Agilent 8903B

Audio Analyzer, 20 Hz to 100 kHz

Product Overview

Versatile

The Agilent Technologies 8903B Audio Analyzer provides unparalleled versatility and performance for audio measurements from 20 Hz to 100 kHz. The 8903B combines the functionality of a high-performance distortion analyzer, frequency counter, ac voltmeter, dc voltmeter, and SINAD meter with a low-distortion audio source. This allows it to perform stimulus-response measurements, such as signal-to-noise ratio, automatically with no additional equipment.

Accurate

For accurate measurement of complex waveforms and noise, the analyzers use true-rms detection. Average (rms calibrated) and quasi-peak detection are also available via front panel control. Accurate distortion measurements can typically be made down to less than –90 dB (0.003%) between 20 Hz and 20 kHz. Over the same frequency range, flatness measurements are possible to 0.05 dB (0.5%). The analyzers precision reciprocal counter gives you fast, accurate characterizations of audio frequencies. For example, when counting a 1 kHz signal, the analyzers will be accurate within ±0.14 Hz.

Simple

For ease of use, most measurements are made with one or two keystrokes. The 8903B automatically tunes and autoranges for maximum accuracy and resolution. For quick identification of input signals, the analyzers count and display the input frequency in all ac measurement modes. The 8903B can also measure distortion of one signal while generating another frequency, because analyzer tuning and source frequency are independent.

Agilent Technologies

Innovating the HP Way

Features/Measurements	8903B
Audio Source	✓
50/600 Ω Output Impedance	✓
Fully Programmable	✓
Balanced Input	✓
Frequency Counter	✓
Distortion	✓
SINAD	✓
AC Volts	✓
DC Volts	✓
RMS/Average/Quasi-Peak Detection	✓
Plug-In Filters	✓
Distortion Level	✓
Signal-to-Noise	✓
Sweep	✓

Audio Applications

The Agilent 8903B Audio Analyzer makes your audio measurements fast and easy. It automatically tunes and autoranges for maximum accuracy and resolution. Distortion, frequency response, and ac and dc voltage measurements are only a single keystroke away. With a built-in low distortion audio source, the 8903B is ideally suited to stimulus-response applications. Microprocessor control of source and analyzer allows the 8903B to perform swept measurements.

Transceiver Tests

The 8903B is optimized for receiver testing. For SINAD measurements, extra filtering and smoothing circuits yield more accurate and repeatable results. With its built-in source, the 8903B makes signal-to-noise measurements on AM receivers using similar smoothing techniques. Transmitter testing is also easy. In conjunction with the 8901A, 8901B, or 8902A modulation analyzers, you can measure transmitter distortion, frequency response, and count squelch tones. The 8903B also provides the audio tones to modulate the transmitter.

ATE Systems

GPIB control of all measurement functions makes the analyzers valuable tools for ATE applications. These analyzers combine the power of a digital voltmeter, frequency counter, and distortion analyzer into one instrument. Since these functions are all available at one input connector, interfacing requirements, hardware costs, and software development time are reduced.

Audio Applications

The 8903B has many features which make difficult audio measurements easy. These include flexible data display formats, balanced analyzer input, plug-in filters, fully automatic notch filter tuning, and for the 8903B, convenient audio source control and swept measurements. Complete control over display formatting gives you a choice between volts, millivolts, dBm into 600 ohms, and watts for ac level measurements or percent and dB for distortion measurements. Using the ratio key, you can establish a reference in percent or dB and directly make frequency response and 3 dB bandwidth measurements with out computation.

Balanced Analyzer Input

In the quest for higher output power, many audio amplifiers use bridged output stages. Such amplifiers can be difficult to characterize because their outputs cannot be grounded. To test these devices, the usual approach has been to use a balanced, calibrated isolation transformer connected to an analyzer with an unbalanced input. Balanced inputs on the 8903B make transformers unnecessary. Simply float the analyzer input and connect the bridged device directly and you are ready to make measurements.

Choose the Filters for Your Applications

Internal plug-in filters simplify your audio measurements by providing weighting networks required by international standards. Among the filters available are the CCIR weighting filter, CCIR/ARM weighting filter, and the ANSI "A" weighting filter. In addition to these filters, both analyzers come with selectable 30 kHz and 80 kHz low-pass filters to reject unwanted out-of-band signals and noise.

