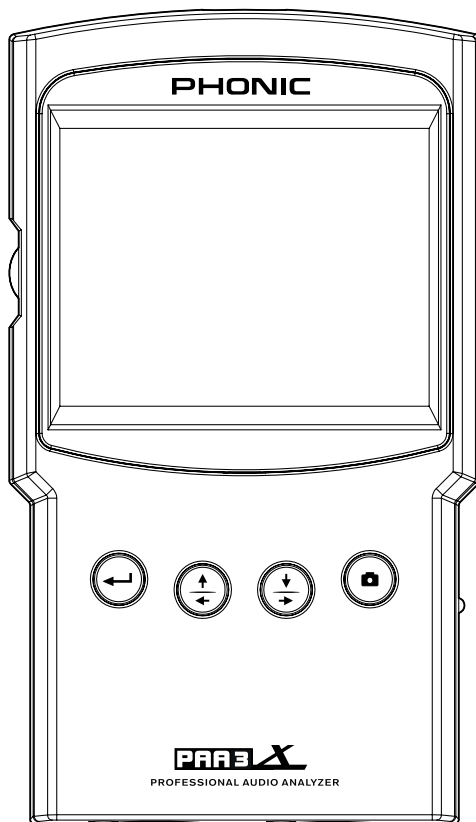


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PAA3X

- User's Manual
- Manual del Usuario

PAA3X

Audio Analyzer with Color LCD

Analizador de Audio con LCD Colorizado



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USER'S MANUAL

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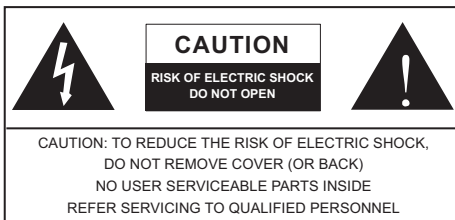
Phonic reserves the right to improve or alter any information within this document without prior notice.

IMPORTANT SAFETY INSTRUCTIONS

The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus. The MAINS plug is used as the disconnect device, the disconnect device shall remain readily operable.

Warning: the user shall not place this apparatus in the confined area during the operation so that the mains switch can be easily accessible.

1. Read these instructions before operating this apparatus.
2. Keep these instructions for future reference.
3. Heed all warnings to ensure safe operation.
4. Follow all instructions provided in this document.
5. Do not use this apparatus near water or in locations where condensation may occur.
6. Clean only with dry cloth. Do not use aerosol or liquid cleaners. Unplug this apparatus before cleaning.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plug, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

CAUTION: Use of controls or adjustments or performance of procedures other than those specified may result in hazardous radiation exposure.



INTRODUCTION

Congratulations on your purchase of the Phonic PAA3X professional audio analyzer – a highly accurate audio analyzer that sits comfortably in the palm of your hand and features all the tools you need to set up any audio system.

With 61-band real-time spectrum analysis, sound pressure and dBu / dBV / line voltage measurement, EQ setting, polarity check, and RT-60, the PAA3X is the ideal companion for all sound engineers. Built upon the popular PAA3, this professional audio analyzer is powered by a long-life lithium-ion battery and offers a detachable microphone and balanced XLR input and output, ensuring all audio analysis situations are possible. With the PAA3X, you will no doubt conquer the acoustics of all environments with precision and ease.

Phonic understands the importance of sound reproduction management. We know that, as this is your profession, your first – and perhaps only – concern is sound quality. Consequently, with an audio tool like the PAA3X, you expect a precise rule to obtain accurate measurements and guarantee the best possible quality of sound that any professional would expect. We at Phonic took the utmost of care in ensuring the PAA3X is an extremely accurate and effective means for you to gather all the data necessary to determine what your set up needs.

To help you familiarize yourself with the PAA3X, this manual includes instructions and tips on every function listed in the main menu and sub-menus. It is recommended that you take the time to have a read of it. After doing so, store it in an easily accessible place in case it's needed in future.

FEATURES

- Powerful palm-size audio analyzer
- 320 x 240 color LCD screen
- Detachable condenser mic can be placed in remote positions
- Elegant graphical user interface
- Useful functions include RTA, RT-60, Polarity and Meter (dB SPL, dBu, dBV & Volt)
- 30 - 130 dB SPL meter
- Tone generator includes pink noise, sine wave, sweep and polarity signals
- Snapshot button for taking instant screen captures saved to SD card
- Rechargeable lithium-ion battery
- USB port for charging
- SD card slot included for screen snapshots

PACKAGE CONTENTS

- PAA3X unit
- USB cable and power adapter
- Microphone stand adaptor
- 5 meter microphone extension cable
- Owner's manual
- Soft carry case
- SD card

CONTROLS & DISPLAY

1. Power Button

Push and hold this button for 3 seconds to turn on the PAA3X. When the unit is on, users can push and hold the button for 3 seconds to turn off the unit, saving their settings at the same time.

2. Microphones Connector

This port is for included precision microphone. When connected, the user is able to take measurements with the PAA3X. As the microphone is removable, an extension cable may be utilized to better position the microphone. When not in use, the microphone can be stored allowing the PAA3X to better fit in your pocket.

3. Color Screen

All features, functions and controls of the PAA3X can be viewed using this display window. All features can be controlled using the on board controls or the jog control on the side.

4. Enter Button

Press this button to move from Real Time Spectrum Analyzer (RTA) display to the PAA3X's main menu. After moving the cursor to a desired function in the menu using the right/down or left/up buttons, press the enter button to select.

