System **824**

TA-LARM

Reference Manual

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System 824 Serial #: _____	PRM902 Pre-amp. Serial #: _____
Microphone Model #: _____	Microphone Serial # _____
	Purchase Date: _____

Table of Contents

CHAPTER

1 *Introduction and Features of 824 TA-LARM*

Welcome to the 824 TA-LARM firmware option. This option is a unique setup in the 824 designed for the appraisal of low frequencies and calculation of tonality as defined in DIN 45680 and DIN 45681.

TA-LARM Features

This manual is best used in conjunction with the 824 Reference Manual (I824.01 Rev. C).

The features of the 824 TA-LARM include the following:

- Measure of Tonality according to DIN 45681
- Appraisal of low frequencies (DIN 45680)

  Calculation of LCeq - LAeq

  1/3 octave analysis from 8 Hz to 12.5 kHz
- Computation of LAIeq (impulse Leq)
- FFT analysis
- Time History Markers
- Measures the following data:

  LAFTM5, LAIeq, LAFTM5-LAeq, LCeq, LAeq, LCeq-LAeq, LFS, LCS, LAS, LFSmax, LCSmax, LASmax, LFF, LCF, LAF, LFFmax, LCFmax, LAFmax, LFI, LCI, LAI, LFImax, LCImax, LAImax, ΔLI

This manual has 3 chapters and 1 appendix and covers the following topics:

- *Chapter 1 - Introduction and Features of 824 TA-LARM:* Discusses the features of the TA-LARM.
- *Chapter 2 - Overview:* Settings menu and settings descriptions.
- *Chapter 3 - Display Views:* Explanation of the different views available.
- *Appendix A - Specifications:* Meets IEC 60651 and IEC 61672

For other information pertaining to the 824 instrument, see the following in the 824 Reference Manual:

- For Data Storage, see Chapter 4.
- For Printing direct reports, see Chapter 8.
- For I/O commands, see Appendix C

Selecting the 824 TA-LARM setup

The TA-LARM instrument is accessed from the SETUP key. When the SETUP key is pressed, the Setup menu will appear showing all of the available IDs.

Press the SETUP key. The following screen will appear:

Press the down ▼ arrow key and highlight TA-LARM.

Press the Check ✓ key to load the TAL instrument. Press the SETUP ✎ key to view the Setup menu again.

You will notice that TA-LARM is now highlighted along with “Edit Settings”. Pressing the Check ✓ key will allow you to change the settings within the TA-LARM instrument. The Settings menu for TA-LARM will be covered in the next chapter.

CHAPTER

2 *Overview*

The SETUP ⊘ key is used to establish the 824 measurement setups and associated parameters. Press the SETUP ⊘ key to access the TA-LARM instrument and settings menu.

Settings Menu

The menu layout of the TA-LARM settings is shown in the table below:

Menu Items	Submenu	Available Settings Options	Available Settings Options
Title		User customized text entry	
SLM	Detector	Slow Fast Impl	
	Weighting	A C Flt	
	Ln	Enable Ln	No Yes
		Start Level	0 - 99 dB
		Ln 1 Percent	0 - 99.99%
		Ln 2 Percent	0 - 99.99%
		Ln 3 Percent	0 - 99.99%
		Ln 4 Percent	0 - 99.99%
		Ln 5 Percent	0 - 99.99%
		Ln 6 Percent	0 - 99.99%

Menu Items	Submenu	Available Settings Options	Available Settings Options
SLM	Time History	Hist Enable	No Yes
		Hist Period	0 - 255
		Period Units	1/32s 1.0s 10.0s 60.0s
		Resolution	0.1dB 1.0dB
		TH Setup	Setup-a screen Setup-b screen
		Marker Text	Marker 1 (Aircraft) Marker 2 (Automble) Marker 3 (Truck) Marker 4 (Train) Marker 5 (Animal)
	Run Timer	1 second to 99:59:59 hours	
RTA	Gain	-20 -10 +0 +10 +20 +30 +40 +50	
	RTA Detector	Slow Fast	
	RTA Run Timer	1 second to 99:59:59 hours	
Tone	Gain	-20 -10 +0 +10 +20 +30 +40 +50	
	Avg Count	30 - 255	
Transducer	Condnsr Elctret Direct		

Settings Descriptions

Title

Printing of TAL reports is not currently available.

Use the title setting to create a title or heading for printed reports. This title will be placed at the top of each printed TA-LARM report. You are allotted 30 characters.

SLM Settings Menu

Detector

Selects the detector rate of the instrument's Ln's and time history Leq. This setting provides the following three options:

- **Slow** - An exponential average with a one second time constant.
- **Fast** - An exponential average with a 1/8 second time constant.
- **Impl** - An impulse detector with a 35 millisecond exponential rise time and a 1.5 sec. decay time.

Weighting

Selects the desired frequency weighting for the Ln's and time history Leq. The weighting setting provides the following three options:

- **A** - The instrument uses an A-weighted input filter
- **C** - The instrument uses a C-weighted input filter.
- **FLT** - The instrument uses Flat weighting (see specifications for passband frequency in the 824 Reference Manual, Appendix D).

Ln

Ln's are calculated using the selected detector and weighting.

Ln is the RMS noise level that was exceeded n% of the time. The Ln's are computed from the overall level distribution histogram. The measured and displayed Ln may be changed during the measurement. The six Ln's are automatically listed in increasing order.

Enable Ln

Enables or disables automatic storage of Ln percentiles. This setting has two options:

- **No** - Ln percentile storage is disabled.
- **Yes** - Ln percentile storage is enabled.