Filters	Standard	Optional*
80 kHz Low-Pass	✓	
30 kHz Low-Pass	✓	
400 Hz High-Pass		✓
CCITT Weighting Filter		✓
CCIR Weighting Filter		✓
C-Message Weighting Filter		✓
CCIR/ARM Weighting Filter		✓
"A" Weighting Filter		✓

* These are plug-in filters; any two can be installed in either analyzer.

High-Performance Distortion Capability

Distortion measurements are fast and accurate. With a single keystroke, the analyzers count the input signal, autorange for maximum performance, and display the result. Typical time to return the first distortion measurement is 1.5 seconds with a measurement rate of two readings per second thereafter. Residual distortion and noise for the analyzer sections are specified to be less than –80 dB from 20 Hz to 20 kHz in an 80 kHz measurement bandwidth.

Simplicity in Stimulus-Response Testing

With its internal audio source and microprocessor, the 8903B performs swept frequency response, swept distortion, and signal-to-noise measurements automatically.

Making swept measurements with the 8903B is very easy. For example, to check the frequency response of an active filter, only a few steps are required. After connecting the device and setting the required source level, you need only to enter the sweep start and stop frequencies, and then press the sweep key.

Automatic Signal-to-Noise Measurements

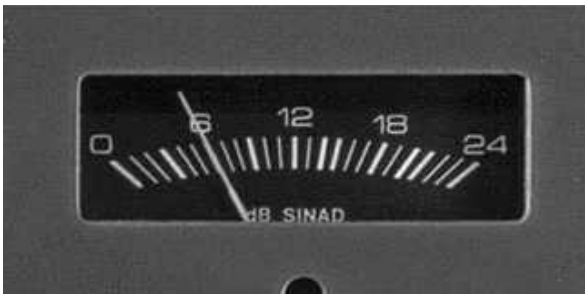
For signal-to-noise measurements, the 8903B monitors the ac input while turning the source on and off and displaying the ratio. With optional plug-in filters, you can perform weighted signal-to-noise measurements easily, accurately, and in real time.

Transmitter and Receiver Tests

The Agilent 8903B has several measurements and features which have been designed specifically for transceiver tests. These include SINAD measurements; optional plug-in weighting filters for testing to CEPT, EIA, CCIR, and Bell standards; rms detection for accurate noise readings; a reciprocal counter for measuring squelch tones; and signal-to-noise ratio measurements.

SINAD, Designed for the Real World

SINAD measurements, which are one of the most common FM receiver tests, must be made repeatedly when checking receiver sensitivity or adjacent-channel selectivity. In order to smooth out the noisy signals found in receiver testing, the analyzers' SINAD mode employs extra filtering circuits. These circuits have been optimized for high speed (more than two readings per second) and excellent repeatability. The 8903B overcomes the tendency of many automatic analyzers to become unlocked in SINAD mode by tuning its notch filter to the source frequency.



Optimized SINAD Display

To reduce digit flicker, the analyzers round off the display to the nearest 0.5 dB for SINAD ratios less than 25 dB. As an extra aid in reading noisy signals, the 8903B adds an analog SINAD meter which displays rations less than 24 dB.

Filters for Transmitter and Receiver Applications

With two internal filter positions and six optional plug-in filters to choose from, you can tailor the analyzers to fit your applications. The CCITT, CCIR, and C-message weighting filters meet international standard for receiver testing. For transmitter testing, a seven-pole 400 Hz high-pass filter is available to reject sub-audible squelch signals. Providing greater than 40 dB rejection of signals up to 250 Hz, the analyzers' 400 Hz high-pass filter allows you to measure transmitter audio distortion to 1% without disabling squelch signals.

ATE Systems

Accurate Signal Detection

In order to accurately characterize signals with high noise content, as found in receiver SINAD measurements, true-rms detection is required. The analyzers employ true-rms detection for all signals with crest factor less that three. In addition, average detection (rms calibrated) and quasi-peak detection (CCIR 468-4) are also available via front panel control.

