



**Rhythm**<sup>®</sup>:ds32a  
High Resolution  
Auscultation

**Stethoscope  
Recording  
Package**

**User's Manual**



## Caution - Follow Directions for Use

Misuse of this product could result in damage to the product, malfunction of the product, or compromise performance.

- Use only AAA Alkaline batteries. The ds32a will not function if battery voltage is depleted. Use fresh batteries, and replace when indicated.
- Do not sterilize this device, or immerse it in liquids. Clean using alcohol swabs or non-abrasive cloth lightly dampened with alcohol or water.
- Avoid use/storage in very high humidity, high temperature or dusty conditions. Leaving the device in excessively hot or cold vehicles is NOT recommended.
- Do not attempt to modify or repair this device yourself. If you experience problems, send this device to Thinklabs for repair. See the Support page at <http://www.thinklabsmedical.com>
- The Thinklabs Rhythm stethoscope has been tested to be resistant to electromagnetic interference (EMI & ESD). However, it may be susceptible to stray electromagnetic fields. If unexpected sounds are heard, change location, or move away from possible sources of interference, such as cellular telephones or wireless devices.
- At the conclusion of the ds32a useful life, dispose/recycle in accordance with local regulations.

## Electrical Safety Precautions

Read these safety precautions before using your stethoscope with accessory audio cables.

The Thinklabs ds32 and ds32a Digital Stethoscopes include an Audio Output for recording patient sounds. This can be used for education, electronic medical records, email or telemedicine, using cables supplied with your stethoscope or available from Thinklabs.

## Safety Precautions When Recording Patients

**When in patient contact, DO NOT CONNECT the Stethoscope to ANY Equipment which is MAINS-POWERED.**

Record only on equipment which is "floating" i.e. operating on battery power and not connected to any other equipment. The following equipment connections meet these criteria:

- Stethoscope connected to a portable mp3 recorder such as an iPod, iRiver or other handheld recorder as long as the recorder is NOT simultaneously connected to other equipment. Recording attachments that connect to the iPod are permissible since they are powered by the iPod.
- Stethoscope connected to a notebook computer, as long as the computer is being powered by its internal batteries, and is not connected to any other equipment except devices powered by the notebook computer, such as a mouse.

The following recording setups would NOT be safe and may NOT be used:

- Stethoscope connected to an mp3 recorder which is simultaneously being charged in a cradle or is connected via USB or other interface to a mains-powered computer.
- Stethoscope connected to a desktop computer while the stethoscope is applied to patients for recording.
- Stethoscope connected to a notebook computer connected to mains power, such as during charging. (Even if the batteries are charged, the notebook computer must be "floating").
- Stethoscope connected to a notebook computer which is in turn connected to a Local Area Network (LAN) or other wired connection to provide, for example, internet service. The LAN is probably grounded to the mains power grid, and is thereby grounding the notebook computer.
- Stethoscope connected to a notebook computer which is in turn connected to an external disk drive which is main-powered, a display monitor, etc. Again, the peripheral equipment is not "floating" and therefore the notebook computer is grounded.

IF YOU ARE IN ANY DOUBT WHATSOEVER ABOUT THE SAFETY OF YOUR RECORDING ARRANGEMENT, PLEASE CONTACT THINKLABS IN WRITING VIA EMAIL FOR CONSULTATION.

## Audio Playback of Recorded Sounds

The Audio connection on the ds32 and ds32a is bi-directional, allowing the same connection to be used for listening to recorded sounds. The benefit of using the stethoscope for listening is that the headphones are designed specifically for listening to auscultatory sounds.

When using the stethoscope for playback, you may connect the stethoscope to any headphone output, including mains-powered equipment i.e. safety precautions apply only to recording or listening to patients, when the device is being used as a stethoscope.



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## Thinklabs ds32a Digital Stethoscope Recording Package

Congratulations on purchasing your Thinklabs ds32a Digital Stethoscopes Recording Package. You now own an instrument designed for high resolution auscultation - an instrument that produces body sounds with low-noise and high-amplification, providing a new level of clarity. By simply connecting your Thinklabs Stethoscope Audio Port with the XtremeMac MicroMemo™ iPod attachment, you now have the ability to record and listen to Thinklabs quality heart and lung sounds on your iPod.

### Recording Package Contents:

#### Thinklabs Stethoscope

- ds32a Stethoscope
- Instructions
- 2 Cables
- 2 AAA Batteries

#### XtremeMac MicroMemo

- MicroMemo
- XtremeMac Microphone

#### iPod Nano 2G

- iPod nano 2G
- Earphones
- USB 2.0 cable
- Dock adapter
- Quick Start guide



### Indications

The Thinklabs ds32a Digital Stethoscope is intended for use as a diagnostic aid in patient diagnosis. It can be used for the amplification of heart, lung, and other body sounds with selective frequency filtering. This product is not designed, sold, or intended for any use except as indicated.



# Quick Reference - ds32a Stethoscope

## Controls and Display

### Bell or Diaphragm Select

Click to alternate Bell/Diaphragm

### Noise Rejection On/Off

Push & Hold for >2 secs, Release to turn Noise Rejection On/Off. Adjusts for high ambient noise or regular office environments.

### Volume Control

behind Control Panel  
(active when Blue LED ▲ is On)

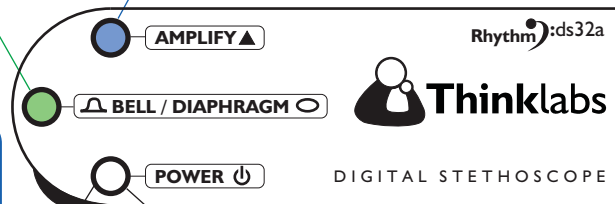
### Amplify - Amplification On/Off

Click to alternate between volume-adjustable Amplified mode and pre-set Acoustic mode similar to an acoustic stethoscope.

### Mute

Push & Hold key down to temporarily Mute sound - useful if patients speak when listening to carotid, pediatric use, etc.

## Control Panel



### Power On Click to turn on

**Power Off** (auto or manual)

Shuts off automatically after 2 minutes\*

OR Push & Hold until all LEDs light, Release.

