



AMBCO 1000+ AUDIOMETER



AMBCO ELECTRONICS

15052 REDHILL AVE SUITE #D • TUSTIN, CA 92780 • (714) 259-7930 • FAX (714) 259-1688
WWW.AMBCO.COM

Table of Contents

1	About the 1000+ Audiometer	3
2	Features and Specifications of the Model 1000+	3
3	Getting Started – Patient Instructions	3
4	Threshold Hearing Tests	4
5	No Response	4
6	Recording Results	5
7	Screening Manually	5
8	Screening with AUTO TEST	6
9	Exiting AUTO TEST Mode	6
10	Interpreting Results	7

1. ABOUT THE 1000+ AUDIOMETER

The AMBCO Model 1000+ is a microprocessor controlled pure tone air conduction audiometer with automated screening test feature.

2. FEATURES AND SPECIFICATIONS OF THE MODEL 1000+

Meets performance requirements of ANSI S3.6-1996

OPERATING TEMPERATURE: 15° to 30°C (59°F to 86°F)

PRODUCT TYPE: Pure Tone, Type 4 Audiometer

TEST FREQUENCIES

AUTOMATIC SCREENING MODE(HZ):

TEST 1: 500, 1000, 2000, 4000

TEST 2: 1000, 2000, 3000, 4000

MANUAL MODE: 250, 500, 1000, 2000, 3000, 4000, 6000, 8000

FREQUENCY ACCURACY: Less than 3% – Typically better than 2%

TOTAL HARMONIC DISTORTION: Less than 2.5%, typical 1%

HEARING LEVEL RANGE: 0 to 90 dB in 5 dB increments

POWER SUPPLY: 107-127 VAC 60 Hz, 10 Watts, UL approved (Optional 220 VAC 50/60 Hz available)

AC Adapter Output: 12V DC nominal at 500mA

HEARING LEVEL ACCURACY /Attenuator linearity: ± 1 dB

STIMULUS: Continuous, pulse or warble

Rise/fall time: 20 - 50 ms

EARPHONES: TDH-39 or DD45, 10 OHM

CASE: Injection molded, impact resistant A.B.S. plastic

DIMENSIONS: Width 10 inches, Length 8 inches, Height 4.2 inches

TOTAL WEIGHT: 4.0 Lbs.

WARRANTY: 5 Years on base system

PRINT TIME: Typically less than 20 seconds (printer dependent)

3. GETTING STARTED – PATIENT INSTRUCTIONS

3.1. Turn audiometer ON. The power switch is located in the bottom left-hand corner of the front side of the audiometer.

3.2. Select **TONE** (Continuous, Pulse or Warble). Press TONE SELECT for choice.

3.3. Test the RIGHT ear first, press EAR for choice.

3.4. Inform the subject that you will place the headset over his/her head and the receivers will cover the ears. You will present tones, thus the patient shall respond by using the patient response switch. Make certain the patient understands the instructions, in that they will respond by pushing and releasing the hand switch as soon as they CLEARLY HEAR A TONE.

3.5. Adjust the headset, making certain the patient is comfortable. Place the right receiver (RED) over the right ear and the left receiver (BLUE) over the left ear.

4. THRESHOLD TESTING – ESTABLISHING HEARING LEVEL AT SELECTED FREQUENCIES

- 4.1. Follow the steps in Section 3 – Getting Started.
- 4.2. Present familiarization tone. Set HTL at 40 dB and FREQUENCY at 1000 Hz.
- 4.3. Press PRESENT TONE (lower center of panel) for 1-2 seconds. RED light above TONE indicates tone is being presented.
- 4.4. The patient responds by pressing hand switch. The green light shows a RESPONSE. If there is no green light, there was no response. SEE ALSO Section 5 - Negative Response.
- 4.5. If positive response, proceed with test by setting HTL at 30 dB and selected frequency, i.e., 500 Hz.
- 4.6. Press PRESENT TONE for 1-2 seconds.
- 4.7. Positive response, set HTL at 25 dB, PRESENT TONE, 1-2 seconds.
- 4.8. Positive response, set HTL at 20 dB, PRESENT TONE, 1-2 seconds.
- 4.9. Positive response, set HTL at 15 dB, NO RESPONSE.
- 4.10. This indicates the patient's hearing at 500 Hz in the right ear is 20 dB. The patient responded to 20 dB, but not to 15 dB.
- 4.11. Record result per Section 6 – Recording Results.
- 4.12. Set the HTL at 30 dB and FREQUENCY at next desired level, i.e., 1000 Hz and repeat Steps 1-11.

