



Rhythm[®]:ds32a
High Resolution
Auscultation

**Recording
Package
Sony ICD-UX71/81**

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, Sony, Olympus or other handheld recorder as long as the recorder is NOT simultaneously connected to other equipment. Recording attachments that connect to an 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 Rhythm Digital Stethoscope Recording Package

Congratulations on purchasing your ds32a 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. The ds32a provides unprecedented control of the listening process, unmatched by any other stethoscope today. Combined with a digital recorder, the Sony ICD-UX71/81 or other digital audio recorder, it is possible to acquire auscultation sounds for teaching, electronic medical records, or other purposes and edit/display sounds using Thinklabs Phonocardiography Software. Features of the ds32a include:

- **Amplification Modes:** Amplify mode with Adjustable Volume provides low distortion, high power amplification. Standard Acoustic mode provides the sound of a conventional stethoscope.
- **Ease-of-Use:** Three simple controls provide Power on/off, Amplify on/off, and Bell/Diaphragm selection, with mode changes at the push of a button. Additional features are hidden behind these keys to un-clutter simple use, while providing new useful functions when needed. For example, a new Mute function (hold the Amplify key down) provides for muting sound when patients speak, cry, cough, or produce other unwelcome sounds during auscultation.
- **Patented Transducer:** The Electromagnetic Diaphragm™ (EmD) senses and converts body sounds to electronic signals right at the diaphragm, eliminating signal degradation and ambient noise coupling through air-borne transducers or tubing. The EmD is pressure-modulated. By subtle variation of Probe pressure, amplitude and frequency response can be tuned to listen to specific sounds. This provides powerful tactile control over audio characteristics.
- **ANR2 Noise Rejection:** Thinklabs pioneered ambient noise rejection with patented EmD diaphragm technology and acoustically-vented solid aluminum Probe design. The ds32a builds on this with 2nd-generation Ambient Noise Rejection (ANR2), a 2nd-stage Noise Rejection (NR) function for increased noise immunity in high-noise environments. NR can be turned off in quieter office environments to provide very high-sensitivity, direct-coupled EmD audio.
- **User-programmable Presets:** You can preset the ds32a to power-up in mode settings to match your clinical habits and needs. The ds32a can simply power up in the previous mode settings, or in specific modes suited to your preferences.
- **Audio Port:** An Input/Output port provides an audio line-level output signal for recording or use of the ds32a as headphones suited to listening to recorded auscultation sounds.
- **Design:** All these features are packaged in a stethoscope that has the form factor and weight of an instrument so familiar to the professional community of users.

See Also (available at <http://www.thinklabsmedical.com>):

- Thinklabs ds32a User's Manual
- Sony ICD-UX71/81 Operating Instructions
- Thinklabs Phonocardiography Software (and Instructions)

Indications

The Thinklabs Rhythm 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.

Thinklabs ds32a Recording Package Contents

Your Recording Package contents include:

Thinklabs ds32a Digital Stethoscope

- ds32a Digital Stethoscope
- 2 x AAA Alkaline Batteries
- Male-Male 2.5mm - 3.5mm Recording Cable
- Male-Female 2.5mm - 3.5mm Headphone Cable
- 2 x Extra Eartips
- Quick Reference Guide

