

Product List

Release February 2012

AUDIOMETER: AM13 FreeQuency PC based Diagnostic AM13 FreeQuency PC based Clinical

MIDDLE EAR ANALYZER: A756 Diagnostic A766 Clinical resonance

Resonance, a new MRS brand for Audiology, introduces the **AM13 FreeQuency type 3**, ideal for Hearing Centers, Hearing Aid Fitting, Industrial Audiometry and traveling professionals looking for great mobility and accessible price with the best price/performance ratio. The **Resonance line** includes also middle ear analyzers and new exciting products that will be coming soon.

AVAILABLE TESTS

AC - BC Audiometry Pure tones and Warble, continuous and pulsed, with NBN and WN masking. UCL tests included.
AC - BC Speech Ext1 and Ext2 inputs. Built-in Speech lists
Synchro Synchronous masking
Lock Simultaneous presentation of CH1 and CH2 signals
FF outputs Binaural - Stereo for all test signals
Automatic Autothreshold test

Accuracy of test results is guaranteed by silent controls. Just position the mouse on function controls to activate the function, without any hint to the patient. Rapid PC keys set frequency and intensity levels, saving precious test time.

AM13 FreeQuency interface

Audiometry with programmable parameters

AC, BC and UCL curves are displayed. Right and Left audiograms can be displayed in single frame.



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Speech Audiometry with programmable parameters

AC, BC and FF Speech testing can be performed in several languages, embedded in AM13 program.



AM13 FreeQuency

PC based two channel diagnostic type 3 audiometer, portable, compact easy to use



AUDIOMETRY PROGRAMMABLE FUNCTIONS

- Frequency range from 125 to 8000 Hz
- dB steps: 1, 2 or 5 dB
- Signal mode (continuous or pulsed)
- Type of masking (NBN or WN), synchronous masking
- Interlock between channels
- Audiogram display (two frames or single frame).
- SPEECH AUDIOMETRY PROGRAMMABLE FUNCTIONS
- Stored speech calibration automatically active
- dB steps: 1, 2 or 5 dB
- Type of speech list and language
- Type of masking (WN or SN), synchronous masking
- Interlock between channel

SPEECH AUDIOMETRY SPECIAL FEATURES

- Speech calibration is permanently stored
- Presented speech items are displayed.
- SRT values displayed in dB HL and in dB SPL.
- Special functions for difficult to test patients:
 - TIME INTERVAL between speech items,
 - WAIT before presenting the next word,
 - PAUSE whenever needed for patient comfort
 - REPEAT whenever asked by patient.

AUTOTHRESHOLD

• Automatic audiometry according to Hughson-Westlake method controlled by patient switch

AM13 FreeQuency characteristics

SPECIFICATIONS

Outputs	AC	BC	FF		
Pure tone and Warble					
Frequency range, Hz	125-8000	250-6000	250-8000		
Signal mode	continuous & pulsed (0.5, 1 and 2 H				
dB steps	1-2-5	1-2-5	1-2-5		
Maximum output	120 dB HL	80 dB HL	95 dB HL		
Pure tone masking noises					
NBN Maximum output	95 dB EM	100 dB	95 dB EM		
WN Maximum output	90 dB EM	90 dB EM	95 dB EM		
Speech Audiometry					
Speech max. output	105 dB HL	60 dB HL	90 dB HL		
Speech masking noises					
WN&SN max output	90 dB EM	90 dB EM	95 dB EM		

Weight / Dimensions				
Net weight	350 grams - 9.4 ounces			
Dimensions, cm	14 w - 16,2 d - 3.5 h			
Dimensions, inches	5.6″ w - 6.4″ d - 1,4″ h			
Standards				
Audiometer type	Type 3 (EN 60645-1 and ANSI 3.6)			
Audiometry	EN 60645-1, EN 60645-2, ANSI S3.6, EN ISO 389, EN ISO 389-7			
Safety	EN 60601-1 Class 2 Type BF - EN 60601-1-1			
EMC	EN 60601-1-2			
Audiometer code number				
4300100820	includes all accessories & the DVD			

STANDARD ACCESSORIES



Windows® operating systems

AM13 audiometers operate with Noah® compatible modules and KIS stand alone program, with following OS:

ations are subject to change without notice

- W7 x 32 bits and x 64 bits,
- Vista SP1XP SP3

Note: the PC is not included with the device PC MINIMUM CHARACTERISTICS PC: Pentium IV 1.7 GHz or equivalent Ram: 512 Mb Video resolution: 1024 x 768 USB port: 2, type 1.1/2 Audio output for headphones QUALITY SYSTEM:

EN ISO 9001: 2008 and EN ISO 13485:2003.

