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# AA-51A

# Audio Analyzer

## Key Features

Shielded, Balanced Inputs

Auto-Null THD

Frequency Readout

Compatibility with NAB Test

Stereo Measurements

Measures:

- THD, IMD, Volts
- Signal + Noise/Noise
- Stereo Phase
- Stereo Ratio
- Wow and Flutter
- Frequency



## Description

The AA-51A is a multi-purpose, precision audio analyzer that helps to automate proof-of-performance measurements and equipment maintenance. Unique features of the AA-51A make it the ideal instrument for engineers, and service professionals. Excellent RFI shielding enables measurements to be made within the high-level RF environments of commercial broadcast transmitter facilities.

Total harmonic distortion measurements are made by simply setting the Mode Switch to THD and reading the meter. The AA-51A automatically accomplishes nulling and tuning to the input frequency. This enables the operator to accurately measure the harmonic distortion at various discrete frequencies and different power levels much faster than using conventional distortion analyzers.

Intermodulation distortion measurements are performed with equal simplicity. Utilizing the SMPTE Standard intermodulation signal the AA-51A displays percent of IM. Measurements are completely automatic over a wide dynamic range.

Accurate frequency response measurements are facilitated by a wideband voltmeter which exhibits a flat response (+ or - 0.1dB) from 20 Hz to 100 kHz. Input level range is 1 mV to 100 V full scale. The average responding meter is calibrated to the rms value of a sine wave. For Signal + Noise/Noise measurements the voltmeter bandwidth may be restricted to 20 kHz by placing the mode switch in the NOISE position.

Incidental frequency modulation — "Wow and Flutter" — usually associated with tape decks, cart machines and turntables is measured automatically. The AA-51A measure weighted peak flutter as specified by IEEE Standard 193.

Stereo signals and mono signals derived from a stereo source are often degraded by phase errors and differential gain variation between left and right channels of a given audio system. The AA-51A contains both phase and ratio measuring circuitry which enables the operator to evaluate these characteristics quickly and accurately throughout the complete audio spectrum, and over a wide dynamic range. Phase angle is displayed with a zero center scale indication and a full scale, switch selected sensitivity of either + or - 180 degrees. The ratio meter is also a zero center scale device with a + or - 6dB full scale deflection.

The Phase and Ratio measurement features of the AA-51A are particularly useful for line equalization measurements, azimuth alignment of stereo tape heads, and trouble shooting of audio consoles, amplifiers, and networks.

## Specifications

### INPUT:

|                       |  |
|-----------------------|--|
| Impedance             | Balanced 80 k ohms+100 pF, each pin to ground        |
| Maximum AC            | 220 Vrms, each pin to ground                         |
| Maximum DC            | 250 Vdc, each pin to ground                          |
| Common-mode rejection | greater than 60dB                                    |
| Cable connector       | Switchcraft p/n 05CL3M                               |
| MON SCOPE output      | 5.6 Vp-p for inputs from 40 m to 90 Vrms, typical    |
| MON PHONES output     | Set to 70mVRMS, internal adj.                        |
| HIGH LED on when:     | nput less than 80 Vrms (except for VM and NOISE)     |
| LOW LED on when:      | Input less than 100 mVrms, (except for VM and NOISE) |

*continued next page*

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932 Philadelphia Ave./ Silver Spring, MD 20910-4912 / Voice: 1 301.589.2662 / Fax: 1 301.589.2665 / web: www.pi-usa.com

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# AA-51A

## Specifications

### THD METER:

|                       |  |
|-----------------------|--|
| Input frequency range | 20 Hz to 20 kHz, fundamental   |
| Measurement passband  | 1.7 to 12.5X input frequency at -3dB   |
| Notch attenuation     | greater than 100 dB  |
| Ranges                | 6 ranges, 0.03% to 10% full scale, -20 dB to -70 dB full scale                 |
| Accuracy              | + or - 15% (+ or - 1.5 dB)   |
| Input level ranges    | 100 mV to 80 V   |
| Internal THD + noise  | 0.01% max, 0.006% typical, 20 Hz-5 kHz 0.02% max,<br>0.012% typical at 20 kHz  |
| Filters               | 22 kHz low-pass at input, switch selected<br>400 Hz high-pass, switch selected |
| METER MON output      | 100 mVp-p, meter at full scale   |
| Nulling time          | 2 seconds approximately  |

