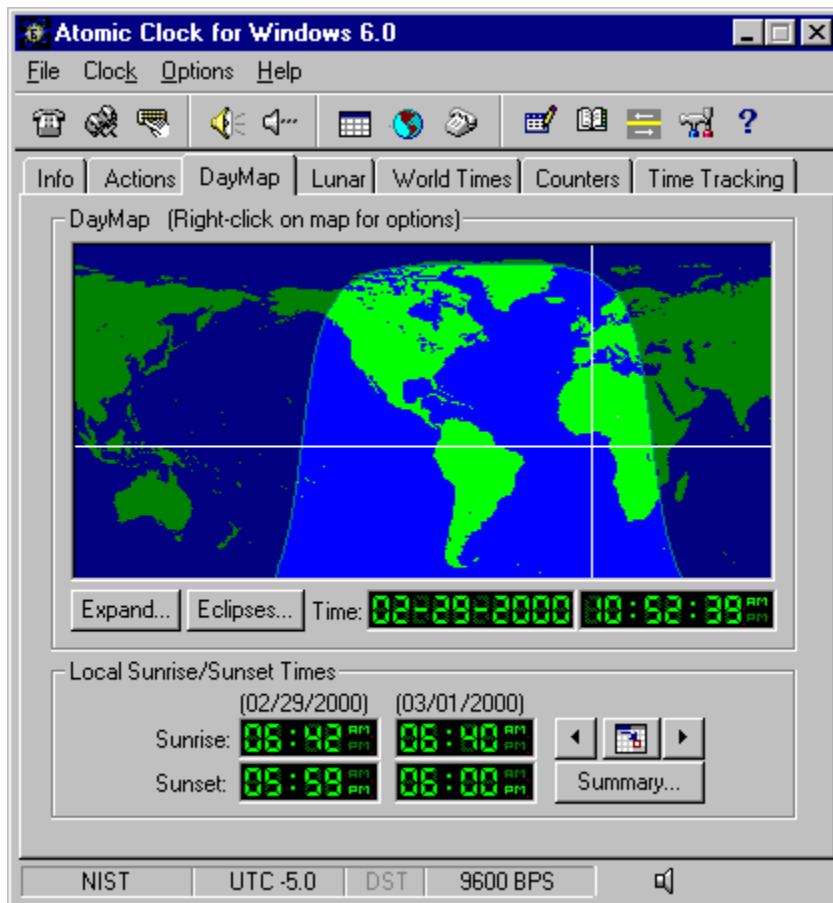
Select this option if you wish to automatically perform time updates at pre-defined intervals when a WinSock-compliant connection (such as CompuServe, AOL, MSN) is active. You can adjust the frequency of the interval by selecting it from the **Update Interval (Minutes)** combo box.

**Ignore Received Time If Correction Value Exceeds Preset Limit**

Select this option to ignore the clock adjustment if the difference between the time received from the host and your system clock exceeds the preset limit.

This option will help you detect if you improperly set your local time zone, as well as a corrupted time stamp.

## DayMap(tm) Section



The following items are displayed:

### Current Local Time:

This section will display your current local time.

### DayMap:

This section will display a two-dimensional map of the Earth, showing the areas currently in sunlight, and those in darkness. The map will automatically update once per minute.

If you wish to view the DayMap in more detail, select the **Expand...** button.

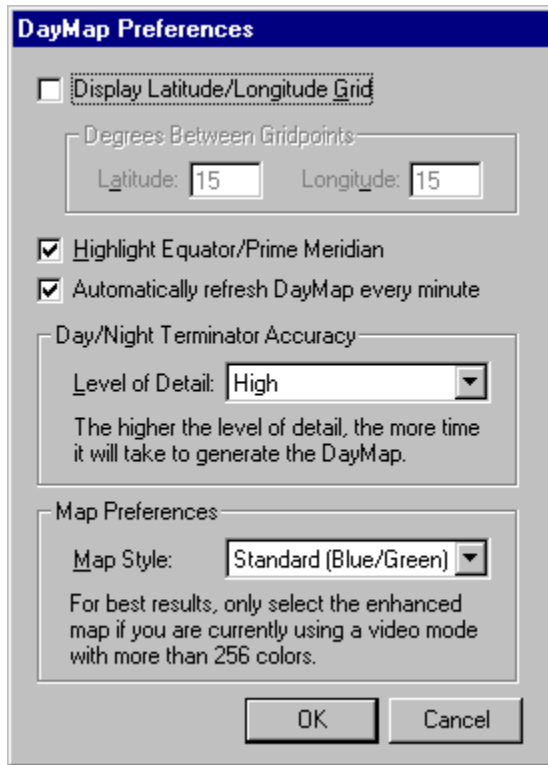
To access the DayMap options menu, right-click on the DayMap.