Compliance with European Community Directive MDD 93/42 EEC, Class IIa device	M.R.S. s.r.l. is certified ISO 9001:2008 and ISO 13485:2003
660434	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 13485:2003 = COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 = 70909-2010-CE-ITA-NA

M.R.S. S.r.l. - via C. Battisti, 134 - 24025 Gazzaniga (BG) - Italy - +39 035 712091 - mrselectronics.it

MPE resonance

Resonance, a new MRS brand for Audiology, introduces the **AM13 FreeQuency type 2**, ideal for Hearing Centers, Hearing Aid Fitting, Industrial Audiometry and traveling professionals looking for great mobility and accessible price with the best price/performance ratio. The **Resonance line** includes also middle ear analyzers and new exciting products that will be coming soon.

AVAILABLE TESTS

AC - BC Audiometry Pure tones and Warble, continuous and pulsed, with NBN and WN masking. UCL tests included. AC - BC Speech Ext1 and Ext2 inputs. Built-in Speech lists Synchro Synchronous masking Lock Simultaneous presentation of CH1 and CH2 signals FF outputs Binaural - Stereo for all test signals ABLB Fowler test for Recruitment testing Automatic Autothreshold test Communication Talk-forward -Talk-back function; Operator Monitor phones with built-in boom microphone

Accuracy of test results is guaranteed by silent controls. Just position the mouse on function controls to activate the function, without any hint to the patient. Rapid PC keys set frequency and intensity levels, saving precious test time.

AM13 FreeQuency interface

Audiometry with programmable parameters

AC, BC and UCL curves are displayed. Right and Left audiograms can be displayed in single frame.



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Speech Audiometry with programmable parameters

AC, BC and FF Speech testing can be performed in several languages, embedded in AM13 program.



AM13 FreeQuency

PC based two channel clinical type 2 audiometer, portable, compact easy to use



AM13 FreeQuency programmable functions and special features

AUDIOMETRY PROGRAMMABLE FUNCTIONS

- Frequency range from 125 to 8000 Hz
- Signal mode (continuous or pulsed)
- Type of masking (NBN or WN), synchronous masking
- AUTOTHRESHOLD: automatic audiometry according to Hughson-Westlake method controlled by patient switch
- Interlock between channels
- Audiogram display (two frames or single frame).

SPEECH AUDIOMETRY PROGRAMMABLE FUNCTIONS

- Stored speech calibration automatically active
- Type of speech list and language
- Type of masking (WN or SN), synchronous masking
- Interlock between channel

SPEECH AUDIOMETRY SPECIAL FEATURES

Speech calibration is permanently stored

- Presented speech items are displayed.
- SRT values displayed in dB HL and in dB SPL.
- Special functions for difficult to test patients:
 - TIME INTERVAL between speech items,
 - WAIT before presenting the next word,
 - PAUSE whenever needed for patient comfort
 - REPEAT whenever asked by patient.

ABLB - FOVVLER TEST

- Four ladder-grams simultaneously displayed
- Loudness balance graphic for up to 4 recorded frames
- Alternated rate: $0.\overline{5}$, 1, 2 Hz for all the frequency

COMMUNICATION WITH PATIENT

• Operator Monitor with microphone, Talk-forward and Talk-back functions.

