

Limited One-Year Warranty



- 1. Maico Diagnostics warrants**
its audiometers to be free from all defects in materials and workmanship for a period of one year from date of purchase. Maico Diagnostics will make all necessary repairs to correct any such defects without charge to the original registered purchaser within one year from the date of purchase.
- 2. If this instrument should require repair**
or other service, it should be brought or sent to the authorized Maico Diagnostics special instruments representative from whom it was purchased. All transportation costs are the responsibility of the purchaser.
- 3. Maico Diagnostics Corporation makes no**
warranties other than the warranty set forth herein. Maico Diagnostics and special instruments representatives are independent business people and agents or employees of Maico Diagnostics; they are not authorized to extend or alter the terms of this warranty.
- 4. This warranty is not valid unless the conditions**
set forth herein are observed, and does not apply to any damage or loss resulting from accidents, abuse, dropping, mishandling, misuse, or from any unauthorized attempt to repair, alter, or disassemble this instrument.
- 5. This warranty gives you specific legal rights,**
and you may also have other rights that vary from state to state.

If you need to send your audiometer to Maico Diagnostics for service,
please contact 1-888-941-4201



Maico Diagnostics
7625 Golden Triangle Drive
Eden Prairie, MN 55344

phone (952) 941-4200
toll free (888) 941-4201
fax (952) 903-4200
web www.maico-diagnostics.com

Operating Instructions Scout



10. **Your audiometer is** and electroacoustic device which should only be serviced by an authorized Maico Special Instruments representative. Your Maico representative has all of the necessary acoustical calibration equipment required to repair and recalibrate your audiometer. Annual calibration is recommended. The name of the Maico Special Instrument representative in your area will be provided by directing your inquiry to Maico Diagnostics 888-941-4201.

Troubleshooting



There are several things you can do when your audiometer does not seem to be working properly. Check the list below before calling Beltone or your Special Instruments representative.

- A. Neither the left nor the right** indicator light illuminates when power is connected to the audiometer. The audiometer does not work.
 1. Check the power source. Is there power in the outlet? Try another outlet.
 2. Check the DIN connector to assure that it is properly inserted.
- B. LED indicators illuminate;** no tone.
 1. Are the earphone cords properly plugged into the jacks?
 2. The tone switch presents the tone only in the normally off condition.
- C. Tone is weak** and/or intermittent.
 1. Check the cords to the earphone by turning the tone on and wiggling the cord. If intermittent, replace the cord.
 2. Check to see if the tone mode switch is in the pulsed mode.

Maintenance



The Scout Audiometer is a precisely engineered electronic instrument, designed and manufactured to provide many years of trouble-free service. Here are some worthwhile suggestions for keeping it in proper operating condition.

1. **Keep the audiometer** cover closed when not in use. This keeps out dust, direct and accidental spills.
2. **Always remove the earphones** from the storage compartment carefully. Do not pull them out by their cords.
3. **Place earphones** in the storage compartment with care. These are the most vulnerable part of the audiometer, so treat them carefully.
4. **Do not place earphones** face down on any surface; the rubber ear cushions will stick in a short time.
5. **Do not force faces** on the earphones together. This may damage their delicate diaphragms.
6. **Be careful not to drop the earphones.** If they are accidentally dropped, check them immediately on yourself to assure that they are still working properly. A severe shock can affect calibration.
7. **At the beginning** of each test day, check the audiometer on yourself to see if it is in proper working order. At least once a month, test several persons having known stable audiometric curves that do not exceed 25 dB HL. If these test results show a shift of 10 dB or more at the same frequencies, then servicing of the audiometer is required.
8. **Do not interchange earphones.** This will affect the calibration of the audiometer.
9. **It is best** for the audiometer to be powered at the beginning of the test day and left on until the end of the day.

SCOUT

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CONTROLS & FUNCTIONS **12 & 13**

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Getting Started



First plug the round DIN plug of the power module into the socket labeled power located inside the storage compartment.