If you wish to center the map on another location, position the mouse over the point you wish to be displayed in the center and click your right mouse button and select the **Center Map Here** option. The map will scroll to show that area in the middle of the map.

To zoom in on a location on the map, point to the area, right-click and select zoom.

To force the DayMap to immediately recalculate, right-click on the DayMap and select the **Refresh** option.

To alter other properties of the DayMap, right-click on the map and select the **Properties** option. When this option is selected, the following window will be displayed:



The image shows a 'DayMap Preferences' dialog box with a blue title bar. It contains several sections: a checkbox for 'Display Latitude/Longitude Grid' (unchecked), a 'Degrees Between Gridpoints' section with input fields for 'Latitude' and 'Longitude' both set to '15', two checked checkboxes for 'Highlight Equator/Prime Meridian' and 'Automatically refresh DayMap every minute', a 'Day/Night Terminator Accuracy' section with a 'Level of Detail' dropdown set to 'High' and a descriptive note, and a 'Map Preferences' section with a 'Map Style' dropdown set to 'Standard (Blue/Green)' and another descriptive note. At the bottom are 'OK' and 'Cancel' buttons.

#### **Display Latitude/Longitude Grid:**

Select this option to display a latitude/longitude grid across the map.

#### **Degrees Between Gridpoints:**

Specify the number of degrees between gridpoints.

#### **Highlight Equator/Prime Meridian:**

Select this option to draw lines representing the approximate locations of the equator and Prime Meridian.

#### **Automatically Refresh DayMap Every Minute:**

Select this option to have the DayMap updated every minute. Otherwise, the map will display the same image until the program is terminated.

#### **DayMap Accuracy**

##### **Level of Detail:**

The higher the level of detail, the more processing time is required to redraw the image. The



default level is medium.

### **Map Preferences:**

You can select between the normal (blue/green) and true color maps. Only use the true-color map if you are currently using a true-color video mode, otherwise, the DayMap image will appear distorted. Also, true color images will take longer to render.

### **Upcoming Solar Eclipses:**

To view a listing of upcoming solar eclipses, select the **Eclipses...** button.

### **Sunrise/Sunset Times:**

If you properly defined your physical location, Atomic Clock can determine the time of the sunrise and sunset for the current and following date.

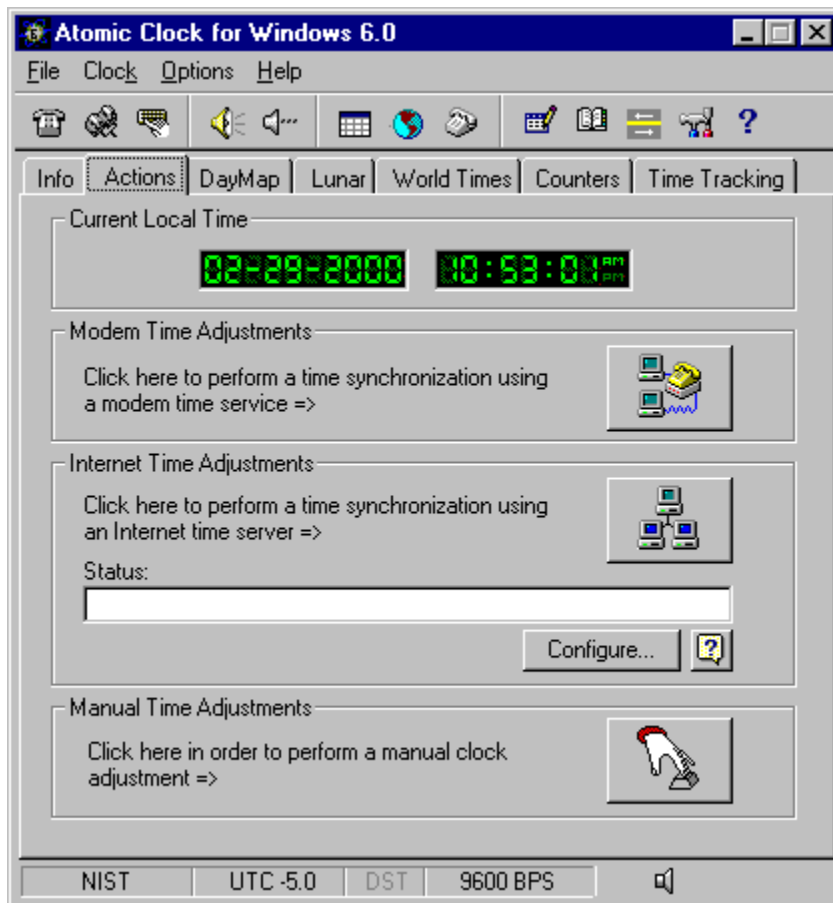
To make the process of obtaining the necessary information easier, you can select your location (or the nearest one) from a list of pre-defined cities from the Configuration section.

