



## Digital Sound Level Meter



**Owner's Manual**  
Please read before using this equipment.

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## **Features**

Your new RadioShack Digital Sound Level Meter precisely measures area noise and other sound levels. The meter's digital design and special measuring features, such as the bargraph and date hold, ensure pinpoint accuracy for checking an acoustic environment. The meter is lightweight and easy to operate.

**Note:** This meter should be used for home/hobbyist use only. This meter does not meet the requirements set forth by the American National Standards Institute (ANSI), Standard S1.4.

Your meter also has these features:

**3-Digit Liquid Crystal Display** — makes it easy to read sound measurements.

**21-Dot Analog Bargraph** — gives you a visual representation of the measured sound.

**Mode/Condition Indicators** — show you the current mode and status of the meter.

**Wide Sound-Measuring Abilities** — measures from 50 dB to 126 dB SPL with seven ranges.

**Average or Maximum Sound Level Display** — continuously shows the average or maximum sound level: per second with digits, per 0.2 or 0.5 seconds with the bargraph.

**Tripod Ready** — lets you attach the meter to a tripod ( $\frac{1}{4}$ -inch) for more accurate sound measurements.

**Date Hold** — lets you *freeze* a measurement on the display.

**Integrated Averaging** — measures the integrated average, and holds the maximum and minimum sound levels for a pre-set period.

**Underrange and Overage Indicators** — show you when the sound level reading is under or over the selected range.

**A and C Weighting** — lets you select either type of weighting to suit the purpose of the measurement.

**Selectable Bargraph Response** — lets you select a slow (0.5 second) or fast (0.2 second) bargraph response.

**Peak Level Indication** — shows you when the meter registers the maximum level measurement on the bargraph.

**Reset Button** — lets you clear the current measurements from the meter's memory and begin a new measurement.

**9-Volt Battery Operation** — lets you power the meter with a 9-volt battery.

**Phono Output Jack** — lets you connect the meter to your stereo system or test equipment.

**Low-Battery Indicator** — shows you when the battery needs to be replaced.

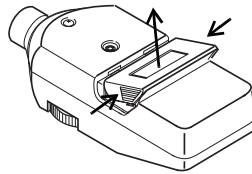
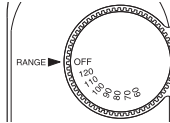
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## **□ Installing the Battery**

The meter requires one 9-volt battery for operation. For the best operation and longest life, we recommend RadioShack alkaline batteries. Follow these steps to install the battery.

1. Set **RANGE** to **OFF**.
2. Remove the battery compartment cover by pressing in both sides and lifting off the cover.



3. Install the battery as indicated by the diagram marked in the compartment. Place the battery over the red ribbon to make it easy to remove the battery later.
4. Replace the battery compartment cover.

**Notes:**

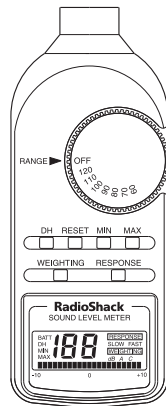
- When you are not using the meter, set **RANGE** to **OFF**.
- If you will not use the meter for a week or more, remove the battery.
- When the battery becomes low, **BATT** appears on the display.

Replace the battery with a fresh one of the same type.

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## □ **Making Measurements**



### **SETTING THE SOUND RANGE**

The meter can measure sound levels within seven different ranges. Each range covers 20 dB. The number of each range represents the center of the range. For example, if you set **RANGE** to **70**, the meter measures sound levels from 60 to 80 dB.

Set **RANGE** for the approximate sound level you want to measure. If you do not know the sound level, start with the highest range setting (120) and gradually reduce the setting. When the measured value is lower or higher than the set range, an underrange or overrange indicator appears. See “Level Indications” on Page 12.

**Notes:**

- If you set **RANGE** to **120**, the meter measures sound levels from 110 dB to 126 dB.
- If you change the range setting during a measurement, you clear all the current data and a normal continuous measurement resumes.

## **SETTING THE WEIGHTING**

**WEIGHTING** lets you set the meter's weighting characteristics, which determine the meter's frequency response curve. You can select *A-weighting* or *C-weighting*.