Plug the power module into a grounded AC wall socket. (115 volts are typical, with optional power supply available in 100 or 230 volts, 50 to 60 Hz.) NOTE: Always insert the DIN plug prior to plugging the power module into a wall outlet. Either left or right indicator on the front panel will illuminate, indicating that the audiometer is plugged in. There is no on/off switch.

The red cord from the headset plugs into the jack marked right-red located inside the storage compartment of the audiometer. The blue cord plugs into the jack marked left-blue. If the cords are plugged into the wrong jacks, the instrument will work but the test results will be wrong. Also, never take a headset from one audiometer and plug it into another audiometer. The earphones are calibrated at the factory to the specific audiometer, and any changes will give incorrect test results.

Selecting the output is done by pressing the left or right selector switch. These switches are located above the hearing level dial. The LED indicator of the selected earphone will light when selected.

Test frequencies are selected using the frequency selector dial on the left side of the control panel. The frequency range is from 125 Hz to 8000 Hz in 11 steps. The control has definite detents so you can accurately tell by the feel when you have changed frequencies.

The sound level of the test signal is adjusted by the hearing level dial on the right side of the control panel. (Zero on this dial corresponds to average normal threshold level.) Levels greater than 90 dB can be quite uncomfortable to some people and may startle them, so at and above that level, caution is advisable.

The test tones are presented to the patient by lightly pressing the tone presentation switch on the front panel. When a stimulus is

4. Patient Response Indicator

Lights when the patient presses the handheld patient signal switch.

5. Norm On Switch and Indicator

This switch controls the method of tone presentation.

- In the default condition (normally off) the tone is presented when the tone switch is pressed.
- When the norm on function is selected, the tone is on until the tone switch is pressed and then the tone is interrupted. In this mode, the norm on indicator is lit.

6. Tone On Indicator

Lights when a test signal is presented.

7. Left/Right Switches and Indicators

When the left switch is pressed and the indicator lights, the test signal will be presented to the left ear of the patient.

When the right switch is pressed and the indicator lights, the test signal will be presented to the right ear of the patient.

Only one output may be selected at any time.

8. Hearing Level Dial

The hearing level dial controls the level of the pure tone test signal.

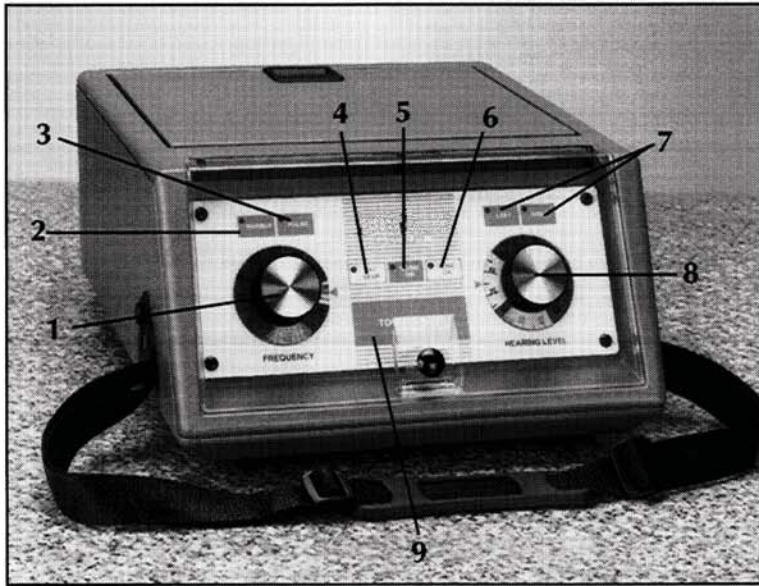
This dial has a position indexing mechanism that firmly indicates each 5 dB position change.

9. Tone Presentation Switch

A light touch will activate the tone switch to present a pure tone, pulse or warble signal or interrupt the signal when the norm on option is selected. When neither warble nor pulse lights are illuminated, pure tones are presented.