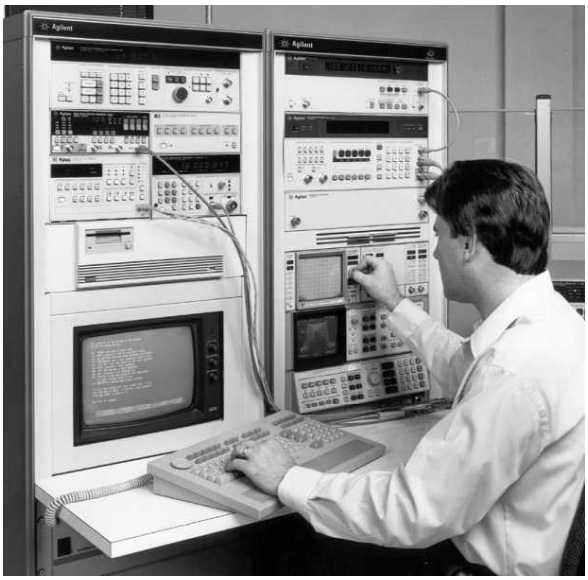
Generate and Count Tone Bursts

Under GPIB control, the analyzers use their reciprocal counters to count tone-burst sequences. Maximum count rate for the Rapid Frequency Count mode is six milliseconds per reading. With the 8903B, you can generate tone burst sequences. Minimum tone duration is three milliseconds, which is fast enough for such applications as unsquelching pagers.

Signal-to-Noise Ratio for Receivers

Just as SINAD measurements are most often performed on FM receivers, signal-to-noise ratio measurements are usually employed as a measure of signal quality on AM receivers. The 8903B automatically makes signal-to-noise ratio measurements by monitoring the ac level while turning its source on and off. Like SINAD, signal-to-noise mode in the 8903B uses display rounding and filtering to reduce the effects of noise on the measurement.

Simple but powerful programming, combined with GPIB control of all major functions, make the analyzers valuable tools for the automatic test equipment environment. All analyzer function are available at one input connector, reducing hardware and software development time and costs. Many ATE systems require automated measurements to determine the quality of audio signals. The analyzers provide distortion and SINAD measurements with an acquisition time of less than 1.5 seconds and a measurement rate of greater than two reading per second after locking. Another application often found in ATE systems involves measuring low-level ac signals. With a full-range ac-level display of 0.3000 mV and an accuracy of 2% of reading (V_{in} >50 mV, 20 Hz to 20 kHz), the analyzers accurately characterize these small ac signals.



Flexible ATE Source

The 8903B has enhanced ATE capabilities with its internal low-distortion source. Rapid-source programming mode enables the internal oscillator to be directly programmed through GPIB with five bytes. Additionally, the source has switchable output impedance (50 or 600 ohms). With a choice of source output impedance, you can match the 8903B to the instruments in your ATE system. In the 50-ohm position, the 8903B delivers +17 dBm into a 600-ohm load.

Condensed Specifications

Agilent 8903B System Specifications

(8903B only, source and analyzer combined)

Distortion

Residual Distortion and Noise (the higher of):
80 kHz BW: –80 dB or 17 μV, 20 Hz to 20 kHz
500 kHz BW: –70 dB or 50 μV, 20 Hz to 50 kHz
–65 dB or 50 μV, 50 kHz to 100 kHz

Source Specifications

(8903B only)

Frequency

Range: 20 Hz to 100 kHz

Accuracy: 0.3% of setting

Output Level

Range: 0.6 mV to 6 V open circuit

Accuracy: 2% of setting 60 mV to 6 V, 20 Hz to 50 kHz

Flatness (1 kHz reference): ±0.7% (±0.06 dB), 20 Hz to 20 kHz

Distortion and Noise (the higher of):
80 kHz BW: –80 dB or 15 μV, 20 Hz to 20 kHz
500 kHz BW: –70 dB or 38 μV, 20 Hz to 50 kHz
–65 dB or 38 μV, 50 kHz to 100 kHz

Analyzer Specifications

Distortion

Fundamental Frequency Range: 20 Hz to 100 kHz

Accuracy: ±1 dB, 20 Hz to 20 kHz

Residual Distortion and Noise (the higher of):
80 kHz BW: –80 dB or 15 μV, 20 Hz to 20 kHz
500 kHz BW: –70 dB or 45 μV, 20 Hz to 50 kHz
–65 dB or 45 μV, 50 kHz to 100 kHz