Sony ICD-UX71/81 Digital Audio Recorder

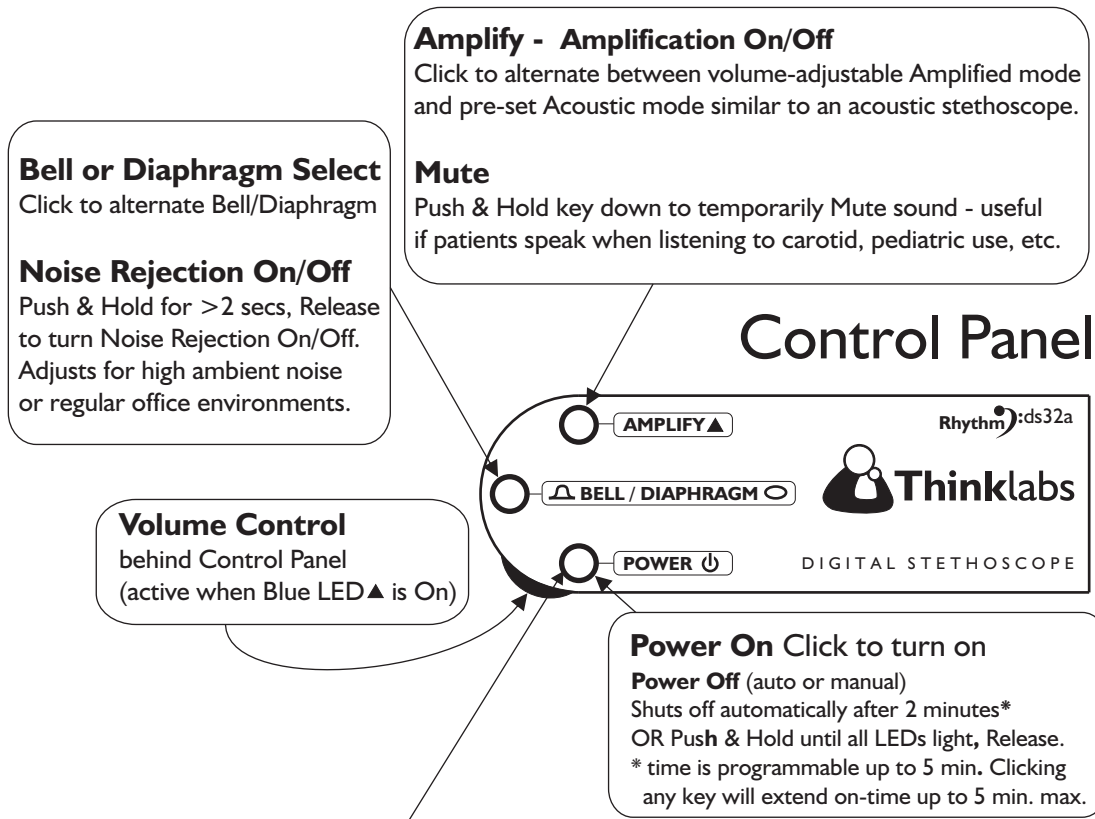
Thinklabs Phonocardiography Software

available for free download on Thinklabs website <http://www.thinklabsmedical.com>

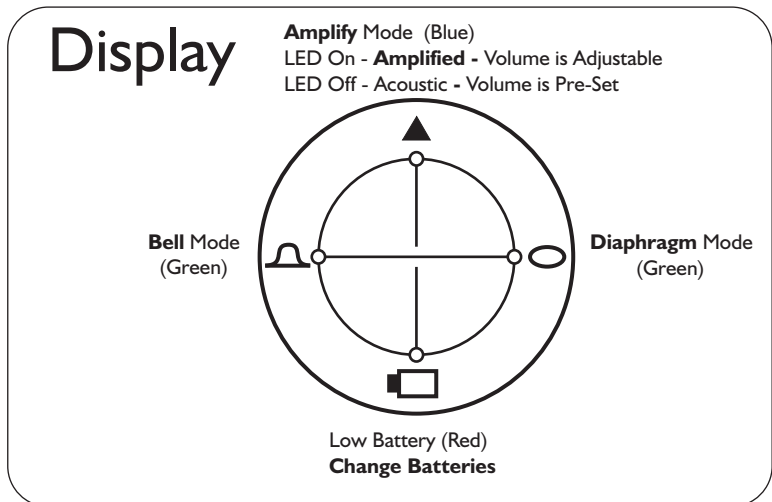
Using this Package, you can:

- Record Patient Sounds live to the Digital Recorder
- Transfer Recording Files to a computer (Mac/PC)
- View, Play, Edit, Annotate Sound Recordings
- Save edited sound files for education or electronic medical records

Quick Reference - Controls and Display



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.