Start Level

The Start Level allows you to set the minimum decibel level that would be included in the statistical histogram and calculated Ln Percentiles. The maximum level is +127.9 dB.

Ln's (Ln 1 to Ln 6)

The Ln percentiles set the six percentile values to be measured, logged (if selected) and shown in the "SLM View Ln" display. Using these six settings, you can select any six percentile values. For example, setting one of the six settings to 30 would show the SPL that has been exceeded 30% of the time during the measurement. These settings can each take on any value within the following range:

A setting of 0 will give you Lmax for the measurement time.

- 0 to 99.99%

Time History Settings

The time history is active only when viewing SLM data.

The time history record can store up to 23 different parameters such as: LAeq, LCeq, LFeq, LAFTM5, and LIeq. The default parameters stored are LAeq and LAmax. Levels can be stored rapidly, up to 32 samples per second. Since this function continues storing data as long as the measurement is in progress, the combination of a fast storage rate and a long measurement time can consume a large amount of data memory.

Hist Enable

This setting provides the following two options:

- **No -** Time-history storage is disabled.
- **Yes -** Time-history storage is enabled.

Hist Period

This setting is used in conjunction with the "Period Units Setting" (below).

Hist Period sets the number of history **period units** that transpire between successive time history samples. These samples continue until the instrument is stopped or runs out of memory. This setting can include any integer value in the following range:

*The sample interval is defined by the equation, Hist Period * Period units.*

0 to 255

Period Units

Period Units selects the type of units the instrument uses to calculate the time that transpires between successive time history storage operations. To calculate the timer period, the instrument multiplies the units selected in this setting by the number set in ***Hist Period*** setting.

This setting provides the following four options:

If the TaktMax5 value is selected for time history, the time history interval wil be forced to multiples of 5 seconds.

- **1/32s -** This sets the History Period Unit to 1/32 second intervals. Since the instrument samples the detector 32 times per second, this is the smallest resolution time period that you can use. If you set the time history period to 1/32 second (i.e. period setting = 1 and unit setting = Sample = 1/32s), the instrument will store every sample it takes.
- **1.0s -** This sets the history period unit to one second.
- **10.0s -** This sets the history period unit to ten seconds.
- **60.0s -** This sets the history period unit to sixty seconds.

Resolution

In order to double the time history storage capacity, it is possible to reduce the resolution of the Time History record from 0.1dB to 1.0dB.

- **0.1dB -** Time History levels are stored with the highest resolution (0.1dB) which requires 2 bytes of memory per level.

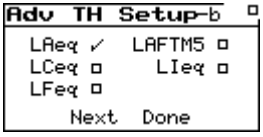
- **1.0dB -** Time History levels are stored with 1.0dB resolution which requires only 1 byte per level stored. Levels are rounded to the nearest integer (85.5 would be stored as 86dB and 85.4 would be stored as 85dB).

TH Setup

Up to 23 different parameters can be stored with each time history period. These are all user selectable from the two Advanced Time History displays.

An overall reset will be required to change the history setup. Press the Reset ⏬ key to clear the check boxes.

The ***Advanced Time History*** displays are shown below:



Once the Advanced Time History displays have been selected, do the following to navigate through and setup each display.

- Use the up ⏫ and down ⏬ and left ⏪ and right ⏩ arrow keys to move the cursor between each selection or check box.

- The Check ✓ key toggles the selection on or off (The Reset key ⏬ will uncheck all the items on the current display).

- To move to the next screen, (a or b), highlight “Next” and press the Check ✓ key.

When all of your selections have been made, highlight "Done" and press the Check ✓ key.

Marker Text

One of the features of the 824 is the ability to **mark** or annotate the TAL Time History as the instrument is running. This allows the user to identify each noise source as the measurement is being taken. There are 5 **Markers** and each marker can be assigned an 8 character description. Use this setting to name each marker.

NOTE: See Chapter 3 for instructions concerning the use of these markers in the TAL Time History display.

Run Timer

An overall reset will reset all data, reset the measurement timer and delete the time history if time history is enabled.

The Run Timer is a preset integration time for the basic SLM measurement set in units of hh:mm:ss with a range from 1 second to 99:59:59 hours. If the measurement time is set to 0, the measurement will run continuously until the RUN/STOP ⏯ Key is pressed. For any other time, the 824 will automatically stop when the measurement time is greater than or equal to the runtime setting.

A stop is required to change the run timer settings.

NOTE: On every run, a current reset is automatically performed.

RTA Settings

Gain

The gain setting sets the measuring range of the instrument in 10 dB steps by adjusting the amplification of the microphone's signal. The lowest and highest levels that can be measured accurately are indicated by each live display's graph scale. This setting provides the following options:

- -20, -10, +0, +10, +20, +30, +40, +50

RTA Detector

The **RTA Detector** sets the time averaging characteristics for real-time frequency analysis. This setting provides the following two options:

- **Slow** - The frequency analysis uses exponential averaging with a one second time constant.
- **Fast** - The frequency analysis uses exponential averaging with a 1/8 second time constant.

RTA Run Timer

The **RTA Run Timer** is a preset time entered by the user for the RTA measurement time in the format hh:mm:ss with a range from 1 second to 99:59:59 hours. (See “Run Timer” under SLM Settings)

Tone Settings

Gain

The gain setting sets the measuring range of the instrument in 10 dB steps by adjusting the amplification of the microphone’s signal. The lowest and highest levels that can be measured accurately are indicated by each live display’s graph scale. This setting provides the following options:

- -20, -10, +0, +10, +20, +30, +40, +50

Avg Count

An approximation of the averaging time can calculated as Time = 0.05 * Avg Count seconds.