AM13 FreeQuency characteristics

SPECIFICATIONS

Outputs	AC	BC	FF		
Pure tone and Warble					
Frequency range, Hz	125-8000	250-6000	250-8000		
Signal mode	continuous & pulsed (0.5, 1 and 2 Hz)				
dB steps	1-2-5 1-2-5		1-2-5		
Maximum output	120 dB HL 80 dB HL		95 dB HL		
Pure tone masking noise	ès				
NBN Maximum output	95 dB EM	100 dB	95 dB EM		
WN Maximum output	90 dB EM	90 dB EM	95 dB EM		
Speech Audiometry					
Speech max. output	105 dB HL	60 dB HL	90 dB HL		
Speech masking noises					
WN&SN max output	90 dB EM	90 dB EM	95 dB EM		
Talk Over					
Output levels	from 70 to 1	10 dB SPL			
Weight / Dimensions	;				
Net weight	350 grams - 9.4 ounces				
Dimensions, cm	14 w - 16,2 d - 3.5 h				
Dimensions, inches	5.6″ w - 6.4″ d - 1,4″ h				
Standards					
Audiometer type	Type 2 (EN 60645-1 and ANSI 3.6)				
Audiometry	EN 60645-1, EN 60645-2, ANSI S3.6, EN ISO 389, EN ISO 389-7				
Safety	EN 60601-1 Class 2 Type BF - EN 60601-1-1				
EMC	EN 60601-1-2				
Audiometer code number					
4300100840	includes all accessories & the DVD				

STANDARD ACCESSORIES



Windows[®] operating systems

AM13 audiometers operate with Noah® compatible modules and KIS stand alone program, with following OS:

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- W7 x 32 bits and x 64 bits,
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Note: the PC is not included with the device PC MINIMUM CHARACTERISTICS PC: Pentium IV 1.7 GHz or equivalent Ram: 512 Mb Video resolution: 1024 x 768 USB port: 2, type 1.1/2 Audio output for headphones QUALITY SYSTEM:

EN ISO 9001: 2008 and EN ISO 13485:2003.

Compliance with European Community Directive MDD 93/42 EEC, Class Ila device	M.R.S. s.r.l. is certified ISO 9001:2008 and ISO 13485:2003
0434	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 13485:2003 = COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 = 70909-2010-CE-ITA-NA

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resonance



3T01 A756 data sheet specifications October 2011

- Automatic Tympanometry
- Reflex: fixed intensity, Threshold and Growth
- Three automatic test sequences, user-programmable
- Two probe systems: handheld (HH) and headband (HB)
- Two in one with both probes: HH for children and HB for adults
- Ideal for centers: screening and diagnostic impedance testing
- Easy rapid testing with full patient comfort
- Internal memory for patient tests

A756 Screening

Automatic middle ear analyzer portable, compact and easy to use

Resonance A756 Screening

TWO PROBE SYSTEMS

• Lightweight handheld probe (HH), especially designed for screening, allows remote selection of probe ear.

• Headband probe (HB) is well suited for adult diagnostic application. The handheld probe can be supplied as optional.

TYMPANOMETRY

• The AGC ensures the same probe tone level independently

of the sealed cavity volume.

• The A756 continuous airflow system ensures perfect sealing also in difficult to test patients, such as children. This compensates for intermittent seal at start and during test, and avoids time-consuming resetting.

• In AUTO mode, the digitally controlled pump system, operating at high speeds, gradually changes to slower speed to ensure maximum resolution at tympanogram peak.

ACOUSTIC REFLEX PLUS REFLEX GROWTH

- Three test modalities: fixed intensity, threshold and growth
- \bullet 5 pure tone frequencies: 0.5, 1, 2, 3 and 4 k Hz
- Threshold detection in 5 or 10 dB steps
- Reflex Growth: user-programmable from keyboard in 1 dB step from 1 to 10 dB
- Automatic reflex detection through algorithms based on reflex characteristics (latency, amplitude and duration).

AUTOMATIC TEST SEQUENCES

- Test 1: tympanogram and reflex threshold at 1000 Hz
- Test 2: tymp and fixed intensity reflex (all frequencies)
- Test 3: tymp and reflex threshold (all frequencies)

Test parameters can be customized and permanently saved.

