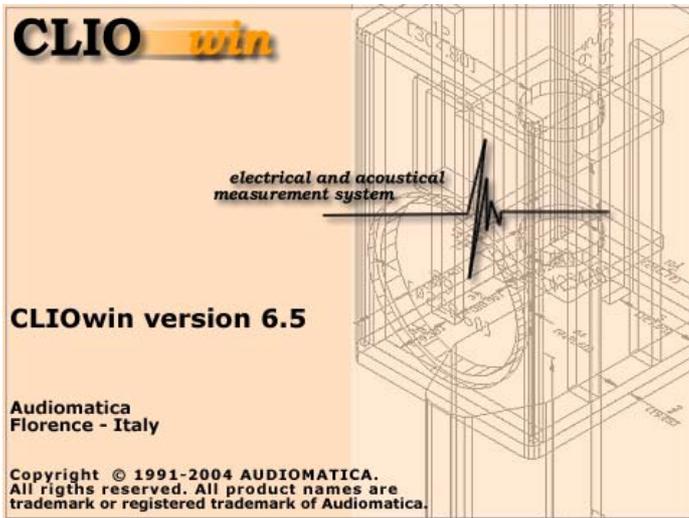


***Turns your PC into the most complete easy-to-use electrical and acoustical measurement system ....***



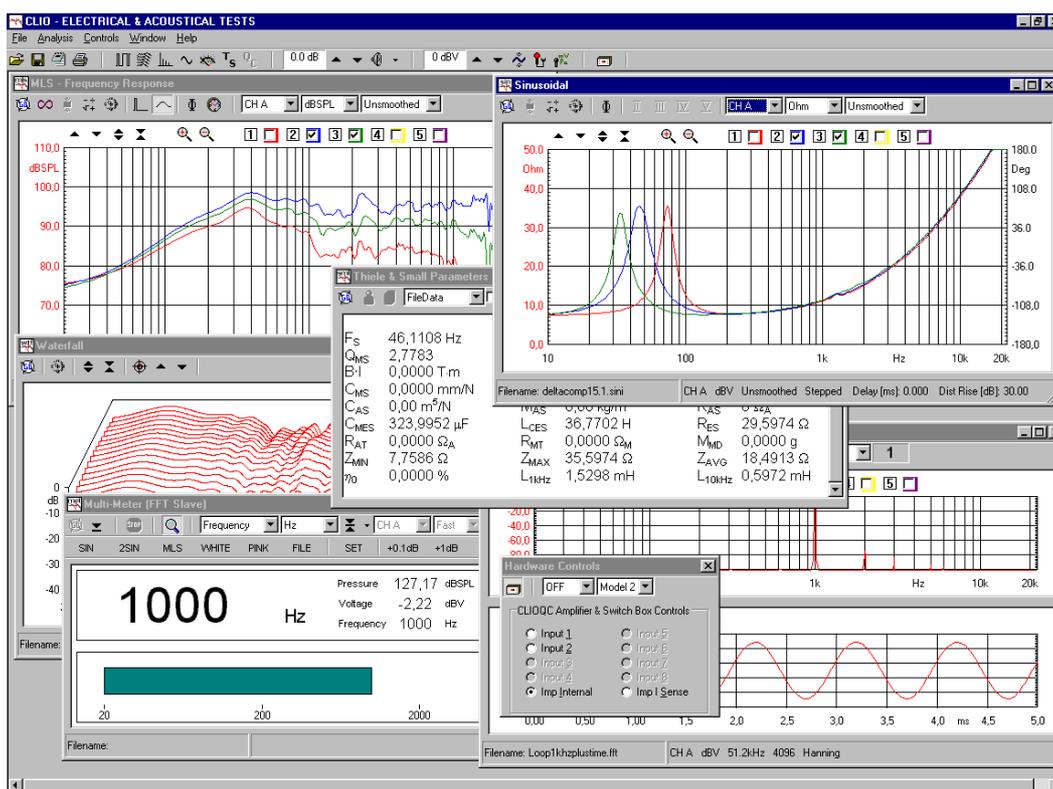
■ CLIOwin 6.5, by Audiomatica, is the latest measurement software for the CLIO System. It gives an unprecedented power and flexibility to this complete and reliable electro-acoustic measurement system. CLIO is the easiest and less expensive way to measure:

