

# The Trojan Room Coffee Pot

## A (non-technical) biography

by [Quentin Stafford-Fraser](#)

Several people have asked about the origins of the [Trojan Room coffee pot](#). It started back in the dark days of 1991, when the World Wide Web was little more than a glint in CERN's eye. I was working on ATM networks in a part of the Computer Lab known as the [Trojan Room](#), (a name which, perhaps, causes some amusement to American readers). There were about fifteen of us involved in related research and, being poor, impoverished academics, we only had one coffee filter machine between us, which lived in the corridor just outside the Trojan Room. However, being highly dedicated and hard-working academics, we got through a lot of coffee, and when a fresh pot was brewed, it often didn't last long.

Some members of the 'coffee club' lived in other parts of the building and had to navigate several flights of stairs to get to the coffee pot; a trip which often proved fruitless if the all-night hackers of the Trojan Room had got there first. This disruption to the progress of Computer Science research obviously caused us some distress, and so XCoffee was born.



In the Trojan Room there were several racks of simple computers used in the testing of our networks. One of these had a video frame-grabber attached and was not being used at the time. We fixed a camera to a retort stand, pointed it at the coffee machine in the corridor, and ran the wires under the floor to the frame-grabber in the Trojan Room. Paul Jardetzky (now working in California) then wrote a 'server' program, which ran on that machine and captured images of the pot every few seconds at various resolutions, and I wrote a 'client' program which everybody could run, which connected to the server and displayed an icon-sized image of the pot in the corner of the screen. The image was only updated about three times a minute, but that was fine because the pot filled rather slowly, and it was only greyscale, which was also fine, because so was the coffee.

This system only took us a day or so to construct but was rather more useful than anything else I wrote while working on networks. It also made a better topic of conversation at dinner parties than ATM protocols. The first published record of XCoffee came when Bob Metcalfe wrote about it in [Comm Week](#) on 27th January 1992 after visiting the lab, and inspired by this success, there was talk of other monitoring applications using low-frame-rate video. Systems such as XSandwich and XPrinterOutputTray were mooted, but the elderly frame grabber eventually gave up the ghost, Paul and I moved on to other things, and the Trojan Room coffee pot would have sunk into obscurity had not [Daniel Gordon](#) and Martyn Johnson resurrected the system, treated it to a new frame grabber, and made the images available on the World Wide Web. Since then, hundreds of thousands of people have looked at the coffee pot, making it undoubtedly the most famous in the world.

I don't think the coffee's any better, though.

[Quentin Stafford-Fraser](#)

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First published May 1995. See the [Coffee Pot Timeline](#)

# Reference Manual



# AudioTron™

Digital Music Player for Home Networks

## Notices

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Your Turtle Beach™ AudioTron is designed and tested to meet the latest standards for safety of digital music technology equipment. However, to ensure safe use of this product, it is important that the safety instructions marked on the product and in the documentation are followed. Always follow these instructions to help guard against personal injury and damage to your product:

- Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use. Do not use this product near water or a heat source such as a radiator. Set up the system on a stable work surface. The product should be operated only from the type of power source indicated on the rating label.
- Openings in the product case are provided for ventilation. Do not block or cover these openings. Make sure you provide adequate space, at least 6 inches (15 cm), around the system for ventilation when you set up your work area. Never insert objects of any kind into the ventilation openings.
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- This equipment contains no user serviceable parts. Please refer all servicing to trained, qualified service personnel.
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- Do not use this product in areas classified as hazardous locations. Such areas include patient care areas of medical and dental facilities, oxygen-laden environments, or industrial facilities.
- To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.
- Replace fuse only with a 5 x 20mm Slo-Blo® UL/CSA Cartridge Type Fuse matching the original equipment specifications.

## Contacting Turtle Beach

<b>AudioTron is a product of:</b>	Voyetra Turtle Beach, Inc.	5 Odell Plaza Yonkers, NY 10701 USA
<b>Technical Support:</b>	Tel: (914) 966-2150	Fax: (914) 966-1093
<b>Main:</b>	Tel: (914) 966-0600	Fax: (914) 966-1102
<b>Web Sites:</b>	<a href="http://www.turtle-beach.com">www.turtle-beach.com</a>	

## Technical Support



*If you experience trouble with the operation of AudioTron, first look in the AudioTron Reference Manual or visit our on-line Knowledge Base.*

### AudioTron User group

Turtle Beach monitors and maintains user groups which can be found by following the "Users Forum and Archives" link at <http://www.turtle-beach.com/site/support/forums.asp>. Here AudioTron customers discuss how they use their AudioTrons, request feature updates, and help each other with configurations.

### Web-based technical support

The Turtle Beach web site provides AudioTron firmware updates, Frequently Asked Questions (FAQ) and a comprehensive Knowledge Base that includes the latest product information and troubleshooting tips.

**AudioTron FAQ and Knowledge Base:** The Knowledge Base is in the Support area of our web site. Go to the Turtle Beach web site ([www.turtle-beach.com](http://www.turtle-beach.com)) and click on "Support", then "Knowledge Base". Under the "A" section, click on "AudioTron". This will bring up the list of articles.

**AudioTron Firmware & Software Updates:** Go to the Turtle Beach web site ([www.turtle-beach.com](http://www.turtle-beach.com)) and click on "Support", then "FTP Files". Under the "A" section, click on AudioTron. This will bring up the list of files available for download (including firmware updates and other support files). Note that there is an icon at the top of the product page that lets you switch between the Knowledge Base (which is where you find the articles) and the FTP site (which is where you can download files).

### Other Technical Support



*Please include your Product ID, firmware version number and AudioTron Serial number in all correspondence with Technical Support. **Note that all Technical Support correspondence is conducted in English.***

If you can't solve the problem by visiting our web site, contact Turtle Beach Technical Support as follows:

**E-mail Tech Support:** [support@turtle-beach.com](mailto:support@turtle-beach.com). Please allow at least 2-3 business days for a response.

**Fax Tech Support:** (914) 966-1093 Attn: Tech Support. Fax a description of your problem to this number.

**Phone Tech Support:** (914) 966-2150 M-F, 9 a.m. to 5 p.m. EST (except public holidays.) Please note that all calls will be answered on a first-come, first-served basis. Because we cannot guarantee the length of time you will be on hold, we highly recommend you only use this option as a last resort. Times are subject to change without notice.



*Because networks can be set up in so many different ways, Turtle Beach technical support cannot provide assistance on network troubleshooting. Please contact the manufacturer of your network hardware for assistance on getting the network running per the requirements in this manual.*

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## AudioTron Controls

AudioTron's main controls are illustrated below. For details on the Front Panel, Rear Panel and Remote Control functions, see the relevant sections in this manual.



AudioTron front and rear panels with Remote Control

## Turning on AudioTron's Power

AudioTron has two power switches:

The **rear panel power switch** turns on the main AC power to the unit.

The **front panel Standby button** places AudioTron in a "sleep" state whereby the main power is still on, but the unit is in a "partial shutdown" mode that retains its temporary settings.

### To Power-on AudioTron...

1. Insert the AC cable into AudioTron's rear panel AC receptacle. Plug the other end of the cable into an AC outlet.
2. Turn on the rear panel AC switch. Wait a few seconds, then press the front panel Standby button.
3. If AudioTron is properly connected to the network, it will search the network for PC hosts with song files. After finding the PC hosts, it scans for songs and catalogs the song names in its internal memory so they can be quickly accessed.
4. Once AudioTron is powered on, the unit should be turned on and off with the Standby button. This bypasses the network search process initiated by turning on the power with the rear panel switch.

☞ *If you will not be using AudioTron for an extended period of time, the AC power switch on the rear panel should be turned off.*

### If AudioTron won't power on

- ✓ Check that the rear panel power switch is on.
- ✓ Be sure to press and hold the Standby button for a few seconds.
- ✓ Check that the power cord is seated properly in AudioTron's rear panel receptacle and in the AC wall outlet.



- ✓ Check for power in the AC outlet power by installing another known working electrical appliance (e.g. a lamp) into the same outlet to see if it operates.
- ✓ Check AudioTron's fuse (see the section "**Rear Panel Reference**")

**Power-On Messages**

One or more of the following messages may appear while AudioTron is powering on:

<b>Version x.x – Enet DHCP</b>	Indicates the firmware version number and the type of network connection detected. For details on how to upgrade the firmware version, see the Reference Manual section called " <b>Updating AudioTron's Firmware</b> ".  If you connected an Ethernet cable and AudioTron's display indicates HPNA, check the network cable connection to AudioTron and check the network for proper operation.
<b>Connecting to TurtleRadio</b>	Indicates that AudioTron is searching for an internet connection to download radio station URL locations from the TurtleRadio web site. The internet radio feature is disabled by default and may be enabled from the AudioTron web server " <b>TurtleRadio</b> " page.
<b>Searching for Hosts – xx% Complete</b>	Indicates that AudioTron has found the network connection and is searching for PCs on the network.
<b>Searching Host x of x</b>	Indicates the number of PCs detected on the network.
<b>Searching for Music Found xxxx Songs XXX Stations</b>	Indicates the number of songs found on the PCs in the network. After the song search is completed, the main menu is displayed and AudioTron is ready to play music. Internet Radio Stations are displayed after the number of local songs found.
<b>Waiting for network: xx secs</b>	<i>(DHCP Mode Only)</i> Indicates that AudioTron is trying to connect to the network. If a network connection can't be established after 120 seconds, AudioTron stops searching and displays "No Hosts Found" followed by "No Song Titles Found". Use the Setup Utility to help troubleshoot this problem.
<b>No Song Titles Found</b>	Indicates that no songs were found on the host, or that no host was found. Use the Setup Utility to help troubleshoot this problem, or check for the proper directory names and shares, as described in the <b>Reference Manual</b> .
<b>No Hosts Found</b>	Indicates that no PCs were found on the network. Reconnect the network cable into AudioTron's rear panel to make sure it "clicks" when inserted, or try another network cable. Use the Setup Utility to help troubleshoot this problem.

**"Re-setting" AudioTron**

AudioTron may be "reset" by turning the rear panel power switch off and on, waiting a few seconds, then pressing the Standby button. This would be necessary, for example, if AudioTron is behaving erratically, or if you have loaded new firmware.



# Front Panel Controls



<p>① <b>Headphone Jack</b></p>	<p>Drives headphones. Volume is set with the control knob while a song is playing. When headphones are connected, the rear panel analog outputs will be muted. The digital audio output is not affected.</p>
<p>② <b>Standby button</b></p>	<p>After turning on the AC power with the rear panel switch, the front panel Standby button is used for turning the unit on and off. The rear panel AC switch shuts down the entire unit. Standby shuts down only the display and certain internal functions, with power maintained to the memory and processor.</p> <p>The red light under the Standby button indicates that the rear panel AC Power switch is "on" and the unit is in "Standby Mode". The red light flashes when the remote control is used, indicating that the IR signal was received.</p> <p><b>To reset AudioTron</b> – Turn the back panel AC power switch off, then on. Wait a few seconds and press the Standby button to turn on the unit. This will initiate a complete start-up sequence where the unit searches for network hosts, songs, etc.</p> <p><b>To "soft" reset AudioTron</b> – Press the Standby button off, then on, to reset the audio outputs if there is no sound on the analog line and headphone outputs.</p>
<p>③ <b>Transport Buttons</b></p>	<p><b>Play</b> – Starts playback of the currently selected Song or Playlist.</p> <p><b>Stop</b> – Stops playback of the current Song or Playlist.</p> <p><b>Pause</b> – Pauses playback if a Song is playing and resumes playback if a song is Paused.</p> <p><b>Next &gt;&gt; Previous &lt;&lt;</b> - When a song is playing, these buttons select the next/previous song in the Play Queue. If clicked within the first 5 seconds of the currently playing song, AudioTron will skip back to the next (or previous) song. If the <b>Previous &lt;&lt;</b> button is clicked after the first 5 seconds of the currently playing song, AudioTron will return to the beginning of that same song. When these buttons are clicked in the Select menu, the display selection will skip to the beginning of the next/prev alphabetical category in the list, making it easier to navigate through long lists.</p>
<p>④ <b>Options Button</b></p>	<p>Activates "Options Mode". See the section entitled "Options Menu" for details.</p>
<p>⑤ <b>Repeat Button</b></p>	<p>Plays songs continuously when lit.</p>
<p>⑥ <b>Mute Button</b></p>	<p>Mutes the analog and digital audio outputs when lit.</p>
<p>⑦ <b>Random Button</b></p>	<p>Plays songs in random order when lit.</p>
<p>⑧ <b>Group Buttons</b></p>	<p><b>Group</b> – When lit, activates Group Edit mode for deleting single songs in the Group List with the Clear Button. See the section entitled "Using Group Mode" for details.</p> <p><b>Add</b> - Adds the currently playing or selected song, album, list, etc. to the Group List.</p> <p><b>Clear</b> – Deletes all songs in the Group List when the Group Button is not lit and a song is not playing. Deletes individual songs in the Group List when the Group Button is lit.</p>
<p>⑨ <b>Infrared (IR) sensor</b></p>	<p>The infrared (IR) sensor receives commands from the remote control. The IR sensor is located next to the control knob, on the front of the unit.</p>
<p>⑩ <b>Control Knob</b></p>	<p>The operation of the control knob depends on the context in which it is used. Functions are described in the various sections of this manual.</p> <p>While a song is playing, turning the knob adjusts the playback volume. Pressing the knob activates Song Position mode, whereby turning the knob changes the playback position (e.g. FF or Rewind). The default setting for volume and song position can be set in the Web Server "Settings" tab.</p> <p>In certain menu operations, turning and pressing the knob initiates a selection.</p>



## Setting Options from the Front Panel

The **Options** button activates the Options Menu display. Turn the control knob to scroll through the available menu items and press the knob to select. Not all of the options are accessible from the front panel display and instead are accessed via the web server. See the web server “**Settings**” section for details.

The AudioTron Web Server can be used to lock the display options menu so that options cannot be changed from the front panel. This is useful, for example, if AudioTron is being used in a public place where you do not want anyone to change the options from the front panel.

**NOTE:** Any change made to an option listed with an **R** will not take effect until AudioTron is re-booted:

<b>Check for New Music Files?</b>	Checks for any new music files stored on PC music server (Host PC). Does not search for new host PCs.
<b>Check for New Internet Stations?</b>	Checks for any new radio stations added to the TurtleRadio site. See TurtleRadio section for details.
<b>Set Clock Options</b>	Allows you to configure the clock time and alarm functions
<b>Bass Boost</b> <i>(default = 0)</i>	Activates the Bass Boost control. Turn the knob to set the level in 1dB increments. Bass boost does not affect the S/PDIF digital output.
<b>Treble Boost</b> <i>(default = 0)</i>	Activates the Treble Boost control. Turn the knob to set the level in 1dB increments. Treble boost does not affect the S/PDIF digital output.
<b>Set LED intensity</b> <i>(default = 100%)</i>	Dims the LED intensity from 10% (lowest intensity) to 100% (maximum intensity) in increments of 10%. Note that this does not affect the LCD back-light intensity.
<b>Display Network History</b> <i>(press Options button to exit)</i>	<p>Displays a series of character strings that indicate what happened when AudioTron logged on to the network. The display strings include:</p> <p><b>Local IP Address = x.x.x.x</b> – The IP address that AudioTron is currently using. If static IP addressing is configured, this setting should be the same as the static version. If DHCP is configured, then this is the address that was assigned by the DHCP server.</p> <p><b>AudioTron Name = Atronxxxxxx</b> – This is the name by which the AudioTron can be found on your network.</p> <p><b>Local MAC address = x:x:x:x:x:x</b> – The local MAC (ethernet) address for AudioTron.</p> <p><b>Local Net Mask = x.x.x.x</b> – The net mask that AudioTron is currently using. If static IP addressing is configured, this setting should be the same as the static version. If DHCP is configured, then this is the mask that was assigned by the DHCP server.</p> <p><b>Local Gateway = x.x.x.x</b> – The gateway that AudioTron is currently using. If DHCP is configured, then this is the gateway that was assigned by the DHCP server.</p> <p><b>Local DNS server = x.x.x.x</b> – This is the Domain Name Server that the AudioTron is using. If DHCP is configured, then this is the DNS that was assigned by the DHCP server.</p> <p><b>Initial Search at x days x hrs x mins</b> – Indicates that the first search of the network occurred at this amount of time since AudioTron was booted.</p> <p><b>Found TurtleRadio station server</b> – Indicates that AudioTron was able to communicate with the TurtleRadio server.</p> <p><b>Found xxx stations</b> – Indicates how many new radio stations were found.</p> <p><b>Host [hostname] found at IP x:x:x:x</b> – Indicates that the host was found at the indicated IP address.</p> <p><b>Update Search at x days x hrs x mins</b> – Indicates when the last search for new music occurred.</p> <p><b>Share [sharename] has xx new songs</b> – Indicates the number of new songs found on the indicated share.</p> <p><b>[Sharename] - Share Access Denied</b> – Indicates that access to this share was denied because the share password was wrong.</p> <p><b>[Sharename] – Error accessing share</b> – Indicates that there was a non-password related error accessing this share.</p> <p><b>[Hostname] – Access to host denied</b> – Indicates that the NT username and password are incorrect.</p> <p><b>[Hostname] – Error accessing host</b> – Indicates that there was a non-password related error accessing this host.</p> <p><b>No Name for host at IP x.x.x.x</b> – Indicates that no name was found for a host found at</p>



		that IP address, therefore TCP/IP was installed but File Sharing was not installed or not bound to TCP/IP. <b>Using TOC file for Share xxxxx</b> – indicates that there is a "Table of Contents" file that the AudioTron is using to determine the contents of a network share.
R	<b>Configure DHCP</b> (default = Enabled)	<b>Enable</b> – For connecting AudioTron to a network with a DHCP server so that AudioTron will automatically accept a valid IP address from the DHCP server PC. <b>Disable</b> – For configuring AudioTron with a static IP address as described in the "Set IP Address" option (see below). <b>NOTE:</b> If DHCP is Enabled, the settings in <b>Select Network Interface</b> , <b>Set IP Address</b> , <b>Configure Subnet Mask</b> and <b>Configure IP Gateway</b> will be configured automatically. Any manually added settings in these menus will be ignored.
R	<b>Select Network Interface</b>	<b>Ethernet</b> – For connecting AudioTron to a 10BaseT-compatible Ethernet network. <b>Phone Line</b> – For connecting AudioTron to an HPNA 2.0 network.
R	<b>Configure IP Address</b> (default = 192.168.0.10)	If DHCP is disabled, lets you assign an IP address to AudioTron. A typical IP address is 192.168.0.xxx where the xxx setting ranges from 1 – 254 as determined by the Subnet mask (a "Class C" network IP address).
R	<b>Configure IP Subnet Mask</b> (default = 255.255.255.0)	If DHCP is disabled, lets you enter an IP Subnet Mask that should match the one on your network. A typical subnet mask setting for a Class C network is 255.255.255.xxx, where the xxx setting ranges from 0 – 252 and sets the valid starting point for an IP address in the network. (e.g. 0 signifies a valid IP address range of 1 – 254.)
R	<b>Configure IP Gateway</b> (default = 192.168.0.1)	If DHCP is Disabled, sets the IP address of the network gateway (your host PC). This must match the setting on your host PC.
R	<b>Restore Factory Defaults</b>	Resets AudioTron to its original factory default settings and discards all user-customized changes. Re-start AudioTron for the default settings to take effect: Turn the rear panel power switch off and back on. Wait a few seconds and press the front panel Standby button. Once the start up procedure is completed, AudioTron will be operating with the original factory default settings.
R	<b>Update Firmware</b>	Updates the internal software ("firmware") from a file on the host PC. See the section entitled "Updating AudioTron's Firmware" for details.
	<b>Button Test Diag</b>	A diagnostic menu that is used for testing the operation of front panel buttons, control knob and remote control.



## Rear Panel Connectors




<p>① <b>ETHERNET</b></p>	<p>Ethernet Network Connector - Use the included Category 5 Ethernet cable to connect this jack to a 10BaseT Ethernet network hub or switch.</p> <p>AudioTron will also work with a dual speed 10/100 hub, but will not work with a 100baseTX-only hub or switch.</p>
<p>② <b>PHONE</b></p>	<p>When AudioTron is connected to an HPNA phone line network, this jack may be used to connect a telephone or to cascade a second AudioTron via the HPNA connection.</p>
<p>③ <b>LINE</b></p>	<p>HPNA Network Connector – Connect the included telephone cable to this jack when using AudioTron on an HPNA home phone line network.</p>
<p>④ <b>DIGITAL OUT</b></p>	<p>S/PDIF optical digital audio output - Connect to powered speakers or stereo receiver with an optical digital input. Connect with an optical Toslink cable (not included).</p>
<p>⑤ <b>ANALOG OUT</b></p>	<p>RCA Analog Line Outputs (L/R) - Connect to powered speakers or stereo receiver with RCA line input jacks.</p>
<p>⑥ <b>AC Power Connector</b></p>	<p>Insert the female end of the included three-pin IEC power cord into this receptacle</p>
<p>⑦ <b>AC Fuse</b></p>	<p>Receptacle for a 250mA Slo-Blo 250V mini-fuse.</p> <p>To Replace the fuse:</p> <p>Remove the electrical cord from the rear panel receptacle.</p> <p>Take a small flat-blade screwdriver and insert into notch. Gently pry out the fuse holder cover with the screwdriver. Take note of how the plastic was aligned in the holder.</p> <p>Take out the old fuse and replace with a new mini-fuse of the exact same type and rating (5 x 20 mm, 250mA or 1/4 Amp, 250V Slo-Blo® UL/CSA cartridge type)</p> <p>Put the fuse in the plastic holder and press the holder back into place on the AudioTron rear panel. Be sure to re-insert the holder in the same way it was originally installed.</p>
<p>⑧ <b>AC Power Switch</b></p>	<p>Use this switch to power up AudioTron for the first time, or to turn off all power to AudioTron (this should only be necessary when you want to completely disconnect the unit or you need to perform a complete 'reset').</p> <p>Once AudioTron is powered on, the rear panel power switch should be left on and the unit should be turned on and off with the Standby button. Turning AudioTron on and off with the Standby button avoids the network search process initiated by the "power on" sequence and retains AudioTron's temporary settings, so it's ready to play music with your custom configuration settings.</p> <p>If AudioTron is acting erratically, or if you want to rescan the network, "reset" the unit by turning the rear panel power switch off and on, wait a few seconds, then pressing the Standby button.</p>




# Remote Control

As with the buttons on the AudioTron front panel, most of the remote control's buttons activate a single function, while some serve multiple purposes depending on the active display.

 The remote control functions may be checked by using the Options "Button Test Diagnostic". See the Options Menu section for details.

## Buttons that function similarly to the front panel controls

<b>GROUP, ADD, CLEAR</b> (Group Mode controls)	Equivalent to the front panel Group, Add and Clear buttons.
<b>POWER</b>	Equivalent to the front panel Standby button.
<b>MUTE</b>	Equivalent to the front panel Mute button. Silences the audio playback.
<b>PLAY, STOP, PAUSE</b>	Equivalent to the front panel transport buttons.
	Equivalent to the front panel previous/next track buttons.  When in Select modes, these buttons also scroll through lists in the same way as turning the Control Knob. The scrolling speed will increase as the buttons are held down longer.
<b>VOL+ (volume up), VOL- (volume down)</b>	Equivalent to the front panel Control Knob when in Play Mode (Volume Control).
<b>RANDOM / REPEAT</b>	Equivalent to the front panel Random and Repeat buttons.

## Buttons not available on the front panel

<b>FAVORITES</b>	The 16 "Favorites" buttons work in conjunction with the Add FAV button to quickly activate favorite songs and lists by pressing one of the FAVORITES buttons. See the section Using "Favorites" Mode for details.
<b>ADD FAV</b> (Add Favorite)	This button is only active in the select screen (Select Mode). It prompts the user to select a favorite slot and saves the current selection type and entry into the Favorites slot you choose. See the section Using "Favorites" Mode for details.
<b>JUMP + (jump forward)</b> <b>JUMP- (jump back)</b>	When selecting from the menu, jumps forward or back to the next entry that does not begin with the same character (case insensitive) as the current Entry. Makes it easier to navigate through long lists of songs.  While a song is playing, selects song position (like fast forward and rewind.)
<b>PRESETS</b>	These are 4 additional favorites buttons grouped into a separate area for quicker access. Use these buttons for assigning "favorites" you intend to use often.
<b>TITLE, ARTIST, ALBUM, GENRE, LISTS</b>	Equivalent to the categories in the main menu for selecting lists.
<b>NET (Internet)</b>	Activates Internet radio menu.



AudioTron Remote Control





## Assigning “Favorites” to the Remote Control

The “Favorites” feature lets you assign a song, album, artist, genre, Internet radio station or playlist to the Favorites Buttons on the remote control so you can instantly play them with a push of a button.

The remote control includes a set of 20 user programmable buttons, grouped as 16 “FAVORITES” buttons (labeled 1 – 16) and 4 “PRESETS” buttons (labeled A, B, C and D). When one of these buttons is pressed, the current playing song (if any) is stopped and the songs associated with the button will be loaded into the Play Queue.

### To assign the Favorites and Presets buttons on the Remote Control

1. Turn the knob to highlight **Title, Artist, Album, Genre, Net or Lists** in the display menu (or press the corresponding button on remote control). For example, to assign an album, select Album.

Title	Artist	Album	Genre	Net	Lists
Select by Album					

2. Press the knob (or **Play**) and turn the knob to scroll album names.

Select by Album
Sting - Brand New Day

3. When the desired album is displayed, press the “**Add FAV**” button on the remote control. The display will prompt for the number of the Favorites button you wish to use.

Save Album: Sting - Brand New Day
As Favorite #?

4. Press one of the 16 “Favorites” buttons or one of the 4 “Preset” buttons on the remote control. For example, if you press button #1, the # sign in the display will change to a “1”, indicating the number of the button pressed. From this point on, pressing Favorites Button 1 will load and play this album.
5. To re-assign a song or list to a button that has been assigned, follow the same process to overwrite the previous contents.

➔ The Favorites buttons can also be assigned with the AudioTron web server. See the web server “**Favorites**” section for details.

## Using the “More songs like this” Feature

➔ The “**More songs like this feature**” is activated from the web server Preferences screen, accessed by selecting **Settings** → **Preferences** in the AudioTron web server.

The remote control “**More songs like this**” feature lets you easily play all songs by a particular artist, genre or album while listening to your music. When this feature is enabled via the web server Preferences screen, the remote control ARTIST, ALBUM, or GENRE buttons no longer operate as menu selection buttons. Instead, they will clear the play queue and load all songs corresponding to the category of the current song.

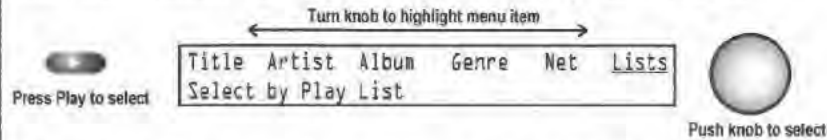
For example, if you’re listening to a Jazz song and decide that you’d like to hear more Jazz songs, pressing the Genre button on the remote control will clear the Play Queue and load every Jazz song in your library. Or, if you’re listening to a song by a particular artist and want to hear only songs by that artist, pressing Artist will clear all of the songs in the Play Queue and load all songs by that artist. Or, while listening to a song from a particular album, pressing Album will clear the Play Queue and load all songs from that album.



# Playing your Music Library from the AudioTron Panel

## Main Menu Display

AudioTron's **Main Menu** display (shown below) lets you find songs by **Title** (individual song titles), **Artist** (creator of the song), **Album** (the name of the CD the song came from), **Genre** (type of music), and **Lists** (User-defined Playlists). The **Net** menu item lets you select Internet radio stations if AudioTron is configured for Internet radio via the web server **Settings** → **TurtleRadio** page. The stations in the **Net** category are configured at the **TurtleRadio** web site, as described in the Setup Guide section entitled "Configuring AudioTron to play Internet Radio."

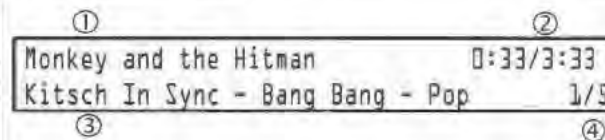


The categories Title, Artist, Album and Genre are part of the "song tag" created by AudioStation or other PC jukebox program used to transfer the song from a CD to the hard drive. When an entry from these categories is selected, AudioTron searches the music library for a song that matches the tag. If a song was entered without tag data, its file name (rather than song title) will be displayed when the Title category is selected and the file name will not appear when Artist, Album, or Genre are selected. For more information on Song Tags, see the section called "Managing your Music Library with AudioStation".

### To select a category...

1. Turn the knob until the desired category flashes. Press the knob to select the category.
2. While making a selection, pressing STOP at any point will return to the main menu.
3. Pressing the **Play** button while a song is playing will activate the main menu so you can add more songs to the Play Queue. If no selections are made within a fixed timeout period, the song status display will return.

## Song Playback Display



Pressing the **Play** button starts song playback and displays the following information:

① <b>Song Title</b>	The song title appears in this field. If there is no Title embedded in the music file's tags, the song's file name will be displayed.
② <b>Play time/status</b>	Displays how long the song has been playing and the total time of the song. If the song is not playing, the current status is displayed: <b>PAUSED</b> – Indicates that the Pause button has been pushed and the song is paused. Press Pause or Play to resume playback. <b>BUFFERING xx%</b> – Indicates that AudioTron is transferring song data from the network into its internal song buffer. <b>MUTED</b> - If the MUTE button is pressed, the word MUTED will flash.
③ <b>Tags</b>	"Tags" are data embedded in the audio files that provide information about the song (e.g. title, artist, album name, genre.) If no tags have been entered for the song, the file name for the song will be displayed. If the song tags contain more information than can be displayed at one time, the display can be set to scroll as a "marquee" See the web server " <b>Settings - Preferences</b> " section for information on controlling the display settings from the web server <b>Preferences</b> screen.
④ <b>Play Queue Status</b>	Displays the current song number and total number of songs in the Play Queue (e.g. the first song in an album that contains 5 songs will display as "1/5")



## Song Position Display

Setting Position 3:10/6:12

To set the song position while a song is playing, press the remote control JUMP + or JUMP - buttons or press and turn the knob on the front panel. The display will indicate the song position and the song will continue to play while you move the cursor. After the cursor stops moving, the song will jump to the new position.

Note that the song position feature will show a percentage instead of the time with MP3 files encoded in VBR (Variable Bitrate) format.

- The web server **Settings** → **Preferences** screen lets you set the knob to default in the Song Position mode on power up, rather than default to the Volume function. See the Web Server section for details.

## Playback Volume Display

Gain  
0 dB

Turning the knob while a song is playing or pressing the remote control volume buttons will momentarily display the volume setting. The volume control will only affect the rear panel analog outputs and headphones output. The S/PDIF digital output volume will not be affected by the volume control.

The volume setting indicates the “attenuation” of the maximum signal level. A setting of 0dB (“zero decibels”) indicates that there is no attenuation (i.e. “full volume”). Turning the knob counterclockwise will attenuate the signal by -1dB steps. The volume setting is saved when the Standby button is turned off. When turned back on, the volume will return to the saved setting.

- The Volume Control should be left at the 0dB (maximum) setting unless AudioTron is used with headphones or powered speakers that do not have a volume control. For best fidelity, the volume control on your stereo system or powered speakers should be used to control the playback level.

## Play Queue

Songs selected from the menu display are added to the “**Play Queue**”, which is a list of songs to be played. By navigating through the song selection menu, you can add songs to the Play Queue while listening to other songs.

- Contents of the Play Queue can be viewed and edited with the AudioTron web server.

The currently playing song is at the beginning of the Play Queue. For example, if a song is playing and three songs are selected from the display menu, the Play Queue will contain four songs—the currently playing song and the three songs added to the queue. When the current song is over (or if the **Next Track** button is pressed before the song is over) the second song in the queue begins to play, followed by the third and then the fourth, until the queue is completed.

Pressing the **Random** button will cause the songs in the Play Queue to play in a random order. Pressing the **Repeat** button will cause the Play Queue list to start over after the last song has finished playing.

The Play Queue cannot be edited from the front panel and the contents are erased when the Stop button is pressed. You can, however, remove songs from the play queue from the web interface. To stop a song without erasing the Play Queue, press the **Pause** button.



## Group List

A more permanent and editable play list can be created with the **Group List**. Pressing the **Add** button will add the displayed items to the end of the Group List. Selecting **<Group>** in the **Lists** menu plays the songs in the Group List. Songs may be added while a song is playing or while searching for songs in the display menu.

➤ *The Group List may also be viewed and edited via the AudioTron web server.*

➤ *If you do not clear the Group before adding songs to your custom play list, the songs will be added to those already in the Group.*

### To clear the Group List...

1. Press **Stop** to activate the display menu.
2. To delete all of the songs from the Group List, press the **Clear** button.
3. To delete specific songs from the Group List, press the **Group** button (LED turns on), turn the knob to select the song, then press the **Clear** button to delete only the song in the display.

### To add songs to the Group List...

1. To clear out the entire Group List or specific songs in the Group List, see above. Adding songs without first clearing the Group List will add the songs to those already in the list.
2. To add a song while it is playing, press the **Add** button on the front panel.
3. To add a song while searching for songs, press **Add** while the song title is on the display.
4. To add all of the songs from an album, by an artist, in a genre, or in a playlist to the Group List, press **Add** while the Album name, Artist name, Genre Name or Playlist Name is displayed.
5. To add multiple songs, repeat the steps above. For example, to add three songs from the same album to the Group List, press **Add** → scroll → **Add** → scroll → **Add**. Or to add all of the songs in the album, select **ALL** rather than the individual titles.

### To play the Group List...

1. Press **Stop** to activate the menu display. Turn the knob to select **Lists** and press either the knob or the **Play** button to select.
2. Turn the knob to display **<Group>**, then press either the knob or **Play** button to load all of the Group List songs into the Play Queue. The Group List can also be edited with the web server.

➤ *Turning off the AC power to AudioTron will delete the Group contents. Placing AudioTron in "Standby mode" will not delete the Group.*

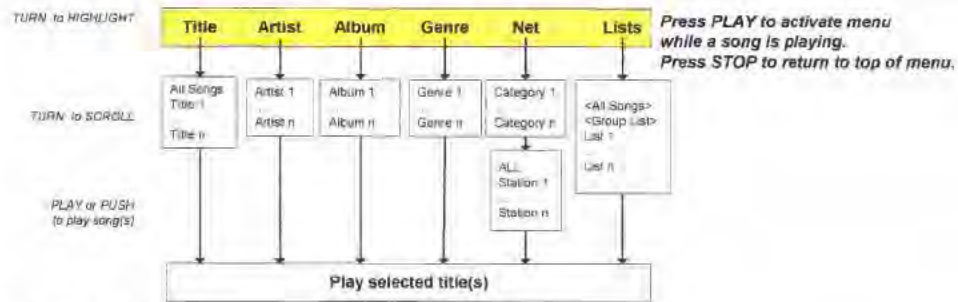
## Songs vs. Items

An important concept to remember when using AudioTron is the difference between "songs" and "items" when selecting what to play. AudioTron lets you select songs by searching for titles, artists, albums, genres and playlists. When you search for and add a "title" to the Play Queue, you effectively select one "item" that adds one song to the queue. However, if for example, you select an album with 12 songs, you would have selected an item that added 12 songs to the queue. Or if you select a genre with 300 songs, you would have selected an "item" that adds 300 songs to the queue.

The point to remember is that functions, which accept songs for playback (e.g. Play Queue, Group List and Favorites buttons), can accept single songs or "items" with multiple songs. For example, to create a Favorites button that would play all of your classical music, you'd add the "Classical" genre item to the Favorites button, rather than each song individually.



# Simple Menu Mode



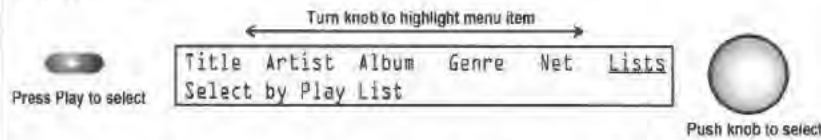
### Simple Menu Tree

The AudioTron defaults to “Simple Menu Mode”, which lets you select songs by category and then a group within that category. For example, selecting **Album** would let you find an album by name and play all of the songs on the album. Or, selecting **Artist** would let you play all of the songs by an artist. Only the **Title** menu item lets you find and play individual songs from the music library.

The flow chart shows the “tree” structure of Simple Menu Mode. The top of the tree shows the main menu selections (**Title**, **Artist**, **Album**, **Genre**, **Net** and **Lists**) while the boxes below each menu item show the corresponding categories.

## Navigating the Menu Tree

To navigate in the menu tree, begin at the top by turning and pressing the knob to select the items below the menu. Then, turn the knob to scroll the items in the sub-menu and press to select the displayed item.



For example, selecting “Artist” presents a sub-menu listing all of the artists in the music library. Turning the knob scrolls the artist names and pressing the knob loads all of the songs by the selected artist into the Play Queue.

### To play a single song

1. Turn the knob until the **Title** menu item selection flashes. Press the knob, then turn to select a song title from the song library. (NOTE: Pressing the **Next/Prev** buttons on the front panel or the **JUMP+** and **JUMP-** buttons on the remote control will skip to the first song in the next letter of the alphabet, which provides a quick way to scroll through a large library.)
2. When the desired title is displayed, press the **Play** button or push the knob to start playback. The song will be added to the Play Queue.
3. To load the song into the Group list, press the **Add** button when the title is displayed, before pressing **Play**.

When **Play** is pressed, AudioTron will transfer a portion of the song file from the PC Host to its internal memory buffer for playback. After the buffer is adequately filled, the song will play once, then stop. The “time indicator” on the right side of the display will advance as the song plays. To play the song repeatedly, press the **Repeat** button.

🔄 If there are multiple songs with the same name in the music library, AudioTron differentiates between them by adding a number in parentheses after the name of the song (e.g., “Song” and “Song-(1)”.)



### **To play songs by a particular Artist**

1. Turn the knob until the **Artist** menu item flashes. Press the knob, then turn to select the Artist Name. (Pressing the <</> buttons on the front panel or the **JUMP+** and **JUMP-** buttons on the remote control will skip to the first song in the next letter of the alphabet, which provides a quick way to scroll through a large library.)
2. When the desired artist is displayed, press the **Play** button or push the knob to start playback. The number of songs for the selected artist will be loaded into the Play Queue and the first song will begin to play.
3. To load the artist songs into the Group list, press the **Add** button when the artist name is displayed, before pressing **Play**.

### **To play songs from a particular Album**

1. Turn the knob until the **Album** menu item flashes. Press the knob, then turn to select the Album name. (Pressing the <</> buttons on the front panel or the **JUMP+** and **JUMP-** buttons on the remote control will skip to the first song in the next letter of the alphabet, which provides a quick way to scroll through a large library.)
2. When the desired album is displayed, press the **Play** button or push the knob to start playback. The number of songs for the selected Album will be displayed and the entire list of songs from the Album will be loaded into the Play Queue.
3. To load the Album songs into the Group list, press the **Add** button when the album name is displayed, before pressing **Play**.

### **To play songs of a particular Genre**

1. Turn the knob until the **Genre** menu item flashes. Press the knob, then turn to select the Genre name. To scan by letter, press the next/prev track buttons. (Pressing the <</> buttons on the front panel or the **JUMP+** and **JUMP-** buttons on the remote control will skip to the first song in the next letter of the alphabet, which provides a quick way to scroll through a large library.)
2. When the desired genre is displayed, press the **Play** button or push the knob to start playback of all the songs in the genre.
3. To load the genre songs into the Group list, press the **Add** button when the genre name is displayed, before pressing **Play**.

### **To play songs from a Play List**

Play Lists are groups of songs created on the PC using a jukebox program such as AudioStation. For information on Playlists, see the section called "Managing your Music Library with AudioStation".

1. Turn the knob until the **Lists** menu item flashes. Press the knob, then turn to select the List name. The first list item, <All songs> will select all of the songs in the music library. The second item, <Group> is the list created by the Group buttons. The rest of the lists are the play lists created on the PC as M3U or PLS files.
2. When you find the desired play list, press the **Play** button or push the knob to start playback of the songs in the list.

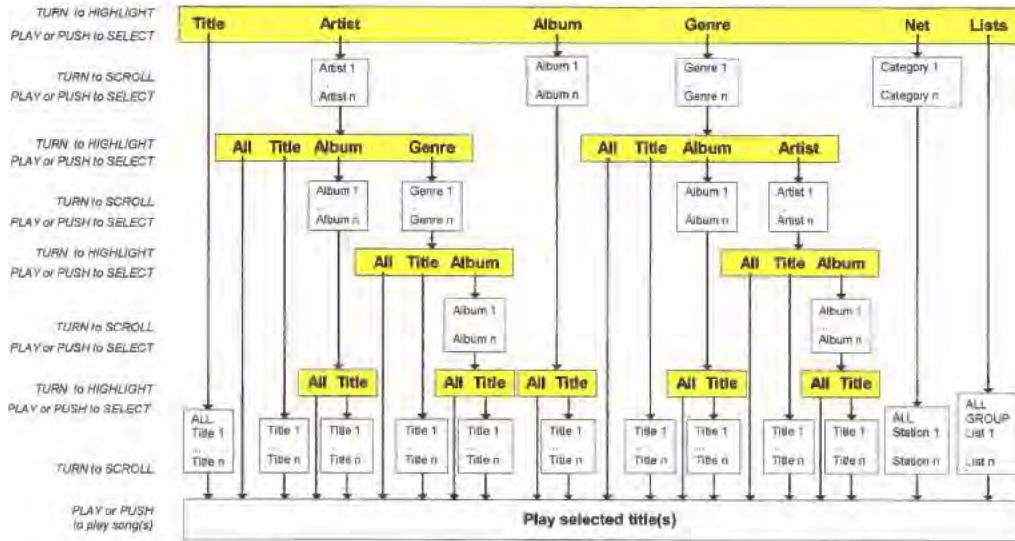
### **To select with the Remote Control**

1. Press the menu item you'd like to select (e.g. "Genre").
2. Press the |< and >| buttons to move through the selections, just like turning the knob. Press Jump + and Jump - to scroll to the next letter in the list.



# Advanced Menu Mode

Press PLAY to activate menu while a song is playing.  
Press STOP to return to top of menu.



Advanced Menu Tree

Advanced Menu Mode provides a search mechanism significantly more advanced and versatile than Simple Mode, providing detailed control over selection of songs from the music library. For example, you could find an album by name, and play a single song on that album. Or, you could find an artist by name, then all albums by that artist, then a song on one of those albums.

➤ Advanced Menu Mode is enabled from the AudioTron web server **Preferences** screen

## “Filtering” Selections in the Menu Tree

The flow chart above shows the “tree” structure in Advanced Mode. The top shows the main menu selections (Title, Artist, Album, Genre, Net and Lists), while the boxes below each menu item show the categories and paths for navigating the tree. For example, selecting “Artist” presents a list of all artists, as in Simple Mode. However, once the artist is selected, a sub-menu allows the selection of **All** (all songs by the artist), **Title** (single titles by the artist), **Album** (album titles by the artist), and **Genre** (genres by the artist). Once one of these items has been selected, another sub menu appears, and so on, until the bottom of the tree is reached. This effectively “filters” the music library by the criteria chosen in each part of the menu tree so that only songs matching the selected criteria will be listed in the display.

The menu tree shows how Advanced Mode lets you find songs by following a path beginning with the main menu at the top and ending with a list of song titles “filtered” along the path to the bottom. For example, a song on an album can be found by following one of two paths: **Artist → Album → Title** or **Album → Title**. Similarly, finding a song in a particular genre by an artist could be found by **Artist → Genre → Title** or by **Genre → Artist → Title**.

Navigating the other paths through the menu tree follows a similar pattern. Therefore, by referring to the above diagram of the menu tree, the following descriptions of how to navigate through the Title and Artist trees can be extrapolated to understand the paths in the other trees.



Advanced Menu Mode is enabled in the web server Preferences screen.



## Selecting Songs by Title

### To select all songs in the music library (Method 1)

<b>Title</b> Artist Album Genre Net Lists Select by Title	Turn knob to highlight <b>Title</b> in the display menu (or press <b>Title</b> on remote control.) Then press <b>Play</b> or push knob to select Title mode.
Select by Title (STOP to exit) <All Songs>	<All Songs> is highlighted as the first entry in the list. Press <b>Play</b> or push knob to select all songs.
Selected 2,572 Songs	All songs in the music library are added to the Play Queue.

### To select all songs in the music library (Method 2)

Title Artist Album Genre Net <b>Lists</b> Select by Lists	Turn knob to highlight <b>Lists</b> in the display menu (or press <b>Lists</b> on remote control.) Press <b>Play</b> or push knob to select Title mode.
Select by List (STOP to exit) <All Songs>	<All Songs> is highlighted as the first entry in the list. Press <b>Play</b> or push knob to select all songs.
Selected 2,572 Songs	All songs in the music library are added to the Play Queue.

### To select a song by Title

<b>Title</b> Artist Album Genre Net Lists Select by Title	Turn knob to highlight <b>Title</b> in the menu (or press <b>Title</b> on remote control.) Press <b>Play</b> or push knob to select songs by title.
Select by Title (STOP to exit) Anytime at All	To scroll songs, turn knob (or press [ <b>&lt;/&gt;</b> ] on remote control). Press <b>&lt;&lt;/&gt;&gt;</b> (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to play.
Selected 1 item	Selected song is added to the Play Queue.

## Selecting Songs by an Artist

### To select all songs by an Artist

Title <b>Artist</b> Album Genre Net Lists Select by Artist	Turn knob to highlight <b>Artist</b> in menu (or press <b>Artist</b> on remote control.) Press <b>Play</b> or push knob to select songs by Artist.
Select by Artist (STOP to exit) Sting	To scroll artists, turn knob (or press [ <b>&lt;/&gt;</b> ] on remote control). Press <b>&lt;&lt;/&gt;&gt;</b> (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select.
<b>All</b> Title Album Genre (STOP to exit) Play All for Sting 63 songs	The number of songs by this artist is shown at the bottom right Press <b>Play</b> or push knob to select all songs by this artist.
Selected 63 items	All songs by this artist are added to the Play Queue.

### To select a single song by an Artist

Title <b>Artist</b> Album Genre Net Lists Select by Artist	Turn knob to highlight <b>Artist</b> in menu (or press <b>Artist</b> on remote control.) Press <b>Play</b> or push knob to select songs by Artist.
---	---





Select by Artist (STOP to exit) Sting	To scroll artists, turn knob (or press [ $</>$ ] on remote control). Press $<</>>$ (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select.
All <b>Title</b> Album Genre (STOP to exit) Select Title for Sting 63 songs	Turn knob to highlight <b>Title</b> (or press <b>Title</b> on remote control.) Press <b>Play</b> or push knob to select a song by this artist.
Select Title for Sting A Thousand Years	To scroll songs, turn knob (or press [ $</>$ ] on remote control). Press $<</>>$ (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select song.
Selected 1 Items.	The selected song by this artist is added to the Play Queue.

**To select all songs on an Album by an Artist**

Title <b>Artist</b> Album Genre Net Lists Select by Artist	Turn knob to highlight <b>Artist</b> in menu (or press <b>Artist</b> on remote control.) Press <b>Play</b> or push knob to select songs by Artist.
Select by Artist (STOP to exit) Sting	To scroll artists, turn knob (or press [ $</>$ ] on remote control). Press $<</>>$ (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select artist.
All Single <b>Album</b> Genre (STOP to exit) Select Album for Sting 63 songs	Turn knob to highlight <b>Album</b> (or press <b>Album</b> on remote control.) Press <b>Play</b> or push knob to select a song by searching albums by this artist.
Select Album for Sting Brand New Day	To scroll albums, turn knob (or press [ $</>$ ] on remote control). Press $<</>>$ (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select album.
All <b>Title</b> (STOP to exit) Play All for Sting: Brand New 10 songs	All is highlighted. The number of songs on this album is shown at the bottom right (10 songs). Press <b>Play</b> or push knob to select all songs on this album.
Selected 10 items	The 10 songs on this album are added to the Play queue.

**To play a song on an Album by an Artist**

Title <b>Artist</b> Album Genre Net Lists Select by Artist	Turn knob to highlight <b>Artist</b> in menu (or press <b>Artist</b> on remote control.) Press <b>Play</b> or push knob to select songs by Artist.
Select by Artist (STOP to exit) Sting	To scroll artists, turn knob (or press [ $</>$ ] on remote control). Press $<</>>$ (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select artist.
All Title <b>Album</b> Genre (STOP to exit) Select Album for Sting 63 songs	Turn knob to highlight <b>Album</b> (or press <b>Album</b> on remote control.) Press <b>Play</b> or push knob to select a song by searching albums by this artist.
Select Album for Sting Brand New Day	To scroll albums, turn knob (or press [ $</>$ ] on remote control). Press $<</>>$ (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select album.
All <b>Title</b> (STOP to exit) Select Title for Sting: Brand New 10 songs	Turn knob to highlight <b>Title</b> . Press <b>Play</b> or push Knob to select a song on this album.
Select Title for Sting: Brand New Day A Thousand Years	To scroll songs on this album, turn knob (or press [ $</>$ ] on remote control). Press $<</>>$ (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select song.
Selected 1 item	Selected song on this album is added to the Play Queue.

**To play all songs in a Genre by an Artist**

Title <b>Artist</b> Album Genre Net Lists Select by Artist	Turn knob to highlight <b>Artist</b> in menu (or press <b>Artist</b> on remote control.) Press <b>Play</b> or push knob to select songs by Artist.
---	--



Select by Artist (STOP to exit)  
Sting

To scroll artist names, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select.

All Title Album Genre (STOP to exit)  
Select Genre for Sting 63 songs

Turn knob to highlight Genre (or press Genre on remote control.) Press Play or push knob to select songs by Genre for this artist.

Select Genre for Sting  
Rock

To scroll genres by this artist, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select genre.

All Title Album (STOP to exit)  
Play All for Rock: Sting 63 songs

All Songs mode is highlighted. Press Play or push knob to select all songs in this Genre by this artist.

Selected 63 items

All songs in this genre by this artist are added to the Play queue.

**To select a song in a Genre by an Artist**

Title Artist Album Genre Net Lists  
Select by Artist

Turn knob to highlight Artist in menu (or press Artist on remote control.)  
Press Play or push knob to select songs by Artist

Select by Artist (STOP to exit)  
Sting

To scroll artists, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select.

All Title Album Genre (STOP to exit)  
Select Genre for Sting 63 songs

Turn knob to highlight Genre (or press Genre on remote control.)  
Press Play or push knob to select songs by Genre for this artist.

Select Genre for Sting  
Rock

To scroll genres by this artist, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select genre.

All Title Album (STOP to exit)  
Select Title for Rock: Sting 63 songs

Turn knob to highlight Title (or press Title on remote control.)  
Press Play or push knob to select a song.

Select Title for Rock: Sting  
After the Rain Has Fallen

To scroll songs in this genre by this artist, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select song.

Selected 1 item

Selected song is added to the Play Queue.

**To select all songs in a Genre on an Album by an Artist**

Title Artist Album Genre Net Lists  
Select by Artist

Turn knob to highlight Artist in menu (or press Artist on remote control.)  
Press Play or push knob to select songs by Artist.

Select by Artist (STOP to exit)  
Sting

To scroll artists, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select.

All Title Album Genre (STOP to exit)  
Select Genre for Sting 63 songs

Turn knob to highlight Genre (or press Genre on remote control.)  
Press Play or push knob to select songs by Genre for this artist.

Select Genre for Sting  
Rock

To scroll genres by this artist, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select genre.

All Title Album (STOP to exit)  
Select Album for Rock: Sting 63 songs


Turn knob to highlight Album mode (or press Album on remote control.)  
Press Play or push knob to select an Album.

Select Album for Rock: Sting  
Brand New Day

To scroll albums in this genre by this artist, turn knob (or press |< / >| on remote control). Press << / >> (or Jump + / Jump - on remote control) to jump by letter. Press Play or push knob to select album.



<p><b>All Title</b> (STOP to exit) Play All for Rock: Sting: Brand Ne 10 songs</p>	<p>All titles is highlighted. Press <b>Play</b> or push knob to select all songs on this album.</p>
<p>Selected 10 items</p>	<p>All songs on this album are added to the Play Queue.</p>
<p><b>To select a song in a Genre on an Album by an Artist:</b></p>	
<p>Title <b>Artist</b> Album Genre Net Lists Select by Artist</p>	<p>Turn knob to highlight <b>Artist</b> in menu (or press <b>Artist</b> on remote control.) Press <b>Play</b> or push knob to select songs by Artist.</p>
<p>Select by Artist (STOP to exit) Sting</p>	<p>To scroll artists, turn knob (or press  &lt; / &gt;  on remote control). Press &lt;&lt; / &gt;&gt; (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select.</p>
<p>All Title Album <b>Genre</b> (STOP to exit) Select Genre for Sting 63 songs</p>	<p>Turn knob to highlight <b>Genre</b> (or press <b>Genre</b> on remote control.) Press <b>Play</b> or push knob to select songs by Genre for this artist.</p>
<p>Select Genre for Sting Rock</p>	<p>To scroll genres by this artist, turn knob (or press  &lt; / &gt;  on remote control). Press &lt;&lt; / &gt;&gt; (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select genre.</p>
<p>All Title <b>Album</b> (STOP to exit) Select Album for Rock: Sting 63 songs</p>	<p>Turn knob to highlight <b>Album</b> mode (or press <b>Album</b> on remote control.) Press <b>Play</b> or push knob to select an Album.</p>
<p>Select Album for Rock: Sting Brand New Day</p>	<p>To scroll albums in this genre by this artist, turn knob (or press  &lt; / &gt;  on remote control). Press &lt;&lt; / &gt;&gt; (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select album.</p>
<p>All <b>Title</b> (STOP to exit) Select Title for Rock: Sting: Brand 10 songs</p>	<p>Turn knob to highlight <b>Title</b> (or press <b>Title</b> on remote control.) Press <b>Play</b> or push Knob to select a song.</p>
<p>Select Title for Rock: Sting: Brand New Da Big Lie Small World</p>	<p>To scroll songs on this album, turn knob (or press  &lt; / &gt;  on remote control). Press &lt;&lt; / &gt;&gt; (or <b>Jump + / Jump -</b> on remote control) to jump by letter. Press <b>Play</b> or push knob to select song.</p>
<p>Selected 1 item</p>	<p>Selected song is added to the Play Queue.</p>

 The above techniques for selecting songs can also be used to add the selections to the Group List by pressing the **Add** button when the song or item is displayed.



## Controlling AudioTron with the Web Server

### Web Server Overview

AudioTron's extensive list of features cannot all be controlled from the limited number of buttons on the remote and front panel. Instead, we've provided an integrated "web server" that can be accessed from your PC's web browser. Once your AudioTron is configured, any PC on your network can be used to access the web server by simply launching your web browser (e.g. Internet Explorer or Netscape) and entering the IP address of your AudioTron, enabling you to communicate with the AudioTron from the PC.

After you've become accustomed to AudioTron's powerful set of features, you'll appreciate the convenience of using the AudioTron web server to control your song library and AudioTron settings.

- *The AudioTron Web Server is incompatible with Netscape Navigator earlier than version 6.0.*
- *Ad blocking, cookie blocking or personal firewall programs may prevent the web server from communicating with the PC and therefore should be disabled.*
- *The web server also supports a "thin client" mode compatible with the smaller screen on a PocketPC device. This mode enables devices such as the Compaq iPaq to control AudioTrons from its web browser. For more information, see the section "Using PocketPC devices with the Web Server."*

#### To access the Web Server

1. Activate the web browser on a PC connected to the same network as AudioTron.
2. Find the network name assigned to AudioTron by pressing the front panel **Options** button, selecting **Network History**, and scrolling to **AudioTron Name =**. After noting the name (e.g. Atron00096a), press the **Options** button to exit Options mode.
3. In your PC web browser screen, enter the AudioTron name the same way you'd enter an Internet Web site URL, and then press Enter on your PC keyboard. For example, if the AudioTron name is Atron00096a, enter `http://Atron00096a`. Note that you can also use AudioTron's IP address. (e.g. `http://192.168.1.10`) or use the link created by the Setup Utility.
4. If you attempt to access the web server Settings or Clock functions, the web browser will ask for a user name and password. Enter the default password "admin" for both. This password can be changed from the **Settings Web Server** screen and is useful if you want to prevent others from changing the AudioTron's settings without your permission.
- *The "Restore Factory Defaults" button in the web server **Firmware** screen can be used to reset the password and user name to "admin".*
5. After the username and password are entered, the browser will search for AudioTron at the address you've entered. When it finds AudioTron on the network, the AudioTron web server home screen will be displayed.



Web server running in the Windows Explorer Web browser



6. To make it easier to activate the web server from this point on, you can use the web browser's "Add to Favorites" setting to add the AudioTron address to your list of favorite URLs. Your web browser will also let you rename the "favorite" to something easier to remember, such as "AudioTron in Living Room".

## Web Server Menu Selections

The gray area on the left side of the screen lists all of the web server screens. To access a screen, click the name in the menu list. The list is divided into three key sections:

- The **Music Selection Section** lets you play and access music files or Internet radio stations.
- The **Clock Section** lets you activate and set the clock/alarm features.
- The **Settings Section** lets you configure web server and AudioTron operation options.

You can also access Internet-based information by clicking on these key areas in the screen:

- Clicking on the **Turtle Beach logo** at the top of the screen will access the Turtle Beach web site.
- Clicking on the **TurtleRadio logo** at the bottom of the left menu will access the TurtleRadio web site.
- Clicking on the **Help on the Web** menu item will access the relevant help information from the Turtle Beach web site.



*The **Music Selection** pages may be password protected by setting the check box in the **Settings** → **File Access** screen.*

## Music Selection

The **Home**, **Play Queue** and **Group List** screens work together with the **Music Selection** screens to let you select and play music. Because the web server runs on a PC screen, rather than being limited by the characters on the front panel display, selecting and playing songs is more intuitive. It's also easier to perform such tasks as assigning songs to the "Favorites" buttons on the remote control.

### Home

This is the web server's main screen, which emulates the controls on the front panel. From here you can set volume, song position, mute, random, and repeat. You can also see what song is currently playing and what song is coming up next in the "Play Queue".

The **Sleep Timer** setting on this screen lets you automatically stop the music after a preset time, such as when you're listening to music before falling asleep.

### Play Queue

Click on this menu item to see the list of songs selected for playback. From here you can jump to any song in the queue. Note that the song currently playing will be noted by a "← **Now Playing**" symbol next to the song, which corresponds to the "Playing" song shown on the Home screen. The next song in the list corresponds to the "Next..." song on the Home screen.

### Group List

Click on the **Group List** menu item to see the songs you've entered into the Group List. Songs are added to the Group List by pressing the **Add to Group** button at the bottom of the song selection pages, or by pressing the **Add** button on the front panel.

The Group List works just like a playlist created with AudioStation or other music management program—except you can create the Group List from the AudioTron front panel or the web server. You can play the songs in the Group List either by pressing the "Play Group" button at the bottom of the screen, or by selecting the Group List from the Lists menu item, just as you would select any other playlist.

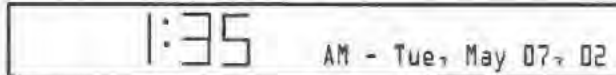


### Music Selection Menu Items

The menu items under the heading “**Music Selection**” correspond to the main menu display options on the AudioTron front panel—Title, Artist, Album, Genre, Net and Lists. These menu items let you select songs from your music library, just as you would from the front panel—but with *much* more control over song selection. For example, click on **Title** to see all of the songs in your library listed by title, or click **Artist** to select songs by Artist name, etc. You can even assign songs to the “Favorites” button on the remote control by clicking on the **Favorites** menu item.

### Clock / Alarm

AudioTron can be set to display the time and date as well as act as an alarm clock, complete with a “snooze” feature! Click on the Clock **Settings** menu item to set the clock options and click on the **Alarm** menu item to set the alarm functions.



AudioTron Front Panel Clock Display

➤ When the clock display is active, pressing the Stop button will display the main menu for song selection and pressing the Play button will display the last category selected in the menu.

### Settings

The menu items under the **Settings** heading let you configure the way AudioTron operates, search for songs in your music library, update AudioTron’s firmware, search for Internet radio stations and more. Click on each menu item to see the available options and refer to the detailed descriptions in the following sections.

➤ The **Settings** pages require a password to access. The default password (**admin**) may be changed from the **Web Server Settings** screen.



# Music Selection

## Selecting Songs and Internet Radio Stations

The web server Home screen shows the name of the currently playing song and the next song in the queue. From here, you can control all of the play transport functions, and access the other web browser pages by clicking on the left panel menu items.

### To play songs from the Web Server

1. The menu items under the **Music Selection** section correspond to the menu items on the AudioTron front panel display (in addition to Favorites.) Click on one of these menu categories to select songs as you would on the AudioTron display. For example, clicking on **Title** presents an alphabetical list of the Titles in your music library.
2. To find a song by Title, click **Title** to activate the **Title Selection** screen. Navigate by using the alphabet letters at the top of the screen. Note that if you have many songs beginning with a certain letter, the list will be separated into multiple pages that can be selected by using the numbers underneath the row of letters.
3. To immediately begin playing a song in place of the currently playing song, click **Play** to the left of each song Title.
4. To add songs to the Play Queue without stopping the current song, check the boxes next to the song titles and press the **Add to Queue** button at the bottom of the screen.

➤ Note that the first of the Titles displayed on the Web Server is always the "All Songs" playlist, making it easy to simply play all your digital music.

➤ You can change the number of items displayed on each page by changing the **Results per Page** setting on the **Web Server Preferences** screen, or by clicking on the "results per page" setting at the bottom of each screen.

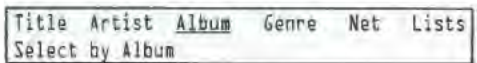
In the above example, the "filtering" functions of Advanced Menu Mode are not used, because the **Title** menu path does not require filtering criteria. However, some of the other categories provide additional steps as described in the following example for selecting songs by **Artist**:

### To select songs by Artist

1. Click on the **Artist** menu item to activate the Artist Selection screen, which lists the Artists in the music database sorted by alphabetical order. To find a particular Artist, click on the alphabet letters at the top of the screen. If there are many artists beginning with the selected letter, the results will be listed in multiple pages which can be accessed by using the numbers at the top of the page, or by using the **<<Previous** and **Next>>** links at the bottom of the page.



Web server Music Selection menu



Front panel main menu display



Web server Title Selection Page



Web server Artist Selection Page



2. To immediately begin playing all songs by an Artist in place of the currently playing song, click **Play** to the left of the check box.
3. To add all songs by an artist to the Play Queue, select the checkbox next to artist name, then click the **"Add to Queue"** button. These songs will play after the songs already in the queue are done playing.
4. To find songs from a particular **Album**, **Genre**, or **Title** by an Artist, click on the links to the right of the artist's name.
5. When selecting the **Artist** by Album, Genre, etc... the current selection will appear at the top of the screen. To clear the criteria and start over, click on the menu item on the left side of the screen to start over.
6. Follow this procedure for the Album and Genre categories that utilize the filter function.



Web server **Album** screen



Web server **Genre** screen





## Play Queue

You can view and edit the songs in the Play Queue from the web server **Play Queue** screen, accessed by pressing the Play Queue menu item on the left.

The currently playing song will have a “← **Now Playing**” designation next to its label. To jump to another song, click on **Play** next to the title.

To remove a song or group of songs from the Play Queue, select the checkbox next to the item(s) and press the “**Delete from Queue**” button at the bottom of the screen.



Web server **Play Queue** Screen

## Favorites

The 16 Favorites buttons (labeled 1 – 16) and 4 Preset buttons (labeled A – D) on the remote control can each be assigned to load preset song lists into the Play Queue. These 20 buttons can be assigned from either the remote control (with the **Add FAV** button) or from the web server **Favorites** screen.

The Favorites buttons may be assigned songs by any of the categories in the main menu, which includes individual title, artist, album, genre, or playlist. For example, you can assign a single song title or all of the songs by an artist to a Favorites button. The following example describes how to assign a Favorites button to load songs into the Play Queue:

### To assign songs to the Favorites buttons

1. Click on the **Favorites** menu item to activate the Favorites screen, which shows the assignment of the 16 Favorites buttons and 4 Presets buttons.
2. To play any of the Favorites or Preset buttons which have music assigned, click on **Play** next to the check box.
3. For this example, lets assign an album to Favorite button #3. Click **Configure** in the line for Favorite #3, then select **Album** from the left menu to activate the Album selection screen.
4. Check the desired album from the list, then click the **Set Favorite** button at the bottom of the screen to assign all songs in that album to Favorite button #3. Now, pressing button #3 on the remote control will immediately play the songs from the assigned album.
5. Song titles, genres, artists, lists, and Internet radio stations may be assigned to the other buttons using a similar procedure.



Web server **Favorites** screen



## Group List

The Group List is a special play list to which you can add songs from the AudioTron front panel and remote control **Add** buttons or from the web server selection screens.

To play the songs in the Group List, select it from the **Lists** item on the main menu display or the **Lists** button on the remote control. The following example describes how to assign songs to the Group List from the web server:

### To assign songs to the Group List

1. For this example, assume we'd like to add several songs to the Group List.
2. Click **Title** under the **Music Selection** menu to activate the Title screen. Select the check box next to the name of the desired songs.
3. Scroll to the bottom of each page with a checked song title and press "**Add to Group**."
4. When you're done, click on the **Group List** menu item to activate the Group screen. All of the selected songs should be listed in the screen.
5. To play the songs, press the **Play Group** button. You can also play the Group List by clicking on the **Lists** menu item and selecting **Group List** from the Playlist screen.
6. To remove specific songs, check the box next to the songs, then press **Delete from Group**.
7. To remove all songs, press **Clear Group**.



Web server Group List screen



## Clock / Alarm

AudioTron is not only an amazing digital media playback device, but it can be one of the most accurate and configurable alarm clocks in your home!

Imagine waking up to your favorite MP3 playlist or Internet Radio, from an alarm that gets the exact time from an Internet time server! When the clock feature is enabled, the AudioTron front panel displays the time and date, along with any alarm settings you have configured.



### *AudioTron clock display*

When the Clock feature is activated, the AudioTron LCD display will look like the illustration above. If the alarms are set, they will be indicated above the date display.

- *Pressing the Stop button on the front panel will activate the main menu display for a brief interval. While the main menu is displayed, you can select and play music just as if the clock display were disabled.*

This section describes how to use the web server Clock Settings and Alarms screens to set the clock and alarms. Here's a quick overview of how they work:

1. To turn on the clock display, click on the **Clock → Settings** menu item to activate the **Clock Settings** screen. From there, select the **Display Mode** from the drop-down menu at the top.
2. Next, select where the clock gets its time and date and how they're displayed.
3. To set the alarms, click on the **Clock → Alarms** menu item to enter the **Alarm Settings** screen.
4. The **Snooze** function determines how long it will take the alarm to turn back after you've pressed any button or the knob on the front panel (except the Stop button).
5. The **Nap alarm** puts AudioTron into an "instant alarm" mode where it plays music once the Nap time setting is reached.
6. **Alarm 1** and **Alarm 2** work just like the alarm on a clock, where you can set the time and day for each one.
7. To change the alarm sounds, click on the **Change Alarm Sound** button under each alarm. This lets you navigate through your music library to find a specific song to play when the alarm sounds.



## Clock - Settings

The **Clock Settings** screen displays the settings relevant to configuring the Clock feature. This screen is accessed by clicking on the **Settings** menu item under the **Clock** section at the left of the screen.

### Clock Configuration

**Display Mode:** The clock feature can be enabled several different ways by selecting the options in the **Display Mode** pull-down menu settings and then pressing the **"Set Clock Config"** button:

- **Disable Clock:** This option turns off the clock feature.
- **Enable Clock using TurtleRadio:** This option turns on the clock feature and obtains the time from the TurtleRadio time server whenever you use the **"Search for New Stations"** feature in the TurtleRadio Settings screen. Although this is the easiest method of enabling the clock, the TurtleRadio server is not a true time server, so the actual time setting is accurate to only to 30-40 seconds as compared to the time obtainable from a true time server, as explained below.
- **Enable Clock using Manual Setting:** If your AudioTron is not connected to the Internet, or if you'd like to set your clock ahead or behind several minutes, you can use this setting to manually set the time, per the settings in the **Manual Time Setting** below.
- **Enable Clock using Time Server Setting:** This option uses the Internet Time Server Setting below to set the time using an Internet Time Server. This option requires an Internet connection and provides the most accurate time possible. A list of time servers is available at the Turtle Beach web site (click on the menu item "Help on the Web" for more information.)



Web server Clock Settings screen

**Set Time Zone:** This pull-down selection lets you set your time zone so the AudioTron clock can properly display the time in your area. Note that if you use the manual time settings, this step is not necessary.

**Display Seconds:** When enabled, pressing the **"Set Clock Config"** button will set the clock to display Hrs: Mins: seconds. When disabled, the display will indicate Hrs: Mins.

**Display Time During Playback:** When enabled, pressing the **"Set Clock Config"** button will cause the time to be displayed during music playback, except when changing songs or selecting a new item. When unchecked, the clock display will appear only when the unit is not playing digital music.

**24-Hour Clock:** When enabled, pressing the **"Set Clock Config"** button will set the clock to display in 24-hour format.

**Daylight Saving Time:** When enabled, pressing the **"Set Clock Config"** button will move the time forward one hour from the time it receives from a Time Server. Note that enabling this will not cause the AudioTron to automatically move the time forward or backward twice a year!



## Clock - Alarms

The **Alarm Settings** screen displays the settings relevant to configuring the clock alarms. This screen is accessed by clicking on the **Alarms** menu item under the **Clock** section at the left of the screen. AudioTron can sound two traditional alarms (Alarm 1 and Alarm 2) and one “Nap Alarm.”

For example, you can use Alarm 1 and Alarm 2 to wake yourself up in the morning, remind yourself about an appointment, or have AudioTron start playing “Auld Lang Syne” on New Year’s Eve, while the nap alarm can be used if you’d like to have the AudioTron start playing music after a certain number of minutes or hours from the time you enable it.

### Stopping the Alarm and Snoozing

When the alarm is sounding, pressing the knob on the front panel or any of the 16 Favorites buttons on the remote control will cause the unit to “snooze.” Pressing the stop button will cause the alarm to stop playback.

➡ *If an Alarm has been sounding for more than 30 minutes after the last time you hit Snooze, the AudioTron will turn off the Alarm automatically.*



Web server Alarm Settings screen

**Snooze Function Setting:** This setting determines how long AudioTron will remain silent after the “Snooze button” has been pressed during alarm playback.

### Nap Alarm

**Nap Interval:** This setting sets the time before AudioTron will start playing the **Current Nap Alarm** sound. For instance, if set to 1 minute, the unit will start playing the selected music one minute after the **Set Nap Alarm** button has been pressed.

**Soft Wake:** When enabled, the alarm will turn on gradually and increase in volume until reaching the specified volume level. Soft Wake will have no effect when using the digital audio output.

**Change Alarm Sound:** Pressing this button lets you select the song, group of songs, or Internet radio station that will play when the Alarm is triggered. To preview the alarm, press the “**Audition**” button next to the Alarm. To stop the preview, press the **Stop** button.

### Alarm 1 and Alarm 2

The features of Alarm 1 and Alarm 2 are identical. The alarms operate independently. No settings will take effect until the **Set Alarm** button is pressed.

**Enable:** When checked, the Alarm is enabled (as indicated on the front panel display.)

**Soft Wake:** When checked, the alarm will turn on gradually and increase in volume until reaching the specified volume level.

**Alarm Time:** Selects the Alarm time (don’t forget to specify AM or PM!).

**Alarm Days:** Specifies what days of the week you would like the alarm to sound. By default, Monday through Friday are selected.

**Alarm Volume:** Changing this value will specify a new volume setting for the alarm.

## Settings

### Settings - Network

The web server **Network Settings** screen lets you configure AudioTron's network settings and is accessed by clicking on the **Network** menu item under the **Settings** section at the left of the screen.

**Test Internet Connection:** Press this button to check if AudioTron can access the Internet.

**Use DHCP:** If your network has a DHCP server, selecting this option will cause AudioTron to obtain its IP address information from the DHCP server.

**Use Static IP Settings Below:** Select this option if you do not have a DHCP server on the network or if you wish to specify your own network parameters. When this option is enabled, the settings in the sections "**Static IP Settings**" will take effect.

#### Static IP Settings

These settings will only be in effect if the "**Use Static IP Settings Below**" check box is selected. Press the "**Save Connectivity Settings**" button to activate the settings below:

**Network Interface:** Select **Ethernet** if AudioTron is connected to a 10BaseT Ethernet network or **Phone Line** if to an HPNA 2.0 network.

The settings for the following categories may be obtained from the AudioTron Setup Utility "**View Test Results**" screen:

**IP Address:** AudioTron's IP address.

**Subnet Mask:** IP Subnet Mask assigned to network.

**Gateway:** The IP address assigned to the network gateway. The gateway device provides Internet access to the network devices.

**DNS Server:** The IP address assigned to your network Domain Name Server (DNS). The DNS server finds Internet web sites by the name assigned to its IP address number.

#### Proxy Settings

Press the "**Save Proxy Settings**" button to activate the settings below:

**Enable Proxy:** If your network is using a proxy server, check this box, then enter the proxy address and port. Note that AudioTron will not support proxy server authentication.

**Proxy address:** The IP address of your proxy server.

**Proxy port:** The port of your proxy server.

#### Ping Host

This setting is useful for gateway (try to ping an IP) and DNS (try to ping a domain name) tests. Enter the IP address and press the **Ping Host** button to ping the device at that address.

#### Front Panel

"**Disable network config from front panel**" lets you disable the editing of network configuration settings from the AudioTron front panel. To activate, check the box and press the **Submit** button. This option is useful in situations where the AudioTron is in an area where the network settings may be inadvertently altered by a curious user, which in turn could make the unit inoperable.



Web server **Network Settings** screen



## Settings - File Access

The File Access Settings screen lets you configure features that relate to playback of the digital music files in your PC music library. This screen is accessed by clicking on the **File Access** menu item under the **Settings** section at the left of the screen.

**Current number of files found:** This is the number of music files found in your music library.

**Check for New Files:** Pressing this button causes AudioTron to search the PCs (i.e. "Hosts") on your network for new music files. Use this whenever you add music files to your music library or whenever you add PCs to your network.

**File Playback:** Check "Enabled" and click "Save File Playback Settings" to configure AudioTron to play songs from your music library. Disable this feature and enable the Internet radio function in the TurtleRadio Settings screen if you want to use AudioTron only as an Internet radio device.

➔ *If the File Playback option is disabled, AudioTron will not be able to play music from your music library.*



Web server File Access Settings screen

**Additional Pre-buffering:** AudioTron plays music files by transferring data from the PC hard drive to AudioTron's internal memory (called a "buffer") via the network. The music file is transferred to AudioTron as individual "packets" of data interleaved with other network data. AudioTron's buffer is designed to hold enough data packets to assure that any temporary loss of data from the stream will not cause the audio playback to stop, or drop out.

The "Additional Pre-buffering" option determines the size of the buffer. With a lower setting, the time between pressing the Play button and the start of the song will be shorter because the song will begin to play after a smaller percentage of the buffer is filled. With a higher setting, there will be more of a delay because the song will not play until a greater percentage of the buffer is filled.

If the buffer is too small, it may cause "dropouts" if increased network traffic causes the buffer to empty before new data arrives. If the buffer is too large, it may cause a noticeable delay between the time the **Play** button is pressed and the time the song begins to play.

Since MP3 and WMA music files are compressed, they require a smaller buffer than WAV files (which can be up to 10 times larger.) Therefore, WAV files will exhibit a longer delay between the time **Play** is pressed and when the song begins playing.

**Windows 98/Millennium Share Password:** If you password-protected shared directories that contain song files, enter the password here so AudioTron can access the songs. Press "Save Share Password" to load the password into AudioTron.

**Windows NT/2000/XP User Name:** Sets a "User Name" used when the host PC is running Windows NT 4.0, 2000, XP or Linux. Note that the user name is case sensitive. Default is "atron". Press "Save" to load the entry into AudioTron.

**NT/2000/XP Password:** Sets a "User Password" used when host PC is running Windows NT 4.0, 2000, XP or Linux. Note that the password is case sensitive. Default is "atronpass". Press "Save" to load the entry into AudioTron.

**Click to configure share search options:** Click on this option to activate the Shares Configuration screen described in the next section.



## Share Search Options

The **Share Search Options** screen lets you configure the directories where AudioTron will search for music files. To access this screen, click on "[Click to configure share search options](#)" at the bottom of the **File Access Settings** screen.

For details on how AudioTron uses shared folders to find songs on your networked PCs, see the section entitled "[AudioTron and Shared Directories](#)".

### Share Search Mode

These three options determine where AudioTron will look for songs on your networked PCs after you press the "**Check for New Files**" button in the File Access Settings screen, or activate the "**Check for new music files**" option on the front panel.

To select one of these three options, check the option and then press the **Save Share Search Mode** button.

**Option 1 - Search default folders in all shares:** When this option is selected, AudioTron will only search for music files in shared directories with the specific names described in the section entitled "[AudioTron and Shared Directories](#)". Choose this option if you configured your music directories with the AudioTron Setup Utility and you do not have music files in directories with other names.

#### Option 2 - Search all folders in all shares:

When this option is selected, AudioTron will search for music files in every shared folder on every networked PC. If you have many shared folders, using this option could significantly increase the time to search for music. Thus, it is suggested that this option only be used if you have music files stored in many folders that would be too difficult to consolidate into the default folders in option 1.

**Option 3 - Search all folders in shared folders listed below:** When this option is selected, AudioTron will only search for music files in the folders listed in the **Configure Shares Manually** section below. Use this option if your music is stored in several shared folders with names that do not conform with the default folders in option 1.

### Configure Shares Manually

This section, activated when option 3 is selected, lets you specify the shared folders with your music files so that AudioTron will search only those folders.

Clicking the **Search Network for Shares** button will activate a search for all of the shared folders on your network, which will be listed next to "**Found Shares**". After the search is done, you can either copy and paste the folder names from the list into the boxes below, or type the names directly into the boxes. Clicking the **Save Manual Search Settings** button will cause AudioTron to search only the listed folders when you press the "**Check for New Files**" button in the File Access Settings screen or activate the "**Check for new music files**" option on the front panel.



Web server Share Search Options screen





## Settings - Preferences

The Preferences Settings screen lets you configure the way some of AudioTron's display and other functions operate. This screen is accessed by clicking on the **Preferences** menu item under the **Settings** section at the left of the screen.

### Functional Preferences

**Knob Default Function:** Checking "Volume" will cause the knob to act as a volume control when turned while a song is playing. When the knob is pressed, it acts as "song position", letting you jump to a specific point in the song by turning the knob as the song is playing.

Checking "Position" will reverse these functions, so the knob powers up as a song position control and when pushed, controls volume.

**Select Album by "Artist-Album":** When enabled, the display will place the artist name prior to an album name.

**Select Title by "Title-Artist":** When enabled, the display will place the artist name after the song title.

**Advanced Menu Mode:** When enabled, turn on **Advanced Menu Mode** on the AudioTron front panel display. Un-checking will enable **Simple Menu Mode**. See the separate section in this manual explaining how these modes operate.

**"More Songs Like This":** When enabled, the remote control Artist, Album and Genre buttons will no longer operate as menu navigation buttons. Instead, pressing ARTIST, ALBUM, or GENRE, on the remote control will clear the existing play queue, and play only songs of the corresponding category. Note that this will not stop the currently playing song. See the separate section in this manual for more details on this feature.

### Display Preferences

**Display During Playback:** Checking any of the four options will display the option during song playback. For instance, if Bitrate is enabled, the bitrate of the song will be displayed along with its title.

**Top Line Scroll:** **Continuous** scrolls the top line of the front panel display continuously if the message is longer than the number of characters. **Once** will scroll the line once and stop. **Never** will truncate characters that do not fit in the display.

**Bottom Line Scroll:** Same as the **Top Line Scroll** option, except it applies to the bottom line of the display.

**Message Timeout:** Controls how long the temporary messages on the front panel will be displayed.



Web server Preferences screen

## Settings - Web Server

The Web Server Settings screen lets you configure the way certain functions on the web server operate. This screen is accessed by clicking on the **Web Server** menu item under the **Settings** section at the left of the screen.

**Refresh Time:** Sets the data refresh time of certain web interface functions.

**Results Per Page:** Sets the default number of items to display on Music Selection, Play Queue and Group List screens.

**AudioTron Location:** Lets you assign a name to identify the AudioTron being controlled by the web server, making it easier to identify when multiple AudioTrons are on your network. The name will appear at the top right of each web server screen (e.g. in the illustration, the name "Den" has been assigned and appears at the top right).

**Web Server Password:** Lets you restrict access to the web server Settings pages by allowing access only with the proper password. The default password (**admin**) can be changed by entering a new password in this box. The password can be reset to the default "**admin**" by using the "**Restore Factory Defaults**" as described above, or from the AudioTron front panel Options.

**Confirm Password:** Retype the password into this box to make sure it's correct.

**Password Protect Music Selection Pages:** To also restrict access to the Music Selection pages, check this box and press the **Save Web Server Settings** button. This will effectively require a password to use any of the web server features.



*If you disable the Front Panel Network settings from the Network Settings screen and forget your web server password, the unit must be returned to the factory for reprogramming, as there will be no way to retrieve the password from the web server or front panel options.*



Web server Settings screen



## Settings - Firmware

The Firmware Settings screen lets you update AudioTron's firmware, which you can download from the Turtle Beach web site. This screen is accessed by clicking on the **Firmware** menu item under the **Settings** section at the left of the screen.

➤ See the section entitled "**Updating AudioTron's Firmware**" for more details on the firmware update process.

**Check for new Firmware:** Press the **Search** button to initiate a search for the AudioTron firmware file on all of the directories accessible to AudioTron (as determined by the **Shares Access Settings** screen.)

**Current Found:** This will display the latest firmware version found in any of the directories accessible to AudioTron.

**Current Installed:** This displays the firmware version currently installed in the AudioTron.

**Restore Factory Defaults:** Clicking the "**Restore Defaults**" button will reset AudioTron to its original factory default settings and discard all user-customized changes. When using this option, turn the rear panel power switch off and back on to reset AudioTron.

**Update Firmware:** If **Current Found** is a newer version than **Current Installed**, then press the **Update Firmware** button to load the newer version into AudioTron. After the update is complete, turn AudioTron off and back on with the rear panel power switch.



Web server Firmware Settings screen



## Settings – Network History

The History screen displays the events that occurred when AudioTron logged on to the network, which is useful for troubleshooting network issues. This screen is accessed by clicking on the **History** menu item under the **Settings** section at the left of the screen.

Some of the information displayed includes:

**Local IP Address = x.x.x.x:** The IP address that AudioTron is currently using.

**AudioTron Name = Atronxxxx:** A unique name assigned to AudioTron that can be used in the web browser to access the Web Server.

**Local MAC address = x:x:x:x:x:** The local MAC (Ethernet) address for AudioTron.

**Local Net Mask = x.x.x.x:** The net mask AudioTron is using.

**Local Gateway = xxx.xxx.xxx.xxx:** The IP address of the node that connects AudioTron to the Internet for using Internet radio.

**Local DNS Server = xxx.xxx.xxx.xxx:** The address of the Domain Name Server that translates URLs to IP addresses.

**Initial Search at x days x hrs x mins:**

Indicates that the first search of the network occurred at this amount of time since the AudioTron was booted.

**Host [hostname] found at IP x:x:x.x:** Indicates that the host was found at the indicated IP address.

**Update Search at x days x hrs x mins:** Indicates when the last search for new music occurred.

**Share [sharename] has xx new songs:** Indicates the number of new songs found on the indicated share.

**[Sharename] - Share Access Denied:** Indicates that access to this share was denied because the share password was wrong.

**[Sharename] – Error accessing share:** Indicates that there was a non-password related error accessing this share.



Web server Network History screen



## Settings - TurtleRadio

The TurtleRadio screen displays the settings relevant to configuring the TurtleRadio feature. This screen is accessed by clicking on the **TurtleRadio** menu item under the **Settings** section at the left of the screen.

**Total number of stations found:** This shows the number of Internet radio stations found at the TurtleRadio web site, which represents the number of stations listed in the **Net (by Station Name)** screen.

**Check for New Stations:** If the AudioTron has access to the Internet via the network, pressing this button will connect with TurtleRadio.com and search for new Internet radio stations. The number of stations found will be indicated above the button.

➡ *To check if AudioTron can access the Internet via the network, use the **Check Internet Connection** feature on the Network screen.*

**Visit TurtleRadio on the Web:** If your PC has access to the Internet, clicking here will launch the TurtleRadio web site, where you can configure Internet radio stations for AudioTron, and sign up for TurtleRadio.

**TurtleRadio Player ID:** Enter your TurtleRadio Player ID to access your TurtleRadio station list. (The TurtleRadio Player ID is issued to you after registering at the TurtleRadio web site.) Press **"Save"** to load the entry into AudioTron.

**Internet Radio Enabled:** To activate the AudioTron Internet radio feature, check this box and press **"Save TurtleRadio Settings"**.

➡ *Note that the Internet Radio feature is turned off by default from the factory.*



Web server *TurtleRadio Settings* screen

## Web Server “Thin-Client” mode

The AudioTron web server can run in a “thin client” mode compatible with the smaller screen on a PocketPC or certain other small web access devices.

To use a PocketPC to control AudioTron from the web server, the PocketPC must be connected to the network, either through a wireless link, such as an 802.11 interface, or an Ethernet interface with CAT-5 cable.

To access the web server from the PocketPC, enter the AudioTron name into the browser as you would on a standard PC. AudioTron will automatically detect the browser type and activate the “thin client” page style to format the web server screens for the smaller PocketPC screen.

You can also access the thin client page by typing in the AudioTron’s IP address. For example, if AudioTron is assigned to the IP address 192.168.1.100, you’d enter the following into the browser:

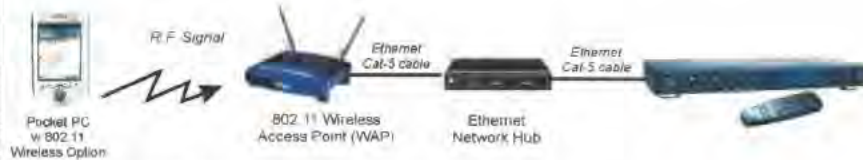
`http://192.168.1.100/index_thin.asp`



Compaq iPaq PocketPC

### Using a PocketPC as a Wireless Remote Control

The most useful application for running the web server from a PocketPC is to control AudioTron from a wireless Ethernet connection via an 802.11 Wireless Access Point (WAP) and a wireless network adapter for the PocketPC. This configuration turns the PocketPC into a remote control for every AudioTron on your network.



Controlling an AudioTron with a PocketPC RF remote

In this illustration, the wireless iPaq handheld device includes an 802.11 adapter, allowing it to communicate with the Wireless Access Point (WAP). The WAP is configured as a node on the network via a hub. This enables you to control AudioTron from the iPaq’s browser from anywhere in your home.

For more information on creating a wireless access point to your network, visit [www.linksys.com](http://www.linksys.com) and [www.compaq.com](http://www.compaq.com). For more information on the Compaq iPaq PocketPC device, visit [www.compaq.com](http://www.compaq.com).



## Maintaining your Music Library

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### Backing up the Songs in your Music Library

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One of the advantages of a digital music library on a PC is that you can back-up your entire music collection and restore it should something happen to your originals. A music collection of 5,000 songs recorded in WMA or MP3 formats can consume more than 25GB of hard drive space, which is a significant amount of data. To play it safe, you should back up this data to other media just in case your music hard drive fails. After you've backed up the library, you can rely on incremental back ups for new music that has been added to the library since the initial full backup.

Backing up this data can be accomplished in a number of ways:

- **Tape Drive Backups:** Tape backup provides an inexpensive and convenient way to back up large amounts of data. A major advantage of tape is that you can store it in a fireproof box or off site. A disadvantage is that it is slower to back up and restore than, say, backing up to another hard drive.
- **Adding a second hard drive to one of your PCs:** Large-capacity hard drives have become cost-effective enough to use as a backup for a music library. Connecting a second large capacity drive to your music library PC lets you copy the library from the primary drive to the backup drive using Windows Explorer. When connecting the second drive, its best to use the secondary IDE bus that is not connected to the primary drive, since data transfer rates on drives connected to separate IDE cables are faster than drives connected to the same IDE cable. Although using a second drive is fast and convenient, the drawback is that it cannot be stored off site and it too can crash—although in most cases it is unlikely that both drives will crash simultaneously.
- **Adding a removable hard drive bay:** Placing the second drive in a removable drive bay lets you safely store the drive either off site or in a fireproof box, affording much of the same benefits of a tape backup with the speed of a hard drive.
- **Adding a Network Attached Storage (NAS) device to your network:** A NAS can be used to store your music library files on a drive that does not require a PC, so you can play your music with AudioTron without the need for a PC to be powered on. Of course, the data on the NAS drive also should be backed up, so one of the other methods for backing up the data should be implemented for the NAS.
- **Backing up your music files to Recordable Compact Discs (CD-R):** AudioStation can be used to burn data CDs from your music library. These data CDs not only provide backup for the library, but can also be used to play your music library on CD players compatible with MP3 and WMA file formats. Although slower than other methods, this serves the purpose of backup, off site storage, and a source of music while travelling. With a typical 640MB CD, backing up 25GB of music would require approximately 40 CDs.