- 30 - 255

Transducer

The transducer setting allows the user to select the type of transducer being used. This setting provides the following three settings:

- **Condnsr** - This indicates that the microphone being used is an air condenser type and the System 824 will generate the appropriate polarization voltage.
- **Elctret** - This indicates that the microhpone being used is an “electret” (pre-polarized) microphone. The instrument will not generate any polarization voltage.
- **Direct** - This indicates that no microphone is being used and that electrical signals are being injected directly into the preamplifier. The instrument will not generate any polarization voltage.

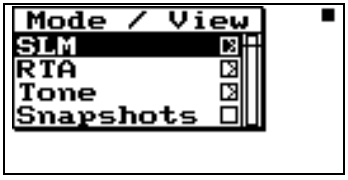
CHAPTER

3 *Display Views*

This Chapter explains the various displays available under the **View** key for the TA-LARM instrument

SLM Views

The SLM Views are accessed through the View Key. To select the SLM Views, press the View Key. The following menu will appear:



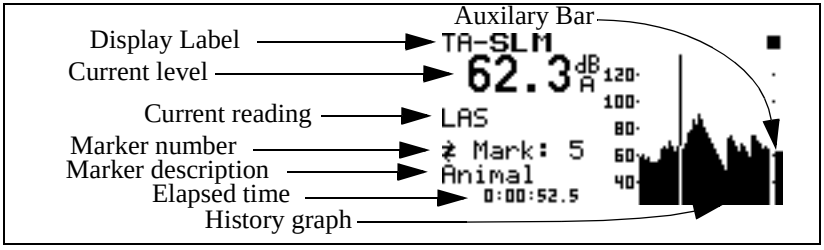
Press the right arrow key to access the “SLM” views.

Press the Check Key or the right arrow key to select “SLM + Mark”.

SLM + Mark

The **SLM + Mark** view shows the SLM data with a graphic display of time history. The data that is currently being displayed (shown by the **Current reading**) is shown in the history graph. When the displayed data (**Current reading**) is changed, the new data in the history graph will begin to be scrolled on the display. See the table below for the values displayed and the values which are graphed under **Current reading**.

Another feature of this view are 5 markers, each with an eight character description. These are used to identify different noise sources during the measurement. (See SLM + Mark check menu)



The following is a brief description of each of the components of this display:

- **Display label** - The Display label identifies the display.
- **Current level** - Shows the current level according to what is chosen in the Selectable Reading field. (See **Current reading** below)
- **Current reading -** This annotates the currently displayed level. The currently displayed level can be changed one at a time using the up ⏶ and down ⏷ arrow keys. The sequence of levels is:

  LAFTM5, LAeq, LCeq, LAIeq, LTM5-LAeq, LCeq-LAeq, ΔLI, LAS, LCS, LFS, LAF, LCF, LFF, LAI, LCI, LFI, LASmax, LCSmax, LFSmax, LAFmax, LCFmax, LFFmax, LAImax, LCImax, LFImax

The following graph shows the values which can be displayed for the Current reading, the value that is graphed on the display and the SPL value shown by the **Auxilary bar**.

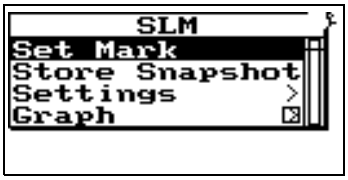
Current value displayed	Value graphed	SPL Value shown by AUX bar
LAFTM5	LAFTM5	A Fast SPL
LAeq	LAeq	A Slow SPL
LCeq	LCeq	C Slow SPL
LAIeq	LAIeq	A Impulse SPL
LAFTM5-LAeq	LAFTM5	A Fast SPL
ΔLI	LAIeq	A Impulse SPL
LAS	LAS	A Slow SPL
LCS	LCS	C Slow SPL
LFS	LFS	Flat Slow SPL
LAF	LAF	A Fast SPL
LCF	LCF	C Fast SPL
LFF	LFF	F Fast SPL
LAI	LAI	A Impulse SPL
LCI	LCI	C Impulse SPL
LFI	LFI	F Impulse SPL
LASmax	LASmax	A Slow SPL
LCSmax	LCSmax	C Slow SPL
LFSmax	LFSmax	Flat Slow SPL
LAFmax	LAFmax	A Fast SPL
LCFmax	LCFmax	C Fast SPL
LFFmax	LFFmax	F Fast SPL
LAImax	LAImax	A Impulse SPL
LCImax	LCImax	C Impulse SPL
LFImax	LFImax	Flat Impulse SPL

- **Marker number** - Shows the marker number that will be used when setting the marker for the time history. There are 5 markers to choose from. Use the left ◀ and right ▶ arrow keys to scroll through the markers.

- **Marker description** -This is an eight character description of the marker. Go to the “Settings” menu to change the names of the markers.
- **Elapsed time** - Displays the run time for the measurement.
- **History graph** - This shows the history of the Current reading.

SLM + Mark Check Menu

Pressing the Check ✓ Key once while in the “SLM + Mark” view puts you in the Check menu. The check menu is shown below:



The check menu offers the following options:

The time history must be enabled in order to set a marker in time history. The prompt “Function Not Enabled” will appear if the time history has not been enabled.