\* time is programmable up to 5 min. Clicking any key will extend on-time up to 5 min. max.

### Advanced Use - Preset and Save all your power-on Mode preferences

Program the ds32a to power up in most recent Modes, or in your preset configuration.

Recent Mode wakeup - Push+Hold Power key 5 secs, Red LED flashes slowly, Release.

Preset Modes - (1) Set ds32a in your preferred modes. (ALL Modes are memorized).

(2) Set auto shutoff time - **Click** the Power key the number of minutes ds32a should stay on before auto shutoff (2, 3, 4, or 5 minutes).

(3) Push+Hold Power key > 10 secs, Red LED flashes faster, Release.

## Display

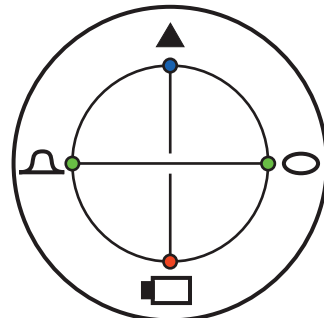
**Amplify Mode** (Blue)

LED On - **Amplified** - Volume is Adjustable

LED Off - **Acoustic** - Volume is Pre-Set

**Bell Mode**  
(Green)

**Diaphragm Mode**  
(Green)

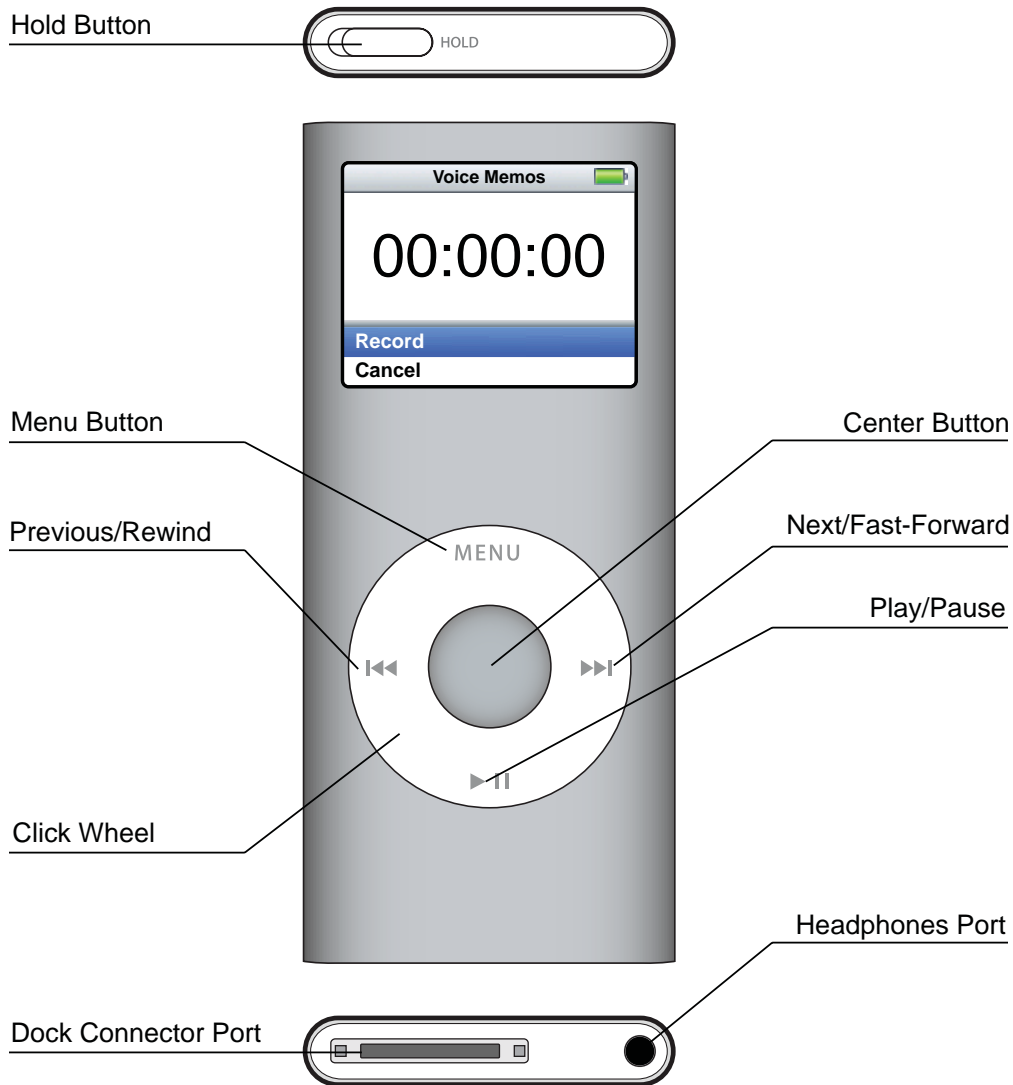


**Low Battery** (Red)  
**Change Batteries**



# Quick Reference - iPod Nano

## Controls and Display



### Using iPod nano Controls\*

Use the Click Wheel and Center button to navigate through on-screen menus, play songs, change settings, and view information. Move your thumb lightly around the Click Wheel to select a menu item. To choose the item, press the Center button. To go back to the previous menu, press Menu on the Click Wheel.