### Adding Songs or PC Hosts to your Music Library

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Whenever you add songs or playlists to your music library, each AudioTron connected to the network must rescan the library so the internal database tables can be updated with the new data. Also, if you add PCs ("hosts") to the network, each AudioTron must rescan the network in order to recognize the new hosts. The network scan can be initiated either from the AudioTron front panel or from the web server as follows:

- **From the Front Panel:** Press the **Options** button to display "**Check for new music files?**" Press the control knob to select "**Yes**" to search the network for hosts, music files and playlists not already in AudioTron's local database. If new music files or hosts are found, they will be added to the database.
- **From the web server:** Go to the web server **File Access** page and click on the **Press to Check** button next to **Check for New Files**.



- *If there are multiple songs with the same name in the music library, AudioTron differentiates between them by adding a number in parentheses after the name of the song (e.g., "Song" and "Song - (1)").*

Note that the "**Search for new music**" function does not remove songs or playlists that have been deleted from the music library, nor does it capture new tag information for previously logged songs. Refreshing the AudioTron database for these changes requires that you reboot AudioTron from the rear panel power switch so it re-scans for music and completely rebuilds its internal database.

If AudioTron fails to find music that you are certain is on one of the PCs in your network, run the **AudioTron Setup Utility** (as described in the Setup Guide) to determine if the files are accessible to AudioTron. For example, if the files are in directories that are not shared, AudioTron will not be able to access them. The web server provides several different options for setting up your music directories, and the AudioTron Setup Utility "**Fix It**" feature lets you easily configure a directory for AudioTron access, as described in the Setup Guide.





## Managing Your Music Library with AudioStation

☞ See the *AudioStation reference manual on the AudioTron CD* for a detailed description of features.

AudioStation is a valuable tool that lets you play audio CDs, transfer CD tracks to your digital music library, play songs from your music library, listen to Internet radio and manage your TurtleRadio stations.

AudioStation's file management architecture closely resembles that of AudioTron, making it easier to manage your library than using other PC jukebox programs.

The tabs on the left of the main screen activate AudioStation's modes of operation:

- **CD Tab:** From here, you can play and record CDs from your PC's CD drive.
- **Music Library Tab:** From here, you can listen to your music library, burn custom CDs of your favorite songs and listen to Internet streaming audio configured in the Internet Tab.
- **Internet Tab:** From here, you can access the TurtleRadio web site to configure custom radio stations, as well as access music web sites for downloading music files.

AudioStation lets you easily manage and play your music library using similar "selection lists" as AudioTron, including:

- **All Tracks (equivalent to "Title" in AudioTron's selection display)** – Displays all tracks in the music database. In addition to MP3, WMA and WAV files (which are compatible with AudioTron) the All Tracks feature will display MIDI files and AVI movie files, which can be played on your PC with AudioStation.
- **Albums** – Displays songs grouped by CD title.
- **Artists** – Displays songs grouped by Artist name.
- **Genres** – Displays songs grouped by Genre.
- **TurtleRadio** – Just like the AudioTron Net main menu selection, this displays your custom Internet radio stations list downloaded from the TurtleRadio web site.
- **User Playlists (equivalent to "Lists" in AudioTron's selection display)** – Displays songs grouped into custom playlists.

### Benefits of Using AudioStation

For AudioTron users, the benefits of using AudioStation instead of another PC jukebox program include:

- Guaranteed compatibility of tag and song formats of CDs ripped using AudioStation.
- Batch processing of tag data. For example, it's easy to change the artist name or genre of a large group of songs.
- CD tracks can be ripped to WAV format with proper tag information.
- You can listen to TurtleRadio stations, add stations to your custom station list and edit station names that are displayed in AudioTron.
- The AudioStation and AudioTron music database views are very similar, so it's easier to manage your music database.



*AudioStation can be used to build and manage your music library and Internet Radio station lists.*



## Digital Music File Formats

AudioStation plays and records music files in MP3, WMA and WAV formats. MP3 and WMA compressed audio formats reduce the size of an audio file by removing some of the sounds determined to be “inaudible” by the encoder. Although the playback quality of these compressed audio formats is good enough for most listeners, some audiophiles can hear the difference between compressed and uncompressed audio. For this reason, AudioTron is capable of playing true CD-quality audio in uncompressed WAV format when used with an Ethernet network.

➤ *A unique feature of AudioStation is its ability to embed tag data into WAV files compatible with AudioTron.*

**WAV** format preserves CD-Quality audio, which is sampled at 16 bits 44.1kHz. Although this is the purest form of audio, it also takes up a significant amount of hard drive space (a typical three-minute song consumes more than 30MB of hard disk space.) Playback of uncompressed WAV audio will be most important for audiophiles who can discern the loss of dynamic range and other limitations of compressed audio formats. For these listeners, maximum fidelity will be achieved when playing WAV files through AudioTron’s S/PDIF optical digital output.

**MP3 (MPEG-1 Layer III)** format uses a compression process that implements psychoacoustic principles to reduce the file size while preserving a high level of sound quality. Digital music files encoded using MP3 technology (“MP3 files”) are very popular on the Internet, due to their combination of good sound quality and small file size (a three-minute song can be reduced to less than 3MB—a factor of 10 reduction as compared to WAV format.)

**WMA (Windows Media™ Audio)** format was developed by Microsoft as an alternative to MP3 for compressed digital audio. Similar in many ways to the equally common MP3 format, WMA offers equal sound quality in an even smaller file size.

In most cases, the MP3 or WMA formats offer acceptable listening quality, especially when recorded at the higher sample rate options. However, the following table lists some of the issues to consider when deciding which format to use for storing music files:

WAV format benefits	WAV format drawbacks
<ul style="list-style-type: none"> <li>▪ Preserves all of the qualities of the original CD recordings by maintaining the original 16-bit, 44.1kHz standard used for CD recordings. MP3 and WMA formats remove audio information that is determined to be “inaudible” in order to compress the file size.</li> <li>▪ The highest fidelity is achieved when using AudioTron’s optical digital output with uncompressed WAV format.</li> <li>▪ WAV format lets you burn high-quality custom CDs from your music library with AudioStation. Although you can also burn a CD from files saved in MP3 or WMA format, these compressed formats must be converted to uncompressed WAV format prior to creating the CD. This process will reduce the audio quality of the resulting CD.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Typically, WAV format does not include song tags as do MP3 and WMA formats. So, AudioTron will only display the file name and can’t display or sort songs by Title, Artist, Album, Genre, etc.. However, AudioStation lets you add tag information to WAV files so that they can be sorted and displayed just like WMA and MP3 formats.</li> <li>▪ WAV files cannot be transferred to portable digital audio players. Typically, these players are only compatible with MP3 and WMA formats.</li> <li>▪ WAV format can take up more than 10 times as much hard drive space as MP3 and WMA formats.</li> <li>▪ AudioTron does not support WAV format on an HPNA network. An Ethernet network is required for playback of WAV files.</li> </ul>



## Song Tags (Title, Artist, Album, Genre, etc.)

A song “tag” (also called an “Attribute” or “Track Property”) refers to data embedded as a text header in the MP3, WMA or WAV file. The data includes information about the track (e.g. artist, title, genre, etc.) which can either be automatically obtained from the CDDB database or entered manually.

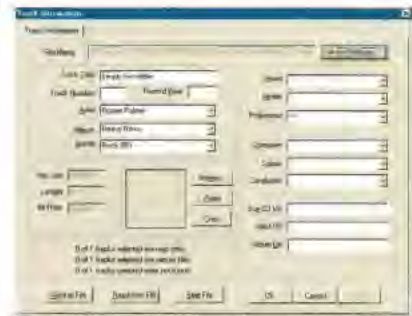
When recording CD tracks to the hard drive, the tag information can be viewed in AudioStation’s **Track Information** dialog, accessed by right-clicking on a highlighted track and selecting **Track Information**.

The proper management of tag data is important for optimum use of AudioTron because it affects how songs are accessed in the main menu. For this reason, it is suggested that the track tag information be carefully checked each time a CD is converted to digital format, so the tag data will be consistent. For example, it is best to avoid entering artists as “The Beatles”, “Beatles” and “Beatles, The”, since this would create three separate categories for the same artist and make it difficult to find tracks by that artist.

Unfortunately, there are different versions of tag formatting, which can lead to incompatibilities among tag data when the music files have not been recorded using the same PC jukebox program, or when music is downloaded from the Internet. Using AudioStation as your CD recording software can avoid these issues by assuring consistency in tag data format. To modify groups of song tags, drag and drop the song files from the right side “playlist” screen into the appropriate category on the left side “library” screen and AudioStation will change the tag accordingly. This operates like a “batch editor” for tags and is useful for cleaning up inconsistent tags.

For more information on tags, check out the web site [www.ID3.org](http://www.ID3.org).

➤ *AudioTron can display tag information saved in the Windows Media (WMA), MP3 ID3 version 1.0, 1.1 and 2.3 formats and WAV files tagged in AudioStation. Tags in other formats may not display properly.*



AudioStation “Track Information” dialog shows Tag data.

## Security Features in WMA Music Files

The WMA file format provides a “security” feature that encrypts song files so they may be played but not copied. AudioTron cannot play music files encrypted with this security feature.

➤ *AudioTron cannot play songs recorded with the “secure” feature enabled. The security setting in Windows Media Player and AudioStation should be turned off before converting CD tracks to WMA files for use with AudioTron. Once recorded, a song’s security feature cannot be turned off. The song must be re-recorded with the security option turned off.*

### To turn off the WMA recording security feature in AudioStation

1. Activate the AudioStation “Preferences” dialog by clicking on **Options → Preferences**.
2. Click on the “Digital Rights” tab and uncheck the “Secure my music when recording” option.
3. Click the “Apply” button, then click on the “OK” button to exit.



AudioStation Digital Rights Tab.

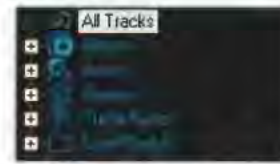
## Using AudioStation to Create Playlists

Playlists are custom song lists created in AudioStation (or other compatible PC jukebox program) and accessed from the AudioTron "Lists" menu category. Playlists are stored in the AudioStation Music Library tab under the "User Playlists" folder. When you click on this folder, it expands to show all of the custom playlists you've created. Clicking on a playlist will list all of the songs in the Playlist screen.

Playlists adhere to two types of formats, M3U and PLS, each compatible with AudioStation and AudioTron.

AudioStation exports playlists to M3U playlist files, which can be read by most other PC jukebox players. M3U files are lists of 'pointers' to the locations of MP3 or Windows Media (WMA) files.

### Library



*User Playlists is the last category in the AudioStation Library Folders list*

### To create a User Playlist

1. Click on the **Music Library Tab**, then click on the + next to the "User Playlists" folder in the Library tree (on the left side of the screen). Right-click "default" and select **New Playlist**, or click on the **New Playlist** button above the Playlist pane (on the right side of the screen) in the Music Library tab window.
2. Drag-and-drop tracks from the Playlist screen on the right side to the User Playlist folder you've defined on the left side. For example, select **All Tracks** in the Library tree, then "drag and drop" tracks from the **Playlist** pane (on the right) to the Playlist folder in the **Library tree** on the left.
  - You can select a group of tracks by holding down the Control (Ctrl) key and left-clicking on the Tracks that you wish to select. Or, to select a group of consecutive Tracks, click on the first Track that you wish to select. Then hold down the Shift key and click on the last Track in the list that you wish to select. All Tracks between the first and last Tracks in the list will be selected.
3. You can also add tracks to your playlist by highlighting the track and pressing "**Send To → User Playlists**". This will activate a "fly out" menu listing all of your User Playlists.
4. To re-order the tracks in a list, drag-and-drop the track to a new position in the list.

### To add a Track to a User Playlist

To add more tracks to an existing User Playlist, highlight the track in the Playlist window on the right side and drag-and-drop it to the User Playlist folder in the Library tree in the left side.

### To Import a Playlist

Playlists in M3U and PLS formats that were not created with AudioStation can be imported to the User Playlist folder with the **File Menu → Import Playlist** feature.

You can also add tracks to your playlist by highlighting the track and pressing "**Send To → User Playlists**".



## Using AudioStation to Manage Your TurtleRadio Station List

Entering your AudioTron TurtleRadio Player ID into AudioStation lets you play the same TurtleRadio stations with AudioStation. You can also manage the station list with AudioStation by adding stations and editing station names without having to re-visit TurtleRadio.

To enter the TurtleRadio Player ID, click **View** → **Preferences** → **TurtleRadio**. Then enter the Player ID used in the AudioTron web server **Access Controls** Tab.



### AudioStation TurtleRadio List

The TurtleRadio station list is accessed from the AudioStation **Library Menu Tree** under the **TurtleRadio** folder. Clicking on the + sign next to the TurtleRadio folder will show the categories you've configured in the custom station list at the TurtleRadio web site. Clicking on a category shows the stations in the Playlist window, along with their source URL, as shown below.



AudioStation TurtleRadio list

When you've found a station URL from a broadcasting web site that you'd like to add to a category, click on **File** → **Open URL** and enter the URL into the **Open URL** dialog box.

To play the station on AudioTron, update your TurtleRadio list by clicking on "**Send To**" at the top of the playlist window, then select "**TurtleRadio**" from the drop down menu. This activates the "**Add Station**" dialog, which lets you enter station name, description and genre along with the URL.



"Open URL" dialog box



"Add Station" dialog box

## AudioTron and Shared Directories

### Shared Directories

File directories (or “folders”) can either be “shared” or “not shared”. The files in a shared directory are available to other users on the network, while the files in an un-shared directory are only accessible on the PC where it resides. By limiting the extent to which other users can access your networked PC's file system (i.e. directories and files), the “sharing” setting lets you keep your files safe from unauthorized access and accidental modifications by other users. AudioTron can only access music files from shared directories.

➤ *The AudioTron Setup Utility lets you check how directory shares are set up on any PC accessible on the network.*

File sharing operates only when Windows is set to enable “File and Printer” sharing.

#### To set File and Printer sharing in Windows 98

1. Launch the Windows Control Panel (**Start → Settings → Control Panel**). Double click on the **Network** icon to launch the **Network Dialog**.
2. Click on the **File and Print Sharing** button.
3. In the dialog box that appears, check the options “**I want to give others access to my files**”.
4. Close all of the windows and reboot your PC if prompted.

Each directory can be set as shared or unshared. All of the directories under a shared directory are automatically set as shared, so they don't have to be set individually.

#### To set up a shared directory

1. In the Windows Explorer directory window, right click on the directory name and select the “**Sharing**” option from the menu. If there is no “Sharing” option, see the above step to check for File and Printer Sharing settings in the Network dialog.
2. From the **Share Properties** screen, Select “**Shared As**”. The “**Share Name**” is the name of the sub-directory you're setting as a “shared directory”
3. For “**Access Type**”, select “**Read Only**”
4. Press “**OK**” to close the window.



Windows “Network” screen



Windows “Share Properties” screen

### AudioTron Shared Directories Default Settings

By default, AudioTron searches for music files (MP3, WMA and WAV) and playlists (M3U and PLS) in directories named **My Music**, **Music**, **Audio** and **My Documents\My Music** that reside *under* a shared directory. This restriction is imposed in order to accelerate the search for music files on large hard drives and multiple PCs.

➤ *A “**Nested Share**” condition occurs when the directories under a shared root directory are also shared. This case should be avoided, since AudioTron will list the same songs multiple times if they're located in nested shares. Note that the AudioTron Setup Utility can check for and correct “nested shares”.*



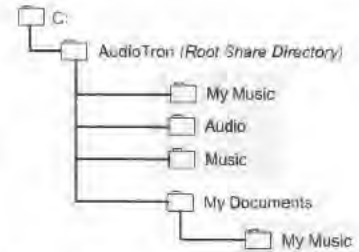
As an example of why AudioTron provides this directory restriction, consider the case where drive C: is shared and the conditions were not imposed. If AudioTron were to look in the root share (in this case C:) as well as in every directory below the root share, it would search the entire hard disk for music files. A large hard disk full of non-music files, such as programs and data, would take a very long time to search from one end to the other. For this reason, AudioTron ignores all directories other than those with specific names under the root, thereby significantly reducing the search time for logging all of the files in a large music library.

Once the search is completed, AudioTron keeps a local database of the file names in its internal memory so it does not have to search the drives each time a song list is requested. If more songs are added later on, the "Search for New Music" menu in the Options display and web server can be used to add only the new file names to AudioTron's local directory, which saves the time of logging all of the music files it already knows about. If songs are deleted from the network drives, AudioTron must be re-booted in order to remove the files from its internal database.

In the following examples, AudioTron would find music stored in the shaded directories:

**Shared Directory Example 1**

- AudioTron will not find music in C:\ because it is not under a shared directory.
- AudioTron will not find music in C:\AudioTron because it is the root share.
- AudioTron will not find music in C:\My Documents because it does not follow the naming convention.
- AudioTron will find music in C:\AudioTron\My Music, C:\AudioTron\Audio, C:\AudioTron\Music and C:\AudioTron\My Documents\My Music because they follow the naming convention and reside under the shared directory \AudioTron.



Example 1

**Shared Directory Example 2**

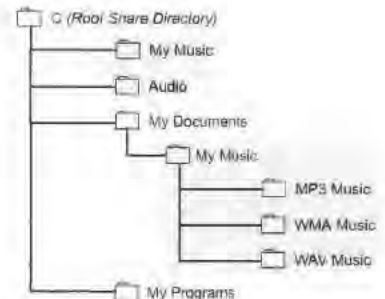
- AudioTron will not find music in C:\ because it is not under a shared directory.
- AudioTron will not find music in C:\AudioTron because it is the root share.
- AudioTron will not find music in C:\My Music because it is not under a shared directory (even though it follows the naming convention.)
- AudioTron will find music in C:\AudioTron\My Music because it resides under a shared directory and follows the naming convention.
- AudioTron will find music in C:\AudioTron\My Music\MP3Music, C:\AudioTron\My Music\WMAMusic and C:\AudioTron\My Music\WAVMusic because they reside under C:\AudioTron\My Music.



Example 2

**Shared Directory Example 3**

- AudioTron will not find music in C:\ because it is the root share. AudioTron will not find music in C:\My Programs or C:\My Documents because they do not follow the naming convention.
- AudioTron will find music in C:\My Music, C:\Audio and C:\My Documents\My Music because they follow the naming convention and reside under a shared directory.
- AudioTron will find music in all directories under C:\My Documents\My Music, even though they do not follow the naming convention (because they reside under C:\My Documents\My Music.)



Example 3



## Overriding AudioTron's Default Directory Settings

### Web Server Shared Directory Features

The AudioTron web server lets you select how you'd like AudioTron to search for music files in shared directories on your networked PCs.

**Search default folders in all shares:** This option will only search for music files in shared folders that adhere to the AudioTron default restrictions described in the previous section.

**Search all folders in all shares:** This option will search for music files in all shared folders on all networked PCs found by AudioTron. Note that in systems with many files in shared folders, this option could result in long search times when searching for new songs.

**Search all shares in shared folders listed below:** This option lets you see which shared folders have been detected by AudioTron and then enter those which should be searched for music files.

These options are selected on the web server **Share Search Options** screen, accessible by clicking on the option "**Click to Configure Share Search Options**" in the File Access Settings screen.



Web server File Access Settings screen



Web server Shares Search Options screen

### AudioTron Setup Utility Index Files

The Setup Utility can be used to automatically find folders with music files and place "index files" in those folders. When AudioTron finds index files during a music file search, it identifies the directory with the index file as a music directory and logs the music and playlists in the directory listings of the Configure Shares Manually section of the Shares Search Options screen. Note that these folders still must be shared in order to allow AudioTron to access its files.

To activate the Index File feature, run the Setup Utility main menu option called "Check Local Computer for Music Files" or "Check Remote Computer for Music Files". On the Search Results screen that lists the directories for the PC searched, press the "Fix it" button to place index files in the directories where music files were found.

Directories with music accessible to AudioTron will be identified with the Play triangle. To remove the index files from all directories, run the Setup Utility Advanced Options and check "Remove index files from local computer".



Setup Utility directory search results





## Troubleshooting Tips



For an up to date list of troubleshooting questions and answers, please visit <http://www.turtle-beach.com/wb/audiotron/faq.htm>

### Song Playback Issues

#### Song "skips" while playing

Under conditions of extremely heavy use, your network might be unable to provide an adequately sustained rate of digital audio data to AudioTron while playing music. For instance, if the music server PC is being used for high-overhead tasks (e.g. playing a PC game, accessing the Internet, transferring files, etc.) it could interfere with the task of sending music over the network. If this happens for a period of time that causes AudioTron's internal music buffer to become empty, it is possible for the music to skip due to data loss. To reduce the possibility of this, try the following:

- ✓ Minimize usage of the music server PC while AudioTron is accessing music files stored there.
- ✓ De-fragment the hard drive of the host PC to minimize file transfer time.
- ✓ Use a dedicated PC for music storage so it will not be used for other tasks while playing music.
- ✓ Try a larger buffer threshold to allow more buffer to be filled before the music starts playing. See the Options Menu and web server sections to set the "**Prebuffer Threshold**".
- ✓ WAV files use uncompressed data and therefore require as much as 10 times more data to travel over the network than do MP3 and WMA files. Also, WAV files can be used only with Ethernet networks. Try using MP3 or WMA to see if the skipping problem goes away.
- ✓ **If you're running an HPNA network...** Be sure you do not have a line filter on the PC's HPNA interface or the AudioTron's HPNA connector. Also, if the PC has a modem, try connecting the HPNA interface and modem to the phone line with a splitter, rather than in series with each other.
- ✓ If only certain songs skip, try playing them on your PC with AudioStation to see if the song is damaged. If it skips on the PC, it will also skip on AudioTron. If the song is problematic, try re-recording the song from the original CD to make a new copy.
- ✓ As a last resort, power off AudioTron from the rear panel power switch, wait a few seconds and power it on again. This will rescan the music library and reset the AudioTron's processor.

#### Pauses between songs

AudioTron eliminates pauses between tracks during playback, which preserves the natural playback of song medleys. AudioTron accomplishes this "gap-less" playback by buffering the currently playing song while simultaneously buffering the beginning of the next track in the Play Queue. Two things can interfere with this process, and create a delay between tracks:

- Unusually high network traffic, which could interrupt the data packet stream and prevent proper filling of the buffer.
- Songs that are less than 1 minute in length do not provide enough data to finish buffering the next song before the current song is over.

Note that if you're listening to two songs that have zero silence between them on the original CD, you may hear a slight 'pop' as the AudioTron MP3 codec shuts down and then opens again for the next track. This pop does not occur with WAV files because no codec is used to decompress the audio stream. It will not occur in most songs, as they have a small buffer of silence at the beginning and/or end of the song.



### Certain songs won't play at all, or display the message "CLOSED"

The "CLOSED" message indicates that the PC host has denied access to the music file, making it impossible for AudioTron to play the file. Some of the possible causes include:

- ✓ If the PC on which the file is stored is in "power save" mode, AudioTron will display "closed" until the PC is ready to transfer the file. This should only happen when the PC "wakes up" from the sleep state.
- ✓ Some MP3 and WMA files have odd sample rates that are incompatible with AudioTron. If the song was obtained from the Internet, it is possible that it was created in one of these non-standard rates and is not recognized by AudioTron. This is usually not a problem with songs created from a CD with AudioStation.

### A song plays on the analog outputs but not on the S/PDIF digital output

- ✓ Songs will only play through the optical S/PDIF output if the digital audio file was stored using one of the standard S/PDIF sample rates of 32 kHz or 44.1 kHz. AudioTron does not support playback of uncompressed WAV files recorded with a sampling rate of 48 kHz. See the "Product Specifications" section in the Setup Guide for details on supported sample rates.
- ✓ When converting your CD collection to the PC hard drive in WAV format, set the recording rate to 44.1 kHz, which matches the sampling rate used on the CD. Re-sampling to a different rate usually results in decreased sound quality and may be incompatible with the S/PDIF output.
- ✓ Songs downloaded from the Internet from an unknown source may not have compatible S/PDIF sample rates and might only play out of the analog outputs.

### Delay between the time the Play button is pressed and the time the music starts playing

- ✓ When you press the "Play" button, AudioTron first downloads a portion of the song file from the PC before it can start the music. Therefore, there will be a short delay caused by the digital file stream being transferred from the PC to the AudioTron. This is indicated by the message "Buffering" on the Display Panel when the track is first selected.
- ✓ Try changing the "Pre-buffer threshold" as described in the Options Menu and web server sections. A shorter threshold will cause the song to start playing sooner, but could result in audio dropouts in heavy network traffic situations.
- ✓ Because they are not compressed, WAV files require the transfer of more data into the buffer before playback can begin, and therefore will exhibit a longer delay than WMA and MP3 files.
- ✓ If the PC on which the song resides is in "energy-saving" mode and has been idle long enough for the hard drive to shut down, there will be an extra delay after pressing Play while the hard drive starts up and begins to access the song file. This will only occur on the first song.

## Music Library Issues

### AudioTron doesn't list some songs in the music library

- ✓ Use the Setup Utility to see which directories can be accessed by AudioTron. If you have music in directories that are listed as inaccessible, either move them to accessible directories or use the "Fix it" feature in the Setup Utility to place an index file into the directory so AudioTron will recognize it.
- ✓ Check the password setting on the shared directories. If you have a password set, then it must also be set on AudioTron.
- ✓ Check that "file and printer sharing" is enabled in the network control panel.
- ✓ AudioTron will list but won't play WMA music files with the "security" option set. Use AudioStation to see if the songs have been recorded in "secure mode".



- ✓ If the songs are stored on a Host PC running "firewall" software, it must be set to "pass" AudioTron's IP address or it will be treated as an "unauthorized user" and be blocked from accessing the PC.

#### **Some song titles appear twice in the display**

- ✓ Two songs with different file names but the same Title tag information will be displayed as the same song twice (e.g. Song (1) Song (2)) because the tag information for "Title" is the same. The same applies to a song with the same title saved in different formats (e.g. WMA, MP3 or WAV).
- ✓ If, after checking your song library to confirm there's only one version of the song, try re-setting AudioTron with the rear-panel power switch. This will reset the internal memory and cause it to re-scan the network for songs.
- ✓ Nested shares can also cause double-occurrences. For instance, if songs are stored in C:\My Documents\My Music and both the C: drive and \My Music are set as shared directories, the music files in \My Music might be displayed twice. The Setup Utility can check for this.

## **Internet Radio Issues**

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### **AudioTron has trouble connecting to Internet radio stations**

Try pinging a web site by name and by IP address from the web server **Network Settings** page. If you are able to ping the web site by IP address, but not by name (i.e. you can ping 192.233.80.9, but not novell.com) then investigate your network DNS Server setup. If you are unable to ping a web site by IP, investigate your network gateway setup.

### **Internet radio stations play erratically**

There are many things that can affect the quality of playback of an Internet radio station, some of which may be out of your control. If radio stations of similar bitrates play fine, it is most likely a problem with the station broadcasting. If stations of similar bitrate are also skipping, change your preferences at [www.turtle-radio.com](http://www.turtle-radio.com) to only allow lower-quality streams. If the stream is only occasionally skipping, try pausing the stream for several seconds, then continuing.

### **A station plays on the analog outputs but not on the S/PDIF digital output**

Stations will only play through the optical S/PDIF output if the digital audio stream uses one of the standard S/PDIF sample rates of 32 kHz or 44.1 kHz. The TurtleRadio web site lets you restrict station lists to those which support the S/PDIF sample rates.



## Network Issues

### General Network Troubleshooting Tips

- ✓ **Regardless of whether you're using HPNA or Ethernet, AudioTron requires a network that is running the TCP/IP protocol.** If your AudioTron isn't working, yet your network is running fine, it may be that the network is not set to use the TCP/IP protocol.
- ✓ **If your network has a DHCP ("Dynamic Host Control Protocol") Server...** An IP address can either be assigned to AudioTron automatically by one of the devices in the network (called a "DHCP Server"), or you can "hard code" an address into AudioTron (called "Static IP" addressing.) If your network has a DHCP server, AudioTron defaults to a setting whereby it will automatically accept an assigned IP address from a DHCP server.
- ✓ **If you're using a DSL or cable modem with a router/hub...** Many router/hubs (e.g. the Etherfast Cable/DSL Router from Linksys) also act as DHCP servers. Check with the manufacturer of the device to see if this is the case for your router/hub device. You should also check with the manufacturer to see if there's an update for the device's firmware.
- ✓ **File sharing...** AudioTron has special requirements for the directories in which your digital music files are stored. These directories must be called **Music, Audio\My Music** or **My Documents\My Music** and must be located *under* a shared directory. Simply *sharing* these directories will not allow AudioTron to find the music files. The Setup Utility can help you properly configure the directories on your PC. For a description of AudioTron's directory restrictions, see the section "**AudioTron and Shared Directories**".

### AudioTron doesn't work with a specific Router or Hub

Some router/hubs need a firmware update to operate properly with AudioTron:

**SMC Hub:** Version 1.8x firmware works with AudioTron using Static IP addressing. It works intermittently as a DHCP server—sometimes AudioTron finds a host but no host name and it often cannot find files on shared PCs. The firmware update to 1.90 seems to correct the DHCP server and file share problems and can be found on the SMC web site: [www.smc.com](http://www.smc.com).

**Linksys 4 Port Router/Hub:** Version 1.35 firmware works with AudioTron using Static IP addressing and intermittently as a DHCP server. Sometimes it finds a host but no host name and it rarely can find files on shared PCs. The firmware update to v1.37 corrects this and is available on the Linksys web site [www.Linksys.com](http://www.Linksys.com).

### If AudioTron is connected directly to your computer using an Ethernet or HPNA interface (Win98 and Win ME only)

- ✓ **Make sure TCP/IP is installed for your adapter:** Double-click on the "Network" icon in the Windows control panel. In the installed network component list box, search for "TCP/IP -> *your adapter name*". If TCP/IP is not installed, click on the "Add" button, select "Protocol", then click on "Add" again. Select "Microsoft" from the list box on the left and select "TCP/IP" from the list box on the right. Click the "OK" button. Restart your computer if you were prompted to do so.
- ✓ **Make sure "Client for Microsoft Networks" is installed:** Double-click on the "Network" icon in the Windows control panel. In the installed network component list box, search for "Client for Microsoft Networks". If "Client for Microsoft Networks" is not installed, then click on the "Add" button, select "Client", then click on "Add" again. Select "Microsoft" from the list box on the left and select "Client for Microsoft Networks" from the list box on the right. Click the "OK" button. Restart your computer if you were prompted to do so.
- ✓ **Set up your adapter to use static IP addressing.** Double click on the "Network" icon in the Windows control panel, then select "TCP/IP -> *your adapter name*" component, and click on "Properties". In the "IP Address" tab, select "Specify an IP address" radio button, and type "192.168.0.1" as the IP address, and "255.255.255.0" as the subnet mask. In the "Bindings" tab, make sure "Client for Microsoft Networks" and "File and printer sharing for Microsoft



Networks" are checked. Click the "OK" button. Restart your computer if you were prompted to do so.

- ✓ In AudioTron options menu, disable DHCP, and set the IP address, and subnet mask as explained above.

### **AudioTron displays "No Hosts Found" when first turned on**

- *The AudioTron web server "History" screen can be used to check many of the network settings. See the web server section for details.*

When powered up from the rear panel power switch, AudioTron will search the network for hosts after the Standby button is pressed. If AudioTron is in DHCP mode and does not find a host after searching for two minutes, it will display "**No Hosts Found**". If this occurs, check the following:

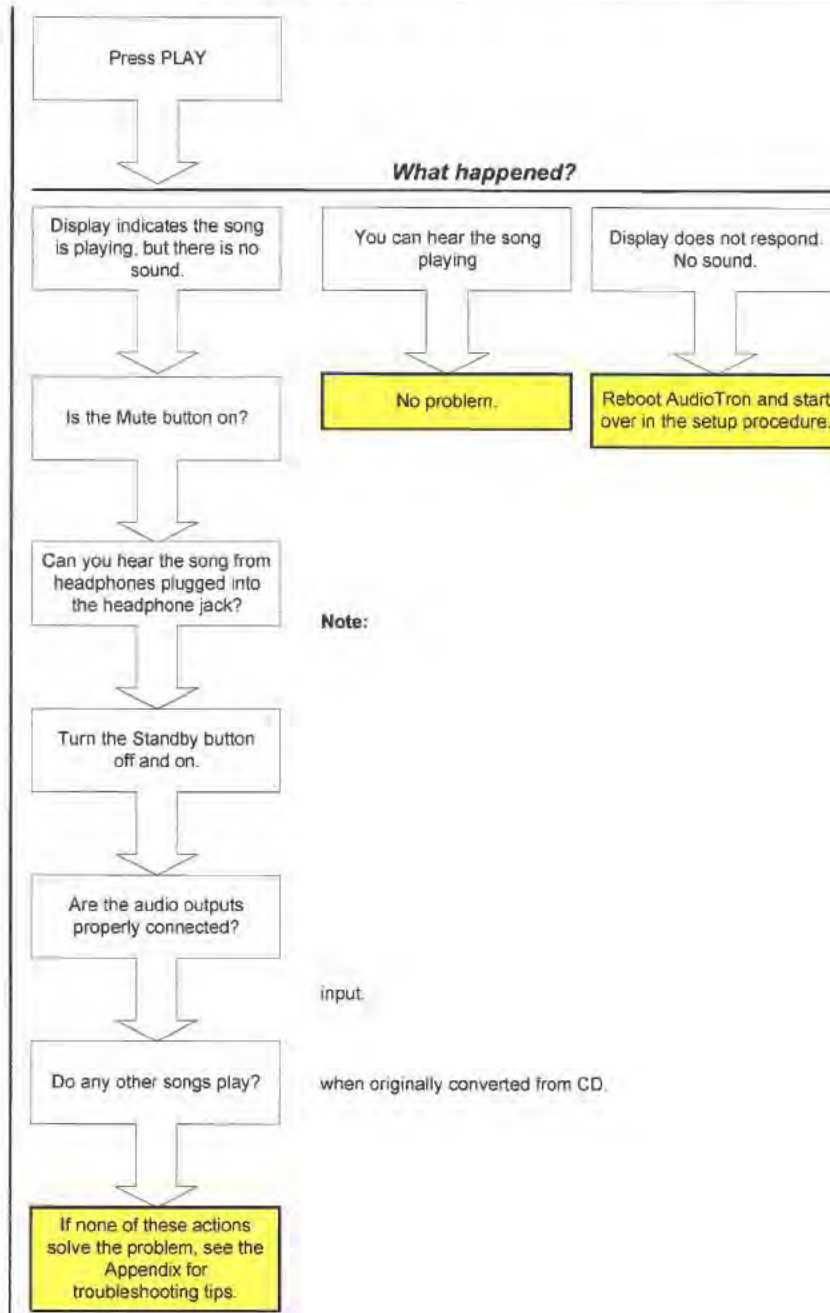
- ✓ Reconnect the network cable to make sure it "clicks" when inserted.
- ✓ Try another network cable to make sure the problem is not due to a defective cable.
- ✓ If AudioTron is connected to a hub, try another hub.
- ✓ Make sure the host PC is powered on.
- ✓ If you're using DHCP, make sure that only one computer is configured as a DHCP server. If you are using a "smart" hub that acts as a DHCP server, make sure that none of the host computers are configured as DHCP servers.
- ✓ Try re-setting your cable/DSL router so it re-scans the network for new nodes.
- ✓ If you're using Static IP, use the AudioTron Setup Utility to check that AudioTron's IP address settings don't conflict with another PC or another AudioTron on the network.
- ✓ If your PC is running "firewall" software, it should be configured to pass AudioTron's IP address. Check the software manufacturer's instructions on how to set this.
- ✓ If you're using a 4-port LinkSys Etherfast Cable/DSL router, check that the firmware is version 1.37 or higher. Firmware versions lower than 1.37 may have a problem providing DHCP and IP address access to AudioTron if the Linksys is used as a hub for your network.

### **If you're using an HPNA network**

- ✓ Make sure AudioTron is connected to the same phone line as your HPNA network. Try hooking up two phones to the jacks you're using for AudioTron and an HPNA-connected PC. If you can't talk on the two phones using the same jacks and cables, then the HPNA network won't be able to communicate between the PC and AudioTron.
- ✓ If you have DSL service, make sure the DSL line filter is not between AudioTron or your PC's HPNA interface or it could affect the HPNA network signals and cause performance problems.
- ✓ Do not connect a telephone line filter between AudioTron's HPNA jack and the wall phone jack. Transient protection is built into the AudioTron phone jack.



## Audio Troubleshooting Procedure





## Updating AudioTron's Firmware

Turtle Beach periodically releases new updates for the AudioTron firmware to implement feature enhancements, bug fixes, and operational modifications. The firmware updates may be obtained at the Turtle Beach web site ([www.Turtle-Beach.com](http://www.Turtle-Beach.com)) and transferred to the AudioTron either from the web server or from the front panel display, as described in this section. The firmware version number in your AudioTron can be found as follows:

- The firmware version is displayed on the front panel whenever AudioTron is powered on from the rear panel AC power switch.
- The firmware version is displayed on the front panel when the Options button is pressed.
- The firmware version is displayed in the web server Firmware Settings screen.

### CAUTION:

⚠ *Do not turn off AudioTron's AC power or disconnect its network connection before the firmware download is completed! Removing the power while the firmware is being transferred to AudioTron from the PC could cause the AudioTron "boot loader" to be inadvertently deleted and will render the unit inoperable. If this occurs, AudioTron will no longer start up and will require factory service to reload the firmware.*

### To update the firmware from the web server

1. Launch the AudioTron web server, per the instructions in the Web Server section of this manual. Click on the **Settings Firmware** menu option to activate the **Firmware** screen.
2. Note the **Current Installed** version, which indicates the version number of the firmware installed in the AudioTron.
3. Check for firmware updates at the Turtle Beach web site. If the version number posted at the Turtle Beach web site is higher than the version number displayed in the Current Installed Version, download the firmware file from the web site. Unzip the file to any subdirectory that contains shared music files (e.g. My Music, Audio, Music) so that AudioTron can find the firmware file.

⚠ *AudioTron firmware files have a .Nb0 extension and are typically formatted with a name such as **atron20122.nb0**, which represents firmware version 2.01.22.*

4. On the **Firmware** screen, click on the **Search** button to begin a search for the firmware file. After the search is completed, check if **Current Found:** indicates that the version number found during the network search matches the version number downloaded from the Turtle Beach web site. If not, then make sure the file was copied to a directory accessible to AudioTron (e.g. a directory used for storing music library files), then try the search again.
5. If the **Current Found** version is newer than the **Current Installed** version (i.e. a higher number), then click the **Update Firmware** button and wait for the updating process to complete (AudioTron's display should indicate that the firmware is being updated.)
6. After the firmware update is completed, the AudioTron display reads **"Please power cycle to activate"**. Turn the back panel power switch off then back on, to reset AudioTron.
7. Check if the firmware version number has been updated from the original setting either by noting the version number displayed on start-up, or by checking the web server home screen as described above. Note that the new version number will not be displayed until AudioTron is reset.




Web server Firmware screen



### To update AudioTron's firmware from the front panel

1. Press the Options button to display the version number of the firmware. The display will look similar to the following illustration, with the firmware version number shown on the top row.
2. Check for firmware updates at the Turtle Beach web site. If the version number posted at the Turtle Beach web site is higher than the version number displayed in step 1, download the firmware file from the web site. Unzip the file to a subdirectory that contains your shared music files (e.g. My Music, Audio, Music) so that AudioTron can find the file.

 AudioTron firmware files have a .Nb0 extension and are typically formatted with a name such as **atron20122.nb0**, which represents firmware **version 2.01.22**.

3. If the Options LED is not lit, press the Options button. Turn and press the knob to select the **"Update Firmware"** option. Turn and press the knob to select **"Yes"**.

Select Option - Version 2.0.0  
Update Flash

4. Once AudioTron finds the firmware file, it will transfer the file from your PC to the internal FLASH RAM, as noted on the display. A successful transfer will display the messages "ERASING", "PROGRAMMING" and "VERIFYING". The new version number will not be displayed until AudioTron is reset, as described below.
5. If these messages are not displayed, it indicates that AudioTron did not find the firmware file and the update did not occur. In this case, check that the firmware file is located in a shared directory that is accessible to AudioTron (such as a directory with music files that have been known to operate with AudioTron.) Once the file location is confirmed, try re-setting AudioTron from the rear-panel power switch to initiate a full network rescan and repeat the update procedure from step 4 above.
6. After the firmware update is completed, the AudioTron display reads **"Please power cycle to activate"**. Reset AudioTron with the rear panel power switch.
7. Check if the firmware version number has been updated from the original setting either by noting the version number displayed on start-up, or by checking the web server home screen as described above. Note that the new version number will not be displayed until AudioTron is reset.





## Network Basics

Many books have been written about the subject of networking. Therefore, this section is only intended to provide a brief overview of how AudioTron works in a home network environment and covers only those issues essential to setting up a proper network for using AudioTron.

### Overview of Home Networks

A Home Network lets you transfer files between PCs as well as share hardware (e.g. printers, scanners, etc.) and Internet connections among several users. If you don't have a network, you can set one up with a network starter kit, which typically includes all of the hardware and software you'll need for a small network. Be sure to get a kit that supports the Windows Plug and Play (PnP) standard, which makes it easier to install the driver software.

The rate at which data is transferred on a network is measured in Megabits per second ("Mb/s"). The higher the data transfer rate, or Mbs, the faster data will be transferred between devices on the network.

Many different types of network standards have been developed, some of which are more widely accepted than others. Each standard uses different types of connections and protocols (the language of networks) to communicate between devices. AudioTron is compatible with Ethernet or HPNA (Home Phone Line) network technologies and the TCP/IP protocol. Wireless and power line networks are not compatible with AudioTron.

### HPNA (Home Phone Network Alliance) Networks

An **HPNA** network uses standard analog phone lines, so in most cases you won't have to add wiring to your home. There are two versions of HPNA:

- **HPNA 1.0** transfers data at a maximum rate of 1 Mb/s
- **HPNA 2.0** operates at rates up to 10 Mb/s.

AudioTron is designed to work with HPNA 2.0, and will not work reliably on HPNA 1.0.

An HPNA network does not affect your phone line or Internet connection. You can transfer data on the network and make phone calls at the same time, even though the network and your phones are using the same wires. HPNA is incompatible with digital phone lines that are sometimes used with multi-line phone systems. To find out more about HPNA visit <http://www.homepna.org>.

### Ethernet Networks

Ethernet is a well-established networking standard, so it has a wide variety of components that are relatively inexpensive. Like HPNA, there are two types of Ethernet:

- **Regular Ethernet** (referred to as 10BaseT) runs at 10Mb/s.
- **Fast Ethernet** (referred to as 100BaseTX) runs at 100Mb/s.

AudioTron is compatible with 10BaseT Ethernet and is incompatible with networks that can run only 100BaseTX Ethernet. Ethernet networks that automatically switch between these two speeds (referred to as "10/100BaseT") are also compatible with AudioTron since they support both data rates.

Ethernet requires special cable (called "CAT-5" or "CAT-5e") used exclusively for transmitting the Ethernet signals between devices. When connecting Ethernet devices together, you'll need an Ethernet "Hub", which distributes the Ethernet signal between multiple devices and controls the network "traffic". There are many types of hubs available, and some have enhanced features, such as built-in switches that intelligently route data in the network to optimize transfer speeds.

Many computer stores have inexpensive hubs and CAT-5 cables in fixed lengths with connectors already mounted on each side, making it relatively easy to wire an Ethernet network in your home.

### HPNA vs. Ethernet for AudioTron


Although increased speed of an Ethernet network is not necessary for operating your AudioTron (except in the case of WAV file playback), it does improve file transfer speed between PCs in your network. If you don't mind wiring your home with CAT-5 cable, you can enjoy the benefits of faster data transfer offered by Ethernet networking. If you cannot wire your home with CAT-5 cables, HPNA 2.0 provides an easy way to set up an adequate network that is compatible with AudioTron. The only drawback over an Ethernet network is HPNA's inability to handle WAV file playback on AudioTron. Playback of MP3 and Windows Media (WMA) compressed formats will not be restricted.

Setting up either type of network will require a Network Interface Card (NIC), which is available from several manufacturers as cards that install inside your PC, or external network adapters that connect to a USB (Universal Serial Bus) port.

## Network Terminology

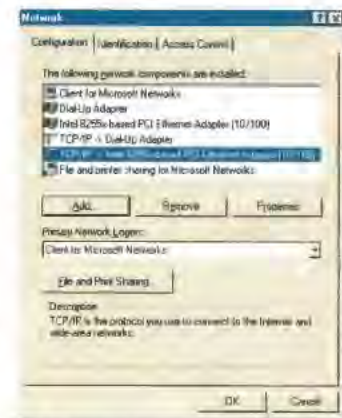
### TCP/IP Network Protocol

The "language" used to transfer data between devices in a network is called the "network protocol" and includes acronyms such as TCP/IP, IPX/SPX and NetBEUI. AudioTron uses **TCP/IP (Transmission Control Protocol/Internet Protocol)** to communicate over a network, therefore your network must be set up to use TCP/IP for compatibility with AudioTron.

 The AudioTron Setup Utility can be used to check if your network is running TCP/IP. See the Setup Utility section in this manual for details.

#### To check if your network is running TCP/IP in Windows 98

1. Launch the Control Panel by clicking **Start → Settings → Control Panel**. Double click on the **Network** icon to launch the **Windows Network** screen.
2. In the Network Dialog, click on the listing for your Ethernet or HPNA network interface card (NIC). Then, click on Properties and in the Bindings Tab, check that TCP/IP and File Sharing are enabled.
3. If TCP/IP is not installed, refer to the Windows Help for instructions on how to set up the network with TCP/IP.




"Windows Network" screen

### IP (Internet Protocol) Addresses and Sub-net Mask

Each device connected to the network (PCs AudioTrons, etc.) is referred to as a "node" and each node is identified by a unique **IP Address**. The IP address is determined in part by a **sub-net mask** number that is used to derive the address of the entire network.

An IP address can be thought of as the "phone number" of each node (i.e. device) on the network. Within the same area code, no two people have the same phone number. If two calls are made to the same number at the same time, both callers will get a busy signal and no communication can take place. Similarly, with IP addresses each computer and each AudioTron on the network is regarded as a node that must each have a unique **IP address** ("phone number"). The network must also have its own "area code", which is derived from its **Sub-net Mask**.

 The AudioTron Setup Utility can find the IP address settings for the AudioTrons and PCs on your network.



### Setting up AudioTron's IP Address

The AudioTron Setup Utility can help you set up AudioTron's IP address, found on the web server's **Connectivity** tab. An IP address can be assigned manually, which is called "**Static IP Addressing**", or automatically by a "**DHCP Server**", which is a PC or other device on the network that manages IP addresses for all nodes. The Setup Utility can determine if a DHCP server is available on your network, or if AudioTron requires a Static IP address.

### DHCP (Dynamic Host Client Protocol) Server

The easiest way for a device to get an IP address is to have it automatically assigned one by another device, such as a PC or router, so you don't have to do it manually. If you're using a cable modem or DSL, the cable/DSL routers typically act as DHCP servers. You can also configure a PC as a DHCP server, as described in any good home networking manual.

➤ *If you have a Cable/DSL router installed on your network, use the Cable/DSL router box as the DHCP server, not a PC. A network cannot have more than one DHCP server.*

### Gateway and DNS Server

In order to provide the Internet radio function, AudioTron must be able to access the Internet on your network. If your network is configured for "**Internet Connection Sharing**", the device that provides a connection between the network and the Internet connection (i.e. dial-up, DSL or cable modem) is called a "**gateway**". The gateway is connected to another device called a "**DNS Server**" that determines the connection between a URL (Universal Resource Locator) such as [www.TurtleRadio.com](http://www.TurtleRadio.com), and the IP address for that URL. Thus, when AudioTron plays Internet radio stations, the gateway provides AudioTron a link to the Internet from the network and the DNS Server finds the location of the stations based in AudioTron's station list.

➤ *The Setup Utility can find IP addresses for the gateway and DNS devices on your network.*

### Routers and Internet Connection Sharing

A "**router**" is a network device that forwards or "routes" TCP/IP data between your network and the Internet. Routers are typically separate boxes that connect to your network and the Internet. However, Windows 98 S/E (and higher) provides a feature called "**Internet Connection Sharing**" ("ICS") which lets a PC connected to the Internet act as a simple router and DHCP server. On the Internet side of a router, all of the TCP/IP data seems to be going to a single IP address, while on the network side, the router distributes the data to each node on the network, each with a distinct IP address.

Using ICS on a PC can be a daunting task because if something goes wrong, there is little user interface to help you troubleshoot. Also, if the ICS PC host crashes, every PC and AudioTron on the network will lose its Internet connection. Sharing a cable or DSL modem on an ICS host PC will also require two Ethernet adapters in the PC, and figuring out which one is connected can be complicated. For this reason, it's much easier to set up a separate hardware router on your network.

### Firewalls

A Firewall is "security" software that keeps outsiders from breaking into your network. Firewalls are primarily used to prevent "hackers" from accessing your PC hard drive while you're on the Internet. The greatest risk of this is when the IP address for your Internet connection is static, such as when using a DSL or cable modem. Since these devices typically maintain the same IP address to the outside world, and are always on, they make it easier for hackers to return to the same address until they've figured out a way to "break in". For this reason, a firewall is typically used between the DSL or cable modem to prevent unauthorized users from accessing your network from the outside.

➤ *If a firewall is running on a network PC that contains music for AudioTron, the firewall should be set to pass AudioTron's IP address. Otherwise, it will treat AudioTron as an "unauthorized*

*user" and prevent it from accessing music files in the PC's Shared directories. To do this, follow the instructions supplied with your firewall product.*

## Passwords

AudioTron uses two kinds of passwords, which can be set via the web server: One is for protecting "shared directories" on Windows 98/Me and the other is used in conjunction with a network running on Windows NT, XP or 2000.

AudioTron can save only one password, so you can only use a single password to protect all your shared music directories in Windows 98/Me. When password protecting your shared directories, set the password in the AudioTron web server Options "Share Password" setting.

AudioTron also requires a password if your music server is running Windows NT, XP or 2000. These Network Operating Systems treat all devices accessing the PC as a "User". Each user requires a user name and user password, so AudioTron will need one as well. The user names and passwords set in the Windows Network Control Panel for the music server PC should match those in AudioTron's web server **File Access** page.

👉 *Passwords are case sensitive! The password "MYPASS" is a different password than "MyPass" or "mypass".*

## Checking Network settings with "Winipcfg.exe"

Windows 98 includes a network diagnostic program called **Winipcfg.exe** which may be run from the Windows "Start" menu ("Start → Run → Winipcfg"). This program may be used to find the IP Address, Subnet Mask, and other relevant TCP/IP settings for each PC on your network.

When the dialog box appears, click on the "pull down" menu to select your network interface card (in this case an Intel 82557-based Ethernet PCI card). Then note the IP Address, Subnet Mask and Default Gateway settings. The IP address setting for AudioTron should not conflict with the IP addresses for any of the PCs on your network. The Subnet Mask and Default Gateway settings on AudioTron should match the settings on your network PCs.

If your network is running a DHCP server, the IP addresses will be assigned by the DHCP server. You can reassign the IP address by pressing the Release All button, followed by Renew All. Typically, this would be done on each PC when you add a new PC to the network. More information on this procedure can be found in the Windows Help file, or in a Windows reference manual.

In Windows NT, XP and 2000, the utility IPCONFIG.EXE may be run from the DOS prompt to obtain the IP configuration settings.

👉 *Note that the AudioTron Setup Utility can also provide most of the information for your network settings.*



Winipcfg screen



## Setting AudioTron's IP Address

### *To assign an IP address with a DHCP Server (on HPNA or Ethernet)*

1. Plug AudioTron into the HPNA or Ethernet network connection and make sure the PCs and network hubs are all turned on.
2. Turn on AudioTron from the rear panel power switch, wait a few seconds, then press the front panel Standby button. When powering on, AudioTron will automatically detect if it is connected to the network through an HPNA or Ethernet interface and choose the appropriate interface.
3. When the display indicates the type of network connection detected (Ethernet or HPNA), make sure it corresponds to the type of network you're using. For instance, if you connected an Ethernet cable and AudioTron's display indicates it has detected HPNA, the cable is either not connected properly or the Ethernet network may not be operating properly.
4. Once AudioTron detects the network connection, it will begin searching the network for a DHCP server and may display "**Waiting for Network**". This could take up to 120 seconds, so wait until it's done.
5. If AudioTron finds the DHCP server and it assigns AudioTron an IP address, it will display "**Searching for Hosts**" and search for all of the host PCs on the network.
6. If AudioTron finds music files on any of the PC hosts, it will display "**Found xx Hosts**" (where xx is the number of PCs it found) and search for music files. After it's done finding songs, the main menu will appear and AudioTron will be ready to play music. From this point on, you should turn AudioTron on and off with the Standby button. Turning off the rear panel power switch will erase the internal database of song titles and the network scan procedure will be repeated the next time AudioTron is powered on.
7. If "**No Hosts Found**" is displayed, check the suggestions for "**No Hosts Found**" in the **Troubleshooting Tips** section. If, after rebooting AudioTron "**No Hosts Found**" is again displayed, restore AudioTron's default settings as described below.

### *To restore AudioTron's default settings*

1. Press the **Options** button. Turn the knob until the "**Restore Factory Defaults**" is displayed.
2. Press the knob to display the "**No/Yes**" menu screen. Turn and press the Knob to select "**Yes**" to restore the factory default settings.
3. Reboot AudioTron to repeat the DHCP process.
4. If "**No Hosts Found**" is again displayed, it is possible that your network does not have a DHCP server (or if it does, AudioTron can't find it.) In this case, you must manually assign an IP address using the Static IP address procedure as described below. You can check for a DHCP server on the network by running the Setup Utility.

### *To assign a Static IP Address from the front panel*

1. **Find the addresses of the PCs in your network:** Run the Setup Utility from the AudioTron CD to find the IP address, Subnet IP Mask and gateway address for each PC in your network. These numbers will be used in a later step.
2. **Choose an IP address that doesn't conflict with the IP Addresses of the PCs in your network:** Choose an IP address for AudioTron that won't conflict with any of the IP addresses you found in Step 1. For example, if there are two PCs with the first set to IP address 192.168.0.1 and the second set to 192.168.0.2, then choose a number for AudioTron that's at least 10 higher than the highest IP address already assigned. (e.g. 192.168.0.12 in this example). Choosing a number that's significantly higher than any of the other IP Addresses (but no higher than 254) will help assure that AudioTron won't conflict with other IP Addresses.
3. **Select the network type (Ethernet or HPNA):** Press the **Options** button on the AudioTron front panel and turn the knob to display "**Select Network Interface**". Press the knob to select, then turn and press the knob to set the network interface as either **Ethernet** or **Phone Line HPNA**, so that it matches your network installation.



4. **Disable DHCP:** Press the **Options** button on the AudioTron front panel and turn the knob to display "**Configure DHCP**". Press the knob to select, then turn and press the knob to "**disable**" DHCP. Note that disabling DHCP will cause AudioTron to ignore the IP address, Subnet Mask and Gateway Settings assigned by a DHCP server.
5. **Set the IP Address:** Press the **Options** button on the AudioTron front panel and turn the knob to display "**Configure IP Address**". Press the knob to select, then turn and press the knob to enter the **IP address, subnet mask, gateway** and **DNS server** settings obtained from the Setup Utility.
6. **Set the "Sharing" Password (Optional):** If you have password-protected your Shared directories, go to the web server **File Access** page and enter the password in the "**Windows 98/Millennium Share Password**" setting. Then press "**Save Share Password**". This will enable AudioTron to access the shared directories. **Note that passwords are case sensitive.**
7. **Set the NT/2000/XP User Name and Password (NT/XP and Win2K only):** If you're running an NT 4, XP or Win 2000 network, the NT User Name and Password should match those set in AudioTron. In the web server **File Access** page, enter the password for NT/XP/2K and click on the "**Save NT/2000/XP Settings**" button. **Note that passwords and user names are case sensitive.**



## Regulatory Compliance Information

### For United States users: FCC Part 15

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

#### Declaration of conformity

**Responsible party:** Voyetra Turtle Beach, Inc. 5 Odell Plaza, Yonkers, NY 10701 (914) 966-0600 Fax: (914) 966-1102 [www.turtle-beach.com](http://www.turtle-beach.com)

**Product:** AudioTron Digital Music Player

This device complies with Part 15 of the FCC Rules. Operation of this product is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### Caution

Changes or modifications not expressly approved by Voyetra Turtle Beach could void the FCC compliance and negate your authority to operate the product.

### For United States users: FCC part 68

The AudioTron HPNA interface complies with Part 68 of the Federal Communications Commission (FCC) rules. On the HPNA interface card is a label that contains the FCC registration number and Ringer Equivalence Number (REN) for this device. If requested, this information must be provided to the telephone company. An FCC-compliant telephone line cord with a modular plug is required for use with this device. The HPNA interface is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68-compliant. See installation instructions for details.

The Ringer Equivalence Number (REN) is used to determine the number of devices which may be connected to the telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most areas, the sum of RENs should not exceed five (5). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. If this device causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. The telephone company may request that you disconnect the equipment until the problem is resolved. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of this equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

Connection of the phone line interface to a party line service is subject to state tariffs. Contact the appropriate state public utility commission, public service commission or corporation commission for information.

### For Canadian users: ICES-003

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par Industrie Canada.

#### DOC notice (for products fitted with an IC-compliant modem)

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation, and safety requirements. The Department does not guarantee the equipment will operate to the users' satisfaction. Before installing this equipment, users should make sure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the inside wiring associated with a single-line individual service may be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should make sure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas. The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five (5).

#### Warning!

- To avoid electrical shock or equipment malfunction do not attempt to make electrical ground connections by yourself. Contact the appropriate inspection authority or an electrician, as appropriate.
- To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.

## Using the Rio Receiver (and other unimportant info)

[Chris Uriarte, chrisjur@cju.com](mailto:chrisjur@cju.com)

Originally Published: November 22, 2001; Last Updated: January 5, 2001

This review was featured on [Slashdot](#) on November 23, 2001. View the article, comments and flames [here](#).

[**Update: January 2002:** Since this article hit Slashdot, I've received a number of emails from some helpful people. I had the opportunity to chat with a member of the Rio development team that worked on the original product. It appears that SonicBlue is working hard to add new features to the client software and firmware. Two months after purchasing the Rio, I still love it and my friends are still jealous.]

### What is it?

The RIO receiver is a small devices that allows you to play your digital MP3 and WMA music through any stereo system. It attaches to an Ethernet network or a HPNA (phone line) network, allowing it to access digital music files stored on a Windows PC. It's manufactured and sold by [SonicBlue](http://www.sonicblue.com) [http://www.sonicblue.com], the people who bought the [Rio](http://www.riohome.com) [http://www.riohome.com] line of digital music equipment from Diamond. The same device is re-branded and sold by [Dell](http://www.dell.com) [http://www.dell.com] as the Dell Digital Audio Receiver The street price for the unit is about US\$200. You can find out more about it at [its website](http://www.riohome.com/products/receiver.htm) [http://www.riohome.com/products/receiver.htm]. Here's a picture for your viewing enjoyment:



(Picture Says: "Click me for a giant-sized view")

### What are the tech specs?

Without going into the nitty gritty details, here's some tech specs on the unit:

- Unit measures 9"x9"x3"; contains small LCD screen, a few buttons and a jog dial on the front.
- 74MHz ARM7 Cirrus processor
- Runs a tiny version of Debian Linux
- 4MB of DRAM
- 512KB of flash memory
- CS8900 based 10MB ethernet interface
- Broadcom HPNA interface. HPNA is some ass-backwards networking setup that allows you to run data over your home phone lines - be afraid, be very afraid! [**Update: December 2001:** OK, I admit, I was too harsh on the HPNA. A lot of people have written me to say that the HPNA works just fine.]
- One set of standard RCA audio output jacks
- One set of standard speaker connectors

### Why buy it?

The advantage of purchasing the unit is that it gives you access to your digital audio collection through any stereo in your house that's close enough to a phone line or ethernet port on your home network.

### Why I bought it.

Let me set the stage by saying that I have over 500 CDs and that I am addicted to music. One day, I realized something important: my music collection was taking over my life. It was getting too large to handle and my fickle nature makes me want to listen to many different types of music in a relatively short period of time. CDs tend to get stale very quickly when they are in my CD player. After having, what alcoholics sometimes refer to as, "a moment of clarity", I realized that it was time to get my act together. I discovered that my car contained 70 CDs - it was a \$30,000 CD holder that happened to also be able to get me back and forth to work. There were about 100 CDs laying around in my home office and about 30 in my office at work. There were numerous CDs



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stuck in changers and players and CD holder and travel pouches and attache bags and just about everywhere I could put them. I was out of control. My girlfriend was about to stage an intervention when I told her that I was going to buy a third CaseLogic car visor CD holder - which I somehow thought I could rig into place, despite the fact that my car, like most others, only has two sun visors. It was bad, and I needed help. One day, I had a vision - If I made my music collection digital, I could access it from anywhere - my stereo, my car (through a car MP3 player), on the road (through a portable MP3 player), at the office, etc. I really hated my trusty Sony CD 200-disc changer, which I know has swallowed a number of CDs that I've been looking for the last 5 years. I had a dream about being able to "dial up" my music - without having to know which slot it lived in or figuring whether it was even in my house at all. I thought the Rio Receiver could help me fill these dreams. (I know, It's sad. One day I'll seek professional help.)

Where to buy it.

When I was first searching for it (November 2001), the unit was somewhat difficult to find. There were only about five online retailers carrying it, and most were out of stock. I settled on the dependable, but expensive, [Crutchfield](http://www.crutchfield.com) [http://www.crutchfield.com], where I purchased it for \$179. Note that I have seen street prices as low as \$156. Check out [CNET's price comparison service](http://shopper.cnet.com/) [http://shopper.cnet.com/] to try to hunt one down.

What do you get with it?

The box it's packaged in is roughly the size of a toaster over. Open it up and you'll find:

- the Digital Audio Receiver itself
- Home PNA adapter card - (*Note: It appears that some models do not include the PNA adapter. That's good...avoid it at all costs*)
- Remote Control
- 2 "AA" batteries
- one 6" RCA stereo patch cord
- one 6'6" telephone cord (*probably only included if you get the HPNA card*)
- one 12' 6" telephone cord (ditto)
- one 6' 6" AC power cable
- one CD containing the necessary server software installation and owner's manuals
- lots of cardboard, styrofoam, plastic, foam and other things that kill the environment. Crutchfield is also sure to pack the receiver box in a larger box small enough to hold a child - however, the child would never survive after suffocating from the grotesque amount of styrofoam peanuts inside.

It comes with a "quick start" sheet, which is good enough to actually get it up and running pretty quickly. The full documentation is on the CD-ROM, or available on the Rio website in the Support section. However, the full documentation is scarce on juicy details, although worth a quick read.

Setting it Up

Assuming that you already have an Ethernet network in place, all you need to do is the following:

1. Install the Windows software. Reboot (of course). Run the software and specify drives and directories that contain your MP3 and WMA files. Sit back for a minute and let it catalog your files.
2. Plug the unit in. Hook up the RCA jacks to your stereo. Plug Ethernet cable in the back. Turn the unit on.
3. Select your artist/album/playlist from the LCD screen and start playing music.

The whole setup process literally took me less than 10 minutes, most of which was spent chasing runaway styrofoam peanuts across my hardwood floors.

What does the Windows Software Do?

Yes, you must - I repeat - you MUST use the Windows software for this thing to work (see notes on the Linux

hack below, however). The software is not exactly what I would call "feature filled". The software has two purposes in life:

1. Catalog the digital music files on your computer system.
2. Communicate with the Digital Audio Player.

That's it. And you don't have options to play with those two either. It is truly as if SonicBlue had a meeting and said, "What is the absolute, minimal amount of work we can do to make this piece of software work?". It then appears that they took that list of minimums and cut it in half. It is barebones, to say the least.

Those who own other Rio products may be use to getting some type of CD ripping or digital file management software with players. This, however, doesn't include anything like that.

The Windows software, dubbed the "Audio Receiver Manager", doesn't actually allow you to manage anything. It does manage to discretely sit in your system tray and is loaded when you startup and log into windows. Since I always keep my main computer on and logged in, it's not a big deal to me, however, the audio manager will not start until you log into windows (i.e. enter your username password, if you get prompted for one). I'd like to see this made into a Windows NT/2000 service for the next release. [Update: November 25, 2001: [Scott Alfter](#) wrote me to tell me about [FireDaemon](http://www.firedaemon.com) [http://www.firedaemon.com], which essentially turns any Windows program into a WinNT/2000 service. I downloaded it and got it running in under a minute. It works great with the Rio Audio Receiver Manager and solves the problem I described above.]

Basically, you tell the software where on your system to look for MP3/WMA/M3U files. You have the ability to specify entire drives, which can be very slow, or individual folders. You must update the database every time you want to make new music available to your receiver. During the import process, the Audio Manager must stop playing music - apparently it has difficulty walking and chewing gum at the same time.

Here's some screenshots of the Windows program:



(Click for larger images)

A Note on Image 2 above: The Audio Manager shows that it imported about 1500 tracks and 120 playlists in 16 seconds. This particular import was run on a folder of MP3s that was already imported, so it ran rather quickly. When I first ran the import on this folder, it actually took close to 40 seconds to import all the tracks (not bad at all). However, this was done on a rather speedy Athlon 1.33Ghz with 768MB RAM and 7200 RPM drives. Your mileage may vary. The Rio documentation, for example, shows a screenshot of an import that was smaller, which took a considerably longer amount of time.

### Things that particularly suck about the Windows-based Audio Receiver Manager software:

- It is pretty much un-configurable. Choose your DHCP range and choose your folders to scan, that's it.
- There's no sort of "preferences" available to save your settings, which would be nice. Even though I only search for MP3s under one directory (D:\MP3, for example), it always defaults to search the entire C: and D: drives. I then have to remove and re-select D:\MP3 EVERY TIME. This is maddening.

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- Somehow, SonicBlue thought it would be helpful to have this thing search your MusicMatch and RealJukebox playlists - I can certainly see the value to this feature. However, you don't have the ability to disable searching these programs and the internal track lists and playlists are imported from these programs every time you update your database. This causes duplicate track and artist names to appear on your Receiver. For example, if you tell the receiver to search D:\MP3 for your of your tracks and you have previously imported the track names into Real Jukebox, all your tracks will be duplicated when you bring them up on the Receiver's LCD. This is fine if you want to "manage" all your music from RealJukebox, but I don't. Even after removing the tracks and playlists from RealJukebox, there were still dupes....I finally just uninstalled RealJukebox (it's a piece of junk, anyway). If you use MusicMatch, it will only import your MusicMatch playlists, which can be handy at times - but it's all or nothing....if you create playlists in MusicMatch, they will ALL show up on the Receiver, as you don't have any choice to exclude specific playlists.
- As mentioned before, the software sits in the system tray and is launched from your Startup folder. Therefore, if your machine reboots or you log out of Windows 2000/NT/XP, the Audio Manager software is not running - so no music for you.

### Playing your Music From the Receiver

When it comes down to doing what it is meant to do, the Rio Receiver does a very good job. It's very easy to navigate through your music collection, even if you have a large number of tracks, artists and albums. I have close to 150 albums worth of digital music and I can easily find what I'm looking for in a few seconds.

Music selection is done using a simple jog-dial knob on the front of the unit. You have the ability to search for music by artist, album, song title, genre or m3U playlist. All this information is determined by the [ID3 tags](http://www.id3.org) [http://www.id3.org] contained within your MP3 files - therefore, it's VERY important that all of your MP3 files are embedded with at least the artist, album and song title. (See my "Tips and Tricks" below for details on this). The Rio DOES NOT CARE about the organization of your directory structure - all it wants to know is the contents of your ID3 tags.

### Overall Quality and Performance

Overall, the sound quality is very good. Of course, sound quality greatly depends on the bitrate used to encode your digital music files. I encode all my MP3s at 192 bits using [LAME](http://www.mp3dev.org/mp3/) [http://www.mp3dev.org/mp3/] - the quality is excellent. The Receiver just takes a digital stream of the music files over the network and decodes it, so there is no loss in quality due to the network transfer or any weird types of streaming protocols. At 192bits, no one can tell that the music is sourced from an MP3 file.

The unit has a 10-second buffer, just in case there are any network slowdowns. I wanted to figure out just what it would take to make the thing stop or skip or do whatever it may do if the network gets really busy. So I wrote a simple Perl script to transfer a 200MB file between my Windows box and my Linux box over HTTP using 15 simultaneous threads (i.e. 15 downloads occurring at the same time). This is, of course, way more than what I normally see on my home LAN, which is usually just comprised of me and my girlfriend surfing the web (mostly me, of course). I should note that my home network uses a NetGear 10/100 Hub (not a switch) and a Linksys 10MB in the Living room - so the effective throughput will never exceed 10MB (not including protocol overhead). With [2 Skinny J's](#) *The Whammy* playing in the background, I started the network torture test. Despite the fact that my Linux box's four-year-old hard drive protested, the Rio Receiver didn't skip a beat (no pun intended). So I think you can be pretty sure that this thing will work well, even in a busier network environment.

### Did you say it runs Linux?

Yes, it runs Linux. Many people tend to get very aroused about this these days. I am a Linux advocate, as I like to advocate any technology that helps you work or play better, but I'm not a Linux zealot. But for the more curious, the unit has already been hacked, although it appears to be a bit more difficult to do than it should be. Jeff Mock has put together [a wonderful collection of information](http://www.mock.com/receiver/) [http://www.mock.com/receiver/] related to hacking the Receiver. Even though I was greatly tempted see what you can do with the thing, I figure I bought it to do what it does best - play music. I'm happy with its feature set and don't feel the need to crack it open. If this

unit gets more popular and there are a number of good hacks available out there, you may see more people trying to hack it.

### What Operating Systems Does it Work With? (Do I have to use Windows?)

The Rio Audio Receiver Manager software officially supports Windows98, 98SE, 2000 and ME. Although not listed, I'm sure it also works on XP, as the application nothing more than simple HTTP and UDP server. [Update **(November 25, 2001)**: My friend, [Roy Tucker](#), confirms that the Audio Receiver Manager software runs on XP. So blame him when it blows up your PC.] It will not run on Windows95 or WindowsNT 4.0.

There are a few efforts underway to make the unit work with non-Windows servers. The first is a [home-grown project put together by Jeff Mock](#) [<http://www.mock.com/receiver>]. Jeff has done an excellent job at reverse engineering the Rio's protocols and has put together a number of scripts that allow you to use a Linux machine as the file server. At this time, his software does not support playlists, but after looking at the code and the protocols, it is probably an easy thing to add. Be aware, though, installation of Jeff's code is not a trivial task you need to have knowledge about Linux, Apache and Perl and there's not a lot of "HOW-TO" documentation available (who has time to document, anyway?...especially for open-source projects that don't pay the bills?). It took me about 40 minutes, but I got Jeff's scripts running. Again, he did a great job with this.

Second, there's an open source project called [Digital Audio Server](#) [<http://sourceforge.net/projects/das/>], which I have not tried out. It looks as if it might be a bit more complete and simpler to use than Jeff's solution.

There's a third project called [Jreceiver](#) [<http://sourceforge.net/projects/jreceiver/>], which is open source servlet-based audio server built to support network-based MP3 players like the Rio. However, it appears to be quite immature at this time. It's completely servlet-based, but does not support Tomcat, which is a major drawback, in my opinion.

### Are there competitors?

Yes, in fact there is one generally-available competitor that I am aware of: [The Turtle Beach Audiotron](#) [<http://www.audiotron.net/audiotron.asp>]. I like this particular product a lot. Had it not been for the Rio's attractive \$150 street price, I probably would have bought the Audiotron. There are a few major differences in the way that these boxes operate. First, the Audiotron is a full-size (but thin) stereo rack component, so it can blend nicely into your existing system. Second, the Audiotron accesses music over a simple SMB share, so you can simply export a folder from your Windows or UNIX box and make it available to the Audiotron. There's no server-side software required. Third, you can actually READ the LCD display on the Audiotron from a distance greater than 10 inches. Fourth, the Audiotron has a TOSLINK optical output, which is nice to have. Last, but not least, the Audiotron comes with a suite of useful software, including a web-based front-end. The street price for the Audiotron, however, is about double the price of the Rio. You can read Rob Malda's [review of the Audiotron on Slashdot](#) [<http://slashdot.org/article.pl?sid=01/10/12/1423233>].

### Tips, Tricks and Things to Be Aware Of

- **Use ID3 Tags** - as mentioned before, the Rio gets all its track, artist and album info from the ID3 tags embedded in the MP3 file, so make sure you ID3 tag your MP3s. The easiest way to ID3 tag your MP3s is to do it when you rip them from the CD using a good ripping program with CDDB/FreeDB integration (Check out [Audiograbber](#) [<http://www.audiograbber.com-us.net>]). If you have existing MP3s that are not tagged, [MusicMatch](#) [<http://www.musicmatch.com>] does a good tagging job for no cost. Musicmatch will also identify all the MP3s on your system that are not tagged.
- **Use RealJukebox or simple file system management** - the Rio Audio Receiver Manager WILL import all tracks and playlists you have setup in RealJukebox and you don't have any say over it. Therefore, you should manage your MP3s through RealJukebox or not use RealJukebox at all. If you search for MP3s on your hard drives AND have a RealJukebox tracklist built, you will get duplicate track entries when you bootup the Rio. [Update, **November 25, 2001**: If you delete RealJukebox from your system, the playlists will not be removed in the un-install process. Therefore, you need to manually go into the RealJukebox directory (e.g. C:\Program Files\RealJukebox) and remove all the folders. Note that if you are running the

Rio Audio Receiver Manager, you will get a sharing violation when you try to remove these folders, so shut the Rio software down first]

- **Listening to Full Albums** - There's only one way to listen to full albums the way they were intended to be heard on the CD: create an m3u playlist for the album. If you simply choose "Albums" through the Rio controls, it will list out the unique album names on the system (without the artist name attached to it). If you choose an album, the Rio plays through tracks in the album in alphabetical order - not in the order they appear on the CD. The solution is to create an m3u playlist for each album and then access the album through the "Playlists" option on the Receiver. Again, a good CD ripping program should create these playlists for you when the rip is complete.
- **Album Playlists help if they include Artist Names** - Some CD ripping programs will create m3u playlists and name the file after the album you just ripped. The Rio displays playlists according to their file system name. Therefore, if you don't have the artist name in the playlist file name, you may have a tough time identifying and finding the album playlist your are looking for. The solution is to name your playlists in some format like "Artist-Album.m3u". Sadly, my favorite software, Audiograbber, does not let you configure the file name format of the playlists. So I [wrote a Perl script that goes through your MP3 directories and renames the playlists](#) to "Artist-Album.m3u" format IF you organize your MP3's in the following fashion:

```
+ /MP3-Root-Directory
  + /Artist-Name
    + /Album-Name
      /Track.mp3
      /Track.mp3
      /Track.mp3
      etc.
```

I think this is the typical way most people organize their MP3's, so the Perl script may be helpful. Also, since I think Playlists are so important, I wrote a [Perl script that hunts out any album directories that DO NOT contain playlists](#) and prints them out for you. (BTW, if you didn't know this already, you need to install [Perl](http://www.cpan.org) [http://www.cpan.org] on your machine for these to work).

- **The LCD Screen is Small** - You need to be pretty close to the unit to read the LCD, so choosing tracks from a distance is impossible. This used to piss me off, but I figured that with the old way, I would have to dig out another CD anyway (and chances were that CD I was looking for was MIA).
- **Tiny Gaps Between Songs** - the Rio inserts an every-so-tiny gap between tracks...so small you don't really notice it. I consider this a good thing. For live albums and albums with songs that continue onto the next track without a gap, everything sounds like it did on the CD...the Rio does an excellent job with this. I tested Jerry Seinfeld's *I'm Telling You For the Last Time* (a live comedy album), 311's Live album (a live concert album) and Rx Bandit's Progress (a traditional studio album where the first 5 tracks flow into the next track) - all of them sounded great. [Update: January 2002: A kind reader points out the the small gaps are actually encoded into the MP3 files and points to a discussion [here](#) regarding gapless playback]

## Final Thoughts and Impressions

At \$150 street price, this thing is a no-brainer. Despite some of my gripes, it does what its supposed to do and does it well. I highly recommend it. I no longer require a CD player in my den. Everything gets ripped to MP3 and then played on the Rio. If you already have a home network in place and a lot of digital music, it's pretty much just plug-and-play. I've already enjoyed using the Rio for the short time that I've had it and I'm sure that I will get much more enjoyment out of it in the future. Good job, SonicBlue.

## For the tech weenies:

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How does it work? (Warning: very useless technical information follows...you may want to stop here.)

Given my particular background, I was more interested in how the Receiver actually gets music from the central PC. After further analysis, I became convinced that the great [Rube Goldberg](#) was the chief architect of Rio. I thought the whole thing could have been made a lot simpler, especially compared with the file-sharing simplicity of the Turtle Beach Audiotron (see "Competitors" above).

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So I set out to determine the protocols used between the Receiver and the Windows server. I figured that if I could reverse engineer these protocols, I could write my own server software to circumvent the lack of features in Rio version - including getting the server to run on Linux. So I started running Etherpeek sniffs of my network and began analyzing the traffic flow between the Receiver and my PC. I was about a half hour into it when I first discovered Jeff Mock's great ["Hacking the Rio Receiver" page](http://www.mock.com/receiver) [http://www.mock.com/receiver]. Jeff did a far better job than I did in my first 30 minutes, so I used his notes to compare what I sniffed (btw, Jeff, your 100% right on...awesome work). The result of Jeff's sniffing efforts produced a set of scripts that allow you to run a Linux version of the server software (available for download on his site).

Basically, the protocol is simple, but there's a lot of little steps to actually get to the point where the music starts playing. Here's a quick overview:

- When the box boots, it sends out a DHCP request ("please, someone give me an IP address"). The Rio Audio Manager software on the PC responds to DHCP requests only for the RIO. This is based totally on MAC address, as I was able to send a spoofed DHCP request using the Rio's MAC from my Linux box. FYI, on the Windows side, I always limit the DHCP IP scope to exactly 1 address, which essentially gives the Rio a static IP. [Update: January 2002: Rio's developers have told me that there the software isn't looking for a MAC address, but a magic cookie contained in the Rio's DHCP request packets. I was able to get a response from the Audio Manager software only after completely capturing and replaying the Rio DHCP request from my Linux box. However, a DHCP request MAC src spoof from my Linux box did not work, which supports this fact.] Jeff relies on the OS to do the DHCP stuff - not his server software. You can, however, configure dhcpd to always dish out the same IP to a single MAC address, if you so desire.
- After the Receiver is happy with its IP address, it sends out an SSDP request on UDP 21075 ("someone please tell me where my server is") with the request string "^upnp:uuid:1D274DB0-F053-11d3-BF72-0050DA689B2F\n{Source MAC Address}\n". The Audio Manager responds with the IP address and port of the Windows server. It tends to use TCP Port 12078 on the server side. It actually sends back an URL to an .xml file (http://serverip:12768/descriptor.xml)...the important part is the port 12768, which will be used as the status port between the receiver and server.
- The receiver actually does an NFS mount of /tftpboot on the server and grabs a basic Linux file system - sort of like an XTerm. It then reboots a second time, this time bootstrapping with the downloaded kernel. Jeff points out something interesting that I initially missed: the Receiver does an NFS mount of /tftpboot - it does NOT use TFTP to download the boot image from /tftpboot, as you would normally see with diskless clients.
- When you first scroll through a list - such as "Artists", the box issues a HTTP query to the app port specified in the SSDP response that looks something like: "GET /query?artist=". The server responds with an HTTP response with a standard HTTP 200 header, Content-type, Content-length, etc. a response string that looks like "ArtistA.1=61,0,0:ArtistB.1=32,0,0.....etc." You can start to see that the software assigns a unique index number to each item in the list, starting with 1, assigned in alphabetical order. Once you select an artist, for example, it will then make a subsequent query for the tracks associated with that artist ("http://10.0.0.25:12078/results?\_extended=1&artist=Artist" ). The server returns a similar list of tracks, each also having a unique track ID number. Once a track is selected, using its unique ID number, the Receiver asks for the tags associated with the mp3 file ("http://10.0.0.25:12078/tags/240", for example).
- From that point on, it's time to actually play the music. This accomplished by streaming the data over HTTP, gracefully shooting a flow of TCP PSH's and ACK's across your network. The receiver requests the unique track id over HTTP a la http://10.0.0.25:12078/content/240.
- While alive and active, the Receiver and the server software start to miss each other and send UDP status packets out to each other about every five seconds. Basically, the server says "State? (What's going down?)" and the receiver replies with its current state, which includes its MAC address, the current song it's playing and an associated timecode.
- It should be noted that once you sniff the format of these queries, you can simply just insert them into any old web browser to see the results the server sends back. Type in "http://10.0.0.25:12078/query?artist=", for example, and you'll get a list of all the artists in the database. Doing something like "http://10.0.0.25:12078/query?artist=c" returns all artists starting with C - this might be useful in building

## APPENDIX T

some type of music search engine or something. Doing something like "http://10.0.0.25:12078/results?\_extended=1&artist=Ash" will return all songs associated with the artist Ash. To see all playlists, it sends "http://10.0.0.25:12078/content/100?\_extended=1" and to view a specific playlist, it sends "http://10.0.0.25:12078/content/5e90?\_extended=1", where 5e90 represents the unique playlist ID it was sent when it queried all the playlists. You get the drift...this isn't exactly rocket science. Given this simple protocol, you can easily write a browser-based frontend to the Windows-based Audio manager software.

I figured that if I wanted to write a web-based front-end for the Audio Manager software, I would need to figure out which port the server is running on. So I created [a trivial perl script that mimics the Receiver](#), sending out a direct SSDP query to the Windows server, which is happy to return the all-important port number that the server software happens to be running on. Once you have that port, you can issue any of the HTTP queries above via a regular web browser or with any piece of code you may just create. Interesting note: by sending out the SSDP request from my Linux box, the Linux box now shows up as a "New Audio Receiver" in the Audio Receiver Software. This causes the server software to send my Linux box a UDP "status" query every five seconds (too bad my Linux box isn't answering).

Lots more that can be done with this...if you have the time and can think up a good use for it.

As a side not, if you're looking for a front-end to your MP3 collection and you're using Apache, take a look at Lincoln Steins's [Apache::MP3](http://www.modperl.com/Songs/) [http://www.modperl.com/Songs/], for use with mod\_perl. I use it and love it. It gets me access to my entire music collection anywhere that I have an Internet connection.



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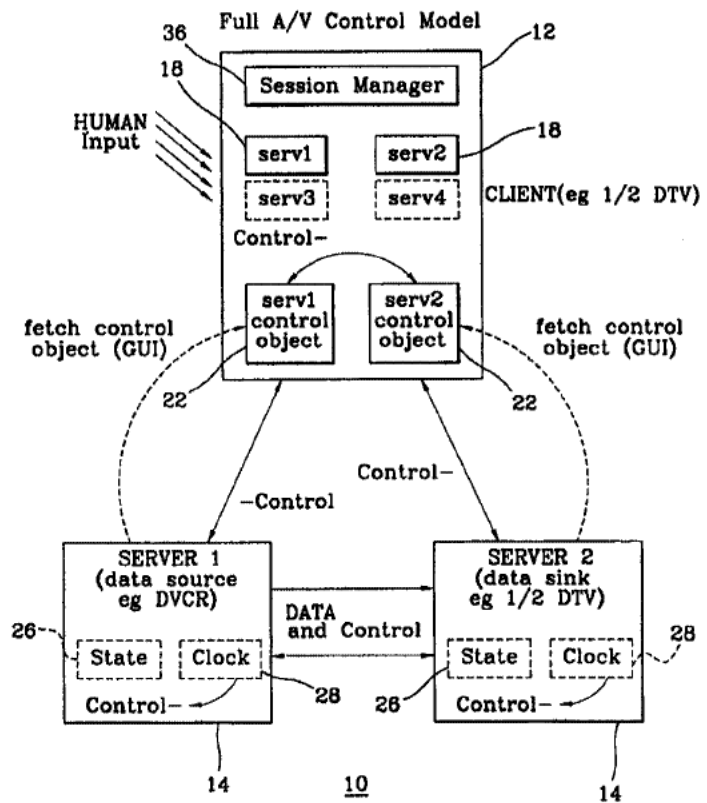
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(54) Title: METHOD AND APPARATUS FOR UNIVERSALLY ACCESSIBLE COMMAND AND CONTROL INFORMATION IN A NETWORK

(57) Abstract

A method and system for performing a service on a home network, by: connecting a first and a second home device to the home network; providing a database including a plurality of application interface description data objects, where each application interface description data object includes information in a structured format for commanding and controlling of a home device by one or more other home device connected to the network; the second home device accessing a first application interface description object for the first home device in the database; the first home device accessing a second application interface description object for the second home device in the database; sending control and command data from the first home device to the second home device utilizing the second application interface description object over the network; and sending control and command data from the second home device to the first home device utilizing the first application interface description object over the network. Whereby, the first and second home devices perform said service.





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**Method and Apparatus for Universally Accessible Command and Control  
Information in a Network**

5 **Technical Field**

The present invention relates to the field of network systems, and more particularly, to home network having multiple devices connected thereto.

10 **Background Art**

A network generally includes a communication link and various devices with communication capability connected to the communication link. The devices include computers, peripheral devices, routers, storage devices, and appliances with processors and communication interfaces. An example of a network is a home network for a household in which various devices are interconnected. A usual household can contain several devices including personal computers and home devices that are typically found in the home. As such the term "device" typically includes logical devices or other units having functionality and an ability to exchange data, and can include not only all home devices but also general purpose computers. Home devices include such electronic devices as security systems, theater equipment, TVS, VCRs, stereo equipment, and direct broadcast satellite services or (DBSS), also known as digital satellite services (DSS), sprinkler systems, lighting systems, micro waves, dish washer, ovens/stoves, washers/dryers, and a processing system in an automobile.

25 In general, home devices are used to perform tasks that enhance a homeowner's life style and standard of living. For example, a dishwasher performs the task of washing dirty dishes and relieves the homeowner of having to wash the dishes by hand. A VCR can record a TV program to allow a homeowner to watch a particular program at a later time. Security systems protect the homeowner's valuables and can reduce the homeowner's fear of unwanted entry.

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Home devices, such as home theater equipment, are often controlled using a single common control unit, namely a remote control device. This single common control unit allows a homeowner to control and command several different home devices using a single interface. Thus, may  
5 manufacturers have developed control units for controlling and commanding their home devices from a single interface.

One drawback associated with using the remote control unit to command and control home devices is that it provides static and command  
10 logic for controlling and commanding each home device. Another drawback associated with using remote control units is that known remote control units cannot control a plurality of diverse devices, and more particularly, cannot control a plurality of devices having different capabilities to communicate with each other in order to accomplish tasks or provide a service.

15

In conventional network systems a user provides commands using a remote control unit or device control panel. Once the user ceases, there is no controller unit or device in the network to provide commands for automatic operation. After a user initially controls and commands a first set of devices,  
20 conventional systems do not provide a mechanism for the first set of devices to automatically communicate with a second set of devices in the network as necessary in order to accomplish tasks without direct user control and command of the second set of devices. Further, conventional systems do not provide an efficient method for various network devices to obtain information  
25 about other network devices in the network for command and control.

There is, therefore, a need for a method and a system which provides dynamic control and command devices in a home network. There is also a need for such a method and system to provide the ability to control a plurality  
30 of diverse devices having different capabilities to communicate with each other in order to accomplish tasks or provide a service. There is also a need for such a method and system to provide the ability for various network

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devices to automatically command and control other various network devices. There is also a need for such a method and system to provide universally accessible command and control information for inter-device communication.

5

### Summary of the Invention

The present invention satisfies these needs. In one embodiment the present invention provides a method and system for performing a service on a home network, by: connecting a first and a second home device to the home network; providing a database including a plurality of application  
10 interface description data objects, where each application interface description data object includes information in a structured format for commanding and controlling of a home device by one or more other home devices connected to the network; the second home device accessing a first application interface description object for the first home device in the  
15 database; the first home device accessing a second application interface description object for the second home device in the database; sending control and command data from the first home device to the second home device utilizing the second application interface description object over the network; and sending control and command data from the second home  
20 device to the first home device utilizing the first application interface description object over the network. Whereby, the first and second home devices perform said service.