FREEDOM TO CONCENTRATE ON PATIENT

Ease of operation and maximum flexibility are the major success of design. The operator is free to concentrate on patient comfort and on running accurate tests without wasting precious time.

FAST DIRECT USER-CUSTOMIZED TESTING

Expediting operation has been one of the major targets of design. The joystick allows the operator to change parameters in no time, still maintaining fully automatic recording of the customized test.

AMPLE LCD AND BUILT-IN PRINTER

Graphics and test results are displayed in real time on LCD and printed by the built-in high-resolution printer.

DATA STORAGE AND TRANSFER

- 1. Internal memory up to 14 patients: all tests, both ears.
- 2. Data transfer to NOAH compatible module, either on-line or deferred.

Technical Specifications

A756 DIAGNOSTIC MIDDLE EAR ANALYZER:

Type 2 Diagnostic (EN 60645-5 - ANSI S3.39) TESTING PROTOCOLS

Tympanometry: absolute and compensated. Automatic measure of Gradient in amplitude (ml) and width (daPa)

Reflex: Fixed intensity and Threshold, ipsi and contralateral Reflex Growth, automatic, ipsi and contralateral Sequential tests: user-programmable parameters

TYMPANOMETRY

Frequency: 226 Hz \pm 1% Probe tone level: 85 dB SPL \pm 2 dB AGC: automatically adapts probe tone level to patient cavity volume AIR PRESSURE

Pressure changes: automatic

Range: +200 to -400 daPa or +100 to -200 daPa Safety limits: +600 to -800 daPa Speed: 300, 200, 100, 50 daPa/s and AUTO (50 daPa/s at tymp peak) Accuracy: ± 5% or ± 10 daPa whichever is greater COMPLIANCE Range: from 0.2 to 5.0 ml

Compensated tymp: automatic, 1.5 or 2 ml Ear Canal Volume: automatic measure Gradient: automatically measured both in ml and in daPa Accuracy: \pm 5% or \pm 0.1 ml whichever is greater FUNCTIONS

Automatic AutoRun once probe has been sealed on test ear Probe ear selection from handheld probe Start/Stop mode: user-programmable, from keyboard and footswitch

ACCESSORIES

Printer High Resolution	built-in	Power cable	included
Handheld probe/insert phone	one included, other optional	Footswitch	optional
Headband probe/TDH phone	depending on ordered model	Rolls of recording paper	included
Assorted ear tips	included	Soft Carrying bag	optional
Calibration cavity	included	Instr. manual, multilingual	included

ACOUSTIC REFLEX STIMULI

Frequencies: 500, 1000, 2000, 3000 and 4000 Hz, ± 1% Ipsi and Contra - User selectable from keyboard Intensity range: from 50 dB to maximum output, in 5 dB steps.

Maximum	Handheld probe		Headband probe	
output level	lpsi	Contra	lpsi	Contra
frequencies	dB eq HL	dB eq HL	dB eq HL	dB HL
500 Hz	100	100	100	115
1000 Hz	100	110	100	120
2000 Hz	100	110	100	120
3000 Hz	100	110	100	120
4000 Hz	95	100	95	120

GENERAL INFORMATION

- Printer: built-in thermal printer with 112 mm paper width
- Cabinet: shock-absorbing ABS
- Power Supply: 110÷ 240 Vac, 60/50 Hz
- Consumption: maximum 40 VA
- Warm-up time: 10 minutes
- Dimensions (I x w x h): 37 x 29 x 18 cm; 14 x 11 x 7 inches
- Weight: 3.5 kg 7.7 lbs.
- STANDARDS

Impedance: EN 60645-5 and ANSI S3.39

Safety: EN 60601-1 Class 1 Type B (1990); EN 60601-1-1 EMC: EN 60601-1-2

QUALITY SYSTEM: EN ISO 9001: 2008 AND EN ISO 13485:2003

Compliance with European Community Directive MDD 93/42 EEC, Class Ila device	M.R.S. s.r.l. is certified ISO 9001:2008 and ISO 13485:2003
CE 0434	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 13485:2003 = COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 = Z0000:2010.CEJTA.NIA