Standard Accessories

- TDH-50 Earphones with Headband and Cords
- Patient Signal Switch
- Audiogram Pad
- Wall Plug-in Power Supply
- Carrying Strap



Scout



1. Frequency Selector Dial

The frequency dial allows the selection of one of eleven audiometric frequencies. The markings on the dial indicate the frequency (top number) and the maximum calibrated hearing level input (bottom number) for that frequency.

2. Warble Tone Switch and Indicator

To use warble tone, press the warble switch which is located above the frequency dial. When the tone switch is pressed, the test signal will be a warbled tone. In this mode the warble indicator is illuminated.

3. Pulse Tone Switch and Indicator

To use the pulse tone, press the pulse switch which is located above the frequency dial. In the pulsed mode, a pulsed tone is delivered to the patient whenever the tone switch is pressed. When neither warble nor pulse lights are illuminated, pure tones are presented.

presented, the tone on indicator will be lit. This will provide you with a visual indication that a tone is being presented to the patient.

If the norm on light is not lit, there is no tone until the tone presentation switch is pressed. If the norm on light is lit, the test stimulus selected will be continuous until the tone presentation switch is pressed. When the tone presentation switch is pressed, it will interrupt the stimulus being presented.

There are three choices for test stimuli: pure tone, warble tone and pulse tone.

1. Pure tones will be presented unless warble or pulse is selected. Pure tone is the most commonly used test stimuli.
2. In the warble mode, a warbled tone is presented when the tone presentation switch is pressed. The warble mode gives you an alternative method for presenting a test signal. This function is used especially when the patient begins to exhibit signs of fatigue or inattentiveness during the test session.
3. In the pulse mode, the audiometer will automatically produce a series of tonal "beeps" when the tone presentation switch is pressed. The pulse mode may be useful in holding the attention of small children better than a continuous tone presentation. Pulsed tones are also appropriate if the patient has tinnitus (ringing in the ears).

The patient signal is an accessory that can be used at your option. When used, it is plugged into the patient signal jack located inside the storage compartment.

The patient is instructed to press the button when the test tone is heard. When the button is pressed, it illuminates the patient response light on the front panel of the audiometer. In this manner you can observe the patient's response without needing to look up from the audiometer. This speeds up the testing process and eliminates the possibility of giving a visual cue to the patient that a tone was presented. If preferred, the patient can be instructed to raise his/her hand or finger when the tone is heard.

Testing Environment



A **quiet area** is needed for audiometric testing. Threshold testing measures the softest levels people can hear and, therefore, requires a very quiet room. Screening testing is performed at higher levels which most people can hear with little effort, so this does not require as quiet a room as threshold testing.

A good way to determine if the test area is adequately quiet is to actually test someone with known good hearing. If the threshold levels you obtain are worse than the levels you know exist for that person, then the room is probably too noisy for accurate testing. Low-frequency background noise is likely to present the greatest problem.

When testing for industrial purposes, the noise level in the test area must meet specific requirements as established by the Occupational Safety and Health Administration (OSHA). Sound level meters are used for this kind of analysis. However, it is still a good idea to also test someone with known, good hearing to verify that the area is sufficiently quiet.

Instructing the Patient



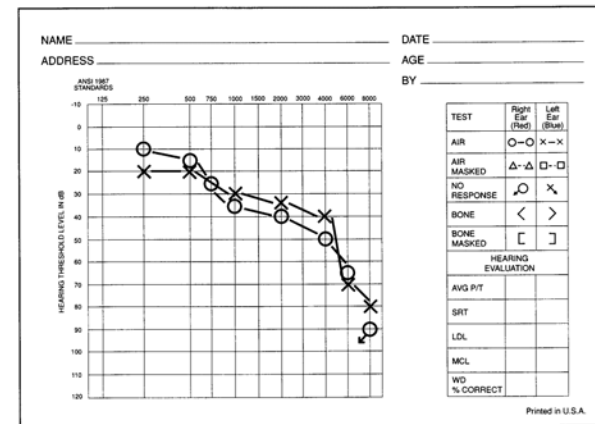
It is important that the person being tested understand exactly what is to be heard and what is supposed to be done. The simpler the instruction, the better. For example, in pure tone testing you might say, "When you hear the tone, push the button (raise your hand.) Release the button (put your hand down) when you no longer hear the tone." Patients should be told that some tones will be very soft and they should listen carefully. Young children and the elderly often require a slower, more carefully articulated explanation or several repetitions of the explanation.