5. Left / Up Button

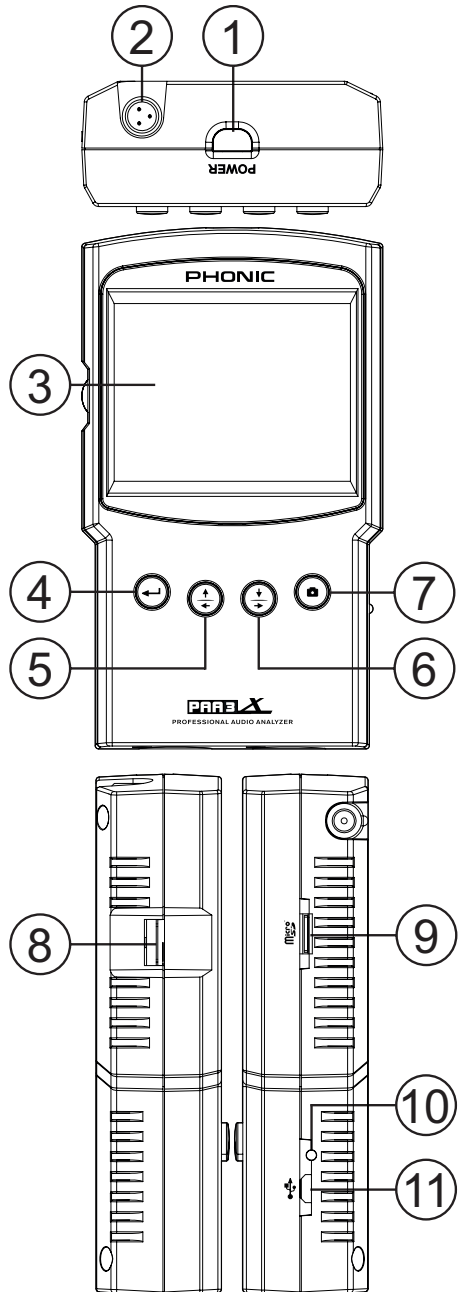
Press this button to scroll up or to the left of the currently selected option.

6. Right / Down Button

Press this button to scroll down or to the right of the currently selected option.

7. Capture Button

Press this button to instantly take a snapshot of the PAA3X's screen. These snapshots are can be kept indefinitely on the inserted SD card, or transferred to a computer. Snapshots are saved in BMP format, easily opened on all operating systems. Image size is 320KB with an image resolution of 320 x 240 pixels. If no SD card is inserted, the image will not be saved.



8. Jog Control

Jog control, on the left-hand side of this unit, provides users with a hassle free method of scrolling menus and selecting options with a single hand. Simply rotate to scroll up and down menus and push the wheel inwards to select (to either enter a menu or finalize a setting). Alternately, the three function buttons (points 4 to 6 on page 2) may also be used to scroll options and finalize selections. However, with a little practice, this jog wheel is perhaps the fastest way to use the PAA3X.

9. SD Memory Card Slot

Insert an appropriate SD memory card into this slot to save screen captures. The SD card must be formatted in FAT-32 file format. Please be aware that formatting the SD card will remove all content.

10. Power LED

This LED indicator will light up green when the PAA3X is turned on. When the USB connector is connected to an appropriate power adapter or computer, this LED will flash to indicate the battery is charging.

11. USB Connector

This USB port is used for charging the PAA3X's built-in battery. Please use the included power adapter only (5VDC, 2A).

12. Balanced XLR Input

This balanced input allows users to feed signals from external devices to the PAA3X to take various readings in any number of functions. To use the XLR input as your input source, select "Line in" as the system's primary input source.

13. Balanced XLR Output

This connector is for sending a balanced signal from the internal tone generator to external devices. The level of the output signal is determined by the internal signal generator.

14. Stand Mount

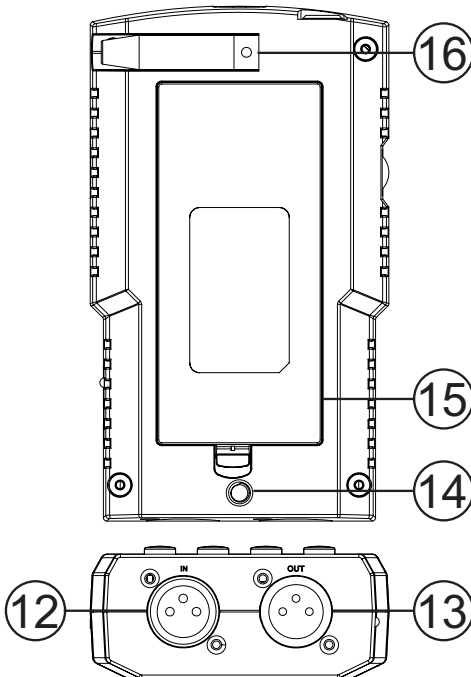
A stand mount is located on the rear of the PAA3X. This allows for connection to a tripod or any other stand that has a standard 1/4"-20 connecting screw. These are often found on camera tripods. Also included with the PAA3X is a stand adapter, allowing the unit to be mounted on microphone stands as well.

15. Battery Cover

The PAA3X's rechargeable lithium-ion battery can be found within this battery cover. In the event you will not use the PAA3X for an extended period of time, Phonic suggests removing the battery to preserve its integrity.

16. Mic Slot

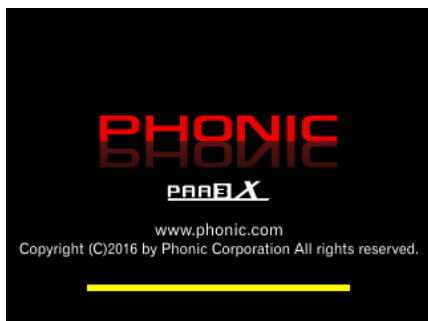
Place the detachable microphone here when not in use.



GETTING STARTED

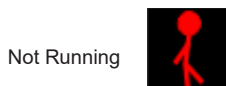
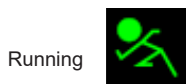
When you initially start the PAA3X, the first screen you'll see is the startup sequence. This occurs each and every time you start up the PAA3X and goes through a quick diagnostics to ensure there are no DSP issues that may affect performance.

After the DSP diagnostics are complete, the PAA3X logo will appear and a yellow bar will make its way across the screen. This indicates that the PAA3X's internal user interface (UI) is loading.



Once the startup sequence has finished, the PAA3X will immediately start the Real Time Analyzer (RTA) function. This is the default function of the PAA3X. A new function can be selected by using either the front-mounted buttons (↑/←, ↓/→ and enter) or the side-mounted jog wheel to select the menu icon on screen.