- **Set Mark** - Sets a marker in the time history for noise source identification. Pressing the Check ✓ Key when “Set Mark” is highlighted puts a marker in the time history and returns you to the “SLM + Mark” display.

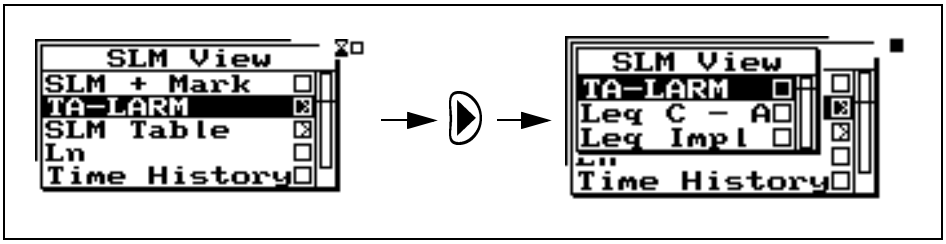
NOTE: The 824 must be running in order to set a marker in the time history. The 824 will give an audible “beep” when you try to set a marker if it is not running.

- **Store Snapshot** - Stores current data at that moment in time.
- **Settings** - Modifies the SLM settings.
- **Graph** - Changes the scaling of the instrument’s SLM history graph and returns you to the “SLM + Mark” display.

NOTE: Pressing the right ▶ arrow key when "Graph" is highlighted allows the graph parameters to be adjusted using a menu.. Pressing the Check ✓ Key when "Graph" is highlighted puts you in a graphical mode. (See 824 Reference Manual)

TA-LARM

To access the TA-LARM displays, press the View 👁 key and highlight TA-LARM.



Press the right ▶ arrow key or the Check ✓ Key to view the TA-LARM displays. The displays are shown below:

TA-LARM-a	
LAFTM5	71.8 dB
LAeq	63.2 dB
LAFTM5-LAeq	8.6 dB
Runtime	0:07:20.5

TA-LARM-b	
LCeq	66.1 dB
LAeq	63.2 dB
LCeq-LAeq	2.9 dB
Runtime	0:07:20.5

TA-LARM-c	
LAIeq	68.6 dB
LAeq	63.2 dB
LAIeq-LAeq	5.3 dB
Runtime	0:07:20.5

Use the left ◀ and right ▶ arrow keys to scroll through the TA-LARM displays. (a, b, and c)

These displays show the following values:

LAFTM5 -- A-weighted, fast, 5 second TAKT maximal level

LAeq -- A-weighted Leq

LAFTM5 - LAeq -- TAKT maximal level minus A-weighted Leq

LCeq -- C-weighted Leq

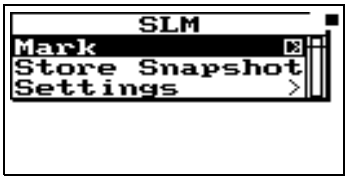
LCeq - LAeq -- C-weighted Leq minus A-weighted Leq

LAIeq -- Equivalent energy of the A-weighted impulse detector

LAIeq - LAeq -- Equivalent energy of the A-weighted impulse detector minus A-weighted Leq

TA-LARM Check Menu

Pressing the Check ✓ Key once while in the "TA-LARM" view puts you in the Check menu. The check menu is shown below:



The check menu offers the following options:

A generic marker is identified with only "Mark" and does not carry an eight character description.

- **Mark** - Sets a marker in the time history. Pressing the right ▶ arrow key accesses the "SLM + Mark" display in order to place a marker in the time history. *Pressing the Check ✓ key will set a generic marker.* (See "Set Mark" under the SLM + Mark Check Menu)

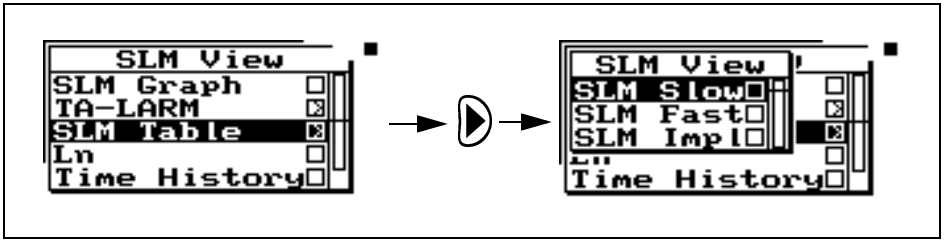
- **Store Snapshot** - Stores current SPL data at that moment in time.

- **Settings** - Modifies the SLM settings.

SLM Table

If the current view is TA-LARM or TA-Ln the down ▼ and up ▲ arrow keys will display the SLM Table displays.

To access the SLM Table displays, press the View 👁 key and highlight SLM Table.



Press the right ▷ arrow key or the Check ✓ Key to view the SLM Table displays. The displays are shown below:

TA-**SLM**-a

	Slow SPL	Slow Max
F	65.6dB	83.5dB
C	61.4dB	83.4dB
A	45.4dB	83.8dB

TA-**SLM**-b

	Fast SPL	Fast Max
F	64.9dB	86.2dB
C	61.4dB	86.1dB
A	47.9dB	86.4dB

TA-**SLM**-c

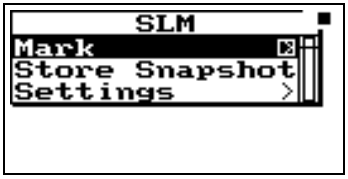
	Impl SPL	Impl Max
F	67.2dB	87.2dB
C	63.2dB	87.2dB
A	51.7dB	87.4dB

Use the left ◁ and right ▷ arrow keys to scroll through the SLM Table displays. (a, b, and c)

In this view, three different tables present **Slow**, **Fast**, **and Impulse** detectors with **A**, **C**, and **Flat** weighting. The maximum values are also shown for each detector and weighting.

