F IRST T HINGS . . . *First*

In this preface, see how

    To make sure you have everything

    To operate with safety

    To get to know your Waverunner scope

    To install and power up

    To initialize

    To check the system status

    To install new software and firmware

    To activate the screen saver

    To use menus, menu buttons and knobs

    To choose button and knob preferences

2

When Your Waverunner is Delivered

CHECK THAT YOU HAVE EVERYTHING

First, verify that all items on the packing list or invoice copy have been shipped to you. (The items are also listed below.) Second, check the SYSTEM STATUS display once your Waverunner oscilloscope is installed (see page 12). Contact your nearest LeCroy customer service center or national distributor if anything is missing or damaged. If there is something missing or damaged, and you do not contact us immediately, we cannot be responsible for replacement.

The following is shipped with the standard Waverunner scope:

10:1 10 MΩ PP006 Passive Probe — one per channel

AC Power Cord and Plug

Performance or Calibration Certificate

Front Scope Cover

Two 250 V Fuses

Operator's Manual

Remote Control Manual

Quick Reference Guide

Declaration of Conformity.

> ***NOTE: The warranty below replaces all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. LeCroy shall not be liable for any special, incidental, or consequential damages, whether in contract or otherwise. The customer is responsible for the transportation and insurance charges for the return of products to the service facility. LeCroy will return all products under warranty with transport prepaid.***

BE SURE TO READ THIS WARRANTY

The Waverunner oscilloscope is warranted for normal use and operation, within specifications, for a period of three years from shipment. LeCroy will either repair or, at our option, replace any product returned to one of our authorized service centers within this period. However, in order to do this we must first examine the product and find that it is defective due to workmanship or materials and not due to misuse, neglect, accident, or abnormal conditions or operation.

Spare and replacement parts, and repairs, all have a 90-day warranty.

The oscilloscope's firmware has been thoroughly tested and is presumed to be functional. Nevertheless, it is supplied without warranty of any kind covering detailed performance. Products not made by LeCroy are covered solely by the warranty of the original equipment manufacturer.

TAKE ADVANTAGE OF MAINTENANCE AGREEMENTS

We offer a variety of services under the heading of Maintenance Agreements. These give extended warranty and allow you to budget maintenance costs after the initial three-year warranty has expired. Installation, training, enhancements, and on-site repairs — among other services — are available through special supplemental support agreements. Inquire at your LeCroy customer service center or national distributor.

OBTAIN ASSISTANCE

Help with installation, calibration, and the use of your Waverunner scope in a range of applications is also available from your customer service center.

RETURN A PRODUCT FOR SERVICE OR REPAIR

If you do need to return a LeCroy product, identify it by its model and serial numbers (see page 12). Describe the defect or failure, and provide your name and contact number.

For factory returns, use a Return Authorization Number (RAN), obtainable from customer service. Attach it so that it can be clearly seen on the outside of the shipping package to ensure rapid forwarding within LeCroy.

Return those products requiring only maintenance to your customer service center.

TIP: If you need to return your scope, use the original shipping carton. If this is not possible, the carton used should be rigid. The scope should be packed so that it is surrounded by a minimum of four inches (10 cm) of shock absorbent material.

Within the warranty period, transportation charges to the factory will be your responsibility, while products under warranty will be returned to you with transport prepaid by LeCroy. Outside the warranty period, you will have to provide us with a purchase order number before the work can be done. You will be billed for parts and labor related to the repair work, as well as for shipping.

You should prepay return shipments. LeCroy cannot accept COD (Cash On Delivery) or Collect Return shipments. We recommend using air freight.

STAY UP-TO-DATE

To maintain your Waverunner scope's performance within specifications, have us calibrate it at least once a year. LeCroy offers state-of-the-art technology by continually refining and improving the instrument's capabilities and operation. We frequently update both firmware and software during service, free of charge during warranty.