SINAD

Fundamental Frequency Range: 20 Hz to 100 kHz

Residual Distortion and Noise: Same as listed under distortion

Accuracy: ±1 dB, 20 Hz to 20 kHz

AC Level

Full Range Display: 300.0 V, 30.00 V, 3.000 V, 0.3000 V, 30.00 mV, 3.000 mV, 0.3000 mV

Accuracy: (rms and average detection)
±2%, 50 mV to 300 V, 20 Hz to 20 kHz

DC Level

Full Range Display: 300.0 V, 48.00 V, 16.00 V, 4.000 V

Accuracy: ±1.0% of reading (600 mV to 300 V)
±6 mV (V_{in} <600 mV)

Frequency Measurement

Measurement Range: 20 Hz to 150 kHz (20 Hz to 100 kHz in distortion and SINAD modes)

Accuracy: ±(0.004% plus one digit)

Standard Audio Filters

30 kHz Low-Pass Filter

80 kHz Low-Pass Filter

Plug-In Audio Filters

400 Hz High-Pass Filter

CCITT Weighting Filter (CCITT rec. P53)

CCIR Weighting Filter (CCIR rec. 468-2)

C-Message Weighting Filter (per BSTM 41004)

CCIR/ARM Weighting Filter (CCIR rec. 468-2, average-responding meter, Dolby Labs Bulletin No. 19/4)

"A" Weighting Filter (IEC rec. 179 and ANSI S1.4, type one sound-level meter)

Analyzer Input

Input Type: Balanced (full differential)

Maximum Input: Maximum peak input voltage, any combination of ac and dc: 425 volts peak, applied differentially or between either input and ground

General

Temperature: Operating, 0 °C to 55 °C; storage, –55 °C to 75 °C

Weight: Net 12.3 kg. (27 lb.); shipping 16.4 kg. (36 lb.)

Dimensions: 146 mm H × 425 mm W × 462 mm D
(5.75 × 16.8 × 18.2 in.)

Ordering Information

Analyzer Mainframes

8903B Audio Analyzer

Option 001 Rear panel input and output

Option 907 Front handle kit

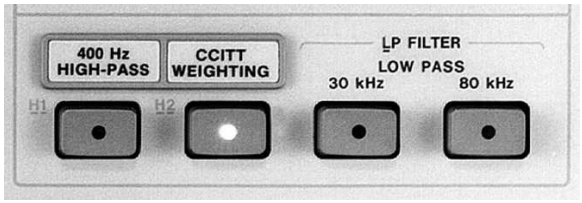
Option 908 Rack flange kit

Option 909 Rack flange kit with front handles

Option 910 Provides additional operation/calibration manual (08903-90079)

Option 915 Add service manual (08903-90062)

Option W30 Three year return repair service



Internal Plug-In Filter Options

Two band-limiting low-pass filters are standard. Optional high-pass and weighting filters can be fitted to match your requirements.

The 8903B has two plug-in filter positions which can be loaded with any of six optional filters. The standard 8903B comes with no plug-in filters. You must order the appropriate filter options if you wish to have any of the filters listed below. Each filter option ordered adds additional cost to the instrument.

Filter Options

	Option Numbers Filter Positions	
Filters	Left	Right
400 Hz High-pass	010	050
CCITT weighting filter	011	051
CCIR weighting filter	012	052
C-Message weighting filter	013	053
CCIR/ARM weighting filter	014	054
“A” weighting filter	015	055

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Agilent Technologies

Innovating the HP Way

HP 8903B Audio Analyzer
HP 8903E Distortion Analyzer
20 Hz to 100 kHz

HEWLETT® PACKARD

Technical Specifications

The versatile choice for audio analysis

All parameters describe performance in automatic operation or properly set manual conditions. Specifications describe the instrument's warranted performance. Supplemental characteristics (shown in italics) are intended to provide information useful in applying the instrument by giving typical, but non-warranted, performance parameters.