### **Options:**

The < and > keys are used to easily scroll forward or backward one day at a time to see the sunrise/sunset times for different dates in the near future/past.

Choosing the **Specify...** button allows you to enter a date of your choice, in order to see the sunrise/sunset times for that date.

## Actions Section



This section is used to provide easy access to the many different methods Atomic Clock uses to correct system time:

### Current Local Time:

This section will display your current local time.

### Modem Time Adjustments:

Select this option to initiate the process of a modem time synchronization. When selected, the modem will dial the time service, receive the time stamp from the selected time service and then disconnect the call.

### Internet Time Adjustments:

This option is used to initiate the process of an internet time synchronization.

Click here for a detailed description of the internet time synchronization process.

### Configure:

Select this option to configure the way Atomic Clock handles Internet time synchronizations. From this section you can specify which time server to use, as well as configuring the various options to automate this process.

**Manual Time Adjustments:**

Select this option to adjust the system clock manually.

## Internet Time Synchronizations

Atomic Clock can perform extremely accurate time synchronizations when connected to the Internet via a WinSock-compliant connection. Examples of some common WinSock-compliant connections include CompuServe, America Online and the Microsoft Network.

### NOTE:

**To perform an Internet time sync, you must already be online. When Atomic Clock performs the synchronization, it *will not interfere* with your connection.**

When the internet time synchronization process is started, Atomic Clock will request the time from the specified server and then automatically update your clock. If the time is updated, it will be displayed on the status line (of the Actions page).

To obtain the most accurate time possible, it is advisable that you select a time server which is located in your own country (or as close to it).

## Perpetual Calendar

When you select the **Perpetual Calendar** button from the toolbar, a dialog similar to the following will be displayed:

**Calendar Year 1998**

January	February	March
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

April	May	June
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

July	August	September
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

October	November	December
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

OK

Year: 1998

Update

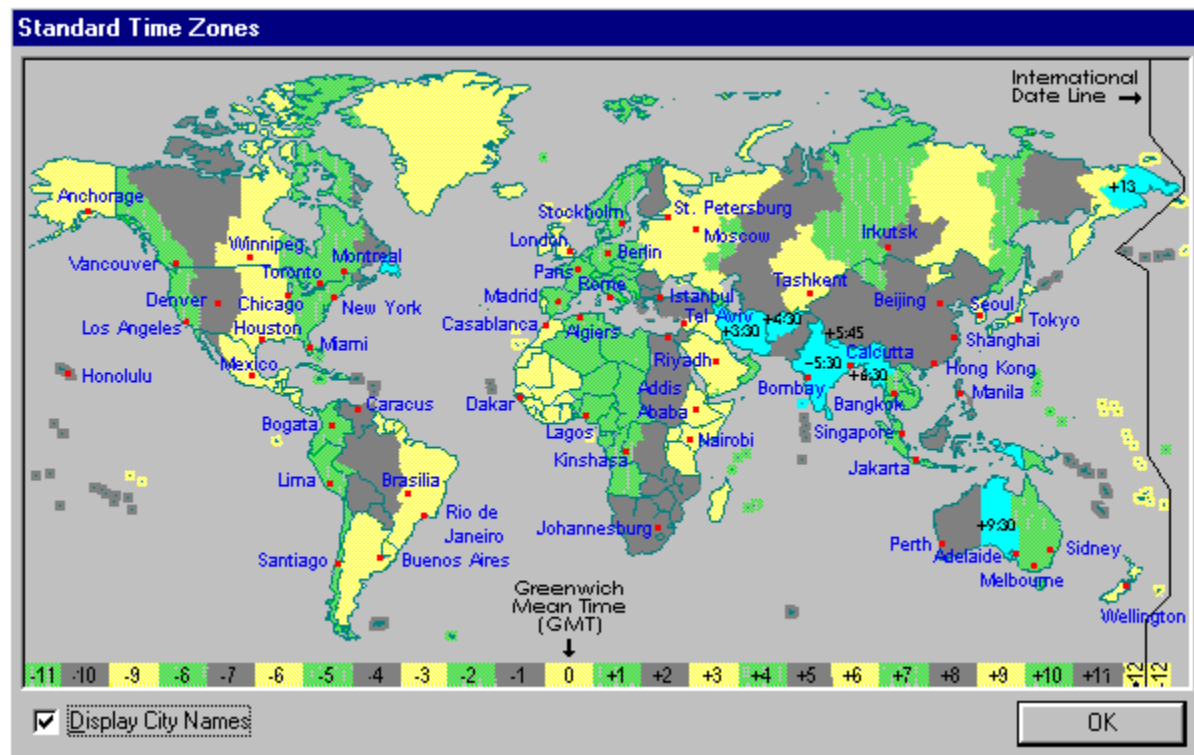
Print

You can view the calendar for other years by either entering the year and selecting the **Update** button or by clicking on the up/down arrows.

To print the current calendar to the default Windows printer, select the **Print** button.

## Time Zone Map

Selecting the **Time Zone Map** button from the toolbar will display the following dialog:

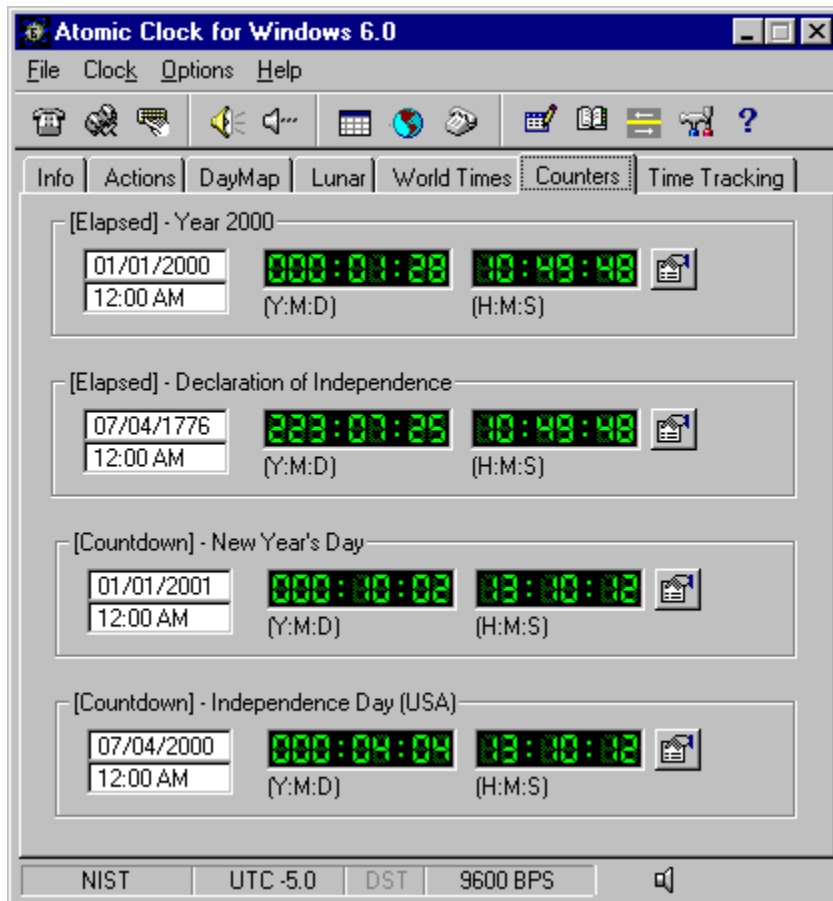


All the world's standard time zones will be displayed, along with a city which is located in each zone. To view the current local time for any location, rest the mouse over the desired area on the map and a tooltip will be displayed containing the local time.