See the ds32a User's Manual for details

Initial Setup

Sony ICD-UX71/81 IC Recorder Settings

Refer to the Sony IC Recorder Operating Instructions and perform the following steps:

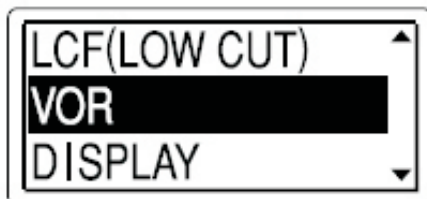
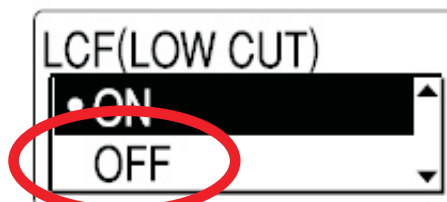
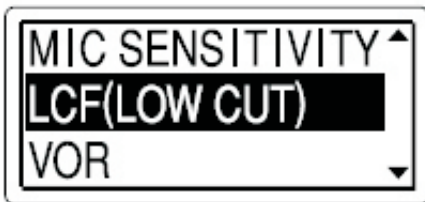
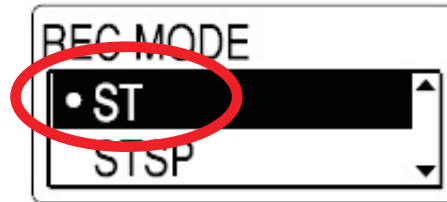
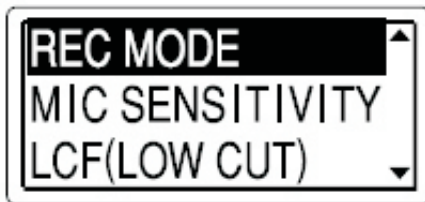
Step 1: Preparing Power Source

Step 2: Setting the Clock

Refer also to the Sony IC Recorder Operating Instructions, “Recording Messages” section.

To record from the ds32a Digital Stethoscope, the Sony Recorder should be set to the settings shown in the following pages.

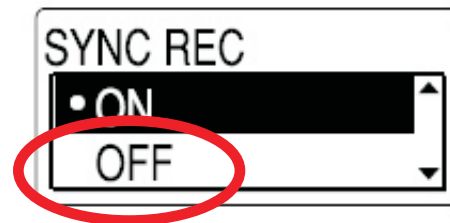
To enter the Menus to make these settings, Push and Hold the MENU Key and use the up and down arrows and the ENT key to make selections.



Initial Setup

Sony ICD-UX71/81 Settings (Cont.)

Enter the **DETAIL MENU** settings by first scrolling down the normal menus, and then selecting **DETAIL MENU**, to enter the settings shown below:



If you select **SYNC REC "ON"**, the Recorder will automatically **DIVIDE** your recordings. For instance, if you record from the Apex, then lift the stethoscope from the patient for at least **2 SECONDS**, and then place it on the Mitral area, the two recordings will automatically be saved as separate files. This can be very convenient, but you do need to be aware of this automation to avoid confusion.

VERY IMPORTANT

When you connect the ds32a Digital Stethoscope to the Sony IC Recorder, the **SELECT INPUT** Menu will appear.

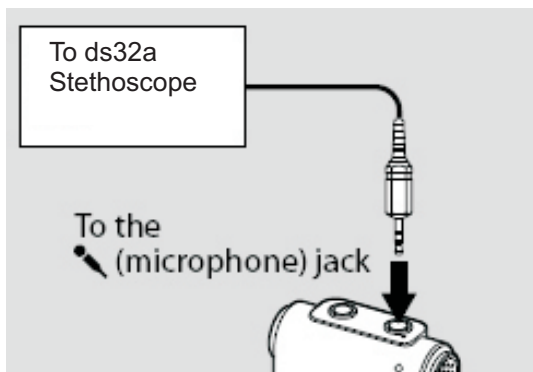
Select the **AUDIO IN** option to ensure that the recorder uses the stethoscope as its audio source, and not the built-in microphone.