Next, ask the patient, "In which ear do you hear better?" Test that ear first. If the better ear is unknown, or if the two ears are about the same, start with the right ear. After giving instructions, carefully place the earphones on the patient's head. If the patient is wearing eyeglasses,

Audiogram Form



An audiogram is used to record the thresholds the clinician has determined. Good, accurate record keeping is essential. Each threshold measurement is marked on the audiogram before making the threshold determination. A sample audiogram is shown in this illustration.



In this example of an audiogram for air conduction thresholds, a red "O" is used for indicating responses from the right ear, and a blue "X" for the left ear. When the air conduction pure tone testing is completed, connect all symbols with a line of the appropriate color.

If patients have a severe loss, they may not hear the tones even at the highest level produced by the audiometer. In these cases, a downward arrow (as shown for the right ear at 8000 Hz) is used to indicate that no response was obtained at the highest presentation level. These symbols are not connected with a solid or dotted line. Note that the frequency dial of the audiometer shows the maximum testable hearing level at each frequency and that the "no response" marking should be made at that level — not at the audiogram extreme.

5 dB steps. After two or three series at the same test frequency, you should get a consistent level at which the patient first responds during the ascending presentations. That level is the threshold for that frequency.

From the above, it may be noted that only the ascending presentations are counted when determining the threshold. Persons with little or no hearing loss are likely to respond after the first time you increase the level by 20 dB. If so, decrease the presentation level another 10 dB until they fail to respond and then begin raising the level in 5 dB steps.

Order of Test Frequencies



Once the threshold is established at 1000 Hz, go on and test the higher frequencies in order. Typically, 2000, 4000 and 8000 Hz are tested next. You may wish to also test at 3000 and 6000 Hz; these two frequencies are required when doing industrial audiograms. An inter-octave frequency (i.e., 750, 1500, 3000 and 6000 Hz) should be tested if there is a difference of 20 dB or more between two standard test frequencies. When you have completed testing at these frequencies, go back to 1000 Hz and retest that frequency; this is to check on the reliability of the patient's response. Then test 500 Hz and finally 250 Hz. Make a habit of following the same sequence of frequencies tested. After testing one ear, repeat the procedure with the other ear. However, it is not important that 1000 Hz be tested twice for the second ear.

Testing at 125 Hz may be done but often that frequency is omitted because the results may suggest a hearing loss which does not exist. It is difficult to obtain accurate test results at the lowest frequencies unless the test environment is extremely quiet. Often room noise can affect test accuracy. Another reason for using care at the lowest test frequencies is that the seal of the earphone against the ear can affect test accuracy.

they should be removed for a snug fit. The person should not be chewing gum or sucking on a piece of candy. The opening in the center of the earphone cushions should be directly over the opening into the ear canals. The red earphone is placed on the right ear and the blue earphone on the left ear. Adjust the headband as needed to provide a snug but comfortable fit.

The patient should be seated so that the operation of the audiometer cannot be seen. If the patient receives visual cues such as hand movement on the tone presentation switch, the test results may be invalid. Be careful to avoid giving other cues that the tone is being presented such as looking up at the patient.

Vary the time between tone presentations to avoid establishing a pattern that the patient can predict. A tone presentation duration of one second is usually best, varying the time between presentations by two to five seconds.