Related Literature:
Product Overview 5968-1388E
Price List 5968-1389EUS

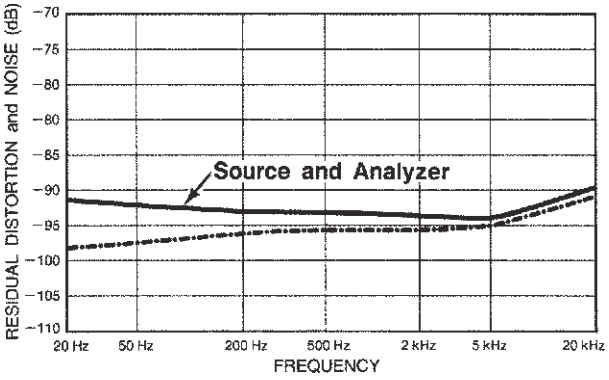
HP 8903B System Specifications

(HP 8903B only, source and analyzer combined)

Distortion

Residual Distortion and Noise (the higher of): 80 kHz BW: –80 dB or 17 µV, 20 Hz to 20 kHz.
500 kHz BW: –70 dB or 50 µV, 20 Hz to 50 kHz.
–65 dB or 50 µV, 50 kHz to 100 kHz.

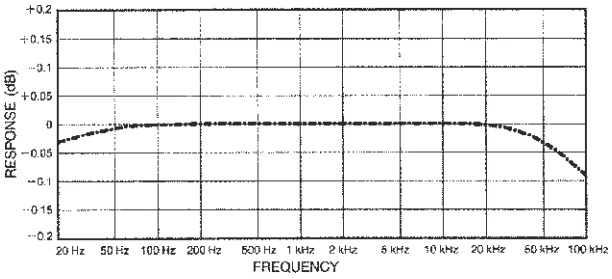
Supplemental Characteristics



Typical residual distortion and noise of the source and analyzer combined (source voltage set to 1.5 V, 80 kHz BW). Dashed line represents typical residual distortion and noise for the analyzer only.

Flatness

Supplemental Characteristics



Typical flatness of source and analyzer combined (source voltage set to 1 V, 1 kHz reference).

Signal-to-Noise

Frequency Range: 50 Hz to 100 kHz
Display Range: 0 to 99.99 dB
Accuracy: ±1 dB
Input Voltage Range: 50 mV to 300 V
Residual Noise (the higher of):
80 kHz BW: –85 dB or 17 µV
500 kHz BW: –70 dB or 50 µV

Supplemental Characteristics

Time to Return First Measurement: *<2.5 second*
Measurement Rate: *One reading per second*
Resolution: *Same as listed under SINAD, on page 2*

HP 8903B Source Specifications

(HP 8903B only)

Frequency

Range: 20 Hz to 100 kHz

Resolution: 0.3%

Accuracy: 0.3% of setting

Output Level

Range: 0.6 mV to 6 V open circuit

Resolution: 0.3% or better

Accuracy:

2% of setting 60 mV to 6 V, 20 Hz to 50 kHz.
3% of setting 6 mV to 6 V, 20 Hz to 100 kHz.
5% of setting 0.6 mV to 6 mV, 20 kHz to 100 kHz.

Flatness (1 kHz reference):

±0.7% (±0.06 dB), 20 Hz to 20 kHz.
±2.5% (±0.22 dB), 20 Hz to 100 kHz.

Distortion and Noise (the higher of):

80 kHz BW: –80 dB or 15 µV, 20 Hz to 20 kHz.
500 kHz BW: –70 dB or 38 µV, 20 Hz to 50 kHz.
–65 dB or 38 µV, 50 kHz to 100 kHz.

Impedance: 600 Ω ±1% or 50 Ω ±2% front panel or HP-IB programmable (47 special function).

Supplemental Characteristics

Frequency Switching Speed: *<3 ms (does not include HP-IB programming time)*

Output Level Switching Speed: *20 ms (does not include HP-IB programming time)*

Sweep Mode: *Log sweep with up to 500 points per decade or 255 points total between entered start and stop frequencies.*

HP 8903B and HP 8903E Analyzer Specifications

Distortion

Fundamental Frequency Range: 20 Hz to 100 kHz

Display Range: 0.001% to 100% (–99.99 to 0 dB)

Accuracy:

±1 dB, 20 Hz to 20 kHz.
±2 dB, 20 kHz to 100 kHz.