You can also install new firmware yourself, without the need of a factory refit. Simply provide us with your Waverunner serial number and ID, and the version number of the software already installed (see page 12), along with ordering information. We will provide you with a unique option key that has a code to be entered through the instrument's front panel to upgrade your software. In addition, the very latest versions of LeCroy's unique oscilloscope software applications can be downloaded from the Internet, free of charge. Included are ScopeExplorer™ and ActiveDSO.
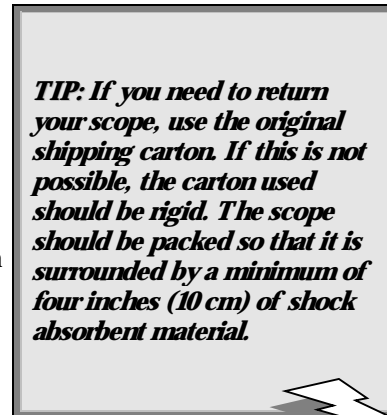
ScopeExplorer is a highly practical PC-based connectivity tool that interfaces Waverunner to a PC that is running Microsoft® Windows™, via the rear panel GPIB (IEEE 488) or RS-232 port. Specially designed by LeCroy for its oscilloscopes, ScopeExplorer allows you to perform data and image transfers and other remote operations from scope to PC with just a few keyboard strokes or mouse clicks. See Chapter 12, "Use Waverunner with PC," for more about using ScopeExplorer with your Waverunner scope.
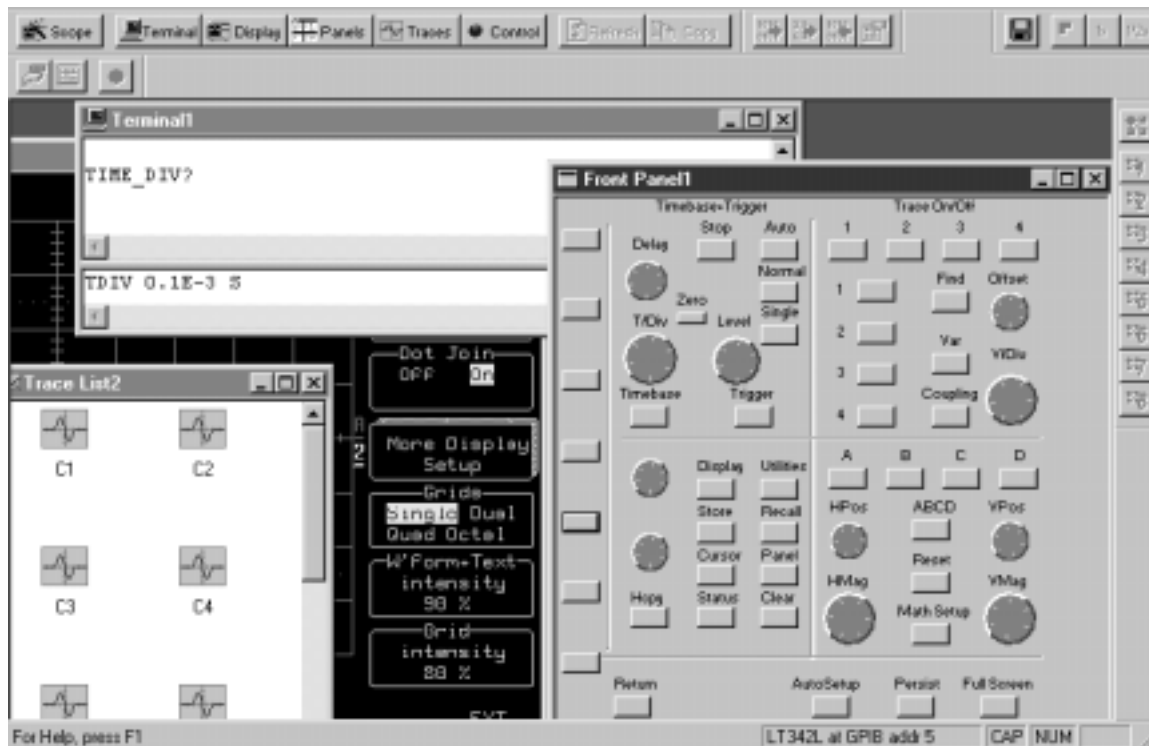
ScopeExplorer now has a virtual front panel to allow full control of remote scopes.

ActiveDSO works on any PC running Windows 95, 98 or NT™, and enables you to exchange data with a variety of Windows applications or programming languages that support the ActiveX standard, such as MS® Office, Internet Explorer, Visual Basic, Visual C++ and Visual Java. ActiveDSO hides the intricacies of programming for each of these interfaces and provides a simple and consistent interface to the controlling application. You can also visually embed ActiveDSO in any OLE automation compatible client and use it manually without programming. You could, for example, generate a report by importing scope data straight into Excel or Word, analyze your waveforms by bringing them directly into MathCad®, archive measurement results "on the fly" in a Microsoft Access® database, and automate tests using Visual Basic, Java, C++, or Excel (VBA).