- Tympanometry: automatic and manual pump
- ETF: Intact and perforated tympanic membrane, and Valsalva Maneuver
- Reflex: Fixed frequency, Threshold, Growth, Decay and AR Latency
- Quick Tests: Automatic sequence of Tymp and Reflex tests, from babies to adults
- Special reflex tests: D.L.I. Reflex Growth and Non Acoustic Reflex Tests

A766 Clinical

Middle Ear Analyzer Manual and Automatic with built-in manual pump

DISPLAY OF TEST RESULTS FOR RAPID COMPARISON

The A766 offers the diagnostic advantage of immediately comparing the results of the tests performed in the two ears, such as Tympanometry, ETF, acoustic reflex tests and all other provided tests.



A MOST COMPLETE AND USER - FRIENDLY BATTERY OF TESTS

The A766 offers a most complete battery of tests. This allows designing the test strategy best suited for the individual patient, from rapid screening to clinical tests, to functional investigation on acoustic and non acoustic reflex, the latter evoked by non acoustic stimuli. The extreme flexibility of the A766 program allows performing an additional ETF test in intact TM subjects, the "Valsalva maneuver" that consists in the forced expiratory effort with closed nose and mouth to inflate the Eustachian tubes and the middle ears, useful to study the ability to compensate sudden pressure increases. The parameters can be modified during test session without permanently saving them. The user - programmable parameters can also be customized and permanently saved.

TYMPANOMETRY - MANUAL AND AUTOMATIC

Automatic Tymp pressure range and velocity are user-programmable; they can be modified and saved.

Manual Tymp allows storing tympanogram peak to perform manual reflex tests.

ETF - EUSTACHIAN TUBE FUNCTION

Two test menus: Intact TM (Williams automatic test) Perforated TM test with cursors to measure opening pressure, closing pressure and residual pressure.

QUICK AUTOMATIC TEST IN RAPID SEQUENCE

Two test menus:

Quick Check: Tymp and 2 reflex thresholds (I and C) Quick Screen: Tymp and 8 reflex thresholds (I and C) Quick Decay: Tymp, 8 reflex thresholds and Decay (I/C) The user-programmable test menus can be modified and permanently saved.

ACOUSTIC REFLEX TESTS

Ipsi and contra reflexes are evoked by pure tones (5 frequencies) and noises (BBN, LPN and HPN). **AR 4 menus**: manual, automatic, threshold and growth

Decay 3 menus: manual, automatic, threshold and growth Decay 3 menus: manual, automatic and threshold

ACOUSTIC REFLEX LATENCY

Manual and automatic, Ipsi and contra recording.

- Automatic subtraction of system delay

- Cursors available to measure reflex onset latency, rise time and amplitude.

SPECIAL TESTS

10 seconds recording of AR and non acoustic reflex.

DLI: the train of 10 increments over carrier tone (even below AR threshold) enhances reflex growth.

Non Acoustic: such as tensor tympani reflex elicited by tapping, air-puff and other stimuli.

Resonance A766 important unique features

MANU AL GRo WTH TEST

ZOOM on reflex during testing and off-line enhances clinical information on reflex characteristics.

- Note reflex growth:
- Ipsi (left of figure)
- Contra (right of figure)

AUTOMATIC D.L.I.

The 10 increment train (of 1, 2, 5 and 10 dB) over carrier tone, even below reflex threshold, enhances the growth of the acoustic reflex, recorded in 10 seconds.

WILLIAMS TEST

Tympanograms are numbered according to recording sequence. The results indicate, for each tympanogram, the PEAK amplitude, in ml, and the PRESSURE, in daPa, indicative of the patient ability to compensate.

ETF - VALSALVA

The maneuver induces a sudden pressure change in the middle ear and the Eustachian tube. The free run test displays the patient ability to compensate.

TyMP + I - C REFLEX

After the tympanogram ipsi and contra reflex thresholds are recorded in sequence: 8 reflexes for each ear. Display of results includes: R and L tympanograms and reflexes recorded in the two ears.