SLM Table Check Menu

Pressing the Check ✓ Key once while in the “SLM Table” view puts you in the Check menu. The check menu is shown below:



The check menu offers the following options:

A generic marker is identified with only "Mark" and does not carry an eight character description.

- **Mark** - Sets a marker in the time history for noise source identification. Pressing the right ▶ arrow key accesses the "SLM + Mark" display in order to place a marker in the time history. *Pressing the Check ✓ key will set a generic marker.* (See "Set Mark" under the SLM + Mark Check Menu.

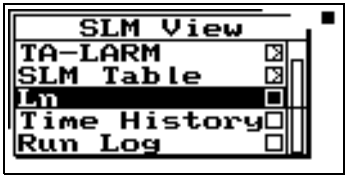
- **Store Snapshot** - Stores current SPL data at that moment in time.

- **Settings** - Modifies the SLM settings.

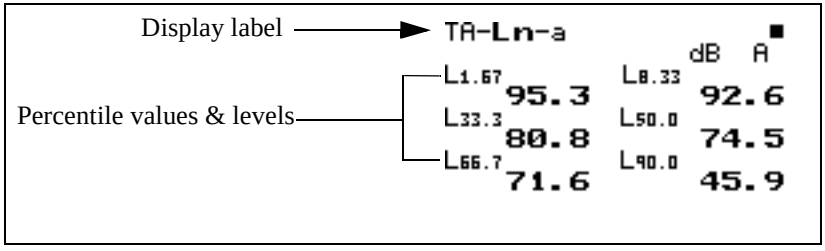
Ln

You can also press the up ▲ or down ▼ arrow keys from within the TA-LARM or SLM Table displays.

To access the Ln displays, press the View ◉ key and highlight Ln.



Press the right ▶ arrow key or the Check ✓ Key to view the Ln displays. The displays are shown below:



The following is a brief description of each of the components of this display:

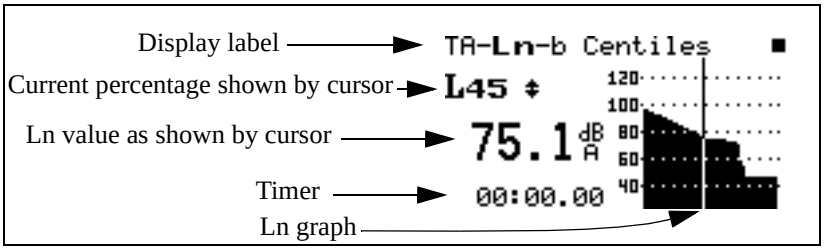
- **Display label** - The Display label identifies the display.

Lns are reset with an Overall Reset

- **Percentile values & levels** - The Ln (percentile levels) level is that level which is exceeded 'n' percent of the measurement time. By modifying the six settings, you can select any six percentile values to be displayed at a time.

NOTE: If Lns are enabled then the Back-Erase feature is no longer available. (See the 824 Reference Manual for information on the Back-Erase feature)

Use the right ▶ arrow key to view the TA-**Ln**-b display.

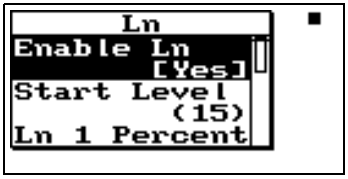


The following is a brief description of each of the components of this display:

- **Display label** - The Display label identifies the display.
- **Current percentage** - Selects % of Ln to display (1 to 99), using the up ▲ and down ▼ arrow keys to move from one percentile to another.
- **Ln** - This shows the current Ln value.
- **Timer** - Shows the elapsed run time accumulated since the last reset.
- **Ln graph** - Graph of Ln's from 1 to 99 (1 being on the left, 99 on the right).

Ln Check Menu

Pressing the Check ✓ Key once while in the "Ln" view puts you in the Check menu. The check menu is shown below:



The Ln check menu items are the same as in the Edit settings menu available under the Settings ⊘ key.

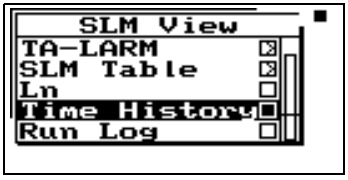
The following table shows the Ln settings:

Menu Items	Available Settings Options
Enable Ln	No Yes
Start Level	**0 - 99 dB**
Ln 1 Percent	**0.00 to 99.9%**
Ln 2 Percent	**0.00 to 99.9%**
Ln 3 Percent	**0.00 to 99.9%**
Ln 4 Percent	**0.00 to 99.9%**
Ln 5 Percent	**0.00 to 99.9%**
Ln 6 Percent	**0.00 to 99.9%**