See "Recording from Other Equipment" in the Sony IC Recorder Owner's Manual for more information.

Connecting the ds32a to Sony IC Recorder

The ds32a Digital Stethoscope is connected to the Sony IC Recorder via the Male-Male 2.5mm 3.5mm Cable supplied with your Stethoscope.



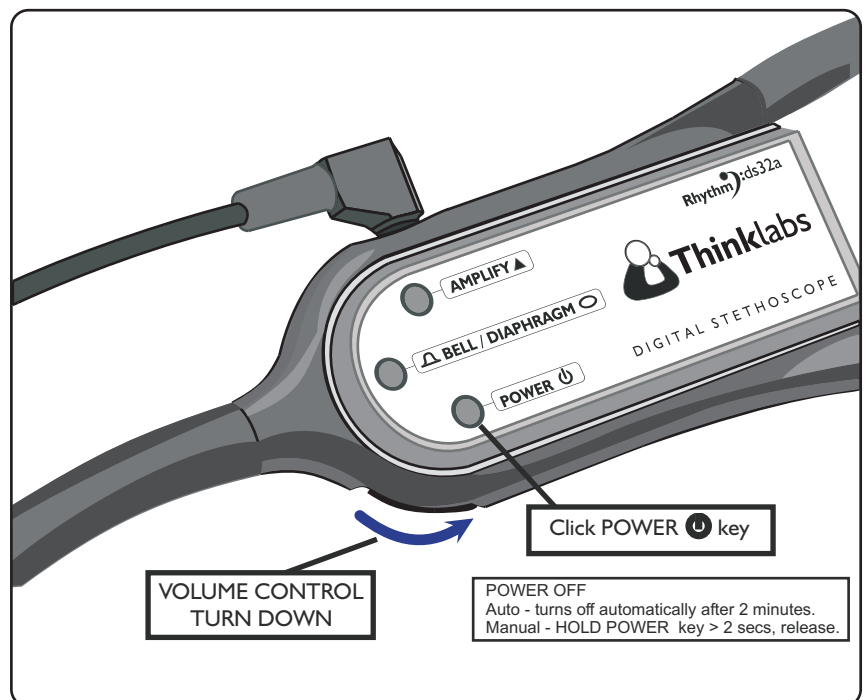
1. Connect the Straight 3.5mm Stereo plug to the Sony IC Recorder RED Microphone Jack located at the top of the Recorder.

Note: When you plug the cable into the Recorder, the SELECT INPUT menu will appear. Do not forget to select AUDIO IN, as shown on the previous page.

2. Connect the Right-angled 2.5mm plug is to the ds32a using the Jack on the side of the ds32a as shown below.

3. Click the POWER key to turn on the ds32a Digital Stethoscope.

4. As shown, adjust the VOLUME CONTROL on the ds32a to the maximum level (10). if you find that recordings are distorted or clipped (peaks distorted), adjust the VOLUME down to a level which is as loud as possible without causing distortion or clipping.

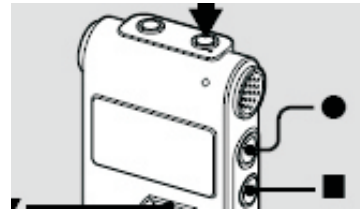


NOTE: The ds32a automatically shuts off after 2 minutes. This can be convenient for patient examination, but extended times may be helpful for recording. See the ds32a User's Manual for instructions on EXTENDING the shutoff time to a maximum of 5 minutes.

Recording Sounds

To Record sounds, follow the instructions in the Sony Operator's Manual "Recording Messages" section.