\*iPod nano Manual and reference available at:  
[http://manuals.info.apple.com/en/iPod\\_nano\\_2nd\\_Gen\\_Features\\_Guide.pdf](http://manuals.info.apple.com/en/iPod_nano_2nd_Gen_Features_Guide.pdf)

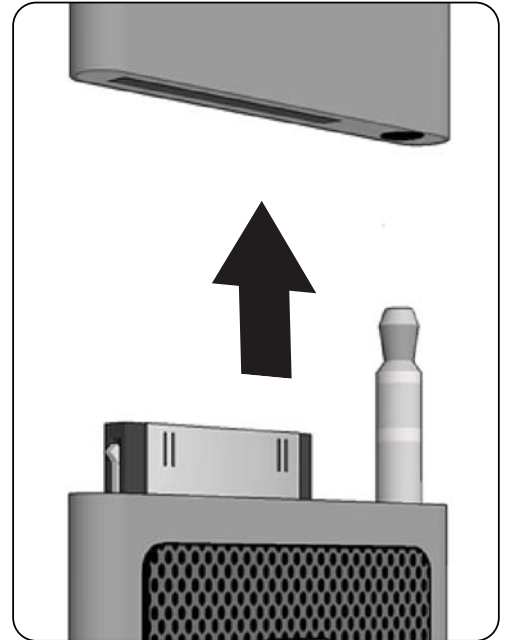
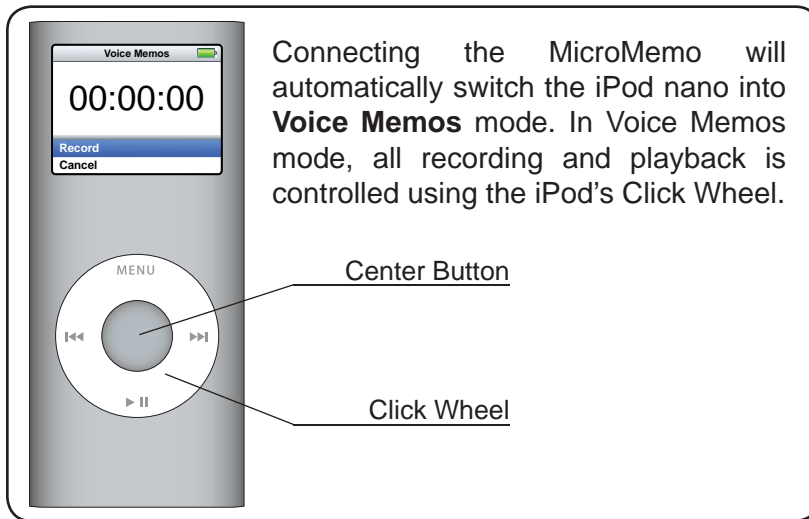


# Initial Setup

## Connections

### 1. Connecting the MicroMemo

Attach the MicroMemo to the bottom of the iPod nano.

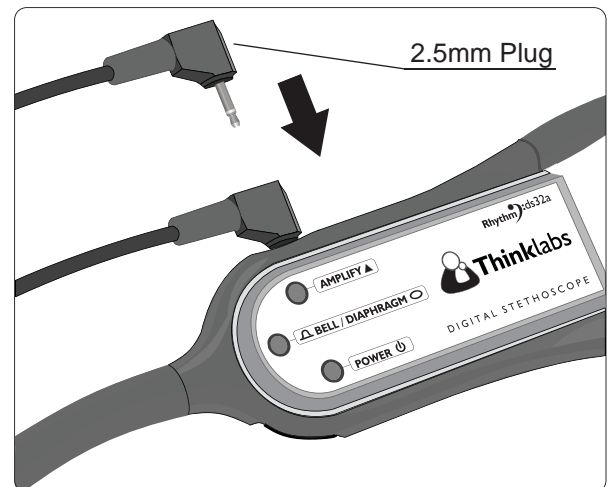
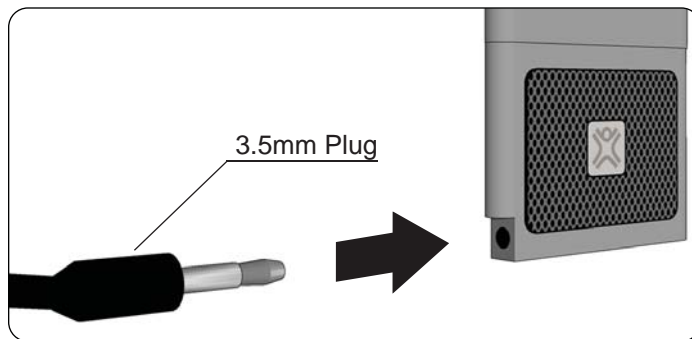


### 2. Connecting the MicroMemo to your Thinklabs Stethoscope

Remove microphone attachment from MicroMemo unit.

Using the male-male cable supplied with your stethoscope, insert the 3.5 mm plug into the port on the lower side of the MicroMemo.

Then insert the smaller 2.5 mm plug into the Audio Port of your Thinklabs Stethoscope.



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## Initial Setup - Cont.

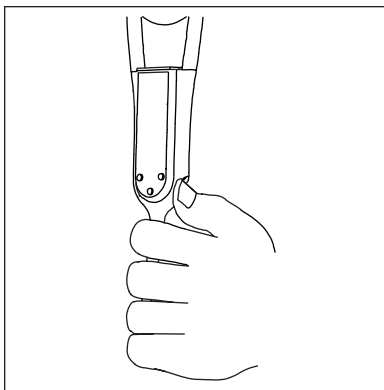
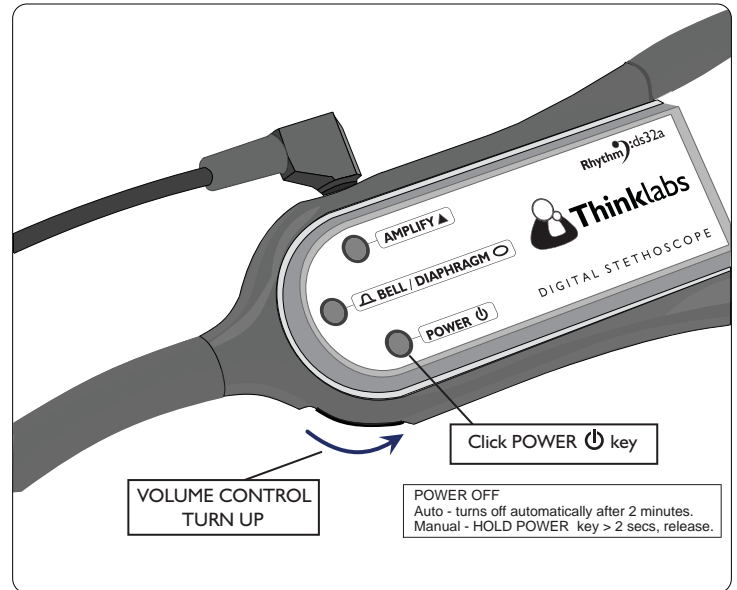
### Thinklabs Stethoscope Power & Volume Settings

#### 3. Power ON

Click the Power key firmly to turn on the stethoscope.