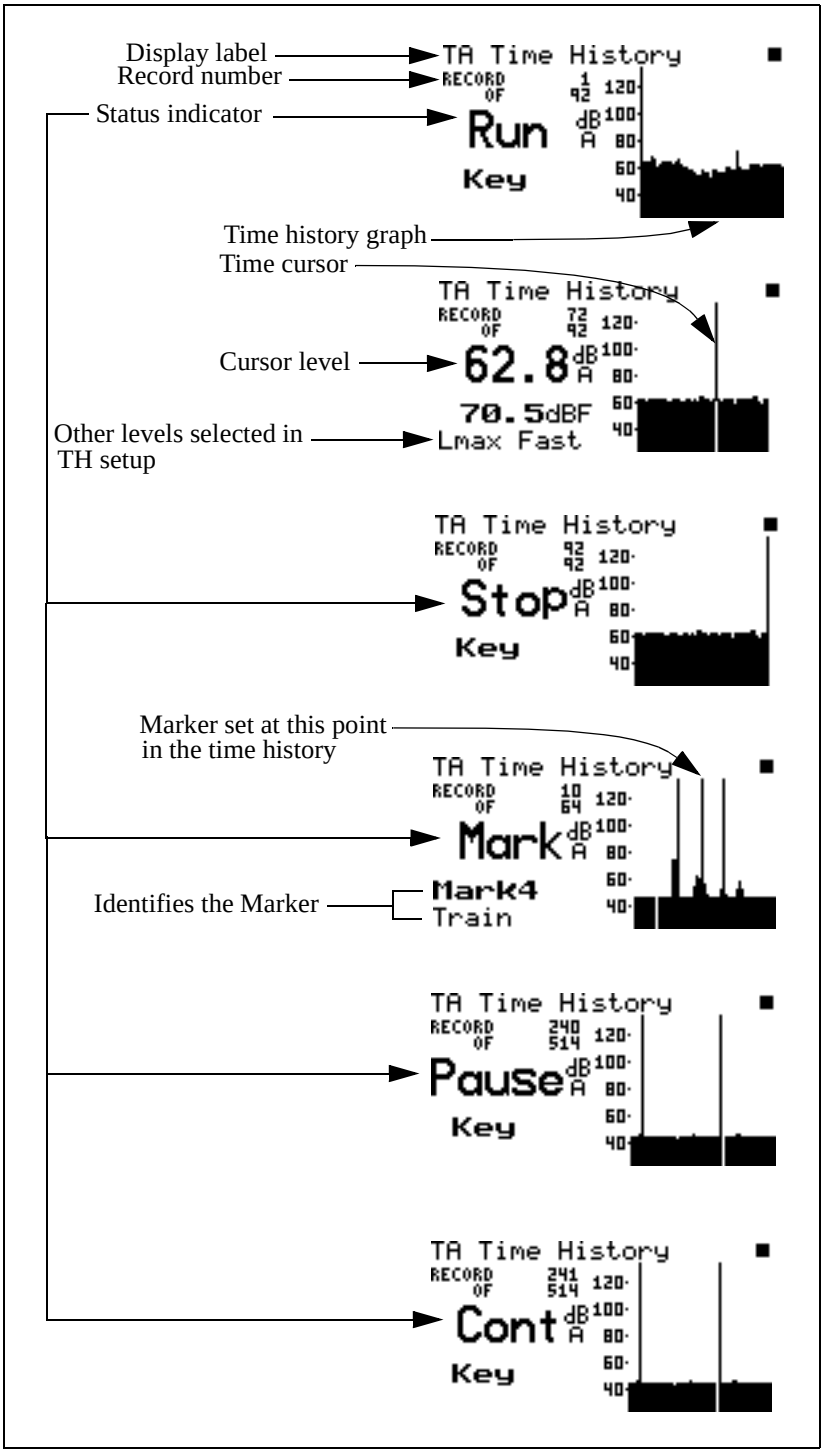
Time History

The **Time History** view shows the level for each time history period graphically.

To access the Time History display, press the View ⊙ key and highlight Time History.



Press the right ⊳ arrow key or the Check ⊘ Key to view the Time History display.


Display label
Record number
Status indicator
Time history graph
Time cursor
Cursor level
Other levels selected in TH setup
Marker set at this point in the time history
Identifies the Marker
TA Time History
RECORD
OF
Run
Key
Stop
Mark
Mark4
Train
Pause
Cont
dB
A
Lmax Fast
62.8
70.5dBF

The following is a brief description of each of the components of this display:

An overall reset will reset all data, reset the measurement timer and will delete the time history if time history is enabled.

- **Display label** - The Display label identifies the current-display.
- **Record number -** Indicates what time history sample you are viewing.
- **Status indicator** -The status indicator will show one of the six possible events that occurred at the point of time referenced by the time cursor:

  Run - Indicates that a measurement started at this time.

  Stop - Indicates that the measurement stopped at this time.

  Pause - Indicates that the measurement paused at this time.

  Cont - Indicates that the measurement continued at this time.

  Reset - Indicates that the measurement was reset at this time.

  Mark - Indicates that a marker was set at this point in time.

Use the left ◀ and right ▶ arrow keys to move the cursor.

- **Time history graph -** Graphical representation of each time history period.
- **Time cursor -** Shows the SPL level at this point in time.

Use the up ▲ and down ▼ arrow keys to scroll through each level.

- **Other level** - Shows all of the levels selected in the TH setup in the settings menu.

Time History Check Menu

Pressing the Check ✓ Key once while in the "Time History" view puts you in the Check menu. The check menu is shown below:

The check menu offers the following options:

- **Locate -** Locate Time History record

  - ***First*** - The first Time History record

  - ***Last*** - The last Time History record

  - ***Find*** - Finds the specified Time History record

- **Settings** - Modifies the Time History settings

- **Graph** - Adjusts the graph scale and offset (See 824 Reference Manual)

  - ***Graph Level*** -Allows numerical entry of graph level in dB.