Briefly, to Start a Recording, simply click the RECORD Key (Red Dot) on the side of the IC Recorder. To Stop Recording, Click the STOP Key (square).



We recommend the following settings for recording:

Amplify:

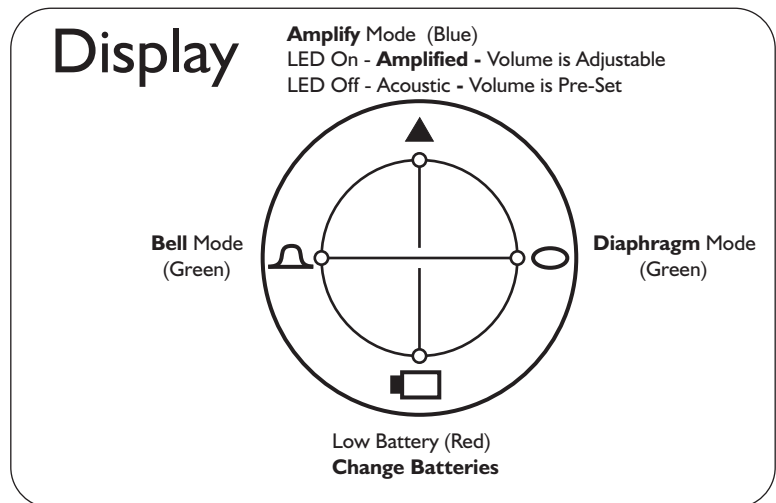
- ON (blue light ON)

Bell Mode:

- Heart sounds, Bruits, BP

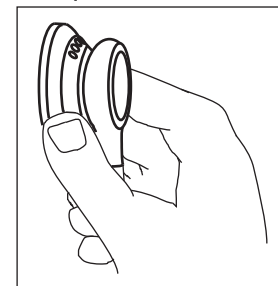
Diaphragm Mode:

- Lung, 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.



Playback of Sounds

To listen to recordings, you **MUST** listen through the ds32a or through good headphones connected to the IC Recorder green HEADPHONE jack. The speaker on the IC recorder is not suited to listening to the low frequency content of body sounds.

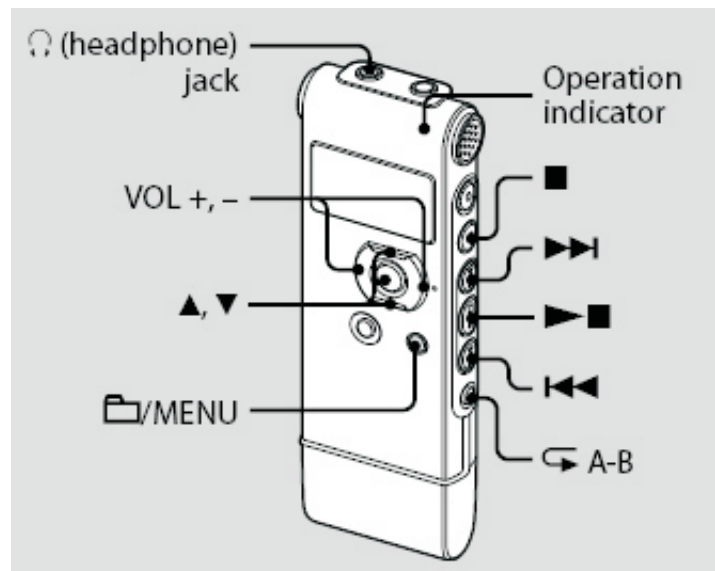
1. To listen via the ds32a, unplug the ds32a from the RED mic jack and connect it to the GREEN headphone jack.
2. Turn OFF the ds32a by holding the POWER key on the ds32a for 2 seconds and releasing. (Do not hold the ds32a POWER key for more than 5 seconds. This performs a different function.)

3. To Play sounds, follow the instructions in the Sony Operator's Manual "Playing Back Messages" section.

The Playback keys are shown in the figure to the right. These are typical "tape recorder" controls and should be quite intuitive to you.