Visit our website at http://www.lecroy.com/software to download these and other free software applications.

Safety First ⚠

OPERATE IN A SAFE ENVIRONMENT

Before installing your Waverunner, ensure that its operating environment will be maintained within these parameters:

Temperature: 5 to 40 °C (41 to 104 °F)

Humidity: ≤80% RH (non-condensing)

Altitude: ≤2000 m (6560 ft)

Operation: Indoor use only

> **NOTE: Waverunner has been qualified to the following EN 61010-1 category:**
>
> **Protection Class I**
>
> **Installation (Over voltage) Category II**
>
> **Pollution Degree 2**

GET TO KNOW THE WARNING SYMBOLS

Wherever these warning signs appear on the Waverunner's front or rear panels, or in this manual, they alert you to aspects of safety.

⚠ CAUTION: Refer to accompanying documents (for safety related information). *See elsewhere in this manual wherever this symbol is present, as indicated in the Table of Contents.*

⚡ CAUTION: Risk of Electric Shock

| On (Supply)

⏻ Standby

⏚ Earth (Ground) Terminal

⚠ **WARNING**

Any use of the instrument in a manner not specified by the manufacturer may impair the instrument's safety protection. Waverunner has NOT been designed to make direct measurements on the human body. Never connect the Waverunner to a living person.

⚡ **CAUTION**

Do not exceed the maximum specified input voltage levels

6

⏚ Protective Conductor Terminal
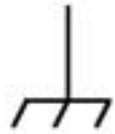
⏛ Chassis Terminal

∿ Alternating Current Only

NOTE: Waverunner automatically adapts to the line voltage present:

115 V (90–132 V)	45–66 Hz
220 V (180–250 V)	45–66 Hz

WARNING   Denotes a hazard. If a WARNING is indicated on the instrument, do not proceed until its conditions are understood and met (see also CAUTION).

CHOOSE THE CORRECT POWER SOURCE

Waverunner operates from a single-phase, 115 V (90 to 132 V) or 220 V (180 to 250 V), AC (~) power source at 45 Hz to 66 Hz.

No voltage selection is required because the instrument automatically adapts to line voltage. The power supply of the oscilloscope is protected against short circuit and overload by one 5x20 mm fuse (T 6.3 A/250 V). See next page for replacement procedure.

MAINTAIN POWER GROUND

Maintain the ground line to avoid electric shock.

The current-carrying conductors cannot exceed 250 V rms with respect to ground potential. Waverunner is provided with a three-wire electrical cord containing a three-terminal polarized plug for line voltage and safety ground connection. The plug's ground terminal is connected directly to the frame of the unit. For adequate protection against electrical hazard, this plug must be inserted into a mating outlet containing a safety ground contact. Set the power switch to STANDBY before connecting or disconnecting the power cord.

REPLACE WITH THE CORRECT FUSES

For continued fire protection at all line voltages, replace fuses only with those of the specified type and rating.

Disconnect the power cord before inspecting or replacing a fuse. Open the fuse holder (located directly to the left of the mains power plug) using a small, flat-bladed screwdriver. Remove the old fuse and replace it with a new 5x20 mm fuse (T 6.3 A/250 V).

CLEAN YOUR WAVERUNNER (BUT LET US MAINTAIN IT)

Maintenance and repairs should be carried out exclusively by a LeCroy technician.

Clean only the exterior of your Waverunner, using a damp, soft cloth. Do not use chemicals or abrasive elements. Under no circumstances allow moisture to penetrate the oscilloscope. To avoid electric shocks, disconnect the instrument from the power supply before cleaning.

