

Welcome to the newest standard in hearing aid testing



The FONIX[®] 7000 HEARING AID TEST SYSTEM

The FONIX 7000 test system combines unbeatable accuracy, speed, and innovative measurements with a flexible, easy-to-use interface that will fit the needs of any hearing health professional.

THE FONIX 7000

The newest standard in hearing aid testing

USABILITY

The 7000 Test System has a flexible user interface and a colorful, high-resolution display. Users navigate from screen to screen using the function and exit buttons. Each test screen has a help menu describing all the different things that you can do, and a settings menu that lets you make all kinds of test adjustments.

Beginning users will appreciate the 7000 Test System's smart default test settings, while advanced users will love the ability to fine-tune the system to meet the particular needs of the hearing aid being tested. Measurements can be performed quickly from within an automated test sequence, or you can perform individual measurements at your own pace.



FLEXIBILITY

Up to ten different response curves can be measured and displayed on a screen at the same time. These curves can be turned on and off without actually deleting them, allowing you to view any combination. The measurements can be displayed in gain or in output, in graphical or in numerical format. Other useful measurements, such as three-frequency averages, static tones, and distortion, are also available.

AUTOMATION

The 7000 Test System can be purchased with ANSI, IEC, JIS, or a combination of these automated test sequences. When ANSI is ordered, ANSI 87, ANSI 92, ANSI 96, and ANSI 03 are all included, so you can always use the appropriate standard for the hearing aid being tested.

If you aren't satisfied with using one of the published standards, you can use the 7000 Test System to build your own test sequences. The Auto Test feature, available in both coupler and real-ear screens, lets you program the source type and source level for up to 10 different measurements. You can even add pauses to the test sequences to give you time to adjust the hearing aid to different settings. Three different custom test sequences for each user can be stored in the analyzer's permanent memory.

ENHANCED DSP

Enhanced DSP is an innovative new test useful for both analog and digital hearing aids. It consists of a test for *group delay* and a test for *phase*. Group delay is the amount of time it takes for the digital hearing aid to process sound. This is an important measurement if the patient has a monaural or open vent fitting because sound can travel to the unaided ear faster than through the aided ear, possibly creating an echoing effect.

Phase is a measurement of how the hearing aid pushes and pulls sound. For a pair of aids in a binaural set to be working properly together, both aids must be "pushing" and "pulling" sound in the same manner. If they aren't in phase with each other, it's possible that a part in the aid was wired backwards during assembly. The phase measurement will give you the ability to quickly determine if the aids are working together as a team. Both right and left ear measurements can be displayed simultaneously.

TEST SIGNALS

The 7000 Test System contains a full array of test signals including:

Composite—a real-time broadband signal composed of 79 different frequencies that are presented simultaneously. Made into an ANSI standard in 1992, it has been used faithfully by hearing health professionals for many years, leading to test results that are quick, accurate, and reliable.

Digital Speech—a modulated broadband signal designed to test advanced digital hearing aids with noise suppression technology. Digital Speech comes in two varieties: ANSI and ICRA.

Bias Signal—a pure-tone signal that can be added to Digital Speech for testing how the hearing aid reacts to the presence of noise at various frequencies and amplitudes. This is a useful tool that can be used to figure out how the aid's digital filters are working.

Spectrum Analysis/Live Speech—an analyzer mode in which any external signal can be used while measurements are taken, including the patient's own voice, the voice of a spouse, or any recorded noises.

Pure-tone Normal—a conventional pure-tone sweep that has been the industry standard for many years

Pure-tone Fast—a repeating pure-tone sweep that can be used in place of the Composite when pure-tones are desired

Pure-tone Short—a limited pure-tone sweep normally used for checking output levels in real-ear measurements

LIVE SPEECH DISPLAY

The SPL screen is also great for using external signals to test the hearing aid. Use live speech, recorded signals, or everyday office noises and determine how the hearing aid's response to those signals compares with the patient's threshold and uncomfortable levels. This can be a fantastic counseling tool for your patient—use it to show him how well the hearing aid amplifies (or suppresses) those sounds.

CUSTOMIZATION

Many of the power-on default settings of the 7000 Test System can be changed to meet the needs of the clinician using the analyzer. There are three possible users, making three different ways the analyzer can be set up automatically.

REAL EAR CAPABILITY

The Real-Ear Option on the 7000 Test System gives you the ability to see precisely how the aid is performing inside your patient's ear. It comes with a remote module that allows you to perform real-ear measurements while you move around your patient freely.