A-weighting has A-curve frequency characteristics. This setting causes the meter to respond mainly to frequencies in the



500-to-10,000 Hz range, which is the human ear's most sensitive range. Select A-weighting to determine an area's noise-level. Take measurements at several different points in the area.

C-weighting has C-curve (flat) frequency characteristics. This setting causes the meter to respond mainly to frequencies in the 32 to 10,000 Hz range. Select C-weighting to measure sound levels of musical material.

When you set **RANGE** to **OFF**, the meter automatically selects C-weighting.

Press **WEIGHTING** to change the weighting between A and C.

The display shows the current setting (**WEIGHTING A** or **WEIGHTING C**).

**Note:** You can change the weighting setting only during a continuous average or maximum measurement.

## **SETTING THE RESPONSE**

**RESPONSE** lets you set the interval at which the meter revises the bargraph sound level reading. There are two settings – *fast* and *slow*. When you set

**RANGE** to **OFF**, the meter automatically sets the response for *fast*.

At the fast setting, the meter revises the bargraph reading after about every 0.2 seconds. At the slow setting, the meter revises the reading after about every 0.5 seconds.

Press **RESPONSE** to change the bargraph's response between fast and slow.

The display shows the selected setting (**RESPONSE SLOW** or **RESPONSE FAST**).

**Note:** You can change the response setting only during a continuous average or maximum measurement.

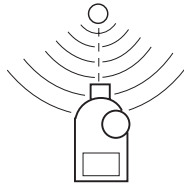
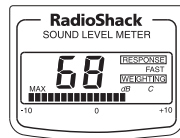
## **MAKING NORMAL MEASUREMENTS**

Follow these steps to measure the average sound level.

1. Set **RANGE** for the desired sound range. If you do not know the sound level, start at the highest range setting (120) and reduce the setting until you get a reading. (See "Setting the

Sound Range” on Page 7 and “Level Indications” on Page 12.)

2. Set the weighting and response. (See “Setting the Weighting” on Page 8 and “Setting the Response” on Page 9.)
3. Face the sound source. Then hold the meter to one side and point its microphone at the sound source.



The meter begins to display the *continuous average* sound level. This is the average sound level during a 1-second sampling period, which the meter updates once per second. The bargraph shows the continuous average for either a 0.2-second or 0.5-second period, depending on the response setting.

When you complete a measurement, set **RANGE to OFF**.

## **MAKING MAXIMUM MEASUREMENTS**

To measure the continuous maximum sound level, follow the steps in “Making Normal Measurements” on Page 10 and press **MAX** so **MAX** appears on the display.

The meter displays only the loudest measured sound level during the 1-second sampling period. The bargraph shows the maximum level of every 0.2 or 0.5 seconds. The bargraph segment that corresponds to the peak reading stays on the display for 2 seconds or until the meter measures a higher maximum level.

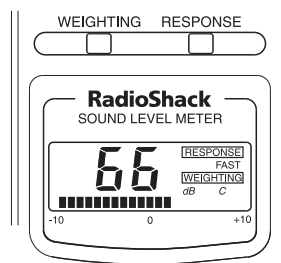
Press **MAX** again to cancel the continuous maximum measurement and resume a normal continuous average measurement.

## **LEVEL INDICATIONS**

The meter displays the sound level using numbers and a bar graph. The numbers show the sound level in dB within  $\pm 10$  dB of the selected range and the meter updates the reading once per second.

The bargraph's center point represents the center level of the selected range (60 dB, 70 dB, 80 dB, and so on).

The points to the left of the center indicate measurements less than the center level (down to  $-10$  dB below the selected range). The points to the right of the center indicate measurements greater than the center level (up to  $+10$  dB above the selected range).

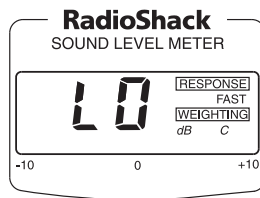


The bargraph updates every 0.2 or 0.5 seconds, depending on the response setting. (See “Setting the Response” on Page 9.)