When selecting a measurement function, it's important to remember that all of the functions can be turned on and off. The below images should help you know whether your selected function is running or not.



SOFTWARE OVERVIEW

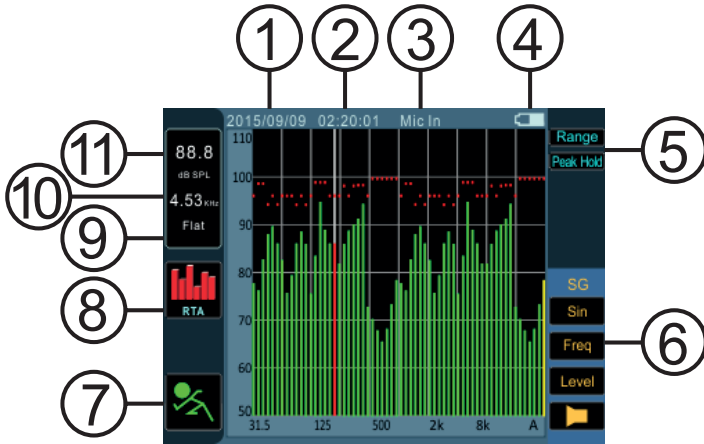
- 1. Date** – Today's date is displayed here. This can be changed within the Utility menu.
- 2. Time** – The current time is displayed here. Like the date, this can be adjusted in the Utility menu.
- 3. Source** – The currently used input source is listed here, as decided in the Settings menu. The two available input sources are Mic and Line.
- 4. Battery Indicator** – This little bar gives users an indication of the current battery levels. When the indicator turns red, it's advised that you connect the USB power cable to charge the unit.
- 5. Range and Peak Hold Buttons** – Use the onboard controls to select either of these buttons and turn their respective functions on and off.

The range icon allows you to adjust the current range on set. The RTA and meter functions only show a specific range on screen at any time. This means that to see the full 30dB to 130dB range you will need to scroll up or down.

The peak hold icon allows users to activate a peak hold on the current function. The peak hold function will cause the highest signal peaks to be held for a short period of time, giving a better visual representation of these high peaks.

- 6. Signal Generator (SG)** – The current settings for the internal signal generator are found here. Show are the signal type (sine, sweep, pink noise, polarity), the current frequency (if appropriate, 20Hz to 20KHz) and the signal level, as output through the XLR Output on the bottom of the unit.

Selecting the uppermost cell will allow you to enter the signal generator menu and adjust its settings, including the type of signal, the level, frequency and gate time. Select the second and third fields in the SG box to adjust the frequency and level. The lowest box, with the speaker icon, will allow users to turn the SG on and off. This icon is yellow when the signal generator is active and red (with a cross through it) when disabled.



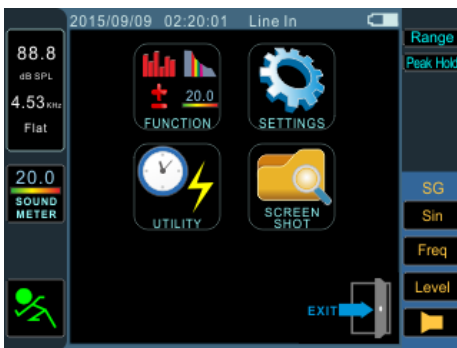
7. Run/Stop Icon – Turn the current function on and off by selecting this on screen icon using the PAA3X’s controls. A standing red stick-figure indicates the current function is not active. The green running stick-figure shows the current function is, well, running.

8. Menu Icon – The currently used function will be displayed here. To select a new function, simply use the PAA3X’s controls to select this icon. This will bring up the Main menu (shown below). Within the main menu there are options for function, settings, utility and screen shot.

9. Weighting – The currently used weighting, as determined in the Settings menu, will be displayed here. The PAA3X has 4 weightings to choose from: Flat, A, B and C. To change the weighting, select the Menu icon followed by the Settings icon in the subsequent menu. The weighting settings can be found here.

10. Frequency – When checking the finer details of the current feature, this window will display the currently selected frequency. When a specific frequency is not selected, this field will read “All”. To select an individual frequency, scroll through the different options until the RTA itself is highlighted. Press enter and scroll through the various frequencies until you find the one you wish to view.

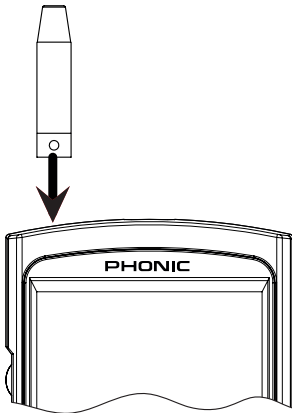
11. Level – This field will show the level of the currently selected frequency (as explained in point 10). The level will be shown in dB SPL, dBu, dBV or Volts, depending on the currently selected function and/or parameter.



MICROPHONE CONNECTION

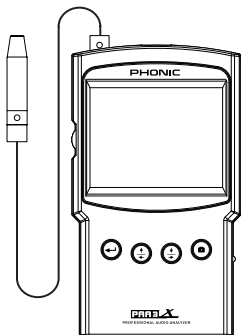
Unlike previous versions of the Phonic Personal Audio series, the PAA3X has a detachable microphone that can be connected directly to the unit or placed remotely through the 5 meter extension cable.

When inserting the microphone into the microphone slot, the release button must be facing the front of the PAA3X, as shown below.



The mic is removed by pushing the release button on the base of the microphone and sliding it out.

Phonic have also included a 5 meter extension cable, as previously mentioned. This can be used along with the mic stand adapter to remotely place the microphone.



AUDIO ANALYSIS

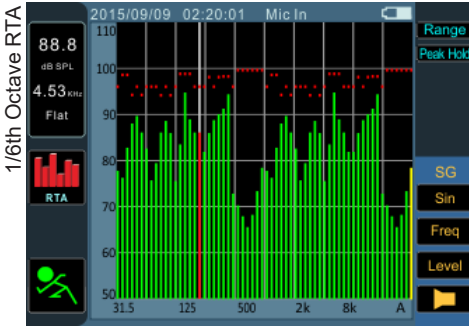
On the following pages we will discuss the various audio analysis functions that the PAA3X provides. There are four main functions in total, all of which are easily accessible through the function menu. If at any point you wish to access a new feature, simply use the controls to select the function icon to bring up the function menu.