In one version of the invention, the first home device stores first  
25 application interface data therein, and the second home device stores second application interface data therein. The database is formed by querying the first and second home devices to transfer said application interface data for the first and second home devices to the database device. The database can be stored in a database device and connected to the network for universal  
30 access by network devices. In that case, the first application interface description object for the first home device can be provided from the data base to the second home device over the network. Further, the second

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application interface description object can be provided from the data base to the first home device over the network.

Further, three or more home devices can be connected to the network, wherein at least one home device accesses the database to query the application interface description objects of a plurality of home devices for sending command and control data to the plurality of home devices over the network. Each application interface description object can include data in a structured format. The structured format can include XML format.

10

#### **Brief Description of the Drawings**

These and other features, aspects and advantages of the present invention will become better understood with regard to the following description, appended claims and accompanying drawings where:

15 Figure 1 shows a block diagram on an embodiment of a network according to one aspect of the present invention;

Figure 2 shows the block diagram of Figure 1 in an example device control and communication scenario;

20 Figure 3 shows a block diagram of an example home network system according to the present invention which includes a plurality of client and server devices;

Figure 4 shows a block diagram of example embodiments of a client device and a server device of Figure 3;

Figure 5 shows example embodiments of client devices;

25 Figure 6 shows example embodiments of server devices;

Figure 7 shows a block diagram of two example networked server devices capable of communication with, and control of, one another;

30 Figure 8 shows a block diagram of an example architecture of an audio/video (AV) model including examples of a source server device, a sink server device and a client device in a network;

Figure 9 shows another example audio/video (AV) model;

Figure 10 shows an example capabilities data table for a network

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device;

Figure 11 shows an example attribute data table for a network device;

Figure 12 shows an example configuration of building blocks for generating command messages among networked devices;

5 Figure 13 shows another example configuration of the building blocks of Figure 12 for generating command messages;

Figure 14 shows three examples of interaction among networked client and server devices;

10 Figure 15 shows an example block diagram for definitions of API extensions of networked device interfaces;

Figure 16 shows an example architecture for a server device application accessing the interface description document of another server device;

15 Figure 17 shows another example inter-device control architecture between a controller server device and a controlled server device;

Figure 18 shows an embodiment of an XML protocol providing a Web standard common middleware layer in a communication stack at the API level between networked devices;

20 Figure 19 shows another embodiment of server device to server device command and control architecture;

Figure 20 shows the relationship between a device interface library and consumer electronics definition data base for home devices;

Figure 21 shows hierarchal form of an embodiment of a device interface definition;

25 Figure 22 shows an example of layers in device interface definition of Figure 21;

Figure 23 shows a command transmission and interpretation process between a sender and receiver device; and

30 Figure 24 shows an example table of a partial list of packet types and formats for providing translation services according to an aspect of the present invention.

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### Detailed Description of the Invention

In one aspect, the present invention provides inter-device communication in a network such as a home network. As home devices become more intelligent and can share information, inter-device communication allows a user to interconnect devices in a network to take advantage of the information sharing capabilities of those devices. As such, inter-device communication plays a crucial role in affording a user with the ability to fully and flexibly utilize the networked devices.

Referring to Figure 1, in an embodiment of the present invention, a network 10 includes at least one client device 12 and at least one server device 14 interconnected via a communication link 16. The communication link 16 can include a 1394 serial bus providing a physical layer (medium) for sending and receiving data between the various connected home devices. The 1394 serial bus supports both time-multiplexed audio/video (AV) streams and standard IP (Internet Protocol) communications. In certain embodiments, a home network uses an IP network layer as the communication layer for the home network. However, other communication protocols could be used to provide communication for the home network.

Each client device 12 may communicate with one or more server devices 14 in the network 10. Further, each server device 14 may communicate with one or more other server devices 14, and one or more client devices 12, in the network 10. Each client device 12 can include a user communication interface including input devices such as a mouse and keyboard for receiving user input, and a display for providing a control user interface for a user to interact with the networked devices. The user interface can include a graphical user interface (GUI) display 18 for providing information to the user. Referring to Figure 2, as defined herein, each server device 14 provides a service for the user, except control user interface, and each client device 12 provides control user interface for user interaction with the network 10. As such, only client devices 12 interact directly with users,

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and server devices 14 interact only with client devices 12 and other server devices 14. Example services can include MPEG sourcing/sinking and display services.

5           Figure 3 shows a block diagram of an example home network 10 that includes a plurality of client devices 12 and a plurality of server devices 14. Each server device 14 may include hardware as a resource in the network for providing services to the user. Further, each server device 14 may store a server or service control program 20 for controlling the server hardware, and  
10           include a graphical control object (GCO) user interface description 22 for user interface with the server control program 20 as shown in Figure 4.

          For control between a controlling client device 12 and a controlled server device 14, the client device 12 accesses the GCO 22 of the server  
15           device 14 by, for example, transferring the GCO 22 from the server device 14 to the client device 12 over the network. The client device 12 then uses the transferred GCO 22 to create a control user interface GUI 18 for the user to communicate with the control program 20 of the server device 14 from the client device 12 over the network. The user provides command and control to  
20           at least the control program 20 of the server device 14 from the client device 12.

          Storing the GCO 22 of each server device 14 in the server device itself may reduce the processing and storage requirements of the client devices 12  
25           in networks with several server devices 14. Further, storing the GCOs 22 in the server devices 14 may allow each server device 14 to provide its own GUI look and feel to the user, and allows for modification or updating of the GCOs 22 without modifications to client devices 12.

30           Referring to Figure 4, to provide command and control between a client device 12 and the server device 14, in one embodiment, the client device 12 can include a renderer 24 for displaying a GUI 18 using a GCO 22



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stored in the client device 12 or transferred to the client device 12 over the network from a desired server device 14. For example, in an initial device selection phase, the client device 12 can fetch the GCO 22 of at least one server device 14 over the network, and the renderer 24 displays a GUI 18  
5 using the GCO 22 for controlling the server device 14. Preferably, the GUI 18 is customized to the server device 14 and can include a built-in command set for controlling the server device 14.

In addition, the GUIs 18 of various server devices 14 may include  
10 commonalities such as: (1) a common GCO model type for the client device renderer 24 to display GUIs 18, (2) common communication protocols for transferring the GCOs 22 from various server devices 14 to the client device 12, and (3) common communication protocols for GUI interaction from the client device 12 to the control program 20 of the corresponding server device  
15 14, wherein the client device 12 does not require a built-in knowledge of a particular server device 14 being controlled.

Referring still to Figure 4, a server device 14 may include one or more server control programs 20 to control the server hardware for providing a  
20 service. The GUI interface 18 from the GCO 22 of the server device 14 provides interface to the server device control programs 20. The server device 14 may also include control state data 26 indicating the control status of the server device 14 and server device hardware in providing a requested  
25 service.

For example, the control state data 26 can include the status of control information in the GUI 18 for the server device 14, such as timer setup for a recording action in a VCR server device. The control state data 26 is stored in the controlled server device 14, and displayed to a user through the GUI 18  
30 of the server device 14 at the controlling client device 12, for user control of the server device 14. Preferably, the controlling client device 12 for displaying the GUI 18 of the server device 14 does not retain knowledge of the control

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state data 26 for the controlled server device 14.

Each server device 14 can be controlled by one or more client devices 12. As such, the control state data 26 stored in the server device 14 includes status of the information in the GUI 18 of the server device 14 at each of the controlling client devices 12. For example, when the user controls a server device 14 using a first client device 12, upon completion of the user control, the information in the GUI 18 of the server device 14 at the first client device 12 is saved by the server device 14 in the control state data 26 of the server device 14.

Alternatively, while the user is interacting with the GUI 18 of the server device 14 at the first client device 12, the control state data 26 of the server device 14 is updated with the information in the GUI 18 of the server device 14 at the first client device 12, and upon completion of user control, the control state data 26 is retained in the server device 14. When the user controls the server device 14 using a second client device 12, the control state data 26 is made available to the user via the GUI 18 of the server device 14 at the second client device 12 for further control. The user can also use the first client device 12 at a later time to control the server device 14, whereupon the control state data 26 is made available to the user via the GUI 18 of the server device 14 at the first client device 12 for further control. The server device 14 can also include a clock 28, or maintains the current time, to allow time delay action based on time or clock input from a user, as described below.

A client device 12 and a server device 14 can be physically bundled together as one unit such as a DTV. In that case, the server device 14 includes a control program 20 for controlling the server hardware, and the client device 12 provides control user interface to the server control program 20 for control and command of at least the server hardware. Figure 5 shows examples of client devices 12 that may include: (1) a PDA(RemoteC) for

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displaying a GUI, (2) a DTV(STB) for displaying a GUI and including a sink server comprising audio and/or video program stream destination server, and (3) a PC for displaying a GUI and including at least one server device for providing multiple services. Hardware and executables in a DTV or PC client device can also be controlled by other client devices. Figure 6 shows example server devices 14, including: (1) a DVDP SmartCard as a source server device, (2) an Audio Amplifier as a sink server device, (3) a DVCR as either a source or a sink server device, and (4) a Management Server for managing remote server devices. The Management Server can be included in a DBS-STB, Cable TV-STB, or ATSC-STB, for example. Such devices include a Management Server for local control or management of the internal workings of the STB. Further, external servers accessed through an external network can be utilized by local client devices for services such as Video-on-Demand, Enhanced-TV, and Internet commerce, for example.

15

Referring to Figure 7, communication and control between two server devices 14 is accomplished by the control programs 20 of the server devices 14 communicating command and control data therebetween. A server device 14 can control one or more other server devices 14 over the network. And, a server device 14 can be controlled by one or more server devices 14, and by one or more client devices 12. Further, a user can utilize a client device 12 to control and command a first set of server devices 14, and the first set of server devices 14 can automatically command and control a second set of server devices 14 without user involvement, as necessary to perform services to the user.

20

For example, for automatic time-delay operation, a user can "log on" to a client device 12 to control a first set of server devices 14 and specify desired services. The user then "logs off" from the client device 12. The first set of server devices 14 perform communication and control among themselves, and at a later time, one or more of server devices 14 in the first set automatically control a second set of server devices 14 as necessary to

25

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collectively provide the desired services without user involvement.

Figure 7 shows example embodiments of two server devices 14 capable of communication with, and control of, one another. Each server device 14 includes a control program 20, a clock 28 and control state data 26 described above. Each server device 14 can also include a GCO 22 for the server device 14 to be directly controlled by a client device 12. However, a GCO 22 does not need to be included in a server device 14 that is not directly controlled by a client device 12 and only communicates with other server devices 14. Each server device 14 also includes a command language (CL) interface 30 and a library of commands. The library of commands includes the commands that the server device 14 utilizes to send and receive information for providing its service. However, a command language is not necessary for user control as shown in Figure 4 and described above.

Figure 8 shows an example audio/video (A/V) model including a source server device 14, a sink server device 14 and a client device 12 in the network. The source server device 14 includes a control program 20 for controlling data stream source hardware 32 of the source server device 14, and the sink server device 14 includes a control program 20 for controlling data stream sink hardware 34 of the sink server device 14. In an example operation, a user utilizes the client device 12 to control the source server device 14 to start the data stream source hardware 32, and to control the sink server device 14 to start the data stream sink hardware 34. Upon initiation of data transfer from the data stream source hardware 32 to the data stream sink hardware 34, the user can relinquish the client device 12. Alternatively, the user can program the initiation of the data transfer for a future time and relinquish the client device 12. Thereafter, the data stream source hardware 32 of the source server device 14 and the data stream sink hardware 34 of the sink server device 14 automatically initiate the data transfer at the time programmed by the user.

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For example, the data stream source hardware 32 can include a Tuner-Access Device such as a Direct Broadcast Satellite (DBS). A DBS is a multi-channel alternative to cable television and provides cable-like television programming directly from satellites on small (18 inch to 3-foot diameter) satellite dishes. With DBS, several standard analog television signals are digitally compressed onto a single satellite transponder thereby allowing up to 200 or more channels receivable with a dish pointed at a fixed position in the sky. The data stream sink hardware 34 can include a Digital Video Cassette Recorder (DVCR) which comprises a digital VCR that is able to decode compressed digital video signals on playback. The user provides command and control data including "time-delay record" event data for the DVCR and a "time-delay select a program" event data for the Tuner-Access Device. After the time-delay, the Tuner-Access Device selects the desired program, and sources program data to the DVCR which receives and records the program data without further control actions from the user.

Figure 9 shows another example audio/video (A/V) model including at least a source server device 14 SERVER1, a sink server device 14 SERVER2 and a client device 12 in the network 10. The client device 12 includes a session manager 36 with a user interface for displaying selection information for a user to select and control the server devices 14 SERVER1, SERVER2 and other server devices 14 such as SERVER3 and SERVER4 (not shown). The selection information can include iconic symbols designated as Serv1, Serv2, Serv3 and Serv4 in the session manager 36 for a user to select the server devices 14 SERVER1, SERVER2, SERVER3 and SERVER4, respectively. The source server device 14 SERVER1 can include a DVCR and the sink server device 14 SERVER2 can include a 1/2DTV.

In one example operation, upon selection of the server devices 14 SERVER1 and SERVER2, the client device 12 transfers the GCO 22 of each server device 14 to the client device and displays a corresponding GUI 18 for each of the server devices 14 SERVER1 and SERVER2. The user can

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interact with the GUI 18 of each server device 14 to provide command and control to the corresponding server device 14 for service. Each server device 14 can provide service alone or in combination with other server devices 14. Further, the session manager 36 transfers control state data 26 between the  
5 GUIs 18 of the server devices 14 in the client device 12 as necessary for the corresponding server devices 14 to perform a service. Based on the user command and control information, two or more of the server devices 14 can communicate command and control information therebetween to provide a user requested service.

10

The session manager 36 can include a software agent which functions to access and display available home network services provided by various server devices 14 in the network 10. The software agent can additionally match the capabilities of various server devices 14 in the network 10 and  
15 display selection information for only those server devices 14 that have compatible capabilities. Further, the session manager 36 can match the selections made in the GUI 18 of one server device 14 to the selections in GUI 18 of another server device 18 to help the user provide meaningful command and control information to the server devices 14.

20

In another example operation, the session manager 36 executes the software agent which searches the network and discovers the server devices 14 connected to the network. The software agent also accesses capabilities data stored in each server device 14 to determine the capabilities of the  
25 server devices 14 and provide information about those capabilities to the user. The session manager 36 then displays the selection icons Serv1, Serv2, Serv3 and Serv4 for the server devices SERVER1, SERVER2, SERVER3 and SERVER 4 as shown in Figure 9.

30

The session manager 36 initially enables all the selection icons Serv1, Serv2, Serv3 and Serv4 to allow the user to select from among all four selection icons. After the user selects the server device SERVER1 by clicking

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on the Serv1 selection icon, the session manager 36 determines that the server devices SERVER3 and SERVER 4 are incompatible in capability with the server device SERVER1. As such, the session manager 36 disables the selection icons Serv3 and Serv 4 for server devices SERVER3 and  
5 SERVER4, respectively. The user can then click on the icon Serv2 to command and control the server device SERVER2.

As the user interacts with the GUI 18 of a selected server device 14, control and command information input by the user into each GUI 18 provide  
10 additional capabilities information which affect further server device selections by the user. For example, if a VCR server device 14 is selected, further action by the session manager 36 in enabling or disabling selection icons for other server devices 14 is affected by a user decision to play or record.

15 Each server device 14 in the network has one or more service capabilities as discussed above by way of example with reference to the server devices in Figure 9. Each service capability includes sourcing or sinking of information. For example, a TV has the sinking capability of receiving video and audio streams, a VCR device can source (transmit) and  
20 sink (receive) video and audio signals, and a PC may be able to transmit and receive video, audio and data. Each sourcing capability has a complementing, and compatible, sinking capability. Similarly, each sinking capability has a complementing, and compatible, sourcing capability. For example, a video output capability of one device is complemented by a video  
25 input capability of another device.

Since each device 14 can be a source or sink for several different services on the network, each device 14 stores a capabilities data table (Capabilities Table 1) as shown by example in Figure 10. The first column of  
30 Table 1 identifies the service capabilities of a device 14, and the second column identifies whether the device 14 is a source or a sink for a corresponding service in the first column. Using the capabilities data Table 1,

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new services can be implemented while maintaining compatibility with older devices. For example, if a new service is developed that is compatible with an older service, both the new and the old service can be entered into the capabilities data Table 1 for a device implementing the new service, whereby  
5 the implementing device remains compatible with older devices using the old service.

In one implementation, a Device Manager conducts a matching or comparison of device source and sink services. For example, the Device  
10 Manager can be implemented as a software agent to compare the capabilities or properties of various devices 14 and locate devices 14 with matching capabilities. For example, in a case where the service is a media stream from a first device 14 across the network to a second device 14, the Device  
15 Manager compares the capabilities of the first and second devices 14 to assist the user in making a sensible selection of the second device 14 which is compatible with the capabilities of the first device 14. The following is an example list of service capabilities for an embodiment of a server device 14:

```
Stream_format_video_dv  
Stream_format_video_mpeg2tpt  
20 Stream_format_video_dsstpt  
Stream_format_video_mpeg2pes  
Stream_format_video_mpeg210801-tpt
```

Each device 14 can further store an attribute data table (Attribute  
25 Table 2) including pertinent attributes of the device, shown by example in Figure 11. A name and a value define each attribute within Table 2. Though character lengths are shown in Table 2, they are not required. The attribute data is available to other devices 14 on the network 10 to facilitate interoperability and to store device information. For example, a Device Page  
30 as described below uses the Attribute Table 2 to store the device name. Other fields can be added to the attribute data Table 2 as necessary.

In the user-to-client device control model described above, attribute data can be displayed on the GUI page of the server device 14 at the client



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device 12. Alternatively, a second level device information home page can be utilized to display said attribute data. Further, the attribute data in the form of a text or Extensible Markup Language (XML) file can be accessed by a software agent. For the device-to-device control model, the attribute data for the controlled device is stored in the device interface application interface.

The Device Location attribute field in the Attribute Table 2 is used to store the location or group for each device 14. The Device Type attribute field specifies the device type, such as VCR, DVD, DTV, Camcorder, PC, Security System, etc. for the particular device 14. The Device Type attributes field is used to select a default device icon to represent the device within the Device Page if the device itself does not supply one. The Attribute Table 2 can include multiple entries for the Default Source and the Default Sink attributes fields. Each such entry represents a different default source or sink device 14 for each data type handled by the device 14.

Preferably, the capabilities and attributes data are packaged into structured data using a hierarchical language. This provides a common method of retrieving the capabilities and attributes data that are used for other purposes such as in GCO transfer and server device-to-server device control. As an example, the attributes data can include the following structured data format:

```

25     <DEVICEATTRIBUTES>
        <ATTRIBUTE name=DeviceManufacturer value="Samsung
Inc.">
        <ATTRIBUTE name=Manufacturer URL
value=www.samsung.com>
30     <ATTRIBUTE name=ManufacturerIcon value="logo.gif">
        <ATTRIBUTE name=DeviceName value="Samsung DSS">
        <ATTRIBUTE name=DeviceModel value="SCH1900">
        <ATTRIBUTE name=DeviceType value=DDS>
        <ATTRIBUTE name=DeviceLocation value="Livingroom">
        <ATTRIBUTE name=DeviceIcon value="device.gif">
35     <ATTRIBUTE name=DeviceAddress value=105.144.30.17>
    </DEVICEATTRIBUTES>

```

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As an example, the capabilities data can include the following structured format:

```
5      <DEVICECAPABILITIES>
      <CAPABILITY type=MPEG2 value=Source>
      <CAPABILITY type=MPEG2 value=Sink>
      <CAPABILITY type=MPEG3 value=Source>
      <CAPABILITY type=MPEG3 value=Sink>
10     </DEVICECAPABILITIES>
```

An application interface language is utilized to allow different server devices 14 to perform device-to-device control, including sever device-to-server device control. The application interface language includes command languages, and can be described using XML, as detailed below. The control program 20 of one server device 14 remotely controls the control program 20 of another server device 14 over the network, without using GUIs 18 or user involvement. An example of device-to-device control is automatic operation. A user initially provides control through a client device 12 for a desired service, and subsequently two or more server devices 14 automatically communicate and control one another without further user interaction to provide the service.

Referring to Figures 12 and 13, preferably a standard application interface language is utilized to allow interoperability among various control programs 20 in various server devices 14. In one embodiment, the standard application interface language includes the following building blocks: (1) functional specification of service 40 such as in a service function database, (2) a block where elements of a message are composed 42, (3) industry standard format 44, (4) message compression 46, and (5) message string construction 48 to output structured message data.

Figure 12 shows an example configuration of the building blocks to perform the function of generating command messages. Each message item is composed from the functional specification of service and standardized by selecting an industry standardized compressed form (Hex) label for the

-18-

message item. A group of such message items are assembled to create a complete command string. Existing command languages such as CAL and AV/C operate as shown in Figure 12. However, such command language mechanisms specify binary or hex code messages and system operation on physical devices on the physical interface, and are based on hardware specifications. Therefore, such command languages may be less desirable for a network layer based control mechanism where a control system specification includes naming, addressing, device capability discovery, communication language and command messages at the application level software level, where one software application program 20 in a controller device 14 locates and controls another software application 20 program in a controlled device 14 over the network 10. Said control mechanism is more suitable for devices such as digital appliances including appliances (e.g., DVCR) as well as multi-purpose, multi-application devices such as computers.

Figure 13 shows a preferred example configuration of the building blocks of Figure 12 to perform the function of generating command messages. In Figure 13, the positions of the industry standard format 44 and the message compression 46 are different than in Figure 12. A number of textual standard forms are selected from the functional specification service 40 to make a complete message. Later the message may be compressed by a lower layer of the protocol stack. Figure 13 represents a method of performing service or device command and control for consumer electronics (CE). Message composition can be defined by the XML standard syntax and compression can be performed by another protocol layer such as HTTP. A command interface language is utilized at the application software 20 interface level, rather than lower hardware levels. As such, the network protocol stack is governed by commands in said language, and each of a controller device 14 and controlled device 14 can be viewed as integrated components of the network for message transmission therebetween.

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Referring to Figure 14, three different instances of interaction among client devices 12 and server devices 14 are shown. In the first instance "A", a human user communicates with a remote service application "S". The user utilizes a browser in a client device 12 as the user interface, wherein the browser controls service programs 20 in the service application "S" and receives response in Hyper Text Markup Language (HTML) or XML formats. A secondary server is included with the browser to accept XML based asynchronous command message postings. For example, for a DVCR the secondary server 14 can accept command messages such as "VCR FAILED: TAPE BROKE." A software agent including a browser can be utilized to display the command messages for a user in the browser's GUI for later attention by the user and control of the DVCR. Preferably, an XML based client device 12 includes an HTTP1.1 server capability to respond to command initiated elsewhere for server device to server device command and control.

In the second instance "B", the user is replaced by a software client control program 50. The software client control program 50 generates XML based command postings to the service application "S" and receives back XML command postings. And, in the third instance "C", the software client control program 50 is replaced by an application such a server device control program 20, wherein commands and responses are exchanged between two service applications 20. In that regard, instance "B" is a special case of instance "C" with a null service.

An application interface language based on XML is used for control between a first server device 14 and a second sever device 14 (device-to-device or service-to-service) for devices or services that are world wide web (Web) enabled and Internet enabled. The application interface language is based on the Web standard, middleware layer. In one embodiment, device-to-device control includes remotely controlling the control program 20 or Application, in one server device 14 from another server device 14 in the

-20-

network 10. As such, the interfaces (API) to such Applications 20 are made available over the network using API extensions. Preferably, the API extensions utilize a standard format, such as an XML-based interface, to provide overall interoperability.

5

Referring now Figure 15, there is shown block diagram definitions of API extensions for a first *Application A*, designated as *Service A*, and a second *Application B*, designated as *Service B*, communicating over the network 10. For example, the *Service A* can be the control program for a first server device *A* in the network, and the *Service B* can be the control program for a second server device *B* in the network. The server device *B* sends commands to the server device *A*. For this example, the first and second service devices *A* and *B* can include CE devices.

15 Referring to the API extensions for the *Service A*, the first upper-most block 52 provides a comprehensive definition or data base of CE objects and methods using English words to describe CE devices. The comprehensive definition or data base can also be in C, XML or other formats capable of representing objects and their respective methods. The comprehensive  
20 definition or data base utilizing XML is termed XCE definition. The second block 54 provides a format for representation of an API in XML form for all devices 14, designated as an interface data type definition INTERFACE.DTD.

A software agent, designated as *Tool A*, utilizes a subset of the XCE  
25 definition for *Service A*, and uses the interface data type INTERFACE.DTD for *Service A* to create an XML form document, INTERFACE-A.XML. The document INTERFACE-A.XML describes the objects and methods supported by the *Service A* according to the document type definition INTERFACE.DTD for *Service A*. Other data type definitions can also be used to create the  
30 INTERFACE-A.XML document.

The software *Tool A* also creates a look-up table 56 to convert from

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XML messages from *Service B* on the network interface, to API definitions for *Service A*, programmed in C for example, and compiled to executable binary. Preferably, the look-up table 56 is created at compile time, whereby during run-time, incoming XML form method messages (commands) from *Service B* are converted to the API format created by the compiled application C code for *Service A*. The look-up 56 table provides run-time translation of XML object method calls from *Service B* into device native language calls for *Service A*. The look-up table 56 is compiled with the device control program 20 for local execution on the server device *A* for *Service A*.

10

The INTERFACE-A.XML can be used by *Service A* for validity checks if it encounters an error in a received message. The INTERFACE-A.XML can also be used by a foreign Application such as *Service B* to determine the message format for *Service A* before communicating with *Service A*. Further, if a message from *Service B* to *Service A* causes an error, *Service B* can access the INTERFACE-A.XML document to diagnose the error.

15

Referring to the API extensions for the *Service B*, the first block 58 provides a comprehensive definition or data base of CE objects such as the XCE definition for *Service A* above. The next block 60 provides a language definition for making XML form method (command) calls to remote API services or devices such as the API for *Service A*. The language definition is a document type definition Method Request CALL.DTD which describes interaction with objects on the network.

20

A software agent, designated as *Tool B*, utilizes at least a subset of the objects and methods in the XCE definition for *Service B* and the CALL.DTD document, to generate a look-up table 62 for converting commands from a compiled C program code for *Service B* into XML form method requests. As such, the look-up table 62 provides conversion between a method invoked by *Service B* (e.g., "PLAY") and the XML document or message that carries the method call across the network interface to *Service A*, for example. The

25

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subset of the XCE definition used by software *Tool B* depends on the extent and nature of use of the network. For example, the subset can be selected to provide global or restricted use of all available services on a home network.

5           Therefore, the API extensions provide for communication between various devices on the network using XML. In the example above, the program code 20 for *Service B* generates method calls to an API, and the API calls are converted to XML form to comply with the Web/Internet standard XML for inter-device communication. The XML method calls (messages) are  
10 sent to *Service A* over the network, and *Service A* reconverts the XML method calls from the network interface to program code API definitions for *Service A*. This conversion and re-conversion provides Web/Internet compatibility for diverse devices in the network with program code APIs which would otherwise require binary compatibility between different devices.  
15 Examples of the XML interface blocks utilizing the block diagrams in of Figure 15 are shown below.

```

-----
20           interface.dtd
            rules for describing an object interface in xml
-----

25       <!ELEMENT     paramater     #PCDATA>
         <!ATTLIST   paramater
                  Type            CDATA #REQUIRED
                  >

30       <!ELEMENT     method        (#PCDATA, (parameter)+)>
         <!ELEMENT     method        (#PCDATA, (method)+)>

-----
35           interface.h
            example object interface in c
-----

40       /* object */
         typedef struct Stream {
              int id;

```

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```

};

/* methods */

5 void StreamPlay (int id, int speed);
  void StresmStop (int id);

-----
10 interface.xml
   the same object in xml using ruels of interface.dtd
-----

15 <object>Stream
   <method>Play
       <parameter type="int">id</parameter>
       <parameter type="int">speed</parameter>
   </method>
   <method>Stop
20       <parameter type="int">id</parameter>
   </method>
</object>

-----
25 call.dtd
   rules for describing a c function call in xml
-----

30 <!ELEMENT   parameter   #PCDATA>
   <!ATTLIST  parameter   value      CDATA #REQUIRED
   >

35 <!ELEMENT   method      (#PCDATA, (parameter)+)>
   <!ELEMENT   object      (#PCDATA)>
   <!ELEMENT   call        (object,method)>

40 -----
   controller.c
   example controller command in c
-----

45 .
   .
   .
   StreamPlay (0x01ae, 500);
   .
50 .
   .

-----
55 call.xml

```



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the same command in xml using call.dtd

---

```

5 <!-- example to play a stream -->
   <call>
     <object>Stream</object>
     <method>Play</method>
10   <parameter value="500">speed</parameter>
     </call>

```

Further, the above provides examples of interface definitions INTERFACE.DTD and CALL.DTD used to create description documents of available services, INTERFACE.XML, described above. The CALL.DTD definition includes a rule set for generating method call or function call message such as XML Remote Procedure Call (RPC) or XMLRPC messages. The CALL.DTD definition describes an output interface of a controller service 14. In a home network, for example, INTERFACE.XML represents the services available on the home network. The available services are a subset of the entire services in the CE space.

In a One-Touch-Record (OTR) scenario, a user is in control of a Tuner-Access-Device such as a Satellite STB. The user controls the tuning using an Electronic Program Guide (EPG) such as a graphical user interface representation of program listings. OTR record provides the user with a service including selection of a future program from the EPG for recording without the user accessing the VCR graphical user interface to program the VCR for a Time Delayed Recording. OTR automates the control of the VCR.

Below is an example control list of actions in OTR.XML: (1) StreamOpen = play the selected program stream output to the network from a Satellite STB; for OTR this control is local to the STB device; (2) StorageOpen = open a storage service; and (3) StorageRecord = Send the Record command across the network to the VCR.

35

---

call.dtd

-25-

rules for describing a c function call in xml

```

5  <!ELEMENT   parameter   #PCDATA>
   <!ATTLIST  parameter
        value      CDATA #REQUIRED
        >

10 <!ELEMENT   method      (#PCDATA, (parameter)+)>
   <!ELEMENT  object      (#PCDATA)>
   <!ELEMENT  call        (object,method)>

```

interface.dtd

15

example for describing an object interface in xml

```

20 <!ELEMENT   parameter   #PCDATA>
   <!ATTLIST  parameter
        value      CDATA #REQUIRED
        >

25 <!ELEMENT   method      (#PCDATA, (parameter)+)>
   <!ELEMENT  object      (#PCDATA, method+)>

```

interface.xml

30

this document describes various CE services offered -a subset of the whole CE space.

```

35 <?xml version="1.0"?>
   <!DOCTYPE interface SYSTEM "interface.dtd">

   <object>Stream
     <method>Open
       <parameter type="int">id</parameter>
       <parameter type="int">channel</parameter>
40     </method>
     <method>Close
       <parameter type="int">id</parameter>
45     </method>
   </object>
   <object>Control
     <method>Set
       <parameter type="int">id</parameter>
       <parameter type="int">level</parameter>
50     </method>
   </object>

   <object>Storage
     <method>Open
55     <parameter type="int">id</parameter>

```

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```

        <parameter type="int">channel</parameter>
    </method>
    <method>Record
        <parameter type="int">id</parameter>
5    </method>
    <method>Play
        <parameter type="int">id</parameter>
        <parameter type="int">speed</parameter>
10    </method>
    <method>Stop
        <parameter type="int">id</parameter>
    </method>
    <method>Close
        <parameter type="int">id</parameter>
15    </method>
</object>

<object>Display
    <method>Open
20        <parameter type="int">id</parameter>
        <parameter type="int">channel</parameter>
    </method>
    <method>Render
        <parameter type="int">id</parameter>
25    </method>
    <method>Blank
        <parameter type="int">id</parameter>
    </method>
    <method>Control
30        <parameter type="int">id</parameter>
        <parameter type="int">cid</parameter>
        <parameter type="int">level</parameter>
    </method>
    <method>Close
35        <parameter type="int">id</parameter>
    </method>
</object>

40 <!-------
    otr.xml

    an xml representation of one touch record

45    c representation:

    StreamOpen (100,2);/* play a stream (pushed by satellite feed
*/
    StorageOpen (24,2);/* open a storage service */
50    StorageRecord (24);/* record the stream */

-----

    <?xml version="1.0"?>
55    <!DOCTYPE interface SYSTEM "call.dtd">

```

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```

5      <call>
      <object>Stream</object>
      <method>Open</method>
      <parameter value="100">id</parameter>
      <parameter value="2">channel</parameter>
      </call>
10     <call>
      <object>Storage</object>
      <method>Open</method>
      <parameter value="100">id</parameter>
      <parameter value="2">channel</parameter>
      </call>
15     <call>
      <object>Storage</object>
      <method>Record</method>
      <parameter value="100">id</parameter>
      </call>

```

As discussed above in relation to Figure 15, a first device *B* can

20 access the INTERFACE.XML document of a second device *A* to examine the device capabilities and API interface details of the second device *A* and determine supported functionality and command details of the second device *A*. In particular, the first device *B* can determine overlapping, and therefore useable, methods supported by first device *B* and the second device *A*.

25 Figure 16 shows an example wherein a first server device *B* including an *Application B* accesses the INTERFACE-A.XML document of a second server device *A* including an *Application A*. The first server device *B* includes a INTERFACE-B.XML document for comparison with that of a INTERFACE-A.XML document in the second server device *A*.

30

In one scenario, the first server device *B* wishes to control the second sever device *A* in the network. The INTERFACE-A.XML document of the second device *A* is transferred from the second server device *A* to the first server device *B* and used by *Application B* to query the capabilities and API

35 interface methods of the second server device *A*. This allows the first server device *B* to control the second server device *A* utilizing XML remote procedure calls XMLRPC. In another scenario, the first server device *B* performs the above steps after attempting to communicate with the second server device *A* at least once, and failed to establish communication. Yet in

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another scenario the first server device *B* queries the INTERFACE-A.XML document in the second server device *A* remotely without transferring the INTERFACE-A.XML document to the first server device *B*.

5           Upon examining the contents of the INTERFACE-A.XML document, the first server device *B* can create commands for sending to the second server device *A* in XML format as described above. Generally, the first server device *B* can interpret at least a portion of the contents of the INTERFACE-A.XML document that overlaps with a subset of the XCE definition used by  
10 the first and second server devices *B* and *A* as described above. If the first server device *B* is unable to interpret a portion of the contents of the INTERFACE-A.XML document, then the first server device *B* can ignore that portion, or fetch an application to assist it in interpreting that portion, by translation as described further below.

15           Referring to Figure 17, another example device-to-device or inter-device control between a controller server device 14 and a controlled server device 14 is shown. The controller device 14 includes a controller application *E* and the controlled device 14 includes an application executable *C*. The  
20 controlled device 14 further includes INTERFACE-A.XML, the application interface description *A* of the application *C*. Application *E* accesses the application interface description *A* in the controlled device 14 to query the capabilities and API interface methods of the controlled server device 14. Application *E* then commands and controls application *C* using XML remote  
25 procedure calls to control hardware or service *D* of the controlled device 14. A scheduler device can be a case of a controller device 14, driven by time of day such as Time-Delay-Record controller in a VCR.

30           In a first example, the application *E* accesses the application interface description *A* by remote query over the network. In a second example, the application *E* accesses the application interface description *A* by transferring a copy of the application interface description *A* from the controlled device 14

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to the controller device 14. The application *E* then queries the interface description *A* locally. In a third example, the application interface description *A* is transferred to a library device 64 which provides library space for interface descriptions, and the application *E* remotely queries the interface  
5 description *A* in the library. The library device 64 stored the address (URI) of the associated applications available for direct control action and responses.

Referring to Figure 18, the XML protocol provides a Web standard common middleware layer in a communication stack 66 at the API level  
10 between applications 20 of various devices 14 in the network. In each device 14, applications at the top of the communication stack send and receive communication messages over the network, and communicate with software layers in the device stack that locally control the device hardware or service software for the device.

15 A first XML layer API, designated as XML Layer OUT 68, is used for sending messages, and a second XML layer API, designated as XML Layer IN 70, is used for receiving messages. The XCE definition and the XML definition of a method call, namely the document type definition CALL.DTD  
20 described above, are used to create the XML Layer OUT 68. Further the XCE definition and the XML definition for a method call, namely document type definition INTERFACE.DTD described above, are used to create the XML Layer IN 70. For example a controller application utilizes the XML Layer OUT 68 and a controlled application utilizes the XML Layer IN 70.

25 Referring to Figure 19, another embodiment of server device-to-server device command and control architecture is shown. An XML-based control architecture is utilized for device-to-device (service to service) control for Web and Internet enabled devices or services. A first device *A* can remotely  
30 control an application 20 in a second device *B* over the network using XML command messages. The interface to each device includes interfaces to the applications in the device, and is described in XML format. Said interfaces

-30-

can be extended and made available on the middleware layer for retrieval and interpretation by other devices over the network, as described further below.

Each of the server devices *A* and *B* includes hardware and software for controlling other server devices over the network and for being controlled by other server devices over the network. In Figure 19, the home network device *A* is a controller device or module, and the home network device *B* is a controlled device or module. Each of the devices *A* and *B* includes a local Device XML Interface 72 comprising an interface document INTERFACE.XML and a document type definition INTERFACE.DTD. The INTERFACE.XML document includes a description of the objects, methods and parameters supported by the corresponding device 14. The INTERFACE.DTD document can be used for validity checks specific to the XML interface of the device, as described above.

Each of the devices *A* and *B* also includes an XML parser 74, comprising program code for parsing and validating XML messages, such as XML interface and XMLRPC commands. The XML parser 74 is similar to said XML Layer IN 70 described above with reference to Figure 18. Further, each of the devices *A* and *B* includes an XMLRPC encoder and decoder (codec) 76 for encoding method names and parameters of an outgoing call in an XMLRPC message, and for decoding an incoming XMLRPC message after it is parsed, to retrieve the method name and parameters therein. The XMLRPC codec 76 is independent of the device XML interface 72 and of the device-to-device control architecture, thereby allowing use of different XMLRPC formats without changing other aspect of the device to device control architecture.

An Interface Fetcher comprising program code, is utilized by each of the devices *A* and *B* to fetch the device interface of another device directly from another device or from a home network Interface Library 80. When a device 14 is a controller device, a controller application program code 82 in

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the controller device 14 effects command and control of other devices 14 over the network, by supervising software and hardware in the controller device 14 such as the XML parser 74, the interface fetcher 78 and the XMLRPC codec 76. When a device 14 is a controlled device, a controlled application program code 84 in the controlled device 14 supervises software and hardware in the device 14 for the device 14 to be controlled by other devices 14. A Home Network Device Web server 86 in each of the devices *A* and *B* manages communication between the devices over the network. An XML to Native Lookup Table 88 in each of the devices *A* and *B* is used by the controlled application 84 to convert information in XMLRPC messages (e.g., method name, parameters name and type) to native interface of the device (e.g., native method name, parameters name and type). Said table 88 is not used when the names of methods and parameters in XML messages and the native interface of the device are the same.

15

Each of device the devices *A* and *B* further includes one or more Handlers 90, wherein each Handler 90 includes a pointer from within the controlled application 84 to a native implementation of one specific device functionality. In most devices, native implementations of device functionality include binary code at run-time. The binary code can be generated from higher level languages at compile time, including C and Java, for example. As such, consumer electronics manufacturers can add more Handlers 90 for new functions without affecting existing Handlers and function implementations. A hardware service 92 in each of the devices *A* and *B* includes native implementations of device functions. Each of the devices *A* and *B* also includes a Native Interface 94 which comprises the API of native implementation of the device functions.

Further, a Network Object Request Broker such as a Home Network Object Request Broker (HNORB) 79 and Interface Library (IL) 80 provides a middleware layer 98 for the home network 10. As shown in Figure 19, the middleware layer 98 can be located in a third device 96 or in a separate

30



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control hub. The HNORB 79 includes a software agent for use by one device 14 to discover the existence of other devices 14 connected to the network 10. The HNORB software agent organizes device names into a naming hierarchical tree structure, organizes device interfaces into said searchable  
5 Interface Library, and provides device interfaces to a device requesting interface information.

The middleware layer, comprising the HNORB 79 and the IL 80, can be connected directly to the Internet, such that selected home devices can be  
10 accessed from outside of a local home network 10. The middleware layer 98 in one local home network can be connected to the middleware layer 98 in other local home networks over the Internet to provide an integrated network comprising two home networks 10. In that case, authorized users with the appropriate stream encryption can access a DVD changer in the user's  
15 primary home, from a TV in the user's secondary home to play a video and view it on the TV.

To use the Interface Library 80, at least one HNORB&IL should be running on the local home network 10. More than one HNORB&IL may also  
20 be available. For example, a cable modem, several DTVs, and a central home hub can all have their own HNORB&IL software agents. To locate the HNORB&IL, a device 14 sends a broadcast message over the local home network. The first HNORB&IL to respond to the device 14 is utilized by the device 14. Once a HNORB&IL is located, the device 14 and the HNORB&IL  
25 can establish a point-to-point Transmission Control Protocol (TCP) or User Datagram Protocol (UDP) connection for registration, interface request and fetch, and device lookup services. If a UDP protocol is not available, a TCP protocol can be used for high bandwidth connections such as IEEE 1394. HTTP-based XMLRPC can also be utilized for device to HNORB&IL  
30 communications. For example, a device 14 can remotely call a "register" method of HNORB to pass the device interface as one or more parameters, or, a XMLRPC call can retrieve a partial or entire device interface from the IL

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as a XMLRPC response or return value.

As aforementioned, more than one HNORB&ILs can run in a local home network 10 simultaneously, wherein each HNORB&IL recognizes a subset of available devices and one HNORB&IL can communicate with other HNORB&ILs to locate the devices 14 it can not find. Multiple HNORB&ILs on one local home network 10 can locate each other automatically by using broadcasting messages, such as UDP or TCP. In this case, multiple HNORBs construct a distributed object request broker, while multiple Interface Libraries 10 80 construct a distributed interface library. To provide fault tolerance, if one of the HNORB&IL should terminate unexpectedly, all devices registered with this HNORB&IL are notified and said devices can automatically register with another available HNORB&IL.

Each device interface has an associated consistent, unique logical name. Other devices can use said consistent, unique, logical name to recognize and access a device, even after said device's location or real network address has changed. The mapping of the logical names and real device addresses are handled by a software agent for naming service in HNORB. Preferably, a standardized naming method is utilized. More preferably, a hierarchical naming structure is used to organize device names into a hierarchical tree. This hierarchical structure can be expressed using "/", similar to that in a file system. The structure can be generated by different methods, such as by different service types as a home/MPEG2/TV; or by different locations, such as home/livingroom/VCR. Several naming trees may coexist for performance and efficiency.

In the example command and control between the controller server device *A* and the controller server device *B* in Figure 19, the middleware layer 30 98 is in the third device 96 or can be in a separate central hub. The grayed blocks show the device elements used for the specific command and control process depicted in Figure 19. In an example operation scenario, after the

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devices *A* and *B* become available and accessible over the network, each device registers/submits itself and its XML interface to the central HNORB and IL middleware layer 98. If a central HNORB and IL middleware layer is not available, then each device broadcasts a message over the local home  
5 network to announce itself.

The controller application 82 of the device *A* attempts to query all or part of the device interface of the controlled device *B*. If an Interface Library 80 is not available, the controller device *A* can request and fetch the device  
10 interface of the controlled device *B* directly from the controller device *B* by first sending a request to device *B* over the network, and then receiving the XML interface of device *B* from the device *B*. However, if an Interface Library 80 is available, the controller device *A* can request all or part of the device interface of the controlled device *B* from the Interface Library 80. The software agent  
15 of HNORB obtains the XML device interface of the device *B* from the Interface Library 80 structure and sends it back to the controller device *A*.

Once the controller device *A* receives the XML device interface of the controlled device *B*, the controller application of device *A* uses the XML  
20 parser 74 of device *A* to parse and interpret the device interface of the device *B*. The XMLRPC codec 76 of device *A* then generates desired XMLRPC command messages using the parser results. The XMLRPC command messages are sent to the controlled device *B* over the network. Upon receiving said XMLRPC command messages, the controlled application 84 of  
25 device *B* uses the XML parser 74 of device *B* to parse and interpret the received XML command messages. The XMLRPC codec 76 of device *B* then decodes the parser results to obtain the method call information in the command message, including a method name and parameters for the device  
*B* functions to perform requested services.

30

The controlled application 84 of device *B* then uses the XML to Native Lookup Table 88 and Handlers 90 in the device *B* to access and launch the

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native function implementations of device *B* through the native interface of device *B*. If a function generates any responses or return values, said responses or return values are encoded into XML or XMLRPC messages and sent to the controller device *A*. Further, the middleware layer HNORB and IL  
 5 can provide the controller device *A* with a reference to the controlled device *B*, whereby the device *A* can generate remote calls to the device *B* native functions just as calls to the local device *A* native function.

Preferably, a standard XMLRPC format is utilized so that all devices  
 10 can interpret and decode RPC calls over the network. Because the device interface of a controlled device 14 can be queried and examined by a controller device 14, preferably a simplified XMLRPC format with sufficient device interface information is utilized to improve efficiency. The following example shows two possible formats of XMLRPC calls for One Touch Record  
 15 (OTR) and Time Delayed Record (TDR) operations.

**EXAMPLE I:**

XML RPC call, example format including detailed tag and interface information:

- 20 1. Example of OTR call:  
 <?xml version="1.0"?>  
 <call>  
     <object>DVCR1.record</object>  
     <method>timeDelayedRecod</method>  
 25     <parameters>  
       <parameter>  
             <name>channel</name>  
             <value><int>4</int></value>  
       </parameter>  
 30       <parameter>  
             <name>recordTime</name>  
             <value><time>2:10:30</time></value>  
       </parameter>  
     </parameters>  
 35    </call>
2. Example of TDR call:  
 <?xml version="1.0"?>  
 <call>  
 40     <object>DVCR1.record</object>

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```

        <method>oneTouchRecod</method>
        <parameters>
    5   <parameter>
            <name>channel</name>
            <value><channelName>NBC</channelName></va
            lue>
        </parameter>
        <parameter>
    10   <name>startTime</name>
            <value><datetime.iso8601>19990401T19:05:35</
            datetime.iso8601></value>
        </parameter>
        <parameter>
    15   <name>recordTime</name>
            <value><time>2:00:00</time></value>
        </parameter>
        </parameters>
    </call>

```

20 EXAMPLE II:

XML RPC call, example format with reduced tags and interface information:

1. Example of OTR call:

```

    <?xml version="1.0"?>
    <call>
    25   <object>DVCR1.record</object>
        <method>timeDelayedRecod</method>
            <parameter value="4">channel</parameter>
            <parameter value="2:10:30"> recordTime </parameter>
    </call>

```

30

2. Example of TDR call:

```

    <?xml version="1.0"?>
    <call>
    35   <object>DVCR1.record</object>
        <method>oneTouchRecod</method>
            <parameter value="NBC">channel</parameter>
            <parameter
            value="19990401T19:05:35">startTime</parameter>
            <parameter value="2:00:00">recordTime</parameter>
    40 </call>

```

Referring to Figure 20, device interfaces for home devices 14 are based on an industry standard structured data base 100 using standardized vocabulary. Interface data for new interfaces and vocabulary can be added to the data base 100. A comprehensive definition or database of CE objects, methods and parameters using English words to describe all CE devices is

45

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5 termed a CE data base 102. The comprehensive definition or database can be in C, XML or other formats capable of representing objects and their respective methods and parameters. The comprehensive definition or database utilizing standardized XML vocabularies is termed XCE definition or data base 104.

10 Controller and controlled applications 82, 84 are programmed using a standard interface subset of the XML based XCE data base 104. Each device interface is stored with said applications 82, 84 in XML form. Although the XCE data base 104 need not be in XML, said subset interface produced at compile time is in XML in an embodiment of the invention, as described above in reference to Figure 15.

15 In Figure 20, for embedded appliances 14, the information designated as 'Manufacturer' information is built-in to the appliances 14 at manufacture time, and the information designated as 'Home Network' is part of the operational run time aspects of the appliance in the network. Device XML interfaces 72 designated as 1 ... N for N devices 14, are branches of the data in a standardized XCE data base 104. A Home Network Interface Library (HNIL) 106 provides a collection of the device interfaces of available devices 20 14 connected to the home network. The Home Network Interface Library 106 is a subset of the totality of the XCE data base 104.

25 In Figure 16, a device interface was transferred from a device A to a device B for an *Application B* in device B to examine the contents of the interface for the device A. As detailed above, a device interface includes a description of the objects, methods, parameters supported by a device, and is referred to as INTERFACE-A.XML for a device A for example. A Device XML interface 72 is a device interface in XML format. The content of the XCE 30 data base 104 is a service oriented structure which provides device interfaces.

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Referring to Figure 20, the XCE database 104 also includes a standardized XCE Interface Document Type Definition (DTD) for CE devices, which provides a standardized set of rules for using XML to represent CE devices 14. The DTD or its subsets can be used for validity checks. A software agent designated as Manufacturer Tool 108, filters and utilizes a subset of the standardized XCE definition 104 for a specific CE device, and uses the standardized XCE Interface DTD to generate an XML device interface 72 of the CE device, for example INTERFACE.XML and INTERFACE.DTD. The document INTERFACE.XML includes a description of the objects, methods and parameters supported by a specific device according to the standardized XCE Interface DTD. The document INTERFACE.DTD is a subset of the standardized XCE Interface DTD, and can be used for validity check for the XML interface of the device. Other document type definitions can also be used to create the INTERFACE.XML document.

The XML interfaces 72 of the CE devices, including said XML interface document and said DTD document, are stored in a universally accessible library such as the home network Interface Library 106. A software agent 110 collects the device interfaces 72 of all accessible devices 14 over the network and places them into the searchable structured Interface Library 106 along with the device name/address information. The Interface Library 106 is a subset of the XCE database 104 and the process of generating the Interface Library 106 is similar to that of rebuilding part or all of the XCE database 104. The Interface Library 106 can function as a collection of device interfaces 72 of all devices 14 in the home network, or as a cache depending on availability of storage space, wherein only the most recently used device interfaces 72 are stored therein. In cases where a device 14 updates its device interface 72 due to an event, such as disk change in a DVD player, part of the device interface 72 is updated based on an event service.

Referring to Figure 21, preferably the device interface definition 72 of

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each device 14 has a hierarchical form. This is because for a home device 14, the device interface definition 72 can be lengthy. Typically, one or few functions such as a single function for Time Delayed Recording, are accessed at a time, and therefore only a small portion of the device interface 5 72 is used. Rather than rendering the entire device interface 72, it is more efficient to render only a portion of the device interface 72. By using hierarchical device XML interface, a controller device 14 can request partial device interface 72 of a controlled device 14 by specifying the desired function categories or functions in a request for the XML device interface from 10 the controlled device 14 or from the HNORB and IL middleware layer 98. In the latter case, the HNORB and IL middleware layer 98 sends back the desired portion of the device interface 72.

Referring to Figure 21, the hierarchical device interface structure can 15 include four layers, including: (1) a first layer 112 for XML interface of each home network, listing current available devices, (2) a second layer 114 for general XML interfaces of each device, listing function categories, (3) a third layer 116 for specific XML interface of each function category for a device, and (4) a fourth layer 118 for specific XML interface of each function in a 20 function category. Inside the home network, only the three lower layers 114, 116 and 118 are utilized, and outside the home network the first layer 112 is utilized.

Figure 22 shows said layers 112, 114, 116, 118 and corresponding 25 interface examples. The interface in each layer is linked to upper or lower layer (if available) through links such as XLink or XPointer, which provide two-way linking. XLink includes a package of hyperlinking functionality that has two parts: (1) an XLink component which allows links in an XML documents to be recognized as such, and (2) an XPointer component which allows links to 30 address into precise sub-parts of an XML document. As such, XLink governs how links are inserted into XML documents, wherein the link may point to data such as a GIF file. Further, XPointer governs a fragment identifier that



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can go on a URL when linking to an XML document, from anywhere (e.g., from an HTML file).

In a typical command and control model for a server device 14 to control another server device 14 according to the present invention, a first device 14 attempts to query the device interface of a second device 14 at the second interface layer 114. After selecting function categories (FC), the first device 14 queries the interface layer 116 of a specific function category in the second device 14, such as Record Category. Further, the first device 14 can query the interface layer 118 of a specific function, such as OTR or TDR, to make calls to said functions. The hierarchical or tree structure makes finding of an interface function more efficient and saves network bandwidth. An example interface file structure and layers can be:

First layer 112 - HN1.xml  
 Second layer 114 - VCR1.xml  
 Third layer 116 - VCR1\_RecordCategory.xml  
 Fourth layer 118 - VCR1\_RecordCategory\_OTR.xml

Similarly, the home network Interface Library 106 is preferably hierarchical and can be structured in a variety of ways such as by different service type of devices or by different locations such as rooms. Said hierarchical structure is the interface of a local home network 10 to other home networks or the Internet.

An example hierarchical device interface definition 72 which can be implemented in XML syntax is shown below.

```
consumer (document_file, doc)
  +----document_file<server_home.dtd, server_auto.dtd>
  +----doc (services_home, server_auto, server_samsung_web_site,
  30  avc_commands, cal_commands,,)
      +----services_home (xml_utility, client, server_av, lighting,
      comms, hvac, utility, security, appliances, convenience,,)
      +----xml_utility (download_DTD_file,,)
  35  +----client (acknowledge, attention, error, post_message,
      sound, stop_schedule, stop_all,,)
```

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```

+----sound (alarm, ring, buzz,,)
+----server_av (controls_gen, source, sink)
+----controls_gen (ping, process_infor, setup,,)
5   +----process_info (s/w_id, h/w_id)
      +----h/w_id (ser_no, manuf, model, class,,)
      +----s/w_id (ser_no, exe_name, version,,)
      +----setup (clock,,)
      +----clock (hours, minutes, seconds)
10  +----source (service_id, media, rate, protocol,
stream_format, controls_av,,)
      +----sink (service_id, media, rate, protocol, stream_format,
controls_av,,)
      +----service_id (url,,)
      +----media (tpt_stream, ram, disk, tape,,)
15  +----disk (name, number,,)
      +----rate<value>
      +----protocol (61883/1394, UDP/IP/Ethernet,,)
      +----61883/1394 (isoch_ch_no)
      +----stream_format (video, audio,,)
20  +----video (dv, mpeg2tpt, dsstpt, mpeg2pes,
mpeg10801-tpt,)
      +----audio (mpeg3, ac-3, midi,,)
      +controls_av (flow_control, tune, timer_record,
25  ui_control,,)
      +----timer_record (tune, flow_control)
      +----flow_control (play, stop, goto, record,,)
      +----play (time_params)
      +----record (time_params)
      +----time_params (now, start, duration, end,,)
30  +----tune (send_epg, channel,,)
      +----channel (number, id, time_params,,)
      +----ui_control (display, acoustic)
      +----display (brightness, contrast, color/tint,
horiz_size, vert_size,,)
35  +----acoustic (volumn, base, treble, balance, fade,)
+----lighting (sensors, lights, send_epg)
      +----sensors (living_room, sky,,)
      +----lights (rooms_up, rooms_down, yard,,)
40  +----rooms_up (bed1, bed2, bed3, bed4,,)
      +----bed1 (lamp, dimmer,,)
      +----dimmer<value>
      +----rooms_down (family, kitchen, living, dining, soho,
garage,,)
      +----yard (front, back)
45  +----comms (homehub, intercom, telco,)
      +----homehub (send_device_list, send_configuration,
send_snmp_mib,,)
      +----intercom ()
      +----telco ()
50  +----hvac (controls_gen, controls_hvac,,)
      +----controls_hvac (a/c, heat, temp, humidity,)
      +----temp (low, high, hysteresis,,)
      +----utility (meters, energy_mgmt,,)
      +----meters (water, gas, electric,,)
55  +----water<value>, gas<value>, electric<value>

```

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```

+----security (sensors, send_epg, alarm,,)
  +----sensors (peripheral, motion,,)
    +----peripheral (rooms_up, rooms_down,,)
    +----motion (room_down, yard,,)
5   +----appliances (microwave, range, oven, fridge, freezer,
    coffee, toaster, washer, dryer, water_heater,,)
    +----microwave (send_epg, controls,,)
    +----fridge (temp,,)
    +----water_heater (temp)
10  +----convenience (window, curtain_open, door/gate, pool/spa,
    bath, fountain, lift, jacuzzi,,)
    +----curtain_open<value>
    +----server_auto (message, server_auto_ford_explorer_98,,)
    +----server_auto_ford_explorer_98 (mileage, maintenance,,)
15  +----mileage <data>
    +----maintenance <data>
    +----server_samsung_web_site (message, service, help,,,)
    +----avc_commands<,,,command_string,,,>
    +----service_id url,,)
20  +cal_commands<,,,command_string,,,>
    +----service_id (url,,)

```

Said hierarchical device interface definition 72 can include the following fields:

25 'document file' name, provides name of the document type definition (DTD) file that can be used by an XML parser 74 for verification of legality and correctness of the XCE database 104 or part of the XML version of the XCE database 104. There can be several DTD files for different parts of the XCE structure, wherein said DTDs are different from the document type definitions for the RPC.CALL and INTERFACE.DTD for communication.

30 'doc' name, provides the top level name of the area of coverage of capabilities, attributes, communication and control interface.

'Services\_home', provides area for home automation, consumer electronics, utility, etc.

35 'Server\_auto', for an automobile in the garage and shows message interface available for one or more automobile types. For example, server\_auto\_ford\_explorer\_98' is the interface for a particular automobile. This allows access to mileage and maintenance interfaces of the automobile, and can also be used for remote access by an automobile manufacturer or garage for direct checking and remote diagnostics, for example.

40 'server\_samsung\_web\_site', provides for communicating with a manufacturer Web site outside the home. Includes interface for message,

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service, help, etc.

'AVC\_commands' and 'CAL\_commands', provides for legacy devices capable of interpreting AV/C and CAL languages, for example. This portion of the structure identifies commands in said languages, where the commands are tagged and carried in XML. As such, the contents are not XCE (Web) objects, and protocol converter applications can be utilized to interface to the original CAL or AV/C application software.

In the above description, 'Services\_home' provides the main structure including AV consumer electronics. A branch of the structure is expanded in detail for a particular example of a video services sink, and stream destination (e.g., DVCR) control interface. The control interfaces in a typical home network can include:

'xml\_utility', provides details for supporting utility network functions such as downloading an updated DTD file, interface file, program file, etc.

'client', describes the interface details of a client device including a Web browser. For example 'acknowledgment' indicates the controller's acceptance of acknowledgment of a message or command sent out.

'server\_av', provides control and capacity interfaces for all audio and video services available, including STB, DVCR, DTV, DVD, AUDIO, etc.

'lighting', provides an interface to a home automation lighting controller, and includes sensors, lights, etc.

'comms', provides control interfaces to communications devices, typically for utility purposes or remote management of the devices' set-up or parameters, or for restoring configurations.

'hvac', provides interfaces for remote control of the HVAC system, and can be used for control of said system from outside the home by the utility company, for example, to turn the home's HVAC system off during peak load periods of the day. Further, said interface can be used for controlling the HVAC system from within the home, by an appliance for device

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based controller to provide a more sophisticated control mechanism than thermostat control.

'utility', provides interface for reading utility meters for the home, for example.

5 'security', provides interface for security sensors and alarm settings. As such, using the interface, applications running on a home network device can have access to the sensor and detector devices around the home for monitoring and controlling of the those devices.

10 'appliances', provides interfaces for kitchen, utility and general home appliances, including, for example, providing remote control or monitoring temperature settings or other controls and parameters from a controller device. In one scenario, a microwave appliance can scan bar code information on the packaging of a food item and access a manufacturer database to obtain cooking time of the food for a given microwave system  
15 type. Such integration of appliances using device to device command and control provides many control scenarios for providing services such as automatically pausing a dishwasher and muting a TV when a phone is picked up in the kitchen or family room.

20 'convenience', provides interfaces to devices for providing convenience services such as interface to a curtain, window, blinds or whirlpool controllers, for example.

In the above description, 'server\_av' is part of the structure for the control interfaces for A/V appliances offering A/V stream service, and is subdivided into 'controls-gen', 'source' and 'sink' capabilities.

25 'controls-gen', provides interface for device manufacturer attributes and general utility interfacing such as ping testing the presence of the device. Further, manufactured-in attributes such as software and hardware identification and version information can also be included. A device supplying this interface returns data providing name or identification  
30 for said software without effecting any control actions. An interface to set the time of day clock can also be included.

'sink', provides interface for the media stream service devices.

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The structure is organized based on service offered (i.e. video stream record and replay) rather than particular device names such as VCR. For example, a Tuner and a DVD player are both video program stream sources for the network with video program formats, and can be controlled, such as started and stopped. Differences in control of particular devices are addressed by the lower layers of the definition structure.

'source' provides interface similar to the 'sink' interface.

Referenced above, 'service\_id' or 'application\_interface\_id' includes the name, address or Web address or URL location of one or more devices. Because the XCE database comprises the totality of agreed upon interfaces, typically a Dynamic Host Configuration Protocol (DHCP) software agent executes to assign an address and a default name to each device, and the address and a default name are added to the interface of the service or device. The software agent then collects device interfaces which include subset or 'device partial XCE' definitions from all the devices locally connected to the home network to generate a 'network partial XCE'. Additional relevant external interfaces can be added to the structure for external control. For example 'service\_id' can be a name/address in a received structure or in a network Interface Library including entries from the software agent according to the device interfaces of the devices connected to the network. Thereafter, a user can search for a service in the database and access an application whose interface includes a particular data branch of the library using said name/address. As such, the network can include multiple identical services distinguished by said name/address information.

'media', provides interface for the type of media including, for example, transport stream from a tuner, RAM from a PC DRAM, disk for CD or DVD, and tape. The media can be named and identified, and a controller device can search the XCE data base to identify the media currently provided on the network. When a new media such as DVD disk is provided on the network,

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that portion of the device interface 72 identifying the program material on the disk is changed accordingly. As such, the entire device interface 72 need not be transferred and only the relevant portion is transmitted to the XCE data base. On receipt of an attention signal, the library software agent 110 can  
5 fetch the new update and place it in the proper place in the interface library 106. The addition of the disk media is similar to adding a service to the network or connecting another appliance to the network.

'rate', provides a value for data stream rate for a device interface, such as 6 Mbits/Sec or 19.2 Mbits/Sec, for example.

10 'protocol', identifies the protocol used for said data stream. If more than one protocol is provided, for example 61883/1394 or UDP/IP, then a desired protocol can be selected.

'stream\_format', provides packet format and/or compression standard for digital stream audio and video split. If more than one format is provided, a  
15 desired format can be selected via an interface message. A controller application 82 can examine the available formats to determine if there are compatible ones.

'controls\_av', provides the main control interface for A/V media appliance.

20 'Flow\_control', provides data stream controls such as: PLAY, STOP, GOTO, RECORD, etc as methods for a particular device. The methods do not change for embedded appliance, except for PC software, for example. The controls can include time parameters for delayed operation.

'Tuning', provides interface for tuning control. A controller device 14  
25 can send a request to the interfaces of a controlled device 14 to send back an Electronic Program Guide (EPG) data structure described above.

'UI control', provides control interface to a controlled application 84 to control adjustments for display such as brightness and contrast, and for audio, such as volume and bass.

30 'Timer\_record' provides interface for set-up data for a controller application 82 to implement delayed time recording. Direct channel tune information and flow control (time\_aparams) information can be utilized.

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The above description can apply equally to client devices 12. An alternative syntax XCE definition or database for the CE space can be utilized. The alternative syntax XCE data base includes full service descriptions including home automation, appliances and automobile, for example. In cases where a service object provides flexibility and parameters for control, a control method is utilized to control the object as desired. Example commands in the AV/C and CAL command languages including binary and hex data strings are shown below.

```

10 consumer (document_file, doc)
      +----document_file<server_home.dtd, server_auto.dtd>
      +----doc (avc_commands, cal_commands, services_home,
server_auto,
15 server_samsung_web_site, server_auto_ford_explorer_98,,)
      +----avc_commands<...command_string...>
      +----cal_commands<...command_string...>
      +----services_home (client, av, lighting, comms, hvac,
utility, security,
20 appliance, convenience,,)
      +----xml_utility (download_DTD_files,,)
      +----client (acknowledge, attention, error,
post_message, sound,
stop_schedule, stop_all,,)
      +----sound (alarm, ring, buzz,,)
25      +----server_av (source, sink)
      +----source (service_id, media, rate, protocol,
stream_format,
controls_gen, controls_av,,)
      +----sink (service_id, media, rate, protocol,
30 stream_format,
controls,,)
      +----service_id (url,,)
      +----media (tpt_stream, ram, disk, tape,,)
      +----disk (name, number,,)
35      +----rate<value>
      +----protocol (61883/1394,
UDP/IP/Ethernet,,)
      +----61883/1394 (isoch_ch_no)
40      +----stream_format (video, audio,,)
      +----video (dv, mpeg2tpt, dsstpt,
mpeg2pes,
mpeg1080i-tpt,)
      +----audio (mpeg3, ac-3, midi,,)
45      +----controls_gen (ping, process_info,
setup,,)
      +----controls_av (flow_control, tune,
timer_record,
ui_control,,)
      +----process_info (s/w_id, h/w_id)

```



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```

class,,)
+----h/w_id (ser_no, manuf, model,
version,,)
+----s/w_id (ser_no, exe_name,
5 +----setup (clock,,)
seconds) +----clock (hours, minutes,
+----time_record (tune, flow_control)
10 record,,) +----flow_control (play, stop, goto,
+----play (time_params)
+----record (time_params)
+----tune (send_epg, channel,,)
15 time_params,,) +----channel (number, id,
start, duration, end,,) +----time_params (now,
+----ui_control (display, acoustic)
20 contrast, +----display (brightness,
color/tint, horiz_size, vert_size,,)
+----acoustic (volume, bass,
treble,
balance, fade,)
25 +----lighting (screen, light, send_epg)
+----sensors (living_room, sky,,)
+----lights (rooms_up, rooms_down, yard,,)
+----rooms_up (bed1, bed2, bed3, bed4,,)
30 +----rooms_down (family, kitchen, living, dining,
soho,
garage,,)
+----yard (front, back)
+----bed1 (lamp, dimmer,,)
+----dimmer<value>
35 +----comms (netman, intercom, telco,)
+----netman (send_device_list,
send_configuration,
send_snmp_mib,,)
+----intercom ()
40 +----telco ()
+----hvac (controls_gen, controls_hvac,,)
+----controls_hvac (a/c, heat, temp, humidity,,)
+----temp (low, high, hysteresis,,)
+----utility (meters, energy_mgmt,,)
45 +----meters (water, gas, electric,,)
+----water<value>, gas<value>,
electric<value>
+----security (sensors, send_epg, alram,,)
+----sensors (peripheral, motion,,)
50 +----peripheral (rooms_up, rooms_down,,)
+----motion (rooms_down, yard,,)
+----appliances (microwave, range, over, fridge,
freezer, coffee, toaster,
washer, dryer, water-heater,,)
55 +----microwave (send_epg, controls,,)

```

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```

+----fridge (temp,,)
+----water-heater (temp)
+----convenience (window, curtain_open, door/gate,
5 pool/spa, bath,
fountain, lift,,)
+----curtain_open <value>
+----server_auto (message, mileage, maintenance,,)
+----mileage<date>
+----maintenace<data>
10

```

In another aspect, the present invention provides for use of existing command language implementations for device-to-device command and control in a network. Devices can include internal objects and APIs which, at run time, create binary strings according to existing transport mechanisms. In that case, in order to provide XML remote procedure calls (XML RPC) from one device 14 to another device 14 in the network, the exiting application interface implementation is replaced with calls to the XML service API. As such, the original implementation is equivalent to a wrapper for the XML service API. Figure 18 also shows applications created using other command languages such as CAL or AV/C in dashed lines, with their interface implementations replaced with a wrapper in the XCE/XML service API. Examples for changing from CAL command language to XML RPC format are shown below.

```

25 -----
existing implementation:

void DeviceCALCommand (int command) {
30     .
     .
     /*
     create CAL formatted byte string to represent this
     object/method and output to the wire
     */
35     CreatCALFormattedByteString(command); /* different for
     every protocol */
     SendCALByteString(); /* different for every protocol
40 */
}

-----
wrapping the XML Service API call:

void DeviceCALCommand (int command) {