To toggle the visibility of the cities on the map, select/de-select the **Display City Names** check box.

## Counters Section

This section provides you with the ability to view the amount of time (in years, months, days, hours, minutes and seconds) which have either elapsed (or are left) since/before a given date and time.



You can select from either a pre-defined list of events (such as holidays) or create your own. If the event occurs in the future (such as the year 2000), a countdown event will be created. An elapsed time counter is created when you specify a date in the past (such as your birth date).

To create or edit events, click on the **Property** button located to the right of the event you wish to edit. When you do, the following dialog will be displayed:


**Counter Properties**

Specify Choice

☒ Use pre-defined counter from list ☐ Create custom counter

Pre-Defined Counters:	Next Occurrence:
Election Day (USA)	11/03/1998
Veteran's Day (USA)	11/11/1998
Remembrance Day (Canada)	11/11/1998
Thanksgiving Day (USA)	11/26/1998
Christmas Day	12/25/1998

Description: Christmas Day

Event Date: 12/25/1998  Hour: 12 Minute: 00 ☒ AM ☐ PM

NOTE: Elapsed time will be displayed if you specify a date before the current date; otherwise, specifying a date after the current date will create a countdown event.

☐ Display notification message when countdown has completed?

Message:

LED Display Color

☒ Green ☐ Red ☐ Blue ☐ Yellow

OK Cancel Help

Either select from the list of pre-defined counters, or enter one of your own.

If you wish a message to be displayed when a countdown event has been completed, select the "Display notification when countdown has completed" check box and enter your message.

To change the color of the counter's simulated LED display, select the appropriate color radio button.



## Locale Adjustments

Users who travel from one location to another may need to change their locale information in order to reflect their current time zone. Fortunately, Atomic Clock makes this a painless process.

The screenshot shows a 'Locale Adjustment' dialog box with a blue title bar. Inside, there's a section titled 'Your New Physical Location (Locale)'. It contains a 'Location Name:' text box with 'Harrisburg, PA - USA' and a 'Select From Pre-Configured Locations...' button. Below is a 'Time Zone:' dropdown menu showing '[UTC -5] USA Eastern'. There are three checkboxes: 'Local Half-Hour Time Zone (+30 Minutes)', 'Local 3/4 Hour Time Zone (+45 Minutes)', and 'Use Daylight Saving Time'. A 'Daylight Saving Time Automation...' button is below the last checkbox. At the bottom of the section are 'Latitude' and 'Longitude' fields, each with degree, minute, and second inputs and a direction dropdown. The latitude is set to 40° 15' 0" North and the longitude to 76° 52' 0" West. At the bottom of the dialog is a checked checkbox labeled 'Adjust system clock to reflect any changes in TZ/DST settings' with a note: 'If selected, the system clock will be updated to reflect the new locale's date and time.' Below this are 'OK', 'Cancel', and 'Help' buttons.

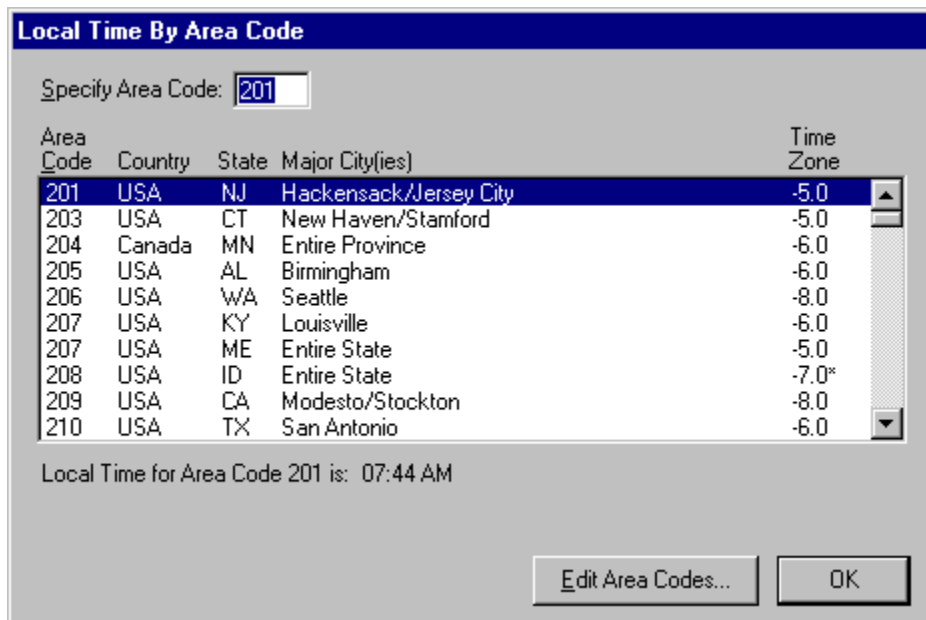
When you arrive at your destination, either select your new location from the list of pre-defined cities, or specify it manually.