#### 4. Set Volume to HIGHEST Setting

For optimal recording, the volume settings on the Thinklabs Stethoscope must be turned to its **HIGHEST VOLUME SETTING (10)**.



The **Volume Control** is located behind the Power Key. It is designed to be operated by the left thumb as shown in the illustration, leaving fingers to control the keys.

The exact grip and position is a matter of personal preference, and should be adjusted for comfort and ease of operation.

Continued on  
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## Initial Setup - Cont.

### MicroMemo and iPod Recording Quality Settings

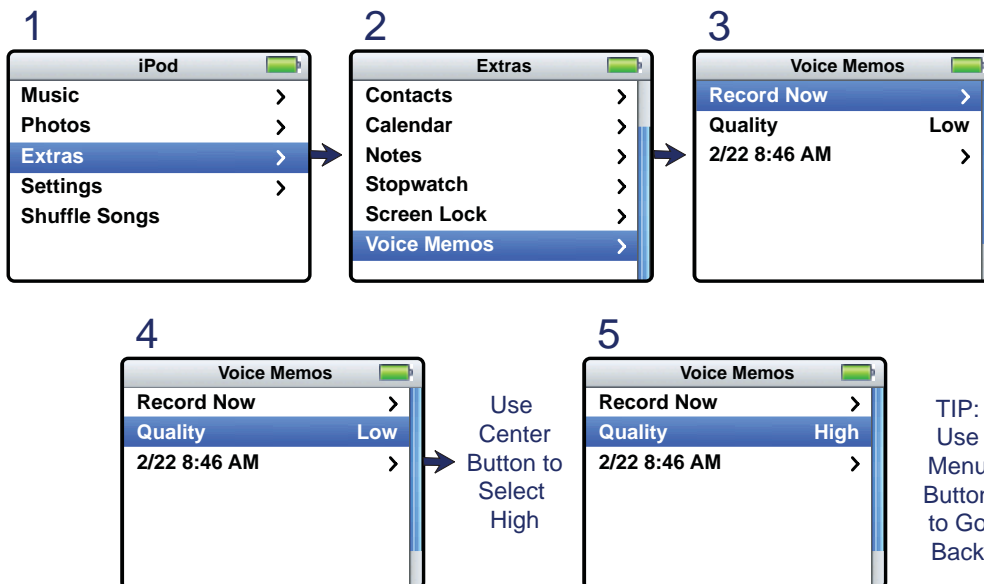
5. Set the MicroMemo Switch to the **LINE** (middle position).



### 6. Configure iPod RECORDING QUALITY

The MicroMemo records at 2 different quality levels: **LOW** (the default setting) and **HIGH**. It is highly recommended to set your iPod's recording quality setting to **HIGH** for optimal recording and playback with your Thinklabs Stethoscope.

You can change the settings at: **Extras>Voice Memos>Quality**.





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# Recording Sounds

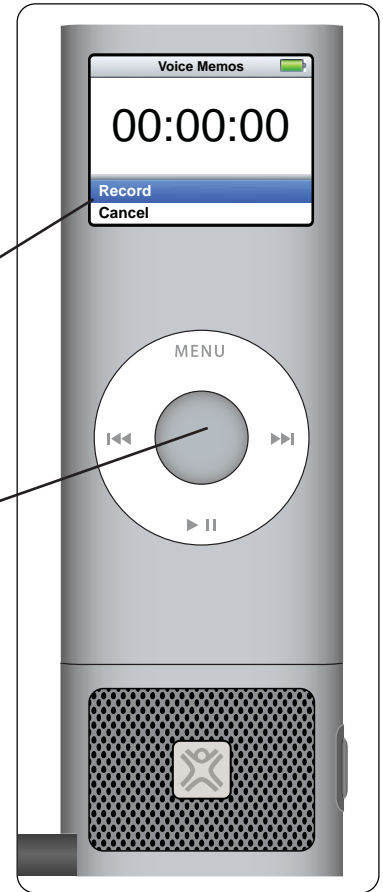
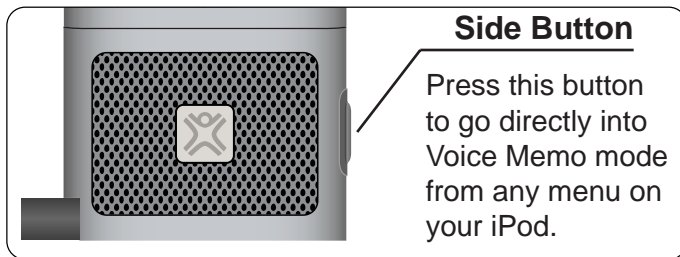
## Voice Memos Controls

### 1. Recordings

To begin recording, select **'Record'** with the Center Button on your iPod Click Wheel

**Record**

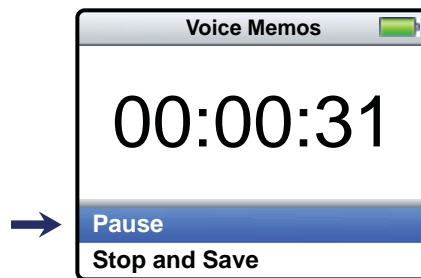
**Center Button**



### 2. Pausing and Continuing

To pause recording, select **'Pause'**.

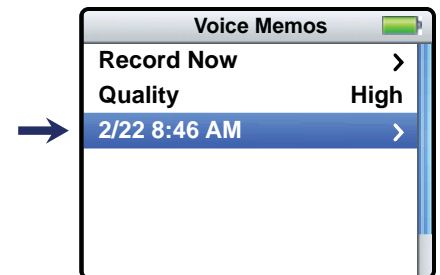
To continue recording, select **'Resume'**.