```

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```
5  {
    /*
    ServiceAPI  replace CAL implementation with calls to the XML
    5  */
    CreateXMLMessage (command); /* always the same */
    sendXMLMessage ();          /* always the same */
10 }
```

Referring to Figure 23, in another aspect, the present invention provides a standard command protocol and control language translation for inter-device communication between disparate devices in a network. For different devices to share information, the information must be in a format that a requesting device can interpret. And, for a device 120 to control another device 22, the two devices must use a common language in order to interpret one another's commands. The present invention provides a common identification format for data and command protocols.

20 In one embodiment, a method of common presentation or packaging of data and command protocol is provided, whereby a receiving device 122 can determine the native format of transmitted data. If the receiving device 122 can interpret that native format, then it can accept the data directly. Otherwise, the receiving device 122 can request a translator device 124 or application to translate the data into a desired format which the requesting device 122 can interpret. The translator device 124 or application determines the native format of the original data, translates the data into said desired format, and sends the translated data to the requesting device 122.

30 The requesting device 122 then processes that data as though the data had originally been provided in the requesting device's native language format by the sending device 120. The requesting device 122 can also send a response back to the sending device 120 in the requesting device's native format, or send a response by proxy through the translator device 124 or application for translation into the native format of the sending device 120. The translation method can be utilized for information including command

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protocols, data files and audio/video streams.

For devices that do not utilize the common format described above, the present invention provides for translation of data including command  
5 protocols to, and from, such non-compliant devices. For example, when a non-compliant device 120 sends data to a compliant device 122, the compliant device 122 can translate the data based on a determination of the native format of the data. For example, the compliant device 122 can examine the data for particular bit patterns within the data. When a compliant  
10 device sends data to a known non-compliant device, the compliant device can translate the data before transmission based on a determination of the native format of the non-compliant device.

An example implementation can be for a home network which supports  
15 the IP and HTTP protocols. The home network can be connected to the Internet to obtain applications and services of various types for desired functionality. As such, the common format method can be made compatible with Internet protocols and procedure for operation over the Internet and the home network.

20 One example of providing a common data format is utilizing XML to create a package for the data for transmission over the home network. The data can include command protocol, streaming audio or video, graphics or applications. The data is 'wrapped' with a standard header identifying the  
25 native format of the data and contents of the package, in XML form. The header allows unique identification of the data type the data portion of the XML code, whereby the data can be translated if necessary and provided to appropriate applications upon receipt.

30 Under the Web standard, the identification process is performed by browsers using file name extensions to identify the type and contents of a file transmission. The browsers then launch appropriate plug-in modules to

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process the file. In the home network, XML is utilized to identify data transmissions which provides all home network transmissions over IP with a common identification method as described above.

5           Alternatively, a software layer can be provided in the home network protocol stack to uniquely identify the contents of all data transmissions over the home network. The software layer can be used instead of XML. The common format and identification principles of the present invention apply equally in either embodiment using XML or said software layer as  
10 identification methods.

In Figure 23, upon receipt of a data package transmission, the receiving device 122 examines the XML identity header of the data package to determine the format of the data therein. If the data is in a format  
15 recognizable by the device 122, the XML identity header information is discarded and the device processes the data directly. Otherwise, the device 122 converts the received XML package into an XML translation request package and sends the request package and the data to the translation server device 124.

20           The translation server device 124 translates the data and converts the translated data into an XML translation response package. The translation server 124 then transmits the response package back to the requesting device 122. In case of a translation error, the translation server 124 can  
25 provide a translation response error condition to the requesting device 122. Upon receiving the translated data, the requesting device 122 processes the translated data in the response package.

30           Example of an XML data package or packet can be:  
          <IDENTITY type=format=AV/c>...packet data ...</IDENTITY>

          Example of a translation request package or packet can be:  
          <TRANSLATION REQUEST type=Command format=CAL>  
          <IDENTITY type=Command format=AV/C>...packet data

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...</IDENTITY>  
 <\TRANSLATION REQUEST>

5 Example of a translation request package or packet can be:  
 <TRANSLATION RESPONSE type=Command  
 format=CAL>...packet data ...  
 <\TRANSLATION RESPONSE>

10 Example of a translation response error condition package or packet  
 can be.  
 <TRANSLATION RESPONSE type=Command  
 format=CAL>...packet data ...  
 <ERROR condition=Unrecognized command>Translation could  
 not be performed<|ERROR>  
 15 <\TRANSLATION RESPONSE>

Further, Table 3 in Figure 24 includes a partial list of package or  
 packet types and formats.

20 To provide translation services, a translation server 124 is identified in  
 the network during network configuration in a manner similar to that of DHCP  
 servers. The translation server 124 broadcasts its IP address to all devices in  
 the network for a period of time after the network is configured. All devices  
 120, 122 compatible with the translation services store the IP address of the  
 25 translation server 124 as it is broadcast over the network during network boot  
 up.

Alternatively, the requesting device 122 can broadcast a translation  
 request over the home network. All translation servers 124 in the network  
 30 that receive the translation request can respond to the translation request by  
 sending a translation response to the requesting device 122. The requesting  
 device 122 then selects one translation server 124 among the responding  
 translation servers. In one example, the requesting device 122 selects the  
 first translation server 124 that responds to the translation request. In  
 35 another example, the translation servers 124 can negotiate among  
 themselves and/or with the requesting device 122 for the selection of a  
 translation server 124 for satisfying the translation request.

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In another embodiment of the invention, multiple translation servers 124 are utilized to fulfill all translation requests. For example, a single translation server 124 may not have the capability to translate all requests. In such cases, it is necessary to identify the address of each translation server 124 and the type of translation service each translation server 124 can provide. Each device 120, 122 can store a list of all translation server IP addresses and a corresponding list of the types of translation services each translation server 124 provides, and optionally the associated translation application.

10

For efficiency, if a sending device 120 wishes to send data to a receiving device 122 which is known to use a different native format than that of the sending device 120, the sending device 120 can send the data to the receiving device 122 by proxy through a translation server 124. The sending device 120 transmits a command to the translation server 124 similar to the translation request command and includes the address of the receiving device 122 as the destination for the translated data.

In cases where a receiving device 122 requires translation of a data stream, the sending device 120 can route the data stream directly to a translation server 124, and the translation server 124 in turn transmits the translated data to the receiving device 122 as described above. Alternatively, the sending device 120 can send the data stream to the receiving device 122, and the receiving device 122 then routes the data stream to the translation server 124 for translation and return of the translated data back to the receiving device 122.

In the description herein, the control mechanism is based on the Hypertext Transfer Protocol (HTTP 1.1) which provides an application-level protocol for distributed, collaborative, hypermedia information systems. HTTP is a generic, stateless, object-oriented protocol in wide use for many tasks. A feature of HTTP is the typing and negotiation of data representation, allowing

30

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systems to be built independently of the data being transferred. Preferably, the network protocol used by devices and applications on the home network is IP (Internet Protocol). However, other protocols can also be utilized.

- 5           Although the present invention has been described in considerable detail with regard to the preferred versions thereof, other versions are possible. Therefore, the appended claims should not be limited to the descriptions of the preferred versions contained herein.



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**What is claimed is:**

1. A method for performing a service on a home network, the method comprising the steps of:
  - 5 (a) connecting a first home device to the home network;
  - (b) connecting a second home device to the home network;
  - (c) providing a database including a plurality of application interface description data objects, each application interface description data object including information in a structured format for commanding and  
10 controlling of a home device by one or more other home devices connected to the network;
  - (d) the second home device accessing a first application interface description object for the first home device in the database;
  - (e) the first home device accessing a second application  
15 interface description object for the second home device in the database;
  - (f) sending control and command data from the first home device to the second home device utilizing said application interface description object for the second home device over the network; and
  - (g) sending control and command data from the second  
20 home device to the first home device utilizing said application interface description object for the first home device over the network;whereby the first and second home devices perform said service.
2. The method of claim 1 wherein the structured format includes  
25 XML format.
3. The method of claim 1 wherein step (c) includes connecting a database device to the network, wherein the database device stores said database.  
30
4. The method of claim 3 wherein:
  - (i) the first home device stores the first application interface

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data therein;

(ii) the second home device stores the second application interface data therein; and

(iii) step (c) includes an initial step of forming said database by steps including querying the first and second home devices to transfer said application interface data for the first and second home devices to the database device.

5  
10 5. The method of claim 1 wherein step (d) includes providing the first application interface description object for the first home device from the database to the second home device over the network.

15 6. The method of claim 1 wherein step (e) includes providing the second application interface description object for the second home device from the data base to the first home device over the network.

20 7. The method of claim 1 further comprising connecting three or more home devices to the network, wherein at least one home device accesses the database to query the application interface description objects of a plurality of home devices for sending command and control data to the plurality of home devices over the network.

25 8. The method of claim 1 wherein each application interface description object includes data in a structured format.

9. A network system for providing a service, comprising:  
(a) a physical layer, wherein the physical layer provides a communication medium than can be used by devices to communicate with each other;  
30 (b) first home device;  
(c) a second home device;  
(d) a database including a plurality of application interface

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description data objects, each application interface description data object including information in a structured format for commanding and controlling of a home device by one or more other devices connected to the network; wherein:

5                   the second home device includes application control means for accessing a first application interface description object for the first home device in the database and sending control and command data from the second home device to the first home device utilizing said first application interface description object; and

10                   the first home device includes application control means for accessing a second application interface description object for the second home device in the database and sending control and command data from the first home device to the second home device utilizing said second application interface description object;

15                   whereby the first and second home devices perform said service.

10.    The network system of claim 9 wherein the structured format includes XML format.

20                   11.    The network system of claim 9 further comprising a data base device storing said database.

12.    The network system of claim 11 wherein:

25                   (i)    the first home device stores first application interface description object therein;

                 (ii)    the second home device stores second application interface description object therein; and

30                   (iii)   said database base device forms said date base by querying the first and second home devices to transfer said first and second application interface description objects, respectively, to the database device.

13.    The network system of claim 9 wherein the control application

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means of the second home device obtains the first application interface description object for the first home device from the database.

14. The network system of claim 9 wherein the control application  
5 means of the first home device obtains the second application interface description object for the second home device from the data base.

15. The network system of claim 9 further comprising three or more  
home devices, wherein at least one home device accesses the database to  
10 query the application interface description objects of a plurality of home devices for sending command and control data to the plurality of home devices over the network.

16. The network system of claim 9 wherein each application  
15 interface description object includes data in a structured format.

17. The network system of claim 9 wherein the structured format includes XML format.

FIG. 1

Building Blocks or Modules

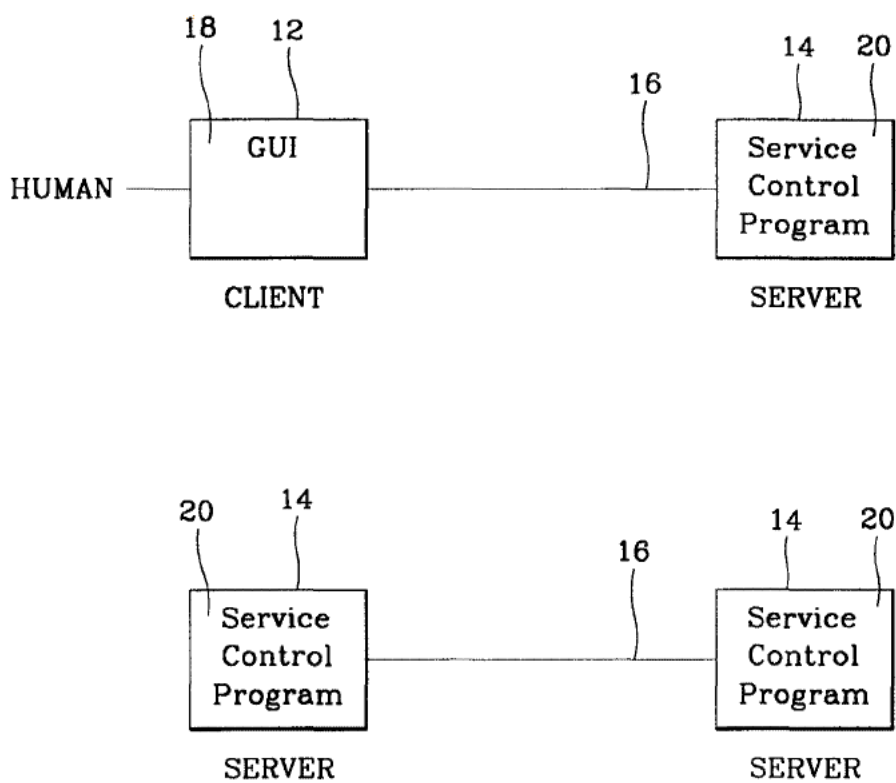


FIG. 2

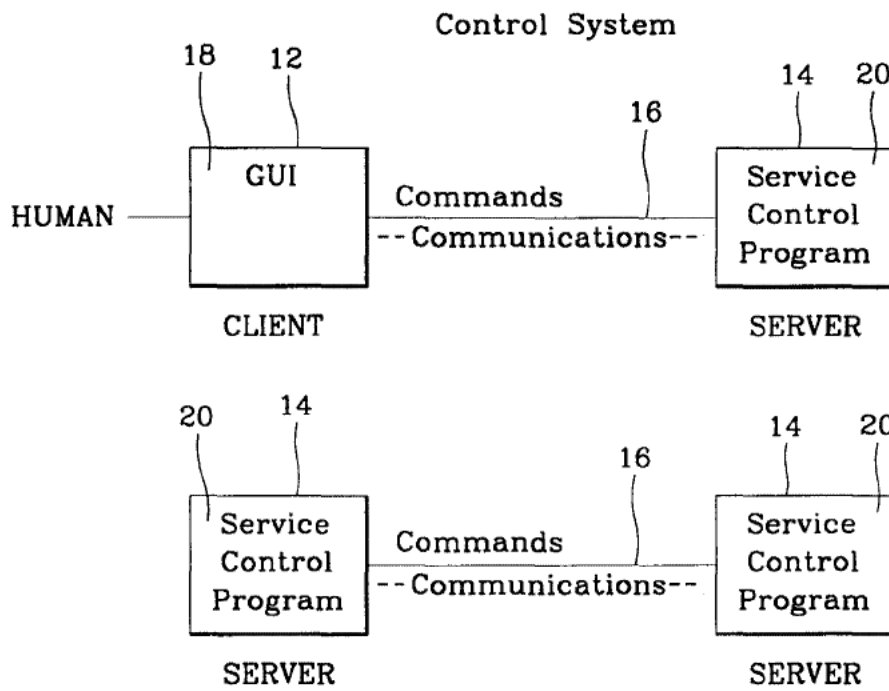


FIG. 3

Multiple Client Multiple Server Home Network Control Model

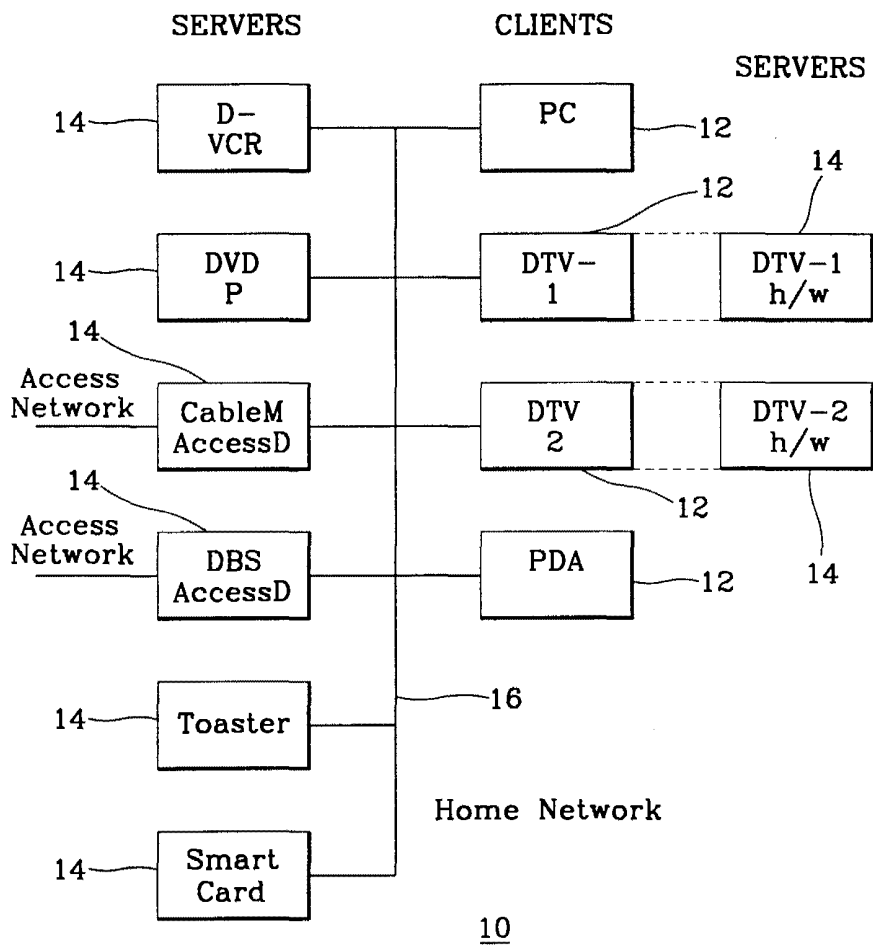


FIG. 4

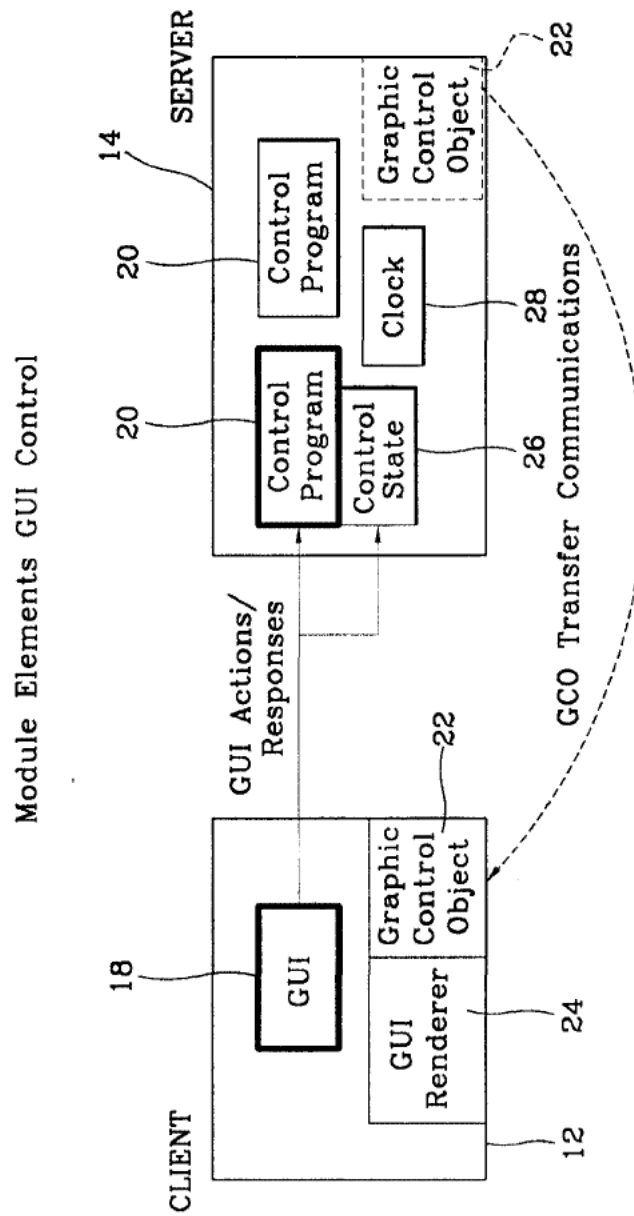




FIG. 5

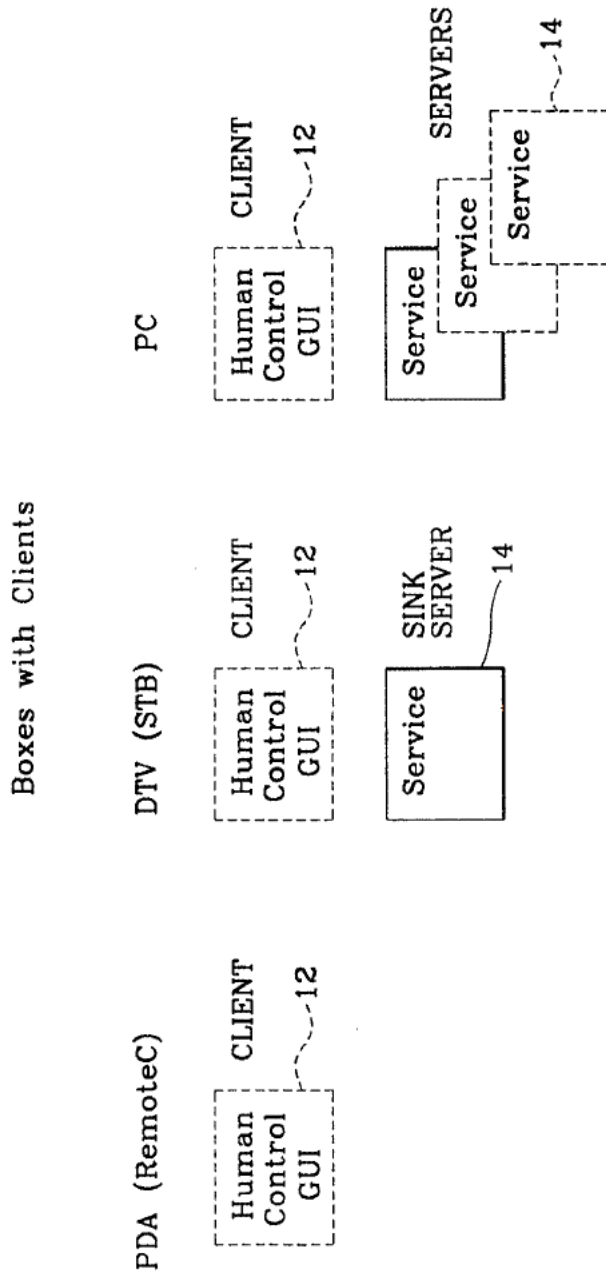


FIG. 6

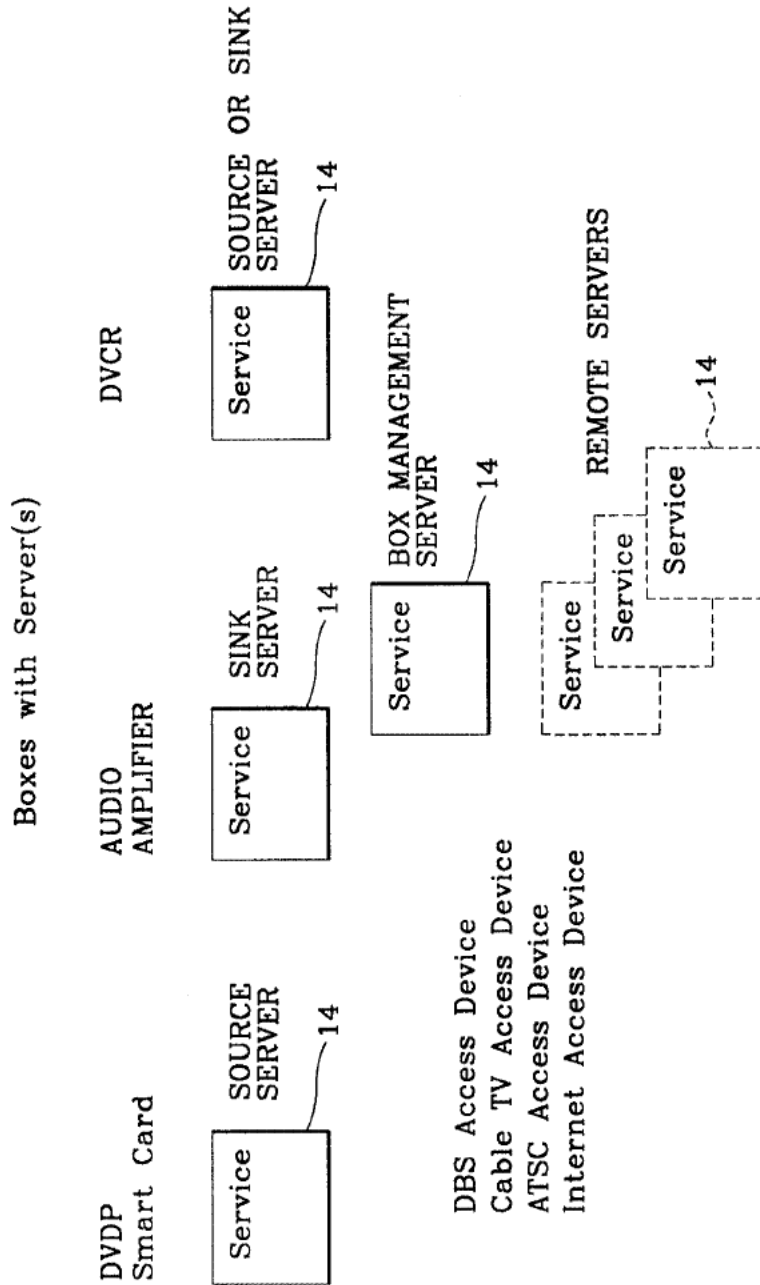


FIG. 7

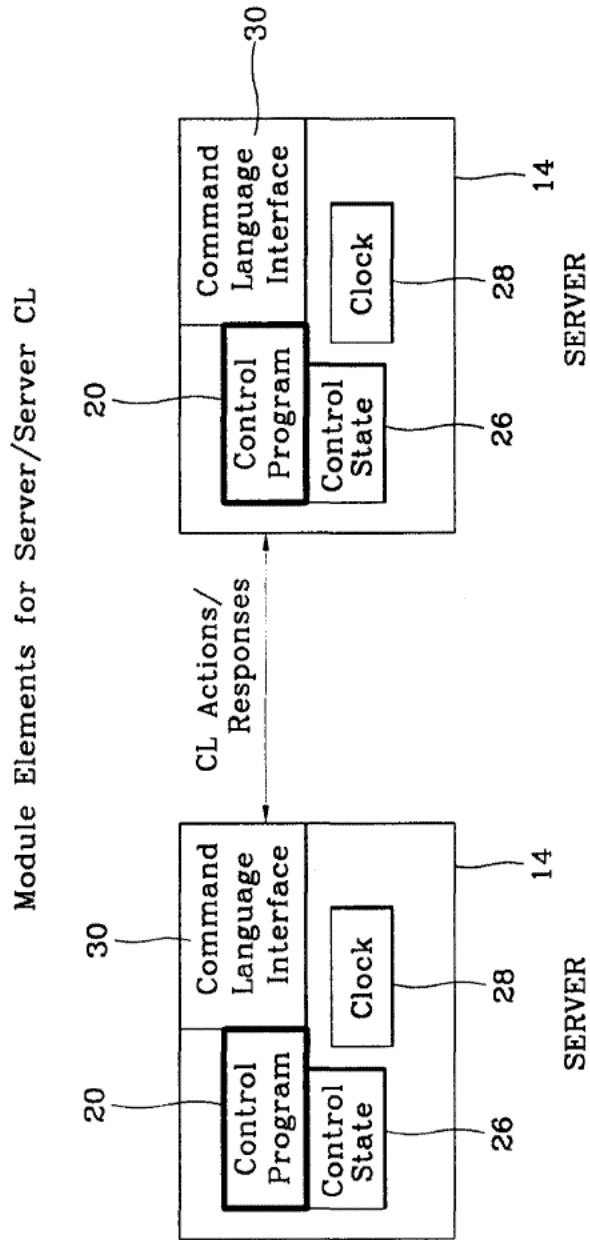


FIG. 8

Basic A/V, Client/Server/Server, Model

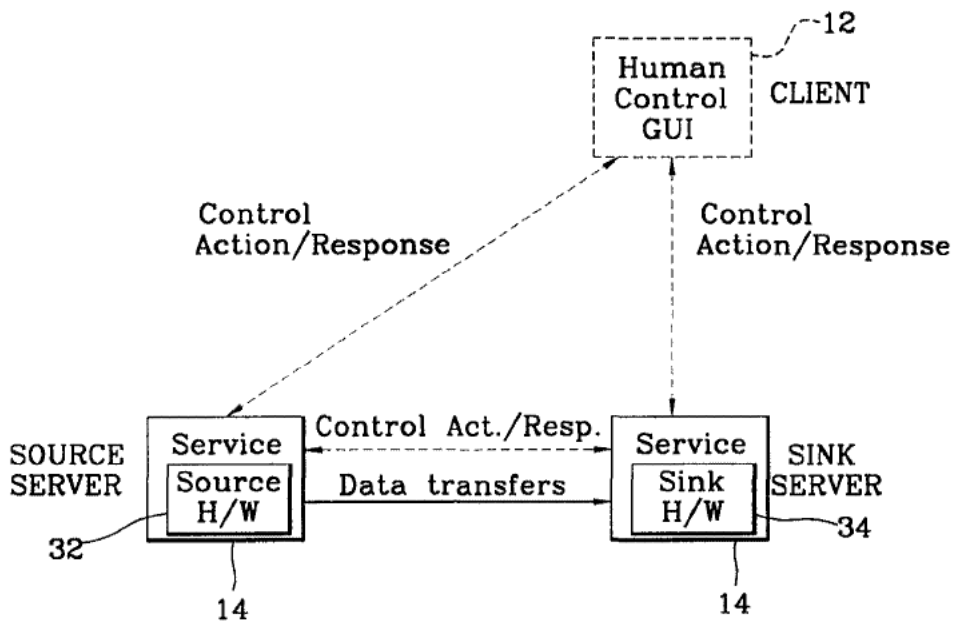


FIG. 9

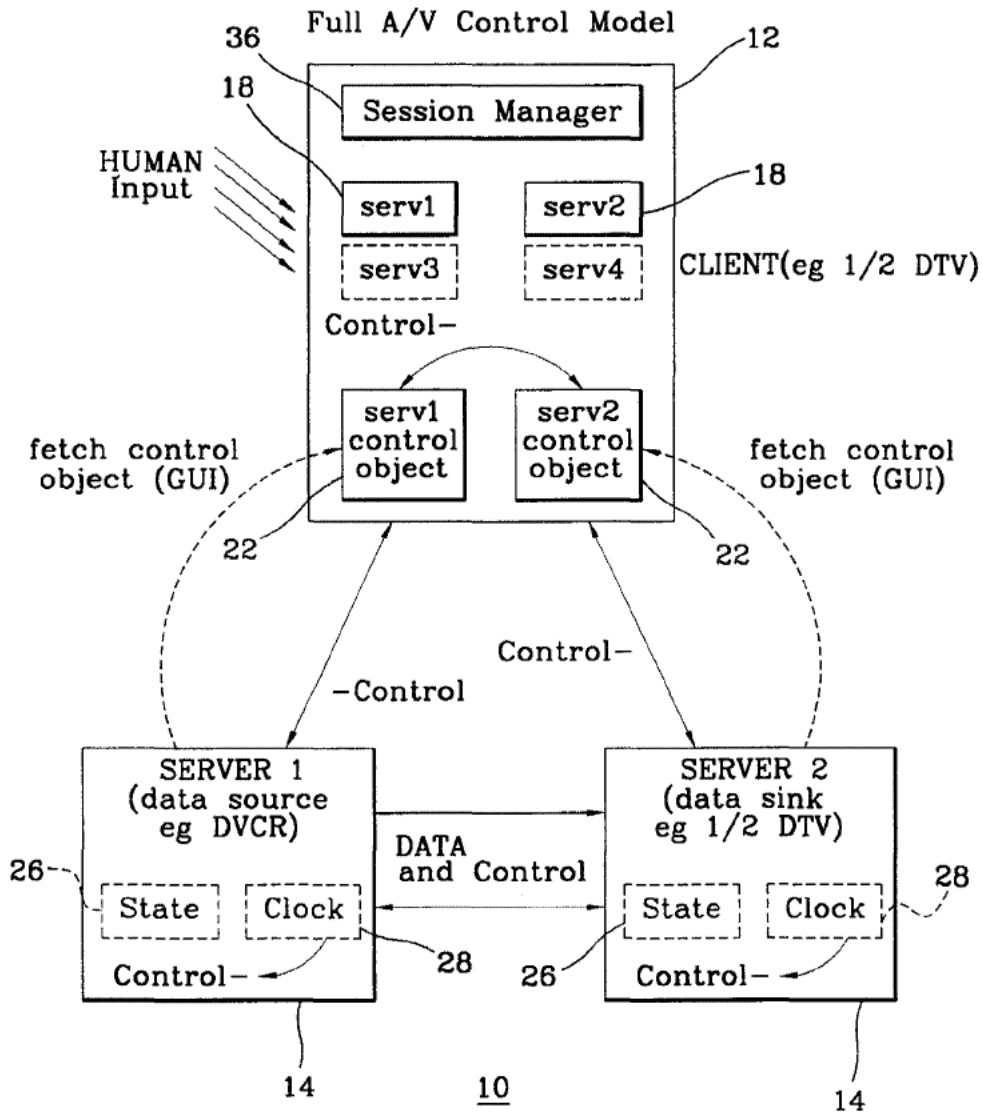


FIG. 10

Table 1: Capabilities Tavble

Service	Sink/Source
Service A	Sink
Service B	Source
Service C	Source
Service D	Sink

FIG. 11

Table 2: Attributes Table

NAME	LENGTH	VALUE
DeviceManufacturer	20 chars	Device manufacturer's name
ManufacturerURL	60 chars	Device manufacturer's home page URL
ManufacturerIcon	20 chars	Name of Device manufacturer's Icon
DeviceName	30 chars	Device name
DeviceModel	20 chars	Device model number
DeviceType	20 chars	Device category
DeviceLocation	30 chars	Device group or location
DefaultSource	15 chars	Data type, Default source device (IP address)
DefaultSink	15 chars	Data type, Default sink device (IP address)
DeviceIcon	20 chars	Name of device icon

FIG. 12

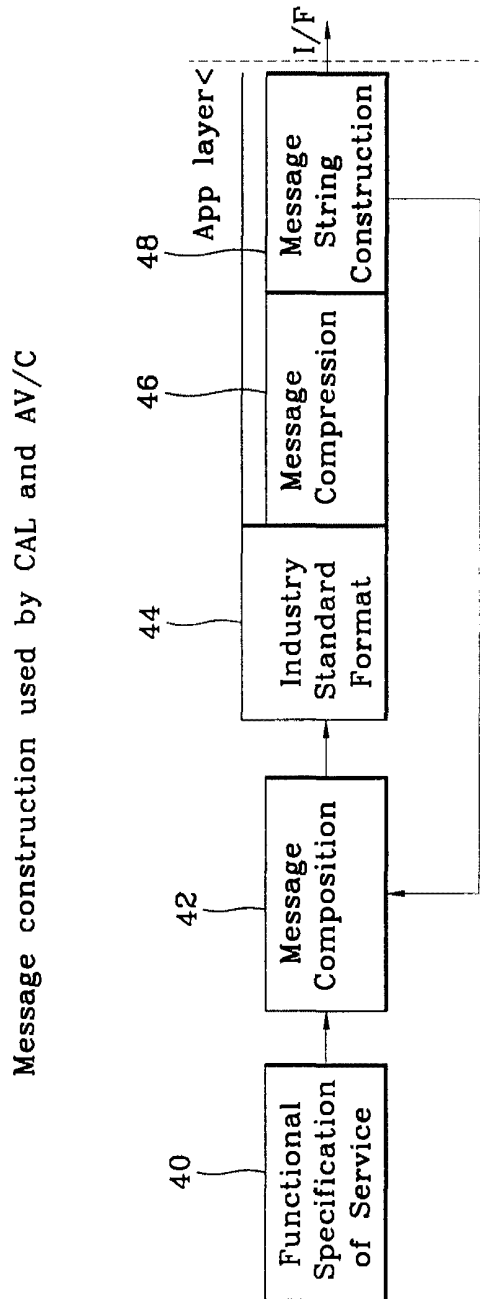




FIG. 13

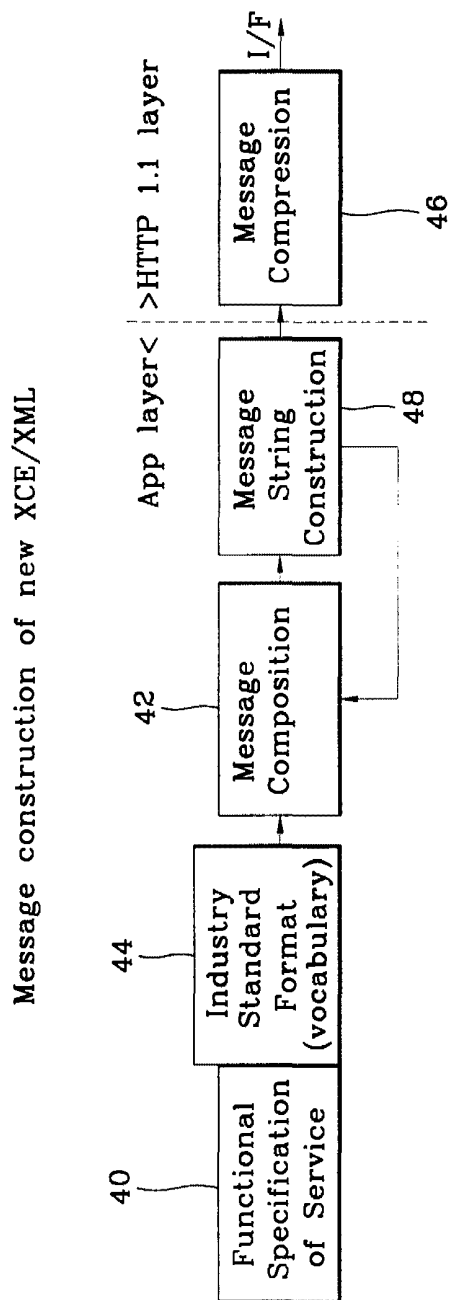


FIG. 14

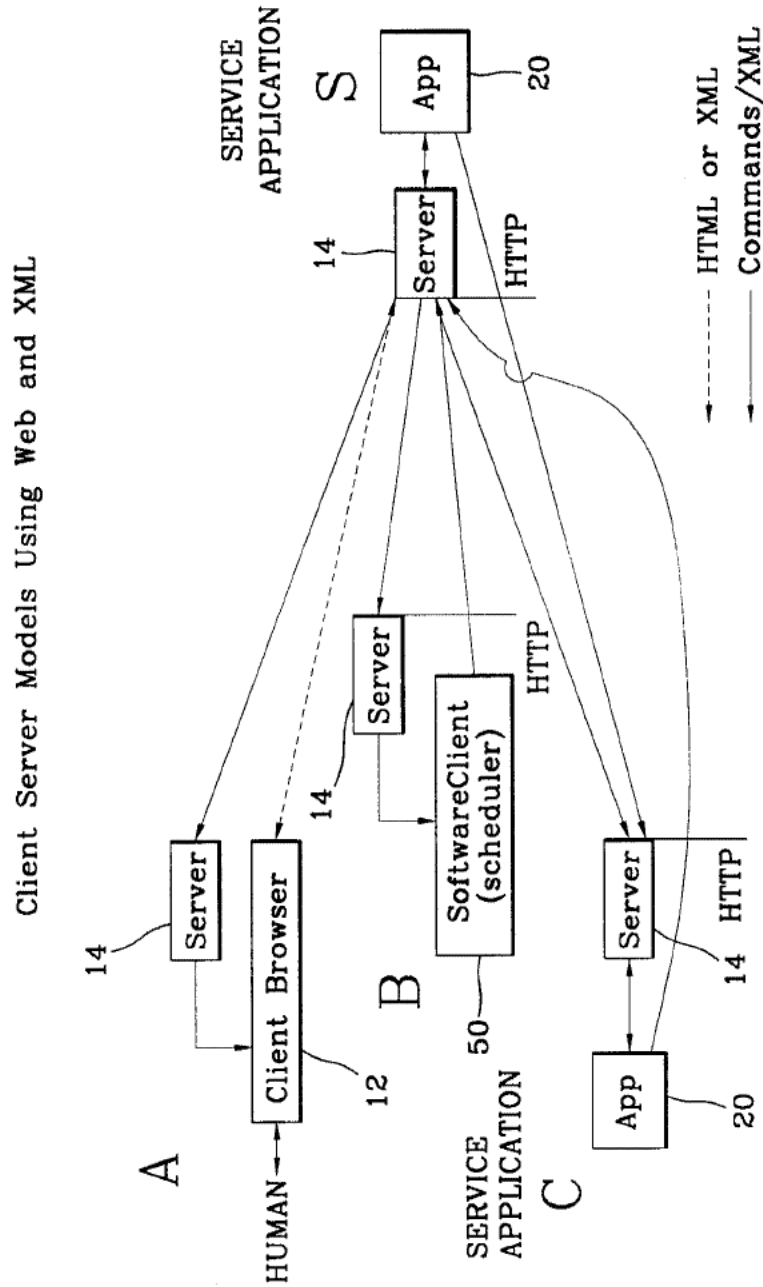


FIG. 15

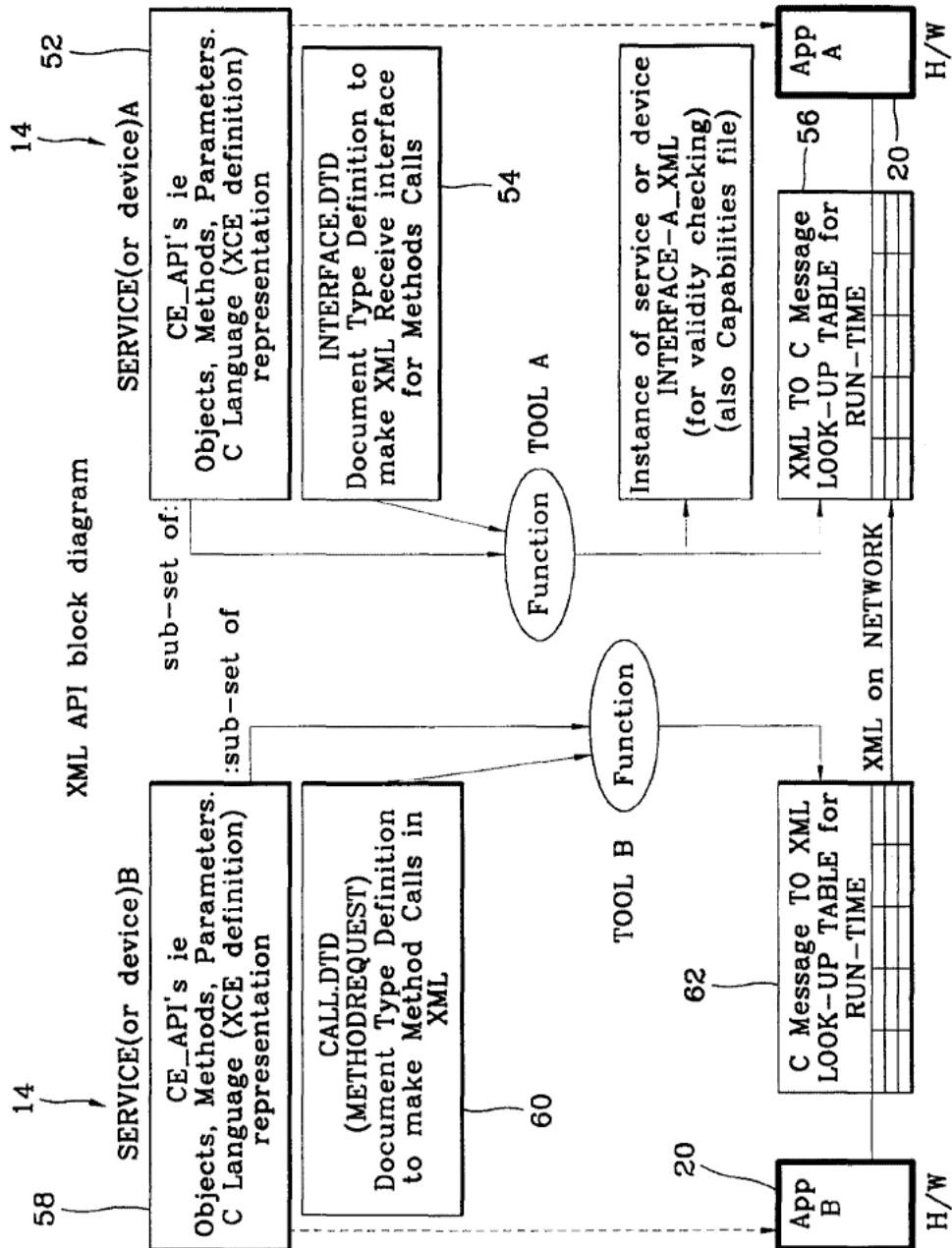


FIG. 16

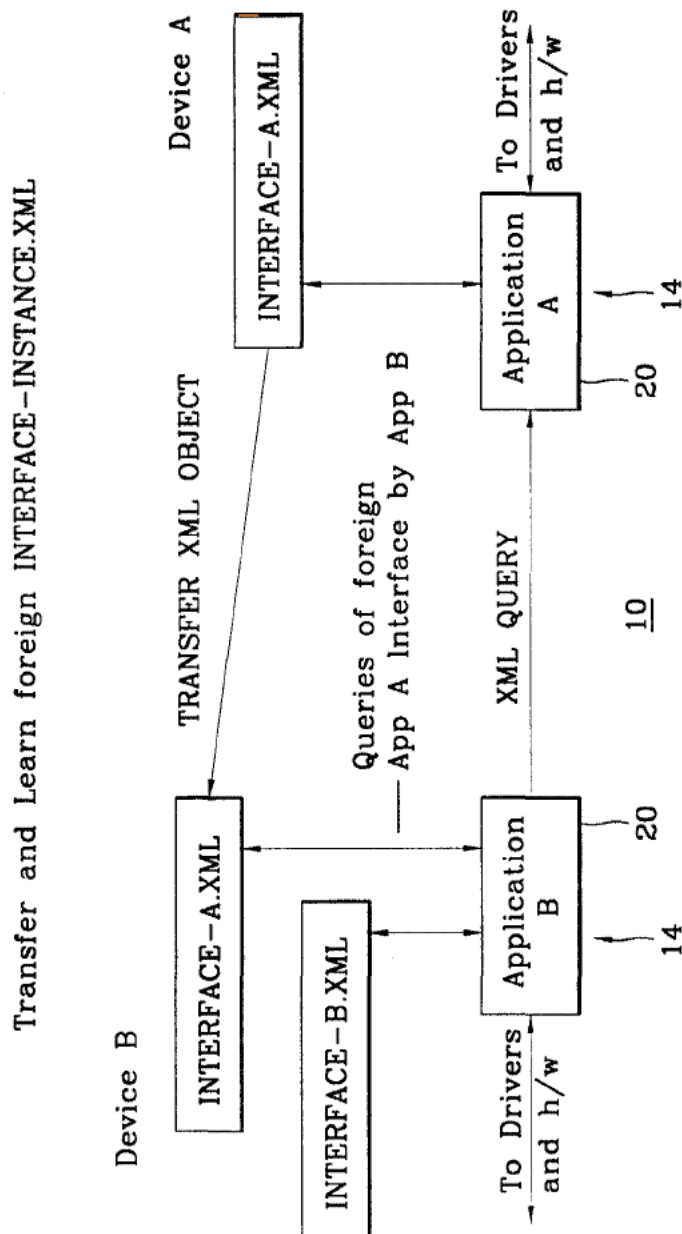
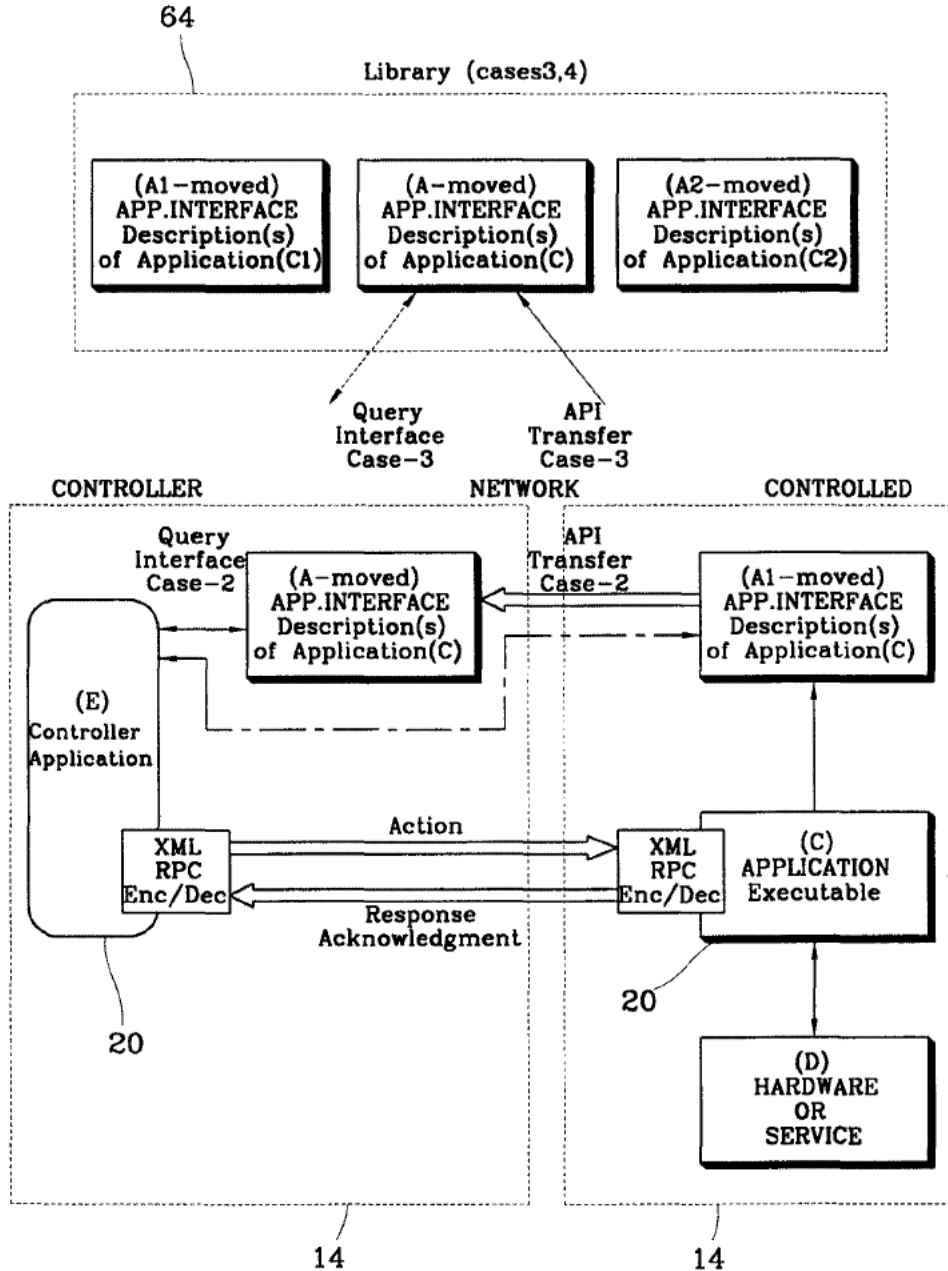


FIG. 17



Case 1. XML Application-C INTERFACE(A) for remote query by (E)  
 Case 2. Move XML Application-C INTERFACE(A) to controller for local query by (E)  
 Case 3. Move XML Application-C INTERFACE(A) to 3rd party device—a collecting place (library) for allinterface for remote query by (E). The library would have to have the address (URL) of the associated application available for direct control action and responses.  
 Case 4. Is case 3 but the 'indirect' control action (and response) is also directed at the library device. In this case the library is built with a 'forwarder'

FIG. 18

XCE/XML Protocol Stack

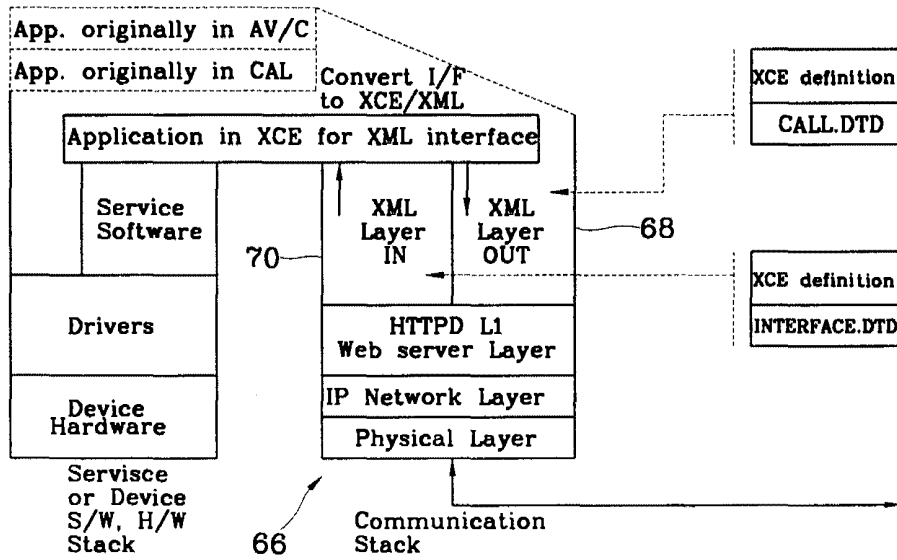
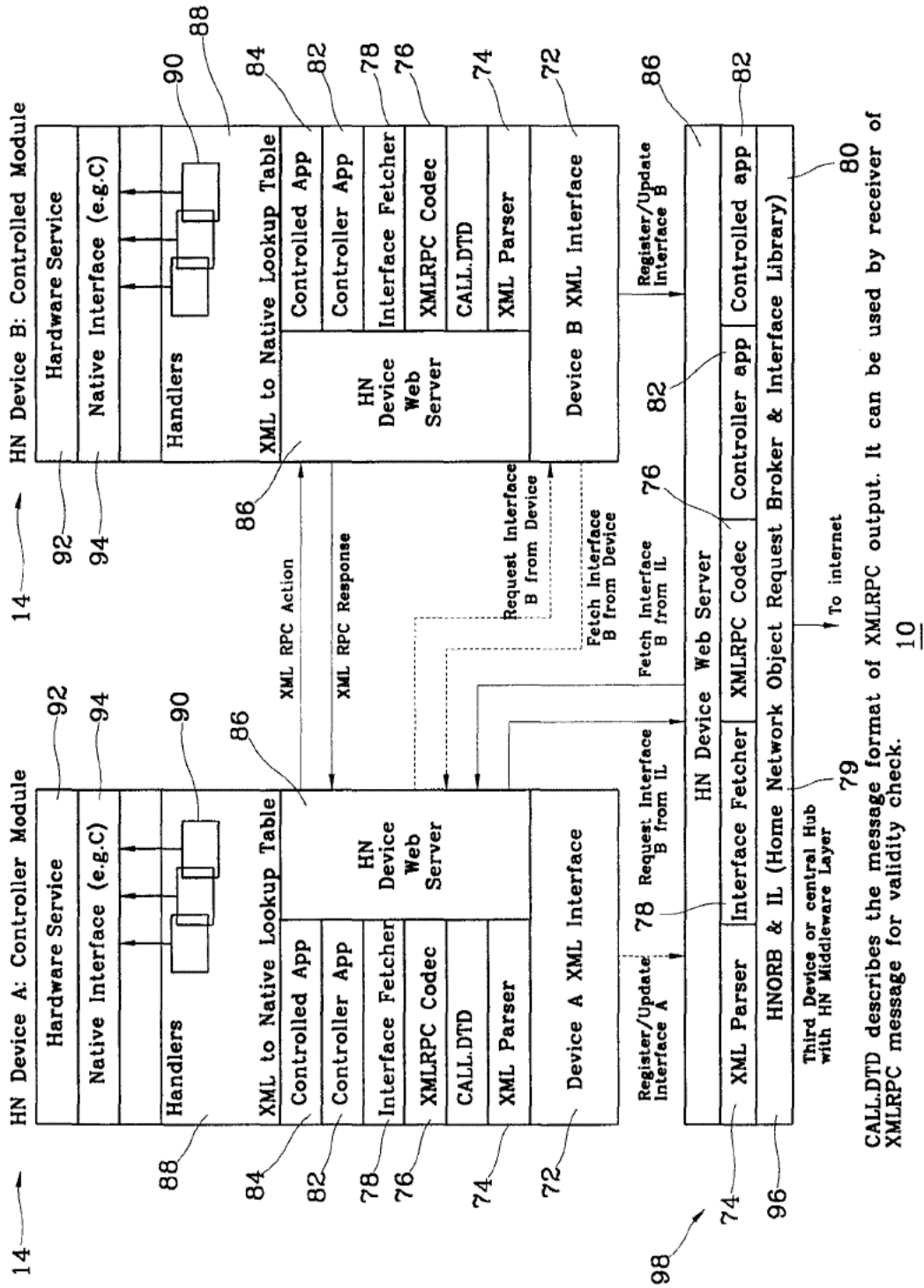


FIG. 19



CALL.DTD describes the message format of XMLRPC output. It can be used by receiver of XMLRPC message for validity check.

FIG. 20

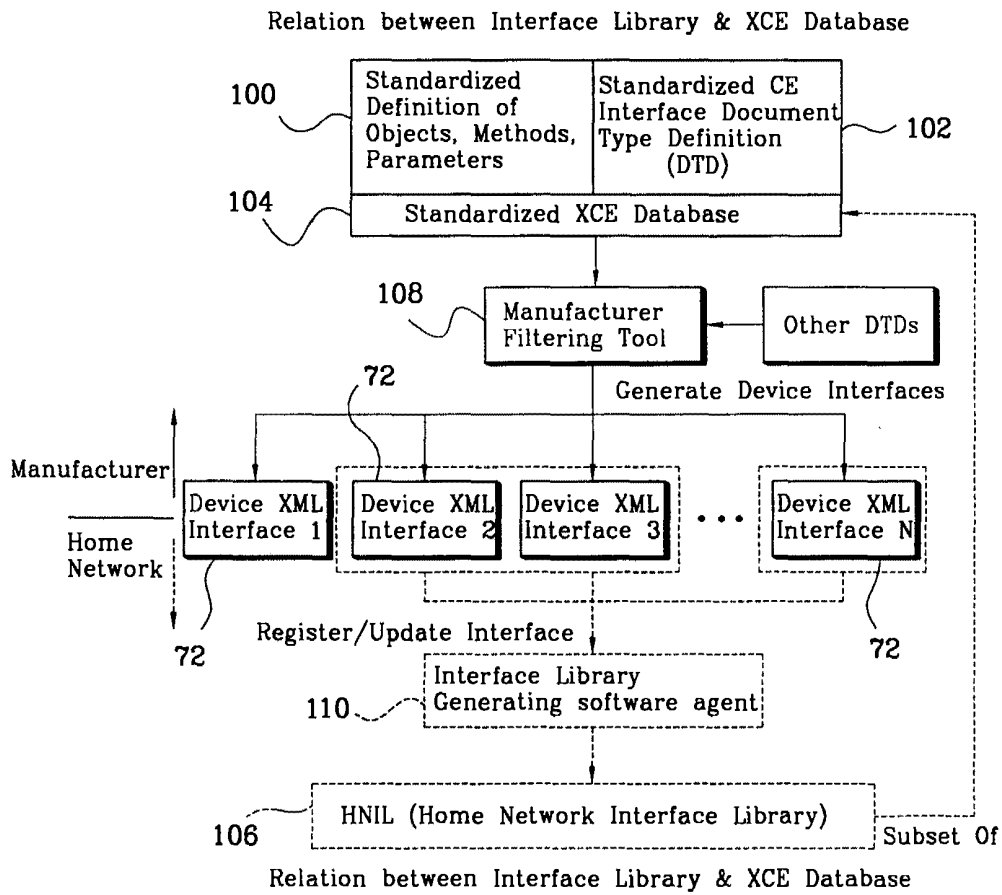
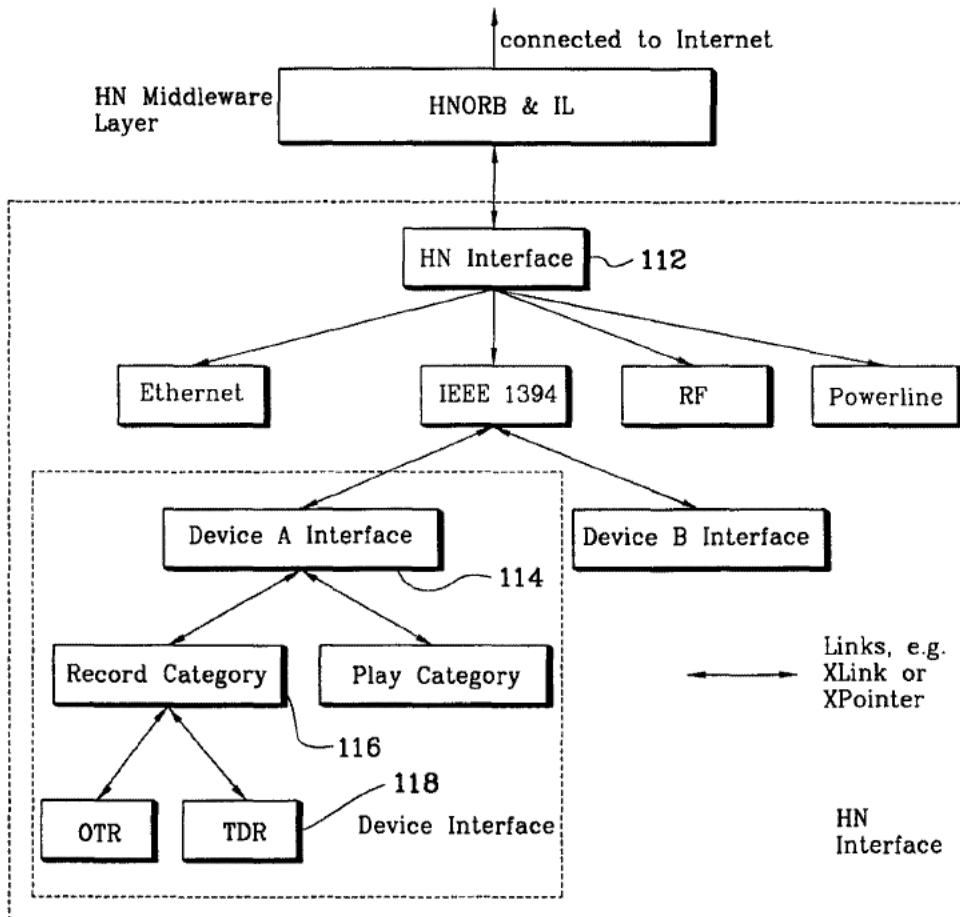




FIG. 21



Example of Hierarchical IL & Device Interface

FIG. 22

Hierarchical Interface Structure. Four layers.

Layer	Interface Layer	Interface Example
112	XML interface for each HN, listing current available devices.	MyHN(VCRs,TVs...)
114	General XML interface for each device, listing function categories.	General VCR Interface. (Record, play...)
116	Specific XML interface for each function category for a device.	VCR.record category
118	Specific XML interface for each function in function category.	VCR.record.tdr function

FIG. 23

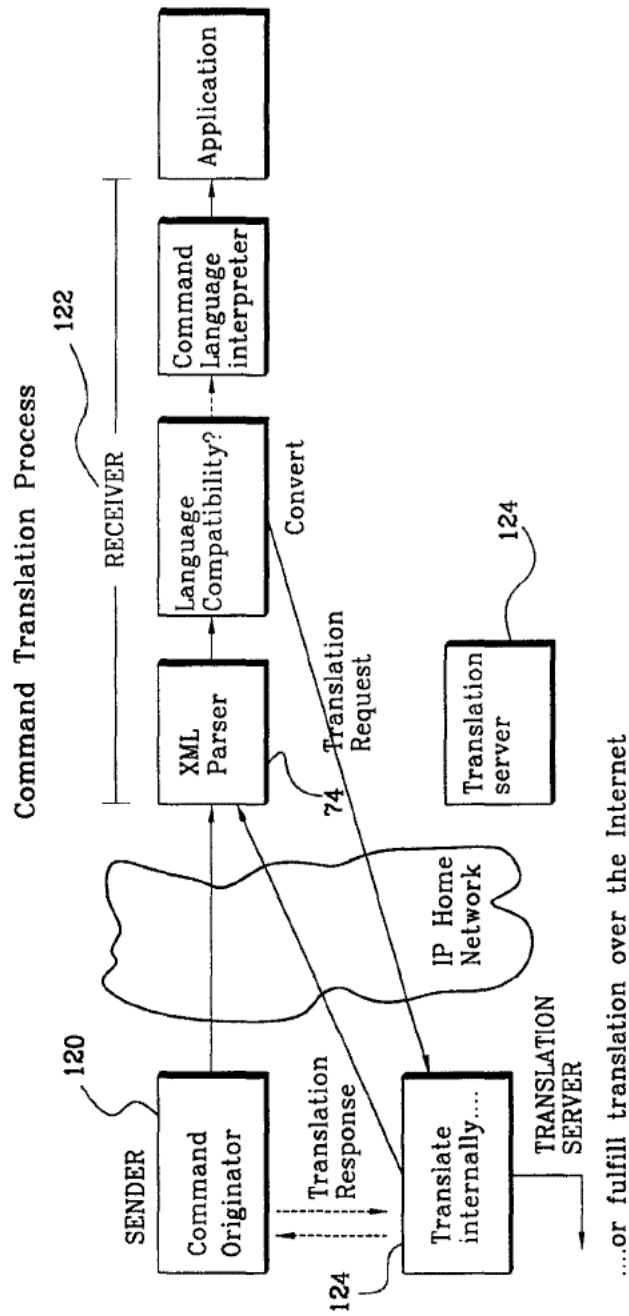


FIG. 24

Table 3: Example Formats and Types

Type	Format
command	CAL, AV/C, X-10
image	jpeg, gif, bitmap, tiff
language	English, French, etc
video_stream	mpeg2
video_clib	avi, quickime, mpeg
text	html, plain
audio	wav, aiff
application	mword, pdf, postscript, gzip

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## A Digital Video Library for Classroom Use

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### Abstract

Moving images, stored in the form of digital video, present a great many challenges to the designers of digital libraries since the source material is not stored in word form. In present-day analog film and video libraries, librarians and patrons must resort to very primitive tools to find information of interest. Digital video provides the opportunity to greatly improve access to moving image material, but new techniques are required for searching video collections, presenting the information contained in large collections in useful summaries, and in databases for annotating the material found in the library. This paper summarizes the new techniques being developed for digital video libraries by the Princeton Deployable Video Library (PDVL) project, a video library we are building to support education and research.

**keywords:** video library, video browsing, video annotation, scene transition graph

### 1 Introduction

The moving image is an important source of information for scholars and students. Moving images record historical events, comprise a literature of feature films, record scientific experiments, and perform many other functions. Film and analog video are much harder to manipulate than books. As a result, film libraries often have fewer accessions, are less fully used, and provide less circulation of materials than the book collections of libraries. Digital video promises to radically transform the cataloging, retrieval, and search of moving image records. However, making moving images truly easy to handle requires a new class of video understanding and manipulation tools which are much more powerful than the VCR controls provided by today's digital video interfaces. The goal of the Princeton Deployable Video Library (PDVL) project is to develop the next generation of digital library tools which provide powerful video understanding mechanisms at cost that allows such systems to be deployed in education and related disciplines.

The next section describes the requirements of educational users on digital video libraries. Section 2 sur-

veys the architecture of the system we are constructing. Section 3 surveys the techniques we are developing for navigation, browsing, referencing, and annotation.

### 2 Educational uses of video libraries

In a digital library, the user has direct access to the full collection, not just cataloging information. Books which have been electronically captured provide characters and words as powerful abstractions to which text search algorithms can be applied. Image recognition provides some powerful tools which are of use in extracting information from video programs. Moving images add the dimension of time to images—not only must we consider a sequence of images in a single shot, but we must consider the construction of the video program as a collection of discrete shots. In order to solve the needs of library patrons, a digital video library must be able to take advantage of all the media which contain relevant information: the moving images, the audio track, bibliographic information, notes, and the knowledge of the librarians and patrons. The search for relevant video information can be divided into two phases: users **navigate** through a large collection of video programs to identify the few which may contain material of interest; they then **browse** through individual programs to determine their contents and identify relevant sections. Patrons also need to **refer** to the sections of video programs they identify as relevant and to **annotate** their selections. The goal of our digital video library project is to make moving image material a first-class element in critical thinking—the equal of text, which can be perused, analyzed, and quoted as well as written.

The PDVL project's aim is to create a testbed system which demonstrates new tools which make advances in navigation, browsing, reference, and annotation. Our first tests of PDVL will be on academic users. Moving images are primary source material for disciplines ranging from political science to literature:

- news coverage of political events and politicians is one of the most important sources of information on politics;

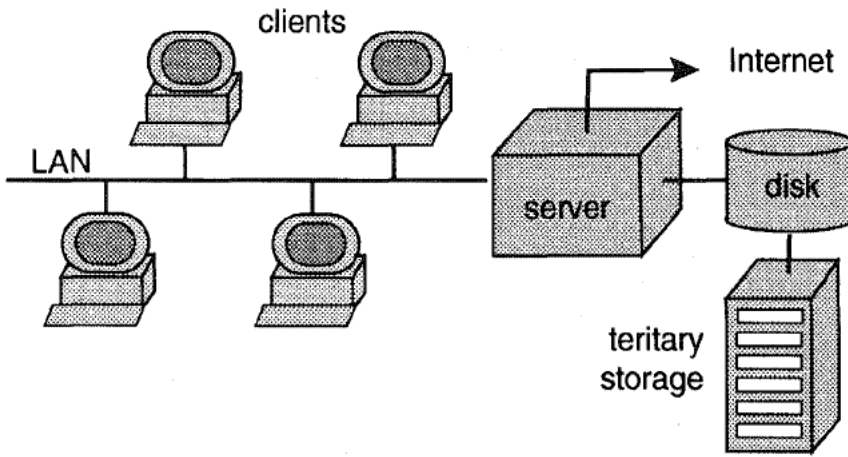


FIGURE 1. Hardware architecture of PDVL.

- psychology courses use video to record experiments and study subjects;
- literature courses study films both for their own content and as how they relate to the books from which they were adapted;
- historians use movies ranging from newsreels to popular entertainment as recordings of the time and culture which made them.

We are starting with users interested in political science and news as a sample domain<sup>1</sup>. Video is a very important source of material for political science because many appearances of politicians, both public and private, are recorded on film and videotape. In an era when so much political discourse takes place over television, politics cannot be fully understood without the examination of video source material. Some of the most important historical documents of this century, such as the Kennedy-Nixon debates and the Zapruder film of the Kennedy assassination, are

moving image documents. Political science and news have several advantages as a test domain for our library: we have access to both historical and current material; the domain is of interest to scholars at Princeton and to potential test audiences at high schools; and since U. S. copyright law places appearances of the President of the United States in the public domain, Presidential libraries provide a valuable source of available material.

Our research effort is still in its early phases and we do not yet have all the answers to these problems. However, we have identified some key problems: how to help patrons find what they want, how to refer to pieces of a video, how to do all this cheaply enough that we can afford to deploy the system. We have also developed some techniques which point the way to the answers to these questions. Section 4 describes an algorithm we have developed which can automatically extract a summary from a complex video program. The summary is sufficiently compact

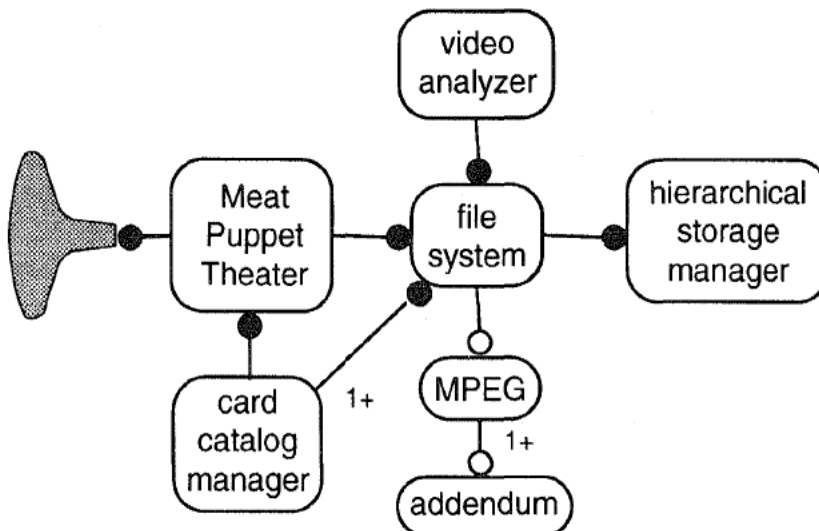


FIGURE 2. Software architecture of PDVL.



to fit a half-hour program on a single computer screen. We believe that such summaries are critical in allowing users to quickly scan a long video program and understand its overall content. We also believe that summaries are critical for content-based searches of large video collections, since eliminating redundant or unnecessary video material greatly increases the efficiency of the complex algorithms required for visual search. The search requirements for a digital video library for educational use are complex—patrons will want and need to use many different types of information, including traditional cataloging information, sound track and closed-captioning information, and visual information, to find the material of interest to them. The architecture of the video library must accommodate cataloging information of many forms. It must also provide searching facilities for all the different components of the video programming. Since we are unlikely to have perfect feature-extraction algorithms for either audio or video track information in the near future, the library mechanisms must make it easy for the human patron to make the final selection of material, based on an initial search conducted by the available algorithms.

While traditional libraries do not have to provide annotation facilities to patrons, digital libraries must provide annotation mechanisms compatible with their content access mechanisms. While well-understood standards like SGML exist for text annotation, we have no such notation schemes available for digital video, so the creation of library-compatible annotation schemes is a key problem in the development of video library systems.

Since we are interested in educational uses of video programs, we are particularly interested in facilities which allow both teachers and students to select and annotate video material and incorporate that material into comprehensive lessons. The ability to refer into and out of a clip is important to courseware development. A reference into a video clip may serve as a table of contents into the clip. References into a clip are also useful when a text accompanying the video makes reference to the video: a political science report may refer to different parts of a political speech video at different parts of the report; an online manual may refer to successive steps in a video of a mechanical operation. References out of a clip are equally important: one clip may refer to a similar action in another clip; a sequence in a clip may refer to an auxiliary text, such as a set of specifications for a part used in an operation.

A digital video library system which provides annotation facilities allows a community of users—both teachers and students—to create a pentimento of notes and links to material. The curriculum developer creates the initial set of links between video,

sound, and textual material. The teacher may enrich that material by adding a new set of annotations and links. The student may make one set of annotations which represent personal notes, and another set of links and notes when writing a report on the curriculum material. The teacher may then comment on the student's report with another set of links, which may refer to both the student's notes and the original material.

We believe that many of the mechanisms we propose are useful in business and entertainment as well. For example, many businesses want to make and use video transcripts of both public and private meetings. In order to make those transcripts useful, they want to search, browse, annotate them, and include important segments in reports passed onto others. The ability to refer to a video library, find, and annotate interesting material would be useful to financial analysts who study stockholders' meetings, managers who want to record internal meetings, etc. Consumers also want to be able to navigate through a large collection of programming to find material of interest, cut and paste multimedia material into personal collages, and in general interact with the material rather than be passive viewers. However, we believe that our educational testbed is a particularly appropriate and useful domain in which to develop digital video library techniques. Political scientists have very aggressive requirements for video libraries—they require large collections, they want powerful search techniques, and they need to perform detailed analysis of certain works. Furthermore, the tools developed for digital video libraries will allow us to teach students how to critically interpret news coverage on television, transforming them from passive viewers of news to active, critical students of the media.

### 3 PDVL architecture

PDVL is designed to be a classroom- or campus-size system. We believe that the most important problems in digital video libraries can be addressed using local user populations; in fact, given the computational requirements of digital video, using a small user population may be the only way to acquire workload statistics from actual use. Since local networks have higher throughputs and lower latencies than wide area networks, testing our system on a local user population lets us focus on the core problems of summarizing and manipulating moving images.

As shown in Figure 1, PDVL is a client-server system. Video storage is distributed across the network: some videos and annotations may be stored on local machines (either on magnetic disk or CD-ROM), videos in current general use will be stored on a file server's magnetic disks, and lower-cost storage will provide backup of other material. We are using per-

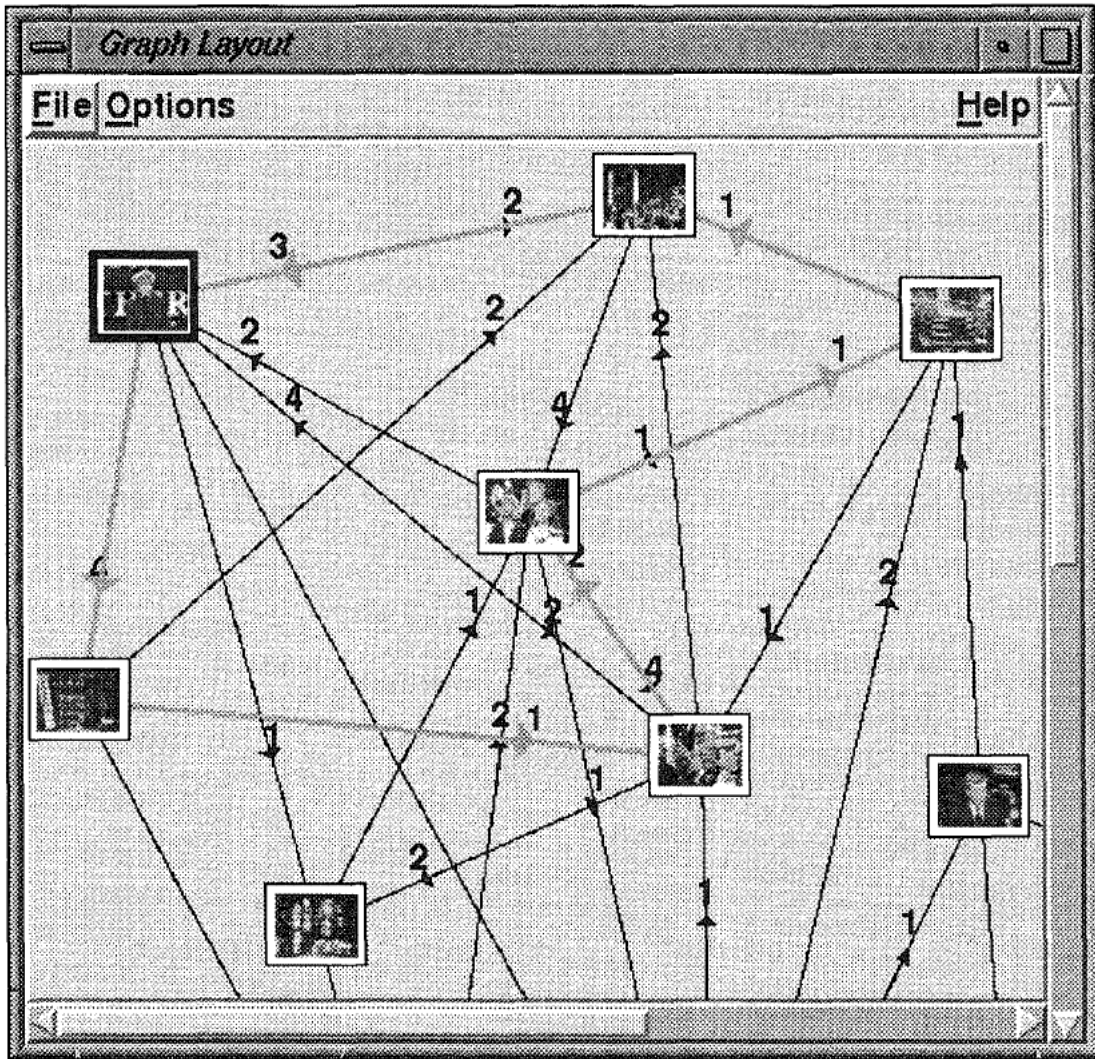


FIGURE 3. A scene transition graph extracted from a network news program.

sonal computers as the clients to reduce system deployment cost.

Figure 2 shows the software architecture of PDVL. We are relying on standards and existing software tools to the extent possible to make deployment easier and allow us to concentrate on problems unique to video libraries. The file system and hierarchical storage are fairly standard. We store videos in MPEG format; each film may have one more addendum files which keep indexing and annotation information. We are designing the card catalog manager to provide cataloging information based on annotation files of the same format used by patrons to annotate videos, giving us a seamless system for describing personal and library-wide descriptions of videos. Our video analyzer extracts information from videos: some of this information may be stored in the file system to provide general-purpose summaries of video programs, while other information may be extracted on the fly for a particular query. Our navigation and browsing tool, Meat Puppet Theater<sup>1</sup>, presents summaries and the results of queries prepared by the

video analyzer, providing a non-linear video interface to the programs in the collection.

#### 4 Video library tools

Given the wide range of possible queries of interest to library patrons, we believe that semi-automated methods of search are most likely to provide useful information to patrons in the next generation of video library systems. Our goal is to develop video understanding algorithms which can extract useful indexing information from videos; patrons will then be presented with a ranked list of programs and can select the material they want based on the presentation of visual, audio, and textual summaries of the programs.

1. "Meat puppet" is television industry term for news anchors who read the news but are not skilled reporters.

Many of our techniques for browsing and navigation rely on **key-frame summaries**. Key frames are representative of the action in longer shots. The storyboard is a traditional, direct representation of key frames in linear order. However, by applying a combination of image and temporal analysis, we can summarize the program by identifying story structure. Figure 3 shows a **scene transition graph**<sup>2</sup> automatically extracted from network coverage of the 1992 Democratic National Convention. The scene transition graph is extracted in several steps summarized in Figure 4: the video analyzer first segments the video into shots and selects one key frame per shot; the key frames are then clustered according to visual similarity (we currently use a combination of color histogramming and first-moment of luminance as the clustering metric); we then build a graph in which clusters are nodes and a directed edge connects two clusters which include temporally contiguous shots; we then analyze the graph to identify story structure. The result of analysis is a hierarchy of scene transition graphs, with smaller graphs providing more abstract views of the overall program and larger graphs providing more detailed information.

Graph structure as well as visual content are important in summarizing the content of video programs, since many programs use the juxtaposition of images to deliver information. For examples, cycles of all sizes are important structures in scene transition graphs: an interview consisting of two talking heads will appear as a pair of nodes connected in a cycle; a longer story segment will often appear as a large cycle, as an establishing shot is used to introduce the subject (such as the shot of the podium and audience in the Democratic National Convention) as well as to denote the transition to another subject at the end of that segment.

Our analysis of scene transition graphs provides very concise summaries of video programs. A summary of a program can often be viewed on a single screen so that the patron can browse and select the part of the program of direct interest. We also use summaries in navigation, since analysis reduces the representation of the program to a handful of key frames. Rather than search for visual information on the complete content of a large set of video programs, we first search over scene transition graph summaries, saving substantial amounts of computation time. For example, by reducing a long interview to a pair of heads, we can quickly search over a large collection of interviews to find the interview with the person being sought; we can also exclude from the search scene transition graph structures which don't have the structure of an interview, interviews which do not fall within a certain length, and other criteria. We also plan to explore how to take advantage of sound in identifying useful sections of video pro-

grams. We are investigating the effectiveness of commercial, speaker-independent speech recognitions systems for keyword spotting. We are also analyzing how more general properties of the sound track, such as the absence of sound, the presence of background music, and changes in speaker help patrons identify clips of interest in length video programs.

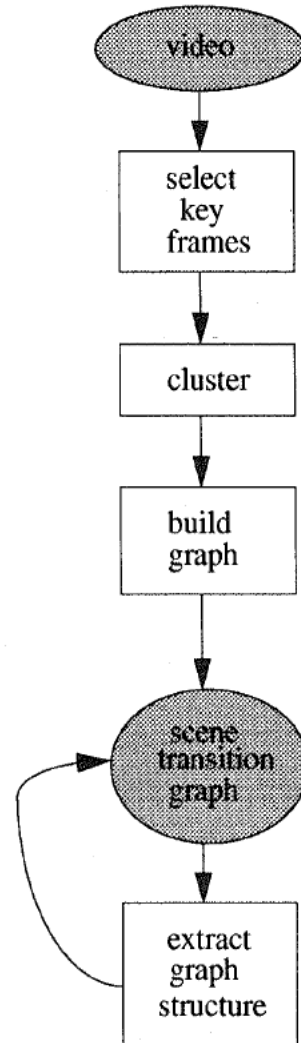


FIGURE 4. The scene transition graph extraction process.

The scene transition graph is a powerful tool for summarizing a long, complex video program—the algorithm has reduced 30 minutes of convention coverage to a graph which can fit on a single SVGA computer screen, while retaining a clear view of the content and structure of the program. The scene transition graph is a much more concise representation of a program than the storyboards used in film production. A storyboard, which is a succession of key frames which make up a scene, is linear. In contrast, the scene transition graph construction algorithm first eliminates visual redundancy by folding key frames with similar visual content into a single node; the graph edges describe complex story structure in a

small amount of space and in an easy-to-follow form.

Scholars and students need annotation for both private and public use. Annotations must be able to refer to particular points within videos, to cross-link videos, and to refer to external textual and audio documents. Patrons want to be able to point to items in single frames or sequences of frames, add textual or audio notes, relate one frame or clip to another clip, and to embed videos in documents. Useful types of annotation and hyperlinks include:

- links from a separate text document into a given point into the video;
- links from a given point in the video to a point in a separate text document;
- annotations which are not part of a separate document;
- drawings on the video, which may be used to point to or highlight certain features;
- additional sound tracks which provide narration or other commentary.

All these types of annotations refer to specific parts of the video, not merely the video as a whole. The annotation system must provide access control—some notes are personal which the patron does not want released until publication, while other annotations are meant to be shared with others. Annotations must also be layerable—consider, for example, a teacher using annotations to correct the annotations made by a student about the contents of a news program. We also plan a seamless system in which cataloging information is a form of publicly-available annotation.

## 5 Conclusions

Moving image source material presents many challenges for digital libraries since the content is kept in multiple media. We are building the Princeton Deployable Video Library as a test-bed to demonstrate the utility of next-generation digital video library tools—we believe that video library tools cannot be evaluated without testing on significant user populations. We are developing interactive methods to allow patrons to navigate through large video collections and find the material of interest to them—our tools extract summaries of programs which can be scanned by patrons much more quickly than they could view the complete programs. We are also developing annotation tools to make moving images first-class elements in digital libraries. Our overall goal is to transform scholars and students from passive viewers of film and television into active users who manipulate and analyze moving images, just as they manipulate and analyze texts today. We believe that the next generation of video library systems will provide powerful tools for library patrons and librarians.

## Acknowledgments

The Princeton Deployable Video Library project is supported by the ARPA CAETI program.

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## Cut in Fiber Cable Disrupts Internet Traffic Nationwide

By SARA ROBINSON  
Published: September 30, 1999

Internet traffic across the United States was severely disrupted yesterday when a gas company in Ohio accidentally sliced through a fiber cable with a backhoe.

The cut, which occurred around noon Eastern Time about 30 miles east of Cleveland, slowed traffic to the point that data transmissions were taking 20 to 50 times longer between the East and West Coasts than they do on a normal business day. Some companies experienced more severe disruptions and were forced to shut down.

While fiber cuts are not uncommon, the size of the cable that was cut yesterday -- a bundle of fibers carrying 40 gigabits, or 40 billion bits, of data a second -- is extremely rare, said Bill Woodcock, network architect for Zocalo, a regional Internet service provider in Northern California.

"We've seen plenty a quarter this size, but my impression is that if this is not the largest to date it's very near," he said.

The traffic most affected was data that would normally travel through the fibers that were cut. This traffic was rerouted to other parts of the global network, but the net effect was congestion that slowed all data moving through large stretches of the nation's Internet arteries.

Corporate customers whose internal networks used the severed cable, Mr. Woodcock said, "might not be able to access their corporate data base or retrieve mail from their mail server."

The GTE Corporation, which owned portions of the cable that was cut, estimated last night that the cable would be repaired by 9 P.M. Eastern time. When that deadline passed, though, officials at some affected companies said they were being told that thunderstorms in Ohio were making it difficult to offer accurate estimates concerning when the repairs would be completed.

It was not clear which Internet service providers, or I.S.P.'s, own or lease the fiber that was cut. Several service providers can own strands of fiber that run through the same cable, or one company can own it and lease portions of it to other I.S.P.'s.











Some of the fiber belonged to GTE, which purchased it two years ago from Qwest. "The majority of our Internet customers are still up -- they are seeing degraded performance, but they are still up," said Vaughn Haring, a spokesman for GTE Internetworking, the Internet division of GTE.

He added, though, that some customers' service had degraded so far that they were effectively off line.

Many reports issued by Internet service providers said that some of the fiber was owned by a division of MCI Worldcom, but the company would not confirm that.

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"It is not impacting MCI Worldcom," a spokesman for that company said, adding that the cut was not affecting customers of MCI Worldcom's Uunet subsidiary either.

Dave Rand, senior vice president and chief technical officer for the Internet service provider Abovenet said that his company's traffic was down about 20 percent, mostly because of problems with other I.S.P.'s. Abovenet's traffic from San Jose, Calif., to Chicago, he said, was down to 25 percent of its normal capacity.

"It's not as bad as it could be," Mr. Rand said.

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Treo™ 180 Communicator  
User Guide

Windows Edition



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## Chapter 1

# Introduction to Your Treo™ 180 Communicator

This chapter explains the physical buttons and controls on your Treo™ 180 communicator, how to use your communicator for the first time, and how to install Palm™ Desktop software and the HotSync® Manager synchronization software so you can synchronize your communicator and your computer.

## Getting to know your communicator

### What is a Treo communicator?

Your Treo communicator combines the power of a full-featured mobile phone, e-mail, SMS messaging, a Palm OS® handheld, and the Internet in one compact and indispensable device. With your Treo communicator, you can do everything you can do with your existing mobile phone with greater speed and ease. You can store thousands of numbers in your PhoneBook and up to 50 speed dial entries, and dial any of them with just a few keystrokes. You can even set up a 3-way conference call by joining two calls and use the personal speakerphone for hands-free use without a headset attachment.

Lighten your load. Everything you need is in one compact device. Your Treo communicator helps you stay in touch. With instant access to your e-mail, you can send and receive e-mail from anywhere, and use SMS messaging to exchange quick messages with other mobile phones on your network. The award-winning Blazer® web browser gives you access to any site on the Internet—not just a few optimized for mobile access; now you can download directions, confirm flight reservations, find a restaurant, and check stock prices wherever you are. Everything you need to stay organized is close at hand on your communicator, including popular Palm OS applications such as Date Book Plus, PhoneBook, To Do List, Memo Pad and more.

To make sure you don't lose any of this important information, you can synchronize your data with desktop software on your computer so you always have a backup copy.

## System requirements

To install and operate Palm Desktop software and the HotSync Manager synchronization software, your computer system must meet the following requirements:

### Minimum requirements

- Windows 98, Windows Me, Windows 2000, or Windows XP with USB port, (for USB HotSync® cable)  
--or--  
Windows 95, Windows 98, Windows Me, Windows 2000, Windows XP, or Windows NT 4.0 with serial port (for serial HotSync cable)
- 32 MB RAM (memory)
- 25 MB available hard disk space
- VGA monitor or better
- CD-ROM drive (you can also download Palm Desktop software from [www.handspring.com](http://www.handspring.com))
- Internet Explorer 5.01 or higher (recommended)

### Upgrade information

If you already own a Palm OS® handheld, Handspring recommends that you install the version of Palm Desktop software that comes with your Treo communicator into the same folder as your current Palm Desktop software. When you install the new version in the same folder as the previous version, all your data is preserved. If you use another personal information manager (PIM), you still need to install Palm Desktop software in order to update the HotSync Manager on your computer.

You perform HotSync operations in exactly the same way, so you can quickly synchronize your old data with your new communicator.

#### To upgrade:

1. Synchronize your old communicator with your old Palm Desktop software. This ensures that the latest information from your communicator is on your desktop computer.
2. (Optional) To ensure against any data loss, go to the folder that stores Palm Desktop software (this is usually the Handspring or Palm folder), copy (do not move) your user name folder, and store the copy outside the Palm Desktop software folder.
3. Follow the installation instructions that begin on page 25. Be sure to install the new software in the same folder as the old software.
4. Connect your new communicator to the HotSync cable and press the HotSync button on the cable. If the Select User dialog box appears, select your user name.
5. Compare the applications on your old handheld and your new communicator.
6. Beam any third party applications that did not transfer from your old handheld to your new communicator, or install them from the original files.

### Each device must have a unique name

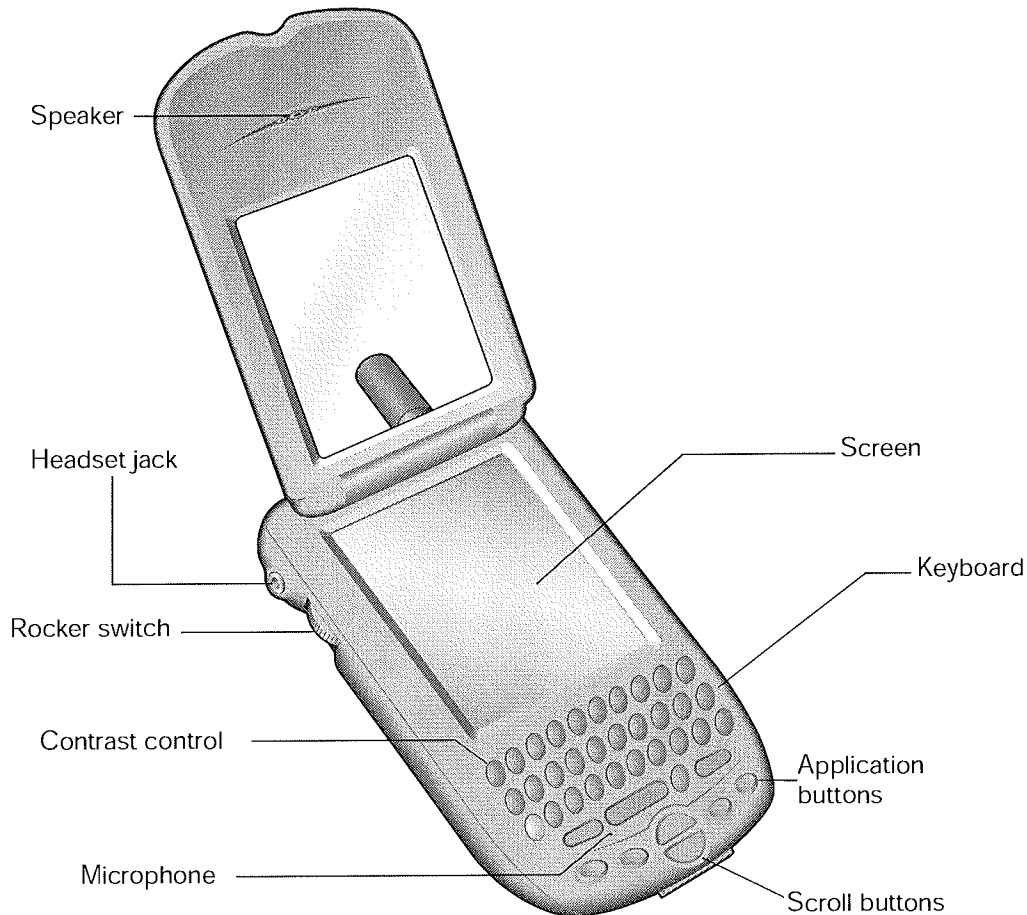
After you complete the upgrade process described above, you have two devices with the same name. This is an undesirable situation. Each device must have a unique name in order to prevent unexpected results during HotSync operations and other complications.


We strongly recommend that you perform a hard reset on your old handheld. See page 211 for details.

A hard reset not only erases all data from the old handheld; it also erases the name and makes that handheld a clean slate, ready to receive a new name. The next time you perform a HotSync operation with this old handheld, you are asked to give it a name. Be sure to give it a unique name.

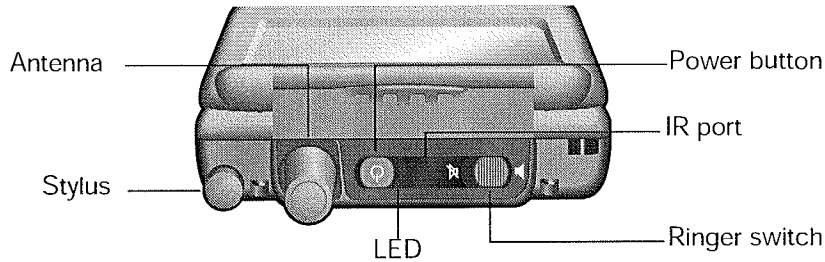
### Treo components

#### Locating front panel controls




<b>Speaker</b>	Functions as the earpiece on your Treo.
<b>Headset jack</b>	Enables you to connect a hands-free headset for use with the wireless features. Use only headsets that are compatible with your communicator.
<b>Rocker switch</b>	<p>Enables you to navigate on your communicator with just one hand. You can use the rocker switch as an alternate method to perform a variety of tasks, such as adjusting the call volume level on your phone. The rocker switch functions change based on whether your communicator's wireless mode is on or off and which application you are using.</p> <p>To use the rocker switch, roll the dial up or down, press it in and release it, or press and hold it.</p>
<b>Contrast Control</b>	Opens the contrast control screen where you can adjust the appearance of your communicator screen for the clearest screen display. See page 19 for instructions.
<b>Microphone</b>	Functions as the mouthpiece when you use the wireless phone features of your Treo.
<b>Scroll buttons</b>	Displays text and other information that extends beyond the area of the communicator screen. Pressing the bottom scroll button scrolls down to view information below the viewing area, and pressing the top scroll button scrolls up to view the information above the viewing area. The scroll buttons also enable you to navigate between records in an application and to adjust the volume during a call.
<b>Application buttons</b>	<p>Activates the applications that correspond to the icons on the buttons: PhoneBook, Date Book Plus, Blazer (or another web browser installed by your wireless service provider), and SMS Messaging. See page 172 for details on reassigning these buttons to activate any application on your communicator.</p> <p>You can also use these buttons in combination with Option  to activate other applications. See Chapter 4 in this guide for details.</p> <p><b>Tip:</b> If your communicator is turned off, pressing any application button turns on your communicator and opens the corresponding application.</p>
<b>Keyboard</b>	Enables you to type letters, numbers and symbols on your communicator. Chapter 2 to learn how to enter information.
<b>Communicator screen</b>	Displays the applications and information stored in your communicator. It is touch-sensitive and responds to the stylus.

Locating top panel controls



**Antenna** Receives and sends wireless communication signals. The antenna does not telescope out of your communicator.

**Stylus** Serves as the instrument used to tap options on your communicator screen. To use the stylus, slide the stylus out of the slot, and hold it as you would a pen or pencil.

**Power button**  Turns your communicator and wireless mode on and off, and controls the backlight. See page 18 for details.

**IR port** Uses infrared technology to transmit data to and receive data from other Palm OS devices. See the section that begins on page 76 for details. You can also use the IR port to update the information between your communicator and computer using HotSync technology. See the section that begins on page 196 for details.

**LED** Provides status information for your Treo based on the color of the light and the blink state.

No light: Wireless mode off

Solid: Connected to travel charger

Green = Fully charged


Red = Charging

Blinking: Wireless mode on

Green = In coverage area

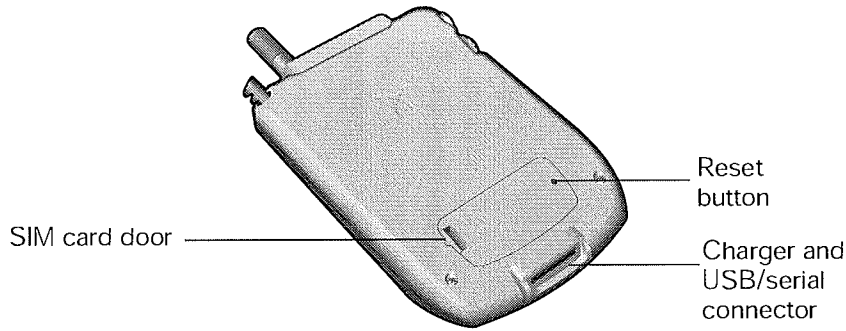
Red = Out of coverage area

Double-blink red: Low battery

**Ringer switch**  Controls the ringer setting. See page 190 for details on changing the settings.

Note: Silencing the ringer turns off all system sounds, including alarms. When you silence the ringer, Date Book Plus alarms vibrate.

## Locating back panel components



- SIM card door**      Secures your SIM (Subscriber Identity Module) card in your phone.
- Reset button**      Under normal use, you should not have to use the reset button. See Appendix A for information about when and how to use the reset button.
- Charger and USB/serial connector**      The connector that connects your communicator to the travel charger and HotSync cable. The HotSync cable connects to a USB port or serial port on your computer and enables you to synchronize the information between your communicator and computer using HotSync technology.

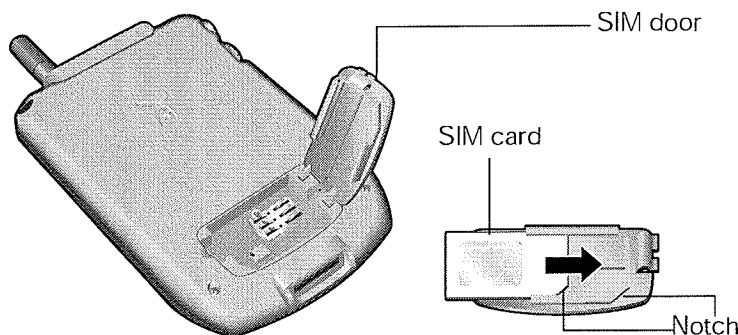
## Inserting the SIM card

The SIM card is a small rectangular plastic piece that contains your phone number and account information. It is included with your wireless service provider's documentation and is often referred to as a "smartcard." If a SIM card did not come with your communicator, your wireless service provider will provide you with one when you subscribe to their service.

You must insert your SIM card into your communicator before you can use it for wireless communications. Since calls are billed to your phone number, you can, however, move your SIM card to any phone that uses a SIM card, and the calls will be billed to your account.

To insert the SIM card:

1. Remove the SIM door.
2. With the contacts face-up, align the notch on the SIM card with the notch on the door and insert the SIM card into the slot on the door.



3. Replace the SIM door.

## Charging the battery

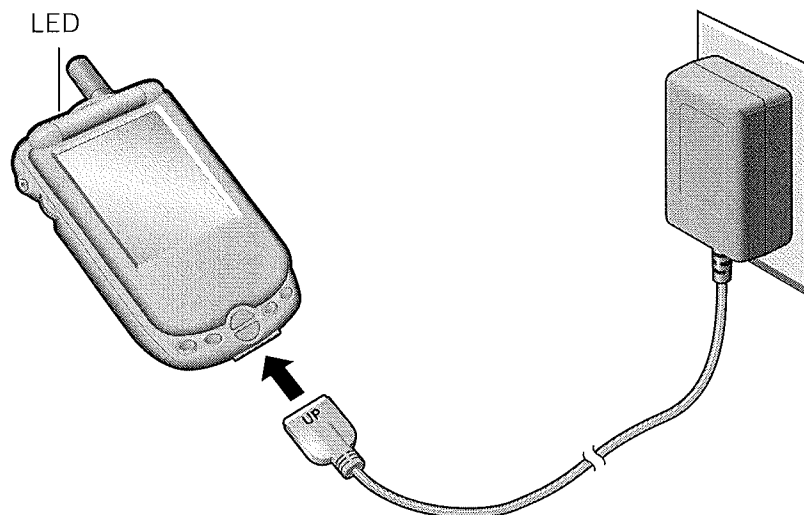
To use your communicator, you must connect the travel charger or the HotSync cable and charge the battery. When you're near your computer, connect your communicator to the HotSync cable with the travel charger connected to a wall outlet as shown in the section that begins on page 23. When travelling, connect the travel charger cable directly to your communicator as shown in this section.

When wireless mode is on, a fully charged battery provides approximately 2.5 hours of talk time or 60 hours of standby time. When wireless mode is off, a fully charged battery provides approximately three weeks of use in handheld mode.

If the battery drains to the point where your communicator does not turn on, it stores your data safely for about three days. Therefore, we recommend that you charge the battery daily to avoid potential data loss. See Appendix A for tips on extending the life of the battery.

To charge the battery with the travel charger:

1. Plug the travel charger into a wall outlet.
2. With the word "UP" facing up (as shown), connect the travel charger cable to the charger connector on the bottom of your communicator.



**Tip:** The LED is solid red while your communicator charges. When the LED turns solid green, your communicator is charged. It takes approximately 90 minutes to charge a fully drained battery.

## Turning your Treo on and off

Your Treo communicator has two operating modes: a handheld mode and a wireless mode. You can turn the handheld mode and the wireless mode on and off independent of each other. When you turn on the handheld mode, you can use organizer applications such as Date Book Plus and To Do List. When you turn on the wireless mode, you can make or receive calls. You can also turn both modes on at the same time. When both the handheld and wireless modes are on, you can use the organizer applications as well as send and receive calls.

To turn handheld mode on and off, do any of the following:

- Open the lid to turn it on, or close the lid to turn it off.
- Press the power button.
- Press and release the rocker switch.
- Press any application button on the front of your communicator.

To turn wireless mode on and off:

- Press and hold the power button until you hear the confirmation tones to turn wireless mode on and off. The ascending tone indicates wireless mode is now on and the descending tone indicates wireless mode is now off.

## Using the backlight

If you have difficulty seeing the information on your communicator in dark environments, you can use the backlight to illuminate the images on the screen.

Note: If you have difficulty seeing the screen in well-lit environments, adjust the contrast instead of using the backlight. See page 13 for details.

To turn the backlight on and off:

- Press the power button twice in quick succession.

### Backlight tips:


- The backlight turns on automatically when an incoming call "wakes up" your communicator.
- The backlight also turns off automatically (after a period of inactivity) with the Auto-off feature. See page 177 for details.



## Adjusting the contrast

The contrast control screen enables you to adjust the appearance of your communicator screen for the clearest screen display. Depending on the lighting conditions or temperature of the environment where you use your communicator, you may need to adjust the contrast.

To adjust the contrast:

1. Press Option .
2. Type the letter Q.
3. Press the scroll buttons on the front panel of your communicator.

Tip: You can also drag the slider or tap the ends of the contrast bar to increase or decrease the contrast.

4. Press Space .

## Using the stylus to get things done

Like using a mouse to click elements on a computer screen, using the stylus to tap elements on your communicator screen is a way to get things done on your communicator.

The first time you start your communicator, setup instructions appear on the screen. These instructions include a calibration screen, or digitizer. Calibration aligns the internal circuitry of your communicator with its touch-sensitive screen so that when you tap an element on the screen, the communicator can detect exactly which task you want to perform.

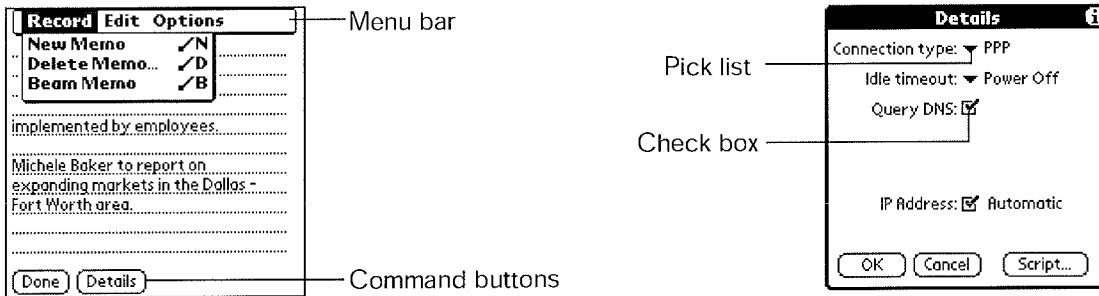
Important: Always use the point of the stylus for tapping the communicator screen. Never use an actual pen, pencil, or other sharp object to tap the communicator screen.

With your communicator turned on, you can tap the communicator screen to perform many operations, such as the following:

- Open applications
- Choose menu commands
- Initiate a global Find operation
- Select options in dialog boxes

Just as you can drag the mouse to select text or move objects on your computer, you can also drag the stylus to select text. You can also use the stylus to drag the slider of any scroll bar.

# Elements of the communicator interface

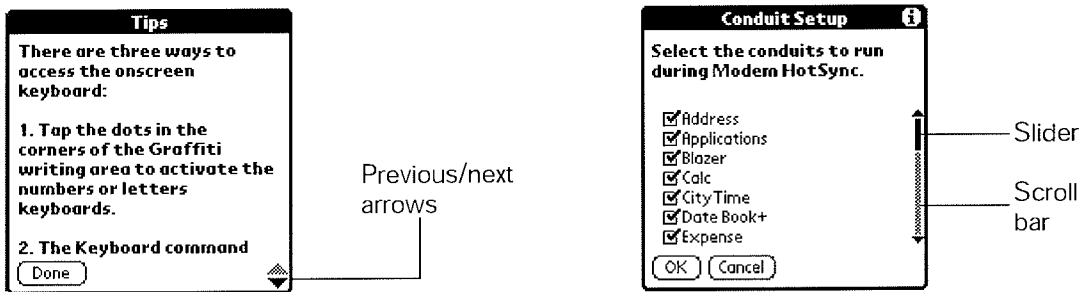


**Menu bar** A set of commands that are specific to the application. Not all applications have a menu bar.

**Command buttons** Tap a button to perform a command. Command buttons appear in dialog boxes and at the bottom of application screens.

**Check box** When a check mark appears in a check box, the corresponding option is active. If a check box is empty, tapping it inserts a check mark. If a check box is checked, tapping it removes the check mark.

**Pick list** Tap the arrow to display a list of choices, and then tap an item in the list to select it.



**Previous/next arrows** Tap the up and down arrows to display the previous and next page of information; tap the left and right arrows to display the previous and next record.

**Scroll bar** Roll the rocker switch or press the scroll buttons on the front panel of your communicator to scroll to the previous and next pages. To scroll the display one line at a time, tap the top or bottom arrow.

You can also scroll by dragging the slider or by tapping the scroll bar just above or below the slider to scroll to the previous or next page.

## Moving around the screen

You can move between entry fields, pick lists, check boxes, and other options by using the stylus, the scroll buttons, or the rocker switch.

To move around the screen do one of the following:

- Tap an item with the stylus.
- Press the scroll buttons to scroll through the items on the screen.
- Roll the rocker switch up or down to scroll through the items on the screen.

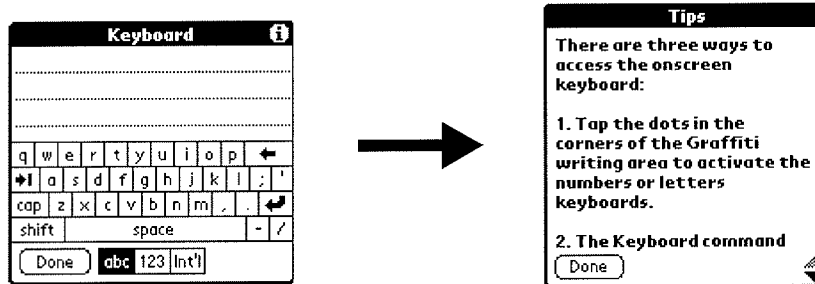
Tip: To learn how to move around the screen using the Treo keyboard, see page 30.

## Displaying online tips

Many of the dialog boxes that appear on your communicator contain an online Tips icon in the upper-right corner. Online tips anticipate questions you have in a dialog box, provide shortcuts for using the dialog box, or give you other useful information.

To display an online tip:




1. Tap the Tips icon .
2. After you review the tip, hold Option  and press Return  to finish.



## Customizing your communicator

You can customize your communicator by using the Preferences application. You can enter personal information such as your name and address; change the time and date; view different date and time formats when you travel; turn off sounds; configure your communicator to work with a modem or network, and select ringer settings. See Chapter 7 for more information on customizing your communicator.

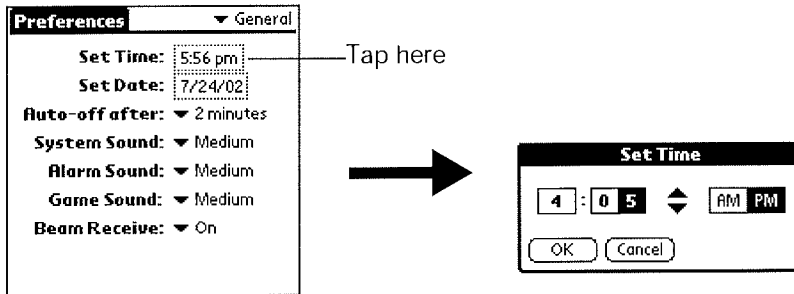
To open the Preferences screens:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the Preferences icon .
3. Tap the category pick list in the upper-right corner of the screen.
4. Tap the Preferences category you want to view.

The following procedures for setting the time and date give you an example of how to customize your communicator. You make changes to the time and date in General preferences.



To set the current time:

1. Tap the Set Time box.




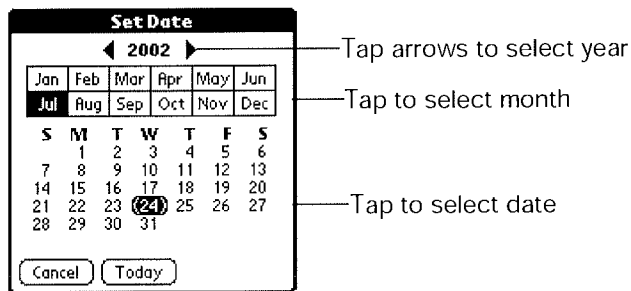
2. Tap the up or down arrows to change the hour.
3. Tap each minute number, and then tap the arrows to change them.
4. Tap AM or PM.



Note: Your communicator can also display time based on a 24-hour clock. See page 176 for details.

5. Hold Option  and press Return  to finish.

To set the current date:

1. Tap the Set Date box.
2. Hold Option  and press a scroll button to scroll to the current year.



3. Hold Shift  and press a scroll button to scroll to the current month.
4. Type the number for the current date.
5. Press Space  to select the date.

Tip: You can also select the date by tapping the screen as shown above.

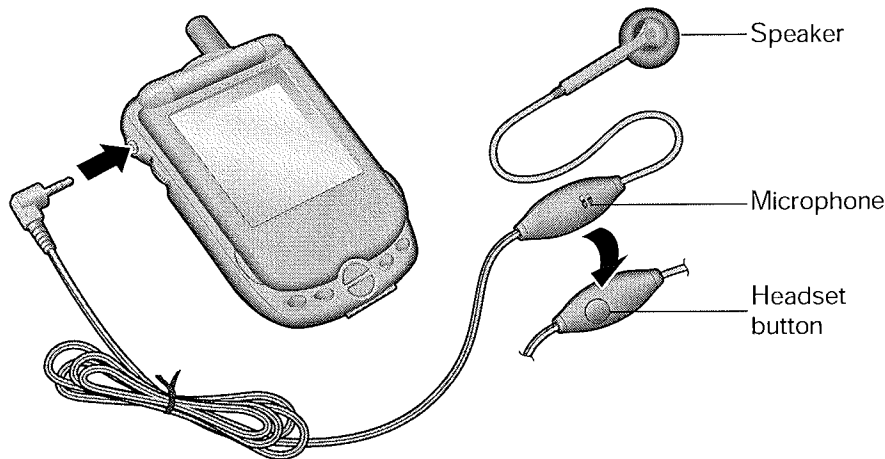
## Using the headset

You can connect a headset for hands-free operation. Your Treo is compatible with the included headset and other headsets listed at [www.handspring.com](http://www.handspring.com). If you need to use your phone while driving and this is permitted in your area, we recommend using a headset.

Note: Treo is not compatible with three-pin (also called three-pole) style headsets. You can determine whether a headset is a three-pin headset by counting the number of silver rings on the headset pin. A three-pin headset has three rings.

To use the headset:

1. Connect the headset plug to the headset jack on the side of your communicator.



2. Place the speaker in your ear.
3. Press the headset button to perform any of the following functions:
  - Answer an incoming call (including an incoming call waiting call).
  - Switch between two active calls.
  - Place the second call on hold when you have two active calls.
  - Hang up an active call.

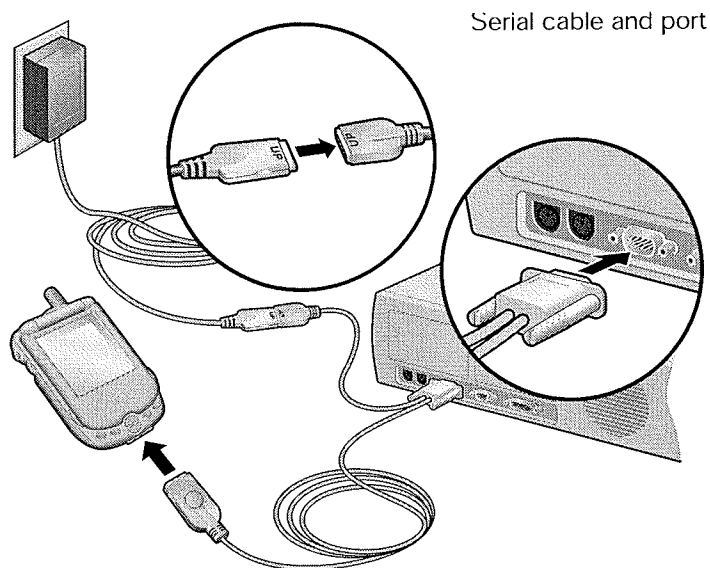
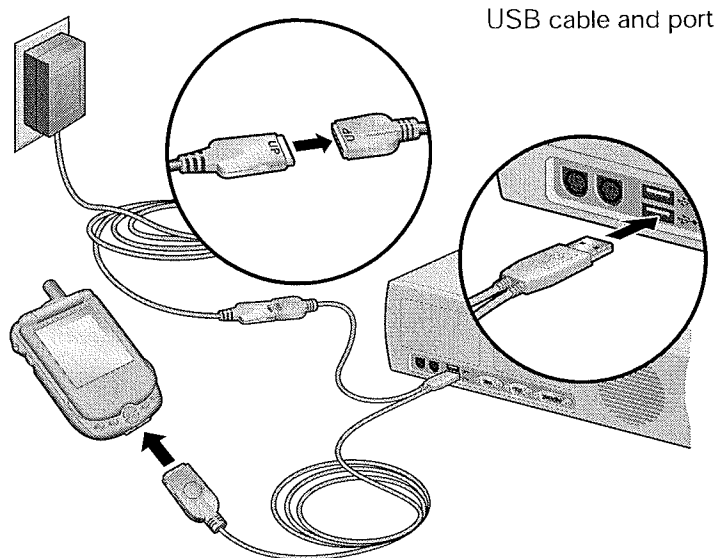
## Connecting the HotSync cable

The HotSync cable that comes with your Treo enables you to charge your communicator battery and to synchronize the information on your communicator using HotSync technology.

Note: If your computer does not have a USB port, or it uses Windows 95 or Windows NT, you need a serial HotSync cable to connect to your computer. You can purchase a serial HotSync cable from [www.handspring.com](http://www.handspring.com).

To connect the HotSync cable:

1. Connect the travel charger cable to the short end of the HotSync cable. Be sure to match the sides of the connectors labeled "UP."
2. Connect the USB HotSync cable to a USB port on your computer, or connect the Serial HotSync cable to a Serial port on your computer.
3. Connect the long end of the HotSync cable to your communicator with the button facing up.



Note: If you are unsure about the exact location of the USB port or serial port on your computer, refer to the manual supplied with the computer.

4. Plug the travel charger into a wall outlet.

Tip: The travel charger does not need to be plugged into a wall outlet to perform a HotSync operation. However, if you want to use the HotSync cable to charge your Treo communicator, you must plug the travel charger into a wall outlet.

## Using desktop software

When you use desktop software with HotSync technology, you can do any of the following:

- Work with your communicator applications on your computer. Most desktop software applications duplicate many of the applications on your communicator, so you can view, enter, and modify most of the data stored on your communicator.
- Back up and synchronize data between your communicator and your computer. Synchronization is a one-step procedure that ensures that changes you make on your communicator or desktop software appear in both places. See the section that begins on page 74 for details.
- Configure the wireless data features of your Treo.
- Import and export data, so you can easily transfer data from other desktop applications into many of your applications. See the section that begins on page 34 for details.
- Print data from your desktop software on any printer.

## Using your communicator with Palm Desktop software

Your communicator comes with Palm Desktop software. Palm Desktop software includes many of the same applications as your communicator: Date Book, Address (the Contacts view in PhoneBook), To Do List, Memo Pad, Expense, and desktop e-mail connectivity.

The following instructions guide you through installing Palm Desktop software. After installation, refer to the online Help in Palm Desktop software for information about how to use the software.

**Note:** You must install the software that comes with your Treo communicator even if you already installed Palm Desktop software for a previous Palm OS handheld.

To ensure a safe and uninterrupted installation of Palm Desktop software, please do not simply copy the Palm Desktop software files to your computer's hard disk. You must use the installer to place the files in their proper locations and to decompress the files.

To install Palm Desktop software:

1. Connect the HotSync cable. See page 23 for instructions.
2. Exit any open programs, including those that run at startup such as Microsoft Office, and disable any virus-scanning software.
3. Insert the Handspring CD-ROM into the computer's CD-ROM drive.
4. If the language selection screen appears, click the same language you selected on your communicator. Choosing a different language may result in loss of data.
5. If the model selection screen appears, click the name of the product you purchased and follow the onscreen instructions to continue the installation.
6. Follow the onscreen instructions to complete the installation and to configure your Treo for wireless data communication.

When the set up process is done, the installation screen closes automatically.

## Using your communicator with Microsoft Outlook

The software that comes with your Treo communicator includes everything you need to synchronize your communicator with Microsoft Outlook. If you already have Microsoft Outlook installed on your computer, the installation program prompts you to choose the Microsoft Outlook synchronization option.

## Using your communicator with another PIM

If you prefer to use another personal information manager (PIM), such as Lotus Notes, you can use it if third-party connection software, called a conduit, is available for your PIM. You must install the software that came with your Treo communicator along with the conduit for your PIM to synchronize the data between your communicator and your PIM. For information on conduit software, go to this web site: [www.handspring.com](http://www.handspring.com).

## Using an e-mail application with your communicator

Your communicator comes with two e-mail applications: One-Touch Mail™ by JP Mobile, and Palm Mail.

**Note:** To use a wireless e-mail application, your wireless service provider must support data services and it must be part of your service package (some wireless service providers may require you to sign up for data services separately). You must also have an account established with an ISP (Internet Service Provider). Many wireless service providers also provide ISP services. If ISP information is available from your wireless service provider when you configure your wireless communication settings with the Handspring CD-ROM, the installation program sets up your communicator for use with that provider.

### One-Touch Mail

One-Touch Mail is a wireless e-mail application that enables you to access your ISP (POP3 account) e-mail directly from your communicator. You may also be able to use One-Touch Mail to access your corporate e-mail; contact your System Administrator for assistance.

To install One-Touch Mail, do one of the following:

- Select the One-Touch Mail option when you configure the wireless communication features using the Handspring CD-ROM.
- If you already installed the desktop software from the Handspring CD-ROM but didn't install this application, select Configure Your Treo under Programs/Handspring (or Palm) on the Windows Start menu, and then choose One-Touch Mail when prompted to select an e-mail application.

### Palm Mail

Palm Mail is a synchronization based e-mail application. Each time you synchronize with your computer, Palm Mail retrieves new messages from your desktop e-mail application and sends any new messages you created on your communicator.

To install Palm Mail:

- Select Mail Setup under Programs/Handspring (or Palm) on the Windows Start menu.



## Chapter 2

# Entering Data in Your Communicator

This chapter explains how to enter data into your Treo™ 180 communicator using each of the following methods:

- Using the communicator keyboard
- Using the onscreen keyboard
- Using your computer keyboard
- Importing data

## Using the communicator keyboard

The communicator keyboard is the primary method you'll use to enter data into your communicator. Each letter key on the keyboard has three functions:

Normal: Types a lowercase letter.

Shift: Types an uppercase letter.

Option: Types the number/symbol, or activates the function, that appears in blue on the key.





## Typing capital letters

To type capital letters, you must first "shift" to caps and then type the character.

Note: Your communicator includes a feature that automatically capitalizes the first letter when you create a new sentence or a new record (by tapping New or a blank line).

To type a single capital letter (Caps Shift):

1. Press Shift .

When Caps Shift is active, an "up arrow" symbol appears in the lower-right corner of the Treo screen. If you accidentally activate Caps Shift, press Backspace  to cancel it.




2. Type the letter you want to capitalize.

To enter only capital letters (Caps Lock):

1. Press Shift  twice.

When Caps Lock is active, an underlined "up arrow" symbol appears in the lower-right corner of the communicator screen.





2. Type the text you want to capitalize.
3. Press Shift  to turn off Caps Lock.

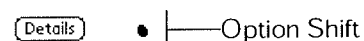
## Typing numbers and symbols

Typing numbers and symbols with your communicator is similar to typing symbols on a computer keyboard. You must first "shift" to option mode and then type the number or symbol strokes.

To enter a single number or symbol (Option Shift):

1. Press Option .

When Option Shift is active, a dot appears in the lower-right corner of the Treo screen. If you accidentally activate Option Shift, press Backspace  to cancel it.

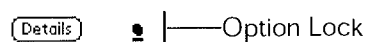



2. Press the key where the number or symbol appears in blue.

To enter only numbers or symbols (Option Lock):

1. Press Option  twice.
2. Press the keys where the numbers or symbols appear in blue.

When Option Lock is active, an underlined dot appears in the lower-right corner of the Treo screen.





3. Press Option  to turn off Option Lock.


## Typing accented characters

The ListType feature enables you to enter accented characters. You can enter the following accented letters:

à á â ã ä å ç è é ë ê ì í î ï ñ ò ó ô õ ö ù ú û ü ý ÿ

To enter accented characters:

1. Type the letter (uppercase or lowercase) to which you want to add an accent.
2. Press ListType .
3. Use the scroll buttons to select the accent you want to apply.
4. Press Space  to insert the accented character.


Tip: You can also select the accented character you want to insert by repeatedly pressing ListType .

## Typing extended characters

The ListType feature also enables you to enter many extended characters that are not on the keyboard, such as currency symbols and emoticons. Extended characters are often found under related characters. For example, the £ symbol is located under \$.



To enter extended characters:

1. Position the cursor where you want to insert the extended character.
2. Type the base character associated with the extended character you want to insert:

Tip: To view a list of available accented and symbol characters, press Menu  and under Edit select Keyboard Help (/G).

Base character	Symbols	Base character	Symbols	Base character	Symbols
a	æ	O	Ø	.	? ! ...
A	Æ	p	¶	,	''
b	β	P	¶	!	¡
B	β	r	®	?	¿
c	ç © ^ ^	R	®	:	;-) :- ( :-) ;-D
C	ç © ^ ^	s	ß š Š	'	' ' < > ~ `
d	đ ð	S	ß Š Š	"	" " « »
D	đ ð Ð	t	~ ™ † ‡	\$	€ £ ¥

e	€	T	~ ™ † ‡	+	&
E	€	x	×	-	— ~ • — —
f	f	X	×	/	\ ÷ †
F	f	y	¥	%	‰
i	£	Y	¥	#	=
L	£	0	‰ °	(	<[{<
m	μ	1	<sup>1</sup> ¼ ½	)	>]}>
M	μ	2	2		
o	ø	3	3		









3. Press ListType .
4. Use the scroll buttons to select the extended symbol you want to insert.
5. Press Space  to insert the extended character.

Tip: To enter a tab, press Shift  and then press Space .

### Navigation keystrokes

In addition to character symbols, your communicator includes special keystrokes that you can use to navigate within text or fields in your applications.

Note: Some applications may not support these navigation keystrokes.

Command	Keystrokes
Move cursor right	Hold Option  while pressing the bottom scroll button.
Move cursor left	Hold Option  while pressing the top scroll button.
Previous field	Press the top scroll button.
Next field	Press the bottom scroll button.
Affirm an action	Hold Option  and press Return  . Use these keys instead of tapping the following onscreen buttons: OK, Done, Yes, Next, Accept, Send, and Dial.
Annul an action	Hold Option  and press Backspace  . Use these keys instead of tapping the following onscreen buttons: Cancel, No, Previous, and Reject.
Open or dial the selected item	Press Space  or press Return  .


## Using menus

Menus on your communicator are easy to use. Once you have mastered them in one application, you can use them the same way in all other applications.

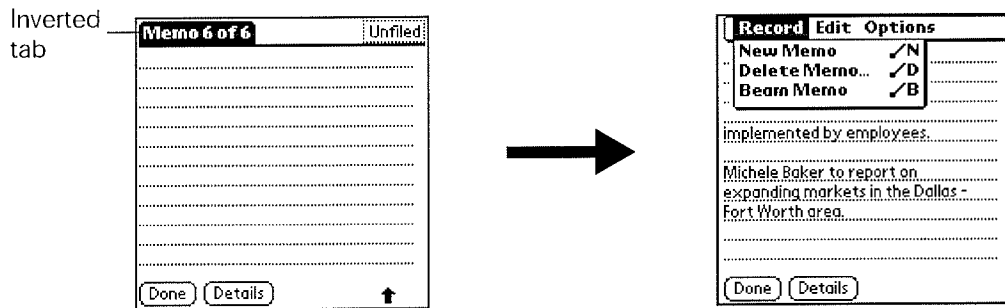
The menus and menu commands that are available depend on the application. Also, the menus and menu commands vary depending on which part of the application you're using. For example, in Memo Pad, the menus are different for the Memo list screen and the Memo screen.

The menus of each application are illustrated in the section on that application in Chapter 6. The Edit menu is described in the section that begins on page 60.


To use the menu bar:

1. Open an application (such as Memo Pad).
2. Press Menu  to open the menu bar.

Tip: You can also open the menu bar by tapping the inverted tab at the top of any application's screen (except Calculator).



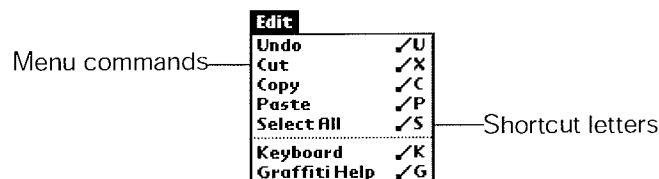
In this example, three menus are available: Record, Edit, and Options. The Record menu is selected and contains the commands New Memo, Delete Memo, and Beam Memo.

3. Press the top scroll button to switch between menus.
4. Press the bottom scroll button to select a command within a menu.
5. Press Space  to run the selected command.


Tip: To close the menus without running a command, press Menu  again.


## Keyboard shortcut menu commands

Most menu commands have an equivalent keyboard shortcut. The shortcut letters appear to the right of the menu command names. Throughout this guide, the shortcut letters appear in parentheses (/C) next to menu selection instructions.



To use keyboard shortcuts for menu commands:

1. Press Menu  to open the menu bar.
2. Type the menu command shortcut letter.

For example, to choose Copy in the Edit menu, press Menu  followed by the letter "c."

Tip: When the menu bar is open, you can enter a shortcut letter for any menu item in the current application view, not just the ones that appear on the current menu.

## Using text ShortCuts



ShortCuts make entering commonly used words or phrases quick and easy. ShortCuts are similar to the Glossary or Autotext features of some word processors.

Your communicator comes with several predefined ShortCuts, and you can also create your own. Each ShortCut can represent up to 45 characters. For example, you might create a ShortCut for your name, or for the header of a memo. See the section that begins on page 190 to learn about creating your own ShortCuts.

Your communicator includes the following predefined ShortCuts:

Entry	ShortCut
Date stamp	ds
Time stamp	ts
Date / time stamp	dts
Meeting	me
Breakfast	br
Lunch	lu
Dinner	di

To use a ShortCut:

1. Type the letter s.
2. Press ListType .
3. Use the scroll buttons to select the ShortCut symbol .


Note: The ShortCut symbol appears by the cursor to show that you are in ShortCut mode.

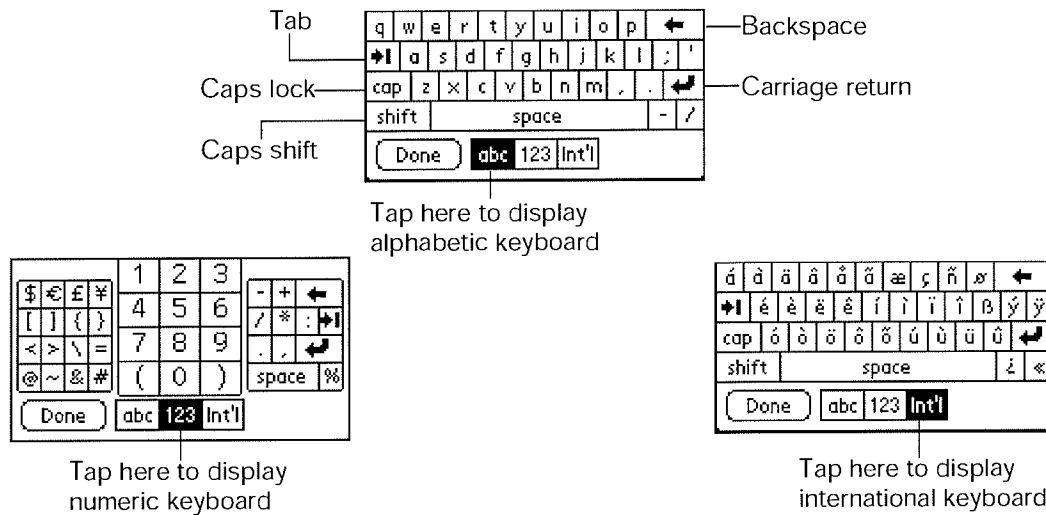
4. Type the ShortCut characters.

## Using the onscreen keyboard

You can open the onscreen keyboard anytime you need to enter text or numbers on your communicator. When used in conjunction with the backlight, the onscreen keyboard is especially useful for typing in the dark.

To use the onscreen keyboard:

1. Open a record in an application that requires you to enter data (such as Memo Pad).
2. Press Menu .
3. Under Edit, select Keyboard (/K).
4. Tap the characters to enter text, numbers, and international characters.



Note: The onscreen keyboard also includes a dialog box for international characters. You can switch among the three dialogs at any time to enter the exact text you need.

5. After you finish, tap Done to close the onscreen keyboard and place the text in the record.

## Using your computer keyboard

Many of the applications on your communicator are available in Palm Desktop software and in most Personal Information Manager (PIM) applications. If you have a lot of data to enter, or prefer to use the computer keyboard, you can use Palm™ Desktop software, or any supported PIM such as Microsoft Outlook, to enter information. You can then perform a HotSync® operation to synchronize the information on your computer with the information on your communicator. See the section that begins on page 74 for details on HotSync operations.

Refer to Palm Desktop online Help or the documentation that came with your PIM software for more information on entering data on your computer.

## Importing data

If you have data stored in computer applications such as spreadsheets and databases, or if you want to import data from another Palm OS® handheld, you can transfer the data to your communicator without having to key it in manually. Save the data in one of the file formats listed below, import it into Palm Desktop software, and then perform a HotSync operation to transfer the data to your communicator.

Palm Desktop software can import data in the following file formats:

- Comma delimited (.csv, .txt): Address and Memo Pad only
- Tab delimited (.tab, .tsv, .txt): Address and Memo Pad only
- CSV (Lotus Organizer 2.x/97 Mapping): Address only
- vCal (.vcs) Date Book only
- vCard (.vcf) Address only
- Date Book archive (.dba)
- Address archive (.aba)
- To Do List archive (.tda)
- Memo Pad archive (.mpa)

Archive formats can only be used with Palm Desktop software. Use the archive file formats to share information with other people who use Palm OS handhelds or to create a copy of your important Palm Desktop information.

### To import data:

1. Open Palm Desktop software.
2. Click the application into which you want to import data.
3. If you are importing records containing a field with category names, select All in the Category box.

Be sure that the same categories that appear in the imported file also exist in the application. If the categories do not exist, create them now; otherwise, the records are imported into the Unfiled category.

4. From the File menu, select Import.
5. Select the file you want to import.
6. Click Open.
7. To import data into the correct Palm Desktop fields, drag fields in the left-hand column so that they are opposite the corresponding imported field on the right.
8. If you do not want to import a field, deselect the check box for that field.



9. Click OK.

The imported data is highlighted in the application.

10. To add the imported data to your communicator, perform a HotSync operation.

See Palm Desktop online Help for more information on importing and exporting data.



## Chapter 3

# Managing Your Applications

This chapter explains how to switch between applications on your Treo™ 180 communicator, how to change application settings so they are personalized to your work methods, and how to categorize applications so you view them in related groups.

## Using the Applications Launcher

Your communicator is equipped with a variety of applications. All the applications installed on your communicator appear in the Applications Launcher.

### Opening applications

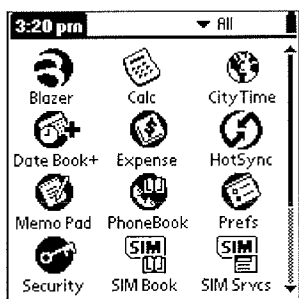
You can use the Applications Launcher to open any application installed on your communicator. You can also open the four main applications — PhoneBook, Date Book Plus, Blazer® (or another web browser installed by your wireless service provider), and SMS Messaging — with the application buttons on the front panel of your communicator.

**Tip:** When you press an application button on the front panel of your communicator, you have instant access to the selected application. You don't even need to turn on your communicator first.

In addition to providing a way for you to open applications, the Applications Launcher displays the current time, battery level, wireless signal status, and application category.

To open an application:



1. Press Option  and then press Menu  to access the Applications Launcher.



2. Tap the icon of the application that you want to open. To see additional applications, press the scroll buttons.

**Tip:** To find an application quickly, you can type the first letter of its name. The Applications Launcher scrolls to the first application with a name that begins with that letter. You can also create categories and organize your applications by category. See page 38 for details.




## Switching between applications

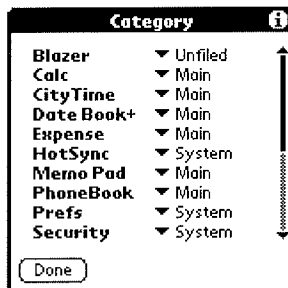
When working in any application, press Option  and then press Menu , or press an application button on the front panel of your communicator to switch to another application. Your communicator automatically saves your work in the current application and displays it when you return to that application.



## Categorizing applications



The category feature enables you to manage the number of application icons that appear onscreen in the Applications Launcher. You can assign an application to a category and then display a single category or all your applications.

To categorize an application:





1. Press Option  and then press Menu  to access the Applications Launcher.
2. Press Menu  again to open the menus.
3. Under App, select Category (/Y).
4. Tap the pick list next to each application to select a category.



Tip: To create a new category, tap Edit Categories from the pick list. Tap New, enter the category name. Hold Option  and press Return  twice to add the category.

5. Hold Option  and press Return  to finish.






To display applications by category:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Do one of the following:
  - Hold Option  and press Menu  repeatedly to cycle through all your categories.
  - Tap the pick list in the upper-right corner of the screen and select the category you want to display.

## Changing the Applications Launcher display






By default, the Applications Launcher displays each application as an icon. As an alternative, you can choose to show a list of applications. You can also choose to view the same category of applications each time you open the Applications Launcher.

To change the Applications Launcher display:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Press Menu  again to open the menus.
3. Under Options, select Preferences(/R).
4. Tap the View By pick list and select List.
5. Hold Option  and press Return  to finish.




To open the Applications Launcher to the last opened category:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Press Menu  again to open the menus.
3. Under Options, select Preferences (/R).
4. Tap the Remember Last Category check box to select it.
5. Hold Option  and press Return  to finish.



## Choosing preferences

You can set options that affect an entire application in the application's Preferences dialog box.

To change preferences for an application:

1. Open an application.
2. Press Menu .
3. Under Options, select Preferences (/R).

Note: Not all applications have a Preferences command.

4. Make changes to the settings.
5. Hold Option  and press Return  to finish.

## Installing and removing applications

This section explains how to install and remove applications on your communicator and how to remove Palm™ Desktop software from your computer.

### Installing add-on applications

Your communicator comes with the PhoneBook, Date Book Plus, Blazer (or another web browser installed by your wireless service provider), SMS Messaging, To Do List, Memo Pad, Expense, Calculator, CityTime, SIM Book, and SIM Services applications installed and ready to use. The Handspring CD-ROM also includes e-mail applications which you can install when you configure the wireless portion of your communicator with the CD-ROM.

You can also install additional applications on your communicator, such as business applications, games, and other software. The Install Tool makes it easy to install software on your communicator during a HotSync® operation. There are a variety of third-party applications available for devices that use Palm OS software. To learn more about these applications, go to the web site: [www.handspring.com](http://www.handspring.com).

When you download an add-on application from the Internet, it is probably in a compressed format such as a .zip or .sit file. If you have a decompression utility on your computer, use it to decompress the .prc and .pdb files inside the compressed file. If you do not have a decompression utility, search the Internet using phrases like 'zip decompression' or 'how to unzip'. This will lead you to various third-party utilities that you can use to decompress any kind of compressed or downloaded file--not just add-ons for your communicator. After you install the utility, you are ready to decompress the add-on application files that you downloaded.

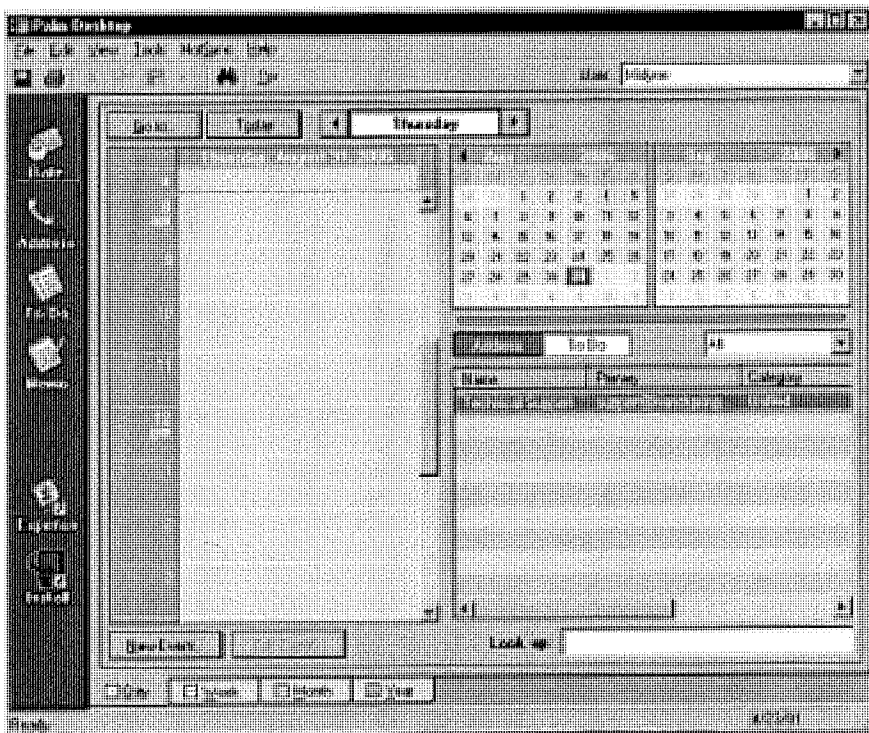
Note: Any applications that you install on your communicator resides in RAM memory; you can delete them at any time.

To install add-on software on your communicator:

1. Copy or download the application you want to install into the add-on folder in your Handspring (or Palm) directory on your computer.

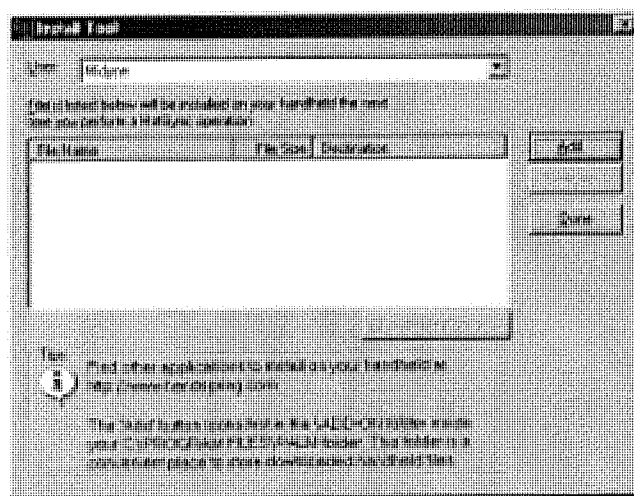
Note: If the software you download is compressed, you need to decompress it into this folder. If you prefer to place the application into another folder, you need to navigate to that folder before you complete step 5.

2. Double-click the Palm Desktop icon on your desktop.

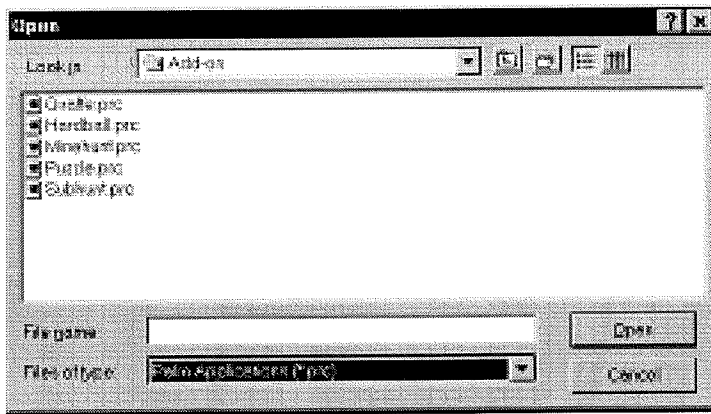


3. Click Install.

Tip: You can also access the Install Tool dialog box by selecting Install Tool under Handspring on the Start menu, or by double-clicking any file with a PRC file extension.



4. In the User drop-down list, select the name that corresponds to your communicator.
5. Click Add.



6. Select the application(s) that you want to install on your communicator.
7. Click Open.

Note: Review the list of applications you selected in the Install Tool dialog box. If you do not want to install an application, select it, and then click Remove. (This does not remove the application from your computer; it simply removes it from the list of applications to install.)




8. Click Done.
9. Perform a HotSync operation to install the application(s) you selected in step 6. See the section that begins on page 74 for details.

Tip: You can also install an application by simply double-clicking the application's icon.

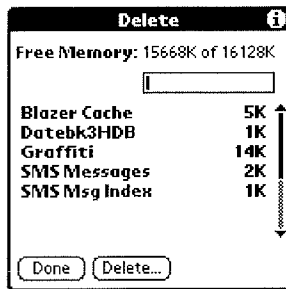
## Removing applications



In the event that you run out of memory or decide that you no longer need an application you installed, you can remove applications from your communicator. You can remove only add-on applications, patches, and extensions that you install; you cannot remove the applications that reside in the ROM portion of your communicator.

To remove an add-on application:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Press Menu  again to open the menus.
3. Under App, select Delete (/D).
4. Tap the application that you want to remove.





5. Tap Delete.
6. Hold Option  and press Return  twice to finish.
7. Check the Backup folder (under your user name folder in the Handspring or Palm folder) on your computer. If you find a PRC file for the application you just removed, delete the PRC file from the Backup folder.

**Tip:** If you installed Palm Desktop software for the first time when you purchased your Treo communicator, the Palm Desktop software is located in the Handspring folder. If you upgraded from a previous version of Palm Desktop software, these files are most likely located in the Palm folder.

## Removing Palm Desktop software

Removing Palm Desktop software also removes HotSync Manager. If you remove this software from your computer, you cannot synchronize your data. So, we highly recommend leaving Palm Desktop software on your computer.

To remove Palm Desktop software:

1. From the Windows Start menu, choose Programs, Handspring (or Palm) and then Uninstall.
2. Click Yes to uninstall the software.

## Security

Your communicator comes with a Security application so that unauthorized users cannot view the entries you wish to protect.

**Note:** To access the Security application, you must first select either the All or System category from the Applications Launcher.






**In Security, you can do the following:**

- Mask or hide entries you define as private. The Mask option displays a gray bar over private records, and the Hide option completely removes (hides) private records. See the section that begins on page 71 for more information.
- Assign a password to the Security viewing options. Assigning a password requires you to enter a password to view masked or hidden private entries; not assigning a password enables you (or anyone else) to view individual masked private entries by tapping them, and to view all hidden or masked private entries by selecting Show Records in the Security dialog box.
- Lock and turn off your communicator so that it does not operate until you enter the correct password.



## Assigning a password

You can assign a password to protect your private records and to lock your communicator.

To assign a password:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the Security icon .
3. Tap the Password box.
4. Enter a password.
5. Hold Option  and press Return .



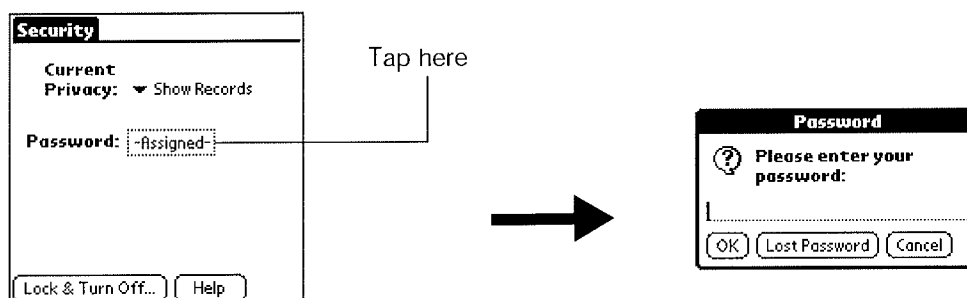
6. Enter the *same* password a second time.
7. Hold Option  and press Return  to finish.

## Changing or deleting a password



Once you define a password for your communicator, you can change or delete it at any time. You must enter the current password before you can change or delete it.

To change or delete your password:

1. Tap the Password box.
2. Enter the current password.



3. Hold Option  and press Return .

4. Do one of the following:
  - To change the password, enter the new password, and hold Option  and press Return .
  - To delete the password, tap Delete.



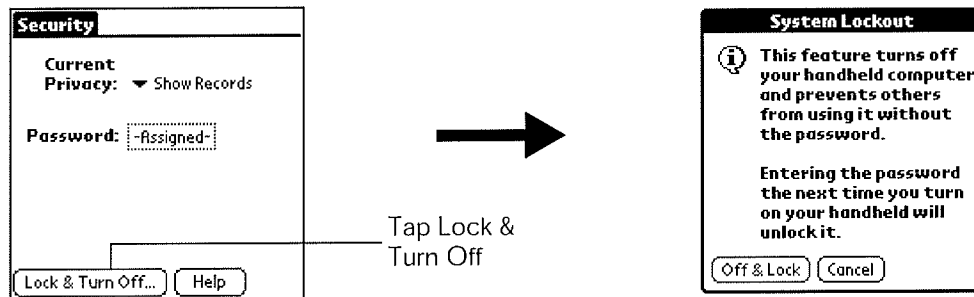
## Locking your communicator

You can also lock your communicator so that you need to enter your password to operate it.

**Important:** If you lock your communicator, you must enter the exact password to re-activate your communicator. If you forget the password, you need to perform a hard reset to resume using your communicator. Performing a hard reset deletes all the records in your communicator; however, you can restore all previously synchronized data at the next HotSync operation. See page 211 for details.

To lock your communicator with a password:

1. Assign a password.
2. Tap Lock & Turn Off.



3. Tap Off & Lock.
4. To start your communicator, turn it on, and then enter the password.

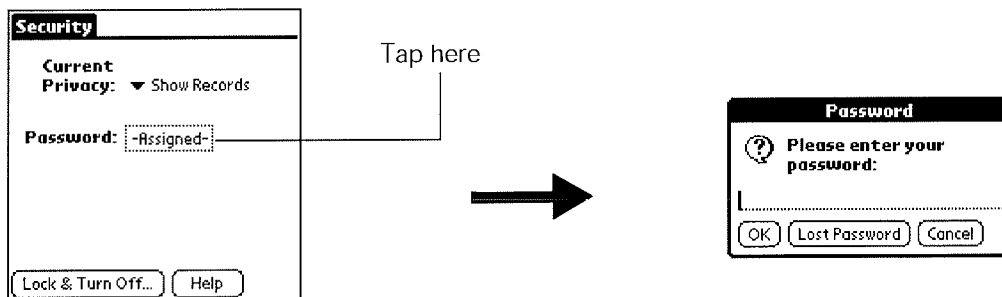
## Recovering from a forgotten password



If you did not activate the Off & Lock feature and you forget your password, you can delete the password from your communicator. Deleting a forgotten password also deletes all entries and files marked as Private.

**Important:** If you synchronize with your computer before deleting a forgotten password, your communicator restores your private entries the next time you perform a HotSync operation, but it does not restore the password.

To delete a forgotten password:

1. Tap the Password box.
2. Tap Lost Password.



3. Hold Option  and press Return  for Yes.

## Chapter 4

# Applications Overview

This chapter briefly describes each application and how to open it. Your Treo™ 180 communicator comes with these applications already installed:

- PhoneBook
- Date Book Plus
- Blazer®
- SMS Messaging
- To Do List
- Memo Pad
- CityTime
- Calculator
- Expense
- SIM Book
- SIM Services

# PhoneBook



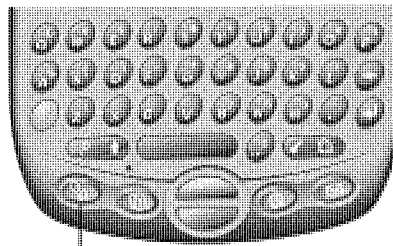
PhoneBook enables you to make and receive telephone calls, and to keep names, addresses, phone numbers, and other information about your personal or business contacts.

## In PhoneBook, you can do the following:



- Store thousands of names, addresses, phone numbers, e-mail addresses, and more, in your Contacts list.
- Create up to 50 speed dial entries.
- Dial numbers from the Dial Pad, your Speed Dial list, your Contacts list, or the Call History list on your communicator.
- Quickly look up, enter, or duplicate names, addresses, phone numbers, and other information.
- Enter up to five phone numbers (home, work, fax, mobile, etc.) or e-mail addresses for each name.
- Attach a note to each Contacts entry, in which you can enter additional information about the entry.
- Assign Contacts entries to categories so that you can organize and view them in logical groups.
- Display a history list of your incoming and outgoing calls.

## To open PhoneBook:

- Press PhoneBook . PhoneBook opens to display the Speed Dial view.



PhoneBook button

**Tip:** Press PhoneBook  repeatedly to cycle through the Speed Dial, Dial Pad, Contacts, and Call History views. Press and hold PhoneBook  to redial the last number you called.

## Date Book Plus




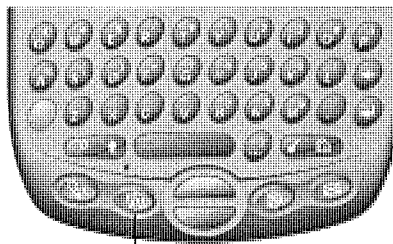
Date Book Plus lets you quickly and easily schedule appointments or any kind of activity associated with a date and/or a time.

### In Date Book Plus, you can do the following:


- Enter a description of your appointment and assign it to a specific time and date.
- Display a chart of your appointments for an entire week to easily spot available times and any potential scheduling overlaps or conflicts, or display descriptions of your appointments for one or two weeks.
- Display a monthly calendar to quickly spot days where you have morning, lunch, or afternoon appointments, or display a calendar for an entire year.
- Display a list of both your appointments and your To Do items.
- Create unscheduled events or To Do items that float from one day to the next until you complete them.
- Create a Daily Journal to track events with automatic time stamps.
- Set an alarm to sound prior to the scheduled activity, and create reminders for events that are based on a particular date, rather than time of day, such as birthdays and anniversaries.
- Attach notes to individual events for a description or clarification of the entry in your Date Book.

### To open Date Book Plus:

- Press Date Book Plus . Date Book Plus opens to today's schedule.



Date Book Plus button

Tip: Press Date Book Plus  repeatedly to cycle through the Day, Week, Week with Text, Month, Year, and List views.

## Blazer Web Browser




Blazer is a wireless Internet browser that lets you browse your favorite web sites while you're on the go.





**Note:** To use Blazer, you must subscribe to data services from your wireless service provider, and you must have an account established with an ISP (Internet Service Provider). Many wireless service providers also provide ISP services. If ISP information is available from your wireless service provider when you configure your wireless communication settings with the Handspring CD-ROM, the installation program sets up Blazer for use with that provider. If you already installed the desktop software from the Handspring CD-ROM but didn't configure the wireless communication settings, select **Configure Your Treo** under **Programs/Handspring** (or **Palm**) on the Windows Start menu, and follow the instructions on the screen.

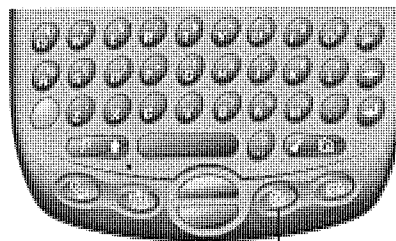
### In Blazer, you can do the following:

- Access the World Wide Web and display Internet content.
- Create up to 100 bookmarks for quick and convenient access to your favorite web sites.
- Navigate between web pages with familiar toolbar icons.

### To open Blazer:

- Press Blazer . Blazer opens to display the Page view.

**Note:** If a different application appears when you press Blazer , your wireless service provider installed another application as the default web browser. To launch Blazer, press **Option** , press **Menu** , and then tap the Blazer icon .



Blazer button

**Tip:** Press Blazer  repeatedly to toggle between the Page and Bookmark views.



## SMS Messaging



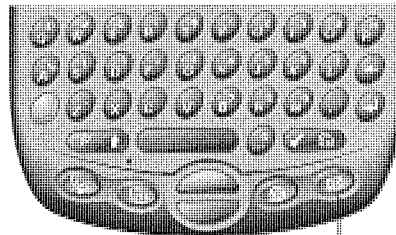
SMS Messaging provides a way for you to exchange short text messages with other people who use GSM mobile phones and subscribe to an SMS service. Some wireless service providers also provide a gateway to communicate with e-mail addresses.

In SMS Messaging, you can do the following:


- Send and receive short text messages.
- Read incoming messages directly from the Inbox.
- Create messages quickly with quick list address selection and boilerplate text.
- Review messages you sent in the Sent folder.

To open SMS Messaging:

- Press SMS Messaging . SMS Messaging opens to display the Inbox view.



SMS Messaging button

Tip: Press SMS Messaging  repeatedly to cycle through the Inbox, Sent, and Pending views. However, if there are no messages in the Pending view, it does not cycle through this view when you press the application button.

## To Do List






To Do List is a convenient place to create reminders and prioritize the things that you have to do.

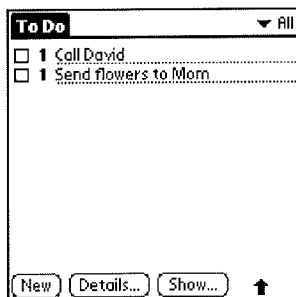
In To Do List, you can do the following:

- Make a quick and convenient list of things to do.
- Assign a priority level to each task.
- Assign a due date for any or all of your To Do items.
- Assign To Do items to categories so that you can organize and view them in logical groups.
- Sort your To Do items either by due date, priority level, or category.
- Attach notes to individual To Do items for a description or clarification of the task.

To open To Do List:

1. Press Option .
2. Press Date Book Plus .

Tip: You can also open To Do List by tapping the To Do List icon  in the Applications Launcher.



To Do List displays the category of items you last viewed.

# Memo Pad






Memo Pad provides a place to take notes that are not associated with records in other applications such as Date Book Plus, PhoneBook, or To Do List.

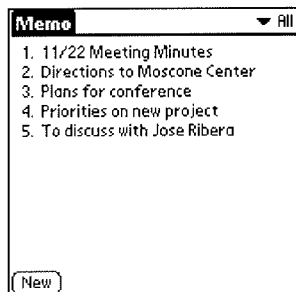
## In Memo Pad, you can do the following:

- Take notes or any kind of message on your communicator.
- Drag and drop memos into popular computer applications like Microsoft Word when you synchronize using Palm™ Desktop software and HotSync® technology.
- Assign memos to categories so that you can organize and view them in logical groups.
- Take down phone numbers and other types of information. Later, you can copy and paste this information to other applications.

## To open Memo Pad:

1. Press Option .
2. Press PhoneBook .

Tip: You can also open Memo Pad by tapping the Memo Pad icon  in the Applications Launcher.



Memo Pad displays the category of memos you last viewed.

# CityTime






CityTime helps you keep track of the time anywhere around the globe.

## In CityTime, you can do the following:

- Select a home city as a point of reference.
- Display the day and time in four other cities simultaneously.
- Add a definition for any city that isn't in the default list.
- Display sunrise and sunset information for your home city.

## To open CityTime:

1. Press Option .
2. Press Blazer .

Tip: You can also open CityTime by tapping the CityTime icon  in the Applications Launcher.



# Calculator



Calculator enables you to perform addition, subtraction, multiplication, division and a variety of advanced math and scientific calculations.

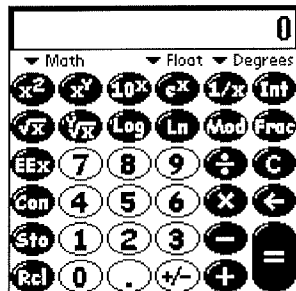
## In Calculator, you can do the following:


- Select a view to perform specific types of calculations including: math, trigonometry, finance, logic, statistics, weight/temp, length, area, and volume.
- Store and retrieve values.
- Display the last series of calculations, which is useful for confirming a series of "chain" calculations.
- Create a custom view with the buttons you use most often.
- Switch to basic mode to perform simple calculations.

## To open Calculator:

1. Press Option .
2. Press SMS Messaging .

Tip: You can also open Calculator by tapping the Calculator icon  in the Applications Launcher.



Tip: Hold Option  and press SMS Messaging  repeatedly to toggle between Basic and Advanced mode.

# Expense






Expense lets you keep track of your expenses and then transfer the information to a spreadsheet on your computer.

## In Expense, you can do the following:

- Record dates, types of expenses, amount spent, payment method, and other details associated with any money that you spend.
- Assign expense items to categories so that you can organize and view them in logical groups.
- Keep track of vendors (companies) and people involved with each particular expense.
- Log miles traveled for a particular date or expense category.
- Sort your expenses by date or expense type.
- Transfer your expense information to a Microsoft Excel spreadsheet (version 5.0 or later) on your computer. (Microsoft Excel is not included in the Treo communicator package.)

## To open Expense:

1. Press Option .
2. Press Menu .
3. Tap the Expense icon .

Expense		▼ All
4/14 Taxi	\$ 20.00	
4/14 Lunch	\$ 42.75	
4/14 Hotel	\$ 98.25	
4/14 Car Rental	\$ 127.38	

# SIM Book






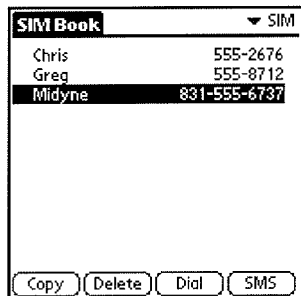
SIM Book enables you to view and manage the phone list on your SIM card.

In SIM Book, you can do the following:

- Copy entries from your speed dial list to your SIM card so you can access your phone numbers if you move your SIM card to another phone.
- Copy entries from your SIM card to your speed dial list.
- Delete entries from your SIM card.
- Dial entries on your SIM card.

To open SIM Book:

1. Press Option .
2. Press Menu .
3. Tap the SIM Book icon .



# SIM Services






SIM Services enables you to access applications on your SIM card that are provided by your wireless service provider.

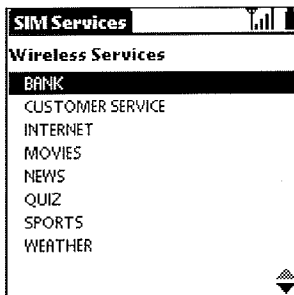
Note: Some wireless service providers do not put applications on the SIM card.

## In SIM Services, you can do the following:

- Access applications from your wireless service provider on your SIM card.

### To open SIM Services

1. Press Option .
2. Press Menu .
3. Tap the SIM Srvcs icon .





## Chapter 5

## Common Tasks




In addition to the wireless communication applications, your Treo™ 180 communicator also includes a full suite of personal information manager (PIM) applications: Date Book Plus, the Contacts view in PhoneBook, To Do List, Memo Pad, and Expense. This chapter provides instructions on how to do tasks that are common to several applications. It's easy to transfer what you learn in one application to the other applications because the structure and behavior of all these applications are quite similar.




Throughout this chapter, the term "record" is used to refer to an individual item in any of the PIM applications: a single Date Book Plus event, Contacts entry in PhoneBook, To Do List item, Memo Pad memo, or Expense item.

## Creating records

You can use the following procedure to create a new record in Date Book Plus, the Contacts view in PhoneBook, To Do List, Memo Pad, and Expense.

To create a record:

1. Open the application in which you want to create a record.
2. Do one of the following:
  - Start entering data (your communicator automatically creates a new record).
  - Tip: To create another new record, press the bottom scroll button and begin entering data.
  - In Date Book Plus and Contacts view in PhoneBook only: Press Menu  and under Record, select New... (/N).
  - Tap New.
3. In Date Book Plus only: Select start and end times for your event, and then hold Option  and press Return .
4. Enter text for the record.
 

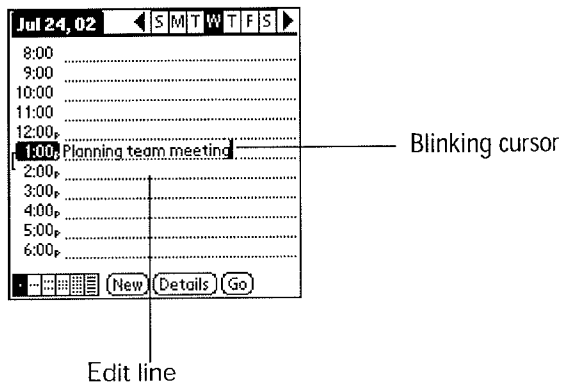
Note: You do not have to press Shift  to capitalize the first letter of the field. Your communicator automatically capitalizes the first letter of each field (except numeric and e-mail fields).
5. Use the scroll buttons, roll the rocker switch or tap a field directly to move between fields.
6. (Optional) Tap Details to select attributes for the record.
7. In Contacts view in PhoneBook only: Hold Option  and press Return  to finish.

There's no need to save the record because your communicator saves it automatically.

## Editing records

After you create a record, you can change, delete, or enter new text at any time. Two screen features tell you when your communicator is in editing mode:

- A blinking cursor
- One or more edit lines



## Entering text

For information on how to enter text using the keyboard on your communicator, the onscreen keyboard, or the keyboard attached to your computer, see Chapter 2.

## Edit menu

The Edit menu is available with any screen where you enter or edit text. In general, commands available in the Edit menu apply to text that you select (or highlight) in an application.

To select text in an application:



1. Tap the beginning of the text that you want to select.
2. Drag the stylus over the text to highlight it. You can drag across the text to select additional words, or drag down to select a group of lines.

Tip: To select a word, double-tap the word. To select a whole line, triple-tap the line.

The following commands may appear in an Edit menu:


**Undo** Reverses the action of the last edit command. For example, if you used Cut to remove text, Undo restores the text you removed. Undo also reverses deletions done by using backspace.

**Cut** Removes the selected text and stores it temporarily in the memory of your communicator. You can paste the text you cut into another area of the current application or into a different application.

<b>Copy</b>	Copies the selected text and stores it temporarily in the memory of your communicator. You can paste the text that you copy into another area of the current application or into a different application.
<b>Paste</b>	Inserts the text that you cut or copied at the selected point in a record. The text you paste replaces any selected text. If you did not previously cut or copy text, Paste does nothing.
<b>Select All</b>	Selects all of the text in the current record or screen. This enables you to cut or copy all of the text and paste it elsewhere.
<b>Keyboard</b>	Opens the onscreen keyboard. When you finish with the onscreen keyboard, hold Option  and press Return  to finish.
<b>Keyboard Help</b>	Opens screens that show many keyboard shortcuts and the base characters associated with symbols and other extended characters. Use this command anytime you need forget how to do something with the keyboard.

## Deleting records

To delete a record in any of the PIM applications:

1. Select the record you want to delete.
2. Press Menu .
3. Under Record, select the Delete command (/D):

Date Book Plus: Delete Item



Contacts view in PhoneBook: Delete Contact

To Do List: Delete Item

Memo Pad: Delete Memo

Expense: Delete Item



A confirmation dialog box appears. If you want to save a copy of the deleted item to an archive file in Palm Desktop software, be sure that the check box is checked. If you don't want to save a copy, tap the check box to remove the check.

4. Hold Option  and press Return  to finish.

If you choose to save a copy of the selected item, your communicator transfers it to the archive file on your desktop the next time you perform a HotSync operation.

## Other ways to delete records

You can also delete records in the following ways:

- In the Details dialog box of the application, tap Delete, and then hold Option  and press Return  to finish.
- Delete the text of the record.

Note: In Date Book Plus, if you delete the text of a repeating event, you delete all instances of that event.


## Purging records

Over time, as you use Date Book Plus, To Do List, and Expense, you'll accumulate records in these applications that have outlived their usefulness. For example, events that occurred months ago remain in the Date Book Plus, and To Do items that you marked as completed remain in the list, as do Expense items.

All these outdated records take up memory on your communicator, so it's a good idea to remove them by using Purge. If you think Date Book Plus or To Do List records might prove useful later, you can purge them from your communicator and save them in an archive file.

Purging is not available in the Contacts view in PhoneBook or in Memo Pad. So you need to delete outdated records from these applications individually.


To purge records:

1. Open the application.
2. Press Menu .
3. Under Record, select Purge (/E).

A confirmation dialog box appears.

Date Book Plus: Tap the pick list and select how old a record must be to be purged. Purge deletes repeating events if the last of the series ends before the date that you purge records.

Date Book Plus, To Do List: If you want to save a copy of the purged records to an archive file on your desktop, be sure that the check box is checked. If you don't want to save a copy, tap the check box to remove the check box.

4. Hold Option  and press Return  to finish.

If you chose to save a copy of the purged records, your communicator transfers them to an archive file on your desktop the next time you perform a HotSync operation.

Note: Purging does not happen automatically. You must use the command to make it happen.

## Categorizing records

Categorize records in the Contacts view in PhoneBook, To Do List, Memo Pad, and Expense applications so that they are grouped logically and are easy to review. (You can also categorize applications. See page 37 for details.)

When you create a record, your communicator automatically places it in the category that is currently displayed. If the category is All, your communicator assigns it to the Unfiled category. You can leave an entry as Unfiled or assign it to a category at any time.

### System-defined and user-defined categories

By default, your communicator includes system-defined categories, such as All and Unfiled, and user-defined categories, such as Business and Personal.


You cannot modify the system-defined categories, but you can rename and delete the user-defined categories. In addition, you can create your own user-defined categories. You can have a maximum of 15 user-defined categories in each application.

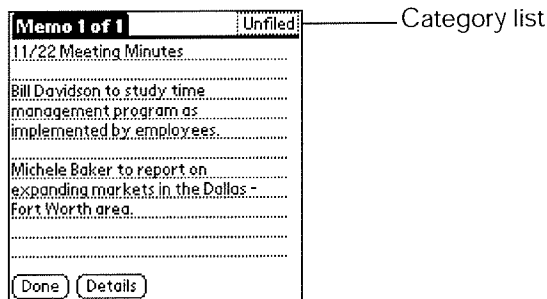
The Contacts view in PhoneBook contains the QuickList user-defined category, in which you can store the names, addresses, and phone numbers you might need in emergencies (doctor, fire department, lawyer, etc.).

Expense contains two user-defined categories, New York and Paris, to show how you might sort your expenses for different business trips.



Note: The illustrations in this section come from Memo Pad, but you can use these procedures in all the applications in which categories are available. Categories are not available in Date Book Plus.

To move a record into a category:

1. Open the record you want to categorize.
2. In Contacts view in PhoneBook only: Press Menu , and under Record, select Edit Contact (/E).
3. In the record view, tap the Category list to display the list of available categories.

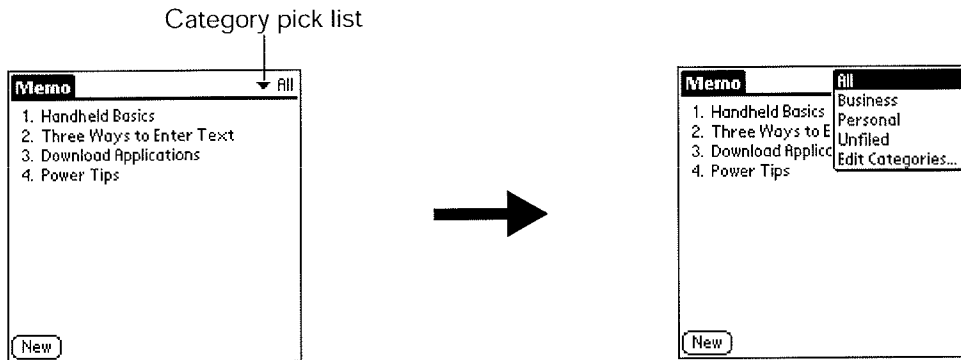


4. Select the category for the record.

Tip: You can also assign a record to a category by tapping the Details button, selecting a category from the Category pick list in the Details dialog box, and then holding Option  and pressing Return  to finish.

To display a category of records:

1. Tap the category pick list in the upper-right corner of the list screen.

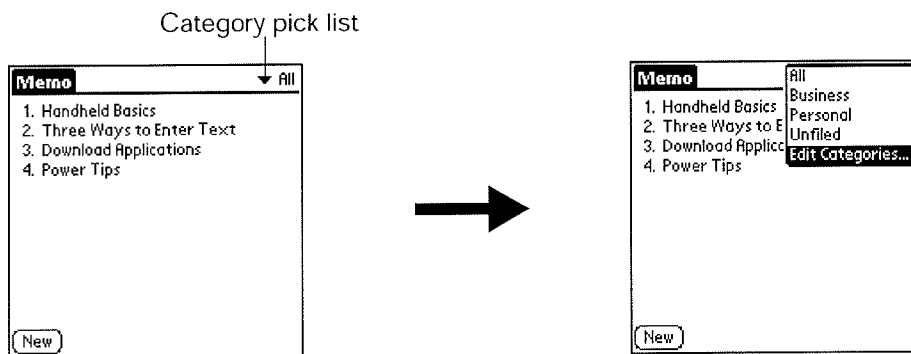


2. Select the category you want to view.

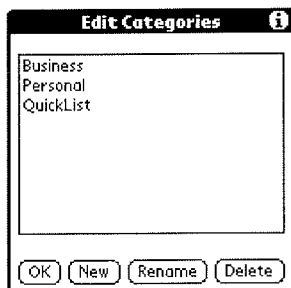
The list screen now displays only the records assigned to that category.

To define a new category:

1. Tap the category pick list in the upper-right corner of the screen.





2. Tap Edit Categories.
3. Tap New.



4. Enter the name of the new category.

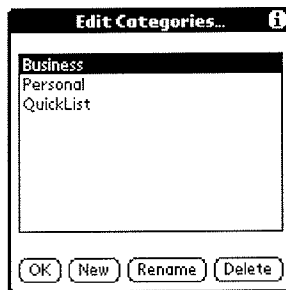


5. Hold Option  and press Return  twice to finish.

You can assign any of your records to the new category.



To rename a category:

1. Tap the category pick list in the upper-right corner of the screen.
2. Tap Edit Categories.
3. Select the category that you want to rename, and then tap Rename.



4. Enter the new name for the category.



5. Hold Option  and press Return  twice to finish.

**Tip:** You can group the records in two or more categories into one category by giving the categories the same name. For example, if you change the name of the Personal category to Business, all records formerly in the Personal category appear in the Business category.

## Finding records


Your communicator offers several ways to find information quickly:

- All applications: The Find utility locates any text that you specify, always starting with the current application.
- Date Book Plus, To Do List, Memo Pad: The Phone Number Lookup feature displays the Contacts view in PhoneBook and shows names and phone numbers for entries that have phone numbers. You can add the information that appears in this list to a record.

- PhoneBook: The Instant Lookup feature lets you scroll immediately to a Contacts record in PhoneBook by entering the first few letters of a first or last name, or the first name initial and the first few letters of a last name.
- Expense: The Lookup feature displays the Contacts in PhoneBook that have data in the Company field. You can add these names to a list of attendees associated with an Expense record.

## Looking up Contacts records in PhoneBook

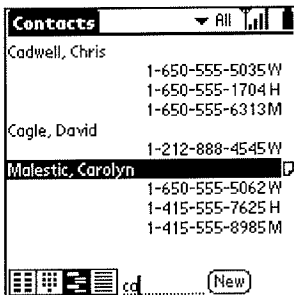
When working with the Contacts view in PhoneBook, the buttons on your communicator make it easy to navigate among your Contacts entries.

- In the Contacts list screen, the scroll buttons move the highlight. Holding Shift  and using the scroll buttons moves up or down an entire screen of records. If you press and hold a scroll button, you accelerate the scrolling and display every third screen.
- In the Contact View screen, the scroll buttons move to the previous or next Contacts record.


You can also use the Instant Lookup feature, from any of the PhoneBook views, to quickly scroll to any of your Contacts entries.

To use Instant Lookup to find a Contacts record:

1. From the Speed Dial, Contacts, or Call History views in PhoneBook, enter one of the following for the name you want to find:
  - First name initial and last name.
  - First name
  - Last name



For example, entering an "s" displays "Susan Lee," "James Sands," "Sal Martini," and "John Smythe." Entering "sm" reduces the list to "Sal Martini," and "John Smythe."



2. Use the scroll buttons to select the contact name.
3. Press Return  to view the contents of the record.



## Using Find

You can use Find to locate any text that you specify, in any application.

To use Find:

1. Press Option  and then press Shift  to open the Find dialog box.

**Tip:** If you select text in an application before you opening the Find dialog box, the selected text automatically appears in the Find dialog box.

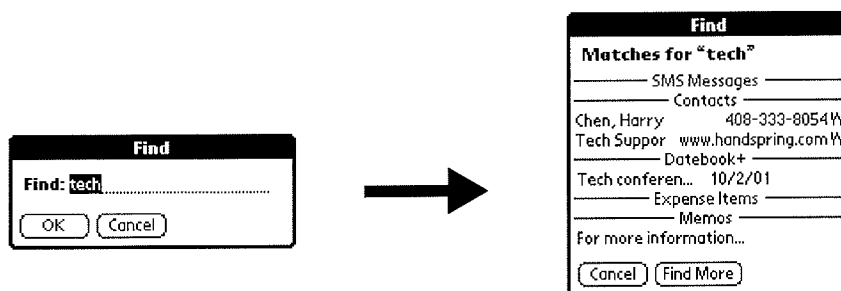
2. Enter the text that you want to find.

Find is not case-sensitive. For example, searching for the name "davidson" also finds "Davidson."

Find locates any word that begin with the text you enter. For example, searching for "plan" finds "planet," but not "airplane."

3. Hold Option  and press Return  to start the search.

Find searches for the text in all records and all notes.




As your communicator searches for the text, you can tap Stop at any time. You may want to do this if the entry you want appears before your communicator finishes the search. To continue the search after you tap Stop, tap Find More.

4. Tap the text that you want to review.

## Using Phone Number Lookup

Phone Number Lookup displays the information you entered in the Contacts view in PhoneBook, and it lets you add this information to a record.

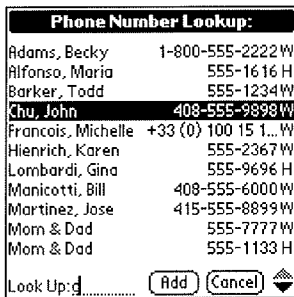
To use Phone Number Lookup:

1. Display the record in which you want to insert a phone number. The record can be in Date Book Plus, To Do List, or Memo Pad.
2. Press Menu .
3. Under Options, select Phone Lookup (/L).
4. If your Contacts view in PhoneBook is sorted by last name, begin to spell the last name. If your Contacts are sorted by first name, begin to spell the first name.

Note: The first initial and last name search in the PhoneBook Instant Lookup feature is not available in the Phone Number Lookup feature.

Phone Number Lookup displays records that begin with the letters you enter based on the sort method in your Contacts view in PhoneBook. For example, if your Contacts are sorted by last name and you enter "su," the list displays "John Sung" and "Mario Suarez." If your Contacts are sorted by first name, and you enter "su," the list displays "Susan Smith" and "Suki Sakimoto."

- Continue to spell the name you're looking for, or when you see the name, scroll to it.



- Press Space  or Return .

The name you selected, along with the other information associated with it, is pasted into the record you selected in step 1.

### Phone Number Lookup tips

You can also enter the keyboard shortcut (/L) to activate the Phone Number Lookup feature in the following circumstances:

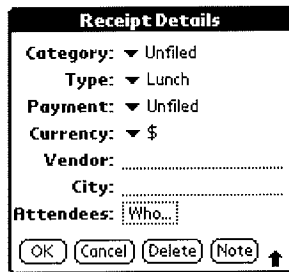
- While entering text: For example, if your Contacts view in PhoneBook is sorted by last name and you want to insert the full name and phone number for someone with the last name "Williams," enter "Wi" and then the Phone Number Lookup keyboard shortcut (/L). Assuming you have only one Contacts record with a last name that begins with "Wi," your communicator inserts the full name "Fred Williams" (and its associated information). If you have more than one name that begins with "Wi," the Phone Number Lookup screen appears and highlights the first record that begins with "Wi."
- For selected text: Drag to highlight the text, and then enter the Phone Number Lookup keyboard shortcut (/L). Your communicator replaces the selected text and adds the name and its associated information.

## Looking up names to add to expense records

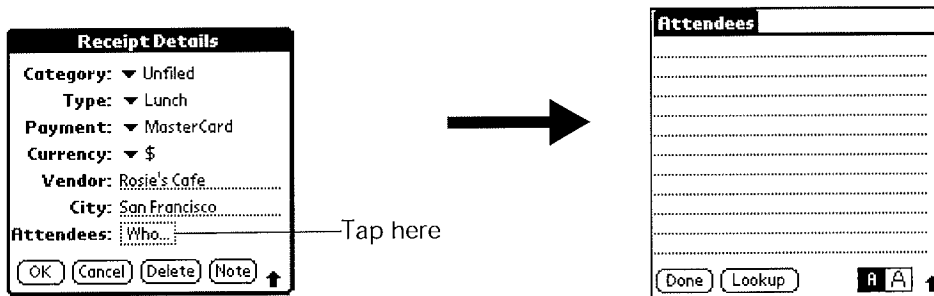
In Expense, Lookup displays the names of Contacts entries in Phonebook that have data in the Company field. You can add these names to a list of attendees associated with an Expense record.

To add names to an Expense record:

1. Open the Expense record to which you want to add names.
2. Tap Details.





3. Tap Who.





4. Tap Lookup.

The Attendees Lookup screen displays all the names of Contacts entries in Phonebook that have data in the Company field.

5. Use the scroll buttons to select the name you want to add.
6. Press Space  or Return .

The name appears in the Attendees screen.



7. Repeat steps 4 through 6 to add more names.
8. Hold Option  and press Return  twice to finish.

## Sorting lists of records


You can sort lists of records in various ways, depending on the application. Sorting is available in applications that have list screens: Contacts view in PhoneBook, To Do List, Memo Pad, and Expense.

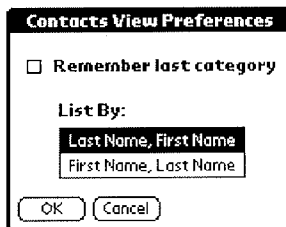
Note: You can also assign records to categories. See page 63 for details.

To sort records in To Do List and Expense:

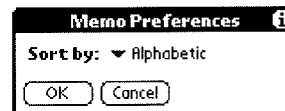
1. Open the application to display the list screen.
2. Tap Show.
3. Tap the Sort by pick list and select an option.
4. Hold Option  and press Return  to finish.

To sort records in Contacts view in PhoneBook and Memo Pad:

1. Open the application to display the list screen.
2. Press Menu .
3. Under Options, select Preferences (/R).



Contacts





Memo Pad

4. Do one of the following:

Contacts view in PhoneBook: Tap the setting you want.

Memo Pad: Tap the Sort by pick list and select Alphabetic or Manual.

5. Hold Option  and press Return  to finish.

To sort the Memo list manually, tap and drag a memo to a new location in the list.

Note: To make the list of your memos appear in Palm Desktop software as you manually sorted it on your communicator, open Memo in Palm Desktop software, click Sort by, and then select Order on Handheld.

## Making records private



In all PIM applications, except Expense, you can make individual records private. Private records remain visible and accessible, however, until you select the Security setting to hide or mask all private records. See the section that begins on page 43 for details.

### Hiding and masking private records




You can hide records that you mark as private. When you hide records, they do not appear anywhere in the application. When you mask records, a visual placeholder appears where the record would normally appear. If you define a password, you must enter it to display private records.

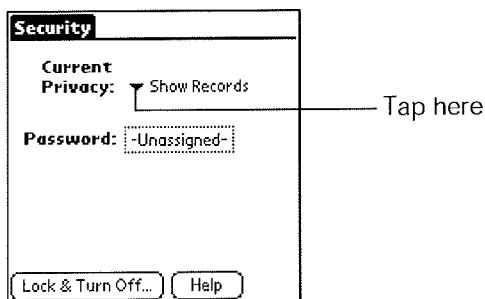
**Note:** As a security measure, masked Contacts records are temporarily hidden when you search for records. So you will not see a placeholder for these records when viewing the results of a Lookup or Find request.



To make a record private:

1. Display the entry that you want to make private.
2. Tap Details.
3. Tap the Private check box to select it.
4. Hold Option  and press Return  to finish.



To hide or mask all private records:

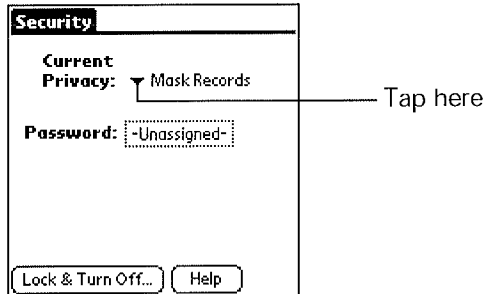
1. Make sure the records you want to mask are marked private.
2. Press Option  and then press Menu  to access the Applications Launcher.
3. Tap the Security icon .
4. Tap the Current Privacy pick list.



5. Tap either Hide Records or Mask Records.
6. Hold Option  and press Return  to confirm that you want to change the security setting.



To display all private records:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the Security icon .
3. Tap the Current Privacy pick list.



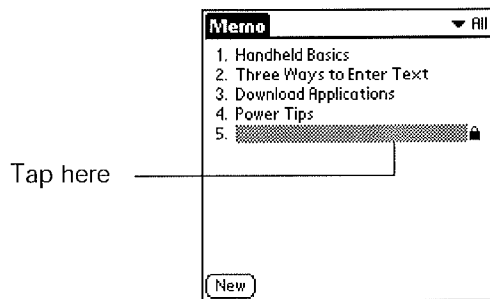
4. Tap Show Records.



If you do not have a password, private records become visible.

If you have a password, the Show Private Records dialog box appears. Enter your password in this dialog box, and then hold Option  and press Return  to finish.


To display a specific masked record:

1. Open the application that contains the record you want to view.
2. Tap the shaded bar that masks the record.





Note: If you have a password, you must enter your password and then hold Option  and press Return  to view the record.

To display all private records in a specific application:

1. Open the application in which you want to display the records.
2. Press Menu .
3. Under Options, select Security (/H).
4. Tap the Current Privacy pick list.






5. Tap Show Records.
6. Hold Option  and press Return  to finish.

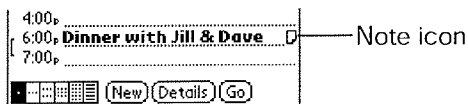
## Attaching notes

In all PIM applications except Memo Pad, you can attach a note to a record. A note can be up to several thousand characters long. For example, for an appointment in Date Book Plus, you can attach a note with directions to the location.

To attach a note to a record:

1. Display the entry to which you want to add a note.
2. In Contacts view in PhoneBook only: Press Menu , and under Record, select Edit Contact (/E).
3. Tap Details.
4. Tap Note.
5. Enter your note.
6. Hold Option  and press Return  to finish.

A small note icon appears at the right side of any item that has a note.



To review or edit a note:

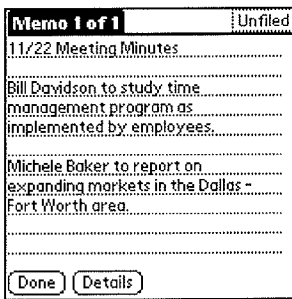
1. Tap the Note icon .

To delete a note:

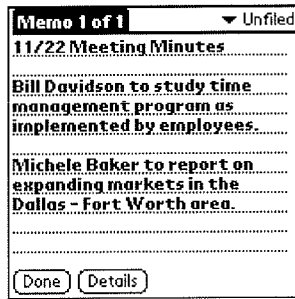
1. Tap the Note icon .
2. Tap Delete.
3. Hold Option  and press Return  for Yes.

## Choosing fonts

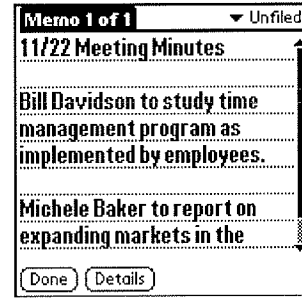
In all PIM applications except Expense, you can change the font style to make text easier to read. You can choose a different font style for each application.



Small font




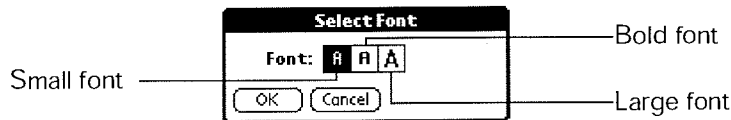
Bold font





Large font

To change the font style:

1. Open an application.
2. Press Menu .
3. Under Options, select Font (/F).
4. Use the scroll buttons to select the font style you want to use.



5. Hold Option  and press Return  to finish.

## Exchanging and updating data: HotSync operations

The HotSync process automatically synchronizes — that is, exchanges and updates — data between your communicator and desktop software. Changes you make on your communicator or desktop software appear in both places after a HotSync operation. HotSync technology synchronizes only the needed portions of files, thus reducing synchronization time. You can synchronize your data directly by connecting your communicator to your computer with the HotSync cable or by beaming the data from the IR port on your communicator to the IR port on your computer, or indirectly with a modem or network. See Chapter 8 for information about performing HotSync operations via the IR port, a modem, or a network.



## Performing a HotSync operation for the first time

The first time you synchronize your data, you need to enter user information on both the communicator and Palm Desktop software. After you enter this information and synchronize, the HotSync Manager recognizes your communicator and doesn't ask for this information again.

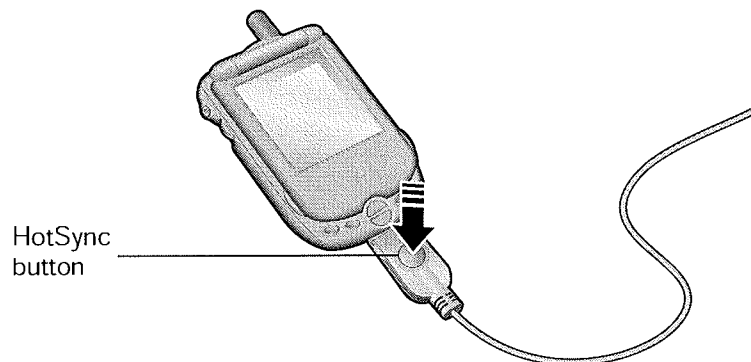
If you are a System Administrator preparing several communicators for a group of users, you may want to create a user profile. See the section that begins on page 207 before performing the following steps.

**Important:** You must use the HotSync cable for your first HotSync operation.

The following steps assume that you have already installed the Palm Desktop software. If you have not installed this software, see page 25 for instructions.

### To perform a local HotSync operation:

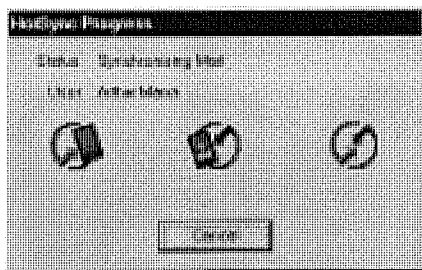
1. Connect your communicator to the HotSync cable. See the section that begins on page 23 for details.
2. If the HotSync Manager is not running, start it: On the Windows desktop, click Start, and then choose Programs. Navigate to the Handspring (or Palm) program group and choose HotSync Manager. Alternatively, you can start the Palm Desktop software which automatically opens the HotSync Manager.
3. Press the HotSync button on the cable.



**Important:** The first time you perform a HotSync operation, you must enter a user name in the New User dialog box and click OK. Every communicator should have a unique name. To prevent loss of a user's records, never try to synchronize more than one communicator to the same user name.

4. From the Select User dialog box, choose the user name you assigned to your communicator.

The HotSync Progress dialog box appears and synchronization begins.



5. Wait for a message on your communicator indicating that the process is complete.

After the HotSync process is complete, you can remove your communicator from the cable.

## Beaming information




Your communicator is equipped with an IR (infrared) port that you can use to beam information to another Palm OS device that's close by and also has an IR port. The IR port is located on the top of your communicator, between the power button and the ringer switch, behind the small dark shield.

You can beam the following information between Palm OS devices:


- The record currently displayed in Date Book Plus, the Contacts view in PhoneBook, To Do List, or Memo Pad
- All records of the category currently displayed in the Contacts view in PhoneBook, To Do List, or Memo Pad
- A special record in the Contacts view of PhoneBook that you designate as your personal business card, containing information you want to exchange with business contacts
- An application installed in RAM memory

You can also use the infrared port to perform HotSync operations. See the section that begins on page 196 for details.

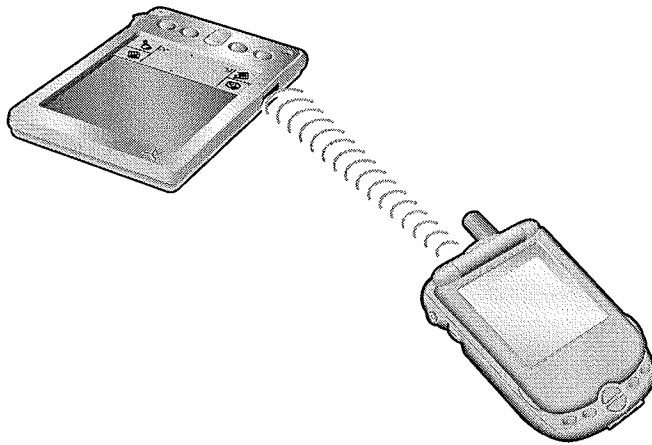
**To select a business card:**

1. In the Contacts view in PhoneBook, create an entry that contains the information you want on your personal business card.
2. Press Menu .
3. Under Record, select Select Business Card.
4. Hold Option  and press Return  for Yes.

**To beam a record, business card, or category of records:**




1. Locate the record, business card, or category you want to beam.
2. Press Menu .

3. Under Record, select one of the following:
    - The Beam command for an individual record (/B)
    - In the Contacts view in PhoneBook only: Beam Business Card (/M)
    - Beam Category (/Y)
  4. When the Beam Status dialog box appears, point the IR port directly at the IR port of the receiving communicator.
- Tip: For best results, Treo communicators should be between 10 and 50 centimeters (about 4 - 20 inches) apart, and the path between the two communicators must be clear of obstacles. Beaming distance to other Palm OS devices may be different.



5. Wait for the Beam Status dialog box to indicate that the transfer is complete before you continue working on your communicator.

**To beam an application:**

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Press Menu .
3. Under App, select Beam (/B).
4. Tap the application you want to transfer.



Note: Some applications are copy-protected and cannot be beamed. These are listed with a lock icon next to them.

5. Tap Beam.
6. When the Beam Status dialog box appears, point the IR port directly at the IR port of the receiving communicator.
7. Wait for the Beam Status dialog box to indicate that the transfer is complete before you continue working on your communicator.

To receive beamed information:

1. Turn on your communicator.
2. Point the IR port directly at the IR port of the transmitting communicator to open the Beam Status dialog box.
3. When the Beam dialog box appears, select a category for the entry.

Tip: If you do not select a category the entry is placed in the Unfiled category.

4. Hold Option  and press Return  for Yes.

Tip: When you receive beamed information with the lid closed, you don't need to respond to the Beam dialog box; simply press the top scroll button for Yes, or the bottom scroll button for No.

## Chapter 6

# Application Specific Tasks

This chapter is organized by application and gives instructions on how to do tasks that are specific to each of the following applications:

- PhoneBook
- Date Book Plus
- Blazer®
- SMS Messaging
- To Do List
- Memo Pad
- CityTime
- Calculator
- Expense
- SIM Book
- SIM Services

# PhoneBook

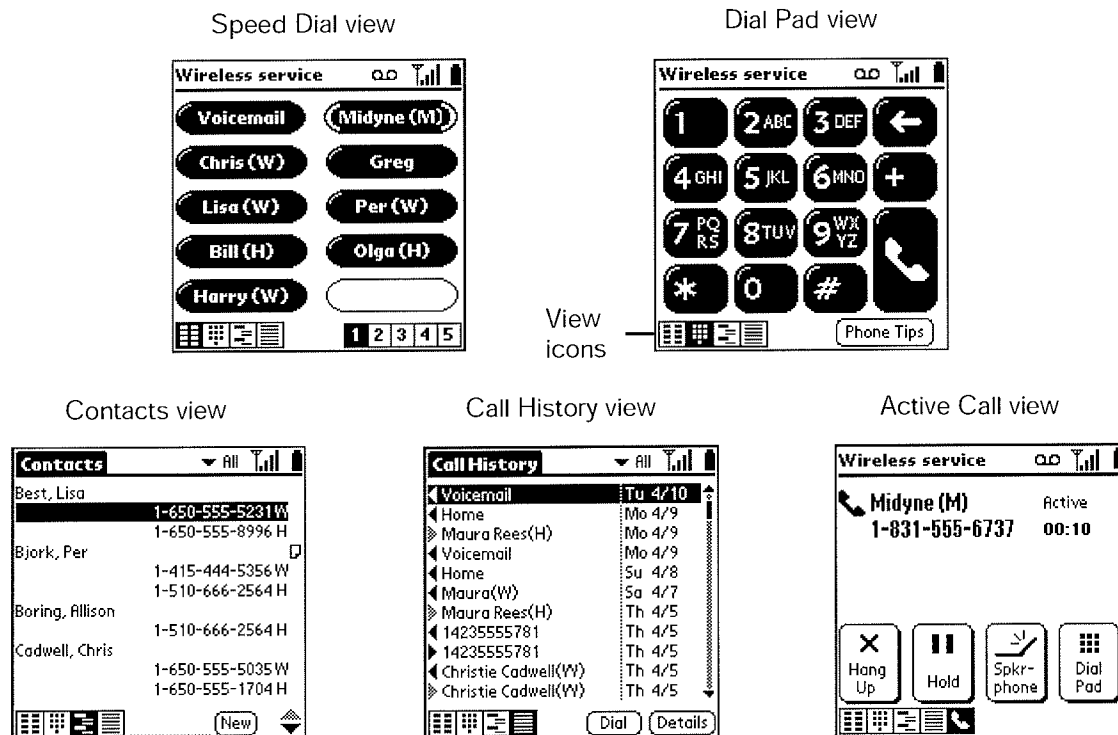
PhoneBook is the application where you store name and address information about people or businesses, and where you place and receive telephone calls.

PhoneBook has five main views. You can place and receive calls from within any view, and you can also receive calls when the screen is off (but wireless mode must be on). The sections that follow explain how to use each of these views.

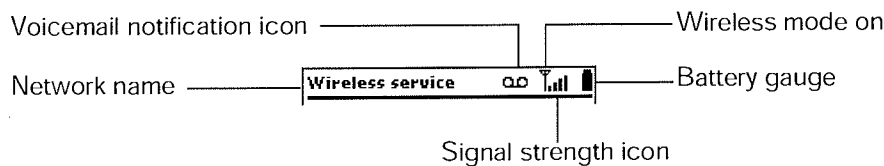
To change the PhoneBook view, do one of the following:

- Repeatedly press PhoneBook  to cycle through the views.
- Tap the icons in the lower-left corner of the PhoneBook screen.

Note: The Active Call icon and view appear only after you place an outgoing call or receive an incoming call.



At the top of each view, many of the following common icons appear to provide wireless mode status information for your phone:



Note: Your wireless service provider may use a different voicemail notification method that does not include the voicemail notification icon.

## Using the Speed Dial view

You can store up to 50 phone numbers in the Speed Dial list. There are five pages of numbers that hold ten numbers per page.


**Tip:** You can keep your Speed Dial list organized by storing different types of numbers on different pages. For example, create separate pages for family, business, friends, and emergency numbers.

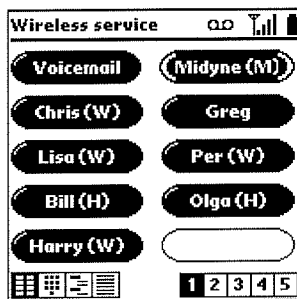
## Defining a Speed Dial button

For each Speed Dial button you can assign a name, phone number, and extra digits such as an extension. By default, the first slot on the first Speed Dial page is reserved for your wireless service provider's voicemail service number. If the voicemail number is pre-programmed on your SIM card, you cannot delete this entry or change the phone number, but you can move the voicemail entry to another button, rename it, and add Extra digits.



If the voicemail number is *not* pre-programmed on your SIM card, you can edit the voicemail entry to enter the number.

To define a Speed Dial button:

1. Open the lid or press PhoneBook  if you are in another application.
2. Tap a blank Speed Dial button.



3. Enter the Name you want to assign to the button.
4. Press the bottom scroll button to move to the Number field and enter the phone number associated with the button.
5. Press the bottom scroll button to move to the Extra Digits field and enter an extension number or other additional digits if needed.
 

**Tip:** To insert a pause between Extra digits when dialing, enter a comma (,). Each comma represents a one second pause.
6. Hold Option  and press Return  to finish.

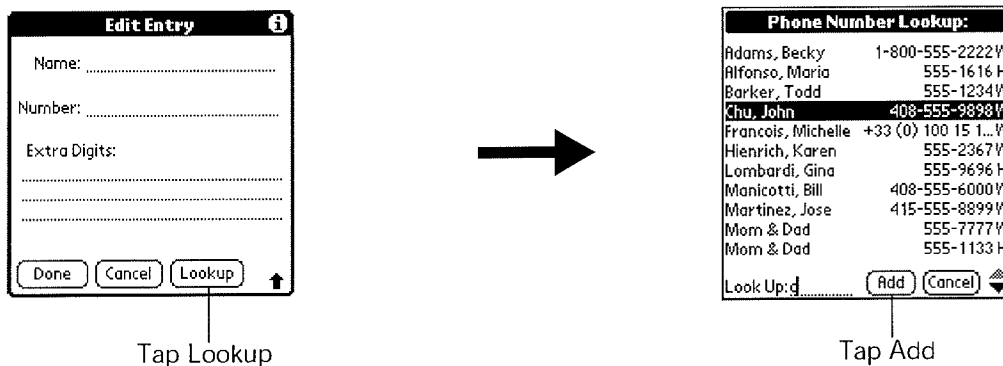
## Adding Contacts list entries to your Speed Dial list


To save time while creating your Speed Dial list, you can add entries from your Contacts list.

To add an entry from your Contacts list to your Speed Dial list:



1. Tap a blank Speed Dial button.
2. Tap Lookup.

Tip: You can also use the Phone Number Lookup feature to locate the entry you want to add. See the section that begins on page 67 for details.



3. If your Contacts list is sorted by last name, begin entering the person's last name. If your Contacts list is sorted by first name, begin entering the person's first name.
4. Select the entry you want to use and press Return .


Tip: You can edit the entry by tapping the number or name in the Edit Entry dialog.

5. In the Edit Entry dialog, hold Option  and press Return  to finish.

## Calling a Speed Dial number


Speed dialing enables you to quickly place a call without entering the number. This is particularly useful for numbers you call often, such as your home or office. You can also call a number in your Speed Dial list using the hands-free headset.


To dial a number from the Speed Dial view:

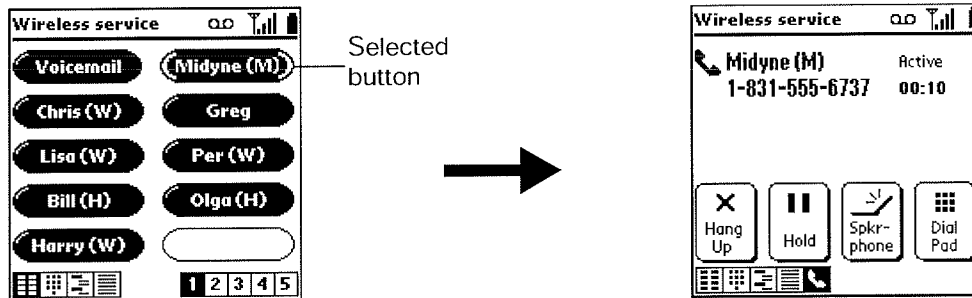
1. Make sure wireless mode is on. See page 18 for details.
2. Press PhoneBook .
3. Use the scroll buttons to select the Speed Dial button for the number you want to call.

Tip: To jump to the next page of Speed Dial buttons, select the first button on the page and press the top scroll button.



4. Press Space  to dial.

Tip: You can also tap the Speed Dial button for the number you want to call, or roll the rocker switch to select the button and then press the rocker switch or Return  to dial the number.



Tip: During a call, if you are prompted to enter a menu selection, tap Dial Pad and then enter the numbers you want with the keyboard. If you defined any Extra Digits, such as an extension, tap Extra Digits.


5. Close the lid to end the call.

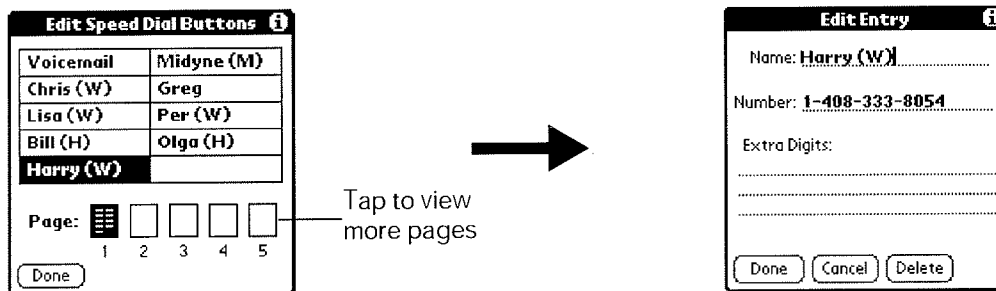
### Changing a Speed Dial entry

You can change any of the information associated with a Speed Dial button.

Note: You cannot change the phone number for your wireless service provider's voicemail service. You can, however, rename, move, or add Extra Digits to this voicemail entry.

To change a Speed Dial entry:

1. From the Speed Dial view, press Menu .
2. Under Edit, select Edit Speed Dial (/E).
3. Tap the entry you want to change.



4. In the Edit Entry dialog, enter the new information.




5. Hold Option  and press Return  twice to save the new information.

## Deleting Speed Dial entries

If your Speed Dial list becomes full, or you no longer need an entry, you can delete it.

Note: You cannot delete the Speed Dial button for your wireless service provider's voicemail service.


To delete a Speed Dial entry:

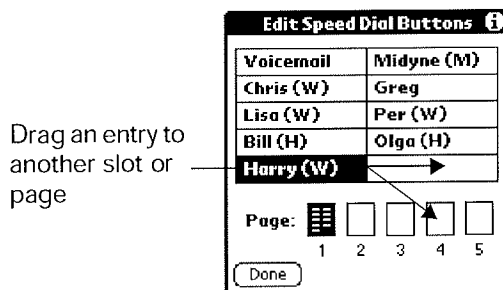
1. From the Speed Dial view, press Menu .
2. Under Edit, select Edit Speed Dial (/E).
3. Tap the entry you want to delete.
4. In the Edit Entry dialog, tap Delete.
5. Hold Option  and press Return  twice to confirm deletion.

## Arranging the Speed Dial list



As your Speed Dial list grows, you may want to rearrange the entries. For example you might want to store different types of numbers on different pages, or arrange the list alphabetically.

To arrange the Speed Dial list:

1. From the Speed Dial view, press Menu .
2. Under Edit, select Edit Speed Dial (/E).
3. Drag the entries to the slot where you want them to appear.





Tip: If the new slot is full, the other entries in the column move down one slot, and overflow from the left column moves to the top of the right column. If you drag an entry to a page icon, the entry moves to the first available slot on that page. You cannot drag an entry to a full page.


4. Hold Option  and press Return  to finish.

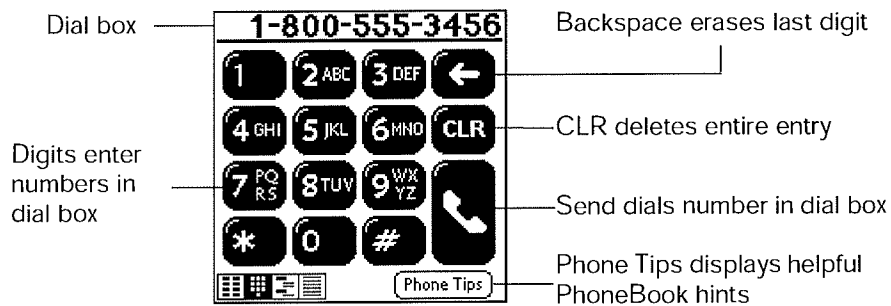
## Using the Dial Pad view

The Dial Pad view provides access to a more traditional phone interface. You can use this view to dial numbers that are not in your Speed Dial or Contacts list.


To dial a number with the Dial Pad:

1. Make sure wireless mode is on. See page 18 for details.
2. Press PhoneBook  to access the Dial Pad view .
3. Enter the number you want to dial. If you are dialing an international number, enter a + before the country code and phone number to automatically insert the prefix for international calls.

Tip: You don't need to press  before entering the number.



Tip: To display the last ten numbers dialed, press the scroll buttons or roll the rocker switch and then press the rocker switch to dial the selected number.

4. Press Space  to dial.
5. Close the lid to end the call.

## Using the Contacts view




The Contacts view is where you store name and address information about people, businesses, and more.

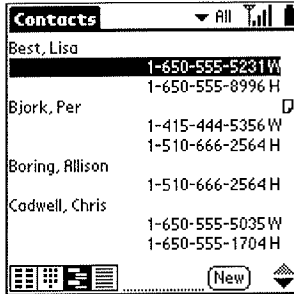
### Creating a Contacts entry

You can create Contacts entries on your communicator, or you can use your desktop software to create entries on your computer and then download the entries to your communicator with your next HotSync operation.

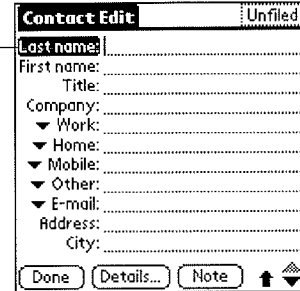
Many desktop software applications also have data import capabilities that enable you to load database files into your Contacts list on your communicator. See the section that begins on page 34 and the online Help for your desktop software for more information.

To create a new Contacts entry:


1. Press PhoneBook  repeatedly to access the Contacts view .
2. Press Menu .
3. Under Record, select New Contact (/N).



Cursor at Last name



4. Enter the last name of the person you want to add to your Contacts list.
5. Press the bottom scroll button to move to the First Name field and then enter the person's first name.
6. Press the bottom scroll button to move to other fields and then enter the other information that you want to include in this entry.

Tip: Hold Shift  and use the scroll buttons to move between pages in this entry.

7. After you finish entering information, hold Option  and press Return  to finish.






Tip: To create an entry that always appears at the top of the Contacts list, begin the Last name or Company field with a symbol, as in \*If Found Call\*. This entry can contain contact information in case you lose your communicator.

## Duplicating a Contacts entry


You can duplicate existing entries, which can be helpful when you want to enter multiple people from a single organization. When you duplicate an entry, the word Copy appears next to the name in the First Name field.

To duplicate an entry:

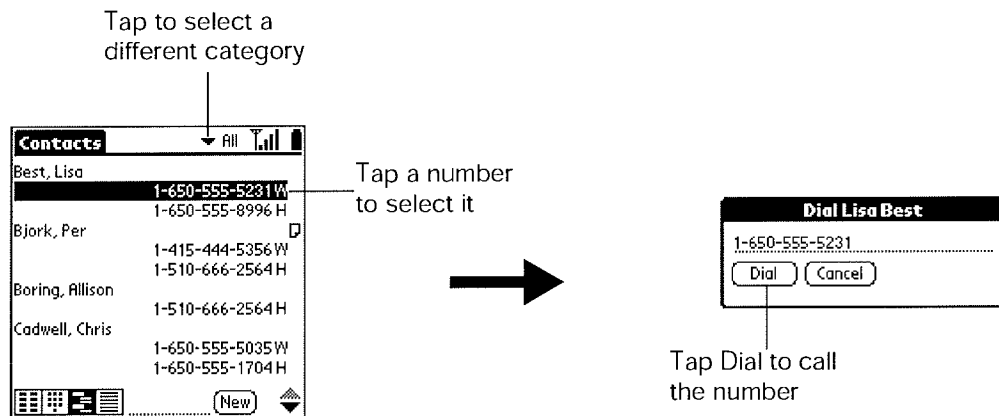
1. From the Contacts view, select the name you want to duplicate.
2. Press Menu .
3. Under Record, and select Duplicate Contact (/T).
4. Edit the entry as necessary.
5. Hold Option  and press Return  to finish.

## Calling a number in your Contacts list

You can dial any number that you've entered in your Contacts list.

1. Make sure wireless mode is on. See page 18 for details.
2. From the Contacts view, use the Instant Lookup feature to select the number you want to call. See the section that begins on page 66 for details.
3. Press Space  to dial.

Tip: You can also roll the rocker switch to scroll to the number you want to call, and then press the rocker switch to dial the number.





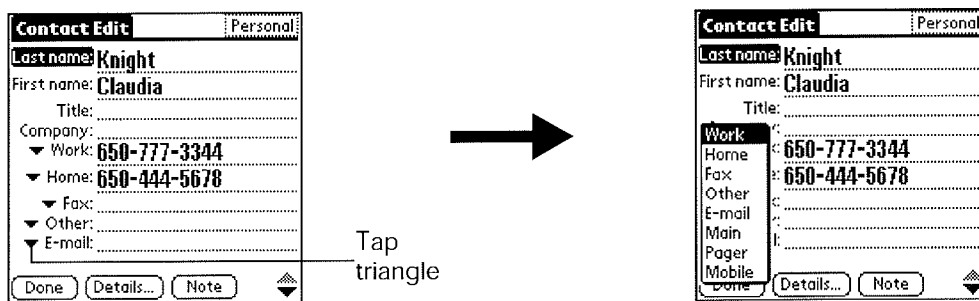
4. Close the lid to end the call.



## Selecting types of phone numbers

You can select the types of phone numbers or e-mail addresses that you associate with a Contacts entry. Any changes you make apply only to the current entry.

To select other types of phone numbers in an entry:

1. Select the contact name for the entry that you want to change.
2. Press Space  to open the entry.
3. Press Menu .
4. Under Record, select Edit Contact (/E).
5. Tap the pick list next to the label you want to change.






6. Select a new label.
7. Hold Option  and press Return  to finish.

## Changing Contact entry details

The Contact Entry Details dialog box provides a variety of options that you can associate with an entry.



To open the Contact Entry Details dialog box:

1. Select the name for the entry whose details you want to change.
2. Press Space  to open the entry.
3. Press Menu .
4. Under Record, select Edit Contact (/E).
5. Press Menu .
6. Under Record, select Details (/E).



7. Select any of the following settings:

- Category** Assign the entry to a category.
- Private** Hide this entry when Security is turned on.

8. Hold Option  and press Return  to finish.

## Using the Call History view

The Call History view provides quick access to the previous 1,000 incoming and outgoing calls.

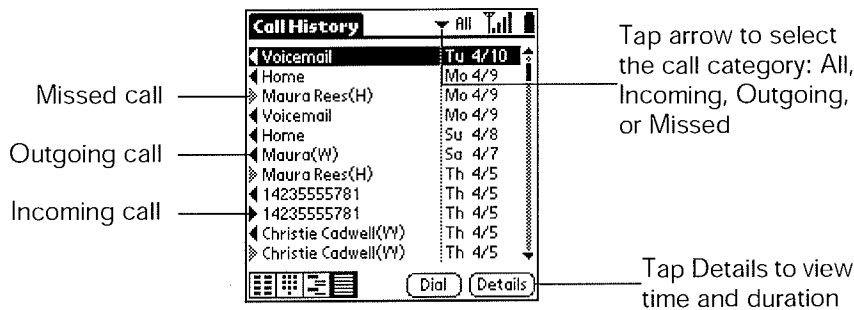
If you miss a call when your Treo is on and you remain in a coverage area, your missed calls appear in the Call History list and you receive a missed call alert message. When your phone is off or you travel outside a coverage area, your missed calls are forwarded to voicemail and they do not appear in the Call History list. Similarly, when your phone is off or you travel outside a coverage area, your wireless service provider stores your text messages until you turn on your phone or return to a coverage area.

## Reviewing Call History




Each item in the Call History view appears with an icon next to it indicating whether it is a Missed call, an incoming call, or an outgoing call. You can display all your calls or one category at a time.

To review Call History:

1. Press PhoneBook  repeatedly to access the Call History view .



2. Tap the pick list at the top of the screen to display a specific type of call: Missed, Incoming, or Outgoing.

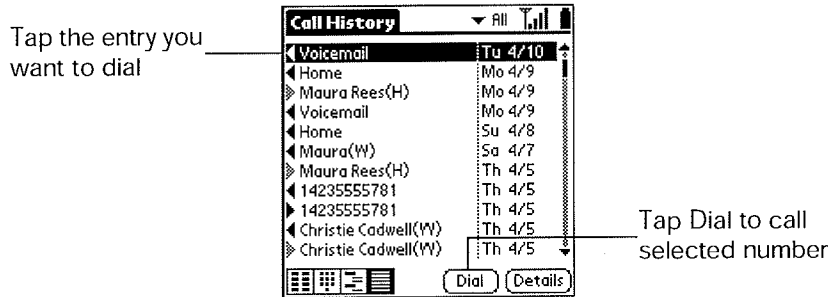
**Tip:** To temporarily store a number in your communicator's memory, press Menu , under Record, select Details (/E), tap Copy Phone #, and then hold Option  and press Return  to finish. You can now Paste this number into any application on your communicator.


## Calling a number in your Call History list



In addition to viewing a list of your incoming, outgoing, and missed calls, you can use the Call History view to dial any number that appears on this view.