> ⚠ CAUTION
>
> *Risk of electric shock. No user serviceable parts inside. Leave repair to qualified personnel.*

Up and Running

GET TO KNOW YOUR WAVERUNNER – FRONT PANEL
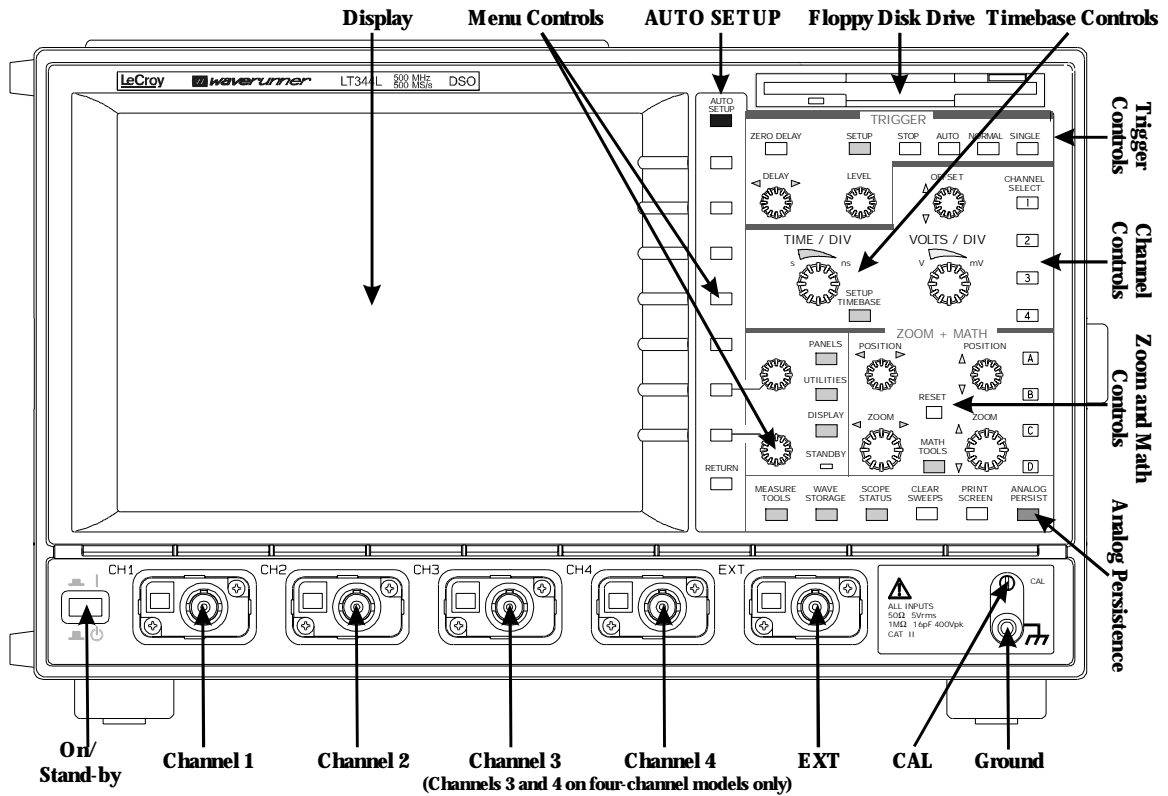
Waverunner main front panel controls and features.

INSTALL AND POWER UP
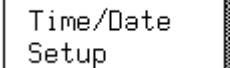
1. Before powering up, check that the local power source corresponds to Waverunner's power range (see page 7).

2. Use the cable provided to connect the scope to the power outlet through its rear panel receptacle (see next page).

3. Turn the scope on by pressing the On button at the bottom left-hand corner of the Waverunner front panel (see above).

Before a display appears, the instrument will automatically perform hardware and software self-tests, followed by a full system calibration. The front panel STANDBY LED will be lit during this sequence. The full testing procedure will take about 10 seconds, after which a display appears.