Real Time Analyzer (RTA)

This function analyzes the audio received through either the built-in microphones or line in connectors, divided into a number of separate bands in 1/3rd or 1/6th octave resolution. Each frequency band is graphed as a vertical bar on the RTA, the height of which represents the level – whether in dB SPL, dBu, etc – of the individual octave or sub-octave bands. A 60 dB range is displayed at any one time, and users can scroll up the page slightly if clipping occurs, or scroll down if the results aren't visible.

Frequencies from 20 Hz to 20 kHz can be monitored individually by selecting the frequency band on screen. The level and frequency will appear to the left of the screen. Measurements can be taken at four different response times (35 ms, 125 ms, 250 ms, and 1 sec) and in four weighting types (A weighting, B weighting, C weighting and Flat). For more info on response times and weighting, please consult the appropriate sections.

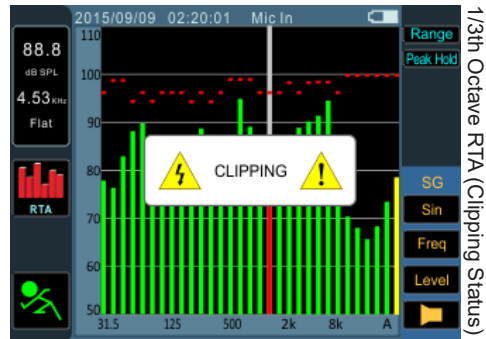


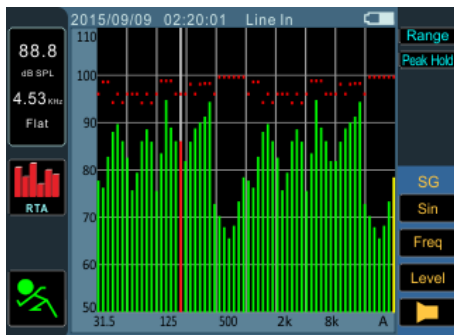
Procedure for taking acoustic measurements:

1. Within the Menu screen, enter Settings. Adjust the source to "Mic" by selecting this field and scrolling up or down.
2. Select the 'octave' settings you wish to use for your calculations. Users can select from 1/3 octave resolution (for a total of 31 bands) and 1/6 octave resolution (for a total of 61 bands).
3. Also on the Settings screen (displayed below), set the appropriate weighting. The most common weighting used for acoustical analysis is perhaps A-weighting, as it closely mimics the conditions of human hearing. Phonic have also included B, C and flat weighting.
4. Adjust response time (Res Time) and peak hold properties as needed.
5. Exit the Settings screen by selecting "Exit."



6. Scroll to the onscreen "RUN/STOP" icon and hit enter. The RTA will begin.
7. Scroll to the RTA screen and press enter to select an individual band to view the dB SPL in real time for center frequencies of that particular band. The rightmost bar is the ALL frequency level. To the left of the screen you will find a boxes with signal properties listed. The top value will be the dB SPL results for the currently selected band, below which you will find the center frequency of the currently selected band (if the all frequency bar is chosen, this value will read ALL). The currently selected weighting will be visible below this.
8. A 60 dB range can be seen on the RTA screen at any one time. The total range viewable is 30 dB to 130 dB. If you find the RTA is clipping constantly (as shown below), selecting "Range" to the right of the screen will allow users to scroll up (in 5 dB increments).
9. When monitoring signals as high as 70 dB to 130 dB SPL, you can still view the lower levels by pausing the RTA (select "RUN/STOP") and adjusting the "Range" to see the lower levels.
10. Take a snapshot of the screen at any time by hitting the snapshot button. These will be saved to an inserted FAT-32 formatted SD card.





Procedure for measuring an electrical signal:

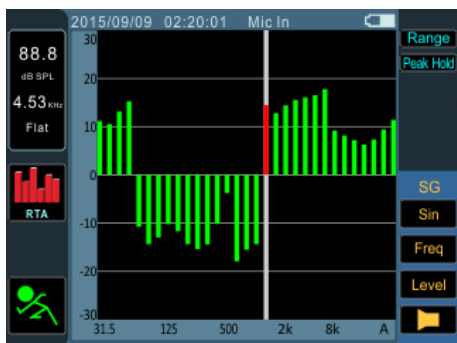
1. Enter the Settings menu and change the input source to “Line” and measurement unit to either “dBu”, “dBV” or “voltage,” as required.
2. You may also want to adjust the response time, weighting, octave and peak hold properties.
3. Send a signal into the PAA3X’s XLR input jack. The wiring should be as follows:

Pin 2 – Hot, Pin 3 – Cold, Pin 1 – Ground

4. Select the “RUN/STOP” icon to start the RTA.
5. You can read the level of any individual frequency or all frequencies simultaneously. Scroll down until the RTA screen is highlighted and hit enter. You can then scroll through the numerous frequencies onscreen to get a clearer picture of each frequency’s signal properties. This information is found on the top left-hand corner of the display.
6. Take a snapshot of the screen at any time by hitting the snapshot button. These will be saved to an inserted FAT-32 formatted micro SD card.

EQ Setting

Also included within the PAA3X is an EQ setting function. Selecting this option within the Settings menu will allow you monitor the suggested equalizer band settings – updated in real time. With perfect equalizer settings, ideally the EQ Setting function would display a flat line with no suggested frequency adjustments. This will allow for great quality audio with little potential for feedback and other issues. The EQ setting function shows a maximum of $\pm 15\text{dB}$ of boost and cut.