In the Audiogram Entry screen, you can enter and view audiometric data for both ears simultaneously. You can also measure the patient's real-ear to coupler difference (RECD).

Real-ear measurements can be performed both quickly and easily using the 7000 Test System. You can use the Insertion Gain screen or the SPL screen. Any measurement made in one of these screens is automatically translated to the other screen, saving you valuable time and effort.

You can measure the unaided response and four different aided responses in the Insertion Gain screen. This lets you compare four different insertion gain responses to the real-ear target.

The patient's thresholds, uncomfortable levels, and real-ear target are all displayed together in the SPL screen. You can take up to four different aided measurements to make sure that soft speech is above the patient's threshold values, average speech meets the target, and loud sounds are below the uncomfortable levels. Thus, the SPL screen gives you a great picture of the dynamic range of the patient and the hearing aid.



COMPUTER COMPATIBILITY

The 7000 Test System comes standard with RS232 computer compatibility. This means that it can be used with all current FONIX software programs, including the FONIX NOAH Module, which gives it complete NOAH 3 compatibility. Other supported software products include WinCHAP and FONIX Press & Go. You can also develop your own custom software program for your own specific uses. Existing custom programs that have been used with the 6500-CX analyzer need only small changes for migration to the 7000

COMING SOON: DSL/NAL-NL1 fitting formulas.

FONIX 7000 HEARING AID TEST SYSTEM SPECIFICATIONS

ACOUSTIC DRIVE SIGNAL

Frequencies:	COMPOSITE: 200 to 8000 Hz in 100 Hz intervals TONE: 200 to 8000 Hz 1/12 oct, nearest 100 Hz intervals
Frequency Accuracy:	1%
Amplitude (RMS 5-dB steps)	
Chamber	COMPOSITE: 40 to 100 dB SPL; TONE: 40 to 100 dB SPL
Sound Field	COMPOSITE: 40 to 90 dB SPL; TONE: 40 to 90 dB SPL
Amplitude Accuracy (All Modes, M1950E only)	Within 1 dB from 300 to 5000 Hz, all others within 3 dB; after leveling

CREST FACTOR

Composite Mode Signal: Less than 12 dB (4 to 1 ratio of peak to RMS value).

TELECOIL DRIVE

1, 1.78, 3.16, 5.62, 10, 17.8, 31.6, 56.2, 100 mA/meter
ANSI S3.22

DIGITAL READOUT OF SOUND PRESSURE LEVEL

Frequency Range:	200 through 8000 Hz.
Amplitude Range:	From 0 through 150 dB (-90 through +110 dB gain).
Resolution:	0.1 dB.
Type:	True RMS.
Accuracy (M1950E only):	Within 1 dB plus or minus 1 digit from 300 to 5000 Hz; within 2 dB plus or minus 1 digit for all other frequencies.
SPL Equivalent Input Noise:	Less than 50 dB RMS (M1950E only)
Noise Reduction:	Averages the measured signal in synchronism with the signal generator by the factor chosen. Factors of 2, 4, 8, and 16 available. Random noise will be reduced by an amount equal to the inverse of the square root of the factor chosen.

SPECTRUM MODE AVERAGING

Spectral averaging: off, 2,4,8 and 16.

BATTERY CURRENT MEASUREMENT

Range:	0 to 25 mA.
Accuracy:	Within $\pm 3\%$ of full scale.
Resolution:	0.01 mA.
Voltages supplied:	1.5 (silver), 1.3 (zinc air). ANSI S3.22-1996.

HARMONIC DISTORTION ANALYZER

Type:	Selectable for 2nd, 3rd, Total (2nd plus 3rd), or none.
Resolution:	0.1 percent.
Reading:	Percent (%) with respect to fundamental. Single frequency readings made at 100-Hz intervals from 200 through 2600 Hz. Sweep readings made at 100 Hz intervals from 400 through 1900 Hz.