TYPICALLY, THRESHOLD TESTS ARE SPECIFIED BY PHYSICIANS. COMMON THRESHOLD TESTING INCLUDES FREQUENCIES 500 Hz, 1000 Hz, 2000 Hz, 3000 Hz, 4000 Hz, 6000 Hz, 8000 Hz. THE STARTING dB LEVEL IS OPTIONAL. IF THERE IS NO RESPONSE AT ANY BEGINNING FREQUENCY (FIRST TONE PRESENTED AT ANY FREQUENCY), PROCEED TO SECTION 5 – NO RESPONSE.

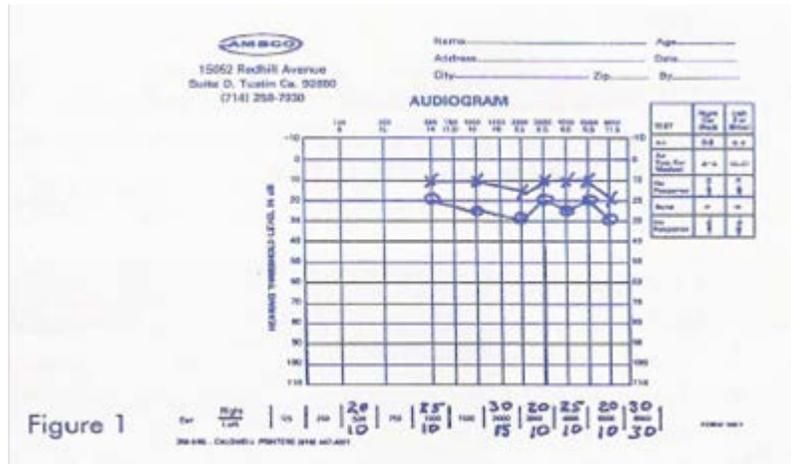
5. NO RESPONSE

- 5.1. NO RESPONSE to familiarization tone or the first tone at any selected frequency. Proceed with the following instructions.
- 5.2. Increase the dB level by 10 dB – present the TONE until there is a positive response, i.e., at 30 dB and 1000 Hz, there is no response.
- 5.3. Increase HTL to 40 dB, PRESENT TONE, no response.
- 5.4. Increase HTL to 50 dB, PRESENT TONE, positive response.
- 5.5. Decrease HTL by 5 dB increments to 45 dB, PRESENT TONE, positive response.
- 5.6. Decrease HTL to 40 dB, PRESENT TONE, no response.
- 5.7. Results – Patient hearing at 1000 Hz is 45 dB. Positive response to 45 dB, but not to 40 dB.

6. RECORDING RESULTS

- 6.1. Using a common pad, Figure 1, you may record the results as in the following example.
- 6.2. Write the results above and below the frequencies on bottom of audiogram pad.

Results	R	L
500Hz	20dB	10dB
1000Hz	25dB	10dB
2000Hz	30dB	15dB
3000Hz	20dB	10dB
4000Hz	25dB	10dB
6000Hz	20dB	10dB
8000Hz	30dB	30dB



- 6.3. To graph results, frequencies are listed on top of diagram and the HTL dB on right and left.
- 6.4. First locate the frequency on top, go straight down where it crosses the dB level, i.e., at 500 Hz, left ear dB is 10. Where the 500 Hz crosses the 10 dB line, put an X – it represents the left ear. The dB is 20 on the right ear, therefore where the 500 Hz line crosses the 20 dB line, put an O – it represents the right ear.
- 6.5. Plot all of the results accordingly as shown in the above example, Figure 1.