To dial a number from the Call History view:

1. Make sure wireless mode is on. See page 18 for details.
2. Use the scroll buttons to select the number you want to call.



3. Press Space  to dial.


Tip: To add a number to your Contacts or Speed Dial list, press Menu , under Record, select Details (/E), tap Copy Phone #, go to the Contacts or Speed Dial view, and press Menu , under Edit, select Paste (/P) to insert the number.

## Purging Call History

Your Treo continues accumulating Call History information for up to 1,000 calls until you purge the Call History list. To conserve storage space, we recommend that you purge this list periodically.

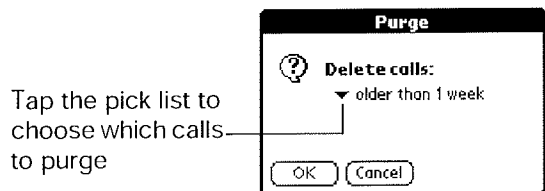
Note: Using the Purge function permanently removes the calls from your communicator. You cannot undo this process to restore the information.



To purge entries in Call History view:

1. From the Call History view, press Menu .
2. Under Record, select Purge.

Tip: To delete a specific item, select the item from the Call History view and select Delete Item from the Record menu instead of Purge.

3. Select the purge option you want to use.

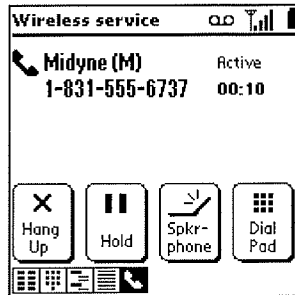


4. Hold Option  and press Return  to finish.



## Using the Active Call view

After you dial and establish a connection, or receive an incoming call, the Active Call view icon appears in the lower left corner of the PhoneBook screen, and the Active Call view appears:

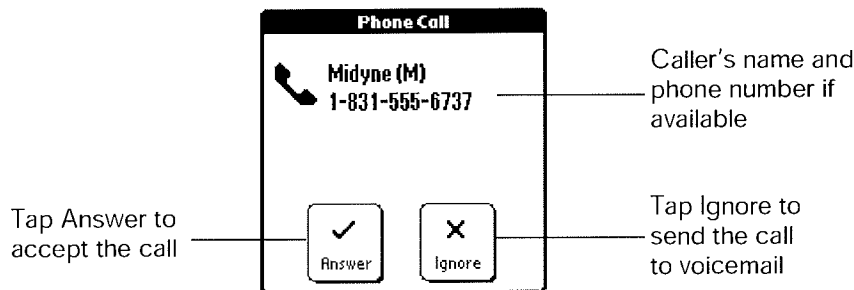


Tap Dial Pad to enter extra numbers such as a PIN code or menu selection

Note: If you dialed a Speed Dial entry that includes Extra Digits, the Dial Pad button changes to an Extra Digits button. Tap Extra Digits to dial the additional predefined numbers, such as an extension.

## Receiving Calls

Whenever your communicator's wireless mode is on and you are within a coverage area, you can receive incoming calls. An incoming call turns on your communicator's screen if it is off and displays the following alert:




To answer a call while it is ringing, do any of the following:

- Open the lid if it is closed.
- Tap Answer if the lid is open.
- Press the button on the headset (if it is attached).

To ignore a call and send it directly to voicemail, do any of the following:


- Close the lid if it is open.
- Press the top scroll button.

To silence the ring, do any of the following:

- Press any button on your communicator.
- Slide the ringer switch to the silent position .

Note: Placing the ringer switch in the silent position turns off all system sounds, including alarms. When you silence the ringer, Date Book Plus alarms vibrate.

To end a call, do any of the following:

- Close the lid (if the headset is not attached).
- Press Backspace .
- Press the button on the headset (if it is attached).
- Tap Hang Up.

### Adjusting call volume

You can adjust the volume level from the Active Call view when a call is in progress.

To adjust the call volume, do one of the following:

- Roll the rocker switch up, or press the top scroll button, to increase the volume.
- Roll the rocker switch down, or press the bottom scroll button, to decrease the volume.

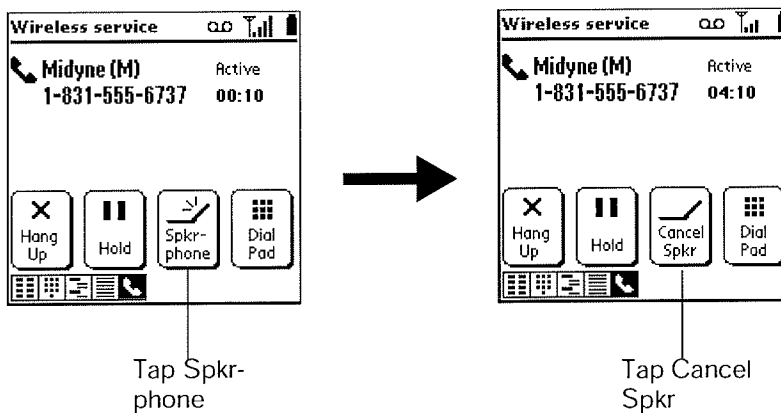
### Using the speakerphone

The speakerphone button enables you to view your communicator screen and use other applications while you're talking on the phone.

Note: The speakerphone feature is optimized for one or two people that are reasonably close to the phone. It is not designed for a conference room or large group. This feature is not available when a headset is attached to your phone.

To use the speakerphone:

1. Place a call.
2. From the Active Call screen, tap Spkrphone.



3. Tap Cancel Spkr to turn off the speakerphone.

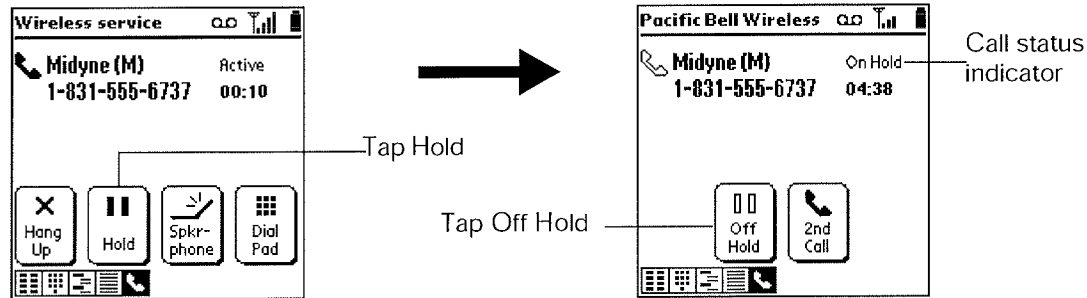
Tip: You can also press Space  to toggle the speakerphone on and off.

### Placing calls on hold

You can place an active call on hold while you use other applications on your communicator or complete another task.

To place a call on hold:

1. Place or answer a call.



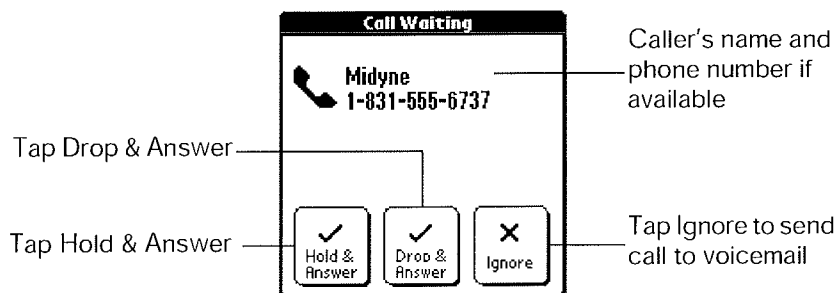
2. Tap Hold to place the call on hold.
3. Tap Off Hold to return to the call.

### Handling Multiple Calls

You can use the Active Call view to handle a variety of situations that involve multiple calls. During an active call, you can receive or place another call, switch between two active calls, and create a 3-way conference call. For example, when you're talking to a friend, you can place another call to a restaurant to make dinner reservations, and return to your friend to confirm the time and place. You can also use call waiting to receive an important incoming call while you're already on the phone, and to facilitate 3-way conference calls when you're on the go.




To respond to call waiting, do one of the following:

- Tap Hold & Answer to place the first call on hold and answer the second call.
- Tap Drop & Answer to end the first call and answer the second call.
- Tap Ignore to send the second call to voicemail.
- Press the button on the headset (if it is attached) to place the first call on hold and to answer the second call.



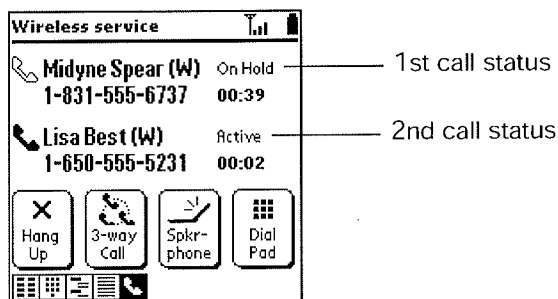
Note: Make sure the Disable Call Waiting option on the Call Preferences screen is off. When this option is off the Disable Call Waiting check box is empty. See the section that begins on page 97 for more information.

To dial another number while a call is in progress:

1. From the Active Call view, repeatedly press PhoneBook  to access the view you want to use.  
Tip: You can also tap the Speed Dial, Dial Pad, Contacts, or Call History view icons.
2. Dial the number.
3. When the confirmation message appears, hold Option  and press Return  for Yes.

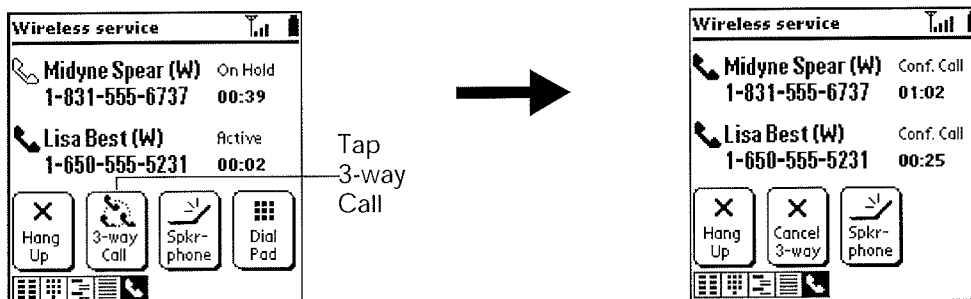
To switch between two active calls, do any of the following:

- Tap the call status line of the call you want to make active.
- Press the button on the headset (if it is attached).



To use 3-way calling:

1. Answer or place two calls.
2. Tap 3-way Call to join the two calls.



3. Tap Cancel 3-way to return to the previous active call and to place the other call on hold, or tap Hang Up to end both calls.


Note: When a 3-way call is active and the headset is attached, pressing the button on the headset places the second call on hold.

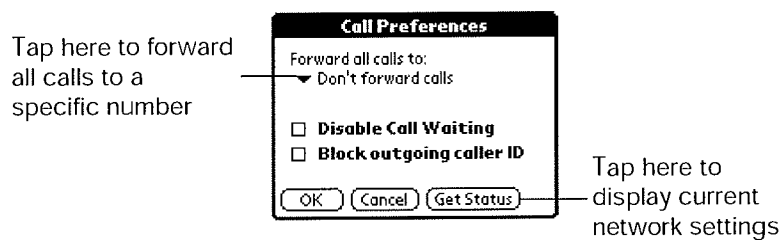
## Forwarding calls

If you need to turn off the wireless mode or know you will be traveling outside a coverage area, you can forward your calls to another number. Keep in mind that your wireless service provider will still charge you for your forwarded calls.



Note: Because call forwarding information is stored by the network, it's a good idea to check the current network settings both before and after you change the call forwarding option.

To forward calls to another number:

1. From the Speed Dial, Dial Pad, or Call History view, press Menu .
2. Under Options, select Call Preferences (/A).
3. Select the call forwarding option you want to use.



Tip: You can define multiple forwarding numbers. Select Edit numbers from the list to add, change, or delete a number. You can also configure your communicator to forward calls only in special situations, such as when you are busy or outside a coverage area. See Appendix E for details.

4. Hold Option  and press Return  to finish.

## Other ways to make a call

In addition to using the Speed Dial, Contacts, Dial Pad, and Call History views, you can also place calls in the following ways:

- Redialing the last number
- Returning a missed call
- Dialing an emergency number

### Redialing the last number

You can redial the last number you called.

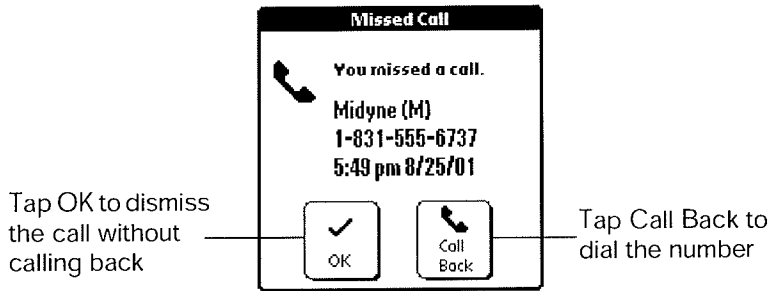
To redial the last number, do one of the following:

- Press and hold PhoneBook  for at least one second.
- Press and hold the rocker switch.

### Returning a missed call

When your Treo is on and you remain in a coverage area, any calls you miss appear in the Call History list and you receive a missed call alert message. When your phone is off or you travel outside a coverage area, your calls are forwarded to voicemail and they do not appear in the Call History list.

- If you miss multiple calls, a message appears indicating the number of calls you missed. See page 90 for instructions on calling a number in your Call History list.
- If you miss a single call, the following screen appears:




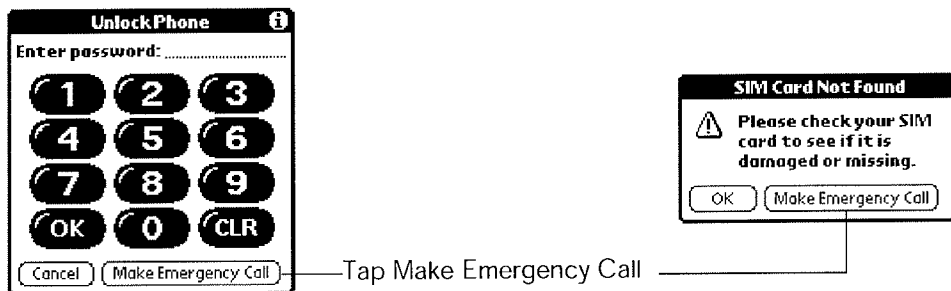
Note: If the caller's phone number is not available, the Call Back button does not appear on the Missed Call screen.

### Calling an emergency number

Your Treo provides easy access to emergency numbers such as 911 in the United States or 112 in Europe.

To call an emergency number:

1. Make sure wireless mode is on. See page 18 for details.
2. Press PhoneBook .
3. Do one of the following:
  - If your phone is unlocked, dial 911 or 112 from the Dial Pad screen.
  - If your phone is locked or your SIM card is missing, tap Make Emergency Call from the Unlock SIM or SIM Card Not Found screen.



Tip: You don't need to unlock your phone or even have the SIM card installed to call an emergency number.

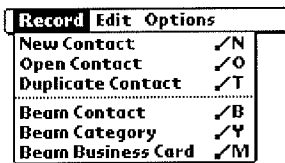
## PhoneBook menus

PhoneBook menus are shown here for your reference, and PhoneBook features that are not explained elsewhere in this guide are described here.

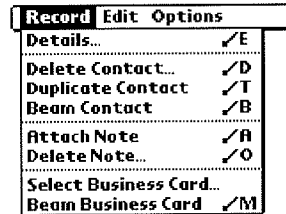
See page 31 for information about choosing menu commands.

The Record and Options menus differ depending on which view is active.

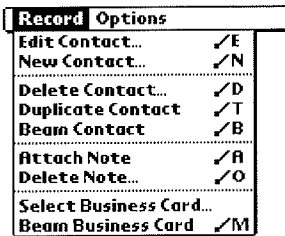
### Record menus



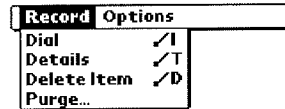
Contacts list view



Contacts edit view

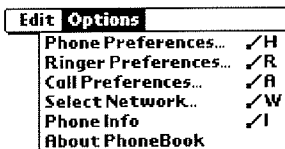


Contacts record view

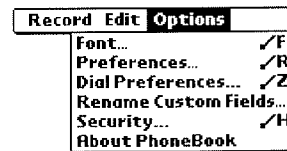


Call History view

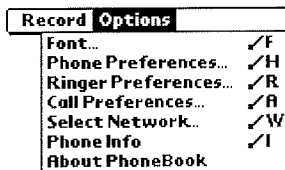
### Options menus



Dial Pad & Speed Dial views



Contacts view



Call History view



Contacts record & edit views

### Phone Preferences

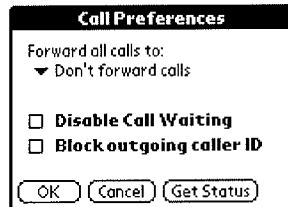
Opens a dialog where you can lock your SIM card to prevent unauthorized use of your communicator's wireless mode features.

Preferences



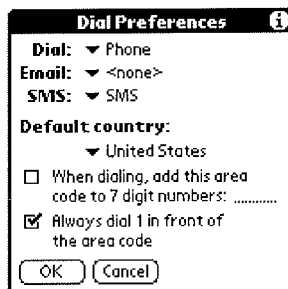
- Remember last category. Determines how the Contacts list appears when you return to it from another application. If you select this check box, the Contacts list shows the last category you selected. If you clear it, the Contacts list displays the All category.
- List By. Determines how the Contact entries are sorted in the Contacts view, and also controls the PhoneBook Instant Lookup feature and SMS address lookup options.

Call Preferences



- Block outgoing caller ID. Determines whether PhoneBook reveals your phone number to the person you're calling. If your service provider supports caller ID blocking, you can prevent revealing your phone number to people you call.
- Get Status. Displays the current call waiting, call blocking, and call forwarding settings stored on your wireless service providers network. Use this button to confirm that the network settings you selected are active.

Dial Preferences



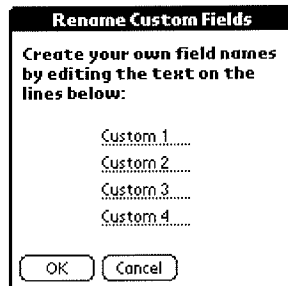
- Dial, Email, SMS. Provides third-party applications access to PhoneBook's dialing functions. In most cases you do not need to change these settings.



- Default country. Determines if North American hyphenation conventions are automatically applied to phone numbers, and whether the following two options are available:
  - When dialing, add this area code to 7 digit numbers. Inserts the area code you specify in front of 7-digit numbers before dialing.
  - Always dial 1 in front of the area code. Inserts a 1 in front of 10-digit numbers before dialing.

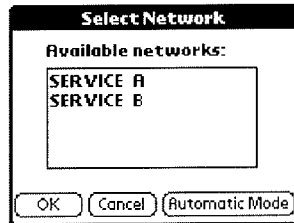
If you select a country other than United States or Canada, numbers are formatted exactly as they appear in the Contact record.

**Rename Custom Fields**



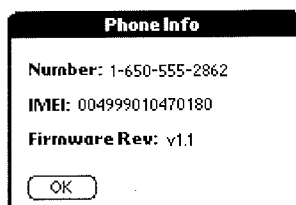
These custom fields appear at the end of the Contact Edit screen. Rename them to identify the kind of information you enter in them. The names you give the custom fields appear in all Contacts records.

**Select Network**



- Available networks. Enables you to manually select networks while roaming if multiple service providers are available. When you manually select a network, your Treo finds only that network until you either choose another network, or return to Automatic Mode.
- Automatic Mode. Allows your Treo to automatically select the provider with the strongest signal. By default, Automatic Mode is on.

## Phone Info



- Number: Displays your SIM card's phone number.

Note: Not all wireless service providers include the phone number on the SIM. If the phone number is not on the SIM, this field displays "No number on SIM" instead of the number.

- IMEI: Displays your communicator's equipment ID number which uniquely identifies your communicator to your mobile service provider's network.
- Firmware Rev: Displays the version number for the mobile communication software on your communicator.

**About  
PhoneBook**

Shows version information for PhoneBook.

# Date Book Plus

When you open Date Book Plus, the screen shows the current date and a list of times for a normal business day.


## Working in Day View

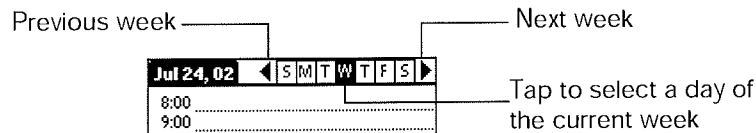
Day View shows an hourly calendar for a particular date. If there are events scheduled on that date, they appear in the appropriate time slot.





To view or select a date, do one of the following:

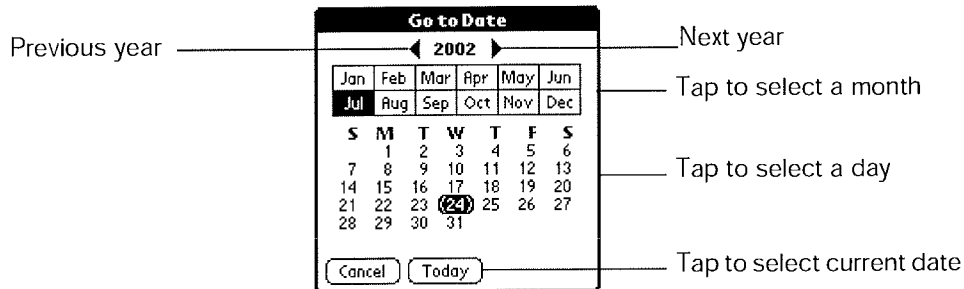
- Use the scroll buttons or roll the rocker switch to move forward or backward one day at a time.

Note: If you plan to do a lot of scrolling in Date Book Plus while the lid is closed, consider enabling the Scroll before day move option in the Day Options dialog box. See page 116 for details.

- Press Shift  and then a scroll button to scroll by weeks.
- Tap the day of the week that you want in the date bar at the top of the screen. If necessary, tap the Previous week or Next week scroll arrows to move to another week.



- Press Menu  and under Options select Go to Day (/O). To scroll by days, press a scroll button. To scroll by months, hold Shift  and press a scroll button. To scroll by years hold Option  and press a scroll button. After you scroll to the date, press Space  to select it. You can also type the number of the day or tap the screen to select a date from the calendar.



## Scheduling an event

A record in Date Book Plus is called an "event." An event can be any kind of activity that you associate with a day. You can enter a new event on any of the available time lines. When you schedule an event, its description appears on the time line, and its duration is automatically set to one hour. You can easily change the start time and duration for any event.

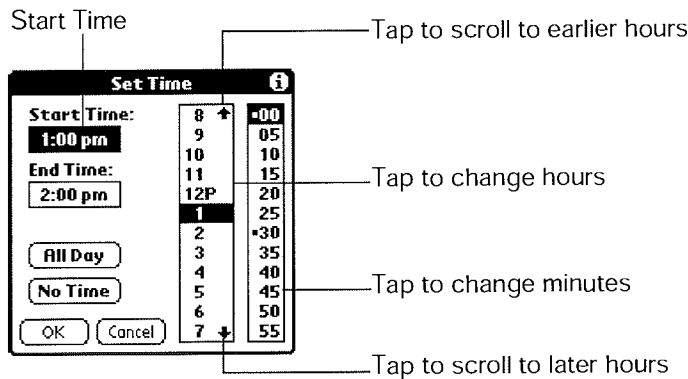
Note: It's possible to schedule events that overlap, but Date Book Plus makes it easy to find such conflicts. See page 111 for details.

You can also schedule events that occur on a particular date but have no specific start or end times, such as birthdays, holidays, and anniversaries. These are referred to as "untimed events." Untimed events appear at the top of the list of times, marked with a diamond. You can have more than one untimed event on a particular date.

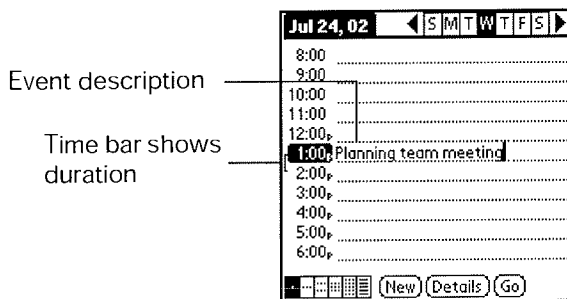
You can also schedule a repeating event, such as a weekly meeting, and continuous events, such as a three-day conference or a vacation.

To schedule an event:

1. Select the date on which you want to schedule the event as described in the previous section.
2. Type the time the event begins to open the Set Time dialog box. For example, type 4 for 4:00.





3. If the event is longer than an hour, press the bottom scroll button and type the end time.
4. Hold Option and press Return to finish.
5. Enter a description of the event. You can enter up to 255 characters.

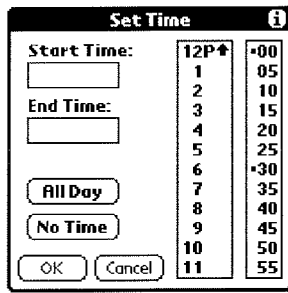


6. Tap a blank area of the screen to deselect the event. A vertical line appears next to the time, indicating the duration of the event.

To schedule an untimed event:

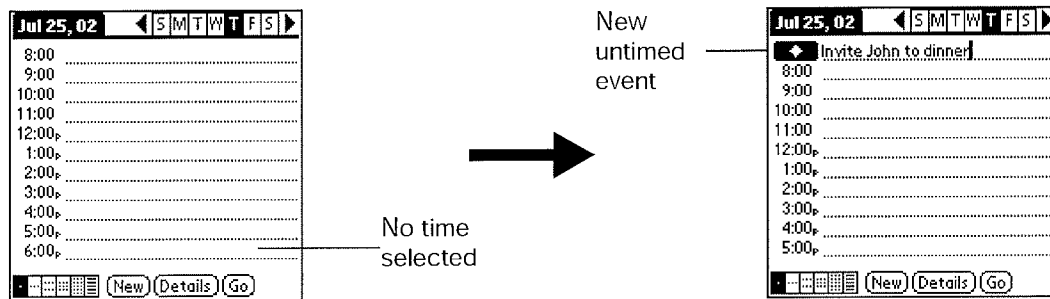
1. Select the date on which you want to schedule the event. See page 101 for details.
2. Press Menu.
3. Under Record, select New Appointment (/N).

4. Hold Option  and press Return  so that no start or end times are defined for the new event.





Tip: You can also create a new untimed event by making sure no event is selected and then entering a description.

5. Enter a description of the event.





6. Tap a blank area on the screen to deselect the untimed event.

Note: If you create an event and decide later that there is no particular start or end time, you can easily change it to an untimed event. Tap the time of the event in the Date Book Plus screen, tap No Time, and then hold Option  and press Return  to finish.

## Rescheduling an event


You can easily make changes to your schedule with your communicator.

To reschedule an event:

1. Tap the event you want to reschedule.
2. Tap Details.
3. To change the time, tap the Time box and select a new time.
4. To change the date, tap the Date box and select a new date.
5. Hold Option  and press Return  to finish.

## Setting an alarm for an event

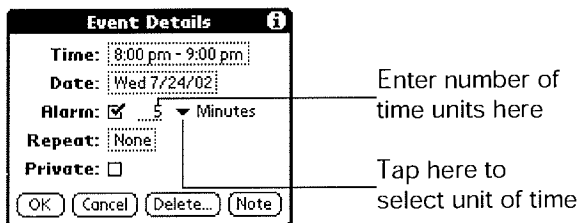
The Alarm setting enables you to set an audible alarm for events in Date Book Plus. You can set an alarm to sound minutes, hours, or days before an event. The default Alarm setting is 5 minutes before the time of the event, but you can change this to any number of minutes, hours, or days.



When you set an alarm, this icon  appears to the far right of the event with the alarm. When the alarm tone sounds, a reminder message also appears onscreen.

Note: Make sure the ringer is on. Silencing the ringer turns off all system sounds, including alarms. When you silence the ringer, Date Book Plus alarms vibrate.



To set an alarm for an event:

1. Tap the event to which you want to assign an alarm.
2. Tap Details.
3. Tap the Alarm check box to select it.
4. Tap the pick list to select Minutes, Hours, or Days.
5. Select the 5 and enter any number from 0 to 99 (inclusive) as the number of time units.



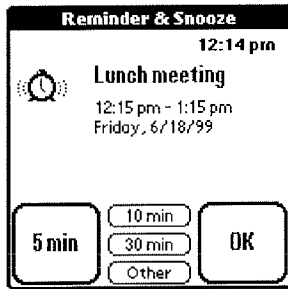
6. Hold Option  and press Return  to finish.

Alarm for untimed events: You can set a silent alarm for an untimed event. In this case, the alarm triggers at the specified period of minutes, hours, or days before midnight (beginning) of the day of the untimed event. No audible alarm sounds for an untimed event; instead, the reminder message appears onscreen.

For example, you set an alarm for an untimed event that occurs on February 4th. If the alarm is set for 5 minutes, the reminder message appears at 11:55 PM on the night of February 3rd. The reminder remains onscreen until you turn on your communicator and hold Option  and press Return  to dismiss it.

To dismiss the alarm reminder, do one of the following:

- Tap 5 min, 10 min, 30 min, or Other to reset the alarm to notify you in a specified period of time.
- Press the top scroll button.



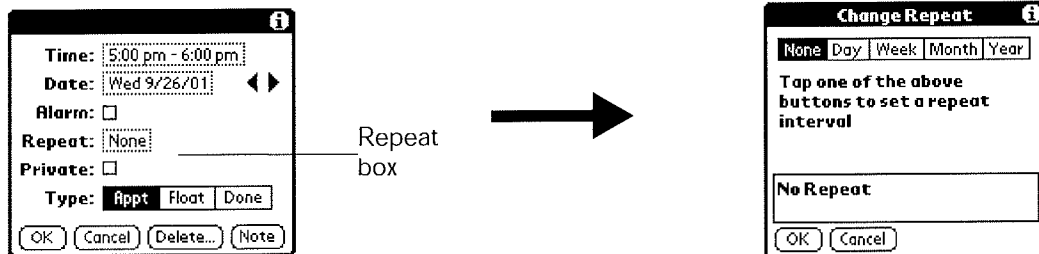
## Scheduling repeating or continuous events



The Repeat function lets you schedule events that recur at regular intervals or extend over a period of consecutive days. A birthday is a good example of an event that repeats annually. Another example is a weekly guitar lesson that falls on the same day of the week and the same time of day.


Typically, a continuous event is an untimed event such as a business trip or a vacation that continues for several days but doesn't occur at a particular time of day.

To schedule a repeating or continuous event:

1. Tap the event.
2. Tap Details.
3. Tap the Repeat box to open the Change Repeat dialog box.





4. Tap Day, Week, Month, or Year to set how often event repeats.
  - For a continuous event, tap Day.
5. Enter a number that corresponds to how often you want the event to repeat on the Every line.
  - For example, if you select Month and enter the number 2, the event repeats every other month.
6. To specify an end date for the repeating or continuous event, tap the End on pick list and tap Choose Date. Use the date picker to select an end date.
7. Hold Option  and press Return  to finish.

After you schedule a repeating or continuous event, this icon  appears to the far right of the event.

## Changing and deleting repeating or continuous events

If you change or delete a repeating or continuous event you can apply the action to only the current event, to all instances of the event, or to the current event and instances that follow.

To change or delete repeating events:

1. Select the record you want to change or delete.
2. Tap Details.
3. Enter the change.
4. Hold Option  and press Return  to accept the change, or tap Delete.
5. Tap one of the following:




Current. Changes or deletes only the current instance of the repeating event.

All. Changes or deletes all past, current, and future occurrences of this event.

Following. Changes or deletes the current event and all future occurrences of this event.

## Considerations for repeating or continuous events

Keep the following points in mind:

- If you change the start date of a repeating event, your communicator calculates the number of days you moved the event. Your communicator then automatically changes the end date to maintain the duration of the repeating event.
- If you change the repeat interval (e.g., daily to weekly) of a repeating event, past occurrences (prior to the day on which you change the setting) are not changed, and your communicator creates a new repeating event.
- If you change the date of an occurrence of a repeating event (e.g., from January 14th to January 15th) and apply the change to All occurrences, the new date becomes the start date of the repeating event. Your communicator adjusts the end date to maintain the duration of the event. If you apply the change to Current or Future occurrences, past occurrences (prior to the day on which you change the setting) are not changed.
- If you change other repeat settings (e.g., time, alarm, private) of a repeating event and apply the change to Future occurrences, your communicator creates a new event. The start date of this new event is the day on which the setting is changed. Past occurrences (prior to the day of the change) are not changed.
- If you apply a change to a single occurrence of a repeating event (e.g., time), that occurrence no longer shows the Repeat icon .



## Changing the Date Book Plus view

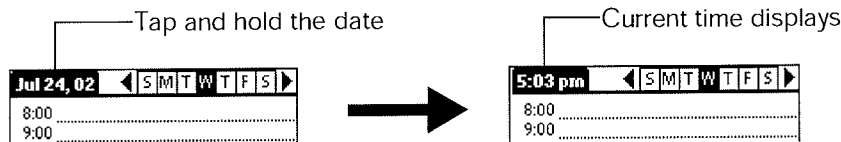
In addition to displaying the calendar for a specific day, you can also display a whole week in graph or text format, a month, a year, or a list of your appointments, as well as the current time.

To cycle through Day, Week, Week with Text, Month, Year, and List views:

- Repeatedly press Date Book Plus  to display the next view.

To display the current time:

1. Tap and hold the stylus on the date in the date bar to display the current time.

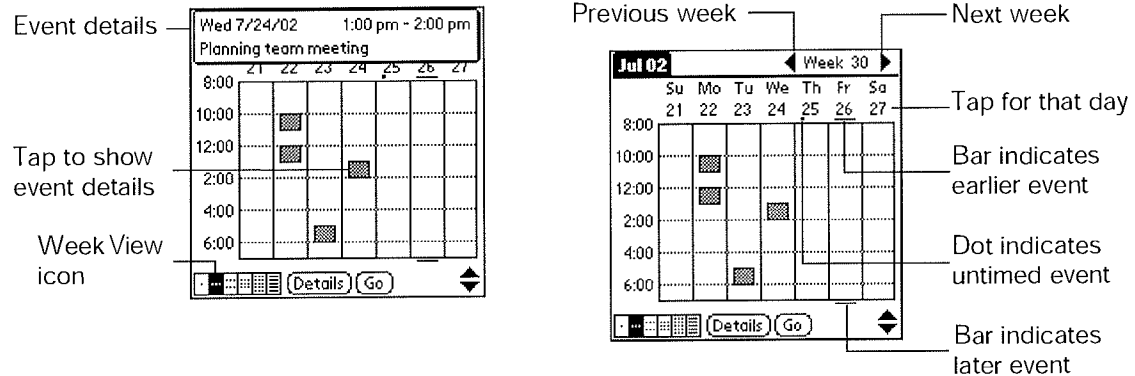


2. Drag the stylus below the date bar and then lift it.

Note: If you lift the stylus while it is still on the date bar, the menu bar appears.

## Working in Week View

Week View shows the calendar of your events for an entire week. This view lets you quickly review your appointments and available time slots. In addition, the graphical display helps you spot overlaps and conflicts in your schedule.



## Tips for using Week View

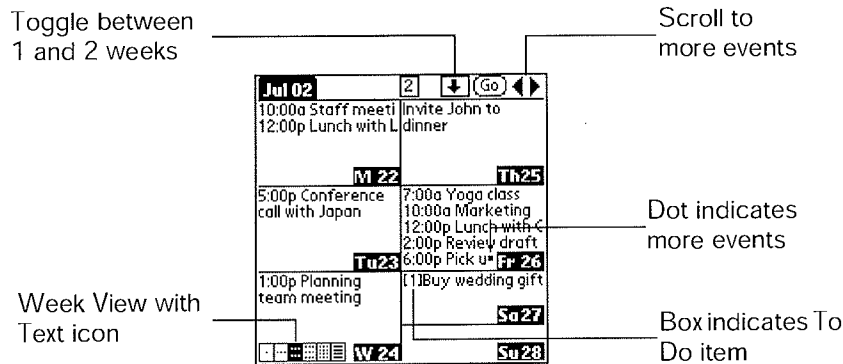
Keep the following points in mind:

- Tap an event to show details for the event.
- Use the scroll buttons or rocker switch to move forward or backward a week at a time.
- To reschedule an event, tap and drag the event to a different time or day.
- Tap a blank time on any day to move to that day and have the time selected for a new event.
- Tap any day or date that appears at the top of the Week View to move directly to that day without selecting an event.

- The Week View shows the time span defined by the Start Time and End Time in the Date Book Plus Preferences settings. If you have an event before or after this time span, a bar appears at the top or bottom of that day's column. Use the onscreen scroll arrows to scroll to the event.




## Working in Week View with Text

The Week View with Text shows an entire week with a description of each scheduled event. This view can display one or two weeks at a time and can include To Do items that are due on the dates shown.



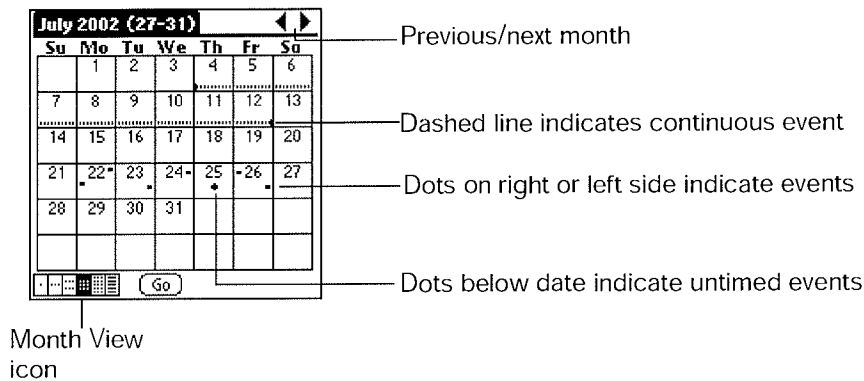
## Tips for using Week View with Text

Keep the following points in mind:

- Tap a day to display that day in the Day View.
- Use the scroll buttons or rocker switch to move between weeks. You can also tap the scroll arrows in the upper-right corner to move forward or backward a week.
- Press Menu , and under Options, select Go to Week (/O). Tap a number to select a different week.
- Tap Go to open the date selector use the scroll buttons to select a week and then hold Option  and press Return  to finish.
- Tap the number of weeks to toggle between a one week view and a two week view.

## Working in Month View


The Month View screen shows which days have events scheduled. Dots and lines in the Month View indicate events, repeating events, and untimed events.



You can control the dots and lines that appear in the Month View. See page 114 for details.

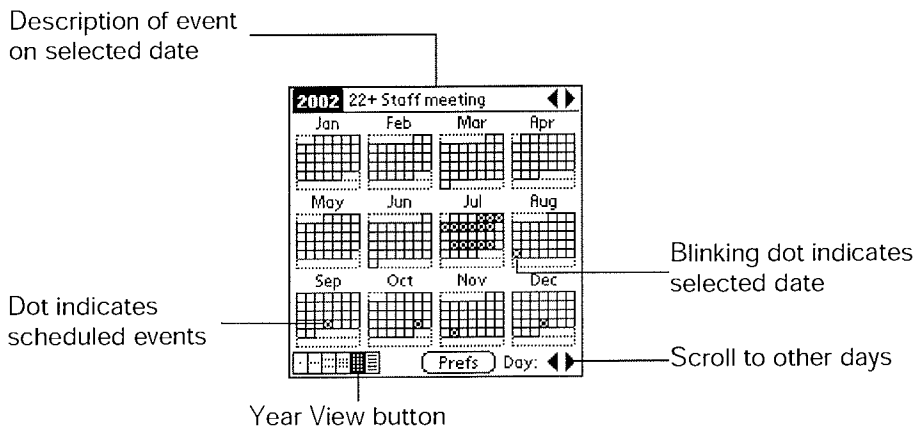
## Tips for using Month View

Keep the following points in mind:

- Tap a day in the Month View to display that day in the Day View.
- Use the scroll buttons or rocker switch to move between months. You can also tap the scroll arrows in the upper-right corner to move forward or backward a month.
- Press Menu , and under Options, select Go to Month (/O) to open the date selector and select a different month.


## Working in Year View

The Year View shows an overview of your calendar for an entire year.



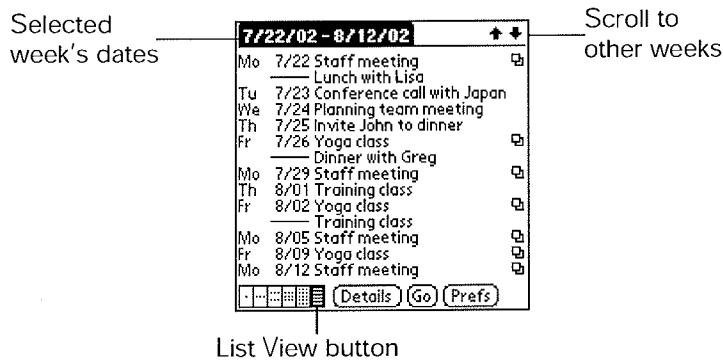
## Tips for using Year View

Keep the following points in mind:

- Tap a day to display the date and events for that day in the title bar. A minus sign indicates only one event is scheduled on that day. A plus sign indicates multiple events are scheduled on that day.
- Use the scroll buttons or rocker switch to move between days. You can also tap the scroll arrows in the lower-right corner to move forward or backward a day.
- Tap the scroll arrows in the upper-right corner to move forward or backward a year.
- Press Menu , and under Options select Year Preferences (/Y) to set display options.



## Working in List View

The List View is a text oriented view that is integrated with To Do List. It displays a list of events and To Do items for the selected week(s).



## Tips for using List View

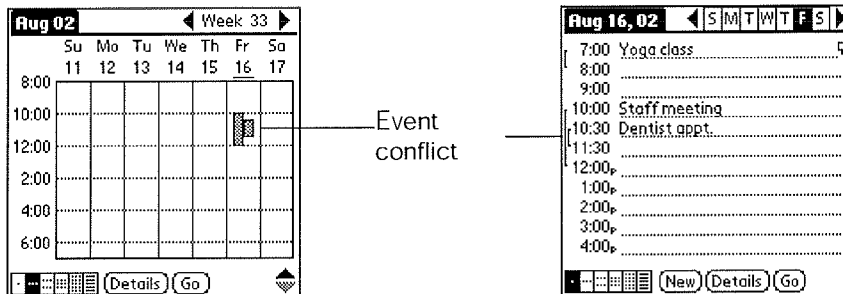
Keep the following points in mind:

- Tap a line to select it. The start and end time display briefly in the title bar. To redisplay the event details, tap to the left of the description.
- Tap the description of the selected line to display the event in Day View.
- Use the scroll buttons or rocker switch to select specific items on the screen. You can also tap the up scroll arrow in the upper-right corner to jump forward by one of the following: 1 Day, 1 Week, 1 Month, or Pick (a specific date). Then tap the scroll arrows to move forward or backward a week.
- Press Menu , and under Options, select Go to Date (/O) to open the date selector and select a different date.
- Press Menu , and under Options, select List View Preferences (/L) to set display options.

## Spotting event conflicts

With the ability to define specific start and end times for any event, it's possible to schedule events that overlap (an event that starts before a previous event finishes).

An event conflict (time overlap) appears in the Week View as overlapping bars. The Day View displays overlapping brackets to the left of the conflicting times.




## Working with floating events

Date Book Plus can include events that are a combination of a To Do item and a Date Book event. These events are called "floating events." Floating events are not assigned to a specific date, but can still be timed or untimed, can have alarms, and can repeat. If a floating event is not completed by midnight, it automatically advances to the next day until you mark it complete.

You can distinguish a floating event from an integrated To Do item by the circle that appears next to the floating event (in place of the To Do item priority number and check box). Floating events appear in alphabetical order at the top of the Day View screen between any integrated To Do items and untimed events.



To create a floating event:

1. From the Day View, press Menu .
2. Under Record, select New Floating Event.
3. Enter a description of the event.
4. Tap a blank area on the screen to deselect the floating event.

To mark a floating event complete:

- Tap the circle to the right or left of the event.

Tips for using floating events:


- To prioritize floating events, enter a number followed by a space or dash as the first few characters of the description.
- To convert an existing event to a floating event, select the event, tap Details, tap Float as the Type, and then hold Option  and press Return  to finish.
- When you complete a repeating floating event, it marks only the current occurrence of the event as complete.

- Avoid scheduling a floating event that repeats daily. These events can accumulate quickly unless you complete them each day.
- When viewing a floating event in a desktop application, the Note field will contain a series of characters: ##f@@@@@@@ for an incomplete event and ##c@@@@@@@ for a complete event. Do not remove or edit these characters.

## Working with To Do items

Date Book Plus can create and display To Do items. To Do items appear in priority order at the top of the Day View screen.

To create To Do items in Date Book Plus:

1. From the Day View, press Menu .
2. Under Record, select New To Do (/T).
3. Enter a description of the To Do item.
4. Tap a blank area on the screen to deselect the item.

To mark a To Do item complete:

- Tap the check box next to the item.


### Tips for using To Do items:

- When you create a To Do item in Date Book Plus, the priority and category are based on the settings in the Create Options dialog box. See the section that begins on page 118 for details.
- If a To Do item does not appear in Date Book Plus, confirm that the category assigned to the item is selected. See the section that begins on page 118 for details.
- If you do not complete a To Do item on or before the due date, then an ! (exclamation mark) appears next to the item as a reminder that it is overdue.



## Using the Daily Journal

You can use the Daily Journal feature to record events as they occur. Events are recorded with automatic time-stamping as Date Book Plus Notes so they do not clutter your schedule. The Daily Journal is especially useful for tracking activities such as sales calls, start and end times for consulting or other work, or keeping a record of how you spend your time at the office.

To create a Daily Journal entry:

1. From the Day View, press Menu .
2. Under Record, select New Journal Entry (/J).




Date Book Plus creates an untimed event, opens a Note for this event, and inserts the current time. If you've already started a journal for the current day, Date Book Plus opens the existing journal and inserts a new entry.

3. Enter a description for the journal entry.
4. Hold Option  and press Return  to finish.

## Using templates

You can use templates to create a list of standard events. You can then select an event from this list and add it to your calendar. Since Date Book Plus saves all the event attributes, including alarms and notes, templates can really save you time when entering reminder notices or events that recur on different days and times.

To create a template:



1. Select the event you want to save as a template.
2. Press Menu .
3. Under Record, select tap Create Template (/V).
4. Hold Option  and press Return  to finish.

To schedule a template event:

1. Select the date on which you want to schedule the event.
2. From the Day View, tap the time line that corresponds to the beginning of the event.
3. Tap New and select Template from the list.



Tap to create an event  
from a template

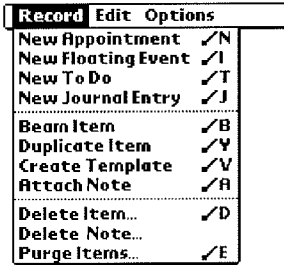
4. Select the event from the Appointment Templates list.
5. Hold Option  and press Return  to finish.

## Date Book Plus menus

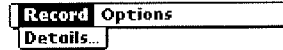
Date Book Plus menus are shown here for your reference, and Date Book Plus features that are not explained elsewhere in this guide are described here.

See page 31 for information about choosing menu commands.

### Record menu



Day View

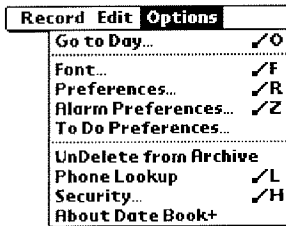


List View

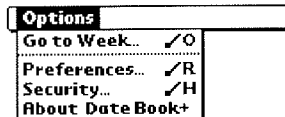
**New To Do** Creates a new To Do item and adds it to your Date Book Plus and To Do List database.

**Duplicate Item** Creates a copy of the selected event and opens the Details dialog box for the new event.

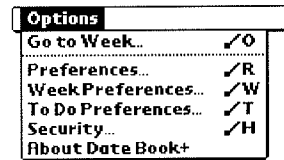
### Options menu



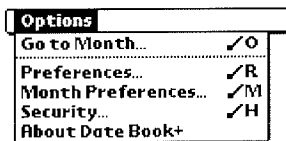
Day View



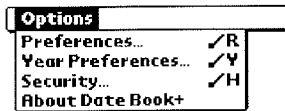
Week View



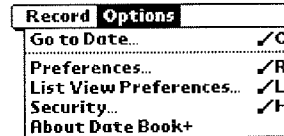
Week View with Text



Month View



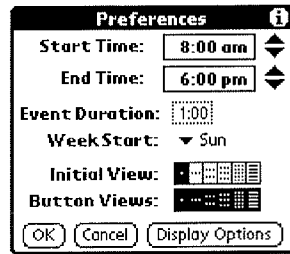
Year View




List View

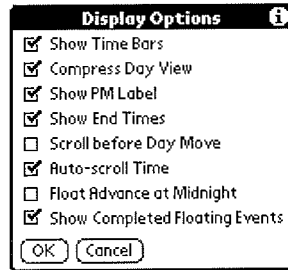


## Preferences (Day View)



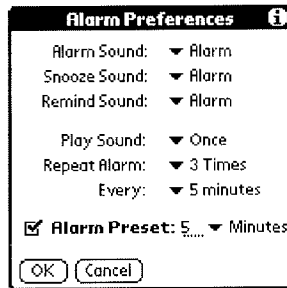
- Start/End Time. Defines the start and end times for Date Book Plus screens. If the time slots you select do not fit on one screen, you can tap the scroll arrows  to scroll up and down.
- Event Duration. Defines the default duration for new events.
- Week Start. Defines the first day of the week. This setting overrides the System Preferences setting for all Date Book Plus views.
- Initial View. Defines the view that appears when you start Date Book Plus.
- Button Views. Defines which views display when you repeatedly press the Date Book Plus button. By default, all views appear.
- Display Options. Opens the Display Options dialog box where you can define the following options:

## Display Options



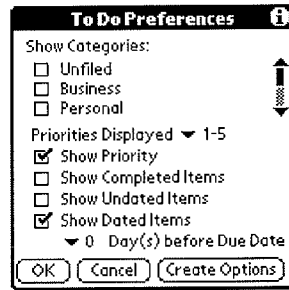
- Show Time Bars. Activates the time bars that appear in the Day View. The time bars show the duration of an event and illustrate event conflicts
- Compress Day View. Controls how times appear in the Day View. When Compress Day View is off, all time slots display. When it is on, start and end times display for each event, but blank time slots toward the bottom of the screen disappear to minimize scrolling.
- Show PM Label. Displays a "p" after PM times.
- Show End Times. Displays all time bars and time slots for end times of an event.
- Scroll Before Day Move. Determines whether the front panel scroll buttons will scroll up and down within the current day before scrolling to the previous or next day.
- Auto-scroll Time. Displays events based on the time of day when the Day View contains more than one screen of information.
- Float Advance at Midnight. Advances floating events to the next day at midnight of the current day.
- Show Completed Floating Events. Displays completed floating events.

## Alarm Preferences



- Alarm Sound. Sets the tone of the alarm.
- Snooze Sound. Sets the tone of the snooze alarm.
- Remind Sound. Sets the tone of the reminder alarm. The reminder alarm sounds when the snooze alarm is not acknowledged.
- Play Sound. Defines how many tones the alarm emits before it stops. The choices are Once, Twice, 3 Times, 5 Times, and 10 Times.
- Repeat Alarm. Defines how many times the alarm repeats when it is not acknowledged. The choices are Once, Twice, 3 Times, 5 Times, 10 Times, and 100 Times.
- Every. Defines how often the alarm sound repeats. The choices are Minute, 5 minutes, 10 minutes, and 30 minutes.
- Alarm Preset. Automatically sets an alarm for each new event. The silent alarm for untimed events is defined by minutes, days, or hours before midnight of the date of the event.

To Do Preferences



- Show Categories. Displays the To Do items in the categories you select.
- Priorities Displayed. Displays To Do items with the selected priority level. The choices are 1 only, 1-2, 1-3, 1-4, and 1-5.
- Show Priority. Displays the priority level for To Do items.
- Show Completed Items. Displays completed To Do items.
- Show Undated Items. Shows all To Do items that have not been assigned a due date.
- Show Dated Items. Shows all To Do items that have been assigned a due date.
- Days before Due Date. Defines the number of days before the due date that an item will appear in Day View as a To Do item.
- Create Options. Opens the Create Options dialog box where you can select the default priority and category for To Do Items you create in Date Book Plus.

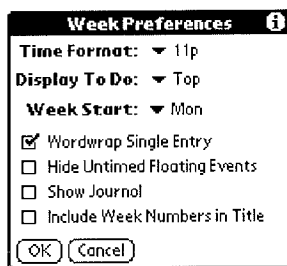
**UnDelete from Archive**

Restores the last event you deleted from Date Book Plus (provided it was stored in the Archive file). You can select this command repeatedly to restore additional events.

**Go to Week**

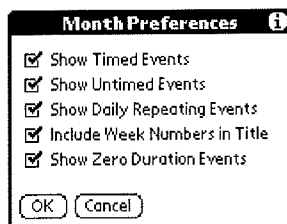
Enables you to jump to a specific week by tapping the week number in the current year.

## Week Preferences



- Time Format. Defines the format of the time display. The choices are No Time, 11p, 11:30p, 23, 23:30.
- Display To Do. Defines where To Do items will appear on the Date Book Plus screen. The choices are Top, Bottom, and Hide.
- Week Start. Defines the first day of the week for Week View with Text.
- Wordwrap Single Entry. Wraps text in cells that contain a single event to display as much text as will fit in the cell.
- Hide Untimed Floating Events. Removes untimed floating events from the Week View with Text display.
- Show Journal. Displays a Daily Journal entry.
- Include Week Numbers in Title. Displays the selected week number in the title bar.

## Month Preferences



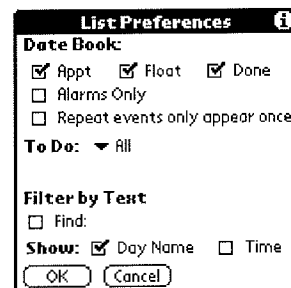
- Show Timed Events. Displays events that you assigned to a specific time.
- Show Untimed Events. Displays events that you assigned to a date, but did not assign to a specific time.
- Show Daily Repeating Events. Displays events that repeat each day.
- Include Week Numbers in Title. Displays week numbers in the title bar for the first and last weeks in the month.
- Show Zero Duration Events. Displays events that have no duration in the Month View display.

## Year Preferences



- Hide Floating and Done Items. Removes floating events and completed To Do items from the Year View display.
- Hide Untimed Events. Removes untimed events from the Year View display.
- Hide Zero Duration Events. Removes events without a duration from the Year View display.
- Hide Events <. Removes events that are shorter than the time you specify from the Year View display. The choices are 0.5, 1, 2, 4, 8, and 12.
- Hide Daily Repeating Events. Removes events that repeat daily from the Year View display.

## List View Preferences



- Date Book. Determines which type of events appear in the List View display. The choices are: Appt, Float, Done, Alarms Only, and Repeat events only appear once.
- To Do. Determines which type of To Do items appear in the List View display. The choices are All, Not Complete, Complete, and None. If you choose either Not Complete or Complete, you also have the following choices: Dated & Undated, Dated only, and Undated only.
- Filter by Text. Displays events that contain the text you enter in this field and hides events that do not contain this text.
- Show. Determines the type of information that will appear for each event. The choices are Day Name and Time.

## About Date Book+

Shows version information for Date Book Plus.

## Blazer

If you can't hold the world in the palm of your hand, at least you can hold the World Wide Web when you use Blazer to browse the Internet on your communicator's screen.

To use Blazer, you must subscribe to data services from your wireless service provider, and you must have an account established with an ISP (Internet Service Provider). Many wireless service providers also provide ISP services. If ISP information is available from your wireless service provider when you configure your wireless communication settings with the Handspring CD-ROM, the installation program will set up Blazer for use with that provider.


**Note:** If you already installed the desktop software from the Handspring CD-ROM but didn't configure the wireless communication settings, select Configure Your Treo under Handspring (or Palm) on the Windows Start menu, and follow the instructions on the screen.





## Viewing web pages

You can view web pages whenever you are inside a coverage area. If you are outside a coverage area, you can view web pages that are stored temporarily on your communicator in an area called the "cache." However, if a page stored in the cache has an expiration date and it is past that date, you need to establish an Internet connection to view that page.

**Tip:** You can tell whether you are inside a coverage area by looking at the signal strength indicator in the lower right corner of the screen.

To view a web page:

1. Make sure wireless mode is on. See page 18 for details.
2. Press Blazer .

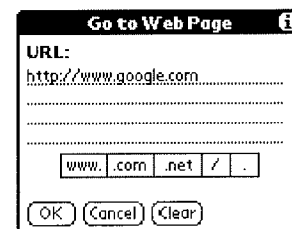
**Note:** If a different application appears when you press Blazer , your wireless service provider installed another application as the default web browser. To launch Blazer, press Option , press Menu , and then tap the Blazer icon .



3. Press Menu .
4. Under Go, select Go to Web Page (/G).



**Tip:** You can also tap the Folder icon  to open the Go to Web Page dialog box.

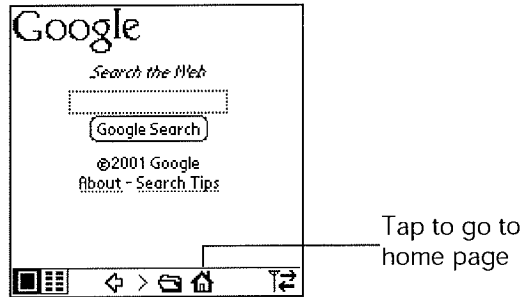


Folder icon



5. Enter the URL you want to view.
6. Hold Option  and press Return  to finish.

While a page is loading, a Progress icon  appears in the lower right corner of the screen. You can tap links to other pages as soon as they appear. You don't need to wait until a page fully loads. To stop loading a page, tap the Stop icon  in the lower left corner of the screen.



7. To scroll through a page, use the scroll buttons or rocker switch, or tap the onscreen arrows or scroll bar (if one appears).

**Tip:** To view a list of web sites that are optimized for your communicator, go to the home page, and then tap Directory of Mobile Sites.





## Working with bookmarks

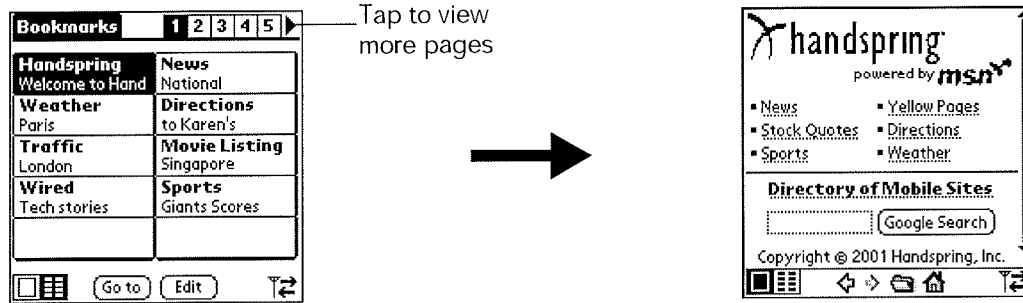
The Bookmark view makes it easy for you to get to web sites you visit often.

### Viewing bookmarked pages

Your communicator may come with a few bookmarks already in place. You can jump directly to any of the predefined bookmarks, or to any pages for which you've created a bookmark.

To view a bookmark:

1. Make sure wireless mode is on. See page 18 for details.
2. Press Blazer  twice to access the Bookmark view .
3. Tap the bookmark you want to view.




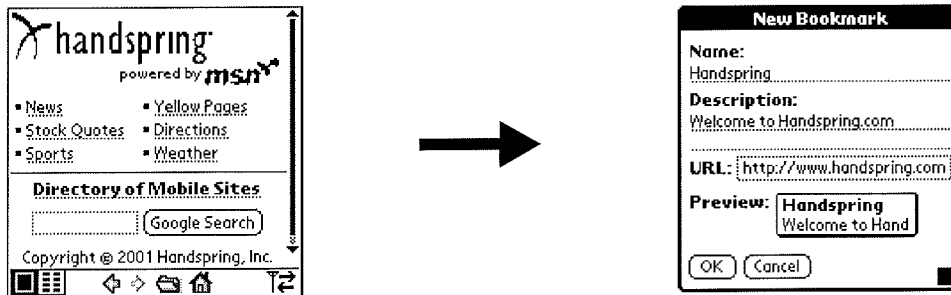
Tip: You can also press the scroll buttons to scroll to other pages, and roll the rocker switch to scroll through the current page. To view the selected page, press the rocker switch.

### Adding bookmarks

You can store up to 100 bookmarks and group them in categories by placing similar links on the same bookmark page. See page 125 for information on creating page categories.

To bookmark the current page:


1. From the Page view, go to the page you want to bookmark.
2. Press Menu .
3. Under Page, select Add Bookmark (/A).



4. Hold Option  and press Return  to finish.

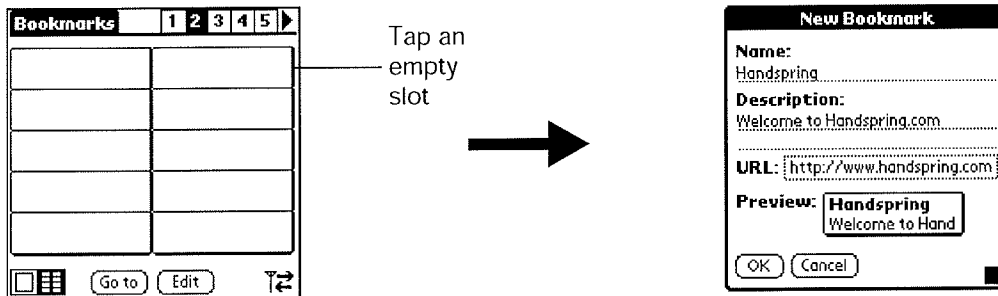
Tip: You can also add a bookmark by tapping an empty bookmark slot in the Bookmark view and entering a Name, Description, and URL for the page you want to bookmark.



To define a bookmark:

1. From the Bookmark view, press Menu .
2. Under Bookmark, select Add Bookmark (/A).

Tip: You can also open the New Bookmark dialog box by tapping an empty bookmark slot.

3. Enter a Name, Description, and URL for the page you want to bookmark.




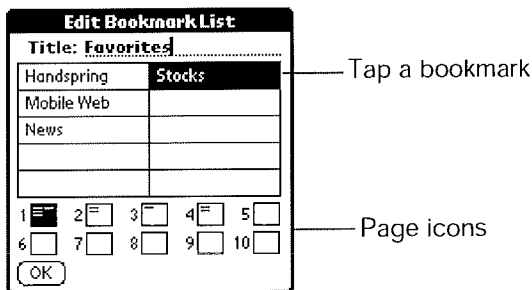
4. Hold Option  and press Return  to finish.

### Editing bookmarks

You can change the title, description, or URL associated with any of your bookmarks.



To edit a bookmark:

1. From the Bookmark view, press Menu .
2. Under Bookmark, select Edit Bookmark (/E).



3. Tap the page icons to navigate to the page containing the bookmark you want to change.




Tip: You can enter or change the Title for any bookmark page. Use the page Title to create bookmark categories. For example, if you want to create a page with links to various investments, you might name the page Assets.

4. Tap the bookmark you want to change.
5. Enter the changes.
6. Hold Option  and press Return  to finish.

## Deleting bookmarks

If your bookmark list becomes full, or you no longer need an entry, you can delete it.




To delete a bookmark:

1. From the Bookmark view, press Menu .
2. Under Bookmark, select Edit Bookmark (/E).
3. Tap the entry you want to delete.
4. In the Edit Bookmark dialog, tap Delete.
5. Hold Option  and press Return  twice to confirm deletion.


## Arranging your bookmarks

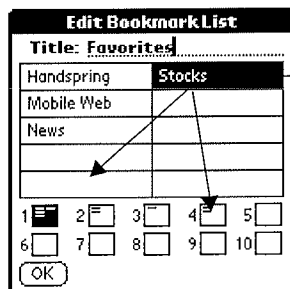
As your bookmark list grows, you may want to rearrange the entries or move entire pages. You can assign a title to each bookmark page and arrange the entries by category. For example, if you want to create a page with links to various sports scores, you might name the page Scores.

To assign page category titles:

1. From the Bookmark view, press Menu .
2. Under Bookmark, select Edit Bookmark (/E).
3. Tap the page icon to which you want to assign a title.
4. Enter the title.
5. Hold Option  and press Return  to finish.



To rearrange bookmark entries:

1. From the Bookmark view, press Menu .
2. Under Bookmark, select Edit Bookmark (/E).
3. Drag the entries to the slot where you want them to appear.




Drag an entry to another slot or page

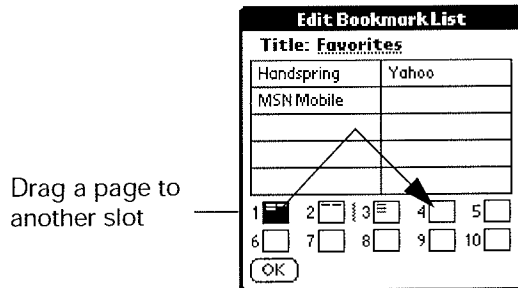
**Tip:** If the new slot is full, the other entries move down one slot as the rows fill from top to bottom. If you drag an entry to a page icon, the entry moves to the first available slot on that page.



4. Hold Option  and press Return  to finish.

To rearrange bookmark pages:

1. From the Bookmark view, press Menu .
2. Under Bookmark, select Edit Bookmark (/E).
3. Drag the page to the slot where you want it to appear.

A grey line appears next to the page when it is in drag mode. When dropping a page on the top row, the grey line appears to the left of the slot where the page will appear. When dropping a page on the bottom row, the grey line appears to the right of the slot where the page will appear.



4. Hold Option  and press Return  to finish.

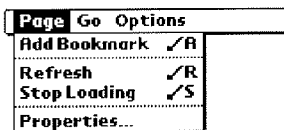
## Blazer menus

Blazer menus are shown here for your reference, and Blazer features that are not explained elsewhere in this guide are described here.

See page 31 for information about choosing menu commands.

The Go and Options menus differ depending on whether you're displaying the Page view or the Bookmark view.

## Page menu



Page view

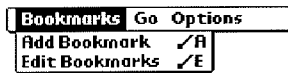
**Refresh** Enables you to update the current web page with the most up-to-date information.

**Stop loading** Cancels the process of loading a page.

**Properties** Displays the Page Properties dialog box where you can view the Page Name, URL, Size (Bytes) and whether the page was loaded from the cache.



Bookmarks menu

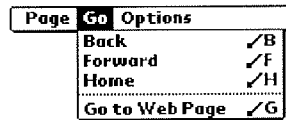


Bookmark view

Go menus

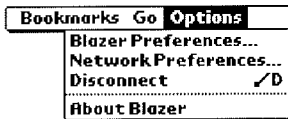


Bookmark view

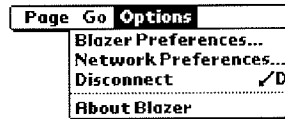


Page view

Options menu

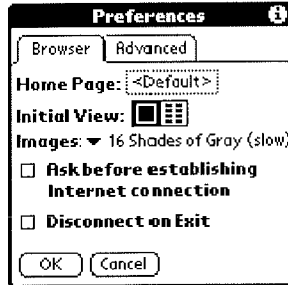


Bookmark view



Page view

## Preferences

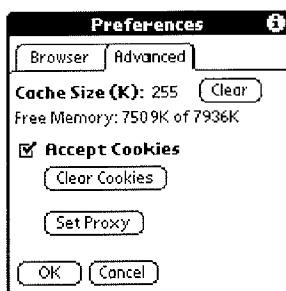
**Browser tab:**

- **Home page.** Displays the URL of the current home page selection. Tap this option to open the Set Home Page dialog box and select a different home page. To restore the factory default Home Page setting, tap Restore in the Set Home Page dialog box.

Note: Some service providers may not support the default Home Page setting.

- **Initial view.** Determines whether the Page view or Bookmark view appears when you start the Blazer application. The default option is Page view.
- **Images.** Determines how many shades of gray are used to display graphic images. You can also choose to not display images at all. The options are: No Images (fastest), Black & White (faster), 4 Shades of Gray (fast), and 16 shades of Gray (slow). The default setting is 16 shades of Gray (slow).
- **Ask before establishing Internet connection.** Displays a confirmation dialog each time you begin an Internet session. The default setting for this option is on.
- **Disconnect On Exit.** Determines whether the Internet connection automatically closes when you exit the Blazer application. Leaving this option off enables you to switch to another application and then return to Blazer while you are still connected to the Internet. The default setting for this option is off.

## Preferences (continued)



### Advanced tab:

- **Cache Size (K).** Displays the amount of memory that Blazer reserves to store recently viewed pages. The amount of free memory available on your communicator appears below this option.
- **Clear.** Erases all the pages stored in the cache. You cannot cancel or undo this action.
- **Accept Cookies.** Enables the receipt of Internet cookies. The default setting for this option is on.
- **Clear Cookies.** Erases all the cookies stored on your communicator. You cannot cancel or undo this action.
- **Set Proxy.** Opens the Set Proxy dialog box where you can enter advanced HTTP proxy server settings. If your ISP or network requires you to go through a proxy server when you connect to the Internet, use this dialog box to enter the proxy server settings. Contact your ISP or system administrator for details.

**Disconnect** Terminates your connection to the Internet.

**About Blazer** Displays version information for Blazer.

## SMS Messaging

In addition to dialing and receiving voice calls, you can use your Treo to send and receive short text messages. These text messages, also called SMS (Short Message Service) messages, are similar to e-mail messages that you send and receive from your computer, but are limited to 160 characters in length. The person receiving your message must also have a GSM mobile phone and a wireless service provider that supports text messages. Some wireless service providers also allow you to use your Treo to send text messages to an e-mail address and to receive text messages from a computer. Talk to your wireless service provider for details about their SMS and SMS Email features.



### Enabling SMS and SMS Email

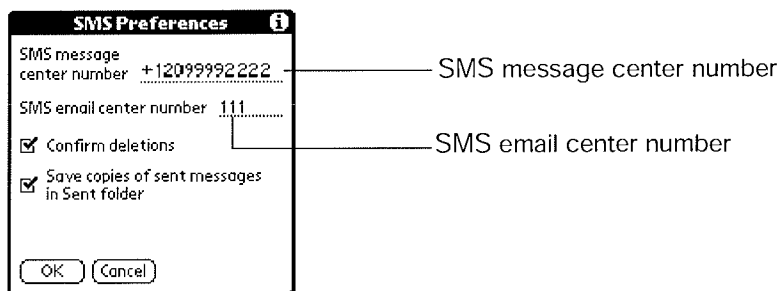
To send and reply to SMS messages, you must subscribe to your wireless service provider's SMS service. If you subscribe to this service, your wireless service provider supplies an SMS Message Center number which appears in the SMS Preferences dialog.



Note: Your wireless service provider may use a different name for their text messaging service. Contact your wireless service provider to see if their service is compatible with SMS.

To use SMS Email, you must subscribe to your wireless service provider's SMS Email service and enter their SMS Email Center number in the SMS Preferences dialog. The SMS Email Center forwards the SMS messages to the recipient's e-mail address. Contact your wireless service provider to obtain their SMS Email Center number.

To enable SMS and SMS Email:

1. Make sure wireless mode is on for at least 30 seconds. See page 18 for details.
2. Press SMS Messaging .
3. From the SMS Messages Inbox, press Menu .
4. Under Options, select Preferences.
5. Enter or confirm the SMS Message Center number.
6. Enter or confirm the SMS Email Center number.



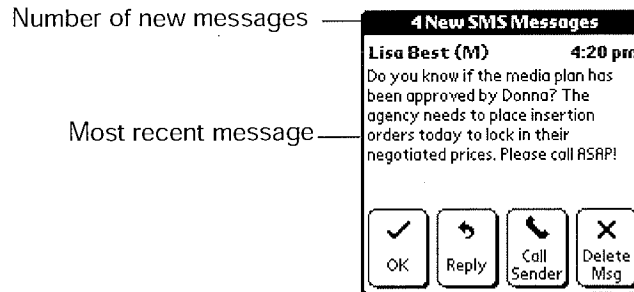
7. Hold Option  and press Return  to finish.



## Receiving SMS messages

When you receive SMS messages, the New SMS Messages alert appears.


Note: You can receive SMS messages even if you don't subscribe to your wireless service provider's SMS service.



In the New SMS Messages alert dialog box, you can save or respond to the first message by tapping any of the following buttons:

- |                    |  |
|--------------------|--|
| <b>OK</b>          | Saves the message in the SMS Messages Inbox category, dismisses the alert dialog box, and returns you to the previous application.             |
| <b>Reply</b>       | Switches to the SMS Messaging application, opens the new message dialog box, and addresses the message to the person who sent you the message. |
| <b>Call Sender</b> | Dials the number of the person who sent you the message. If the message was sent from an e-mail address, this option is not available.         |
| <b>Delete Msg.</b> | Deletes the current message, dismisses the alert dialog box, and returns you to the previous application.                                      |


### Tips:

- To view additional incoming messages, press SMS Messaging .
- You can also dismiss the alert dialog box by pressing the rocker switch or the top scroll button.

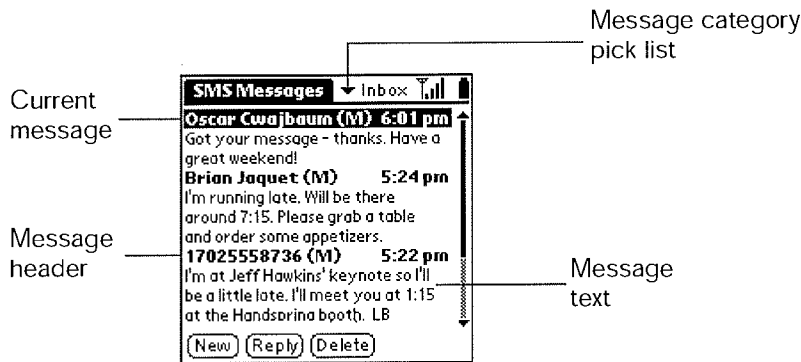
## Viewing messages


SMS Messaging enables you to quickly view your incoming messages. You can also view messages you've sent and pending messages that will be sent when a signal is available.

To view SMS messages:


1. Press SMS Messaging  repeatedly to access the message category you want to view: Inbox, Sent, or Pending.

Note: The Pending category appears only when you have messages pending delivery.



2. Hold Shift  and use the scroll buttons to page through the messages.

**Tips:**

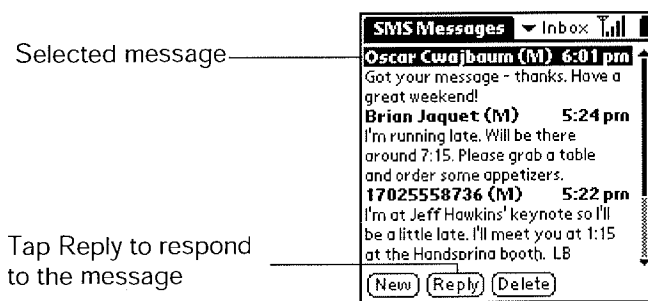
- If a message is too long to fit on one screen, press the scroll buttons to view additional screens in the current message.
- If a message is longer than 160 characters, it is divided into sub-messages which appear as separate items.
- To view one message at a time, use the scroll buttons or rocker switch to select the header of the message you want to view and then press Space  or the rocker switch. Page through messages one at a time with the scroll buttons or rocker switch.


## Replying to messages

You can send an SMS message as a response, or you can call the person who sent you the message.



To send an SMS message reply:

1. From the SMS Messages Inbox, select the message to which you want to reply.




2. Press Menu .
3. Under Message, select Reply (/R).
4. Enter the message text.

When you reply to an SMS message, SMS Messaging fills in the To field for you. When you reply to an SMS Email message, you must enter the e-mail address manually. See the next section in this chapter for more information.

5. Make sure wireless mode is on. See page 18 for details.
6. Hold Option  and press Return  to send the message.

To call the sender:

1. From the SMS Messages Inbox, select the message from the person you want to call.
2. Press Menu .
3. Under Message, select Call Sender (/A).


## Creating SMS messages

SMS Messaging enables you to create short text messages and to send them to a mobile phone number or an e-mail address. If a message exceeds 160 characters, SMS Messaging automatically divides the text into multiple messages when it sends the message. As you create a message, the status bar at the top of the screen indicates how many messages will be sent and the number of characters in each message.


To save time while creating messages, you can insert predefined text from a boilerplate. Some boilerplates ask you to enter information such as a meeting time or place. Using a boilerplate is similar to filling in the blanks on a form letter instead of writing a letter from scratch. You can easily combine the boilerplate text with your own text to personalize your message.

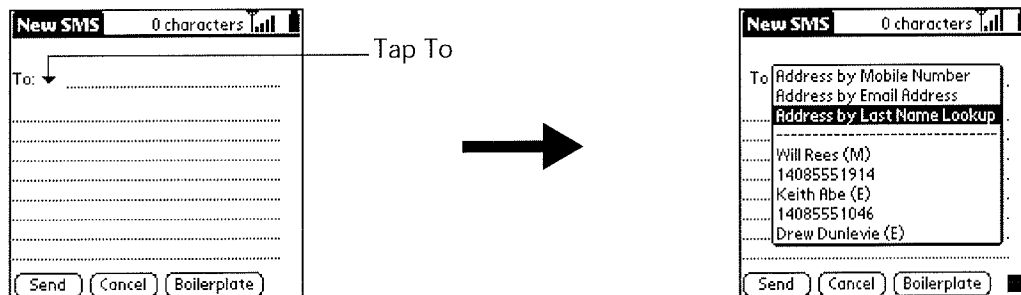
You can create a message at any time, but if you send a message when you are outside a coverage area, your Treo places the message in the Pending category and sends it automatically when you return to a coverage area. While a message is in the Pending category, you can edit or delete it before it is sent.

To create an SMS text message:

1. From any SMS Messaging list view, press Menu .
2. Under Message, select New (/N).

Note: If you defined a signature, it automatically appears at the end of your message. See page 135 for details on defining a signature.

3. Use the scroll buttons to select one of the following address methods, and then press Space .



**Address by Mobile Number** Enter a mobile phone number to send an SMS message to another GSM mobile phone.

**Address by Email Address** Enter an e-mail address to send an SMS message to an e-mail address. To send a message to an e-mail address, you must subscribe to your wireless service provider's SMS Email service and enter their SMS Email Center number in the SMS Preferences dialog. See page 130 for details.

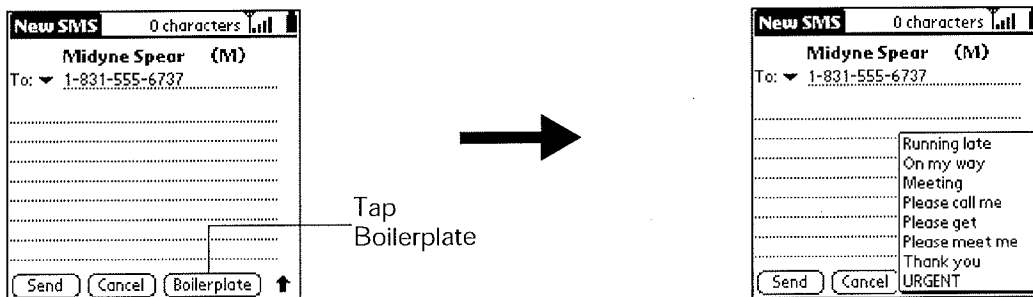
**Address by Last Name Lookup** Look up a name from your Contacts list in the PhoneBook application by entering the first few letters of the last name and then pressing Return . If multiple entries appear, scroll to the GSM mobile phone number or e-mail address you want and press Return to select it.

**Addresses** Tap a recently used mobile phone number or e-mail address on the list.

**Tip:** If you're sending a message to an e-mail address and your wireless service provider supports message titles, you can add a title by entering <subject>#<message>. Simply replace the word subject with the title, and the word message with the message body.

4. Enter the appropriate information for the address option you selected in step 3, and then press the bottom scroll button to move to the text field.
5. Enter the message text.

**Tip:** You can also tap Boilerplate to select a predefined text phrase. If prompted, enter or select other text to complete the phrase.



6. Hold Option and press Return to finish.
7. Make sure wireless mode is on. See page 18 for details.
8. Hold Option and press Return to send the message.


The message goes into the Pending category until your phone transmits the message. After your message transmits, your Treo places a copy in the Sent category. If an error occurs while sending the message, an ! appears next to the message header. Select the message to view information about why the message did not go through.

## Creating a message signature

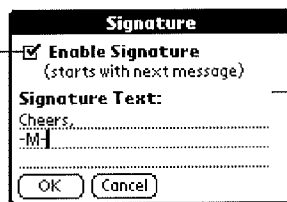
You can create a signature of up to 80 characters. Then, when you create a message, SMS Messaging automatically inserts your signature at the end of each message you create. If necessary, you can edit the default signature text when you create a message.

**Note:** The signature text you define applies only to new messages. If you are editing a message or have messages in the Pending folder when you create the signature text, the signature text will not be added to those messages. If you enable or disable the signature option, the signature will not be added or removed from those messages either.



To create a message signature:

1. From any SMS Messaging list view, press Menu .
2. Under Options, select Signature.

Tap here to add the signature to your messages




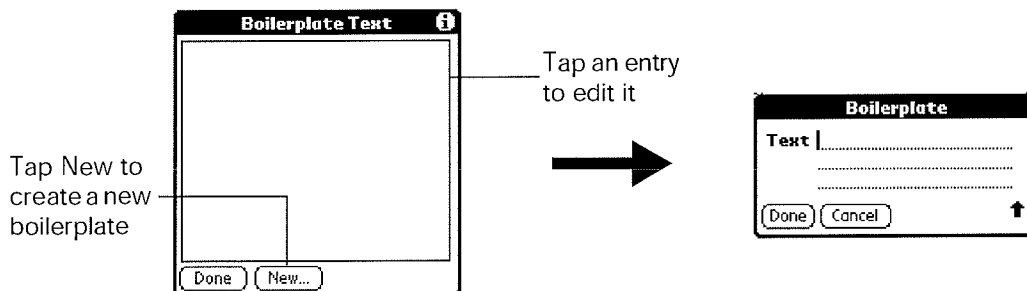
Enter the default signature text

3. Enter the signature text.
4. Hold Option  and press Return  to finish.

## Creating boilerplates



When you create a message you can use the Boilerplate pick list to insert predefined text in your message. You can also add items to the list and modify any of the items you add.

1. From any SMS Messaging list view, press Menu .
2. Under Options, select Boilerplate Text.



3. Tap New, or tap an entry you created that you want to edit.
4. Enter or modify the text in the Boilerplate dialog box.


**Tip:** To delete a boilerplate, tap Delete.

5. Hold Option  and press Return  twice to finish.


## Copying and forwarding messages

You can save time by copying text from your SMS messages, or forwarding messages.


To copy text from an SMS message:

1. From any SMS Messaging list view, tap the text of the message you want to copy.
2. Press Menu .
3. Under Edit, select Select All (/S).



Tip: To copy only a portion of the message, highlight the text you want to copy and select Copy (/C) instead of Select All.

4. Open the message or application where you want to insert the message.
5. Press Menu .
6. Under Edit, select Paste (/P).

To forward messages:

1. From the SMS Inbox or Sent category, tap the header of the message you want to forward.
2. Press Menu .
3. Under Message, select Forward (/F).


Tip: You can edit the forwarded message before sending it.

4. Address the message as described on page 133.
5. Make sure wireless mode is on. See page 18 for details.
6. Hold Option  and press Return  to send the message.



## Modifying messages

You can modify any messages in the Pending category.

To modify Pending messages:




1. In the Pending category, select the message you want to change.
2. Press Menu .
3. Under Message, select Edit (/E).

Tip: You can also tap the body of the message to open it in Edit mode.


4. Edit the message.
5. Make sure wireless mode is on. See page 18 for details.
6. Hold Option  and press Return  to send the message.

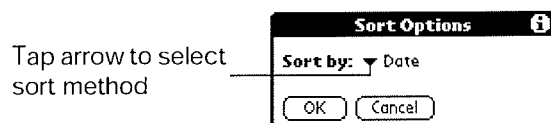
## Resending messages

You can resend any messages in the Sent category.

1. In the Sent category, select the message you want to resend.
2. Press Menu .
3. Under Message, select Resend (/R).
4. If necessary, edit the message.
5. Make sure wireless mode is on. See page 18 for details.
6. Hold Option  and press Return  to send the message.


## Sorting messages

1. From any SMS Messaging list view, press Menu .
2. Under Options, select Sort.
3. Tap the Sort by pick list to select the sort method you want to use.



**Date** Places the most recent messages at the top of the list. This is the default sort method.




**Name** Places mobile phone numbers at the top of the list in numerical order, followed by e-mail addresses and names in alphabetical order.

4. Hold Option  and press Return  to finish.

## Deleting messages


You can delete a single message or a group of messages from a particular category.

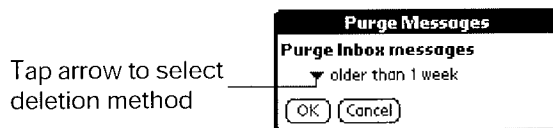
To delete a single message:

1. From any SMS Messaging list view, select the message you want to delete.
2. Press Menu .
3. Under Message, select Delete (/D).
4. If prompted, hold Option  and press Return  to confirm deletion.

Tip: You can also delete a message by selecting it and pressing Backspace .

To delete a group of messages:

1. From any SMS Messaging list view, select the category containing the messages you want to delete.
2. Press Menu .
3. Under Message, select Purge Messages.
4. Select the deletion method you want to use.



- |                           |  |
|---------------------------|--|
| <b>Older than 1 week</b>  | Deletes all messages in the current category with a date earlier than 1 week prior to the current date.  |
| <b>Older than 1 month</b> | Deletes all messages in the current category with a date earlier than 1 month prior to the current date. |
| <b>Except last 10</b>     | Keeps only the 10 most recent messages and deletes all other messages in the current category.           |
| <b>All</b>                | Deletes all messages in the current category.  |

5. Hold Option  and press Return  twice to confirm deletion.

## SMS Messaging menus

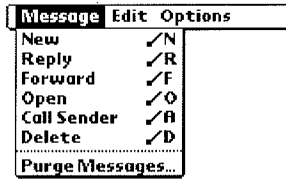
SMS Messaging menus are shown here for your reference, and SMS Messaging features that are not explained elsewhere in this guide are described here.

See page 31 for information about choosing menu commands.

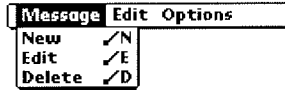
The Message and Options menus differ depending on which SMS Messaging view is on the screen.



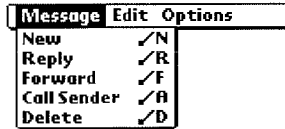
Message menus



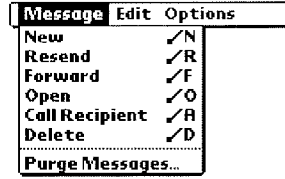
Inbox view



Pending view



Message view

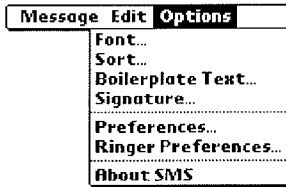


Sent view

Open

Displays the selected message in single message view.

Options menus

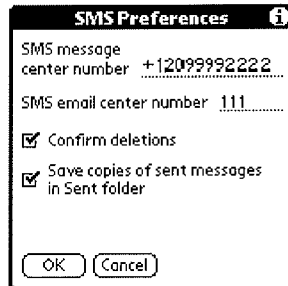


List views



Message views

Preferences



- SMS Message Center number. Enables you to enter the number for your wireless service provider's SMS message center. This number is stored on your SIM card.
- SMS Email Center number. Enables you to enter the telephone number for your wireless service provider's e-mail gateway. This number is stored on your communicator. If you move your SIM card to another phone, you need to enter this number to send SMS messages to an e-mail address.
- Confirm deletions. Determines whether a confirmation dialog box appears when you delete messages or boilerplates.
- Save copies of sent messages in Sent folder. Determines whether messages you send are stored in the Sent folder. If you turn this option off, your outbound messages are not stored in the Sent folder.



About SMS

Shows version information for SMS Messaging.

## To Do List

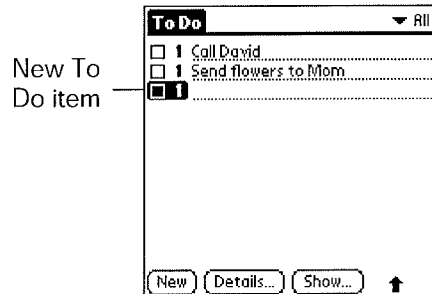
To Do reminds you of tasks you have to complete. A record in To Do List is called an "item."

To create a To Do item:

1. Press Option  and then press Date Book Plus .

Tip: You can also access To Do List by tapping the To Do List icon  in the Applications Launcher.

2. Enter the text of the To Do item. The text can be longer than one line.



3. Press a scroll button to deselect the To Do item.

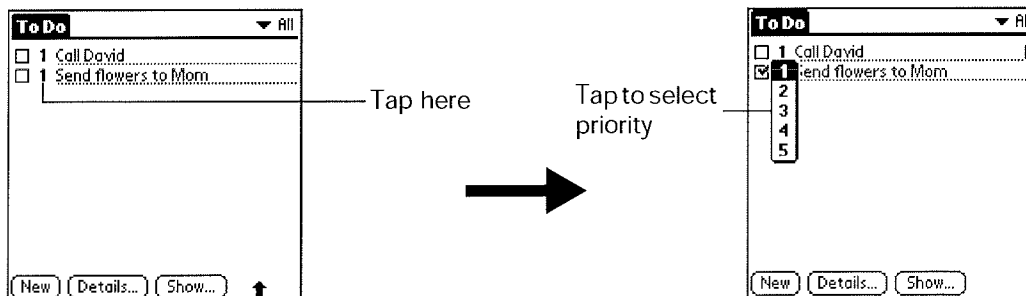
## Setting priority

The priority setting for items lets you arrange your To Do items according to their importance or urgency. The default setting is to arrange To Do items by priority and due date, with priority 1 items at the top. If you have a number of items in your list, changing an item's priority setting may move its position in the list.

Note: When you create a new To Do item, its priority is automatically set to level 1, the highest (most important) level. If you select another item first, however, the item you create appears beneath the selected item and is given the same priority as the selected item.

To set the priority of a To Do item:

1. Tap the Priority number on the left side of the To Do item.



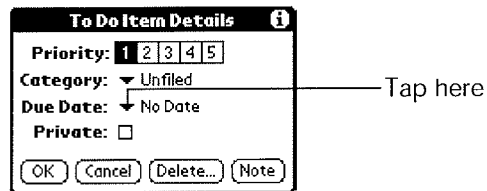
2. Tap the Priority number that you want to set (1 is most important).

## Setting a due date

You can associate a due date with any To Do item. You can also sort the items that appear in the list based on their due date.

To set a due date for a To Do item:

1. Tap the text of the item whose details you want to change.
2. Tap Details.
3. Tap the Due Date pick list.



4. Tap the date that you want to assign the item:

<b>Today</b>	Assigns the current date.
<b>Tomorrow</b>	Assigns tomorrow's date.
<b>One week later</b>	Assigns the date exactly one week from the current date.
<b>No Date</b>	Removes the due date from the item.
<b>Choose date</b>	Opens the date selector, where you can choose any date that you want for the item.

5. Hold Option  and press Return  to finish.

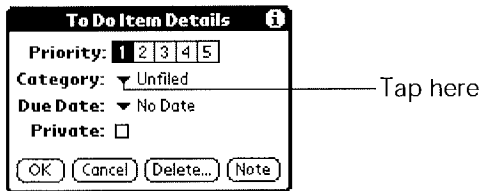
**Tip:** If you turn on the Show Due Dates option in the To Do Show options dialog, you can tap directly on the due date in the To Do list to open the pick list shown in step 4.



## Assigning a category

You can associate any To Do item with a category. You can also sort the items that appear in the list based on their category.

To assign a category for a To Do item:

1. Tap the text of the item whose details you want to change.
2. Tap Details.
3. Tap the category pick list.



4. Tap the category that you want to assign the item.
5. Hold Option  and press Return  to finish.

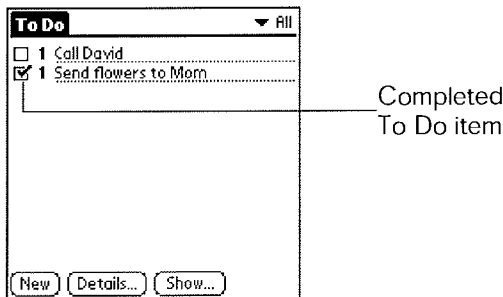
Tip: If you turn on the Show Categories option in the To Do Show options dialog, you can tap directly on the category in the To Do list to assign categories.

## Checking off a To Do item

You can check off a To Do item to indicate that you've completed it. You can set To Do List to record the date that you completed the To Do item, and you can choose to show or hide completed items as described on page 142.

To check off a To Do item:

- Tap the check box on the left side of the item.

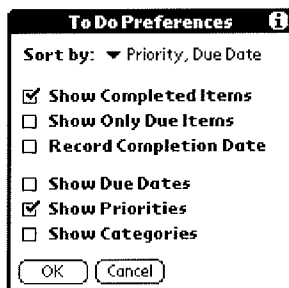


## To Do Show Options

The Show Options dialog box enables you to control the appearance of the To Do list screen.

To change the Show Options settings:



1. In To Do list screen, tap Show.



2. Select any of the following settings:

- Show Completed Items**      Displays your completed items in the To Do list screen. If you turn off this setting, your To Do items disappear from the list when you complete (check) them.

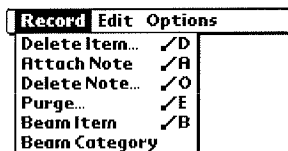
Items that no longer appear on the list because you turn off this setting have not been deleted. They are still in the memory of your communicator. Purge completed items to remove them from memory.
- Show Only Due Items**      Shows only the items that are currently due, past due, or have no due date specified. When this setting is active, items that are not yet due do not appear in the list until their due date.
- Record Completion Date**      Replaces the due date with the actual date when you complete (check) the item. If you do not assign a due date to an item, the completion date still records when you complete the item.
- Show Due Dates**      Displays the due dates associated with To Do items and displays an exclamation mark next to items that remain incomplete after the due date passes.
- Show Priorities**      Shows the priority setting for each item.
- Show Categories**      Shows the category for each item.

3. Hold Option  and press Return  to finish.

## To Do List menus

To Do List menus are shown here for your reference, and To Do List features that are not explained elsewhere in this guide are described here. See page 31 for information about choosing menu commands.

### Record menu



### Options menu





**About To Do List** Shows version information for To Do List.


# Memo Pad

A memo can contain up to 4,000 characters. The number of memos you can store is dependent only on the memory available on your communicator. A record in Memo Pad is called a "memo."

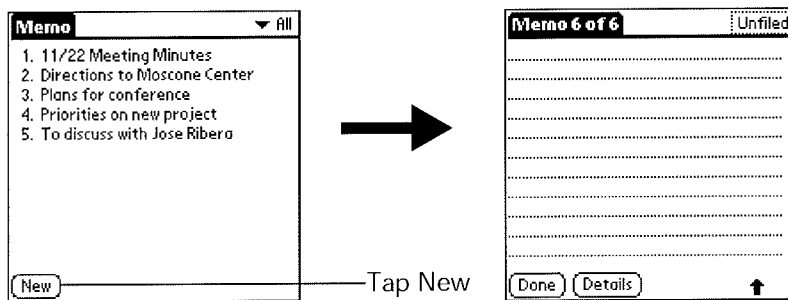
To create a new memo:



1. Press Option  and then press PhoneBook .

Tip: You can also access Memo Pad by tapping the Memo Pad icon  in the Applications Launcher.

2. Enter the text you want to appear in the memo. Press Return  to move down to new lines in the memo.

Tip: The first letter of your memo is automatically capitalized.



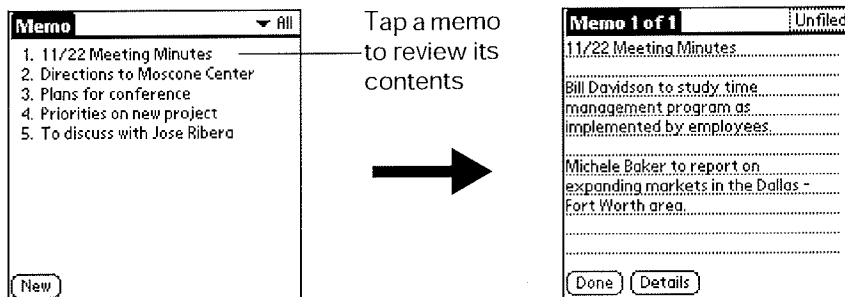
3. Hold Option  and press Return  to finish.



## Reviewing memos

The first line of a memo appears in the Memo list. This makes it easy to locate and review your memos.

To review a memo:

1. In the Memo list, tap the text of the memo.



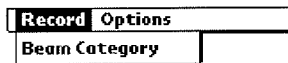
2. Review or edit the text in the memo.
3. Hold Option  and press Return  to finish.

## Memo Pad menus

Memo Pad menus are shown here for your reference, and Memo Pad features that are not explained elsewhere in this guide are described here. See page 31 for information about choosing menu commands.

The Record and Options menus differ depending on whether you're displaying the Memo list or an individual memo.

### Record menus



Memo list



Memo screen

### Options menus



Memo list



Memo screen

- Preferences**      Displays the Memo Preferences dialog box, where you define the sort order for memos.
- About Memo Pad**      Shows version information for Memo Pad.

# CityTime



CityTime enables you to display the day and time in your home city and in four other cities around the globe. Whether you're travelling or at home, now it's easy to keep track of the best time to reach your business associates, friends, and family in far away places.


Note: CityTime does not automatically update the current time for Daylight Savings Time.


## Setting your home city

The home city serves as a point of reference for your other city selections. The information displayed for all the other cities is based on the day and time in your home city. When you use CityTime for the first time (or when you travel or move to another city), make sure you set your home city location. Setting your home city location ensures that CityTime displays accurate information for the other cities you select.



To set your home city:

1. Press Option  and then press Blazer .

Tip: You can also access CityTime by tapping the CityTime icon  in the Applications Launcher.