Adjust the playback VOLUME on the IC Recorder.

The IC recorder has many features for filing and indexing sounds. Please do read the Sony Operator's Manual to get the most out of your IC Recorder.



Selecting Headphones

To listen to heart sounds via headphones, the choice of headphones is critically important, due to the need for excellent low-frequency response. We recommend in-ear headphones that SEAL into the ear canal, in the same way that the ds32a eartips seal your ears. There are numerous products of this type available. Alternatively, you can use large over-the-ear headphones such as Bose QuietComfort 3.

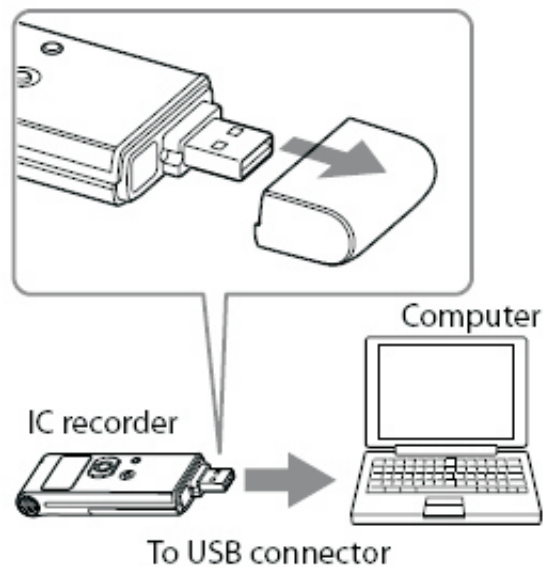
This information applies to the use of headphones plugged into the GREEN headphone jack on the IC Recorder, headphones connected to the ds32a for a second listener, using the supplied Male-Female headphone cable, or when playing back recordings on a computer system. Computer speakers are also typically inadequate for playing heart sounds effectively.

Transferring Sounds to a Computer

The IC Recorder can be connected to a computer USB Port and treated as an external storage device, just as a thumb drive is used. This allows you to transfer files to your computer quickly and easily.

The files on the Sony ICD-UX71/81 are recorded using MP3 format. If you set the recording quality to SP, the bit rate is sufficiently high that sound quality will be suited to recording body sounds.

For further information on using your IC Recorder with your computer, see the Sony IC Recorder Operating Instructions.



Tips and 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.

It is also recommended that you read the Sony ICD-UX71/8.1 Operating Instructions to get the most out of your Sony IC Recorder.

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.

Service and Warranty

The Thinklabs ds32a Digital Stehtoscope is warranted against manufacturing or materials defects for a period of one year from the invoice date. If a material or manufacturing defect occurs within the warranty period, repairs will be performed free of charge upon returning the device to Thinklabs. The warranty will be voided in cases of abuse, excessive or inappropriate use conditions, or accidental damage to the product. Thinklabs may, at its sole discretion, replace the product with a suitable equivalent model. The warranty is transferable at Thinklabs' discretion only.

For maintenance, repair, service and contact information, visit the Thinklabs website at www.thinklabsmedical.com, and check the Support page. Before shipping the product for repair, please contact Thinklabs first, at

service@thinklabsmedical.com,
or (800)918-1088.

Please quote the serial number, located inside the battery compartment when contacting us.

To have the product repaired, ship the product in suitably protective packaging, with name, return address, daytime telephone number and/or email address, a description of the problem, and a copy of the purchase invoice, to:

Thinklabs inc.
Attn: Service
6571 South Pontiac Court
Centennial, CO 80111

Sony Products are serviced and guaranteed by Sony Corporation. See the IC Recorder Manual for details. For service on Sony products, contact:
Sony 1-800-222-7669
<http://www.sony.com>

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service@thinklabsmedical.com
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6571 South Pontiac Court
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Other US and Foreign Patents Pending.

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