Input Voltage Range: 50 mV to 300 V

Residual Distortion and Noise (the higher of):

80 kHz BW: –80 dB or 15 µV, 20 Hz to 20 kHz.
500 kHz BW: –70 dB or 45 µV, 20 Hz to 50 kHz.
–65 dB or 45 µV, 50 kHz to 100 kHz.

Supplemental Characteristics

3 dB Measurement Bandwidth: *10 Hz to 500 kHz*

Detection: *True rms or rms-calibrated average*

Displayed Resolution:

0.0001% (<0.1% distortion).
0.001% (0.1% to 3% distortion).
0.01% (3% to 30% distortion).
0.1% (>30% distortion).

Time to Return First Measurement: *1.5 s*

Measurement Rate: *Two readings per second*

SINAD

Fundamental Frequency Range: 20 Hz to 100 kHz

Display Range: 0 to 99.99 dB

Residual Distortion and Noise: Same as listed under distortion

Accuracy:

±1 dB, 20 Hz to 20 kHz.
±2 dB, 20 kHz to 100 kHz.

Input Voltage Range: 50 mV to 300 V

Supplemental Characteristics

Detection: *True-rms or rms-calibrated average*

Resolution:

HP 8903B: *0.01 dB for SINAD ratios >25 dB. For ratios <25 dB the display is rounded to the nearest 0.5 dB to reduce digit flickering of noisy signals (full resolution is available via special function 16.1).*

HP 8903E: *Powers up with special function 16.1 active for 0.01 dB resolution at all SINAD ratios.*

Analog Meter (HP 8903B only): *Active in SINAD mode only and for SINAD ratios up to 18 dB (24 dB using special function 7.1).*
1.0 dB typical accuracy.

Tuning:

HP 8903B: *Notch filter is tuned to the internal audio source frequency.*

HP 8903E: *Notch filter is tuned to the counted input frequency.*

Time to Return First Measurement: *1.5 s*

Measurement Rate: *Two readings per second*

AC Level

Full Range Display: 300.0 V, 30.00 V, 3.000 V, 0.3000 V, 30.00 mV, 3.000 mV, 0.3000 mV.

Overrange: 33%, except on 300 V range

Accuracy: (rms and average detection)

±2%, 50 mV to 300 V, 20 Hz to 20 kHz.
±3%, 0.3 mV to 50 mV, 20 Hz to 100 kHz.
±5%, 50 mV to 300 V, 20 kHz to 100 kHz.

Supplemental Characteristics

AC Converter: *True-rms responding for signals with crest factor up to 3, rms calibrated average detection, or quasi-peak detection.*

Time to Return First Measurement: *<1.5 s*

Measurement Rate: *>2.5 readings per second*

3 dB Measurement Bandwidth: *>500 kHz*

Quasi-Peak Detector Characteristic: *Meets CCIR 468-4*

Quasi-Peak Detector Accuracy: *(20 Hz to 20 kHz) ±6% typically*

HP 8903B and HP 8903E Analyzer Specifications *cont.*

DC Level

Full Range Display: 300.0 V, 48.00 V, 16.00 V, 4.000 V.

Overrange: 33%, except on 300 V range

Accuracy: ±1.0% of reading (600 mV to 300 V). ±6 mV (V_{in} <600 mV).

Supplemental Characteristics

Time to Return First Measurement: *<1.5 s*

Measurement Rate: *Three readings per second*

Frequency Measurement

Measurement Range: 20 Hz to 150 kHz. (20 Hz to 100 kHz in distortion and SINAD modes.)

Resolution: Five digits (0.01 Hz for input frequencies <100 Hz).

Accuracy: ±(0.004% plus one digit).

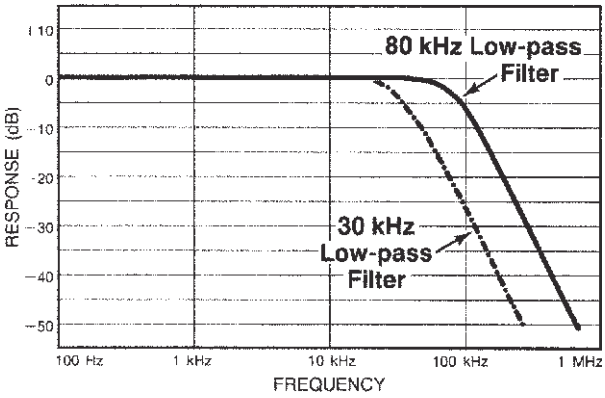
Sensitivity: 50 mV in distortion and SINAD modes. 5 mV in AC-level and signal-to-noise (HP 8903B only) modes.