  - ***Graph Scale*** - Allows numerical entry of graph scale

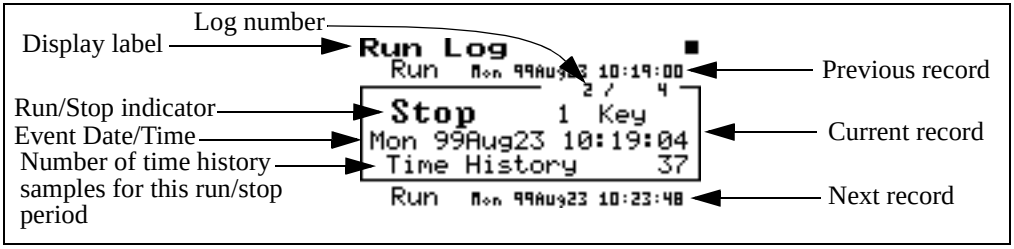
Run Log

The Run Log is only available for the SLM mode and not for the RTA or Tone modes.

The **Run Log** view displays the start and stop times and dates of each measurement.

To access the Run Log display, press the View 👁 key and highlight Run Log.

Press the right ▶ arrow key or the Check ✓ Key to view the Run Log display. The display is shown below:



The following is a brief description of each of the components of this display:

- **Display label** - The Display label identifies the current-display.

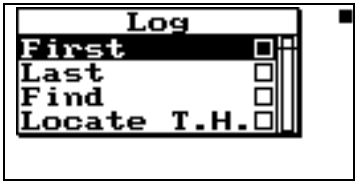
- **Log number** - The Run Log display shows the start and stop times/dates of each measurement. Each measurement is logged in the order it occurred. The Log number indicates the order of the displayed log entry in relation to other log entries.

- **Run/Stop indicator** -Each measurement reading log has two entries; one corresponding to when the measurement started to run and the other entry corresponding to when the measurement was stopped.

- **Event Date/Time** - Shows the time and date that this log entry either started to run or was stopped.

Run Log Check Menu

Pressing the Check ⓥ Key once while in the “Time History” view puts you in the Check menu. The check menu is shown below:

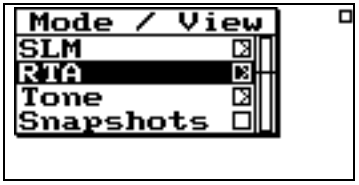


The check menu offers the following options:

- ***First*** - The first Run Log record
- ***Last*** - The last Run Log record
- ***Find*** - Finds the specified Run Log record
- ***Locate T.H.*** - Displays the “TA Time History” screen

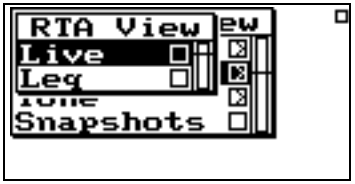
RTA Views

The RTA Views are accessed through the ⓥ View key. To select the RTA Views press the ⓥ View key. The following menu will appear:



Highlight “RTA” and press the ▶ right arrow key to access the “ RTA” display menu.

Use the ▲ up and ▼ down arrow keys to highlight the desired display.

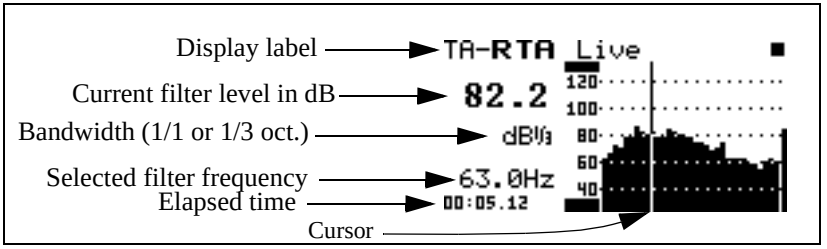


The RTA display view menu offers 2 choices: Live and Leq. Use the ✓ check key to select the **Live** display.

Live

The RTA spectral data uses either fast (1/8 sec) or slow (1 sec) exponential time averaging.

The **TA-RTA Live** display shows the live spectrum and is the current sampled data with a sample time of 8 per second. The live display is updated regularly when the 824 is running.

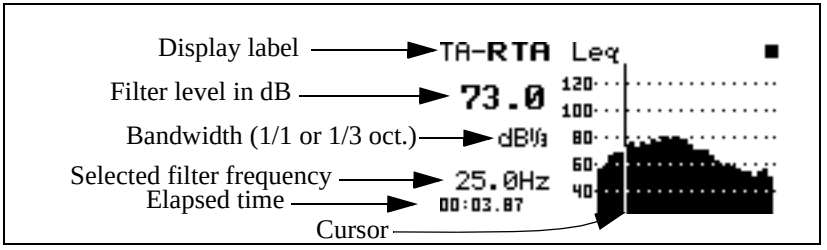


Use the left ◀ and right ▶ arrow keys to change the cursor frequency.

Leq

Press the ⦿ View key again to display the "RTA View" menu. Press the ▲ up and ▼ down arrow keys to highlight the desired display and press the ✓ check key to select the highlighted display.

The **TA-RTA Leq** display shows the equivalent level of all the samples for each frequency. A current or overall reset will reset the Leq data.

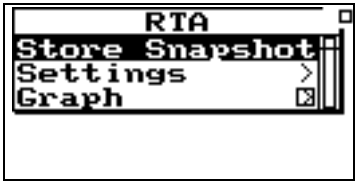


Use the left ◀ and right ▶ arrow keys to change the cursor frequency.

Once you are in one of the two RTA displays (**Live** or **Leq**) use the up ▲ and down ▼ arrow keys to move between them.