### 3. Stop and Save

To stop recording, select **'Stop and Save'**.

MicroMemo will end the recording and will name it with the current date and time.





## Recording Sounds - Cont.

### Bell and Diaphragm Settings



#### Bell Mode

Use this setting when listening for:

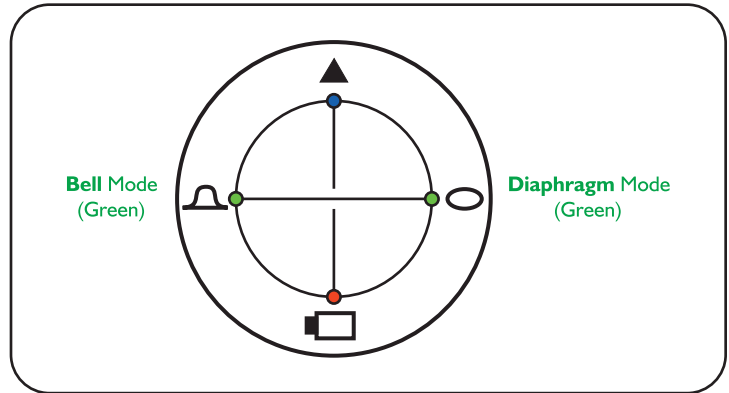
- Heart Sounds
- Bruits



#### Diaphragm Mode

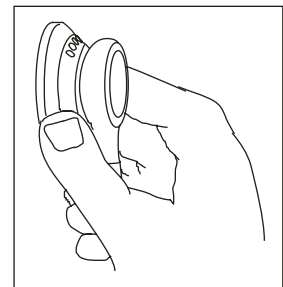
Use this setting when listening for:

- Lung Sounds
- Bowel Sounds



### Tips for Best Sound Quality

- Apply Probe with light, steady contact, not excessive pressure.
- The ds32a works best with direct skin contact. Using through clothing is possible, but less optimal.
- Experiment to find a preferred Volume level that optimizes recording and listening clarity. When you are recording, optimize for recording quality. Generally, higher volume settings produce better recording quality.
- The EmD Diaphragm responds to adjustments in applied pressure, affecting both sensitivity (loudness) and frequency characteristics. This is a very powerful, tactile way to control sound. In most cases, simply apply a light but consistent pressure. Do not push too hard. Gradually increasing pressure will increase sensitivity and loudness. At significant pressure, low frequencies are cut, making breath sounds more audible than heart sounds.
- It is sometimes helpful to hold the Probe so that the fingers also touch the patient chest wall (such as the left edge of the thumb and the fingertips in figure to the right.) The Probe and chest wall then move in unison, for a consistent, light diaphragm pressure.



- The ds32a Manual contain USEFUL TIPS for obtaining best results.

[www.thinklabsmedical.com/manuals\\_references/Thinklabs\\_Stethoscope\\_ds32a\\_Manual\\_v2-2.pdf](http://www.thinklabsmedical.com/manuals_references/Thinklabs_Stethoscope_ds32a_Manual_v2-2.pdf)




# Playback After Recording

An easy and convenient way to listen to a recording you just made is to listen to the recording with your Thinklabs Stethoscope. To enable this quick playback function:

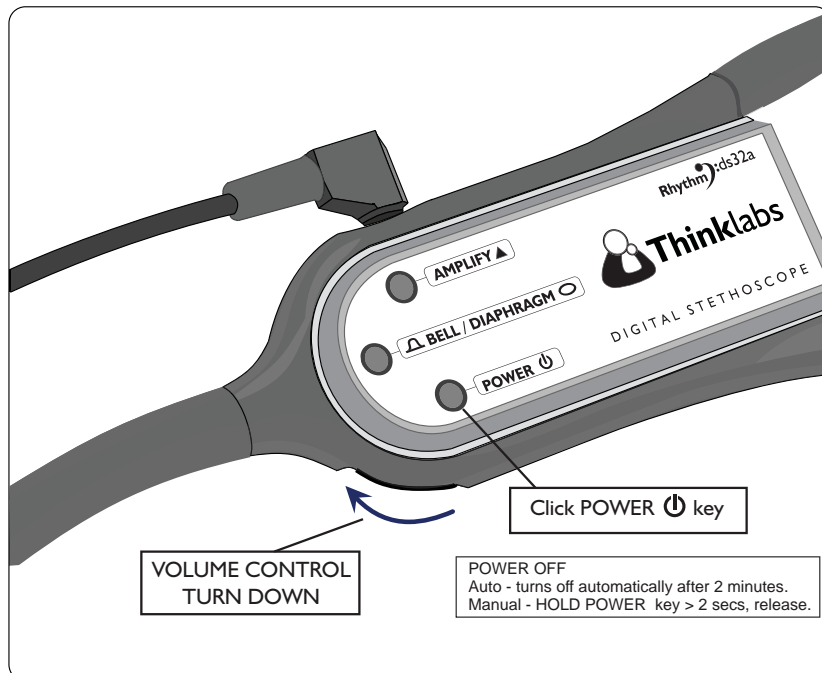
1. Set the MicroMemo Switch to the **EARBUDS** (left position).



2. Power Off or Turn Volume to Lowest Setting on Thinklabs Stethoscope

**Powering Off** - Push and Hold the Power  key until all LEDs light, then release.

If you leave the ds32a On and set the Volume to 0, the ds32a will help to filter recorded hiss that sometimes occurs during playback.