### Underrange Indication

When the measured sound level is lower than the lowest sound level of the selected range, **LO** appears and the bargraph

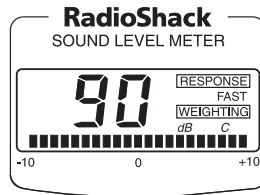
disappears. If this happens, select a lower range.



### Overrange Indication

When the measured sound level is higher than the highest sound level of the selected range (except for the 120 dB range), the bargraph and digits that represent the next higher range flash on the display.

For example, if the meter measures 91 dB in the 80 dB range, 90 and the bargraph flash.



If the meter measures more than 126 dB in the 120 dB range, 126 and the bargraph flash.

If you get an overrange indication, change the range setting until you get a reading in the upper half of the range (0 to + 10 dB).

**Notes:**

- The underrange or overrange indication can also appear when you recall a measurement using data hold and the measurement is under or over the selected range. See “Using Data Hold.”
- The meter cannot measure sound levels lower than 50 dB or higher than 126 dB.

## **USING DATA HOLD**

The data-hold function lets you store the current measurements in memory and *freeze* a measurements on the display. The meter stores the continuous average, the maximum, and the minimum sound levels for the last 1 second.

To store the current measurements, press **DH** during a continuous average or maximum measurement. The last average measurement or last maximum measurement (with **MAX**) appears on the display.

Press **MAX** to freeze the current maximum measurement if the last average measurement (without **MAX**) is on the display. Press **MAX** again to return to the average measurement.

Press **MIN** to freeze the current minimum measurement. **MIN** also appears on the display. Press **MIN** again to return to the average measurement.

Press **RESET** to return to a continuous average or maximum measurement.

**Notes:**

- You cannot change the response and weighting settings during data hold.
- When you set **RANGE** to a different range during data hold, you cancel the function and return to a continuous measurement.

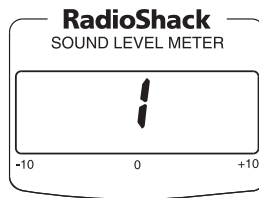
## **MAKING AN INTEGRATED AVERAGE MEASUREMENT**

Follow these steps to monitor the sound level and average the measurement over a preset time period of 1 to 199 seconds. The meter stores the average, the maxi-



mum, and the minimum sound levels during the set time period.

1. Press **DH** for about 2 seconds during a continuous average or maximum measurement. **1** appears on the display.

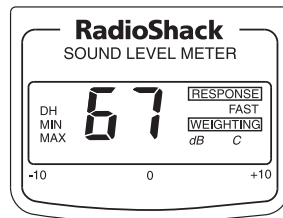


2. Repeatedly press or hold down **MAX** or **MIN** to set the desired measuring period from 1 to 199 seconds.
3. Position the meter for the measurement.
4. Press **RESET** to start the monitoring.

The meter measures the integrated average, maximum, and minimum sound levels for the set time. The meter updates the current integrated average display every second and **MIN** and **MAX** flash until the set time ends.

When the set time ends, **DH** appears, and **MIN** and **MAX** continue to flash. The

meter displays the total integrated average sound level.



Press **MAX** to display the maximum sound level for the set time. Press **MAX** again to return to the total integrated average sound level.

Press **MIN** to display the minimum sound level for the set time. Press **MIN** again to return to the total integrated average sound level.

Press **RESET** after you check the integrated average sound level and the maximum or minimum sound level. The meter resumes a continuous average measurement.

**Note:** If you change the **RANGE** setting during an integrated measurement, you clear any stored data and a normal continuous average measurement resumes.

You must repeat the procedure for making an integrated average measurement.

### **MAKING MAXIMUM AND MINIMUM MEASUREMENTS DURING AN UNDETERMINED TIME PERIOD**

You can check the maximum and minimum sound level over any length of time. To do so, press **RESET** during a continuous average or maximum average measurement.

At the end of the desired time period, press **DH**. **DH** appears.

To display the maximum sound level during the time period, press **MAX** if both **MIN** and **MAX** flash on the display and the last average sound level appears. Press **MAX** again to return to the average sound level.

**Note:** If only **MIN** flashes on the display, the meter is already showing the maximum sound level during the time period.