It is important to be consistent in performing each test procedure. No matter what type of testing is being done, strive to perform that test exactly the same way each time. This is especially important when retesting the same patient every six months or every year, so several audiograms can be compared with confidence.

Air Conduction Screening Testing



Screening tests are used to quickly identify those who may have a hearing problem. For this purpose the hearing level control is set to a fairly low setting but at a level that most people can hear. If the patient hears the test frequencies presented in each ear, his/her hearing can be considered normal or nearly normal. If the patient doesn't hear the test frequencies, he/she should be given a more thorough test. Remember, at this point you are merely screening the hearing, not trying to determine the lowest possible sound level they can hear. The idea is just to determine if the basic test frequencies at a fixed presentation level can be heard.

Screening testing is typically done at four test frequencies in each ear. The usual frequencies tested are 500, 1000, 2000 and 4000 Hz. The

fixed presentation level is usually in the range of 20 to 30 dB HL, depending upon the test environment and the purpose of the screening test.

To administer screening tests, properly instruct the patient as explained, and place the earphones on his/her head as previously described.

Select the ear to be tested. Select the output to the same ear being tested by pressing either the right or left switch. Determine that the instrument is in the normally off mode. (Note: Norm on LED will not be lit in this mode.) Set the frequency dial to the lowest frequency to be tested first, which is typically 500 Hz. It is a good idea to present the tone initially at 40 to 50 dB HL to make sure the patient clearly hears it and knows how to respond. Next, set the hearing level control at your screening level (20 to 30 dB HL), and present the tones for the actual test only at that level. After testing one ear, test the other in the same sequence.

When testing young children, it is helpful to have them watch other children being tested as they wait their turn. This serves as a model for them to follow and shows that the test is not something to fear. Children are very observant, and you need to be careful not give away clues when a tone is being presented. The two most common clues to avoid are rhythmical, predictable tone presentation, and looking up at the patient each time a tone is being presented.

Determining what constitutes failure of a screening test is a matter of professional judgment. It is also dependent upon the goals set for the screening program, state regulations and/or the age of the population. A common rule to follow is that the screening test was failed if two or more frequencies in one ear are not heard, or one or more frequencies in both ears are not heard.

Those not passing the screening test may or may not have a significant hearing loss, but they should be advised to have a more comprehensive audiometric test.

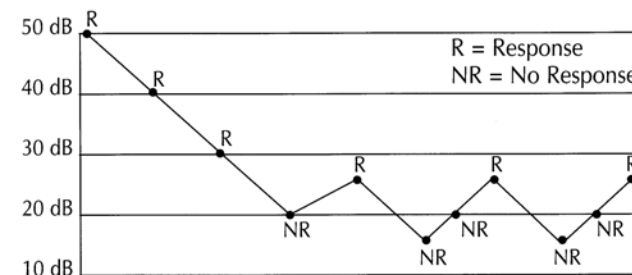
Air Conduction Threshold Test



A **threshold test** determines the softest sound a person can hear at the test frequencies presented. Because the sound is at the level where the person can barely hear it, the threshold is usually defined as the lowest level at which the presence of the tone can be correctly recognized during half of the presentations at a specific level.

A commonly accepted threshold testing technique is known as the Modified Ascending Level Technique. The general idea is to decrease the presentation level to slightly below what you estimated the patient can hear and gradually raise the level in steps until a response is obtained. Make a note of the level heard during the ascending presentation. Then drop below that level and gradually increase the level, again by steps. Repeat this pattern until a response is given at the same level two or three times out of four to six tone presentations. The sample shown below illustrates the Modified Ascending Level Technique.

**Crossing the Response
Threshold Three Times**



To administer this test, set the frequency dial to 1000 Hz and select the ear to be tested. Set the hearing level dial above the presumed threshold (such as 40 dB) and present the tone. Decrease the level by 20 dB and present the tone. If there is no response, raise the level 5 dB and present the tone again. Continue until the patient responds to a presentation while ascending. Note this level, then decrease the level by 10 dB and ascend in