ETF - INTACT MEMBRANE AUTOMATIC TEST



SPECIAL TESTS - VALSALVA MANEu VER IN INTACT TM



QuICk SCREENING - QUICk AUTO MATIC SEQUENTIAL TEST



zoo MoNRECoRDED REFLEX

Resonance A766 specification

A766 CLINICAL

is a type 1 middle ear analyzer (EN 60545-5 and ANSI S3.39) TYMPANOMETRY

- Absolute and compensated
- Frequency: 226 Hz \pm 2%
- Probe tone level: 85 dB SPL \pm 2 dB
- Gain Control: AGC

PRESSURE

- Pressure changes: manual and automatic
- Range: +400 to -600 daPa programmable in 50 daPa Steps
- Safety limits: +600 to -800 daPa
- Velocity: 300, 200, 100, 50 daPa/s and AUTO
- Accuracy: \pm 5% or \pm 10 daPa whichever is greater

COMPLIANCE

- Range: from 0.2 to 5.0 ml
- Compensated Tympanometry: automatic, 1.5 or 2 ml
- Ear Canal Volume: automatic measure
- Gradient: automatic in ml
- Accuracy: \pm 5% or \pm 0.1 ml whichever is greater

RUN MODE - USER PROGRAMMABLE

- AutoRun: automatic once probe has been sealed on test ear
- Start/Stop mode: user-programmable, from keyboard and footswitch
- Probe ear selection from handheld probe

ACOUSTIC REFLEX STIMULI

- Frequencies: 0.5, 1, 2, 3 and 4 kHz, ± 1%
- Ipsi, Contra and Ipsi/Contra user programmable
- Intensity range: from 50 dB to maximum output, in 1, 2, 5 and 10 dB steps
- dB increments (AR growth tests):1, 2, 5 and 10 dB MAXIMUM OUTPUT LEVELS

Stimuli	Handheld probe		Headband probe	
	dB Ipsi	dB Contra	dB Ipsi	dB Contra
500 Hz	100	110	100	115
1000 Hz	110	110	110	120
2000 Hz	110	110	110	120
3000 Hz	105	110	105	120
4000 Hz	100	100	100	120
BBN	100	105	100	115
LPN	100	105	100	115
HPN	100	105	100	115

STANDARDS

- Aural Acoustic Admittance: EN 60545-5 and ANSI S3.39
- Audiometry: EN 60645-1, ANSI S3.6 and EN ISO 389
- Safety: EN 60601-1 Class 1 Type B; EN 60601-1-1
- EMC: EN 60601-1-2

STANDARD CONFIGURATIONS AND ACCESSORIES

- A766 with handheld probe and insert phone for contralateral reflex
- A766 with headband probe and TDH49 phone for contralateral reflex
- Set of ear-tips fitting from children to adults
- Block with 3 compliance calibration cavities
- Shock absorbing ABS cabinet
- LCD 640x200 pixels back lighted
- Built-in high resolution thermal printer (112 mm paper width)
- Built-in parallel interface for external printer and printout format protocol for PLC5 language compatible
- Built-in serial ports: RS232 and USB
- Dust cover
- Power supply cords (110÷240 Vac, 60/50 Hz)
- Spare fuses
- Operator Instruction Manual

OPTIONAL ACCESSORIES

- Footswitch
- Second optional probe system: the A766 automatically recognizes the connected probe, either handheld or headband. It can thus operate with both probe systems.
- Service Manual (on demand)
- External printer: PCL5 language compatible (local purchase recommended)

POWER SUPPLY

- Power Supply: 110÷240 Vac, 60/50 Hz
- Consumption: maximum 40 VA
- Warm-up time: 10 minutes

STORAGE - TRANSPORT - OPERATION

- Storage/transport temperature: -20°C to +50°C; -4°F to +122°F

cations are subject to change without

- Operating temperature: +15°C to +35°C; +60°F to +95°F
- Operating relative humidity: 30% to 90%. non condensing

DIMENSION - WEIGHT

- Dimensions (L x W x H): 37 x 29 x 18 cm; 14"x11"x7" - Weight: net 3.5 Kg - 7.7 lbs