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Next Page 

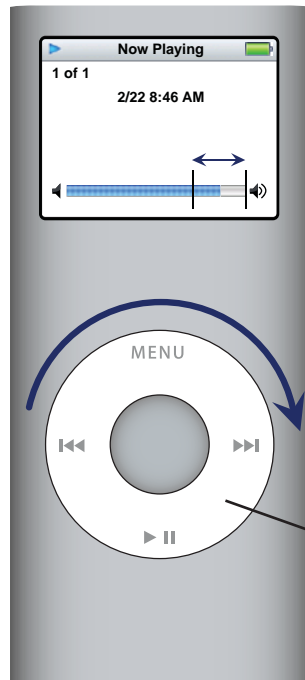
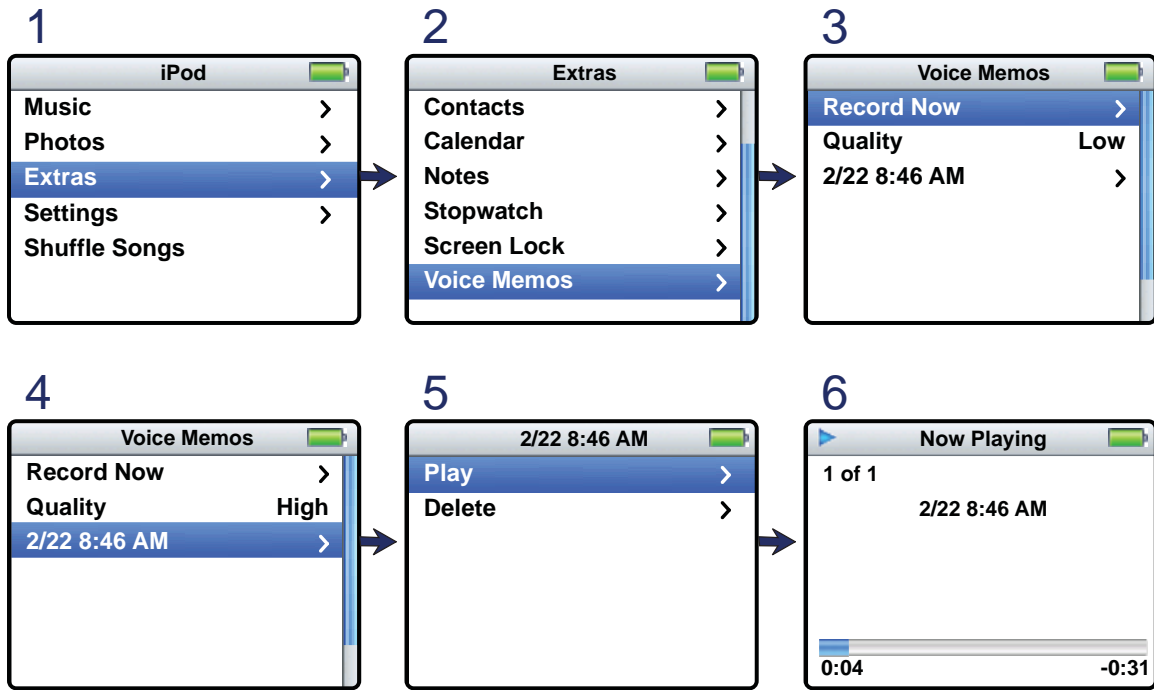


# Playback After Recording (Cont.)

## iPod Playback Controls

Recordings are automatically stored under **Extras>Voice Memos**.

To play a recording, scroll to and select the file you want to **Play**.



### Turn iPod Volume to 70-100%

When in the "Now Playing" screen, move your thumb on the "Click Wheel" to the right to turn the volume to 70% or higher.

Recording can be Filtered using Thinklabs' free Phonocardiography Software available at [www.thinklabsmedical.com](http://www.thinklabsmedical.com)

**Click Wheel**



# Listening To Recordings

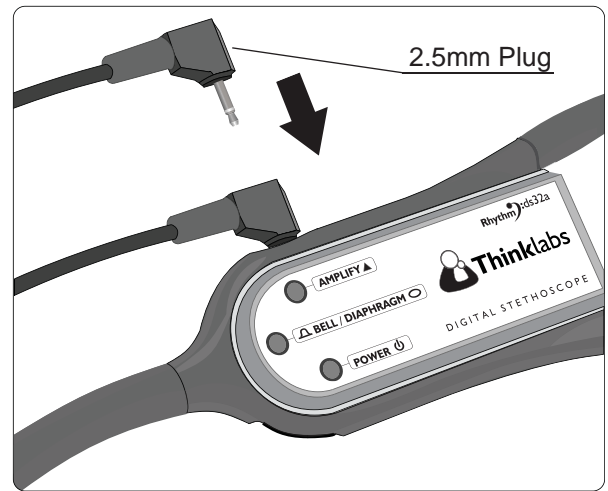
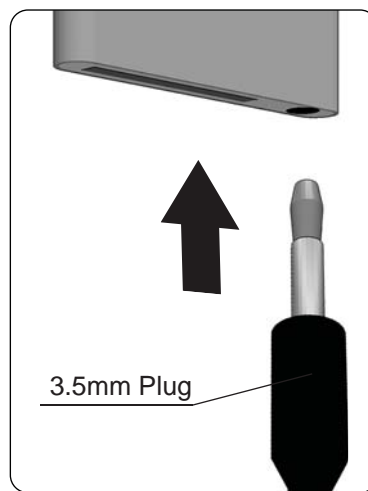
You can connect the stethoscope or headphones directly to the iPod to listen to sounds. The MicroMemo is not required for listening to “Voice Memos.”

Thinklabs recommends listening to your recordings with the Thinklabs Stethoscope because it was optimally designed to produce high quality low frequency heart and lung sounds.

## Listening to iPod via ds32a Stethoscope

1. Remove MicroMemo from iPod.\*

2. Using the male-male cable supplied with your stethoscope, insert 3.5mm plug into iPod headphone port and insert 2.5mm plug into the Audio Port of your Thinklabs Stethoscope.



3. Power Off or Turn Volume to Lowest Setting (0) on Thinklabs Stethoscope

4. Follow the “iPod Playback Controls” on page 14 to select and play recordings.

5. Turn the iPod volume to a setting of 70-100% for best results.

**Turn iPod Volume to 70-100%**

When in the “Now Playing” screen, move your thumb on the “Click Wheel” to the right to turn the volume to 70% or higher

**Click Wheel**

\*Or listen via the MicroMemo. See page 14 for Connection Settings





## Listening To Recordings - Cont.

### Headphones Recommendations

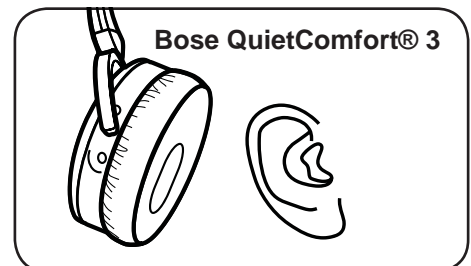
When listening to heart and lung recordings, the choice of headphones is critically important. An essential requirement of any headphone you use is that the ear tips **seal**, or the headphones **seal over your ears** in order to ensure good reproduction of low frequency heart murmurs.