UTILITIES

4.   Press [ ] to display the UTILITIES on-screen menus.

5.   Then press the button beside the menu ⌈ Time/Date Setup ⌋ to set the time and date.
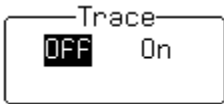
GET TO KNOW WAVERUNNER – BACK PANEL
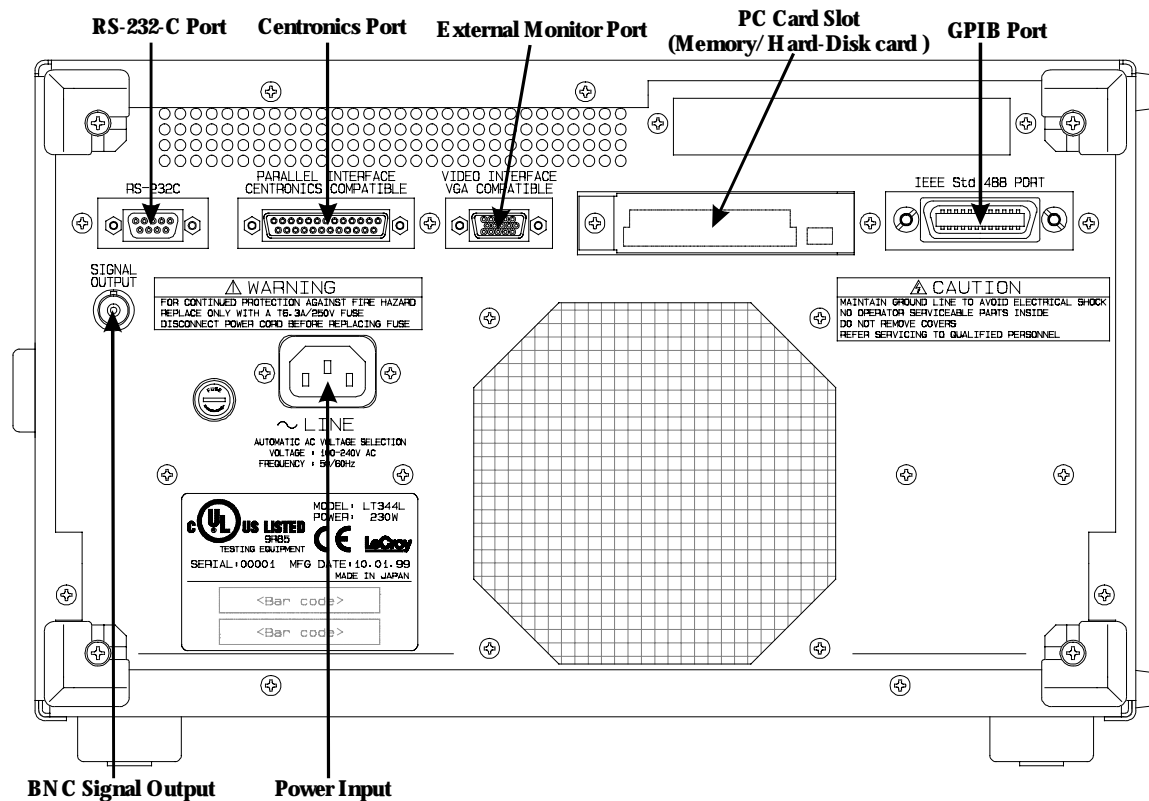
Use the RS-232-C and GPIB ports to connect your Waverunner scope to a computer or terminal, the external monitor port to display your waveforms on another monitor, and the Centronics® port to connect compatible printers or other devices. Use the PC Card slot for the PC Memory Card and portable Hard Disk options, and the BNC output for external clock signals.

10

T O   N AVIGATE   T HROUGH   M ENUS

Menus *such as* ┌─Trace─┐ | **OFF**   On | *enable you to perform actions or adjust settings.*

The menu button *beside each displayed menu controls that menu.*

L onger menus *that span the breadth of two buttons are controlled by both buttons.*

Capitalized menus — | ZOOM | *for example — perform specific actions.*

The two menu knobs *work together with the two menu buttons beside them.*

Combinations of knobs and buttons *control continuously adjustable variables. The button selects or changes the variable, while the knob adjusts its value.*

Menus are grouped *and shown together according to their function. Press a button or turn a knob to select a particular menu or an item on a menu. Travel up or down in the menu list and change the selection. Or change values and settings.*

PANELS

The darker, labeled buttons *also play a role in menu selection:* ▬▬ *— for example — was used to select the menus for initialization. When you press any one of these, it offers access to related menus in its group.*

Menus with shadows *lead to other menus: Press their buttons to display those others.*

RETURN

Press ▭ **to return** *to a shadowed menu. A nd use this button whenever you wish to go back to the previous menu display.*

Arrows on the side of a long menu *indicate that you can scroll up* ⌐ *or* ⌐ *down the menu list. Press one or the other of these menus' buttons to move in the desired direction, and to view or select any menu item not displayed. A rrows disappear when you reach the beginning or end of the menu list.*
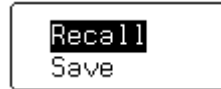
INITIALIZE