Supplemental Characteristics

Measurement Rate: *Same as measurement mode selected*

Counting Technique: *Reciprocal with 2 MHz timebase*

Standard Audio Filters



30 kHz Low-Pass Filter

3 dB Cutoff Frequency: 30 kHz ±2 kHz.

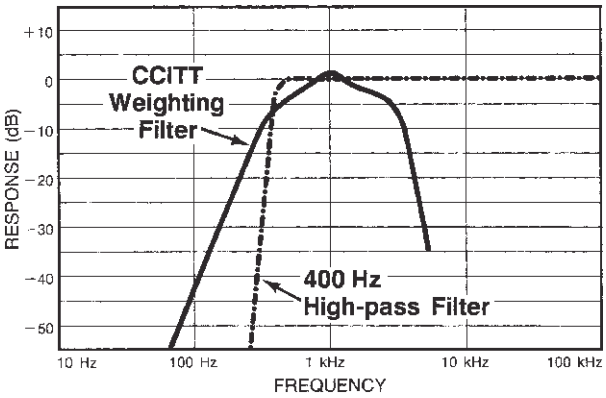
Roll-off: Third-order Butterworth; 18 dB per octave or 60 dB per decade

80 kHz Low-Pass Filter

3 dB Cutoff Frequency: 80 kHz ±4 kHz.

Roll-off: Third-order Butterworth; 18 dB per octave or 60 dB per decade

Plug-In Audio Filters



400 Hz High-Pass Filter

3 dB Cutoff Frequency: 400 kHz ±40 Hz.

Roll-off: Seventh-order Butterworth; 42 dB per octave or 140 dB per decade

CCITT Weighting Filter (CCITT rec. P53)

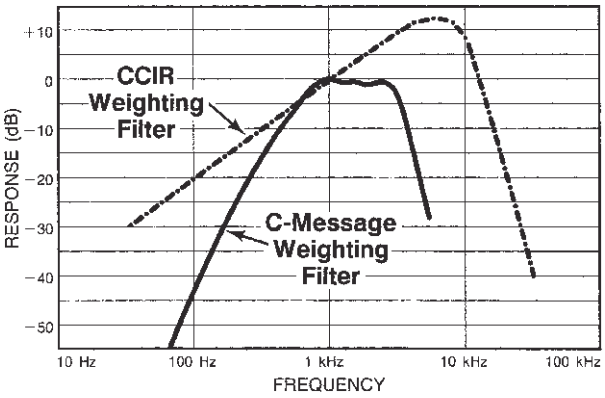
Deviation from Ideal Response:

±0.2 dB at 800 Hz.

±1.0 dB, at 300 Hz to 3 kHz.

±2.0 dB, at 50 Hz to 3.5 kHz.

±3.0 dB, at 3.5 kHz to 5 kHz.



CCIR Weighting Filter (CCIR rec. 468-2)

Deviation from Ideal Response:

±0.1 dB at 6.3 kHz.

±0.2 dB, at 6.3 kHz to 7.1 kHz.

±0.4 dB, at 7.1 kHz to 10 kHz.

±0.5 dB, at 200 Hz to 6.3 kHz.

±1.0 dB, at 31.5 Hz to 200 Hz, 10 kHz to 20 kHz.

±2.0 dB, at 20 kHz to 31.5 kHz.