It is recommended to use headphones with **Soft Silicone Sealed Ear Tips**.

If you use the headphones provided with your iPod, Thinklabs recommends the Griffin EarJams, which provide sealed ear tips and are designed to fit over the iPod headphones to deliver excellent sound.

Thinklabs also Recommends the Following Headphones:

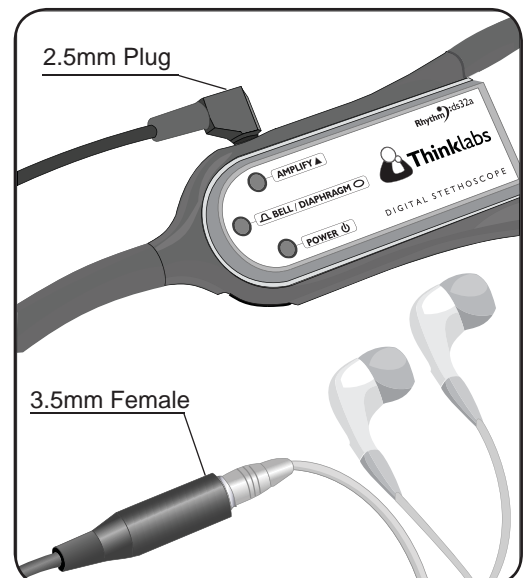
- **Griffin TuneBuds**
- **Shure E Series Sound Isolating Earphones Models EC2, EC3, EC4, EC5**
- **Bose® in-ear headphones**
- **Bose QuietComfort® 3**  
These headphones fit OVER the ear but seal so well that bass response is excellent. Also suggested for users wearing CIC hearing aids.



### Connecting Headphones to ds32a

You can connect a second set of headphones directly to the ds32a Stethoscope for a Second Listener, such as in a teaching or consulting situation.

Use the male-female cable supplied with your ds32a stethoscope and follow the headphone recommendations above.





# Transferring Recordings to Computer

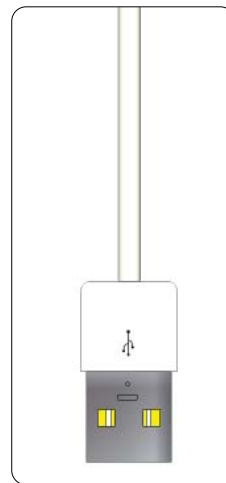
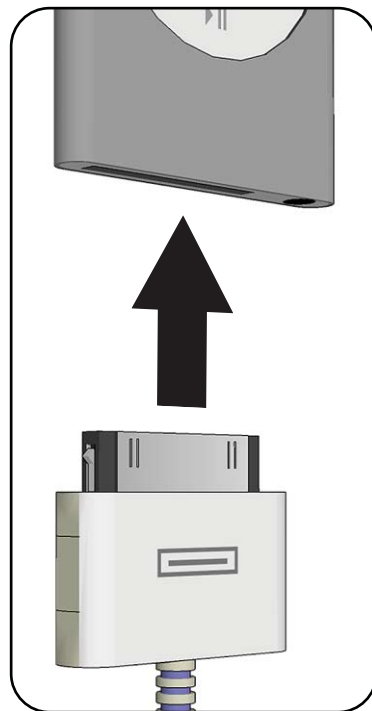
## PC and iTunes

### Transferring Recordings to PC

- Connect the iPod nano to your computer with the USB cable supplied with your iPod.
- In Windows, Open 'My Computer' and double click on the 'removable disk' assigned to the iPod.
- Open the 'Recordings' folder.
- Drag or copy the recording files to your hard drive.
- Once the files are copied to your hard drive, you can rename, delete or edit your recordings.

### Transferring Recordings to iTunes

- Connect the iPod nano to your computer with the supplied USB cable.
- A menu will ask you if you would like to transfer, or sync, your Voice Memos to your hard drive library.
- By selecting 'Yes' to syncing with iTunes, iTunes will create a playlist called 'Voice Memos' and all recordings will be copied to that folder.
- In iTunes, you can rename or add information to your recordings by choosing File>Get info.
- **REMINDER:** When you transfer your Voice Memos to iTunes, the recordings will be removed from the Voice Memos folder on the main menu of the iPod.



**Plug into PC  
USB port**



## Listening To Recordings - Cont.

### WAV File Naming

- Voice Memo Recordings are automatically named by the date and time they were made.
- When you transfer a WAV files to your hard drive, the name of the file will look like the example below:



20070222 204642.wav

- The file name lists the **Year, Month, Day** the **Time** (in 24 hour format)

Year  
} 2007  
Month { 02  
Day { 22  
Hour } 20  
Minute } 46  
Second } 42  
20070222 204642.wav

- In this example the date and time of recording is: **2/22/2007, 8:46PM**



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# Tips & Tricks: Optimal Use of the ds32a

## Instructions

The ds32a is designed to be very easy to use. However, taking the time to read the User's Manual will greatly facilitate the effective and optimal use of the ds32a. These instructions provide valuable tips that are well worth knowing, to get the most out of the ds32a.

## Sound Levels

Adjust the Volume to a comfortable level. The ds32a has powerful amplification. Maximum volume is not necessary in most situations. Experiment to identify optimal settings and personal preferences.

When recording, higher volumes ensure better recording quality.

## ANR2 Ambient Noise Rejection

The ds32a has second generation Ambient Noise Rejection (ANR2), enhancing the noise rejection capability of EmD technology. The noise rejection function can be activated or deactivated, providing you with complete control over signal processing functions. Experiment with each setting to select the best for each situation.