To have Atomic Clock automatically update the system clock to reflect the difference in time from your previous location, ensure that the **"Adjust system clock to reflect any changes in TZ/DST settings"** option is selected.

### NOTE:

Using this section to perform these changes will keep your calculated accuracy readings correct. If you changed your locale settings via the Configuration section, Atomic Clock would interpret the change in time received during the next time synchronization as a major correction, thus skewing its accuracy calculations.

## Time By Area Code



The dialog box titled "Local Time By Area Code" features a text input field labeled "Specify Area Code:" with the value "201" entered. Below this is a table with five columns: "Area Code", "Country", "State", "Major City(ies)", and "Time Zone". The table lists ten entries, with the first entry (201, USA, NJ, Hackensack/Jersey City, -5.0) highlighted. At the bottom of the table is a text label "Local Time for Area Code 201 is: 07:44 AM". Two buttons, "Edit Area Codes..." and "OK", are located at the bottom right of the dialog.

Area Code	Country	State	Major City(ies)	Time Zone
201	USA	NJ	Hackensack/Jersey City	-5.0
203	USA	CT	New Haven/Stamford	-5.0
204	Canada	MN	Entire Province	-6.0
205	USA	AL	Birmingham	-6.0
206	USA	WA	Seattle	-8.0
207	USA	KY	Louisville	-6.0
207	USA	ME	Entire State	-5.0
208	USA	ID	Entire State	-7.0*
209	USA	CA	Modesto/Stockton	-8.0
210	USA	TX	San Antonio	-6.0

Local Time for Area Code 201 is: 07:44 AM

Edit Area Codes... OK

This section is used when you wish to determine the local time for a specified area code.

Either scroll through the list and double-click on the desired area code, or enter it manually. When you do, the current time is displayed for that location.

### Edit Area Codes:

If you wish to modify the list of area codes (for example, to add a new code), select this option. When you do, the following dialog is displayed:

Area Code	Country	State	Major City(ies)	Time Zone
201	USA	NJ	Hackensack/Jersey City	-5.0
203	USA	CT	New Haven/Stamford	-5.0
204	Canada	MN	Entire Province	-6.0
205	USA	AL	Birmingham	-6.0
206	USA	WA	Seattle	-8.0
207	USA	KY	Louisville	-6.0
207	USA	ME	Entire State	-5.0
208	USA	ID	Entire State	-7.0*
209	USA	CA	Modesto/Stockton	-8.0
210	USA	TX	San Antonio	-6.0
212	USA	NY	NYC (Manhattan only)	-5.0
213	USA	CA	Los Angeles	-8.0
214	USA	TX	Dallas	-6.0
215	USA	PA	Philadelphia	-5.0
216	USA	OH	Cleveland	-5.0
217	USA	IL	Champaign/Springfield	-6.0
218	USA	MN	Duluth	-6.0
219	USA	IN	Ft. Wayne/South Bend	-5.0
219	USA	IN	Gary	-6.0