7. MANUAL SCREENING

With the audiometer on and ready, as in Section A – Getting Started, follow the following instructions:

- 7.1. Select a familiarization dB level, i.e., 40 dB, and then set frequency to 1000 Hz.
- 7.2. Press PRESENT TONE for 1-2 seconds. Look for patient’s response, either with the hand switch or a hand signal.
- 7.3. Select the screening dB HTL, i.e., 25, press PRESENT TONE for 1-2 seconds.
- 7.4. With every positive response, select the next frequency, i.e., from 1000 to 2000 to 3000 to 4000 Hz and repeat Step 3, testing both the right and left ear.

SCREENING IS PASS OR FAIL. THE RESULTS CAN BE RECORDED AS FOLLOWS:

		dB LEVEL									
		25									
		1000	2000	3000	4000	1000	2000	3000	4000		
Right Ear		✓	✓	✓	–	✓	✓	✓	–	Left Ear	

PASS  FAIL 

At 25dB the patient failed at 4000Hz both ears

8. SCREENING WITH AUTO TEST

The MODEL 1000+ is a microprocessor-controlled audiometer capable of screening sequentially. Once the AUTO-TEST mode is selected by the operator and after the HTL dB screening is selected by pressing PRESENT TONE, the sequential screening is initiated. When the patient responds to the screening tones which are presented sequentially at the selected frequencies, the right ear is tested, then the 1000+ switches and tests the left ear. When the test is completed, a green light (PASS) indicates the patient was able to hear at the selected dB and frequencies.

- 8.1. Sequential screening is started by pressing AUTO-TEST. A green light (READY) indicates the 1000+ is in the AUTO-TEST mode.
- 8.2. Select the dB level for the test, ranging from 10-35 dB.
- 8.3. The FREQUENCY window shows 5, 1, 2, 4. This indicates that the test will be screening at 500, 1000, 2000, and 4000 Hz frequencies, such as for school testing.
- 8.4. For C.H.D.P. or other testing, turn the frequency knob to show 1, 2, 3, 4. This indicates you will screen at 1000, 2000, 3000, and 4000 Hz.
- 8.5. Prepare the patient per Section A – Getting Started.
- 8.6. In the AUTO-TEST mode, the test is started by the operator pressing PRESENT TONE after the dB level is set and the test frequencies are selected.
- 8.7. First, a 40 dB familiarization tone is presented at 1000 Hz. A positive response by the patient continues the test through 500, 1000, 2000, and 4000 Hz right ear and left ear.
- 8.8. If the green light indicates PASS, the test is completed. The patient passes the screening test.
- 8.9. Press AUTO-TEST for next screening.
- 8.10. Repeat Steps 1-9 in this section for the 1, 2, 3, 4 Hz test.
- 8.11. If the patient responds too soon, is guessing, or if there is no response to a presented tone, the red light (FAIL) will flash. The failed tone and frequency will be repeated.
- 8.12. A positive response will continue the test to the next frequency.
- 8.13. A second failure will be indicated by a solid yellow light (FAIL).
- 8.14. The operator may continue the test after any FAIL, or solid red light, by pressing PRESENT TONE.

9. EXITING AUTO TEST MODE

The operator may exit AUTO-TEST at any time.

- 9.1. To exit AUTO-TEST MODE, press AUTO-TEST when the green light indicates the AUTO-TEST MODE is ON.
- 9.2. Exit AUTO-TEST after FAIL by pressing AUTO-TEST twice.

10. INTERPRETING RESULTS

The hearing test results are interpreted by qualified persons such as physicians, audiologists, or nurses.

Numerous factors affect hearing, such as age and background noise. This list below may be used as a general guideline to compare hearing test results.

AVERAGE THRESHOLD LEVEL (dB)*

00 – 15 dB	Normal hearing
16 – 25 dB	Slight hearing loss
26 – 40 dB	Mild hearing loss
41 – 55 dB	Moderate hearing loss
56 – 70 dB	Moderately severe hearing loss
71 – 90 dB	Severe hearing loss
91+ dB	Profound hearing loss

* Generally, if a person can hear as low as 25 dB at the test frequencies, his/her hearing is considered acceptable.