## Diaphragm Pressure and Skin Contact

The ds32a Probe uses Electromagnetic Diaphragm (EmD) technology which is pressure-sensitive. Sound characteristics change as the Probe is applied with greater pressure to the patient. Simply apply the Probe to the patient as with a conventional stethoscope, and make subtle changes in pressure, listening for desired sound. Lighter pressure is usually optimal. Increase pressure gradually to increase sensitivity and volume. With significantly increased pressure, low frequencies will suddenly be attenuated and lung sounds will be audible over heart sounds. Apply steady diaphragm pressure for best results. The ds32a's EmD diaphragm operates best when in direct skin contact with the patient.

## Maintaining Performance

Your ds32a is a robust instrument designed to provide continued peak performance. If your ds32a is not meeting your highest expectations, please contact us so that we can help you obtain and maintain the performance level for which it is designed.



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# Tips & Tricks: MicroMemo Recording

## Using the Microphone

With the 3.5mm microphone attachment provided with your MicroMemo, you have the ability to record lectures and meetings directly to your iPod.

**1. Insert microphone into 3.5mm port on the lower side of your MicroMemo**

**2. Attach MicroMemo to bottom of iPod, which will automatically switch the iPod into Voice Memos mode. Pressing the Side Button on your MicroMemo will also automatically switch the iPod to Voice Memo mode from any menu.**

**3. Set the MicroMemo switch to the MIC (right position).**

**4. Recording with the microphone is just like recording with your ds32a stethoscope. Select 'Record' to start recording and select 'Stop and Save' to end recording.**

- Recordings are named by the date and time they were created
- See page 11 for iPod recording controls.

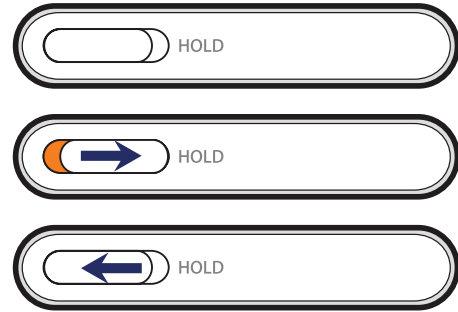


# Tips & Tricks: iPod Troubleshooting

## Resetting your iPod

Most problems with iPod nano can be solved by resetting it. First, make sure iPod nano is charged.

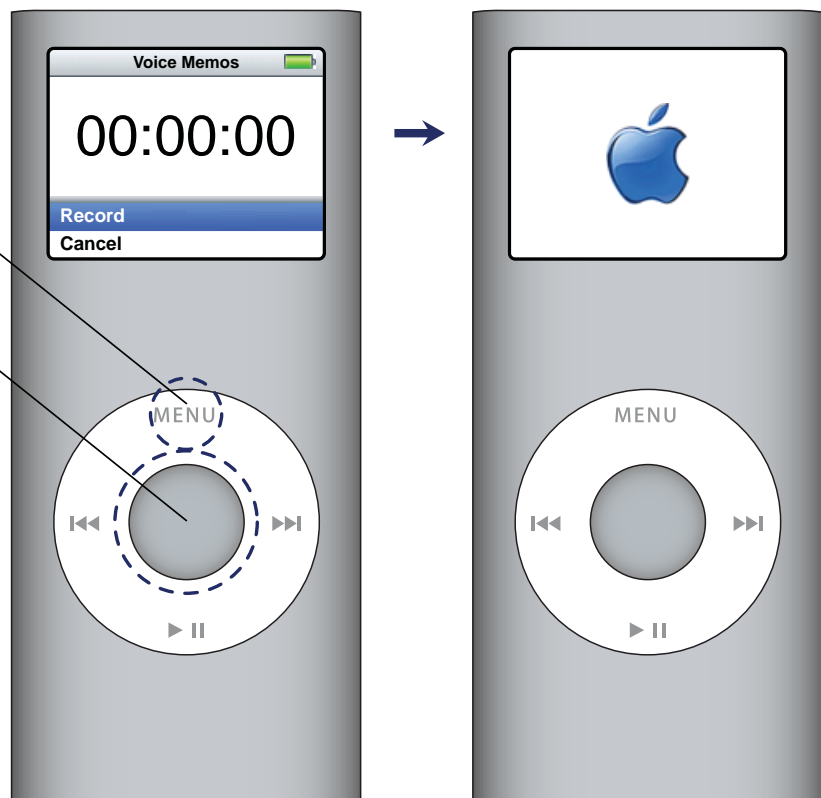
1. Toggle the Hold switch on and off (slide it to HOLD and then back again).



2. Press and hold the Menu and Center buttons for at least 6 seconds, until the Apple logo appears.

Menu Button

Center Button



### If iPod nano won't turn on or respond:

- Make sure the Hold switch is not set to HOLD.
- The iPod nano battery might need to be recharged. Connect iPod nano to your computer or to an Apple iPod Power Adapter and let the battery recharge. Look for the lightning bolt icon on the iPod nano screen to verify that iPod nano is receiving a charge.



# Appendix: MicroMemo Recording Quality

## Low and High Levels

- The Micromemo records in 2 different quality levels: **LOW** (the default setting) and **HIGH**.
- You can change the settings at: **Extras>Voice Memos>Quality**.
- All memo files are saved in WAV format.

	Low	High
Bit Rate	352 kb/s	1411 kb/s
Sample Rate	22.05 kHz	44.10 kHz
1-Minute Recording	2.6 MB	10.3 MB
1-Hour Recording	156 MB	618 MB
Recording Capacity (2GB iPod nano)	12 Hours	3 Hours
Recording Capacity (4GB iPod nano)	25 Hours	6 Hours
Recording Capacity (8GB iPod nano)	51 Hours	12 Hours

\*All times are approximate. Individual results may vary.

\*Source: [http://www.xtrememac.com/support/manuals/docs/micromemo\\_nano\\_2g.pdf](http://www.xtrememac.com/support/manuals/docs/micromemo_nano_2g.pdf)





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US Patents 6,498,854 6,661,897  
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