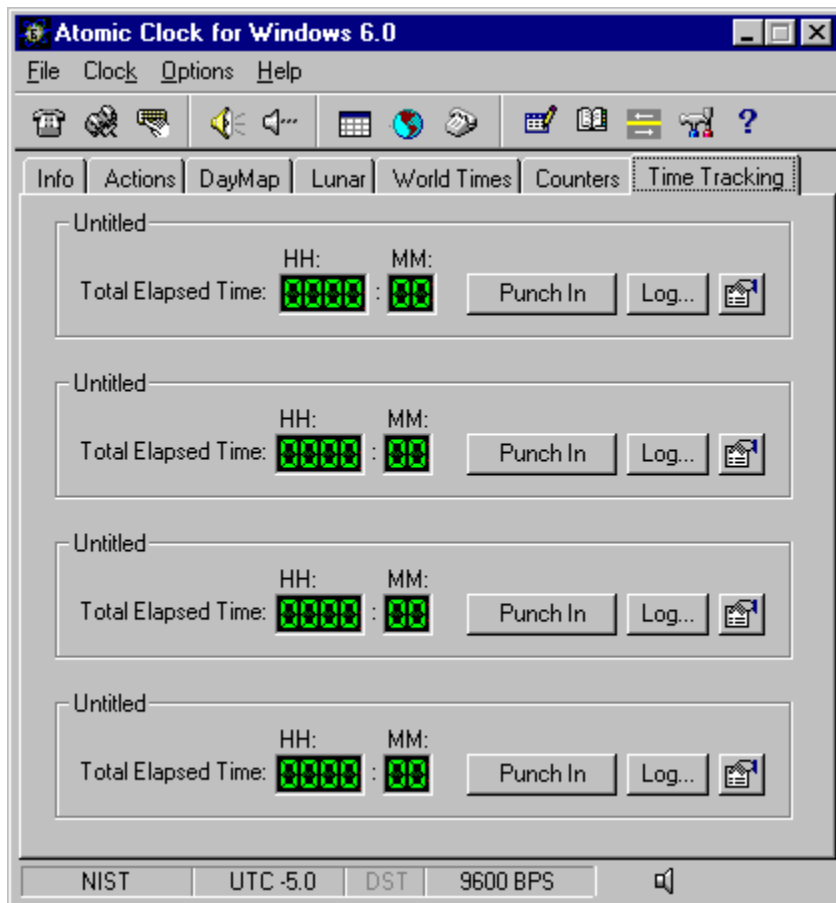
You can add, edit, or delete locations from the list. If you wish to add or edit a location, you will be asked to specify the following information:

Area Code Maintenance	
Area Code Information	
Country: <input type="text" value="USA"/>	State/Province: <input type="text" value="NJ - New Jersey"/>
Major City(ies): <input type="text" value="Hackensack/Jersey City"/>	3-Digit Area Code: <input type="text" value="201"/>
<input type="checkbox"/> <b>This area code crosses multiple time zones.</b> NOTE: If this area code does span multiple time zones, specify the zone closest to UTC.	
Time Zone: <input type="text" value="Eastern (UTC -5.0)"/>	
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

#### NOTE:

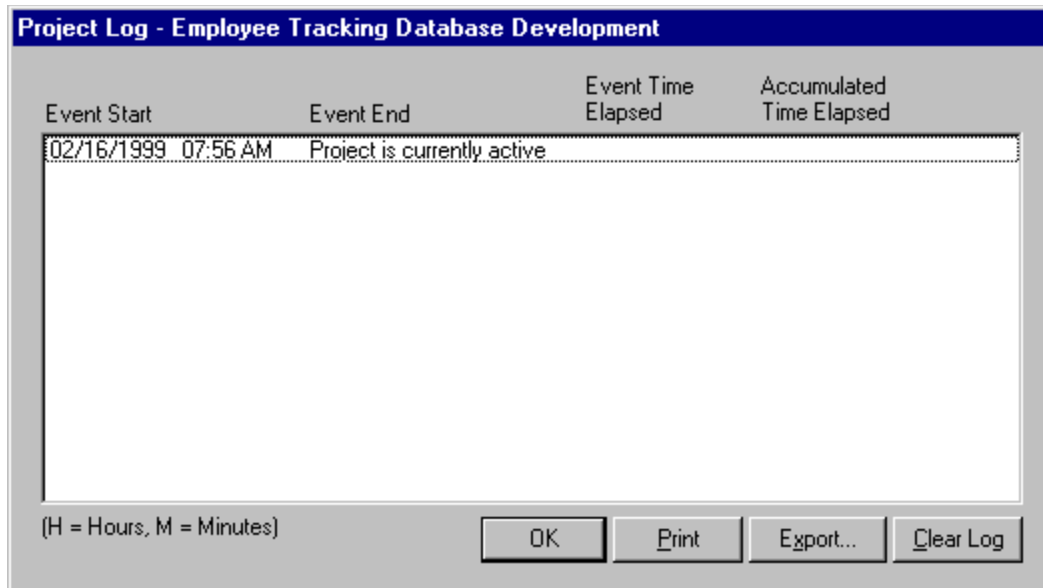
Some area codes cross time zone boundaries, and will be noted as such when they are selected.