### IMD METER:

|                       |                                   |
|-----------------------|-----------------------------------|
| Input signal required | 60 Hz + 7 kHz, 4:1 voltage ratio  |
| Full scale ranges     | 6 ranges, 0.03% to 10% full scale |
| Accuracy              | + or - 10%                        |
| Input level range     | 100 mV to 80 V                    |
| Internal IMD + noise  | less than 0.015%                  |
| METER MON output      | 00 mVp-p, meter at full scale     |

### AC VOLTMETER:

|                    |   |
|--------------------|---|
| Frequency response | 10 Hz to 100 kHz, + or - 0.1dB max.variation                        |
| Ranges             | 11 ranges, 0.3 mV to 30 V full scale, -68 dBm to +32 dBm full scale |
| Accuracy           | + or - 3%   |
| METER MON output   | 100 mVp-p, meter at full scale                                      |
| Internal noise     | 20 uV(-92 dBm) maximum  |
| Filter             | 400 Hz (at -3 dB) high-pass, switch selected                        |
| REF SET Range      | greater than 10 dB  |

### NOISE METER:

|                    |  |
|--------------------|--|
| Frequency response | 20 Hz to 20 kHz at -3 dB                     |
| Ranges             | 11 ranges, 0.3 mV to 30 V full scale         |
| Accuracy           | + or - 3%                                    |
| METER MON output   | 100 mVp-p, meter at full scale               |
| Internal noise     | 15 uV (-94 dBm) max.                         |
| Filter             | 400 Hz (at -3 dB) high-pass, switch selected |
| REF SET range      | greater than 10 dB                           |

### PHASE METER:

|                       |   |
|-----------------------|---|
| Measurement ranges    | + or - 54 degrees and + or - 180 degrees full scale                   |
| Accuracy              | + or - 3 degrees  |
| Polarity              | Positive angle means L leads R  |
| Input frequency range | 20 Hz to 20 kHz   |
| Input level range     | 100 mV to 80 V  |
| METER MON output      | Rectangular wave at input frequency, duty cycle proportional to angle |

### RATIO METER:

|                       |                                       |
|-----------------------|---------------------------------------|
| Measurement range     | + or - 6 dB                           |
| Accuracy              | + or - 0.2 dB                         |
| Polarity              | Positive ratio means R greater than L |
| Input frequency range | 20 Hz to 20 kHz                       |
| Input level range     | 100 mV to 80 V                        |
| METER MON output      | dc voltage proportional to ratio      |

### WOW & FLUTTER METER:

|                    |   |
|--------------------|---|
| Measurement ranges | 0.1% and 0.3% full scale                      |
| Input frequency    | 3.15 kHz + or - 10%                           |
| Accuracy           | + or - 10%                                    |
| Input level range  | 100 mV to 80 V                                |
| Internal noise     | less than 0.01%                               |
| METER MON output   | 500 mVp-p at full scale, passband 0.2Hz-200Hz |

### FREQUENCY COUNTER:

|                   |  |
|-------------------|--|
| Frequency range   | 10 Hz to 200 kHz   |
| Resolution        | less than 900 Hz (approx.), 0.1 Hz<br>900 Hz to 9000 Hz (approx.), 1.0 Hz<br>900 kHz to 24 kHz (approx.), 0.01 kHz<br>greater than 24 kHz (approx.), 0.1 kHz |
| Accuracy          | -1 to 0 count error in RH digit (LSD)  |
| Input level range | 1 mV to 80V  |

### POWER:

|                          |                |
|--------------------------|----------------|
| 117 Vac (230 Vac option) | 50/60 Hz, 10 W |
|--------------------------|----------------|

**WEIGHT, lb (kg): 5.44 (12)**

**DIMENSIONS, in. (cm):**

|                     |   |
|---------------------|---|
| Optional Rack Mount | 15.25 (38.74) W, 5.25 (13.34) H, 10.125 (25.72) D |
|                     | 5.25 (13.34) Rack space reqd.                     |

*Specifications subject to change without notice.*

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