2. Press Menu .
3. Under Options, select Select Home City (/H).
4. Tap the Home City pick list and select the city closest to where you are located.

Tip: If a nearby city isn't in the list, you can use the Edit Cities command to add a new city to the list. See page 147 for details.

5. Hold Option  and press Return  to finish.

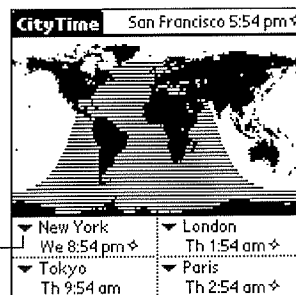
## Selecting remote cities

In addition to your home city, you can display the day and time for four other cities anywhere around the globe. These other cities are called remote cities.

To set your remote cities:

1. Tap a pick list in the lower part of the CityTime screen and select the city closest to the city you want to display.

Tap to select  
a remote city



Tip: If a nearby city isn't in the list, you can use the Edit Cities command to add a new city to the list. See the next section for details.






2. Tap the remaining pick lists and select the other three cities you want to display.

Tip: You can temporarily display the day and time for any other city by tapping the city's location on the map display.

## Adding cities

If the city you want to display is not in the predefined list, you can use the Edit Cities command to add it.

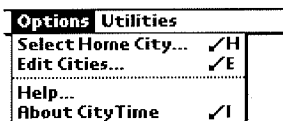
To add a city to the list:

1. Press Menu .
2. Under Options, select Edit Cities (/E).
3. Tap New.
4. Enter the city name and other information.
5. Hold Option  and press Return  to finish.

## CityTime menus

CityTime menus are shown here for your reference, and CityTime features that are not explained elsewhere in this guide are described here. See page 31 for information about choosing menu commands.

### Options menu



**About CityTime** Shows version information for CityTime.

**Help** Displays online help for the CityTime screens.

### Utilities menu



**Change Location** Opens the Change Location dialog box where you can select the city to which you are moving or travelling. Changing the location updates the system time and date.

**Sun Rise/Set** Opens the Sun Rise/Set dialog box where you can view sunrise and sunset information for your home city. To view this information for another city, tap the City pick list and select the city from the list. To view this information for another date, tap the scroll arrows next to the date box.



# Calculator


Calculator includes two operating modes: Basic and Advanced. In Basic mode you can perform simple mathematical calculations. In Advanced mode you can access scientific functions and perform sophisticated math calculations. This section explains how to select the operating mode and use the buttons and menu options available in each mode.

## Selecting the Calculator mode



The Toggle Mode command enables you to choose whether you want to work in Basic Calculator mode or Advanced Calculator mode. You can change modes at any time.

To select the Calculator mode:

1. Press Option  and then press SMS Messaging .







Tip: You can also access Calculator by tapping the Calculator icon  in the Applications Launcher.

2. Press Menu .
3. Under Options, select Toggle Mode (/M).

Tip: You can also toggle between Basic and Advanced mode by holding Option  and repeatedly press SMS Messaging .

## Using the Basic Calculator buttons

The Basic Calculator includes the following buttons.

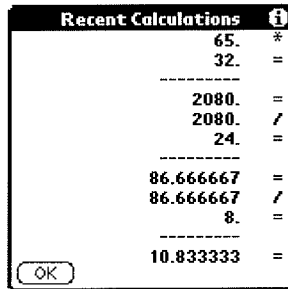
-  Clears the last number you entered. Use this button if you make a mistake while entering a number in the middle of a calculation. This button enables you to re-enter the number without starting the calculation over.
-  Clears the entire calculation and enables you to begin a fresh calculation.
-  Toggles the current number between a negative and positive value. If you want to enter a negative number, enter the number first and then press the +/- button.
-  Places the current number in memory. Each new number you enter with the M+ button is added to the total already stored in memory. You can add either a calculated value or a number you enter by pressing the number buttons. Pressing this button has no effect on the current calculation (or series of calculations); it merely places the value into memory until it is recalled.
-  Recalls the stored value from memory and inserts it in the current calculation.
-  Clears any value that is stored in the Calculator memory.



## Displaying Recent Calculations

The Basic Calculator's Recent Calculations command enables you to review the last series of calculations and is particularly useful for confirming a series of "chain" calculations.

To display recent calculations:

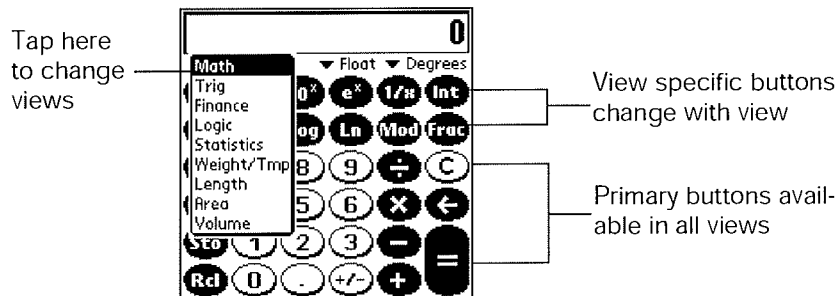
1. Press Menu .
2. Under Options, select Recent Calculations (/I).



3. After you finish reviewing the calculations, hold Option  and press Return  to finish.

## Using the Advanced Calculator mode







The Advanced Calculator screen consists of three regions. Each region performs a different function to help you perform a variety of calculations.















## Using the Advanced Calculator buttons

In addition to most of the Basic Calculator buttons, the Primary buttons are available in all the Advanced Calculator views. The remaining buttons are available only in specific views. The information that follows provides an overview of the Advanced Calculator functions. For more detailed information and instructions, visit the website: [www.radiks.net/~rhuebner/parendoc.html](http://www.radiks.net/~rhuebner/parendoc.html)













## Primary buttons

-  Clears the entire calculation and enables you to begin a fresh calculation.
-  Clears the last digit you entered. Use this button if you make a mistake while entering a number in the middle of a calculation. This button enables you to re-enter the number without starting the calculation over.
-  Enters an exponent symbol in the calculation.
-  Opens the Constants dialog box where you can select a constant to include in the calculation.
-  Opens the Store in which memory dialog box where you can select the memory bank in which you want to store the current value. Advanced Calculator has ten memory banks.
-  Opens the Recall which memory dialog box where you can select the memory bank from which you want to recall a value.

## Math buttons

-  Squares the current value.
-  Calculates the value of x raised to the y power.
-  Calculates the value of a common (base 10) antilogarithm.
-  Calculates the value of a natural (base e) antilogarithm.
-  Calculates the reciprocal of the current number.
-  Displays the integer portion of a decimal value.
-  Calculates the square root of the current number.
-  Calculates the inverse of x to the y power.
-  Calculates the common (base 10) logarithm.
-  Calculates the natural (base e) logarithm.
-  Displays the remainder of x/y.
-  Displays the decimal portion of a decimal value.

## Trigonometry buttons

-  Calculates the sine of the current number.
-  Calculates the cosine of the current number.
-  Calculates the tangent of the current number.
-  Calculates the hyperbolic sine of the current number.
-  Calculates the hyperbolic cosine of the current number.
-  Calculates the hyperbolic tangent of the current number.
-  Calculates the arc (inverse) sine of the current number.
-  Calculates the arc (inverse) cosine of the current number.
-  Calculates the arc (inverse) tangent of the current number.
-  Calculates the arc (inverse) hyperbolic sine of the current number.
-  Calculates the arc (inverse) hyperbolic cosine of the current number.
-  Calculates the arc (inverse) hyperbolic tangent of the current number.

## Finance buttons



Finance buttons enable you to find an unknown variable value based on a group of known variable values. For example, to calculate the monthly payment for a 30-year home loan of \$100,000 with an annual interest rate of 8%, you would enter the following variables:

- Payments/year = 12
- N = 360 (30 years x 12 months)
- APR = 8
- PV = 100,000
- FV = 0













Using these variables, the answer would be -733.76 per month.

To solve this example:













1. Enter a value and then tap the corresponding variable button. Repeat this process until you've entered the following four variables:
  - N = 360 (30 years x 12 months)
  - APR = 8

- $PV = 100,000$
  - $FV = 0$
2. Enter 12 and tap the P/Yr button to enter the number of payments per year.
  3. Tap Edit.
  4. Tap the Pmt line and erase all values on the line including zero.
  5. Tap Solve.
  6. Hold Option  and press Return  to finish.










You can use a similar process to solve other financial equations by entering four of the variables to find the value of the fifth variable.




-  Stores the current number as the total number of payments over the life of the loan.
-  Stores the current number as the annual percentage rate of interest.
-  Stores the current number as the number of payments per year.
-  Stores the current number as the initial loan amount.
-  Stores the current number as the payment amount.
-  Stores the current number as the compounded loan amount including interest.
-  Opens the Time Value of Money dialog box where you can modify values and solve the equation.
-  Stores the remaining balance, interest, and principal (amortization) based on the supplied values.
-  Calculates a given percentage of a value. To use this button, enter a value, tap this button, enter the percent, and then tap the equal sign button.
-  Calculates the change in a value by a given percentage. To use this button, enter a value, tap this button, enter the percent, and then tap the equal sign button.
-  Calculates the percentage of one number relative to another number. To use this button, enter the first number, tap this button, enter the second number, and then tap the equal sign button.
-  Calculates the percentage required to get to one value from another value. To use this button, enter the result number, tap this button, enter the starting number, and then tap the equal sign button.

## Logic buttons












-  Shifts the value to the left and fills the new places with zeros.
-  Enters D in a hexadecimal calculation.
-  Enters E in a hexadecimal calculation.
-  Enters F in a hexadecimal calculation.
-  Calculates bit-by-bit commonalities between two arguments.
-  Calculates bit-by-bit unique occurrences in two arguments.
-  Shifts the sign bit to the right in signed mode.
-  Enters A in a hexadecimal calculation.
-  Enters B in a hexadecimal calculation.
-  Enters C in a hexadecimal calculation.
-  Calculates the inverse of each bit of the argument.
-  Calculates the exclusive OR between two arguments.

## Statistics buttons





-  Adds the current value to the end of the statistics memory list. You can store up to 200 values.
-  Calculates the mean of the values in the statistics memory list.
-  Calculates the standard deviation based on a population of n.
-  Calculates the standard deviation based on a population of n-1.
-  Calculates the sum of the values in the statistics memory list.
-  Calculates the square of the sum of the values in the statistics memory list.
-  Opens the Statistical Data dialog box where you can view, edit, delete, and clear values in the statistics memory list.
-  Displays the number of values in the statistics memory list.
-  Calculates the factorial of any integral from 0 to 170.

-  Generates a random number between 0 and 32767 and then divides this number by 32768 to generate a random fraction between 0 and .99997.
-  Returns the number of combinations of n items taken m at a time.
-  Returns the number of permutations of n items taken m at a time.






### Weight/Temp buttons

-  Indicates the current value is entered in ounces. When you tap this button after tapping another unit of measure, it converts the value to ounces.
-  Indicates the current value is entered in pounds. When you tap this button after tapping another unit of measure, it converts the value to pounds.
-  Indicates the current value is entered in US tons. When you tap this button after tapping another unit of measure, it converts the value to US tons.
-  Indicates the current value is entered in UK tons. When you tap this button after tapping another unit of measure, it converts the value to UK tons.
-  Indicates the current value is entered in milligrams. When you tap this button after tapping another unit of measure, it converts the value to milligrams.
-  Indicates the current value is entered in grams. When you tap this button after tapping another unit of measure, it converts the value to grams.
-  Indicates the current value is entered in kilograms. When you tap this button after tapping another unit of measure, it converts the value to kilograms.
-  Indicates the current value is entered in metric tons. When you tap this button after tapping another unit of measure, it converts the value to metric tons.
-  Indicates the current value is entered in degrees Fahrenheit. When you tap this button after tapping another unit of measure, it converts the value to degrees Fahrenheit.
-  Indicates the current value is entered in degrees Kelvin. When you tap this button after tapping another unit of measure, it converts the value to degrees Kelvin.
-  Indicates the current value is entered in degrees Celsius. When you tap this button after tapping another unit of measure, it converts the value to degrees Celsius.











### Length buttons

-  Indicates the current value is entered in inches. When you tap this button after tapping another unit of measure, it converts the value to inches.
-  Indicates the current value is entered in feet. When you tap this button after tapping another unit of measure, it converts the value to feet.
-  Indicates the current value is entered in yards. When you tap this button after tapping another unit of measure, it converts the value to yards.
-  Indicates the current value is entered in miles. When you tap this button after tapping another unit of measure, it converts the value to miles.















-  Indicates the current value is entered in nautical miles. When you tap this button after tapping another unit of measure, it converts the value to nautical miles.
-  Indicates the current value is entered in millimeters. When you tap this button after tapping another unit of measure, it converts the value to millimeters.
-  Indicates the current value is entered in centimeters. When you tap this button after tapping another unit of measure, it converts the value to centimeters.
-  Indicates the current value is entered in meters. When you tap this button after tapping another unit of measure, it converts the value to meters.
-  Indicates the current value is entered in kilometers. When you tap this button after tapping another unit of measure, it converts the value to kilometers.

### Area buttons

-  Indicates the current value is entered in square inches. When you tap this button after tapping another unit of measure, it converts the value to square inches.
-  Indicates the current value is entered in square feet. When you tap this button after tapping another unit of measure, it converts the value to square feet.
-  Indicates the current value is entered in square yards. When you tap this button after tapping another unit of measure, it converts the value to square yards.
-  Indicates the current value is entered in acres. When you tap this button after tapping another unit of measure, it converts the value to acres.
-  Indicates the current value is entered in square miles. When you tap this button after tapping another unit of measure, it converts the value to square miles.
-  Indicates the current value is entered in square millimeters. When you tap this button after tapping another unit of measure, it converts the value to square millimeters.
-  Indicates the current value is entered in square centimeters. When you tap this button after tapping another unit of measure, it converts the value to square centimeters.
-  Indicates the current value is entered in square meters. When you tap this button after tapping another unit of measure, it converts the value to square meters.
-  Indicates the current value is entered in hectares. When you tap this button after tapping another unit of measure, it converts the value to hectares.
-  Indicates the current value is entered in square kilometers. When you tap this button after tapping another unit of measure, it converts the value to square kilometers.






## Volume buttons




-  Indicates the current value is entered in teaspoons. When you tap this button after tapping another unit of measure, it converts the value to teaspoons.
-  Indicates the current value is entered in fluid ounces. When you tap this button after tapping another unit of measure, it converts the value to fluid ounces.
-  Indicates the current value is entered in cups. When you tap this button after tapping another unit of measure, it converts the value to cups.
-  Indicates the current value is entered in pints. When you tap this button after tapping another unit of measure, it converts the value to pints.
-  Indicates the current value is entered in quarts. When you tap this button after tapping another unit of measure, it converts the value to quarts.
-  Indicates the current value is entered in gallons. When you tap this button after tapping another unit of measure, it converts the value to gallons.
-  Indicates the current value is entered in tablespoons. When you tap this button after tapping another unit of measure, it converts the value to tablespoons.
-  Indicates the current value is entered in milliliters. When you tap this button after tapping another unit of measure, it converts the value to milliliters.
-  Indicates the current value is entered in liters. When you tap this button after tapping another unit of measure, it converts the value to liters.
-  Indicates the current value is entered in cubic inches. When you tap this button after tapping another unit of measure, it converts the value to cubic inches.
-  Indicates the current value is entered in cubic feet. When you tap this button after tapping another unit of measure, it converts the value to cubic feet.
-  Indicates the current value is entered in cubic meters. When you tap this button after tapping another unit of measure, it converts the value to cubic meters.

## Creating a custom view

You can modify any existing Advanced Calculator view to create your own view. While customizing a view, you can change the button names as well as the button definitions.

To create a custom view:

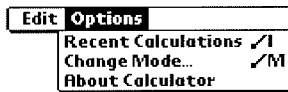
1. From the Advanced Calculator screen, press Menu .
2. Under Program, select Export (/E).
3. Tap the pick list and select the view you want to modify.
4. Tap Export.
5. Hold Option  and press Return  twice.
6. In Memo Pad, open the memo containing the definition you selected in step 3.
7. Modify the definition, and then hold Option  and press Return .

8. From the Advanced Calculator screen, press Menu .
9. Under Program, select Import (/I).
10. Tap the pick list and select the view you modified.
11. Tap Import.
12. Tap Replace to change an existing definition, or tap Add to create an additional definition.
13. Hold Option  and press Return  twice to finish.

## Calculator menus

Calculator menus are shown here for your reference, and Calculator features that are not explained elsewhere in this guide are described here. See page 31 for information about choosing menu commands.

### Options menu



Basic Calculator



Advanced Calculator

**About Calculator** Shows version information for Calculator.

### Program menu






Advanced Calculator

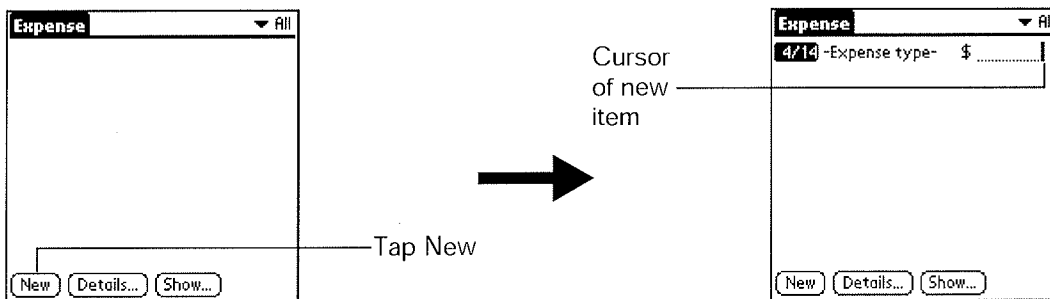
- Export** Opens the Export dialog box where you can select a view definition to export to Memo Pad.
- Import** Opens the Import dialog box where you can select a view definition to import to Memo Pad.
- Delete View** Opens the Delete View dialog box where you can delete a user-defined view.
- Restore Defaults** Returns all the view definitions to the preset default values.

# Expense

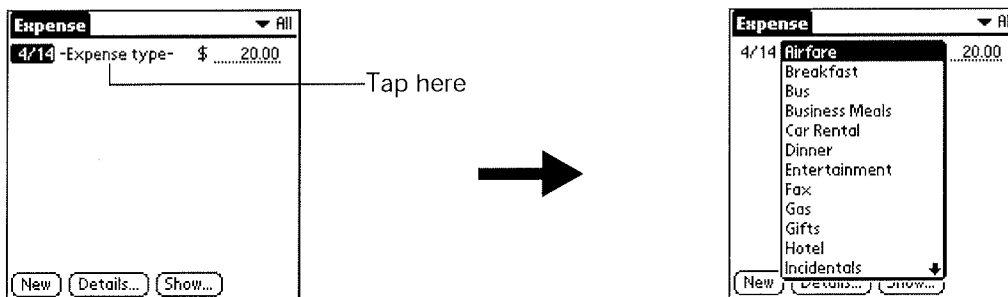
Expense enables you to record the date, expense type, and the amount that you spent. A record in Expense is called an "item." You can sort your Expense items into categories or add other information that you want to associate with the item.

To create an Expense item:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the Expense icon .
3. Enter the amount of the expense.



4. Tap the Expense type pick list and select a type from the list.



**Note:** As soon as you select an expense type, your communicator saves the entry. If you don't select an expense type, it doesn't save the entry.

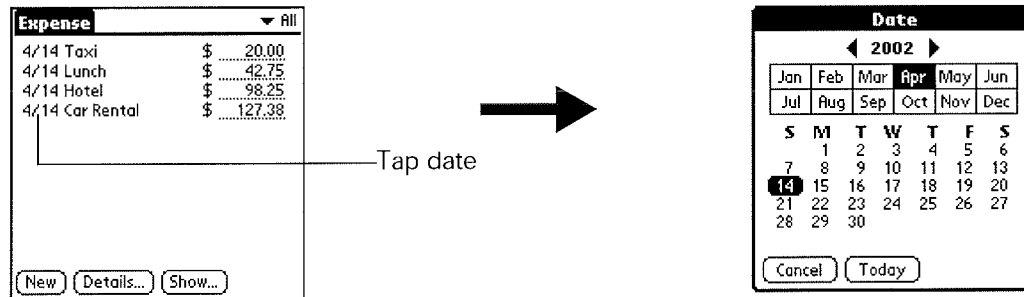
**Tip:** A quick way to create a new Expense item is to make sure that no Expense item is selected in the Expense list, enter the first letter(s) of the expense type, and then enter the numerical amount. This technique takes advantage of the automatic fill feature. See the section that begins on page 164 for details.



## Changing the date of an Expense item

Initially, Expense items appear with the date you enter them. You can use Expense to change the date associated with any Expense item.

To change the date of an Expense item:

1. Tap the Expense item you want to change.
2. Tap the date of the selected item.



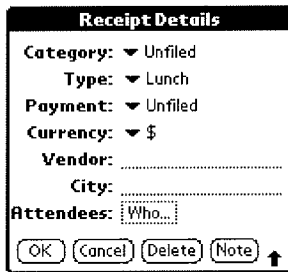
3. Select the new date.
4. Hold Option  and press Return  to finish.

## Entering receipt details

Expense provides a variety of options that you can associate with an item. These options appear in the Receipt Details dialog box.

To open the Receipt Details dialog box:



1. Tap the Expense item to which you want to assign details.
2. Tap Details.



3. Select any of the following options:

- Category** See the section that begins on page 63 for details.
- Type** Opens a pick list of expense types.
- Payment** Lets you choose the payment method used to pay the Expense item. If the item is prepaid (such as airline tickets supplied by your company), you can choose Prepaid to place your expense in the appropriate company-paid cell of your printed expense report spreadsheet. See the section that begins on page 162 for more information.

- Currency** Enables you to choose the type of currency used to pay the Expense item. The default currency unit is defined in the Preferences dialog (see page 164). You can also display up to four other common types of currency, see the next section in this chapter for more information.
- Vendor and City** Lets you record the name of the vendor (usually a company) associated with the expense and the city where the expense was incurred. For example, a business lunch might be at Rosie's Cafe (Vendor) in San Francisco (City).
- Attendees** See the section that begins on page 69 for details.

4. Hold Option  and press Return  to finish.

### Customizing the Currency pick list



You can select the currencies and symbols that appear in the Currency pick list.

To customize the Currency pick list:

1. In the Receipt Details dialog box, tap the Currency pick list and select Edit currencies.




2. Tap each Currency pick list and select the country whose currency you want to display on that line.

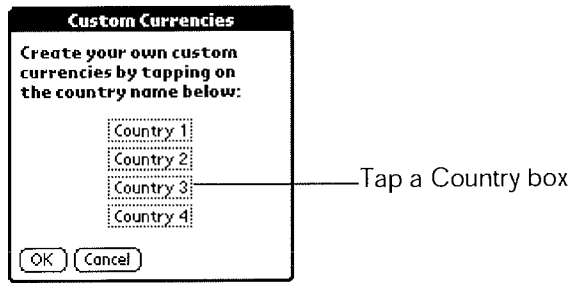
3. Hold Option  and press Return  twice to finish.

### Defining a custom currency symbol

If the currency you want to use is not in the list of countries, you can create your own custom country and currency symbol.



To define a custom currency symbol:

1. Press Menu .
2. Under Options, select Custom Currencies. (/Y)
3. Tap one of the four Country boxes.



4. Enter the name of the country and the symbol that you want to appear in Expense.



5. Hold Option  and press Return  twice to finish.

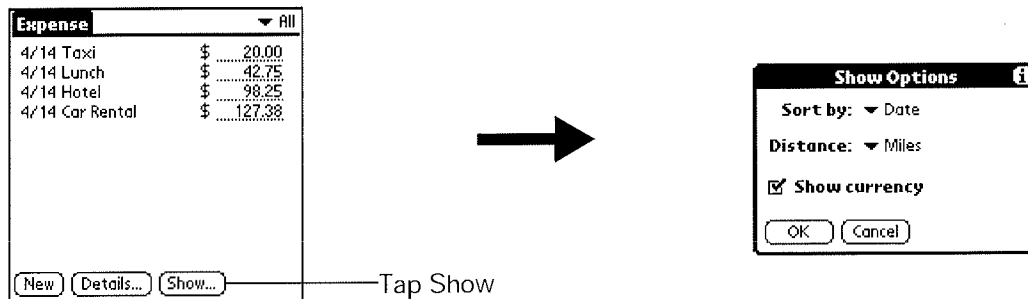
Note: If you want to use your custom currency symbol as the default for all Expense items, select the symbol in the Preferences dialog box. If you want to use your custom currency symbol only for a particular Expense item, select the symbol in the Receipt Details dialog box associated with that item.

## Show Options



Show Options define the sort order and other settings that relate to your Expense items.

To open the Show Options dialog box:

1. In the Expense list, tap Show.
2. Select any of the options.



- Sort by** Enables you to sort expense items by date or type.
- Distance** Enables you to display Mileage entries in miles or kilometers.
- Show currency** Shows or hides the currency symbol in the Expense list.

3. Hold Option  and press Return  to finish.

## Transferring your data to Microsoft Excel

After you enter your expenses into the Expense application on your communicator, you can view and print the data with your computer.

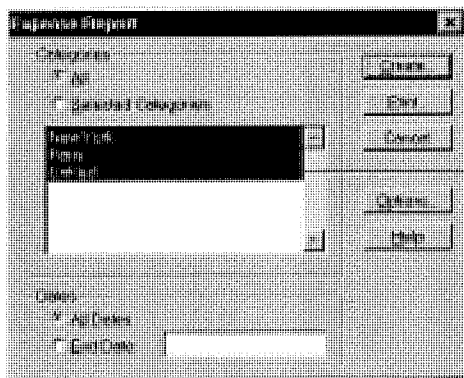
**Note:** You need Microsoft Excel version 5.0 (or later) to view and print your Expense data using one of the provided templates. Microsoft Excel is not included with the Treo communicator package. The procedures in this section also assume that you have installed Palm Desktop software as described on page 25.

### Creating or printing an expense report

It is easy to view and print your Expense data in a Microsoft Excel spreadsheet.

To create or print an expense report:

1. Perform a HotSync operation to transfer your latest Expense data to your computer.
2. Do one of the following:
  - Click Expense in Palm Desktop software to open Microsoft Excel and the Expense Report configuration dialog box.
  - From the Windows Start menu, click Programs, Palm Desktop, Expense Reports, and then choose your user name.
3. Click the expense category that you want.



Click to select  
Categories

**Tip:** You can press Ctrl+click to select multiple categories. To print the expenses associated with all of your Expense categories, select All in the Categories group.

4. If you want to define an end date for the expense report, enter the date in the End Date box.

**Note:** If you do not specify an end date, all expense entries for the selected categories appear — up to the date of the last HotSync operation.

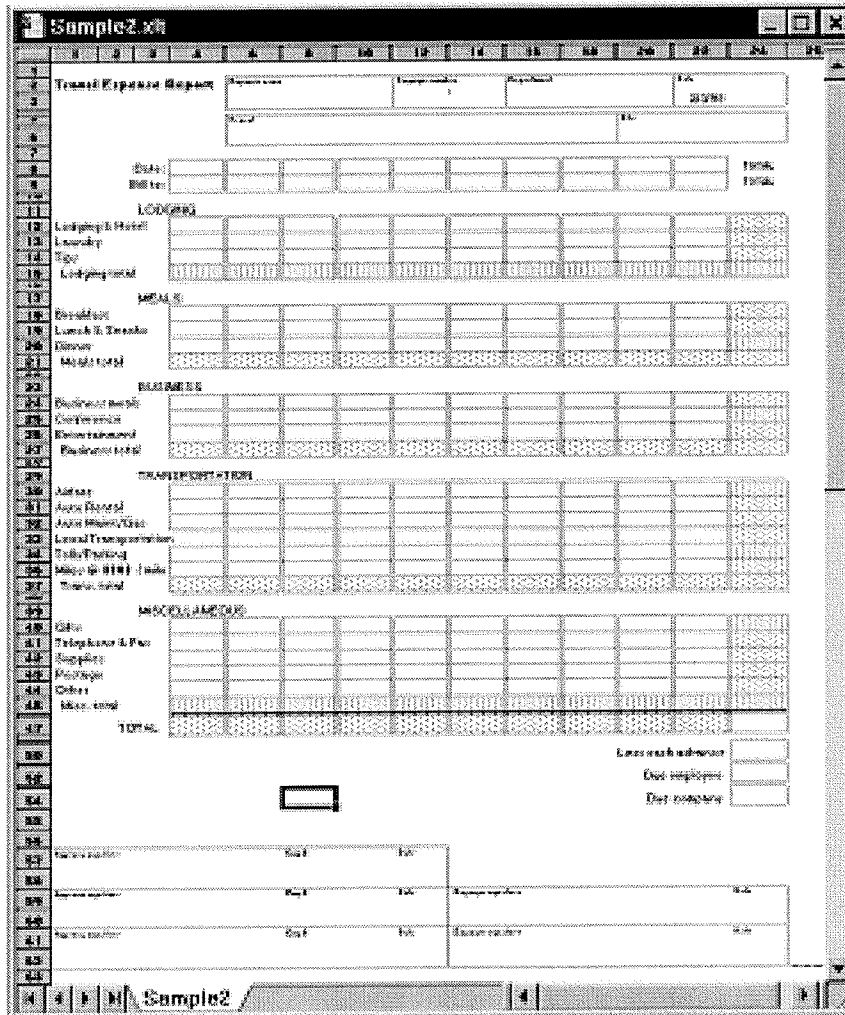
5. Do one of the following:
  - Click Print to display the expense report in the Print Preview window, and then click Print in the Microsoft Excel window to print your expense report.
  - Click Create to display a Microsoft Excel spreadsheet containing your expense data. Your data appears in Microsoft Excel spreadsheet form. You can enter information, make formatting changes, and save and print the file in the normal manner.



### Using expense report templates

Palm Desktop software includes several expense report templates. When you use one of these templates, you can edit your expense data in Microsoft Excel.

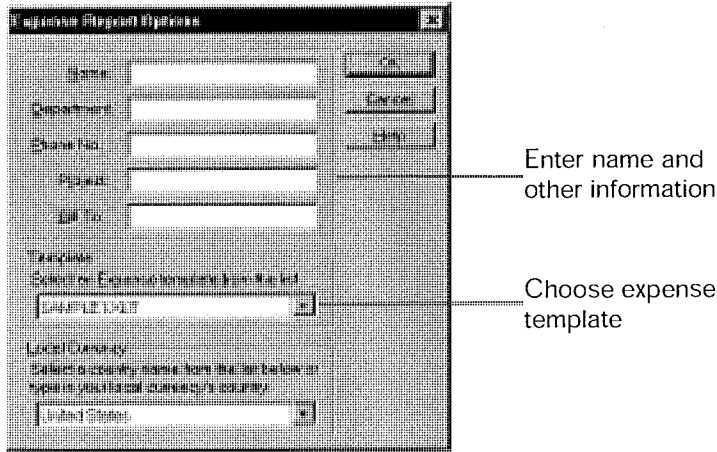
The templates have the extension .xlt and are stored in the template folder in the Palm Desktop software directory on your computer. To see what a template looks like before you use it, open the template in Microsoft Excel. For example, the template Sample2.xlt looks like this:



If you want to streamline or customize your expense reports, you can change these templates. For example, you can add your company name to a template. See Appendix C for information on changing templates.

To view your expense data using a Microsoft Excel template:

1. Display your expense data in a Microsoft Excel spreadsheet as described in the previous procedure.
2. Click Options.



3. Enter name, department, and other information as necessary for your expense report.
4. Click the Templates menu; then select an expense template.

Note: If you want to create your own custom expense template and have it appear in the Templates menu, see Appendix C for more information.

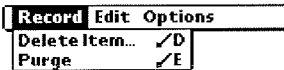
5. Click OK.

## Expense menus

Expense menus are shown here for your reference, and Expense features that are not explained elsewhere in this guide are described here.

See page 31 for information about choosing menu commands.

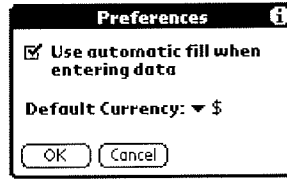
### Record menu



### Options menu



## Preferences



- Use automatic fill. Lets you select an expense type by entering the first letter of an expense type. For example, if you enter the letter "T," it enters the "Taxi" expense type. Entering "T" and then "E" enters "Telephone" which is the first expense type beginning with the letters "TE."
- Default currency. Sets the default currency symbol for Expense.

**About Expense** Shows version information for Expense.

## SIM Book




In addition to storing your phone number and billing information, your SIM card also contains a phone list where you can store names and numbers that are separate from your Contacts and Speed Dial lists. By storing a phone list on your SIM card, you have immediate access to your phone list if you move your SIM card to another phone.


The SIM Book application is a utility that enables you to view and manage the phone list on your SIM card.

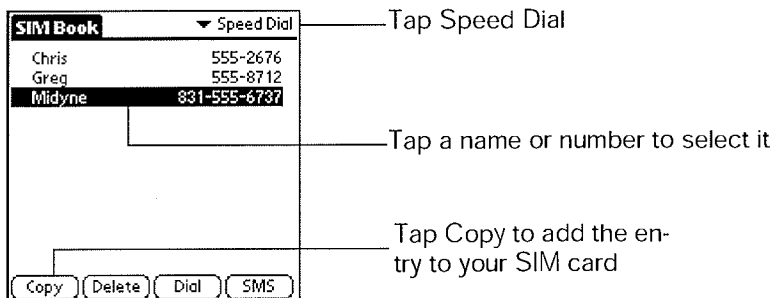
### Copying entries from your Speed Dial list to your SIM card

You can copy entries from your PhoneBook Speed Dial list to your SIM Book. This is a great way to save time and keep your SIM Book up-to-date.

To copy entries from your Speed Dial list to your SIM card:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the SIM Book icon .
3. Tap Speed Dial in the pick list in the upper-right corner.
4. Tap the entry you want to copy.

Tip: To copy all the numbers in your Speed Dial list, press Menu , and under Edit, select Copy All.



Tip: A check mark indicates that the entry is already on both your Speed Dial list and your SIM list.


5. Tap Copy.

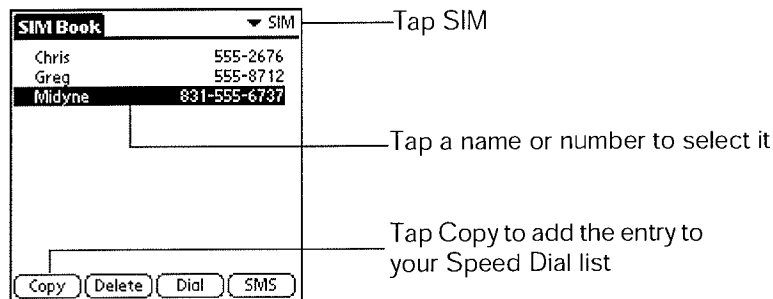
## Copying entries from your SIM card to your Speed Dial list

Just as you can copy entries from your PhoneBook Speed Dial list to your SIM Book, you can also copy entries from your SIM card to your PhoneBook Speed Dial list.

To copy entries from your SIM card to your Speed Dial list:

1. Tap SIM in the pick list in the upper-right corner.
2. Tap the entry you want to copy.

Tip: To copy all the numbers in your Speed Dial list, press Menu , and under Edit, select Copy All.



Tip: A check mark indicates that the entry is already on both your Speed Dial and SIM list.

3. Tap Copy.

## Deleting entries from your SIM card

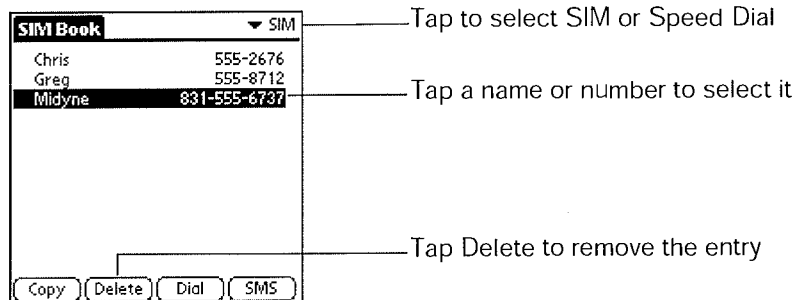
If you find that you no longer need a phone number, you can delete it from your SIM card.

To delete entries from your SIM card:

1. Tap SIM in the pick list in the upper-right corner.

Tip: To delete entries from your Speed Dial list, tap Speed Dial instead.

2. Select the entry you want to delete.



3. Tap Delete.
4. Hold Option  and press Return  to confirm deletion.

## Dialing entries on your SIM card

In addition to storing phone numbers on your SIM card, you can also dial numbers using SIM Book.

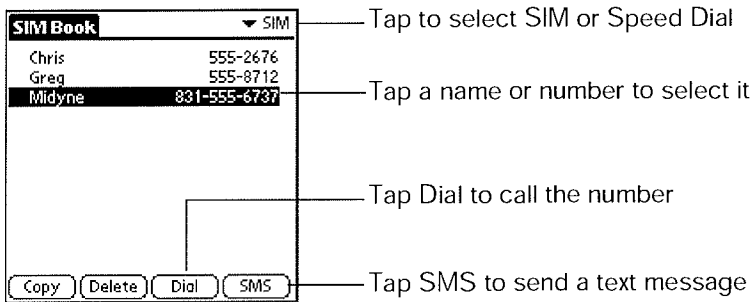
To dial entries from your SIM card:

1. Tap SIM in the pick list in the upper-right corner.

Tip: You can also dial entries from your Speed Dial list by tapping Speed Dial instead.

2. Select the entry you want to dial.

Tip: You can also send a text message to an SMS-enabled mobile phone by tapping a mobile phone number and then tapping SMS instead of Dial.



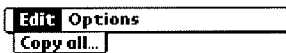
3. Tap Dial.

## SIM Book menus

SIM Book menus are shown here for your reference, and SIM Book features that are not explained elsewhere in this guide are described here.

See page 31 for information about choosing menu commands.

### Edit menu



### Options menu






Help Opens a dialog where you can view tips about using the SIM Book application.

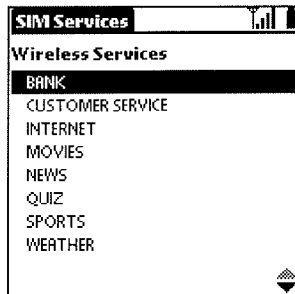
About Opens a dialog where you can view version and copyright information for the SIM Book application.

## SIM Services

The SIM Services application provides an interface between your SIM card and your phone. It enables your SIM card to store applications from your wireless service provider that can control functions on your phone. For example, your wireless service provider might offer an application that provides a secure connection for online banking services.

### To use SIM Services

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the SIM Services icon .



3. Tap the application you want to use.

Note: If your wireless service provider did not install any applications on your SIM card, a message informs you that no services are on your SIM card.

4. If a list of options appears, tap the option you want to use.





## Chapter 7

# Setting Preferences for Your Communicator




The Preferences screens enable you to customize the configuration options on your Treo™ 180 communicator.

In the Preferences screens, you can do the following:

<b>Buttons</b>	Assign different applications to many of the buttons and icons on your communicator and the HotSync® cable.
<b>Connection</b>	Configure your communicator for use with a HotSync cable, for infrared communication, or for wireless data communication.
<b>Digitizer</b>	Calibrate the screen on your communicator.
<b>Formats</b>	Set the country default and the formats for dates, times, calendar, and numbers.
<b>General</b>	Set the current date and time, the auto shut-off interval, the Beam Receive feature, and the system, alarm, and game sounds.
<b>Network</b>	Configure your communicator for use with a wireless data network.
<b>Owner</b>	Assign your name, phone number, and other owner information to your communicator.
<b>Ringer</b>	Set the ringer volume level, unique ring tones for incoming calls and SMS messages, and vibrate settings.
<b>ShortCuts</b>	Define a list of abbreviations.

## Viewing Preferences

To open the Preferences screens:

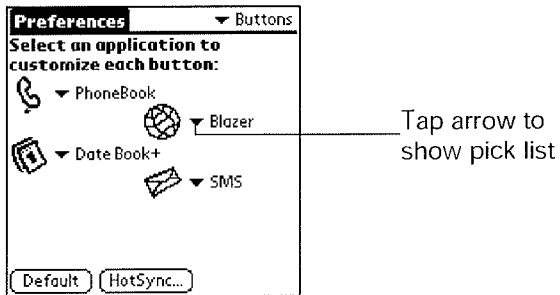
1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the Preferences icon .
3. Tap the pick list in the upper-right corner of the screen.
4. Select the Preferences screen you want to view.

## Buttons Preferences

The Buttons Preferences screen enables you to associate different applications with the application buttons on the front of your communicator and the HotSync button on the cable. For example, if you find that you seldom use SMS Messaging and often use To Do List, you can assign the SMS Messaging button to start To Do List. Any changes you make in the Buttons Preferences screen become effective immediately; you do not have to change to a different screen or application. If you assign a different application to a button, you can still access the original application using the Applications Launcher.

To change the Buttons Preferences:

1. Tap the pick list next to the button or icon you want to re-assign.



2. Tap the application that you want to assign to the button.

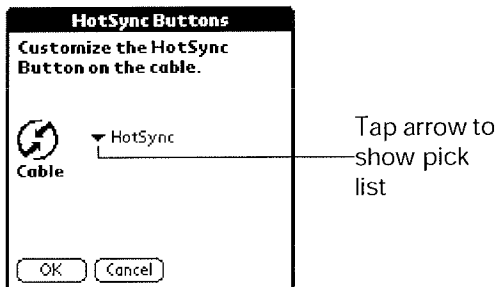
Tip: To restore all of the buttons to their factory settings, tap Default.

## HotSync Buttons Preferences

The HotSync Buttons Preferences screen also enables you to associate a different application with the button on the HotSync cable. Any changes that you make in the HotSync Buttons dialog box become effective immediately; you do not have to change to a different screen or application.



To change the HotSync Buttons Preferences:

1. From the Buttons Preferences screen, tap HotSync.
2. Tap the pick list.



3. Tap the application that you want to assign to the button.

The default setting for the button is the HotSync setting, which means the cable performs its normal HotSync functions.

4. Hold Option  and press Return  to finish.

## Connection Preferences

The Connection Preferences screen lets you create configurations for communicating with other hardware devices: PC, Modem, or Infrared. Configurations, or profiles, once activated are available to applications on your communicator. The Connection Preferences screen displays a list of available configurations that you can modify as needed. This list will vary depending on the software you have added to your communicator.

### Connection Types

There are several types of device connections you can choose when configuring Preferences:

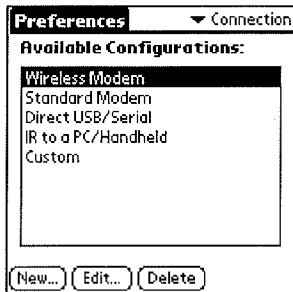
<b>Serial to PC</b>	Defines the direct serial connection between your communicator and your desktop computer. It is used to perform a local HotSync operation when your communicator is connected by its serial connector to the cable. The cable is attached to a serial (COM) port on your desktop computer.
<b>Serial to Modem</b>	Defines a connection between a modem attached to the serial connector of your communicator and a modem that is part of your computer or laptop.
<b>Wireless Modem to Modem</b>	Defines a connection between your communicator's built-in wireless modem and a dial-up service. Use this connection type to access wireless data services.
<b>Auto Detect to PC</b>	Defines a dynamic serial connection between your communicator and your desktop computer. Use this connection type with third-party applications that need to reconfigure the serial port when communicating with a computer.
<b>Auto Detect to Modem</b>	Defines a dynamic serial connection between your communicator and a modem. Use this connection type with third-party applications that need to reconfigure the serial port when communicating with a modem.
<b>USB/Serial to PC</b>	Defines a direct serial or USB connection between your communicator and your desktop computer. When you select this option, your communicator detects which type of cable you have connected to your computer.
<b>USB/Serial to Modem</b>	Defines a direct serial or USB connection between your communicator and a modem. When you select this option, your communicator detects which type of cable is connected to the modem.
<b>USB to PC</b>	Defines the direct USB connection between your communicator and your desktop computer. It is used to perform a local HotSync operation when your communicator is connected by its USB connector to the cable. The cable is attached to a USB port on your desktop computer.
<b>IrCOMM to PC</b>	Defines a connection between the IR port of your communicator and the infrared device of your computer or laptop.
<b>IrCOMM to Modem</b>	Defines a connection between the IR port of your communicator and a modem. The modem can be attached to a computer or some other device containing an IR port.

## Setting wireless modem configurations

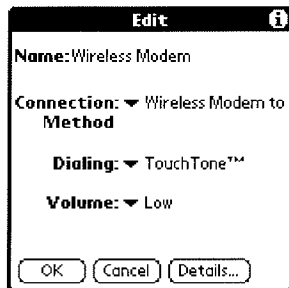
Wireless modem configurations enable you to use your communicator to communicate with your ISP or dial-in server. In most cases the configuration software on the Handspring CD will set up the Connection and Preferences settings you need to connect to your ISP or dial-in server. In the event that you need to manually create a configuration, you must set Network Preferences in addition to configuring Connection settings to define the communication protocols for the selected device.

To create a Wireless Modem to Modem connection:

1. From the Connection Preferences screen, select Wireless Modem.



2. Tap Edit.

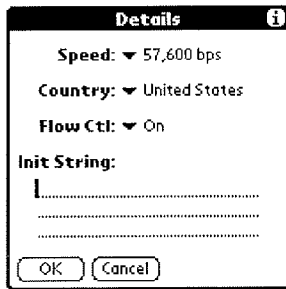




The name of the current configuration appears at the top of the screen.

3. Tap the Connection Method pick list and select Wireless Modem to Modem.
4. Tap the Dialing pick list and select TouchTone.

Note: Select Rotary only if your telephone service does not support TouchTone dialing.

5. Tap the Volume pick list and select the speaker volume for the modem.
6. Tap Details.

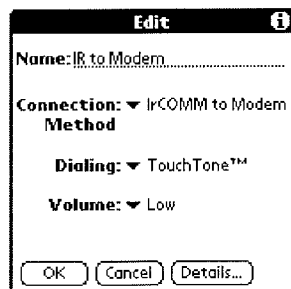


7. Tap the Speed pick list and select 57,600.
8. Tap the Country pick list and select the country in which you are using your communicator.
9. Tap the Flow Control (Flow Ctl) pick list, and select Automatic, On (Xon), or Off (Xoff) flow control for the modem connection.
10. If needed, edit the Init String to change the modem setup string.
11. Hold Option  and press Return  twice to return to the Connection Preferences screen.

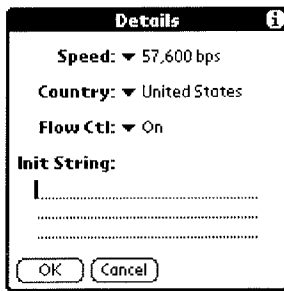
The following steps demonstrate how to create a modem connection that enables IR HotSync through an IR enabled modem. This modem would then dial a modem attached to your desktop to perform the remote HotSync operation.



To create an IrCOMM to Modem connection:

1. In the Connection Preferences screen, tap New.
2. Enter a name for this configuration.
3. Tap the Connection Method pick list and select IrCOMM to Modem.



4. Tap the Dialing pick list and select TouchTone or Rotary.  
 Note: Select Rotary only if your telephone service does not support TouchTone dialing.
5. Tap the Volume pick list and select the speaker volume.
6. Tap Details.



7. Enter the initialization string appropriate for your communicator.
8. Hold Option  and press Return  twice to return to the Connection Preferences screen.

## Digitizer Preferences

The Digitizer Preferences screen opens the digitizer calibration screen. This is the same screen that appears when you start your communicator for the first time. You can recalibrate your screen after a hard reset, or if your digitizer drifts.

## Formats Preferences

Use the Formats Preferences screen to set the country default and the display format of the dates, times, and numbers on your communicator.

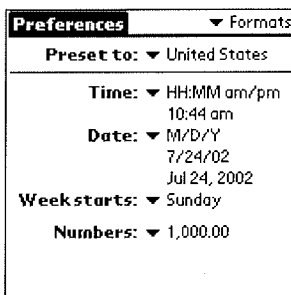
### Country default

The country default sets date, time, week start day, and number conventions based on geographic regions where you might use your communicator. For example, in the United Kingdom, time often is expressed using a 24-hour clock. In the United States, time is expressed using a 12-hour clock with an AM or PM suffix.

All your communicator applications use the Country default settings. See the next section in this chapter for information on customizing these settings.

To set the country default:

1. Tap the country name pick list.



2. Tap the setting you want to use.

## Time, date, week start, and numbers formats

The Time setting defines the format for the time of day. The time format that you select appears in all applications on your communicator.

To select the time, date, week start, and numbers format:

1. Tap the Time pick list and select a format.
2. Tap the Date pick list and select a format.
3. Tap the Week starts pick list, and select whether you want the first day of the week to be Sunday or Monday.

**Note:** This setting controls the Day, Week, Month, Year, and List views in Date Book Plus and all other aspects of your communicator that display a calendar.

4. Tap the Numbers pick list, and select formats for the decimal point and thousands separator.

## General Preferences

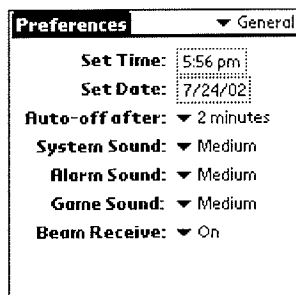
The General Preferences screen enables you to set the time, date, auto shutoff interval, the beam receive feature, and sounds for your communicator. See the section that begins on page 21 for information on setting the time and date.

### Auto-off delay

Your communicator has an automatic shutoff feature that turns off the power after a period of inactivity. This feature conserves battery power if you forget to turn off your communicator. If you find that your communicator shuts itself off before you finish viewing information on the screen, increase the auto-off setting.

To set the Auto-off delay:

1. Tap the Auto-off pick list.
2. Tap the setting you want to use for the automatic shutoff feature: 30 seconds, 1 minute, 2 minutes, or 3 minutes.



**Note:** The Auto-off setting turns off only the handheld mode on your communicator. It does not turn off your communicator's wireless mode. So, you can still receive calls, e-mail and SMS messages after the automatic shutoff period.

## System, alarm, and game sounds

Your communicator uses a variety of sounds. The System, Alarm, and Game Sound settings enable you to turn the sounds on or off, and to adjust the volume level.

Note: If the ringer switch is set to no sound, the ringer setting overrides the sound settings and all sounds are turned off. The system, alarm, and game sounds are used when the ringer switch is set to the ring position.

To set the system, alarm, and game sounds:

1. Tap the System Sound pick list and select the sound level.

Note: When you turn off the System Sounds, you also turn off the "chime" tones associated with the HotSync operation.

2. Tap the Alarm Sound pick list and select the sound level.
3. Tap the Game Sound pick list and select the sound level.

Note: The Game Sound setting works only with games that are programmed to respond to this setting. Older games typically do not respond to this setting.

## Network Preferences and TCP/IP software

Network Preferences let you set a password, telephone number, DNS number, IP address, as well as create a login script for remote connections. TCP/IP provides the ability to connect to your ISP or dial-in server with applications that allow you to view the transmitted data. Visit the web site [www.handspring.com](http://www.handspring.com) for information on third-party applications that take advantage of TCP/IP.

When you use the Handspring CD-ROM to configure your communicator, the configuration software attempts to set up your communicator with settings received from your wireless service provider. If the Configure Your Treo software configured your communicator with your wireless service provider's settings, the Phone field on the Network Preferences screen is set to "Wireless." In this case, we recommend that you do not change the settings from your wireless service provider. However, if the configuration software on the CD-ROM can't complete the configuration, you need to enter Network Preferences and TCP/IP settings to use your communicator as a wireless data device. You can use a preset service template for your ISP or dial-in server, and edit, save, and reuse settings. Or you can create your own service template.

To use the TCP/IP software included in the operating system, you must first configure the Connection Preferences and then the Network Preferences settings. After you configure both of these Preferences, you can establish a PPP (Point-to-Point Protocol), SLIP (Serial Line Internet Protocol), or CSLIP (Compressed Serial Line Internet Protocol) connection with your ISP or dial-in server. You can do this either by using menu commands from the Network Preferences screen or by using a third-party application.

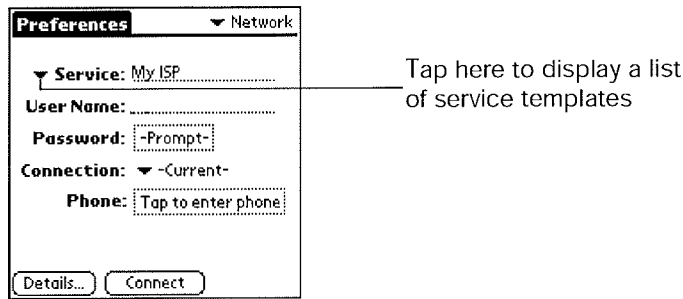
## Selecting a service

Use the Service setting to select the service template for your ISP or a dial-in server. Service templates are a set of ISP and dial-in server configuration settings that you can create, save, and reuse.



To select a service:

1. Tap the Service pick list.



2. Tap the predefined service template.

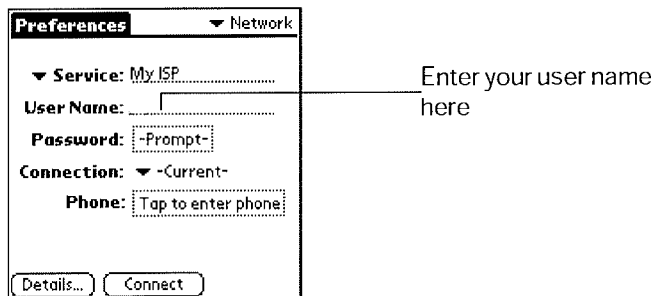
Note: If you want to enter a name for a new service template, see page 183 for details.

## Entering a user name

The User Name setting identifies the name you use when you log into your Internet Service Provider or your dial-in server. Although this field can contain multiple lines of text, only two lines appear onscreen.

To enter a user name:

1. Tap the User Name field.
2. Enter your user name.



Note: Most dial-in servers do not accept spaces in the user name.

## Entering a password

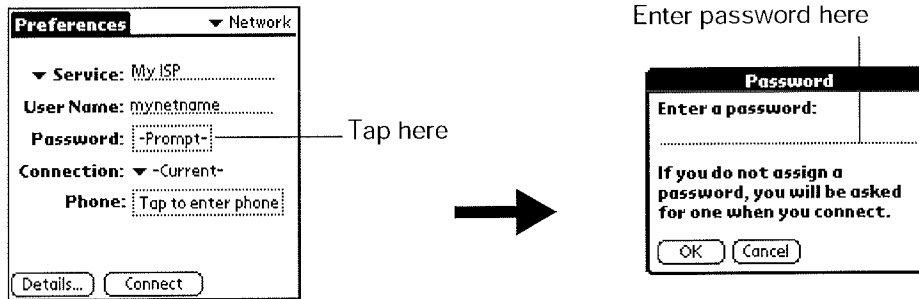
The Password box identifies the password you use to log into your server or ISP. Your entry in this field determines whether your communicator prompts you to enter a password each time you log into your network:



- If you do not enter a password, your communicator displays the word "Prompt" in this field and asks you to enter a password during the login procedure.
- If you enter a password, your communicator displays the word "Assigned" in this field and does not prompt you to enter a password during the login procedure.

Note: If you are concerned about security, select the Prompt option and do not enter a password.

To enter a password:

1. Tap the Password field.
2. Enter the password you use to log into your server.



3. Hold Option  and press Return  to finish.

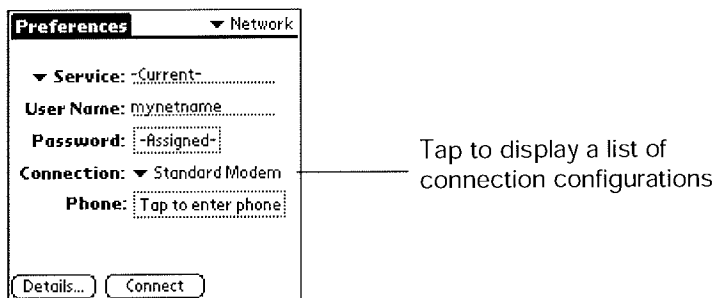
Note: The Password field updates to display the word "Assigned."

## Selecting a connection

The Connection Preferences settings tell your communicator about the hardware you are using for remote data connections. Normally you'll use your communicator's built-in wireless modem to establish a data connection, but you can also use the infrared port or connect an external modem to the USB port. See the section that begins on page 173 for details on how to configure Connection Preferences.

To select a connection:

1. Tap the Connection pick list.
  - The list displays the configurations in your Connection Preferences panel.



2. Select the appropriate Connection.

Tip: For wireless data access, select Wireless Modem to Modem as the Connection.

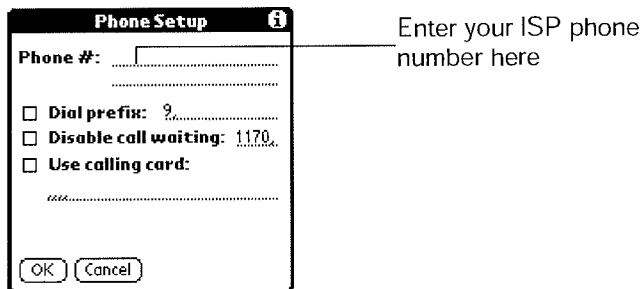
## Adding telephone settings



When you select the Phone field, your communicator opens a dialog box in which you define the telephone number you use to connect with your ISP or dial-in server. In addition, you can also define a prefix, disable Call Waiting, and give special instructions for using a calling card.

Note: The Phone Setup dialog box works correctly for AT&T and Sprint long-distance services. However, because MCI works differently, MCI customers need to put the calling card number in the Phone # field and the phone number in the Use calling card field.

To enter your server phone number:

1. Tap the Phone field.
2. Enter the phone number you use to reach your ISP or dial-in server.



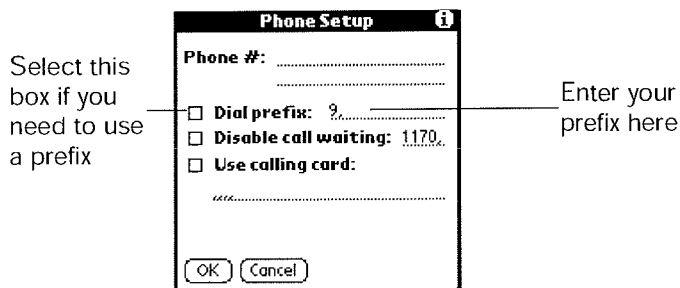
3. If you need to enter a prefix or disable Call Waiting, skip to those procedures. Otherwise, hold Option  and press Return  to finish.

## Entering a prefix

A prefix is a number that you dial before the telephone number to access an outside line. For example, many offices require that you dial "9" to dial a number outside the building.

To enter a prefix:

1. Tap the Dial Prefix check box to select it.



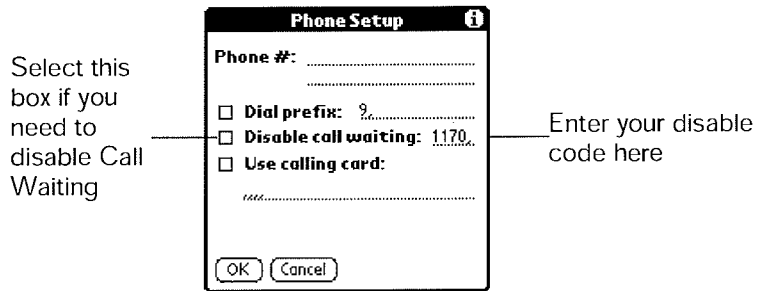
2. Enter the prefix.
3. Hold Option  and press Return  to finish.

## Disabling Call Waiting

Call Waiting can cause your session to terminate if you receive a call while you are connected. If your telephone has Call Waiting, you need to disable this feature before logging into your ISP or dial-in server.



To disable Call Waiting:

1. Tap the Disable call waiting check box to select it.



2. Enter the code to disable Call Waiting on the Disable call waiting line.

Note: Each telephone company assigns a code to disable Call Waiting. Contact your local telephone company for the code that is appropriate for you.

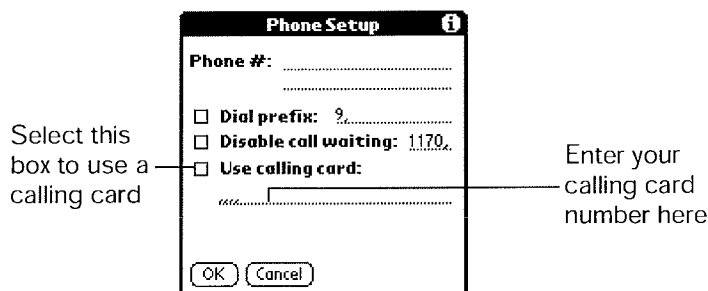
3. Hold Option  and press Return  to finish.

## Using a calling card

The Use calling card field enables you to use your calling card when dialing your ISP or Intranet server. Keep in mind that there is usually a delay before you enter your calling card number. When you define your calling card number, you need to add commas at the beginning to compensate for this delay. Each comma delays transmission of your calling card number for two seconds.

To use a calling card:



1. Tap the Use calling card check box to select it.



2. Enter your calling card number on the Use calling card line.

Note: It's a good idea to add at least three commas at the beginning of your calling card number to compensate for the cue delay.

Tip: MCI customers must enter the calling card number in the Phone # field, and the phone number in the Use Calling Card field.

3. Hold Option  and press Return  to finish.

## Connecting to your service

After you set your Connection and Network Preferences, establishing a connection to your Internet Service Provider (ISP) or your company's network (dial-in server) is easy.

To establish a connection:

- Tap Connect to dial the current service and display the Service Connection Progress messages.

Tip: To see expanded Service Connection Progress messages, press the bottom scroll button.


To close a connection:

- Tap Disconnect to terminate the connection between your communicator and your service.

## Creating additional service templates


You can create additional service templates from scratch or by duplicating existing templates and editing information. After you create a new or duplicate template, you can add and edit settings.

To add a new service template:

1. Press Menu .
2. Under Service, select New (/N).

A new service template (called Untitled) is added to the Service pick list.

To duplicate an existing service template:

1. Tap the Service pick list.
2. Tap the predefined service template you want to duplicate.
3. Press Menu .
4. Under Service, select Duplicate (/L).

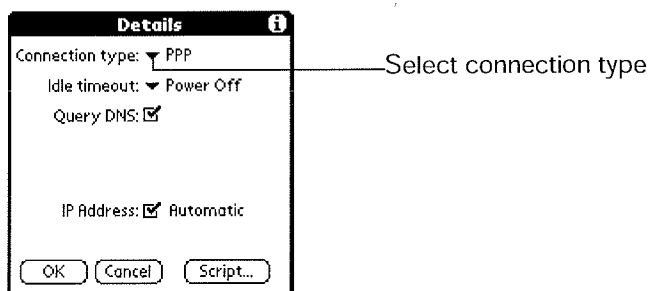
A copy of the service template is added to the Service pick list.

## Adding detailed information to a service template

If you are using one of the predefined service templates, you probably only need to enter your user name and telephone number. If you are creating a new service template, you may need to provide additional information to your ISP or dial-in server. You use the Details dialog box to add additional information to a selected service template.

To select a connection type:

1. Tap the service field.
2. Tap Details.



3. Tap the Connection type pick list and select one of the following connection types:

- |              |  |
|--------------|--|
| <b>PPP</b>   | Point-to-Point protocol                  |
| <b>SLIP</b>  | Serial Line Internet Protocol            |
| <b>CSLIP</b> | Compressed Serial Line Internet Protocol |

Note: If you are not sure, try PPP; if that doesn't work, ask your Internet Service Provider or your System Administrator for the correct connection type.

### Idle timeout

The Idle timeout setting defines how long your communicator waits before dropping the connection with your ISP or dial-in server when you switch out of a TCP/IP application.

To set the Idle timeout:

1. Tap the Idle timeout pick list and select one of the following options:

- |                  |   |
|------------------|---|
| <b>Immediate</b> | Drops the connection to your ISP immediately when you switch to another application.  |
| <b>1 minute</b>  | Waits one minute for you to open another application before it drops the connection.  |
| <b>2 minutes</b> | Waits two minutes.  |
| <b>3 minutes</b> | Waits three minutes.  |
| <b>Power Off</b> | Keeps your PPP or SLIP connection until you turn off your communicator (or until it times out). See page 177 for information on the Auto-off delay setting. |

2. Hold Option  and press Return  to finish.

## Defining primary and secondary DNS

The Domain Naming System (DNS) is a mechanism in the Internet for translating the names of host computers into IP addresses. When you enter a DNS number (or IP address), you are identifying a specific server that handles the translation services.

Each IP address has four sections, separated by periods. In the Details dialog box, you enter each section separately. Each section of an IP address is made up of a number from 0 to 255; numbers are the only allowable characters in this field.



Ask your Internet Service Provider or System Administrator for the correct Primary or Secondary DNS IP numbers.

Note: Most Internet Service Providers automatically provide DNS information. Leave the Query DNS option checked unless you are certain you need to manually enter DNS information.

To enter a primary and secondary DNS:

1. Tap the Query DNS check box to deselect it.
2. Tap the space to the left of the first period in the Primary DNS field, and then enter the first section of the IP address.

Note: Each section must be a number from 0 to 255.

3. Repeat step 2 for the second, third, and last sections of the Primary DNS field.
4. Repeat steps 2 and 3 for the Secondary DNS number.
5. Hold Option  and press Return  to finish.

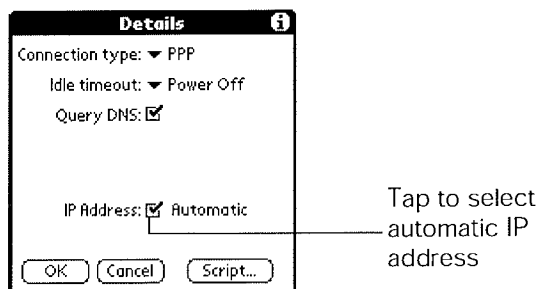
## IP address

Everyone who logs on to the Internet needs to have a unique identifier (an IP address), whether permanent or temporary. Some networks dynamically assign a temporary IP address when clients log in. The IP Address field lets you identify whether your network provides automatic (dynamic) temporary IP addressing.

Note: Most Internet Service Providers automatically assign IP addresses. Leave the Automatic IP Address option checked unless you are certain you need to manually enter IP address information.

To identify dynamic IP addressing:



- Tap the IP Address check box to select it.



To enter a permanent IP address:

1. Tap the IP Address check box to deselect it and display a permanent IP address field below the check box.
2. Tap the space to the left of the first period then enter the first section of the IP address.

Note: Each section must be a number from 0 to 255.

3. Tap and enter the remaining sections of the IP address.
4. Hold Option  and press Return  to finish.

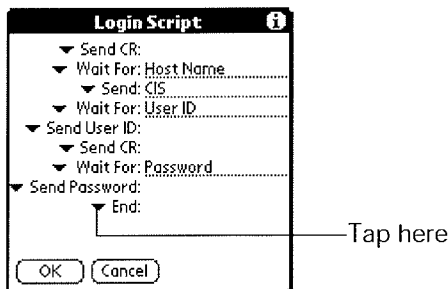
## Creating a login script

A login script is a series of commands, similar to an autoexec.bat file, that automates logging into your ISP. You can create login script files by selecting commands from the Command pick list in the Login Script dialog. Some commands from the Command pick list, such as Send, require you to supply additional information. Those commands have a parameter field so that you can add the necessary data.

Note: You can also use non-ASCII and literal characters in your login script. See Appendix D for more information.

To create a login script:

1. Tap Script.
2. Tap the End pick list.





3. Tap the command you want from the Command list. If the command requires additional information, a field appears to the right of it for you to enter the information. The following commands are available:

**Wait For** Tells your communicator to wait for specific characters from the TCP/IP server before executing the next command.

**Wait For Prompt** Detects a challenge-response prompt from the server and displays a dynamically generated challenge value. When you enter the challenge value into your token card, this generates a response value for you to enter on your communicator. This command takes two arguments, separated by a vertical bar (|) on the input line.






<b>Send</b>	Transmits specific characters to the TCP/IP server to which you are connecting.
<b>Send CR</b>	Transmits a carriage return or LF character to the TCP/IP server to which you are connecting.
<b>Send User ID</b>	Transmits the User ID information entered in the User ID field of the Network Preferences screen.
<b>Send Password</b>	Transmits the password entered in the Password field of the Network Preferences screen. If you did not enter a password, this command prompts you to enter one. The Password command is usually followed by a Send CR command.
<b>Delay</b>	Tells your communicator to wait a specific number of seconds before executing the next command in the login script.
<b>Get IP</b>	Reads an IP address and uses it as the IP address for your communicator. This command is used with SLIP connections.
<b>Prompt</b>	Opens a dialog box and prompts you to enter text of some kind (for example, a password or a security code).
<b>End</b>	Identifies the last line in the login script.

- Repeat steps 2 and 3 until the login script is complete.
- Hold Option  and press Return  to finish.

## Deleting a service template

There is only one way to delete a service template: use the Delete command from the Service menu.

To delete a service template:

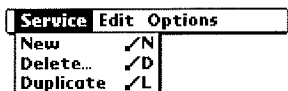
- Tap the Service pick list.
- Tap the service template you want to delete.
- Press Menu .
- Under Service, select Delete (/D).
- Hold Option  and press Return  to finish.

## Network Preferences menu commands

The Network Preferences screen includes menu commands to make it fast and easy to create and edit service templates. TCP/IP application menus are show here for your reference.

See page 31 for more information about choosing menu commands.

### Service menu



### Options menu



## TCP/IP troubleshooting

If you are having a problem establishing a network connection using TCP/IP, check this section and try the suggestions listed.

### Checking your wireless service status

Make sure the wireless mode on your communicator is active and that you are in a coverage area. The LED on the top of your communicator and the signal bars at the top of the PhoneBook screen provide visual cues about the wireless mode status. See page 15 and page 80 for details.




### Displaying expanded Service Connection Progress messages

It's helpful to identify at what point in the login procedure the connection fails. An easy way to do this is to display the expanded Service Connection Progress messages. Expanded Service Connection Progress messages describe the current stage of the login procedure. Press the bottom scroll button at any point during login to display these messages.

### Viewing the Network Log

If viewing the expanded Service Connection Progress messages does not give you enough information to find out why you cannot connect to your ISP or dial-in server, take a look at the Network Log. The Network Log lists all of the communication that occurs between your communicator and your dial-in server during the login procedure. The information in the Network Log can help your ISP or your System Administrator pinpoint where the login procedure communication fails and why.

To view the Network Log:

1. Press Menu .
2. Under Options, select View Log (/V).
3. Use the scroll buttons to see the entire Network Log.
4. Hold Option  and press Return  to finish.

## Adding a DNS number

If your ISP or dial-in server requires a DNS number and you did not enter that information in the Network Preferences screen, it will appear that you successfully logged into your network. When you try to use an application or look up information, however, the connection fails. If this occurs, try adding a DNS number. Ask your ISP or your System Administrator for the correct Primary and Secondary DNS IP numbers.

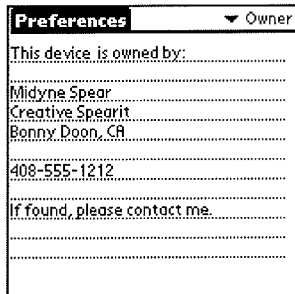
## Owner Preferences

The Owner Preferences screen enables you to record a name, company name, phone number, or any other information that you want to associate with your communicator.

If you use the Security application to turn off and lock your communicator with a password, information that you put in the Owner Preferences displays the next time you turn on your communicator.



To enter the Owner Preferences:

- Enter the text that you want to associate with your communicator in the Owner Preferences screen. If you enter more text than can fit on one screen, a scroll bar automatically appears on the right side of the screen.



If you assign a password with the Security application, the information in the Owner Preferences screen cannot be changed. In this case, an Unlock button appears at the bottom of the screen.

To unlock the Owner Preferences screen:

1. Tap Unlock.
2. Enter the password that you defined in the Security application.
3. Hold Option  and press Return  to finish.

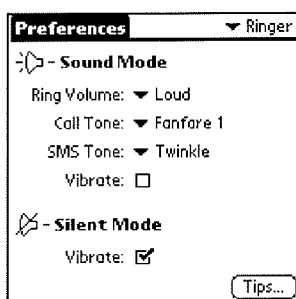
## Ringer Preferences



The Ringer Preferences screen controls the behavior of the ringer on your communicator. You can control the ring volume, select unique ring tones for incoming voice calls and SMS messages, and turn the vibrate option on and off for each of the two ringer switch positions.

To select Ringer Preferences:

1. Tap the Ring Volume pick list and select the level you want to use for incoming voice calls and SMS messages.
2. Tap the Call Tone pick list and select a ringer sound for incoming voice calls.

Note: When you select a ringer sound, the sound plays once. To avoid playing the sound, move the ringer switch to the silent position before selecting a new ringer sound.



3. Tap the SMS Tone pick list and select a ringer sound for incoming SMS messages.
4. Tap the Vibrate check boxes to enable or disable the vibrate option for the corresponding ringer switch position: Sound Mode  and Silent Mode .

## ShortCuts Preferences

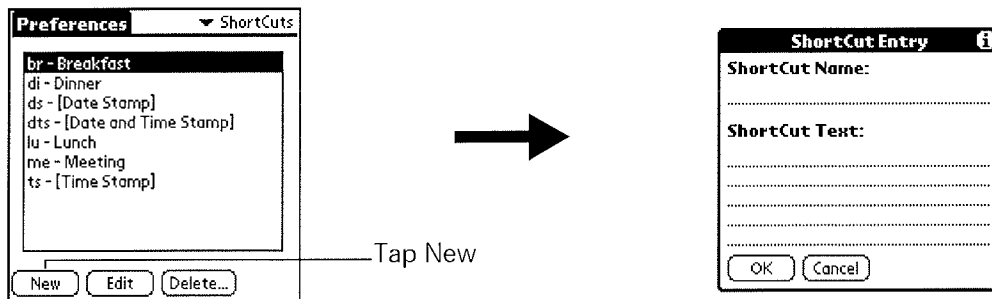
The ShortCuts Preferences screen enables you to define abbreviations for entering text. This section describes how to create, edit, and delete a ShortCut. See page 32 for information on the use of ShortCuts.

### Creating a ShortCut

You can create a ShortCut for any words, letters, or numbers. All ShortCuts you create appear on the list in the ShortCut Preferences screen. All the ShortCuts are available in any of your communicator applications and are backed up on your computer when you perform a HotSync operation.


To create a ShortCut:

1. Tap New.
2. On the ShortCut name line, enter the letters you want to use to activate the ShortCut.



3. Tap the ShortCut Text area and enter the text that you want to appear when you type the ShortCut characters.

Tip: You may want to add a space (space character) after the last word in your ShortCut text. This way, a space automatically follows the ShortCut text.



4. Hold Option  and press Return  to finish.

Tip: To use a ShortCut, enter the ShortCut symbol followed by the ShortCut characters. See page 32 for details.

## Editing a ShortCut

After you create a ShortCut, you can modify it at any time.

To edit a ShortCut:

1. Tap the ShortCut you want to edit.
2. Tap Edit.
3. Make the changes you want.
4. Hold Option  and press Return  to finish.

## Deleting a ShortCut

If you no longer need a ShortCut, you can delete it from the list of ShortCuts.

To delete a ShortCut:

1. Tap the ShortCut you want to delete.
2. Tap Delete.
3. Hold Option  and press Return  for Yes.



## Chapter 8

# Advanced HotSync® Operations

HotSync® Manager enables you to synchronize data between one or more Palm OS® devices and Palm™ Desktop software or another PIM such as Microsoft Outlook. To synchronize data, you must connect your Treo™ 180 communicator and your desktop software either directly, by connecting your communicator to the HotSync cable attached to your computer or using infrared communication, or indirectly, with using the built-in wireless modem or a network.

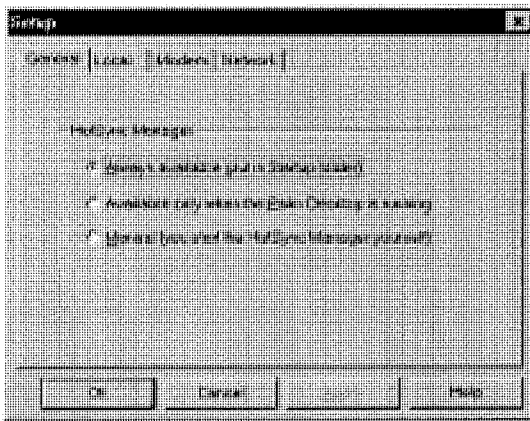
This chapter describes how to select HotSync options and perform a HotSync operation via the infrared port, the built-in wireless modem, or a network. See page 74 for information about performing your first and subsequent local HotSync operations.

## Selecting HotSync setup options

You can choose when you want HotSync Manager to run. If necessary, you can adjust the local and modem HotSync settings as well.

To set the HotSync options:

1. Click the HotSync Manager icon  in the Windows system tray.
2. Choose Setup.



3. Click the General tab and select one of the following options:

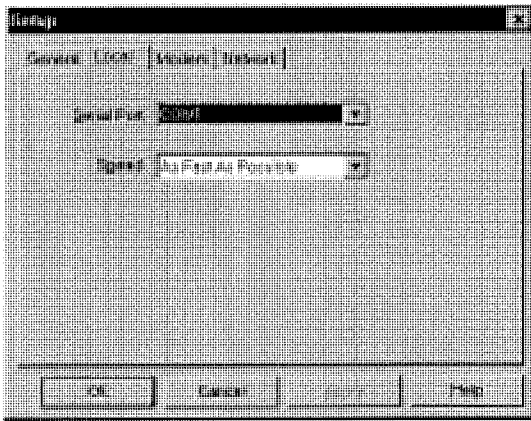
**Always available** Adds HotSync Manager to the Startup folder and constantly monitors the communication port for synchronization requests from your communicator. With this option, the HotSync Manager synchronizes data even when Palm Desktop software is not running.

**Available only when Palm Desktop software is running** Starts HotSync Manager and monitors requests automatically when you open Palm Desktop software.

**Manual** Monitors requests only when you select HotSync Manager from the Start menu.

Tip: If you're not sure which option to use, keep the default setting: Always available.

- Click the Local tab to display the settings for the connection between your computer and the HotSync cable, and adjust the following options as needed.



**Serial Port** Identifies the port that your desktop software uses to communicate with the optional serial HotSync cable. This selection should match the number of the port to which you connected the optional cable.

Note: Your communicator cannot share this port with an internal modem or other device.

**Speed** Determines the speed at which data is transferred between your communicator and your desktop software. Try the As Fast As Possible rate first, and adjust downward if you experience problems. This setting allows your desktop software and your communicator to find and use the fastest speed.

- Click the Modem tab to display the modem settings and adjust the options as needed. See page 200 for more information.
- If you are attached to a network, click the Network tab to display the network settings and adjust the options as needed. See page 204 for more information.
- Click OK.




## Customizing HotSync application settings

For each application, you can define a set of options that determines how records are handled during synchronization. These options are called a "conduit." By default, a HotSync operation synchronizes all files between the communicator and your desktop software.

In general, you should leave the settings to synchronize all files. The only reason you might want to change these settings is to overwrite data on either your communicator or your desktop software, or to avoid synchronizing a particular type of file because you don't use it.

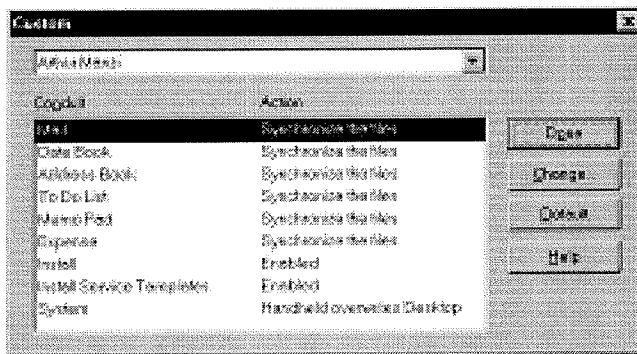
In addition to the conduits for the applications on your communicator, HotSync Manager includes System and Install conduits. The System conduit backs up the system information stored on your communicator, including keyboard ShortCuts. The Install conduit installs applications on your communicator.

To customize HotSync application settings:

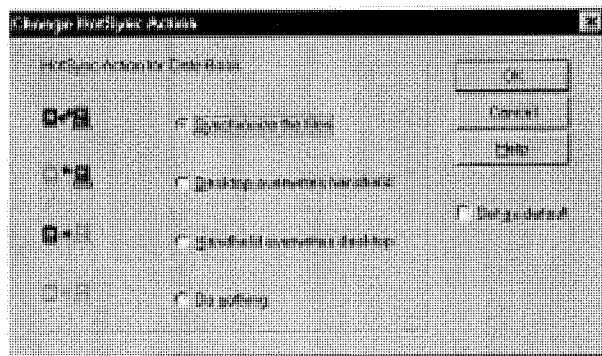
1. Click the HotSync Manager icon  in the Windows system tray (bottom-right corner of the taskbar).

Tip: You can also click the HotSync command on the Palm Desktop software menu bar.

2. From the HotSync Manager menu, choose Custom.



3. Select the appropriate user name from the list.
4. Select an application in the Conduit list.
5. Click Change.



6. Click the direction in which you want to write data, or click Do Nothing to skip data transfer for an application.

Note: Changing the HotSync setting from the default affects only the next HotSync operation. Thereafter, the HotSync Actions revert to their default settings. To use a new setting on an ongoing basis, select the Set As Default box. Thereafter, whatever you selected as the default setting is used when you click the Default button in the Custom dialog.

7. Click OK.
8. Repeat steps 4 through 7 to change conduit settings for other applications.
9. Click Done to activate your settings.

## IR HotSync operations

Your communicator is equipped with an infrared (IR) port that supports the IrCOMM implementation of the standards for infrared communication established by the Infrared Data Association (IrDA). This means that you can beam data to any other device that supports the IrCOMM implementation of the IrDA standards. Most importantly, you can use the IR port to perform HotSync operations. When you use the IR port on your communicator to perform HotSync operations, you don't need your HotSync cable. You simply enable infrared communication on your computer and your communicator and then perform an IR HotSync operation. So there's no need to carry your cable when you're on the road with an infrared-enabled laptop.

### Preparing your computer for infrared communication

To perform an IR HotSync operation, the computer you want to synchronize with must have an enabled infrared port or be connected to an infrared device that supports the IrCOMM implementation of the IrDA standards.

Desktop computers are likely to require an infrared device attached to a physical COM port. Laptops are likely to have a built-in IR port. Your computer must also have an installed infrared driver.

### Does your computer support infrared communication?

If your computer uses Microsoft Windows 98, Windows Me, or Windows 2000, infrared communication is built into the operating system. Some versions of Windows 95 also have built-in infrared communication. If you are using another type of computer, check the documentation that came with your computer to see if it supports infrared communication.

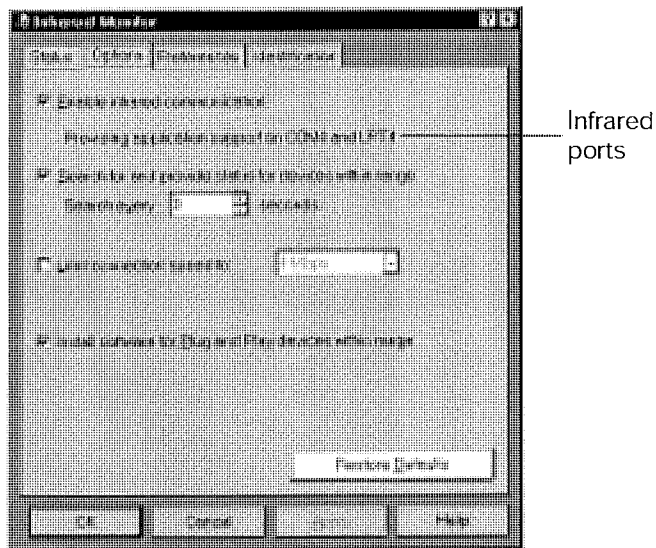
To check the ports used for infrared communication with Windows 98 and Me:

1. In the Windows taskbar click Start, choose Settings, and then choose Control Panel.
2. Double-click the Infrared icon.

Note: If you do not see the Infrared icon, you need to install an infrared driver.

3. Click the Options tab.

4. Select Enable infrared communication.




The COM port displayed on this screen is the port associated with your infrared device. It should be different from the port currently defined for cable synchronization.

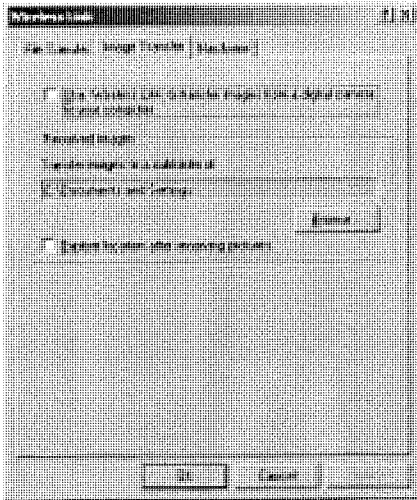
5. Write down the port listed as "Providing application support" so you can configure HotSync Manager for infrared communication.

