word "day".

Choose from the pop-up menus to select the configuration that is used in your area.

Once you have configured the settings for the dates that daylight savings time begins and ends, you must configure the time of day at which the change should occur. To do this, you set the time shown in the box just as you would set the time in other control panels on your Macintosh: Simply click on the hours or minutes, or the AM/PM if your clock is in 12 hour mode. The item you have selected will highlight and the arrows will appear. Click on the up or down arrow, or you can type numbers, to change the time of day.

▲ **Note** In Network Time, this always represents *current local time.* Local time is used in the time zone rules for the United States and elsewhere. For example, daylight savings time changes at 2:00 A.M. local time in the U.S. In other countries, the daylight savings time rules sometimes say "…at 2:00 A.M. Greenwich Mean Time". Be sure you convert that to current local time to enter the correct time in the box. ▲

When you have finished configuring the daylight savings time information, you may click OK or Cancel to return to the time zone list dialog box.

Modifying and deleting time zones

If you want to modify or delete a time zone which is currently

You can then change any of the settings that you wish, just as you would for a new time zone that you add yourself. See the section on adding a new time zone above for further directions.

Using a remote Internet machine as a time server

If for some reason you cannot configure a time server at your local site or don't have a UNIX machine available, you can still use an NTP time server that is connected to the Internet if you have access to the Internet. At the anonymous FTP site at the University of Delaware, "louie.udel.edu", there is a file in the directory "/pub/ntp/doc" called "clock.txt". This file contains a list of NTP servers that are accessible via the Internet. You can use any of the secondary servers as your time server, but try to use one close to your area. Here is the list of servers available at the time this document was written:

ashe.cs.tcd.ie	134.226.32.17	Dublin, Ireland
augean.ua.oz.au	129.127.4.2	Adelaide, South Australia
beno.css.gov	140.162.1.5	Arlington, VA, USA
beowulf.ucsd.edu	132.239.51.6	San Diego, CA, USA
bernina.ethz.ch	129.132.1.170	Zurich, Switzerland
black-ice.cc.vt.edu	128.173.4.71	Blacksburg, VA, USA
chime1.surfnet.nl	192.65.81.6	Utrecht, The Netherlands
churchy.udel.edu	128.4.1.5	Newark, DE
clock.bme.unc.edu	152.2.100.32	Chapel Hill, NC, USA
clock.psu.edu	128.118.25.3	University Park, PA, USA
clock.tricity.wsu.edu	192.31.216.5	Richland, WA, USA
clock-1.cs.cmu.edu	128.2.250.95	Pittsburgh, PA
clock-2.cs.cmu.edu	128.2.222.8	Pittsburgh, PA
constellation.ecn.uoknor.edu	129.15.22.8	Norman, OK, USA
cyclonic.sw.stratus.com	134.111.10.64	Marlboro, MA, USA
delphi.cs.ucla.edu	131.179.128.36	Los Angeles, CA, USA
eagle.tamu.edu	128.194.3.93	College Station, TX, USA
fartein.ifi.uio.no	129.240.102.2	Oslo, Norway
fuzz.psc.edu	192.5.146.42	Pittsburgh, PA, USA
fuzz.sura.net	192.80.214.42	College Park, MD, USA
gazette.bcm.tmc.edu	128.249.2.2	Houston, TX, USA
george.jpl.nasa.gov	137.78.80.3	Pasadena, CA, USA
gus.ecn.purdue.edu	128.46.129.79	West Lafayette, IN, USA
heechee.meediv.lanl.gov	128.165.196.2	Los Alamos, NM, USA
jane.jpl.nasa.gov	137.78.80.7	Pasadena, CA, USA
kuhub.cc.ukans.edu	129.237.32.1	Lawrence, KS, USA
lane.cc.ukans.edu	129.237.32.2	Lawrence, KS, USA
larry.mcrcim.mcgill.edu	132.206.1.1	Montreal, QC, Canada
lectroid.sw.stratus.com	134.111.10.1	Marlboro, MA, USA
lib1.tcd.ie	134.226.1.24	Dublin, Ireland
libra.rice.edu	128.42.1.64	Houston, TX, USA
noc.near.net	192.52.71.21	Cambridge, MA, USA
ntp.ctr.columbia.edu	128.59.64.60	New York, NY, USA

There are several important things you should keep in mind about the Network Time system extension:

1. The Network Time system extension will be created using whatever settings are currently displayed in the Network Time control panel, including the current time server, whether or not it has been verified, all of the check boxes, and all of the time zone information. The time the clock was last set will not be saved.

2. You must specify either "At every startup" or "Every ✕ hours" to create the Network Time system extension.

3. Make sure to turn off virus checking software that checks for "suspicious activity" (like Gatekeeper) before creating the Network Time system extension. Creating a system extension is considered pretty suspicious activity by these programs. Virus checking programs that only check for known viruses (like Disinfectant INIT) are not a problem.

4. Never use both the Network Time control panel and the Network Time system extension on the same machine.

5. If you need to change the configuration later, you can simply replace the Network Time system extension and reboot the Macintosh; Network Time will always use the settings stored in the system extension itself.

The Network Time system extension will function exactly as the Network Time control panel except for the lack of a user interface. Error notifications, however, will be displayed if Network Time is configured to do so.

When using NTP, Network Time is able to communicate with any version of NTP up to version 3. Network Time only uses the client implementation of NTP, not the full peer-to-peer protocol described in RFC 1305. It does, however, do more than the implementation described in RFC 1361, *Simple Network Time Protocol*. For instance, Network Time performs delay and dispersion calculations to determine clock offset, unlike SNTP. However, it does not keep state information about these values to determine the most reliable NTP server; Network Time simply takes the first reliable response it gets from the specified time server and uses that information to set the time on the Macintosh.

Network Time fully implements the client for the older TIME protocol. It only uses this protocol if it is unable to use NTP with the specified host, and only then if the user does not specify that only NTP is to be used.

Program implementation

The main portion of Network Time is implemented as a *device driver*. The control panel and system extension portions of Network Time communicate with the driver, and the driver itself does all of the work setting the time and updating the preferences file. The device driver is the only piece of the program that remains active during normal operation of the Macintosh, and only then if a request to automatically set the time is upcoming (as when "Every ✕ hours" is specified in the control panel). If the device driver determines that it no longer needs to be active, it is closed and removed from memory. Consult the *Network Time: Information for developers* manual for information on calling the device driver from your own program. Network Time was written using THINK C from Symantec Corporation.

Network Time Preferences

Network Time uses a file called *Network Time Preferences* to store all information that it needs to change and use later. The preferences file is initially created by either the control panel

6. Right-to-left text input and text display is supported in user interfaces.

7. Double-byte characters in Japanese and Chinese scripts are supported in text entry.

8. All display text is stored in separate resources for easy localization of interfaces. Several localized international versions are available.