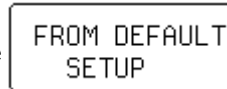Initialize your Waverunner scope to its basic default waveform display settings:

PANELS

6.   Press [ ] to display the PANEL SETUPS menu group.

7.   If **Recall** is not selected, press the button once to select it:

> Recall
> Save

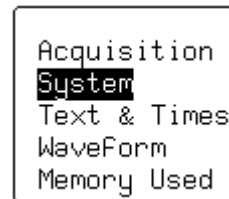8.   Then press the button beside

> FROM DEFAULT
> SETUP

.

Initialize to Waverunner default settings whenever you wish to clear your settings and make a fresh start on a new measurement.

CHECK YOUR WAVERUNNER SYSTEM

SCOPE
STATUS

9.   Press [ ] to show the STATUS menus.

> Acquisition
> System
> Text & Times
> Waveform
> Memory Used

10.   Press the top button to highlight and select **System**. The screen will show your Waverunner's serial number, the version of software installed and the date of its release, as well as a full list of your currently installed software and hardware.

Contact LeCroy customer service immediately if any of the options you ordered have not been installed.
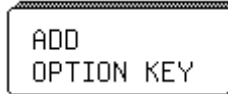
ADD AN OPTION

This menu will also be displayed when you select **System**:

> SoFtware
> Options
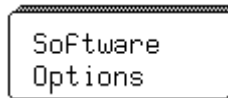
Use it to install new options — without the need to return your Waverunner for a refit.

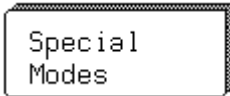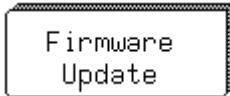1. Press that menu's button to display

> ADD
> OPTION KEY

2. Then press that menu's button to display the ADD OPTION menus. Use them whenever you wish to add a Waverunner option by means of a special code. Contact your LeCroy sales or service center to obtain the code.

UPDATE TO THE LATEST FIRMWARE

Your Waverunner comes with the latest firmware installed. But to take advantage of our continuous improvement, contact us to obtain a floppy disk or card containing the latest firmware. Then use these menus to install it:

UTILITIES
1. Press ▭ to display the UTILITIES menus.

2. Press the button for

> Special
> Modes

, then for the one for

> Firmware
> Update

.

3. Place the floppy or card in the Waverunner and press the buttons to select **Floppy** or **Card** and then Update Flash. The newly installed firmware will appear on the System Status screen (see above).

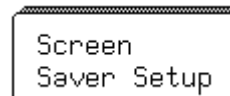You may also download the firmware from the internet, using ScopeExplorer.

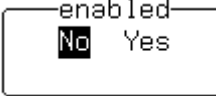**SAVE THE SCREEN (AND ENERGY)**

Enable or disable your Waverunner's screen saver:

DISPLAY
1. Press ▭ to show the DISPLAY SETUP menus.

2. Press the button for "More Display Setup" to access this menu:

> Screen
> Saver Setup

```
 ┌─enabled──┐
 │ No  Yes  │
 │          │
 └──────────┘
```
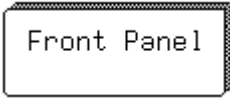
3.   Press its button, then select **Yes** or **No** from

When enabled, the built-in screen saver is activated 10 minutes after the last use of a front panel control. This is a complete display shutdown of the internal screen — an "Energy-Saver." The front panel LED light will indicate when the scope is in the screen-saving STANDBY state. Press any front panel button to restore the screen.

DO YOU PREFER YOUR CONTROLS WITH SOUND AND AUTO-REPEAT?

Have your buttons and knobs repeat their actions and make an audible sound when used:

UTILITIES

1.   Press [   ] to display the UTILITIES menus. These you will find useful for a variety of functions.

2.   Press the button for | Special Modes | , then the button for | Front Panel | .

3.   Make your preferences by means of the USER PREF'S menus displayed.

With Pushbutton auto-repeat **On**, all front panel buttons, when pressed and held in, will move the selection automatically and sequentially through all items in a menu.

With audible feedback for buttons and knobs **On**, an audible "click" will sound when any front panel button is pressed or any knob is turned.