## Time Tracking



This section provides functionality similar to that of a time clock. Up to four separate projects can be tracked. Time is tracked in hour a minute intervals.

To start a project, click the properties button. When you do, the following dialog is displayed:



The dialog box has a title bar "Project Log - Employee Tracking Database Development". It contains a table with four columns: "Event Start", "Event End", "Event Time Elapsed", and "Accumulated Time Elapsed". The first row of the table contains the text "02/16/1999 07:56 AM" and "Project is currently active". Below the table is a large empty rectangular area. At the bottom left, there is a text label "(H = Hours, M = Minutes)". At the bottom right, there are four buttons: "OK", "Print", "Export...", and "Clear Log".

Event Start	Event End	Event Time Elapsed	Accumulated Time Elapsed
02/16/1999 07:56 AM	Project is currently active		

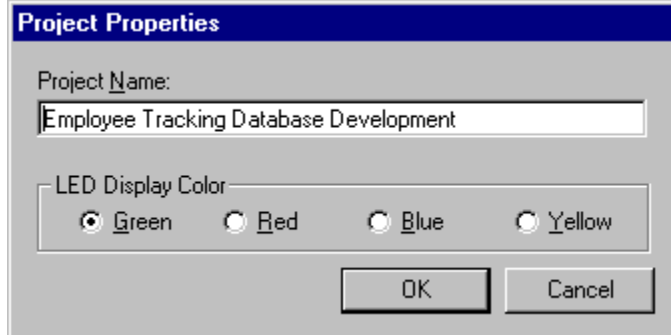
(H = Hours, M = Minutes)

OK Print Export... Clear Log

Enter the name of the project and select the desired LED display color.

To begin tracking time, select the "Punch In" button. To stop tracking time, select the "Punch Out" button. Time is accumulated and displayed.

To view the project log, select the log button. The following dialog is displayed:



The dialog box has a title bar "Project Properties". It contains a label "Project Name:" followed by a text box containing "Employee Tracking Database Development". Below this is a label "LED Display Color" followed by four radio buttons: "Green", "Red", "Blue", and "Yellow". The "Green" radio button is selected. At the bottom right, there are two buttons: "OK" and "Cancel".

Project Name:  
Employee Tracking Database Development

LED Display Color  
☒ Green ☐ Red ☐ Blue ☐ Yellow

OK Cancel

You can choose to print the log, export the log to a text file or to clear the log. Once the log is cleared, all accumulated time entries are permanently removed.

## Product Support

Technical Support is available to assist you with any issue regarding this product. Technical Support can be reached by via the Internet at:

**<http://www.support.broderbund.com>**

The Technical Support Web Site contains common questions and answers and an Interactive Technical Support Contact Form for an email response to your question.

[Registering Your Product](#)

[Replacing Defective Disks](#)

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Call Customer Assistance at 1-319-395-0115 within 30 days of purchase, we replace disks free. After this, contact Customer Assistance for prices. Problems with compact disks (CDs) are more likely to be the result of improper handling rather than a defect in the CD itself. Use these tips to maintain the high quality performance of the disk and the integrity of the data stored on it.

1. Handle the disk only by the outer edge to prevent fingerprints and smears on the surface.
2. Carefully slide the CD from the sleeve each time you use it. Never touch the recording (unlabeled) surface.
3. Store the CD in its protective sleeve, avoiding direct sunlight, heat, and humidity.
4. Use a soft, lint-free cloth to clean the disk. Always wipe from the center to the outer edge and never wipe in a circular motion to remove spots, dust, or fingerprints.
5. Do not use abrasive or solvent cleaners or conventional vinyl record cleaning solution on the CD. Chemical-based cleaners can damage the disk.

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1. Free, unlimited technical support for current versions of all our products.
2. Notification of program upgrades.
3. Announcements and special offers from Broderbund.

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