EQ Setting Function

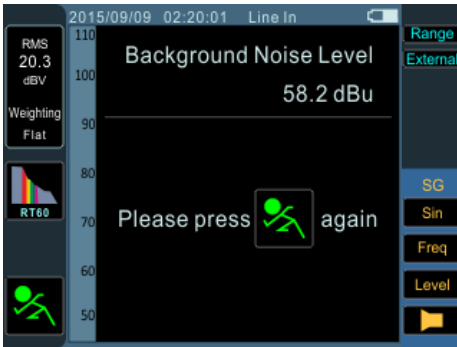
Reverb Time (RT60)

The RT60 function gives the decay time of any signal. The decay time is the time that it takes for a signal to diminish 60 dB below the original sound. This can be done with entirely no filtering (flat weighting) or with filtering imposed (A, B or C weighting). The RT60 calculations are made with no frequency filtering active, meaning the reverb time will be calculated for all frequencies, 20 Hz to 20 kHz.

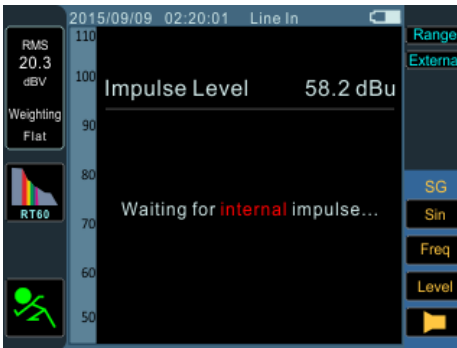
Working out the average of many different RT60 readings from around a room allows users to get an idea as to how much absorption or reflection of audio the room provides. Depending on your needs, you may wish to have a high or low RT60 measurement. For example, for public speaking, an RT60 measurement of less than 1 second is preferable, as to have a clear, concise voice projected to the audience. With choirs or instrumental music, an RT60 measurement of greater than 1.5 seconds may be appropriate.

Measuring Reverb Time:

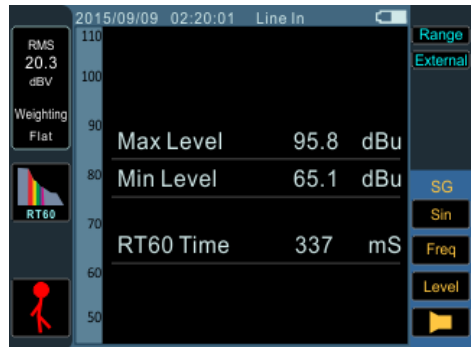
1. Select the RT60 function through the Function menu.
2. Select the "RUN/STOP" icon to allow the RT60 function to begin. The system will then calculate the level of background noise (see image below).



3. After the background noise is detected, select the "RUN/STOP" icon once again. It is important that you try to keep background noise consistent after this point.
4. The PAA3X will wait for a signal greater than 30 dB over the background noise (see image above). A little helpful hint: the louder the test signal, the greater the accuracy of your RT60 calculation.

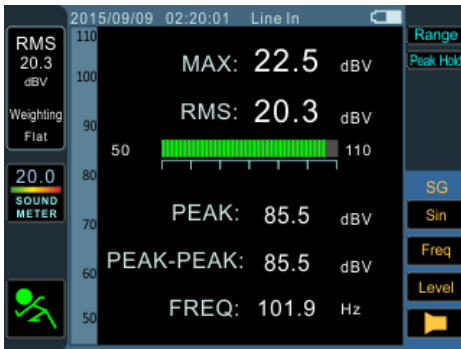


5. Play pink noise through your audio system (this can be done using the PAA3X's signal generator or using an audio test CD). Make sure that if you're sending the pink noise from the PAA3X that the trigger is set to "Internal". If you're getting the pink noise from an external source, the trigger should be set to "External." The trigger can be adjusted by selecting the option below "range" on the right-hand side of the screen.
6. Move the master fader up to a point where the audio level received by the PAA3X is greater than 30 dB over the background noise. This will trigger the RT60 function. Quickly mute the system to get your RT60 reading as accurate as possible.
7. After the measurement is taken, the RT60 measurement results will appear on screen. Users are offered information on minimum level, maximum level and the decay time (as displayed below).
8. Like mentioned in previous functions, take a snapshot of the screen at any time by hitting the snapshot button. These will be saved to an inserted FAT-32 formatted micro SD card.



Meter

The meter function can take calculations in dB SPL (through the detachable microphone), dBu, dBV or Volt (through the line inputs). The SPL function provides users with the overall 'loudness' of their input signal and can be accessed by simply selecting 'Mic In' as the desired input source. The dBu, dBV and Volt measurements can be taken through the line inputs, where the meter function will give visual representations of their respective levels.



Taking SPL measurements:

1. Enter the Settings menu within the Main menu.
2. Select "Mic" as your input source. The unit will automatically be set to dB SPL.
3. Also in the settings menu, users can choose the response time, weighting and peak hold.
4. Return to the meter by clicking "Exit".
5. A 60 dB range is visible on screen at any time. Users can view 30 to 100 dB SPL, 45 to 115 dB SPL or 60 to 130 dB SPL. To change the range, simply the range icon to the right of the screen.
6. Reset the Maximum SPL level by simply highlighting and selecting the word "Max" on screen.

Taking line input measurements:

1. Enter the Settings menu through the Main menu and set your input source to "Line." You can also select your desired measurement unit from dBu, dBV and Volt.
2. You may select a response time, weighting, or peak hold time. Push "OK" to close the settings menu.
3. Connect a source signal into the PAA3X's line inputs.
4. Select the RUN/STOP icon to start the level meter.
5. Reset the Maximum level by highlighting and selecting the word "Max" on screen.
6. If the level meter clips, it may be necessary to adjust the measurement range. This is done by simply clicking the range values on the level meter itself. The measurement range will depend on the unit selected in the settings.

Each unit type has three different ranges that can be selected.