This port is the simulated port. It is the channel through which the actual infrared communication takes place between your computer and your communicator.

6. Deselect all other check boxes in the Options tab.
7. Click Apply and then click OK.

To enable infrared communication with Windows 2000:

1. Click the HotSync Manager icon  in the Windows system tray (bottom-right corner of the taskbar).
2. Choose Exit to close HotSync Manager.
3. In the Windows taskbar click Start, choose Settings, and then choose Control Panel.
4. Double-click the Wireless Link icon.
5. Click the Image Transfer tab and deselect the Use Wireless Link to transfer images from a digital camera to your computer check box.




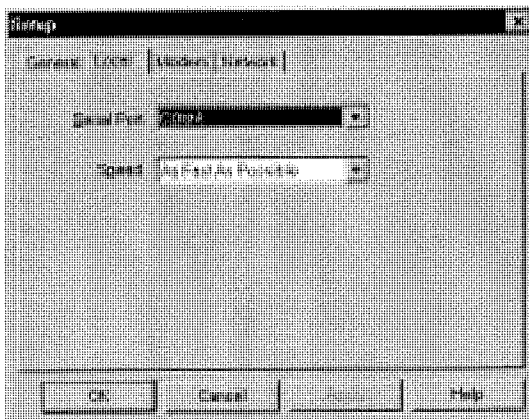
6. Click OK.
7. Disable any other application that opens the IR port.

## Configuring HotSync Manager for infrared communication

Next you need to go to the HotSync Manager and configure it for infrared communication. In Windows 98 and Me, you need to specify the simulated port used for infrared communication. In Windows 2000, you simply need to activate the infrared menu item.

To configure HotSync Manager for infrared communication with Windows 98 and Me:

1. Click the HotSync Manager icon  in the Windows system tray.
2. Make sure Local Serial is checked on the menu.
3. Choose Setup.
4. Click the Local tab.
5. In the Serial Port list, select the simulated port used for infrared communication. See the previous section for instructions on identifying the simulated port.




6. Click OK.

The HotSync Manager is now communicating with the simulated port defined for infrared communication.

Note: You cannot use your cable again until you reconfigure the HotSync Manager to communicate with the port defined for cable synchronization.

To configure HotSync Manager for infrared communication with Windows 2000:

1. If necessary, start HotSync Manager.
2. Click the HotSync Manager icon  in the Windows system tray.






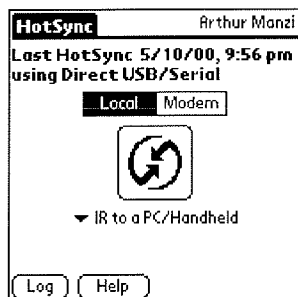
3. Choose InfraRed from the HotSync Manager menu.

## Performing an IR HotSync operation

After you complete the steps to prepare for an IR HotSync operation it is easy to perform the actual operation.

To perform an IR HotSync operation:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the HotSync icon .
3. Tap Local.
4. Tap the pick list below the HotSync icon and select IR to a PC/Handheld.




5. Position your communicator's IR port within a couple of inches of your computer's infrared port.
6. Tap the HotSync icon to start the IR HotSync operation.

## Returning to serial cable HotSync operations


It's easy to return to using the cable for HotSync operations.

**Note:** If you're using a USB cable and the Local USB option is already selected on the HotSync Manager menu, you don't need to do anything to return to cable operations.

To return to serial cable HotSync operations with Windows 98 and Me:

1. If needed, connect the cable to your computer.
2. Click the HotSync Manager icon  in the Windows system tray.
3. Choose Setup, and then click Local.
4. In the Serial Port list, select the COM port where your cable is connected.
5. Click OK.

To disable infrared communication with Windows 2000:

1. Click the HotSync Manager icon  in the Windows system tray.
2. Uncheck InfraRed on the menu.
3. In the Windows taskbar click Start, choose Settings, and then choose Control Panel.
4. Double-click the Wireless Link icon.
5. Click the Image transfer tab, and select the Use Wireless Link to transfer images from a digital camera to your computer check box.

The next time you want to perform a HotSync operation just press the HotSync button on the cable. You can leave the HotSync application on your communicator set to perform IR HotSync operations and still use the cable. This is useful if you perform HotSync operations with both your desktop computer and a laptop. When you are in the office just connect your communicator to the cable and press the HotSync button. When you travel, you don't have to carry a cable.

## Conducting a wireless HotSync operation

Your communicator includes a built-in wireless modem which you can use for wireless synchronization when you are away from your computer.

**Note:** The first HotSync operation must be local, using the cable. After that, you can perform a wireless HotSync operation.

To perform a wireless HotSync operation you must complete the following steps:

- Connect a modem to your computer
- Configure HotSync Manager for use with your modem
- Configure the Modem Preferences on your communicator

## Preparing your computer

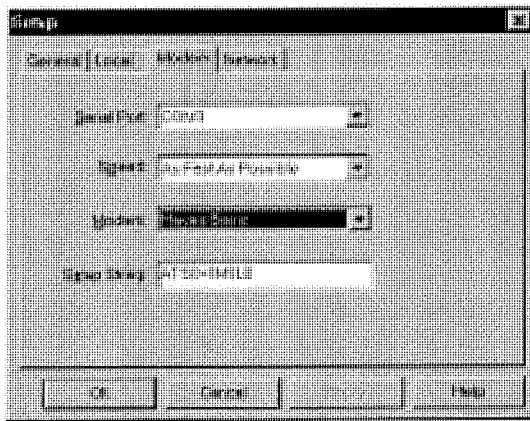
There are a few steps you must perform to prepare your computer for a wireless HotSync operation. Be sure to perform these steps before you leave your office so that your computer is ready to receive a call from your communicator.

To prepare your computer for a wireless HotSync operation:

1. Confirm that the computer modem is connected and turned on, and that no communications applications, such as fax or telephony software, are running on a COM port.

**Note:** Make sure the computer is disconnected from all online services, such as America Online (AOL) and CompuServe. This helps to avoid conflicts with the COM port.

2. Start HotSync Manager if it is not already running, and from the HotSync Manager menu, choose Modem.
3. Adjust the following options as needed.






- |                     |   |
|---------------------|---|
| <b>Serial Port</b>  | Identifies the port for the modem. If you are unsure of the port assignment, look at the Modem Properties in the Windows Control Panel.   |
| <b>Speed</b>        | Determines the speed at which data is transferred. Try the As Fast As Possible rate first, and adjust downward if you experience problems. This setting allows your desktop software and your communicator to find and use the fastest speed. |
| <b>Modem</b>        | Identifies the modem type or manufacturer. Refer to your modem manual or face plate for its type or settings. If you're not sure of your modem type or your modem doesn't match any that appear in the list, select Hayes Basic.              |
| <b>Setup String</b> | Identifies the setup string for your particular modem. Not all modems require a setup string. Refer to your modem manual and enter the setup string if recommended by the manufacturer.   |

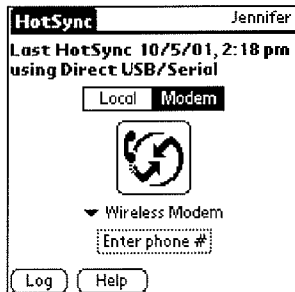
4. Click OK.

## Preparing your communicator

There are a few steps you must perform to prepare your communicator for a wireless HotSync operation.

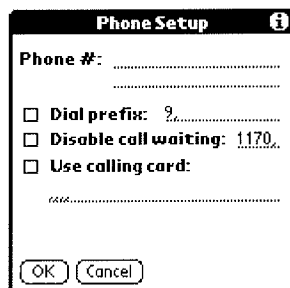
To prepare your communicator for a wireless HotSync operation:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the HotSync icon .
3. Tap Modem.





4. Tap the pick list below the HotSync icon and select Wireless Modem.
5. Tap the Enter Phone # field.

Note: If you plan to connect to your company's dial-in server (network modem) instead of connecting to a computer modem, see page 204.



6. Enter the telephone number to access the modem connected to your computer.
7. If needed, enter a dial prefix (such as "9") to access an outside line, and then tap the Dial Prefix check box.
 





Tip: You can enter a comma in the field to introduce a "pause" in the dialing sequence. Each comma equals a two second pause.
8. Select the Disable call waiting check box to avoid an interruption during the wireless HotSync operation.
9. If you want to use a calling card to place the call, select the check box and enter the calling card number.
10. Hold Option  and press Return  to finish.

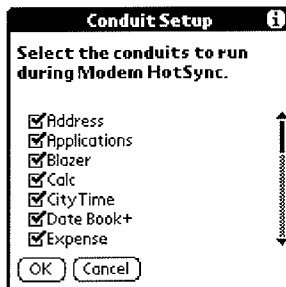


## Selecting the conduits for a wireless HotSync operation



The Conduit Setup dialog box on your communicator enables you to define which files and/or applications synchronize during a wireless HotSync operation. You can use these settings to minimize the time required for wireless synchronization.

To change the Conduit Setup for a wireless HotSync operation:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the HotSync icon .
3. Press Menu .
4. Under Options, select Conduit Setup (/D).
5. Tap the check boxes to deselect the files and applications that you do not want to synchronize during a wireless HotSync operation. The default setting is to synchronize all files.







Note: Applications that do not have a database (such as games) do not synchronize — even if you select the item in the Conduit Setup dialog box.

6. Hold Option  and press Return  to finish.

## Performing a wireless HotSync operation

After you prepare your computer and your communicator, and select your Conduit Setup options, you are ready to perform a wireless HotSync operation.

To perform a wireless HotSync operation:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the HotSync icon .
3. Tap the Modem icon  to dial the desktop modem and synchronize the applications.
4. Wait for the HotSync operation to finish. If you have any problems conducting a successful HotSync operation, see Appendix B.

## Conducting a HotSync operation via a network

When you use the Network HotSync software, you can take advantage of the Local Area Network (LAN) and Wide Area Network (WAN) connectivity available in many office environments. The Network HotSync software enables you to perform a HotSync operation by using the WAN to dial-in to a network or by using a cable that is connected to any computer on your LAN (provided that the computer connected to the cable also has the Network HotSync software installed, your computer is on, and the HotSync Manager is running).


### Connecting to your company's dial-in server

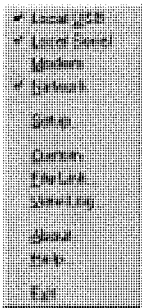
The Network HotSync software requires the following:

- Your computer has TCP/IP support installed.
- Both your company's network system and its remote access server support TCP/IP. (Your System Administrator has this information.)
- You have a remote access account. (If you don't have an account, consult your System Administrator.)

Everything you need to connect to your company's dial-in server (network modem) is included with HotSync Manager and the software on your communicator. You need to activate the feature, however, in HotSync Manager and on your communicator.

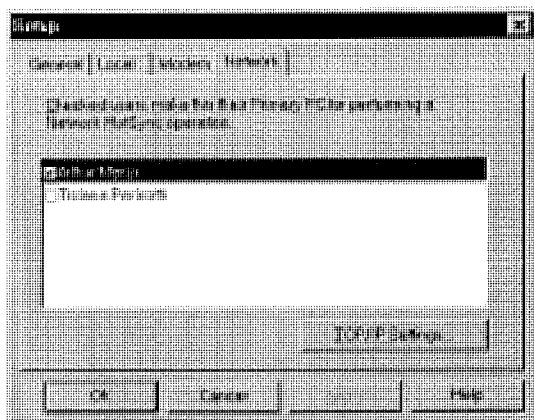
To prepare your computer for a network HotSync operation:

1. Click the HotSync Manager icon  in the Windows system tray (bottom-right corner of the taskbar).
2. From the HotSync Manager menu, choose Network.



Note: To perform a Network HotSync from another computer on your network, you must select Network from the HotSync Manager menu on both your primary computer and the computer you want to use.

3. From the HotSync Manager menu, choose Setup.
4. Click the Network tab and make sure your user name has a check mark next to it. If the check mark is not there, click the check box next to your user name.









5. Click OK.
6. Connect your communicator to the cable and press the HotSync button.

The HotSync operation records network information about your computer on your communicator. With this information, your communicator can locate your computer when you perform a HotSync operation over the network.

To prepare your communicator for a dial-in network HotSync operation:

Note: If you are performing a network HotSync operation via a LAN, you do not need to prepare your communicator and can skip to page 206.




1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the HotSync icon .
3. Press Menu .
4. Under Options, select Modem Sync Prefs (/O).
5. Tap Network.
6. Hold Option  and press Return  to finish.

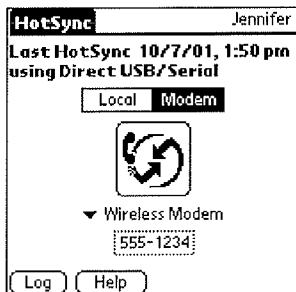
Note: See the section that begins on page 178 for information on configuring Network HotSync preferences.

## Performing a dial-in network HotSync operation

You are ready to perform a dial-in network HotSync operation after you prepare your computer and communicator, and select your Conduit Setup options.

To perform a dial-in network HotSync operation:

1. Press Option  and then press Menu  to access the Applications Launcher.
2. Tap the HotSync icon .
3. Tap the modem HotSync icon to begin the operation.



## Performing a network HotSync operation via a LAN

You are ready to perform a network HotSync from another computer on your network after you select Network from the HotSync Manager menu on both your primary computer and the computer you want to use for the network HotSync operation.

To perform a network HotSync operation via a LAN:

1. Connect your communicator to a HotSync cable that is connected to a computer on the LAN.
2. Press the HotSync button on the cable.

HotSync Manager finds your primary computer on the LAN and synchronizes with the data on your primary computer.

## Using File Link

The File Link feature enables you to import PhoneBook and Memo Pad information onto your communicator from a separate external file such as a company phone list. HotSync Manager stores the data in a separate category on your Palm Desktop software and your communicator. You can configure the File Link feature to check for changes to the external file when you perform a HotSync operation.

With File Link, you can import data stored in any of the following formats:

- Comma delimited (.csv)
- Tab delimited (.tsv)
- Memo Pad archive (.mpa)
- Address archive (.aba)
- Text (.txt)

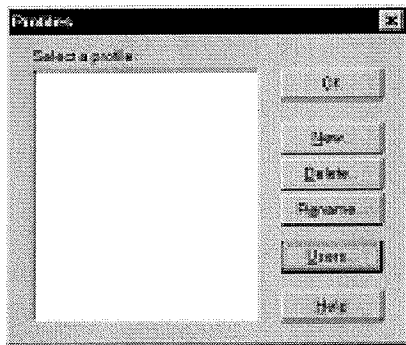
For information on how to set up a file link, see the Palm Desktop online Help.

## Creating a user profile

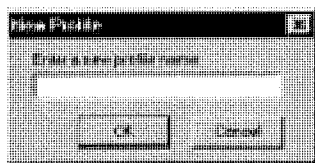
If you need to configure several Palm OS® communicators with specific information (such as a company phone list) before distributing them to their actual users, you can create a user profile to load the data into a communicator without associating that data with a user name. The User Profile feature is designed only for the first-time HotSync operation, before you assign a User ID to a particular communicator.

To create a user profile:

1. Open Palm Desktop software.
2. From the Tools menu, choose Users.
3. Click Profiles.
4. Click New.



5. Enter a unique name for the profile, and click OK.

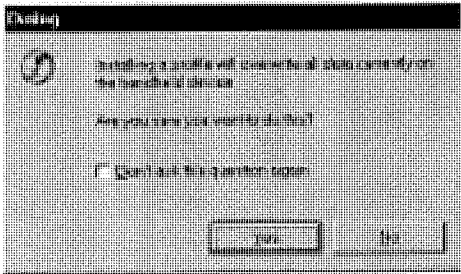


6. Repeat steps 3 and 4 for each profile that you want to create, and then click OK to return to Palm Desktop software.
7. Select the profile from the User list and create the data for the profile (e.g., company phone list, etc.).



To use a profile for the first-time HotSync operation:

1. Connect the new communicator to the HotSync cable.
2. Press the HotSync button on the cable.
3. Click Profiles.
4. Select the profile that you want to load on the communicator, and click OK.



5. Click Yes to transfer all the profile data to the communicator.

The next time you perform a HotSync operation, Palm Desktop software prompts you to assign a user name to the communicator.

## Appendix A

# Maintaining Your Communicator

This chapter provides information on the following:

- Proper care of your Treo™ 180 communicator
- Maximizing battery life
- Resetting your communicator

## Caring for your communicator

Your communicator is designed to be rugged and reliable and to provide years of trouble-free service. Please observe the following general tips when using your communicator:

- Take care not to scratch the screen of your communicator. Keep the screen clean. When working with your communicator, use the supplied stylus or plastic-tipped pens intended for use with a touch-sensitive screen. Never use an actual pen or pencil or other sharp object on the surface of the communicator screen.
- Your communicator is not waterproof and should not be exposed to rain or moisture. Under extreme conditions, water may enter the circuitry through the front panel buttons. In general, treat your communicator as you would a pocket calculator or other small electronic instrument.
- The touch-sensitive screen of your communicator contains a glass element. Take care not to drop your communicator or subject it to any strong impact. Do not carry your communicator in your back pocket: if you sit on it, the glass may break.
- Protect your communicator from temperature extremes. Do not leave your communicator on the dashboard of a car on a hot day, and keep it away from heaters and other heat sources.
- Do not store or use your communicator in any location that is extremely dusty, damp, or wet.
- Use a soft, damp cloth to clean your communicator. If the surface of the communicator screen becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution.

## Battery considerations

Please note the following considerations when using the rechargeable battery in your communicator:

- When wireless mode is on, your communicator battery should provide 60 hours of stand-by time, or 2.5 hours of talk time between charges. When you use your communicator in handheld mode and wireless mode is off, your communicator battery provides approximately three weeks of use between charges.
- You can conserve battery life by minimizing use of the backlight feature and by choosing a lower Auto-off setting which automatically turns the communicator off after a period of inactivity. See page 177 and page 18 for more information.

- If the battery becomes low in the course of normal use, an alert appears on the communicator screen describing the low battery condition. If this alert appears, connect your communicator to the HotSync cable or travel charger to charge the battery.
- If the battery drains to the point where your communicator does not turn on, it stores your data safely for about three days. In this case, there is enough residual energy in the battery to store the data, but not enough to turn on your communicator. If your communicator does not turn on when you press the power button, you should charge the battery immediately.
- If you leave a drained battery in your communicator for an extended period of time, you can lose all of the stored data. If this happens, charge the battery and use the reset button to reset your communicator as described in the next section. After you reset your communicator, perform a HotSync operation to restore the data from your computer.

## Resetting your communicator

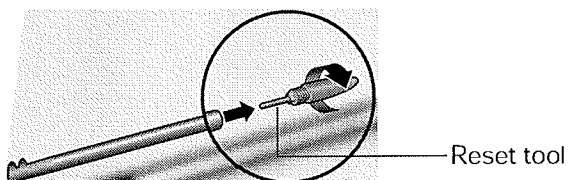
Under normal circumstances, you will not have to use the reset button. On rare occasions, however, your communicator may no longer respond to buttons or the screen. In this case, you need to perform a reset to get your communicator running again.

### Performing a soft reset

A soft reset tells your communicator to stop what it's doing and start over again. All records and entries stored in your communicator are retained with a soft reset. After a soft reset, the Welcome screen appears, followed by the General Preferences screen (to set time and date).

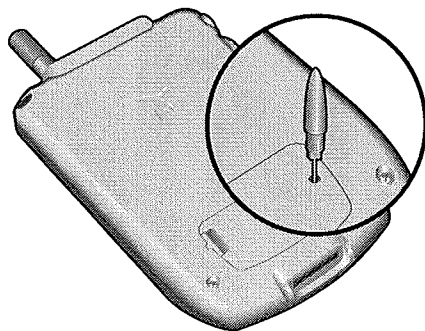
To perform a soft reset:

1. Unscrew the tip of the stylus to access the reset tool.



2. Use the reset tool to gently press the reset button inside the hole on the back panel of your communicator.

Tip: You can also use the tip of an unfolded paper clip (or similar object without a sharp tip).





## Performing a warm (or safe) reset

A warm (or safe) reset bypasses system extensions on your communicator, such as HackMaster hacks or system patches. Performing a warm reset enables you to uninstall a third-party application that may be causing a problem.

To perform a warm (or safe) reset:

1. Press and hold the top scroll button on the front panel of your communicator.
2. While holding down the top scroll button, use the reset tool (or similar object without a sharp tip) to gently press the reset button.
3. When the system screen appears, release the top scroll button.

## Performing a hard reset

With a hard reset, all records and entries stored in your communicator are erased. Never perform a hard reset unless a soft or warm reset does not solve your problem.

Note: You can restore any data previously synchronized with your computer during the next HotSync operation.


To perform a hard reset:

1. Press and hold the power button on the top of the communicator.
2. While holding down the power button, use the reset tool (or similar object without a sharp tip) to gently press and release the reset button.
3. When the system screen appears, release the power button.
4. When a message appears on the communicator screen warning that you are about to erase all the data stored on your communicator, do one of the following:
  - Press the top scroll button on the front panel of your communicator to complete the hard reset and display the Digitizer screen.
  - Press any other button to perform a soft reset.

Note: With a hard reset, the current date and time are retained. Formats Preferences and other settings are restored to their factory default settings.

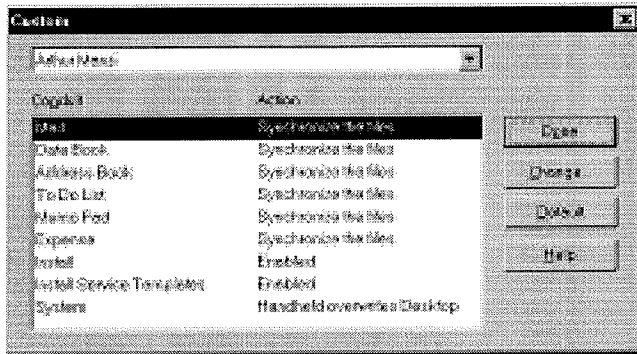
5. If the language selection screen appears, select the same language you selected for your desktop software. Choosing a different language may result in loss of data.

To restore your data after a hard reset:

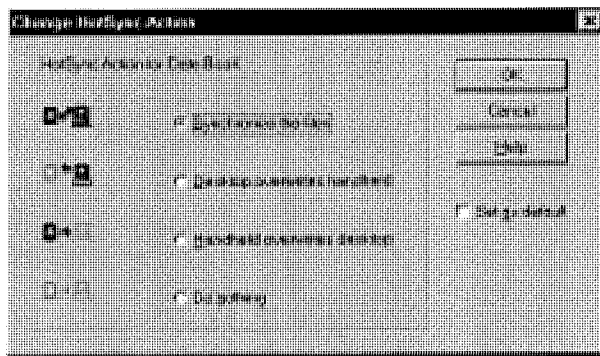
1. Click the HotSync Manager icon ™ in the Windows system tray (bottom-right corner of the taskbar).

Tip: You can also click the HotSync command on the Palm Desktop software menu bar.

2. From the HotSync Manager menu, choose Custom.



3. Select the appropriate user name from the list.
4. Select an application in the Conduit list.
5. Click Change.



6. Select Desktop overwrites handheld.

Note: Changing the HotSync setting from the default affects only the next HotSync operation. Thereafter, the HotSync Actions revert to their default settings.

7. Click OK.
8. Repeat steps 4 through 7 to change conduit settings for other applications.
9. Click Done to activate your settings.
10. Perform a HotSync operation.

## Appendix B

# Troubleshooting Tips

If you encounter a problem with your Treo™ 180 communicator:


- Review this section to see if your problem is listed
- Check our web site at [www.handspring.com](http://www.handspring.com) for the latest technical support information

Note: Thousands of third-party add-on applications have been written for Palm OS® devices. Unfortunately, we are not able to support such a large number of third-party applications. If you are having a problem with a third-party application, please contact the developer or publisher of that software.


## Software installation problems

<b>Problem</b>	<b>Solution</b>
Palm™ Desktop software will not install successfully.	<p>Disable any anti-virus software, close any open applications or utilities, and then perform the installation again.</p> <p>If you are installing on a computer at your workplace, make sure your System Administrator grants you the rights to install software.</p> <p>If you are still having problems installing the Handspring software, try these steps:</p> <ol style="list-style-type: none"> <li>1. Download the latest version of the software from the Customer Support or Product Support section of <a href="http://www.handspring.com">www.handspring.com</a>.</li> <li>2. Restart your computer in "safe mode." In most versions of Windows you can do this by pressing F8 on the keyboard as the computer boots.</li> <li>3. Install the file you downloaded in step 1. If the installation finishes, restart your computer in the normal operating mode and start using Palm Desktop software.</li> </ol>

## Operating problems

<b>Problem</b>	<b>Solution</b>
My communicator won't turn on.	<p>Try each of these in turn:</p> <ul style="list-style-type: none"> <li>■ Adjust the contrast settings.</li> <li>■ Make sure the battery is fully charged.</li> <li>■ Perform a soft reset. See page 210 for details.</li> <li>■ If your communicator still does not operate, try a hard reset. See page 211 for details.</li> </ul>
My communicator keeps turning itself off.	Your communicator is designed to turn itself off after a period of inactivity. This period can be set at one, two, or three minutes. Check the Auto-off setting. See page 177 for details.
My communicator is not making any sounds.	<ul style="list-style-type: none"> <li>■ Check the ringer switch setting on top of your communicator. The  setting turns off all sounds on your communicator.</li> <li>■ Check the System Sound setting. See page 177 for details.</li> </ul>
My communicator has frozen.	<p>This is most commonly attributed to conflicts with third-party software. Try each of these in turn:</p> <ul style="list-style-type: none"> <li>■ Perform a soft reset. See page 210 for details.</li> <li>■ Delete any application you recently installed. See page 42 for details.</li> <li>■ Perform a warm reset. See page 211 for details.</li> <li>■ Perform a hard reset. See page 211 for details.</li> </ul>
I don't see anything on my communicator's screen.	<ul style="list-style-type: none"> <li>■ Adjust the contrast settings.</li> <li>■ Charge the battery.</li> <li>■ Perform a soft reset.</li> </ul>

## Tapping and keyboard problems




<b>Problem</b>	<b>Solution</b>
When I tap the buttons or screen icons, it activates the wrong feature.	Calibrate the screen. See page 176 for details.
When I press Menu  , nothing happens.	Not all applications or screens have menus. Try changing to a different application.

## Wireless communication problems

Problem	Solution
I can't use the wireless features	<ul style="list-style-type: none"> <li>■ Make sure your Treo battery is charged.</li> <li>■ Make sure wireless mode is on. To turn on wireless mode, press and hold the power button for at least two seconds, until you hear a confirmation tone. An ascending tone means wireless mode is now on, a descending tone means wireless mode is now off.</li> </ul>
I get a message that my SIM card is missing when I turn on my Treo	<ul style="list-style-type: none"> <li>■ Make sure your SIM card is properly inserted. The metal contacts must face up on the inside of the SIM door, and the side with the corner cut must slide into the SIM slot first. For details, see the instructions in the Quick Reference guide.</li> <li>■ Your SIM card may be damaged. Contact your wireless service provider for a new card.</li> </ul>
My Treo requires an unlocking code (PIN), but I didn't set one	<ul style="list-style-type: none"> <li>■ Your wireless service provider may have set the locking code before you received your Treo. Enter the default unlocking code (PIN) and then tap OK. In North America, the default unlocking code is usually 1234 or 1111. If this doesn't work, contact your wireless service provider.</li> </ul> <p data-bbox="704 1052 1377 1115">Note: It is actually your SIM card that is locked, not your Treo.</p> <ul style="list-style-type: none"> <li>■ If you see the Unblock Phone screen instead of the Unlock Phone screen, you entered the unlock code (PIN) incorrectly three times, and your Treo is now blocked. Contact your wireless service provider to obtain the unblock code. If you enter the unblock code (PUK) incorrectly ten times, your SIM is permanently disabled.</li> </ul>
I called my wireless service provider to activate my service, but wireless mode still doesn't work	Some wireless service providers require 24 hours or more to activate your wireless service. If it has been longer than your wireless service provider's activation period, report the problem to your wireless service provider.
My phone number isn't on the Phone Info screen	Your wireless service provider may need to install your phone number onto your SIM card. Contact your wireless service provider to see if they can send a message to your Treo that writes your phone number onto your SIM card.

<p>My Treo won't register to the network</p>	<ul style="list-style-type: none"> <li>■ You are probably outside a network coverage area. Try using another GSM phone to verify whether coverage is available in your current location.</li> <li>■ If coverage is available in your location, try your SIM card in another GSM phone. If it still doesn't work, your SIM card may be malfunctioning. Contact your wireless service provider for another SIM card.</li> <li>■ Turn off the wireless mode on your communicator, and then turn it on again. If a dialog appears asking if you want to search for a network, tap Yes.</li> </ul>
<p>I tried dialing a phone number, but my Treo just beeps at me</p>	<ul style="list-style-type: none"> <li>■ Make sure you dialed the correct number.</li> <li>■ Wait a few minutes and try again. If the network is very busy, calls cannot connect.</li> <li>■ Verify that you are in a network coverage area and then move a few yards away and try the call again. If you are in a weak coverage area (1 bar of signal strength or less), you may not be able to complete calls even though you are registered to the network.</li> </ul>
<p>I can't dial international numbers</p>	<p>For security purposes, some wireless service providers require you to enable international calling on your account. Call your wireless service provider for details.</p>
<p>Call waiting doesn't work</p>	<p>Enable call waiting in the Call Preferences dialog. See the section that begins on page 97 for details. If the problem persists, contact your wireless service provider to confirm that this feature is available in your area.</p>
<p>Call forwarding doesn't work</p>	<p>For security purposes, most wireless service providers require you to enable this feature on your account even though there is usually no extra charge. Call your wireless service provider to enable call forwarding.</p>
<p>Caller ID blocking for my outgoing calls doesn't work</p>	<p>Some wireless service providers require you to enable this feature on your account. Call your wireless service provider to enable blocking your Caller ID.</p>
<p>Some incoming caller's names don't appear in Call History</p>	<ul style="list-style-type: none"> <li>■ Find out if a caller has blocked their Caller ID.</li> <li>■ Call History does not show names for records you marked hidden in your Contacts list.</li> </ul>

The Blazer® application won't connect to the Internet

- Confirm that you wireless service plan includes data services and not just voice minutes.
  - Check with your Internet Service Provider to confirm that your Network Preferences settings are properly configured.
1. Press Option  and then press Menu  to access the Applications Launcher.
  2. Tap the Preferences icon .
  3. Select Network from the pick list in the upper-right corner.
  4. Check your Username, Password, and the phone number. The phone number should be the number you use to dial-in to your ISP.
  5. Tap Connect. If the Connect button changes to a Disconnect button after the connection dialogs finish, your Network Preferences settings are working. If the Connect button does not change, tap Details and enter DNS and IP address information for your Internet Service Provider.

**Important:** AOL users must download AOL for Palm from [www.aol.com/anywhere/pda/palm/palmaol](http://www.aol.com/anywhere/pda/palm/palmaol) to retrieve e-mail. AOL does not support web browsing with Blazer.

Some phone numbers don't appear in the SMS Lookup

Make sure the number you want is identified as a mobile number in your Contacts list. Only mobile phone numbers and e-mail addresses appear when you use the SMS Message Manager Address by Last Name Lookup feature.

I can't send SMS messages

- Make sure SMS services are enabled on your account by checking the SMS Preferences dialog to see if the SMS Message Center number is on this screen. If the number is missing, contact your wireless service provider for the SMS Message Center number and enter it in the SMS Preferences dialog.
- Note: Receiving SMS messages does not indicate that you have a subscription to your wireless service provider's SMS service. You must subscribe to this service to send or reply to messages.
- Verify that you are in a GSM coverage area.
  - Make sure the destination number is correct. Some wireless service providers require 11-digit phone numbers for SMS messages.


I get an error message when I send an SMS message to an email address	Make sure you have subscribed to and enabled the SMS Email feature. You need to get the SMS Email Center number from your wireless service provider and enter it in the SMS Preferences dialog. This number is different from the SMS Message Center number you use to send messages to other mobile phone numbers. See page 130 for details.
I get an error when sending a long message to myself	Some wireless service providers have difficulty sending long SMS messages to your own phone number. Try sending long messages as a series of smaller messages instead.
I get an error when making data calls	<ul style="list-style-type: none"><li>■ Check with your wireless service provider to make sure that data services are enabled on your account.</li><li>■ Verify that you are in a coverage area.</li></ul>
The SIM Book application won't open	Make sure your SIM card is inserted in your Treo and that wireless mode has been on for at least 30 seconds.
My SIM Book doesn't display the full name and number	When a name or number is longer than will fit in the SIM Book display, three dots appear to indicate that the entry contains additional information. SIM Book does not truncate the actual entry, it just does not appear on the screen.



## Application problems

<b>Problem</b>	<b>Solution</b>
<p>I tapped the Today button, but it does not show the correct date.</p>	<p>Your communicator is not set to the current date. Make sure the Set Date box in the General Preferences screen displays the current date. See page 22 and page 177 for details.</p>
<p>I know I entered some records, but they do not appear in the application.</p>	<ul style="list-style-type: none"> <li>■ Check the Categories pick list (upper-right corner of the screen). Choose All to display all of the records for the application.</li> <li>■ Check Security and make sure that the Private Records setting is set to Show private records.</li> <li>■ In To Do List, tap Show and check whether Show Only Due Items is selected.</li> </ul>
<p>I am having problems listing memos the way I want to see them.</p>	<ul style="list-style-type: none"> <li>■ If you cannot manually arrange the order of the memos in the list screen, check the Memo Preferences setting. Make sure that Sort by is set to Manual.</li> <li>■ If you choose to view your memos alphabetically on Palm Desktop software and then perform a HotSync<sup>®</sup> operation, the memos on your communicator still appear in the order defined in the Memo Preferences setting. In other words, the sort settings that you use with Palm Desktop software are not transferred to your communicator.</li> </ul>
<p>I created an event in Date Book Plus, but it doesn't appear in the Week View.</p>	<p>In the Week View, you cannot select overlapping events that have the same start time. If you have two or more events with the same start time, choose the Day View for the particular day to see the overlapping events.</p>

## HotSync problems

Problem	Solution
Why can't I synchronize my communicator with my computer?	<p>Try each of these in turn. After each step, try to synchronize to see if the problem persists:</p> <ul style="list-style-type: none"> <li>■ Make sure you installed the software that came with your communicator. You must install this software even if you upgraded from another Palm OS handheld.</li> <li>■ Make sure there are no active calls on your Treo before you begin a HotSync operation. You cannot synchronize while you have an active call, and you cannot make or receive calls during a HotSync operation.</li> <li>■ Make sure you selected your user name in Palm Desktop software before beginning the HotSync operation.</li> <li>■ Perform a soft reset. See page 210 for details.</li> <li>■ Make sure the HotSync Manager icon ™ appears in the Windows system tray in the lower-right corner of the screen. If it does not appear, open the Start menu, select Programs, Handspring, and then HotSync Manager.</li> <li>■ Click the HotSync Manager icon and make sure that the Local USB option has a check next to it. If you are using an optional serial cable, make sure that the Local Serial has a check next to it, then select Setup and confirm that the COM port setting matches the port where you attached the serial cable.</li> <li>■ Make sure the cable is connected securely to your computer and your communicator.</li> <li>■ Make sure you are using the correct type of cable. If your computer does not have a USB port, or is running Windows 95 or Windows NT 4.0, you must use a serial cable.</li> <li>■ If you're using a USB cable, insert the Handspring CD into your computer, use Windows Explorer or My Computer to navigate to the Utilities folder, and then run the Visor USB registry utility.</li> <li>■ If you are using a USB cable, disconnect any other USB devices you are using. If you're connecting your cable to a USB hub, disconnect it and connect your cable directly to your computer.</li> <li>■ If you are using a serial cable, try a lower baud rate setting on the Local tab in the Setup dialog box.</li> <li>■ Restart your computer.</li> <li>■ If you installed a conduit from a third-party software developer, contact the developer for support.</li> </ul>

I did a HotSync operation, but one of my applications did not synchronize.

Click the HotSync Manager and choose Custom. Make sure that the conduit appears on the list and that it is set to Synchronize the files. See page 195 for details.

I cannot launch the HotSync Manager.

- Make sure you are not running another program, such as America Online, CompuServe, or WinFax, that uses the port you selected in the Setup dialog box.

I am using Outlook as my PIM, but I cannot do a HotSync operation.

- Reinstall the Palm Desktop software.
- Click the HotSync Manager and choose Custom. Check that the Outlook conduits are installed and active.
- Reinstall the Palm Desktop software and make sure you select the option to synchronize with MS Outlook.

I tried to do a wireless HotSync operation, but it did not complete successfully.

Check the following on your computer:

- Make sure your computer is turned on and that it does not shut down automatically as part of an energy-saving feature.
- Make sure the modem connected to your computer is turned on and is connected to the outgoing phone line.
- Make sure Modem is checked in the HotSync Manager menu.
- Make sure the modem you are using with your communicator has an on-off switch. Your communicator cannot "wake up" a modem that has an auto-off feature.
- Make sure the modem is connected properly to a serial port on your computer and is connected to the incoming phone line.
- Confirm that the Setup String in the Setup dialog box configures your modem correctly. You may need to select a different Modem Type or enter a custom Setup String. Most modems have a Setup String that causes them to send initial connection sounds to a speaker. You can use these sounds to check the modem connection.
- Confirm that the Speed setting in the Setup dialog box works for your modem.
- If you have problems using the As Fast As Possible option or a specific speed, try using a slower speed.
- Make sure you are not running another program, such as WinFax, CompuServe, or America Online, that uses the serial port you selected in the Setup dialog box.
- Make sure your modem resets before you try again. (Turn off your modem, wait a minute, then turn it back on.)

I tried to do a wireless HotSync operation, but it did not complete successfully.  
(continued)

Check the following on your communicator:

- Confirm that you are inside a coverage area, and that the signal is strong.
- Make sure the dialing instruction dials the correct phone number.
- If you need to dial an outside line prefix, make sure you selected the Dial Prefix option on your communicator and entered the correct code.
- If the you have call waiting, make sure you selected the Disable call waiting check box and entered the correct code in the Phone Setup dialog box. See page 202 for details.
- Make sure the connection is clear. Using a noisy connection can interrupt communications.

## Beaming problems

### Problem

I cannot beam data to another IR-equipped Palm OS device.

### Solution

- Confirm that your communicator and the other device are between ten centimeters (approximately 4") and one meter (approximately 39") apart, and that the path between the two devices is clear of obstacles. Beaming distance to other Palm OS devices may be different.
- Check the General Preferences screen and make sure the Beam Receive setting is on.
- Move your communicator closer to the receiving device.
- Move your communicator farther away from the receiving device.
- Angle the sides of the two devices towards each other.
- Perform a soft reset. See page 210 for details.

When someone beams data to my communicator, I get a message telling me it is out of memory.

- Your communicator requires at least twice the amount of memory available as the data you are receiving. For example, if you are receiving a 30K application, you must have at least 60K free.
- Perform a soft reset. See page 210 for details.

## Password problems

Problem	Solution
I forgot the password, and my communicator is not locked.	<p>You can use Security to delete the password. If you do this, your communicator deletes all entries marked as private. You can, however, perform a HotSync operation before you delete the password: the HotSync process backs up all entries, whether or not they are marked private. In this case, the following procedure restores your private entries and lets you access them:</p> <ol style="list-style-type: none"> <li data-bbox="651 562 1268 621">1. Use the Palm Desktop software and the cable to synchronize your data.</li> <li data-bbox="651 657 1289 716">2. Tap Forgotten Password in Security to remove the password and delete all private records.</li> <li data-bbox="651 751 1360 848">3. Perform a HotSync operation to synchronize your data and restore the private records by transferring them from your computer to your communicator.</li> </ol>
I forgot the password and my communicator is locked.	If you assign a password and lock your communicator, you must perform a hard reset to continue using your communicator. See page 211 for details.

## Technical support

If you cannot solve your problem after reviewing the sources listed at the beginning of this appendix, check our web site [www.handspring.com](http://www.handspring.com) for the latest technical support information.

Before requesting support, please experiment a bit to reproduce and isolate the problem. When you do contact support, please be ready to provide the following information:

- The name and version of the operating system you are using
- The actual error message or state you are experiencing
- The steps you take to reproduce the problem



## Appendix C

# Creating a Custom Expense Report

This section explains how to modify existing Expense application templates and how to create your own custom expense report templates for use with the Expense application.

**Note:** This section assumes that you are familiar with Microsoft Excel or a similar spreadsheet application. If you are not familiar with Microsoft Excel, consult your company's Information Services department or another experienced user.

## About mapping tables

Before creating or modifying an Expense template, it's important to understand the function of the Palm™ Desktop software Expense application. In simple terms, the Expense application moves Expense data from your communicator into a Microsoft Excel spreadsheet.

Each Expense item stored in your communicator represents a group of related data. You can link the following data to an expense item:

- Category
- Date
- Expense Type
- Amount
- Payment Method
- Payment Currency
- Vendor
- City
- Attendees
- Note

When you perform a HotSync® operation between your communicator and Palm Desktop software on your computer, the Expense data is stored on your computer (in a file named Expense.txt). When you open the Expense application in Palm Desktop software, an Excel macro starts, and populates an expense template with your data based on the rules specified in a spreadsheet file named Maptable.xls.

The Maptable.xls file is an editable spreadsheet that functions as a "mapping table." The function of the mapping table is to guide the Excel macro in extracting the Expense data. The mapping table tells the Excel macro how large the spreadsheet is and provides the data-cell layout of the Excel template used for the Expense Report.

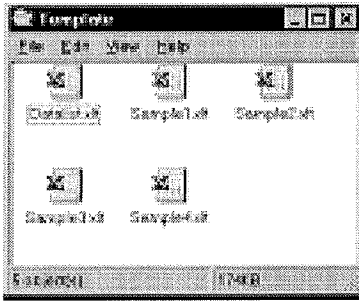
## Customizing existing sample templates

Four sample Expense Report templates come with Palm Desktop software. These templates are stored in the Template folder (which is in the same folder as the Palm Desktop software application).

If the layout of one (or more) of these templates is appropriate for your reporting needs, you can easily customize the templates with your company name and other information.

To customize a sample Expense Report template:

1. Make a backup copy of the contents of the Template folder.



2. Double-click the name of the sample template you want to modify to open it in Microsoft Excel.
3. Make any changes that you want to the names (or other information) in the sample template.

**Important:** Do not insert rows or columns in the sample template. Doing so changes the way your Expense data maps to the template and causes errors. If you want to move the cells to a different location or add or delete rows or columns, you have to make changes to the Mappable.xls file.

**Note:** You can insert your own company logo without changing the Mappable.xls file. If you change the file name, however, you need to make a corresponding change in the Mappable.xls file.

You can also rename cells without changing the Mappable.xls file, provided that the expense type corresponds to your communicator data. For example, you can change "Snack" to "Munchies," and then all items entered on your communicator as "Snack" map to the cell(s) labeled "Munchies."

4. From the File menu, choose Save As.
5. Click the Save as type drop-down list and choose Template (\*.xlt).
6. Navigate to the Template folder (in the Palm Desktop software directory).

**Note:** If you do not need to change the Mappable.xls file, save the template file with its original file name (e.g., Sample2.xlt).

If you do need to change the Mappable.xls file, give your modified template a unique name. Be sure to use the .xlt file suffix, which defines the file as a Microsoft Excel template.

7. Click Save to save your modified template and make it available for future use.

**Note:** If you need to modify the Mappable.xls file, you must do this before you can use the modified template with your Expense data. To modify the Mappable.xls file for your new template, see page 228 for details. Read all of the sections of this appendix before making changes to the Mappable.xls file.



# Determining the layout of the Expense Report

This section describes the layout considerations for the Expense Report and explains the terms used for creating the report.

## Labels

There are two kinds of labels that you need to define for your report: day/date and expense type. Each kind of label can be either Fixed or Variable. A Fixed label means that the label always appears as a header at the beginning of a row or column. If a label is not Fixed, it is variable.

For example, a list table of expenses could have variable labels in the rows for day/date, and variable labels in the columns for expense type. In this case, neither day/date or expense type information would be "fixed" (as a header). Instead, the date and expense type information would be filled into the cells of the spreadsheet as appropriate.

Examples of both Fixed and Variable labels appear in the sample expense templates.

## Sections

A Section is an area of the report that has common formatting. It is common for an Expense report to have more than one Section. For example, the following sample Expense Report named Sample3.xlt contains several Sections.

1	2	3	4	5	6	7	8	9	10
<b>Expense Report</b>									
9	DATE	CITY							
10	MEAL	COMPANY PAID							
11	LUNCH	COMPANY PAID							
12	TRAVEL	COMPANY PAID							
13	TRAVEL	COMPANY PAID							
14	TRAVEL	COMPANY PAID							
15	TRAVEL	COMPANY PAID							
16	TRAVEL	COMPANY PAID							
17	TRAVEL	COMPANY PAID							
18	TRAVEL	COMPANY PAID							
19	HOTEL	COMPANY PAID							
20	PARKING & TOLLS	COMPANY PAID							
21	PARKING & TOLLS	COMPANY PAID							
22	PARKING & TOLLS	COMPANY PAID							
23	PARKING & TOLLS	COMPANY PAID							
24	PARKING & TOLLS	COMPANY PAID							
25	PARKING & TOLLS	COMPANY PAID							
26	PARKING & TOLLS	COMPANY PAID							
27	<b>BUSINESS MEALS AND ENTERTAINMENT EXPENDITURES</b>								
28									
29	DATE	EXPENSE TYPE	AMOUNT	YEAR					
30									
31									
32									

Because your Expense data maps to row and column areas of your final report, different Sections require different definitions for the data mapping. To create additional Sections with different mapping, you create corresponding additional lines to the mapping table file named Maptable.xls. This procedure is explained later in this appendix.

If a section contains cells for prepaid (company paid) expenses, you need to create an additional line in the mapping table for "prepaid." This will count as an additional section in the mapping table. The only data that differs in the prepaid section (from the non-prepaid section) is the row/column numbers for the expense type.

## Analyzing your custom Expense Report

If you already have a custom Excel expense report, you can use it with a modified mapping table. However, before you can create a Mappable.xls file that corresponds to your custom Expense Report, you must first analyze the characteristics of your report.

Perform the following before you begin a custom mapping table:

- Print a copy of your custom expense report. Activate the Row and Column Headings option in the Sheet settings of the Page Setup command. This enables you to quickly determine the size of the Section(s), as well as the numbers for the start rows and columns.
- On the printed copy, identify the data Sections. A Section is an area of data with common row and column formatting. A yellow highlighter marking pen can make it easy to see the Sections as you work with programming the mapping table. Your custom Expense Report can contain any number of Sections, and the same data can be repeated in any Section.
- On the printed copy, identify the type of Labels that apply to each Section. Each Section can have only one kind of Fixed or Variable Label for rows. Likewise, each Section can have only one kind of Fixed or Variable Label for columns.
- Place a copy of your custom Expense Report in the Template folder (in the Palm Desktop software directory). Change the file name so it has the file extension .xlt (which defines it as a Microsoft Excel template). Make a note of the exact file name so it can be defined in the mapping table file.

## Programming the mapping table

Once you have analyzed the components of your custom Expense Report, you can program the mapping table to fill the report with data from the communicator.

To program a new custom mapping table:

1. Open a copy of the Mappable.xls file in Microsoft Excel.

Note: This file is located in the same folder as the Palm Desktop software application. Make a backup copy of this file before you make your modifications.

2. Mapping a new template. Scroll to where you find the name of the original template that you chose for your modifications. The name of the template will appear in column B of the Mappable.xls file, next to the cell highlighted in green that reads "Template Name:". If you did not modify an existing template, move to any table in the Mappable.xls file.
3. Select all the rows associated with the template name. To select the rows, click and drag on the row numbers (left side), so they appear highlighted.

1	2	3	4	5
5	Template Name: SAMPLE1.XLT			
6		ROW		
7		Fixed Label		Variable Label by
8	Day/Date	Expense Type	Day/Date	Expense Type
9	Sections		5	
10				
11				
12				
13	Template Name: SAMPLE2.XLT			
14		ROW		
15		Fixed Label		Variable Label by
16	Day/Date	Expense Type	Day/Date	Expense Type
17	Meal		X	
18	Business Meals & Entertainment			X
19				
20				
21				
22	Template Name: SAMPLE3.XLT			
23		ROW		
24		Fixed Label		Variable Label by
25	Day/Date	Expense Type	Day/Date	Expense Type
26	Meal (PREPAID)		X	
27	Meal			X
28	Business Meals & Entertainment			X
29	Mileage Log			

All rows related to template are selected

- From the Edit menu, choose Copy.
- Scroll down to a blank area of the Maptable.xls file (below the rows used for Sample4.xlt), and click on a row number to select a blank row.
- From the Edit menu, choose Paste. A copy of the rows you selected in step 3 is pasted into the Maptable.xls file.
- Name the table. In the cell immediately to the right of the cell entitled Template Name, enter the exact file name of your custom Expense Report template.
- Define the number of Sections. Each row in a table defines how your communicator data will be placed in a Section of your custom Expense Report. Note that the prepaid portion of a section has its own row and counts as a separate section for map table purposes, even though it is not a separate section in your template.

22	Template Name: SAMPLE3.XLT		
23		ROW	
24		Fixed Label	
25	Day/Date	Expense Type	
26	Meal (PREPAID)		X
27	Meal		X
28	Business Meals & Entertainment		X
29	Mileage Log		

Table with four sections

You may add or delete rows as necessary so that the total number of rows corresponds to the number of Sections in your custom Expense Report. To clear all of the existing settings in a row, click to select the row and press Ctrl+Delete. Name each row to correspond to a Section of your custom Expense Report.

9. Determine the Label settings. The orientation of the data fields (Row, Column) appears in the yellow section of the table.

ROW LABELS				COLUMN LABELS			
Fixed Label		Variable Label Exp		Fixed Label		Variable Label Exp	
Day/Date	Expense Type	Day/Date	Expense Type	Day/Date	Expense Type	Day/Date	Expense Type
		x					x

Determine whether the Rows will contain expense or date information, and place an "x" in the appropriate cell. When you do this, you also define whether the label is Fixed or Variable. You can place only one "x" in the Row section (columns 2–5).

Determine whether the Columns will contain expense or date information, and place an "x" in the appropriate cell. When you do this, you also define whether the label is Fixed or Variable. You can place only one "x" in the Column section (columns 6–9).

10. Define the dimensions of the Section. The dimensions of the Section appear in the green columns (10–13).

# of Rows	# of Columns	Start Row	Start Column
20	15		1

**# of Rows** Represents the total number of rows in the Section, excluding any header or total rows. In other words, this includes only the number of rows in the Section where your communicator data will be placed.

**# of Columns** Represents the total number of columns in the Section, excluding any header or total columns. In other words, this includes only the number of columns in the Section where your communicator data will be placed.

**Start Row** Is the number of the first row of the Section that will be filled with your communicator data.

**Start Column** Is the number of the first column of the Section that will be filled with your communicator data.

11. Define the Dates and Intervals. The dates and intervals between dates appears in the light blue columns (14–17).

Date	Intervals Between		
Date	Dates	Start day	Day
1	0		

In the Date cell, enter the row or column number where all the date information will be placed.

In the Dates cell, enter the number of blank columns (or rows) separating the date fields. If there are no blank columns (or rows) between date entries, leave this number set to zero.

In the Start Day cell, enter the day of the week that starts the expense reporting period. Enter a three-character abbreviation for the day (e.g., Sun, Mon, Tue).

In the Day cell, enter the row or column number where all the day information will be placed. If the dates are in a row or in a column, enter the row or column number.

- Define whether the Section is in list format. This setting appears in the light purple columns (18–19).

<b>Listing Format</b>	<b>Expense Type</b>
YES	8

If the Section will present the data in a list format, enter the word "yes". Otherwise, enter the word "no". The following diagram shows data presented in a list format:

6	Date	Category	Type	Amount	Country	Payment Type
7						
8						
9						
10						
11						

Only if your section is in list format: In the Expense Type cell, enter the number of the row or column where the expense description will be placed. Expense amounts can be entered in several different columns or rows if required by your template. Expense type labels must all appear in the same column.

- Enter the row or column numbers for the expense types that appear in the Section. These settings appear in the aqua columns (20–48).

Expense Type	Row/Column	Row/Column	Row/Column	Row/Column	Row/Column	Row/Column	Row/Column
Meals	4	4	4	4	4	4	4

For these settings, simply enter the row or column number for the expense types that you want to appear in the Section. Note that the same row or column number can be used more than once. An example of this would be meals that encompass breakfast, lunch, dinner, and snacks. In the previous example, all expense items would be populated into row/column 4 of the custom Expense Report.

- Complete the table. All of the remaining columns (49–57) in the table are used to define the column or row number that corresponds to the description.
- Mark a Section for prepaid expenses (yellow column). If a row in the map table is for prepaid (company paid) expenses, type a "yes" in the cell on that Section's row. Type "no" in all the cells of this column that do not pertain to prepaid expenses.

Section	Prepaid

- Repeat steps 9 through 15 for each Section you defined for your custom Expense Report.
- Map Expense Report Options dialog (magenta section). The Expense Report Options dialog has five fields where you can fill in data for the header on your expense report. Use this section to specify the row and column on your template where this information is mapped.

Employee Name	Department
Header 1 Name	Header 2 Name
1	1
2	2

Because header data is not related to any particular Section, you have to fill in only one row. If the item does not appear on your template, leave these cells blank.

## Using applications other than Microsoft Excel

You can use applications other than Microsoft Excel (such as Lotus 1-2-3 or Quattro Pro) to open and manipulate the Expense data on your computer. The data file is named "Expense.txt," and is stored in the Expense folder, within the folder containing the communicator user data.

Expense data in the Expense.txt file is in tab-delimited format.

### Expense file details

The Expense.txt file contains four groups of data. It will be easier to see these four distinct groups of data if you open the file with a spreadsheet application.

<b>Trips</b>	Shows the number of Expense application categories, and lists each one followed by an "end" statement.
<b>Currency</b>	Shows how many currencies were used for the Expense data, and lists the countries that correspond to that currency.
<b>Trip</b>	Shows the number of expenses by category, and lists the expenses for each category.
<b>Expenses</b>	Shows the total number of expenses, and lists them chronologically.

## Appendix D

# Non-ASCII Characters for Login Scripts

The following information enables you to create custom login scripts that require non-ASCII characters. It is provided for advanced users who understand the use and requirements of such characters in a custom login script.

## Use of ^char

You may use the caret ( ^ ) to transmit ASCII command characters. If you send ^char, and the ASCII value of char is between @ and \_ , then the character is automatically translated to a single-byte value between 0 and 31.

For example, ^M is converted to a carriage return. If char is a value between a and z, then the character sequence is translated to a single-byte value between 1 and 26. If char is any other value, then the character sequence is not subject to any special processing.

For example, the string "Joe^M" transmits Joe, followed by a carriage return.

## Carriage return and line feed

You may include carriage return and line feed commands as part of the login script, when entered in the following format:

<cr>    Sends or receives a carriage return

<lf>    Sends or receives a line feed

For example, the string "waitfor Joe<cr><lf>" waits to receive Joe followed by a carriage return and line feed from the remote computer before executing the next command in the script.

## Literal characters

The backslash ( \ ) character defines that the next character is transmitted as a literal character, and is not subject to any special processing ordinarily associated with that character.

Examples:

\^    Includes a caret as part of the string

\<    Includes a < as part of the string

\\    Includes a backslash as part of the string







## Appendix E

# Advanced Call Forwarding Options


Some wireless service providers support advanced call forwarding options through the use of GSM feature codes. These advanced call forwarding options are turned on and off and configured by dialing specific code numbers with your communicator.

Note: Not all wireless service providers support all of these codes. Contact your wireless service provider for more information about which services are available to you.

To use the advanced call forwarding options:

1. Press PhoneBook  to access the Dial Pad view .
2. Enter one of the codes from the charts that follow.

Note: Where the charts indicates to enter a number\_to\_forward\_to, enter a full phone number with a "1" and an area code if necessary. For example, you would use \*67\*16505551234# for the first code in the first chart.

3. Press Return  to send the command.

## Forwarding calls when your communicator is busy

Code	What it does
<b>*67*number_to_forward_to#</b>	Forwards all calls you receive while you are busy on another call to the number you entered. This option typically forwards calls when you ignore a call, when you are on a wireless data call, or when you already have two active calls. You can still answer call waiting calls.
<b>*#67#</b>	Reports whether you activated the call forwarding when busy option.
<b>#67#</b>	Deactivates call forwarding when busy, and the network stores the number to which you were forwarding calls.
<b>*67#</b>	Reactivates the call forwarding when busy option, and uses the number stored on the network when you deactivated this option with the #67# code.
<b>##67#</b>	Deactivates call forwarding when busy, and the network erases the number to which you were forwarding calls.

## Forwarding calls that you do not answer

Code	What it does
<b>*61*number_to_forward_to#</b>	Forwards all calls you receive and do not answer. This option is similar to the way that voicemail typically works.
<b>*#61#</b>	Reports whether or not you activated the call forwarding for calls you do not answer option.
<b>#61#</b>	Deactivates the call forwarding for calls you do not answer option, and the network stores the number to which you were forwarding calls.
<b>*61#</b>	Reactivates the call forwarding for calls you do not answer option, and uses the number stored on the network when you deactivated this option with the <b>#61#</b> code.
<b>##61#</b>	Deactivates the call forwarding for calls you do not answer option, and the network erases the number to which you were forwarding calls.

## Forwarding calls when your communicator is unreachable

Code	What it does
<b>*62*number_to_forward_to#</b>	Forwards all calls you receive when your communicator is unreachable. This option typically forwards calls when wireless mode is off or your communicator is outside a coverage area.
<b>*#62#</b>	Reports whether you activated the call forwarding for calls when your communicator is unreachable option.
<b>#62#</b>	Deactivates the call forwarding for calls when your communicator is unreachable option, and the network stores the number to which you were forwarding calls.
<b>*62#</b>	Reactivates the call forwarding for calls when your communicator is unreachable option, and uses the number stored on the network when you deactivated this option with the <b>#62#</b> code.
<b>##62#</b>	Deactivates the call forwarding for calls when your communicator is unreachable option, and the network erases the number to which you were forwarding calls.

## General Commands

Code	What it does
<b>#002#</b>	Deactivates all advanced call forwarding options, and the network stores the numbers to which you were forwarding calls.
<b>##002#</b>	Deactivates all advanced call forwarding options, and the network erases the numbers to which you were forwarding calls.

# Other Product Information

## Limited Warranty and End User Software License Agreement

For warranty information and a copy of the End User License Agreement applicable to your Handspring product, please see the Handspring web site at <http://support.handspring.com/esupport/forms/hsFileList.jsp?Type=Warranties>. If you would like a copy of these materials mailed to you, or if you have any questions, please contact Handspring Customer Support.

The information included on this web site sets forth Handspring's sole and complete warranty and software licensing obligations with respect to your Handspring product. Use of the product indicates your acceptance of the terms of the warranty and the End User License Agreement.

## FCC Statement

This device may cause TV or radio interference if used in close proximity to receiving equipment. The FCC can require you to stop using the device if such interference cannot be eliminated. If you need assistance, contact Handspring Customer Care.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet or circuit different from that to which the receiver is connected

Consult the dealer or an experienced radio/TV technician for help and for additional suggestions.

## Exposure To Radio Frequency Energy (SAR)

In order to comply with FCC RF exposure safety guidelines, users **MUST** use a Handspring brand body-worn accessory during body-worn operation. Use of accessories not provided by Handspring or that have not been tested for RF exposure compliance with this product may not comply with the FCC RF exposure safety guidelines and should not be used.

See [www.fcc.gov/oet/rfsafety/](http://www.fcc.gov/oet/rfsafety/) for more information on RF exposure safety.

Responsible Party:  
 Handspring, Inc.  
 189 Bernardo Avenue  
 Mountain View, California 94043-5203  
 United States of America  
 (650) 230-5000



## Canadian RFI Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Safety and General Information

IMPORTANT INFORMATION ON SAFE AND EFFICIENT OPERATION. Read this information before using your integrated multi-service portable radio.

### For the Safe and Efficient Operation of Your Radio, Observe These Guidelines

Your radio product contains a transmitter and a receiver. When it is ON, it receives and transmits radio frequency (RF) energy. The radio operates in the frequency range of 800 MHz to 1990 MHz and employs digital modulation techniques. When you use your radio, the system handling your call controls the power level at which your radio transmits. The output power level typically may vary over a range from .001 Watts to 2 Watts.

### Exposure to Radio Frequency Energy

Your Treo is designed to comply with national and international standards, including United States Federal Communications Commission, OET Bulletin 65 supplement C; American National Standards Institute (ANSI) IEEE. C95. 1-1992; Cenelec EN 50360; and Industrie Canada RF exposure guidelines.

In order to comply with FCC RF exposure safety guidelines users MUST use a Handspring brand body-worn accessory during body-worn operation. Use of accessories not provided by Handspring or that have not been tested for RF exposure compliance with this product may not comply with the FCC RF exposure safety guidelines and should not be used.

To assure optimal radio performance, always adhere to the following procedures:

- When placing or receiving a phone call hold the radio as you would a telephone.
- Speak directly into the microphone and position the antenna up over your shoulder.
- DO NOT hold the antenna when the radio is "IN USE." Holding the antenna affects call quality and may cause the radio to operate at a higher power level than needed.

### Interference to Medical and Personal Electronic Devices

Most, but not all, electronic equipment is shielded from RF signals and certain electronic equipment may not be shielded against the RF signals from your Treo communicator.

### Pacemakers

The Health Industry Manufacturers Association recommends that a minimum separation of six inches (6") be maintained between a handheld wireless phone and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by the recommendations of Wireless Technology Research.

Persons with pacemakers should:

- ALWAYS keep the phone more than six inches from their pacemaker when the phone is turned ON.
- NOT carry the phone in a breast pocket.
- Use the ear opposite the pacemaker to minimize the potential for interference.
- Turn the phone OFF immediately if you have any reason to suspect that interference is taking place.

## Audio Safety

Some hearing aids may be affected by some digital wireless phones. You may want to consult your doctor in the event of you experience interference with your hearing aid while using Treo. When using the speakerphone feature, it is recommended that you place Treo at a safe distance from your ear.

## Other Medical Devices

If you use any other personal medical device, consult the manufacturer of your device to determine if it is adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information.

Turn your phone OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

## Interference to Other Electronic Devices

RF energy may affect improperly installed or inadequately shielded electronic operating and entertainment systems in motor vehicles. Check with the manufacturer or representative to determine if these systems are adequately shielded from external RF energy. Also check with the manufacturer of any equipment that has been added to the vehicle.

## Safety and General Use While Driving

Check the laws and regulations on the use of telephones in the area where you drive. Always obey them.

### When using the phone while driving, please:

- Give full attention to driving and to the road
- Use hands-free operation, if available
- Pull off the road and park before making or answering a call if driving conditions so require.

## Aircraft Safety

Turn your radio OFF before boarding any aircraft to prevent possible interference to aircraft systems. Regulations of the United States Federal Aviation Administration prohibit use when the aircraft is in the air and require you have permission from a crew member to use your radio while the aircraft is on the ground.

## Non-ionizing Radiation

As with other mobile radio transmitting equipment, users are advised that for satisfactory operation of the equipment and for the safety of the personnel, it is recommended that no part of the human body be allowed to come to close to the antenna during operation of the equipment.

## General Safety Information

As with other mobile radio transmitting equipment, users are advised to heed all posted warnings on the use and operation of Treo and to turn off your device in any area with a potentially explosive atmosphere, such as fueling stations, even where no warnings or notices are posted.

## Emergency Calls

**IMPORTANT!** The Treo communications features operate using radio signals, like any wireless phone, wireless and landline networks, and user-programmed functions. Therefore you should never rely solely upon Treo for essential communications (for example, medical emergencies).

Remember, the phone feature must be on in order to make or receive calls and you must be in a service area with adequate signal strength. Emergency calls may not be possible on all wireless phone networks or when certain network services and/or phone features are in use. Check with local service providers.

## Acknowledgments

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[www.probe.net/~rhuebner/index.html](http://www.probe.net/~rhuebner/index.html)

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