Press **MIN** to display the minimum sound level during the time period. Press **MIN** again to return to the last average sound level.

Press **RESET** after you check the maximum or minimum sound level. The meter resumes a normal continuous average or maximum measurement.

## **CHECKING STEREO SYSTEM ACOUSTICS**

To check the sound of a stereo system, use a test recording that produces pure tones, one at a time, at intervals that span the entire audio spectrum.

Use C-weighting with either slow or fast response.

Make a graph or table that shows the sound level each tone generates. This gives you a clear idea of the frequency response of the total audio system – including the room. To smooth out the response, adjust the tone control, vary the speaker placement, and use a frequency equalizer.

## **CALIBRATING THE METER**

The recessed calibration control (labeled **CAL** on the meter's left side) is intended **for service technicians only.**

Attempting to calibrate the meter yourself might result in inaccurate measurements.

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## **Care**

Your RadioShack Digital Sound Level Meter is an example of superior design and craftsmanship. The following suggestions will help you care for the meter so you can enjoy it for years.

- Keep the meter dry. If it gets wet, wipe it dry immediately. Liquids might contain minerals that can corrode electronic circuits.
- Use and store the meter only in normal temperature environments. Temperature extremes can shorten the life of electronic devices and distort or melt plastic parts.
- Handle the meter gently and carefully. Dropping it can damage the circuit boards and cause the meter to work improperly.
- Keep the meter away from dust and dirt, which can cause premature wear of parts.

- Wipe the meter with a damp cloth occasionally to keep the meter looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the meter.
- Use a fresh battery of the recommended size and type. Always remove an old or weak battery. It can leak chemicals that destroy electronic circuits.

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## **Specifications**

Battery .....9-volt Alkaline  
 Microphone..... Electret Condenser  
 Range ..... 50 dB to 126 dB  
 Accuracy .....  $\pm 2$  dB at 114 dB SPL  
 Reference ..... 0 dB = 0.0002 Micro Bar  
 Weighting ..... A and C  
 Display Response ..... Fast and Slow  
 Signal Output:  
     Voltage .....1 Volt Peak-Peak Min.  
                     (Open Circuit, Full Scale at 1 kHz)  
     Impedance..... 10 Kiloohms Min. Load  
     Distortion ..... Less than 2% at 1 kHz.  
                     0.5 V p-p Output  
                     (Input: Mic Out, Output: 10 Kohm)

Operating Temperature.....32 °F to 122 °F  
Storage Temperature..... -40 °F to 149 °F  
Dimensions (HxWxD) .. 6 ¼ x 2 ½ x 1 ¾ Inches  
(159 x 64 x 44 mm)  
Weight ..... 5.8oz  
(165 g Approx.)

### Limited Ninety-Day Warranty

This product is warranted by RadioShack against manufacturing defects in material and workmanship under normal use for ninety (90) days from the date of purchase from RadioShack company-owned stores and authorized RadioShack franchisees and dealers. EXCEPT AS PROVIDED HEREIN, RadioShack MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. EXCEPT AS PROVIDED HEREIN, RadioShack SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAMAGE CAUSED DIRECTLY OR INDIRECTLY BY USE OR PERFORMANCE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING, BUT NOT LIMITED TO, ANY DAMAGES RESULTING FROM INCONVENIENCE, LOSS OF TIME, DATA, PROPERTY, REVENUE, OR PROFIT OR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF RadioShack HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

In the event of a product defect during the warranty period, take the product and the RadioShack sales receipt as proof of purchase date to any RadioShack store. RadioShack will, at its option, unless otherwise provided by law: (a) correct the defect by product repair without charge for parts and labor; (b) replace the product with one of the same or similar design; or (c) refund the purchase price. All replaced parts and products, and products on which a refund is made, become the property of RadioShack. New or reconditioned parts and products may be used in the performance of warranty service. Repaired or replaced parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This warranty does not cover: (a) damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current; (b) any repairs other than those provided by a RadioShack Authorized Service Facility; (c) consumables such as fuses or batteries; (d) cosmetic damage; (e) transportation, shipping or insurance costs; or (f) costs of product removal, installation, set-up service adjustment or reinstallation. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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