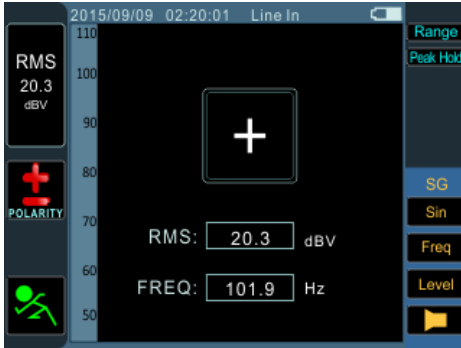
When operating under **dBu**, the range can be adjusted between -85 to -20 dBu, -75 to -5 dBu, -60 to 10 dBu and -45 to 25 dBu.

When **dBV** is selected as the unit, the range is selectable between -87.2 to -22.2 dBV, -77.2 to -7.2 dBV, -62.2 to 7.8 dBV and -47.2 to 22.8 dBV.

Under **voltage**, you can select 43.6u to 77.4mV, 0.14m to 435 mV, 0.78 to 2.45V or 4.36m to 13.7V.

Polarity

The polarity function is most useful in determining whether a speaker is correctly wired. A polarity signal is typically required when checking the phase of a speaker. Thankfully, one is provided through the PAA3X's signal generator.



Checking the polarity of speakers:

1. Go to the Polarity function by accessing the Function menu.
2. Go to the Settings menu and select Mic In as your input source. Exit the Settings menu.
3. Connect the signal generator output to your sound system's inputs. Ideally, with active speakers, you will connect the signal generator directly to your speakers to avoid the complication of finding miswired cables elsewhere in your setup.
4. Start the polarity tone playing by turning the signal generator on/off icon. You could also opt to play a polarity signal through your speakers using some other means (compact disc, external tone generator, etc). For more information on the signal generator, consult the Signal Generator section of this manual.
5. Stand approximately one meter (3 to 4 feet) in front of the speaker that plays the polarity signal.

6. Activate the polarity function by highlighting and selecting the PAA3X's Run/Stop icon.
7. A large "+" appearing on screen means the signal is in phase and the wiring is correct.
8. If instead of a "+" you get a "-", the speaker is out of phase and should be corrected.
9. A big "?" or a screen switching between plus and minus symbols means the sound level is too low and not detectable by the PAA3X. So turn it up! The signal generator's level can be increased through the signal generator menu, but you can also opt to turn up the volume of your speaker/system.

Attention: Make sure the sound pressure level of the polarity signal from the system is higher than the noise from the surrounding environment. The PAA3X will not be able to detect the phase of the speaker accurately if the polarity signal is not at a suitable level.

The above procedure is for checking the polarity of speakers. The same method can be used to check the wiring of cables themselves, you simply need to select the Line In as your input source. After doing so, connect one end of the cable you wish to check to your signal generator and the other end to the PAA3X's input. Points 6 through 9 above should be identical from that point on.

SCREEN CAPTURE

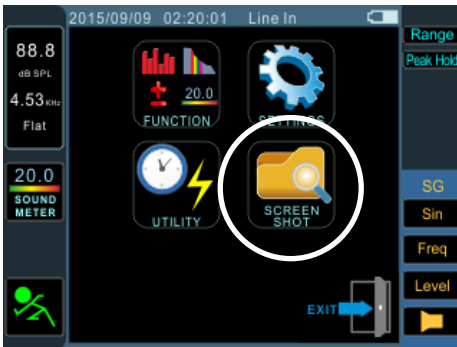
Regardless of the function, the PAA3X can always save screen shots of the current screen to recall at later dates. These are saved on an external SD card. Users can also load or delete their previously stored measurements.

Capture:

1. Insert an appropriately formatted SD card to the PAA3X's SD card slot. SD cards must be formatted as FAT-32 file systems.
2. In any function, on any screen, simply push the Capture button.
3. That's all there is to it. The screen will be instantly captured and a BMP file will be saved to your SD card.

Recall:

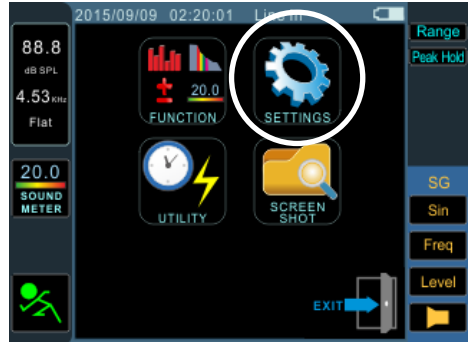
1. Enter the Main menu by selecting the appropriate icon to the left of the screen.
2. Select Screen Shot from the main menu (as shown below). This option is only available when an SD card is inserted. If no SD card is present, the option will be grayed out.



3. Select the "View" icon to view the previously captured files. You can press the \uparrow/\leftarrow and \downarrow/\rightarrow buttons to scroll through all captured files.
4. Selecting the file name on screen allows you to scroll through all saved files. Please note that a list of captured files will not appear on screen.

SETTINGS

Every one of the PAA3X's functions offers its own variable settings. To access the settings menu, select the Menu icon that is found to the left of the screen.



Once in the main menu, select the Settings option to access the Settings menu. The settings menu offers options for input source, units, response time, peak hold, and weighting - among other important features.



Input Source – This setting allows users to switch between the built-in microphones (Mic) and the XLR inputs (Line) as their input source.

Response Time – This feature allows users to select the speed at which their calculations are made and displayed on screen. The response time can be selected between 35 ms (for explosive sounds), 125 ms (fast), 250 ms (medium) and 1 second (slow).

Octave – The octave option allows users to select the resolution of their RTA. There are two options available: 1/3rd and 1/6th octave. In essence, the 1/3rd option is a 31-band RTA while a 1/6th octave has much finer resolution – almost twice the detail – at 61-bands.

Weighting – Any audio analyzer needs to be designed so that it hears sound properties in a manner that would be appropriate for the measurements it is taking. For example, the sensitivity of human hearing is restricted to the frequency range of 20 Hz to 20 kHz. The human ear, however, is most sensitive to sounds in the range of 500 Hz to 8 kHz. The ear becomes progressively less sensitive to sound out of this range. Microphones, however, are not restricted by this limitation and therefore do not respond in the same manner that our ear would.