- electrical networks
- electronic equipment
- loudspeaker systems
- telephones & hearing aids
- environmental noise
- rooms acoustics
- quality of production lines

You can start with - or upgrade to - CLIOwin 6.5 in three different ways:

- 1) If you need a limited but still powerful version, make your choice on **CLIOwin 6.5 Lite** with its unbeatable price.
- 2) If you need the full power of our laboratory grade professional package, choose **CLIOwin 6.5 Standard**.
- 3) If you are looking for an extra flexibility which is basic for testing and controlling a production line, adopt **CLIOwin 6.5 Quality Control**.

CLIOwin 6.5 runs on a standard PC-IBM or compatible computer driving the measurement card and accessory hardware supplied by Audiomatica; the power, precision and reliability of the resulting instrument is 100% warranted. CLIOwin 6.5 is far away from the "soundcards applications philosophy" which leaves to the user the responsibility for an hardware choice!



## ■ CLIOwin 6.5 MEASUREMENT TECHNIQUES

Compared to other measurement systems, CLIOwin concentrates the power of several different instruments into a single one. In fact, CLIOwin implements three different measurement techniques: **MLS** (Maximum Length Sequences), **Sinusoidal Sweeps** and **FFT Averaging**. While other instruments offer one single possible measurement choice, CLIOwin gives you three alternatives and permits moreover to view the physical phenomenon (i.e. frequency response) from three different points of view. The final result will be then validated by the consistency of these measurements: as any expert technician knows, this is the correct approach that should always be adopted. Relying on these measurement techniques, CLIOwin implements several interactive **control panels** and dedicated **post-processing**. You will be able to use a Sound Level Meter or a Frequency Counter having the possibility to generate any predefined stimuli while the RTA Display of the signal accumulates in background. As a speaker designer, you will discover that the real-time L-C-R Bridge and T&S Parameters Calculator will become two invaluable tools in your everyday work.

## ■ MLS ANALYSIS

CLIOwin takes great advantage of the well established MLS analysis technique: the system is stimulated with a pseudo-casual noise and then its **impulse response** is reconstructed, by means of sophisticated algorithms; it is the de-facto standard for accurate anechoic analysis and for room acoustics. The measurement is highly accurate and extremely fast to execute; the data recorded by the computer, can be instantly analyzed or stored for later post-processing. What MLS analysis gives you:

- Frequency response
- Phase response, minimum and excess.
- Group Delay
- Impedance measurement
- Step response
- Energy-Time curve (ETC)
- Schroeder reverberant decay (with fraction of octave filtering)

The actual software release permits, among other features, the following:

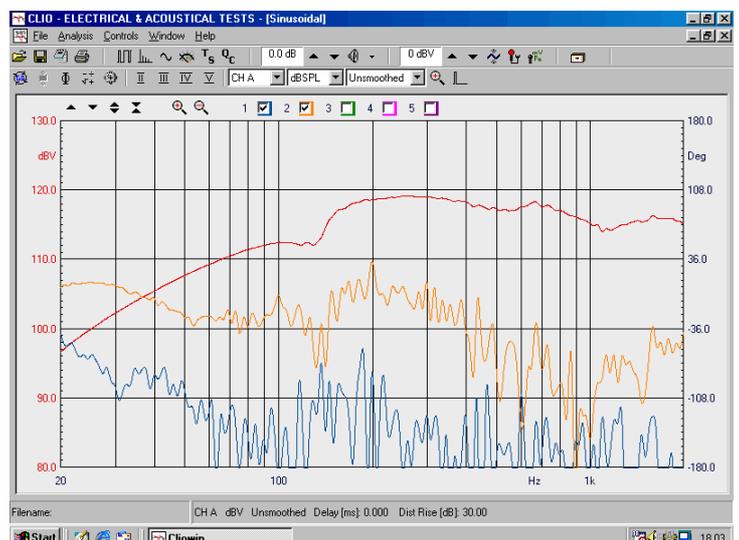
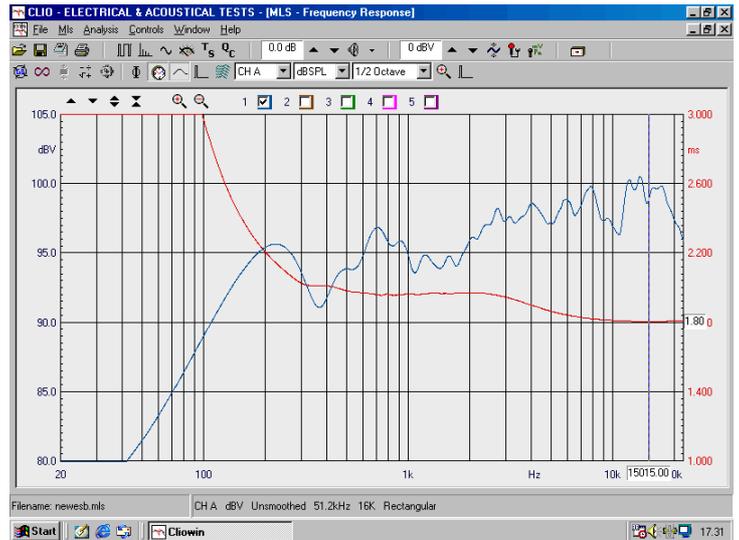
- Sequence length from 4k to 128k points
- Input signal autorange for optimum signal to noise ratio
- Selectable analysis window
- Manual or continuous programmable time average
- Loop function with continuous measurement refresh
- Mathematical operations on data in memory
- Automatic merge function between near and far field
- Selectable smoothing factor (from 1/2 to 1/12 of octave)

## ■ SINUSOIDAL ANALYSIS

CLIOwin executes sinusoidal analysis with a sophisticated digital filtering of input signal to achieve the highest noise-immunity; in this way you add the power of the PC to the most traditional frequency analysis.

The sinusoidal technique is oriented to:

- Frequency response
- Phase response
- Continuous and stepped sweeps
- Gating system with auto-delay for quasi-anechoic measurements
- 2nd, 3rd, 4th, 5th harmonic plot vs. frequency
- Impedance measurement
- Frequency resolution from 1/3 to 1/48 oct.

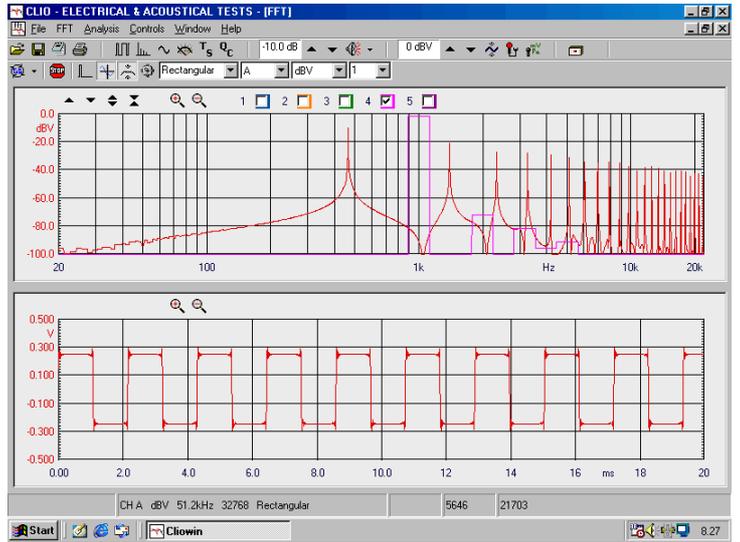


## ■ FFT ANALYSIS AND OSCILLOSCOPE

These measurements are implemented with an interactive control panel that permits the simultaneous display of time and frequency domains. The main features are:

- Two channels measurement and display
- Internal trigger with programmable delay
- FFT from 256 points up to 64k points
- Linear or exponential averaging
- Max hold and min hold functions
- Linear or logarithmic frequency axis
- 1/3 octave or 1/6 octave RTA display
- Linear or dB amplitude scale
- Alltone signals for real-time frequency response
- Multitone signals generation

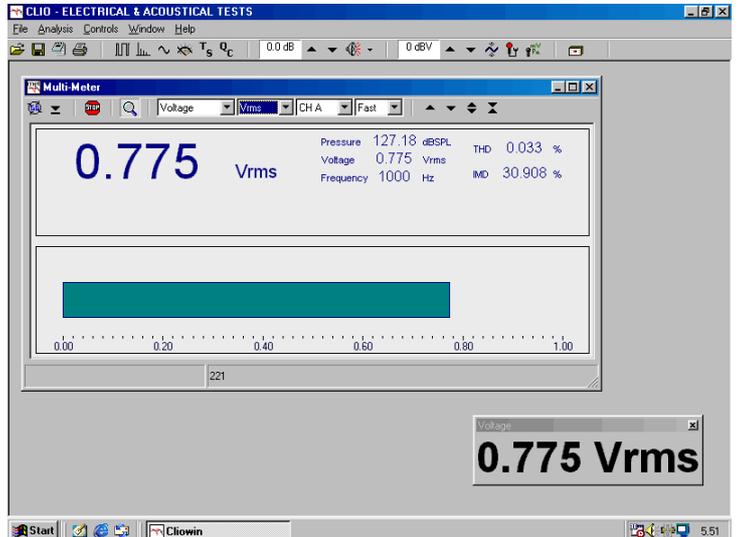
With FFT it is possible to easily execute bursted distortion measurements delivering, for a definable short period of time, very high power to the load.



## ■ THE MULTI-METER AND SIGNAL GENERATOR

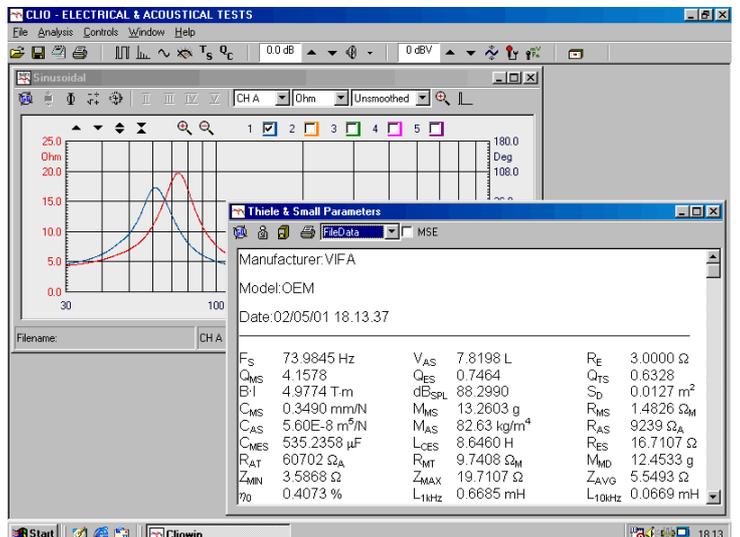
This control panel is a real-time, interactive, measuring instrument giving the following functionality:

- Sound Level Meter (dB SPL, dBA, dBC)
- Millivoltmeter (V, dBV, dBu, dBr)
- Frequency Counter (Hz)
- Distortion meter: THD and IMD (% , dB)
- L-C-R Bridge (H, uF, Ohm)
- Fast and Slow integration
- Generator stimulus control
- Generator amplitude control (0.1 dB steps)



## ■ IMPEDANCE MEASUREMENTS AND THIELE&SMALL PARAMETERS CALCULATOR

The impedance measurements can be done with a direct connection to the analyzing hardware or with an external amplifier and a sensing resistor both in constant current or constant voltage configurations; the procedure for the evaluation of speaker parameters uses the added-mass or known-volume methods and minimum square error routines.