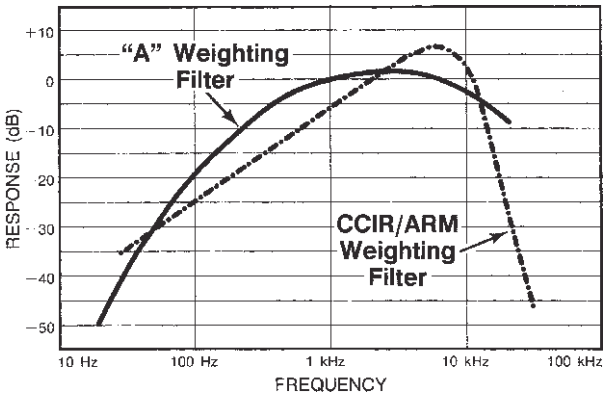
C-Message Weighting Filter (per BSTM 41004)

Deviation from Ideal Response:

±0.1 dB at 1 kHz

±1.0 dB, 60 Hz to 5 kHz

Plug-In Audio Filters *cont.*



CCIR/ARM Weighting Filter (CCIR rec. 468-2, average-responding meter, Dolby Labs Bulletin No. 19/4)

Deviation from Ideal Response: Same as listed previously under CCIR Weighting Filter.

"A" Weighting Filter (IEC rec. 179 and ANSI S1.4, type one sound-level meter)

Deviation from Ideal Response:

±0.1 dB at 1 kHz.

±0.5 dB, 20 Hz to 10 kHz.

±1.0 dB, at 10 kHz to 20 kHz.

HP 8903B and HP 8903E General Specifications

HP 8903B Rear Panel Features

HP-IB Connector

Monitor Output: Provides a scaled output of the input signal. In SINAD, distortion, and distortion-level modes, the fundamental is removed.

Front/Rear Panel Outputs

Monitor Output: *Output impedance 600 Ω.*

AC-level mode: *provides scaled output of input signal.*

SINAD, distortion, and distortion-level modes: *provide a scaled output of the input signal with the fundamental removed.*

HP 8903E Rear Panel Features

HP-IB Connector

Analyzer Input

Input Type: Balanced (full differential).

Input Impedance: 100 kΩ ±1% shunted by <300 pF, each side to ground. (In dc-level mode the input resistance is 101 kΩ ±1%).

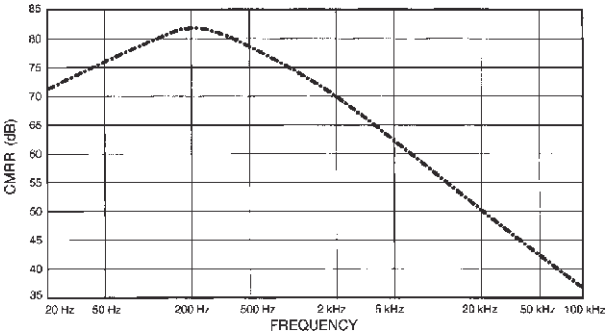
Maximum Input: Maximum peak input voltage, any combination of ac and dc:

HP 8903B: 425 volts peak, applied differentially or between either input and ground.

HP 8903E: 42 volts peak, low side to ground. 425 volts peak, differentially or high side to ground.

CMRR: >60 dB, 20 Hz to 1 kHz, V_{in} <2 V.
>45 dB, 20 Hz to 1 kHz.
>30 dB, 20 Hz to 20 kHz.

Supplemental Characteristics



Typical CMRR: *From 20 Hz to 100 kHz with input voltage of 6 volts.*

General

Temperature: Operating, 0 °C to 55 °C: storage, –55 °C to 75 °C.

Remote Operation: HP-IB. All functions except the line switch, low-terminal ground switches, and the ×10- and ÷10- increment keys (HP 8903B only), are remotely controllable. The HP 8903E has many special functions which can only be accessed via HP-IB commands.

HP-IB Compatibility: SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP0, DC1, DT1, C0, E1.

Power: 100, 120, 220, or 240 V (+5, –10%); 48 to 66 Hz. 100 or 120 V (+5, –10%); 48 to 440 Hz. 100 VA maximum.

Weight:

HP 8903B: Net 12.3 kg. (27 lb.); shipping 16.4 kg. (36 lb.)
HP 8903E: Net 11.8 kg. (26 lb.); shipping 15.9 kg. (35 lb.)

Dimensions: 146 mm H × 425 mm W × 462 mm D. (5.75 × 16.8 × 18.2 in.)

HP System II Size: 5.25 H × 1 MW × 17 D.

EMI: Radiated interference is within the requirements of RE02 of MIL STD 461B and FTZ 526/527.

Conducted and Radiated Susceptibility: Meets the requirements of methods CS01, CS02, and RS03 (1 V/meter) of MIL STD 461B dated 1980.