Audio analysis devices such as the PAA3X provide various weightings for the measurements taken to compensate for the increased and decreased sensitivity. The weighting determines the curve that the PAA3X will use to interpret the input signals from the chosen input source. Flat, A-, B- and C-weightings are available. Each of these weightings is ideal for different applications, with A-weighting perhaps being the most commonly used (and that which most closely matches the human ear) and internationally recognized standard for measurement.

Unit – This allows users to adjust between various measurement units. This may include dB SPL (when the microphone is selected as the input source), dBu, dBV and Volt (when line is selected as the input source).

Peak Hold – The peak hold function will cause the highest signal peaks on the RTA to be held for a short period of time, giving a better visual representation of these high peaks. This is represented by a small red line/dot at the top of the frequency bar. This red mark will remain for as long as the peak hold time is set, or until the signal rises above the previous peak.

EQ Setting – Selecting this option will allow you monitor the suggested equalizer band settings – updated in real time. Please consult the EQ Setting section on page 8 for more info.

Calibration – Entering this menu will allow users to calibrate the precision microphone. See the calibration section below for more information.

MICROPHONE CALIBRATION

As the PAA3X comes factory calibrated, you should never actually need to calibrate your unit. If measurement data or the operation of the unit begins to seem abnormal, however, it may be necessary to perform a calibration. Anyone can calibrate the PAA3X and regain accurate sound pressure level measurement. This is provided they have a quality sound level calibrator with 1/2" diameter adapter that sends out a 1 kHz tone. A B&K TYPE 4231 sound level calibrator is suggested.

Procedure:

1. Enter the Main Menu > Setup menu.
2. Place the PAA3X's microphone within a sound level calibrator with a microphone connector of 1/2" diameter.
3. Select the RUN/STOP icon on screen to start the calibration process.
4. Scroll to the 'dB' level in the middle of the screen and press enter to edit.
5. Adjust the level measured from the SPL calibrator by pressing the \uparrow/\leftarrow and \downarrow/\rightarrow buttons until the level is equal to that of the sound level calibrator (typically 94 dB). Pressing the \uparrow/\leftarrow button once will increase the value by 0.1dB; pressing the \downarrow/\rightarrow button each time will decrease the value by 0.1 dB. This can also be accomplished using the jog wheel control.
6. Press enter and select the SAVE icon to complete the calibration (the PAA3X will restart in this case) or select the "CAL MIC" icon to exit without saving.

SIGNAL GENERATOR

The PAA3X's signal generator can be accessed at any time, for any function. There are four built-in signals, each with their own adjustable properties. All generated signals can have their output level adjusted between -50 dBu and +4 dBu. All signals – except the sweep signal – can also have their gate time adjusted, where users can select a time up to 10 seconds for the signal to run, at which time the signal will turn off.



Sweep: The sweep signal consists of a sine wave with an ever-changing frequency. The frequencies can be user-defined, with 1/6, 1/3, 2/3 and 1 octave intervals selectable by the user. Alternatively, users can choose 'Select' and adjust the sweep range manually. Once users choose 'Select', the Sweep signal's "Start" and "Stop" fields will become active. Users can select the start frequency (between 20Hz and 20 kHz) and stop frequency (between 20 Hz and 20 kHz). Users can opt to have a continuous sweep tone, where the signal generator will run through the entire audio spectrum selected, then start again. Alternatively, users can opt for the tone to repeat itself anywhere between 1 and 10 times before it turns off.

Sine: Used for a variety of purposes. A 1 kHz sine wave is perhaps the most commonly used sine wave. However, users can adjust the PAA3X's sine wave to a number of frequencies between 20 Hz and 20 kHz.

Polarity: The polarity signal is commonly used for checking the polarity of speakers. Check the Polarity section of this manual for more information.

Pink Noise: The pink noise signal is typically used for adjustment of environmental acoustics. The most common use would be in the setting of equalizers. As pink noise encompasses most frequencies audible to humans, playing a pink noise signal in any given setting can give engineers a sense of the acoustical properties of the room and allows them to compensate through the EQ.

UTILITY

The Utility menu can be found within the PAA3X's main menu. Within are some basic settings for the unit.



Calendar: Users can adjust the date here.

Time: Change the time (in 24 hour time).

Display Brightness: Users can adjust the brightness level through this function. Reducing the brightness of the screen can help preserve battery power, or increasing it can enhance visibility in bright areas.

Display Backlight: The backlight time option allows users to adjust the time they wish the PAA3X's screen to remain on. After the selected time has passed, the screen will go dark to preserve the battery power. Adjusting the backlight option to 'off' will disable this feature.

Battery Remain Power: Users can monitor the current remaining battery life here.

Battery Auto Power Off: The auto power off function will turn the PAA3X off after a pre-determined period of time if the user does not use the PAA3X. When set to "OFF", the PAA3X will not automatically power off.

Firmware Update: The PAA3X's firmware can be updated by selecting this option. Check the Firmware Update section for more information.

Initialize: Restore to factory default settings.

FIRMWARE UPDATE

The PAA3X allows for firmware updates which will be periodically available through Phonic's website (www.phonic.com).



To perform a firmware update:

1. Power on the PAA3X.
2. Place an SD card with the latest firmware file in the SD card slot.
3. Enter the Main Menu and select Utility.
4. At the bottom of the page, find the Firmware update option and select "Update". The update will begin immediately.
5. The firmware update can take a few minutes so please be patient.
6. Once the firmware update is complete, users will be prompted to turn the PAA3X off. Please do so by holding the power button for 3 seconds.
7. Turn the unit back on.