## ■ WATERFALLS, POLAR MEASUREMENTS AND MORE...

The Waterfall post processing routines give CLIOwin the possibility of making 3-D plots adding a third dimension (usually time) to classical amplitude-frequency graphs. CLIOwin permits the following 3-D types of waterfall:

- Cumulative spectral decay (CSD)
- Energy Time Frequency (ETF)
- File display (used for polar representation)

## ■ EXTERNAL HARDWARE CONTROL

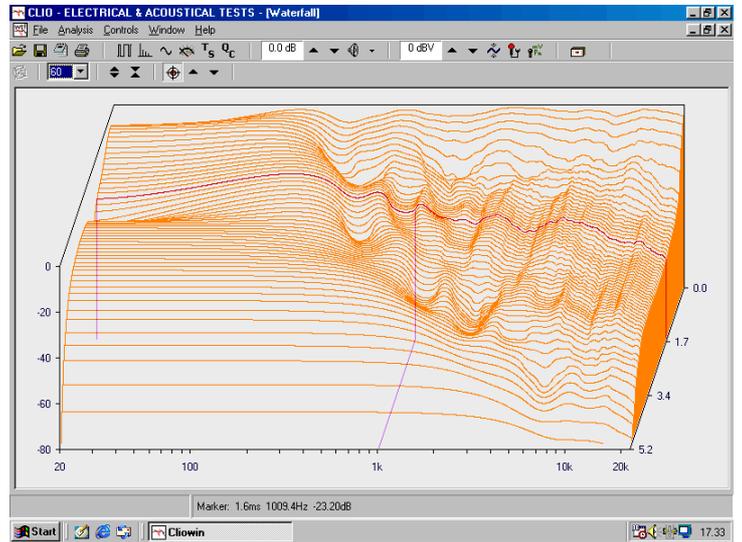
CLIOwin integrates the software control for external hardware:

- Model 1, 2, 3 and 4 Amplifier & SwitchBox
- Turntable
- General Purpose I/O bits

## ■ CLIOwin USER INTERFACE

The various control panels - result of Audiomatica's decennial experience in programming and audio measurements - give you the impression of facing a real instrument. The software displays multiple curves giving you powerful editing capabilities together import and export facilities as a link to simulation programs. The context-sensitive Help On-Line simplifies, even the first time, CLIOwin's use. Featuring:

- ASCII data output
- Color printing through any Windows printer
- Enhanced Metafile & Bitmap graphics export



## ■ LITE VERSION LIMITATIONS

- MLS
  - Size limited to 16k
  - Group Delay disabled
  - No Octave Filter Postprocessing
  - No MLS Impedance measurements
- No Waterfall
- Sinusoidal
  - No continuous sweep
  - No fourth and fifth harmonic display

- FFT
  - Only 1/3 Octave RTA measurements
- Multi-meter
  - No Frequency
  - No THD
  - No IMD
  - No Resistance
  - No Minimized and Display All modes
  - No dBA & dBC
- T&S Parameters
  - No MSE analysis

## ■ SYSTEM REQUIREMENTS

- Audiomatica PC Card (PB4281 or HR2000)
- Pentium processor @ 166MHz or better
- 32 MB RAM or more
- 800x600 256 color video or better
- Windows 95, 98, ME, 2000 or XP (PB4281)
- Windows 95, 98 or ME (HR2000)
- Internet Explorer 4.01 or more
- Adobe Acrobat Reader 4 or more



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# CLIO

ELECTRICAL & ACOUSTICAL TESTS