ATTACK/RELEASE TIME

Range:	1.25 to 5000 mSec.
Accuracy:	$\pm 10\%$ or 2 mSec + Resolution, whichever is larger.
Resolution:	2000-8000 Hz: 1.25 mSec; 800-1600 Hz: 2.5 mSec; 400, 500 Hz: 5 mSec. 100 to 300 Hz and Composite: 10 mSec.
Available Test Modes:	ANSI 96, ANSI 87, ANSI 03, Attack & Release screen
Signal Durations:	ANSI 87: 2000 mSec ANSI 03/ANSI 96: variable (500 to 5000 mSec) Attack & Release Screen: 200-8000 Hz in 100 Hz intervals

TEST SEQUENCES

Choose ANSI, IEC, or JIS as part of standard package. Added charge for additional test sequence.
ANSI 3.22 (87/96/03); ANSI S3.42-1992
IEC EN60118-7 1993

FEATURES

Group Delay and Phase Measurement
Battery Current Measurement
Coupler Multi-Curve
RS232 Function

AVAILABLE SIGNALS

Composite, Puretone, Digital Speech

OPTIONS

Real Ear Measurement (7000 Quik-Probe), additional test sequence, VA CORFIG, MZ coupler.

PRIMARY POWER

100-240 VAC 50/60 Hz. Power requirement is 50 VA.

ELECTRONICS MODULE

Color:	Blue module case, white front panel and gray bezel
Size:	17.4"W x 6.5"H x 14.6"D (44.2 x 16.5 x 37.1 cm).
Weight:	17 lbs.(7.7 kg).

PRINTER, INTERNAL

Type:	High speed line thermal printer
Paper width:	4.41" (112 mm)
Print speed:	80 mm/ s

PRINTER, EXTERNAL (printer not provided)

Port:	25 pin D, female
Type:	HP compatible, Epson Stylus series
Language:	HPCL3 and ESC-P/2

TEST CHAMBER

Type:	FONIX FC 7020
Test Area:	7"x 7.5"x 1.5 deep (17.8 x 19.1 x 3.8cm).
Internal Acoustic Reflections:	SPL at test point will change less than 3 dB above 1 kHz, when lid is raised (w/o feedback compensation).
Ambient Noise Isolation:	45 dB at 1 kHz (allows THD measurement to within 3% at 60 dB source level and a 60 dB ambient). Gray with black trim. Black and white test area.
Color:	13.5"W x 18"H x 11.5"D (34.3 x 45.7 x 29.2cm).
Size:	36 lbs. (16.3 kg).
Weight:	

SHIPPING, INTERNATIONAL

Total Shipping Weight with Quik-Probe Option:	97 lbs. (45 kg)
Total Shipping Weight without Quik-Probe Option:	77 lbs. (35 kg)

STANDARD ACCESSORIES

FONIX M1950E Low Noise Microphone:	14 mm diameter, pressure type Electret with add-only memory chip. 149 dB maximum SPL.
Microphone Adapter:	(044-1006-01) 14mm to 1" (25 mm).
HA-1 Coupler:	(044-1003-03) Dimensions per requirements of ANSI S3.7-1995 for testing all-in-the-ear aids and earmolds.
HA-2 Coupler:	(044-1001-04) Dimensions per requirements of ANSI S3.7-1995 for testing ear level, eyeglass and body aids.
Ear Level Adapter:	(044-1007-00) Per requirements of ANSI S3.22 for adapting ear level aids to the HA-2 coupler.
Sound Chamber Cable:	(119-0204-07)
Battery Pills	#13: (059-2005-02) #675/76: (059-2004-02) #312: (059-2006-02) #10A/230: (059-2010-01). All with 12" cables—24" cables available upon request.
Roll of printer paper	(026-0006-00)
Operator's Manual:	(010-0019-00)

OPTIONAL ACCESSORIES

Video Display Monitor:	(058-0077-00) VGA, flat panel, 15", color. Shipping weight: 21 lbs (10 kg).
6 CC Coupler:	(044-1004-03) NBS 9A, for checking audiometer headphones.
Test Chamber Stand:	(030-1002-04) Tubular steel stand which brings the testing area or the test chamber to convenient table height. Blue color.
Quest QC-10 Sound Level Calibrator:	(030-0004-00) For calibration of microphone amplifier. 1 kHz, 114 dB SPL.
Telewand:	(043-1053-00) For checking response of aids in "telephone" mode. ANSI S3.22.
Telecoil Induction Loop:	(120-1002-00) For checking hearing aid response to a magnetic loop field.
Battery Pills:	#AA: (059-1011-00); #41: (059-2009-02); #5: (059-2008-01). All with 12" cables—24" cables available upon request)
Maintenance Manual:	(010-0020-00) On request at time of purchase.

SAFETY

Electronics module conforms to IEC 60601-1

GUARANTEE

The FONIX 7000 and its accessories are guaranteed to be free from manufacturing defects which would prevent the products from meeting these specifications for a period of one year from date of purchase.



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