OPERATING TIPS

- If you feel a function is not working, first make sure you've selected the correct Input Source in the Settings menu. Throwing the PAA3X at the wall solves nothing.
- Capture your readings quickly using the screen cap button. The right-most button will immediately save a screen shot to any FAT-32 formatted SD card you have inserted.
- If the signal clips, adjust the display range. A higher display range will prevent the unit from clipping when signals go higher than the current display ceiling.
- It is not recommended that you continue using PAA3X for any measurements when the battery is low. Always ensure you have the charger on hand, just in case.
- Push and hold the power button for 3 seconds to turn the unit on and off. In the unlikely event that the PAA3X crashes, push and hold the power button for 10 seconds to turn it off.
- Using the jog wheel is the fastest way to control the PAA3X. Getting familiar with it will save you a lot of time in the long run.
- If you will be reading measurements off the PAA3X over a long period of time, be sure to turn the system's sleep mode 'off', otherwise the screen will go dark after a few minutes. This is done through the Utility menu found in the Main menu.
- When testing sound pressure, the MAX (maximum sound pressure level) field can be reset by simply scrolling to it and hitting enter when it's highlighted.
- The PAA3X can only be charged through the USB connector. This may be done using the included adapter.
- When the PAA3X is charging, the power LED on the side will flash. This LED will stop flashing when the battery is fully charged.

SPECIFICATIONS

English

Inputs / Outputs	Detachable Mic	Condenser mic
	XLR Jacks	Balanced XLR input and output
Display		320 x 240 RGB LCD screen
Range	Mic in / Line In	30 to 130 dB SPL / -85 to 25 dBu
Memory	Micro SD Card	BMP format (320 x 240 pixels)
Generator		Sine, polarity, sweep, pink noise
RTA	Frequency	20 Hz to 20 KHz, all frequencies
	EQ Setting	EQ Cut or Boost
	Dynamic Range	30 to 130 dB; 60dB display range, eg. 70 to 130, 60 to 120, 50 to 110
	dB-scale setting	+ / - 5dB steps on Y-Axis
	Unit	dB SPL, dBu, dBV, Volt
	Octave	1/3, 1/6
	Weight	A, B, C, Flat
RT-60	Unit	dB SPL, dBu, dBV, Volt
	Trigger	Internal / External
	Weight	A, B, C, Flat, 1 Octave
Meter		30 to 130 dB SPL / -85 to 25 dBu / -87.2 to 22.8 dBV / 0.0436mV to 13.7V
Polarity		Polarity checker (Negative / Positive)
Measurement Range	dB SPL	30 to 130 dB SPL
	dBu	-50 to +40 dBu
	dBV	-52 to +38 dBV
	Volts	5mV to 80V
Power Details	Battery	Rechargeable Lithium-ion Battery, 3.7 V / 2200 mAh
	External USB Adapter	+5 VDC, 2A
Dimensions (HxWxD)		156 x 90 x 37.5 mm (6.14" x 3.54" x 1.5")
Weight		325 g (0.7 lbs)

SERVICE AND REPAIR

For replacement parts, service and repairs please contact the Phonic distributor in your country. Phonic does not release service manuals to consumers, and advice users to not attempt any self repairs, as doing so voids all warranties. You can locate a dealer near you at <http://www.phonic.com/where/>.

WARRANTY INFORMATION

Phonic stands behind every product we make with a no-hassles warranty. Warranty coverage may be extended, depending on your region. Phonic Corporation warrants this product for a minimum of one year from the original date of purchase against defects in material and workmanship under use as instructed by the user's manual. Phonic, at its option, shall repair or replace the defective unit covered by this warranty. Please retain the dated sales receipt as evidence of the date of purchase. You will need it for any warranty service. No returns or repairs will be accepted without a proper RMA number (return merchandise authorization). In order to keep this warranty in effect, the product must have been handled and used as prescribed in the instructions accompanying this warranty. Any tampering of the product or attempts of self repair voids all warranty. This warranty does not cover any damage due to accident, misuse, abuse, or negligence. This warranty is valid only if the product was purchased new from an authorized Phonic dealer/distributor. For complete warranty policy information, please visit <http://www.phonic.com/warranty/>.

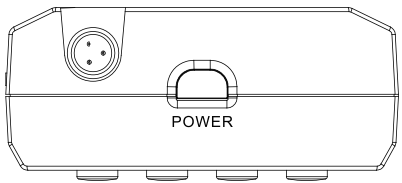
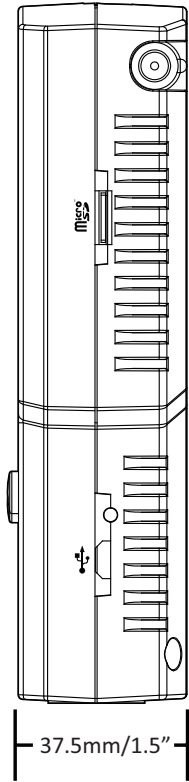
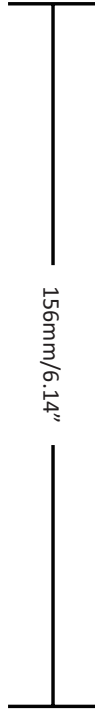
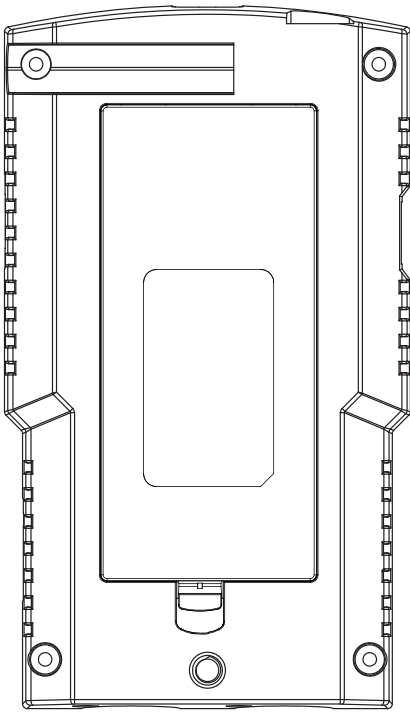
CUSTOMER SERVICE AND TECHNICAL SUPPORT

We encourage you to visit our online help at <http://www.phonic.com/support/>. There you can find answers to frequently asked questions, tech tips, driver downloads, returns instruction and other helpful information. We make every effort to answer your questions within one business day.

support@phonic.com
<http://www.phonic.com>

PHONIC

DIMENSIONS DIMENSION



Appendix

Measurements are shown in mm/inches
Todas las medidas están mostradas en mm/pulgadas.

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