RTA View Check Menu

Pressing the Check ✓ Key once while in the "RTA " view puts you in the Check menu. The check menu is shown below:



The check menu offers the following options:

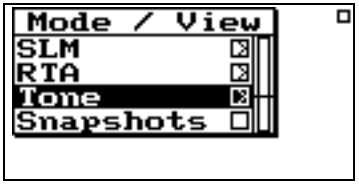
- **Store Snapshot** - Stores current RTA data at that moment in time.
- **Settings** - Modifies the RTA settings.
- **Graph** - Adjusts the graph scale and offset (See 824 Reference Manual)

  - ***Graph Level*** -Allows numerical entry of graph level in dB.

  - ***Graph Scale*** - Allows numerical entry of graph scale

Tonality View

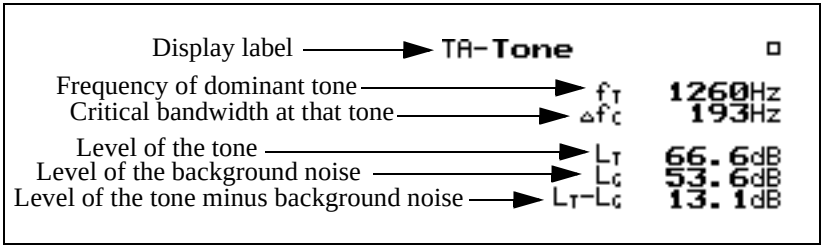
The Tonality View is accessed through the View ⦿ Key. To select the Tonality View, press the View ⦿ Key. The following menu will appear:



Highlight “Tone” and press the Check ⓥ Key or the right ⓡ arrow key to select the Tone display.

Tone

The Tone display calculates tonality as defined in DIN45681. Frequencies from 100 Hz to 15 kHz are analyzed using FFTs and only the largest tone at Ft is reported.



The data comes from 3 FFTs that are computed simultaneously. All FFT’s use the same count for averaging and average over the same time period. The FFT with 5120 Hz sample rate defines the time required to average, since no more than 75% overlap is allowed. An approximation of averaging time as a function of count is:

Time = 0.05 (multiplied by) count seconds

The following table shows some FFT specifications:

FFT lines	Sample Rate	Hertz/bin	lower f	upper f
400	5120	5	100	2005
400	10240	10	2010	4290
400	51200	50	4290	15000

The data ΔFc is the Barq bandwidth for the frequency Ft and is computed from the equation:

Lt is the RMS sum of bins adjacent to the tone that are higher than the level of the tone bin minus 10 dB and higher than **Ls** plus 6 dB.

$$\Delta Fc = 25.0 + 75.0\left[1.0 + 1.4 \cdot \left(\frac{Ft}{1000}\right)^2\right]^{0.69} Hz$$

The lower and upper bandedge frequencies of the Barq are computed as:

The bandedge frequencies are rounded to the nearest FFT bin center frequency to define the Barq bandedges within the FFT.

$$f_1 = Ft - \frac{\Delta Fc}{2} \text{ and } f_2 = Ft + \frac{\Delta Fc}{2}$$

Masking noise, **Ls**, is the RMS equivalent of all levels within the Barq bandwidth that are at least 10 dB below the tone level and are lower than the masking noise level plus 6 dB.

The group masking level, **Lg**, is defined as:

$$Lg = Ls + 10Log\left(\frac{\Delta Fc}{\Delta f}\right) \text{dB}$$

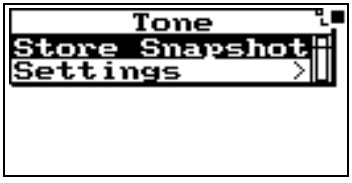
where ΔF is the FFT bin bandwidth.

The value ΔL = Lt - Lg + 6 dB is calculated and **Kt** is evaluated from the following table:

ΔL in dB	**Kt**
0 > L	0
0 < L < 2	1
2 < L < 4	2
4 < L < 6	3
6 < L < 8	4
8 < L < 10	5
10 > L	6

Tone Check Menu

Pressing the Check ✓ Key once while in the "Tone" view puts you in the Check menu. The check menu is shown below:



The check menu offers the following options:

- **Store Snapshot** - Stores current RTA data at that moment in time.
- **Settings** - Modifies the Tone settings.

Snapshot

A Snapshot is a way to capture a particular moment in time It is similar to taking a photograph. It captures the data at that point in time. A snapshot can be taken in the following three modes:

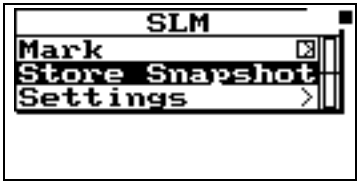
For more information on Snapshots, *see the following check menus: SLM + Mark, TA-LARM, SLM Table, TA-RTA Live, TA-RTA Leq, and Tone.*

- SLM (Stores all of the SLM data including 6 Ln values)
- RTA (Stores RTA Live and RTA Leq)
- Tone (Stores the Tone data)

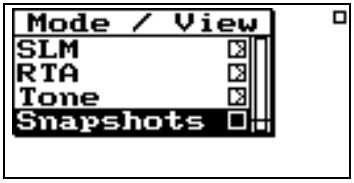
A snapshot is taken by going into any of the above three modes. When you have data that you would like to capture, press the Check ✓ key (which accesses the check menu of that display), select "Snapshot" and press the Check ✓ key.

Below is an example of a check menu:

Simply highlight "Store Snapshot" and press the Check ✓ key to capture that point in time.

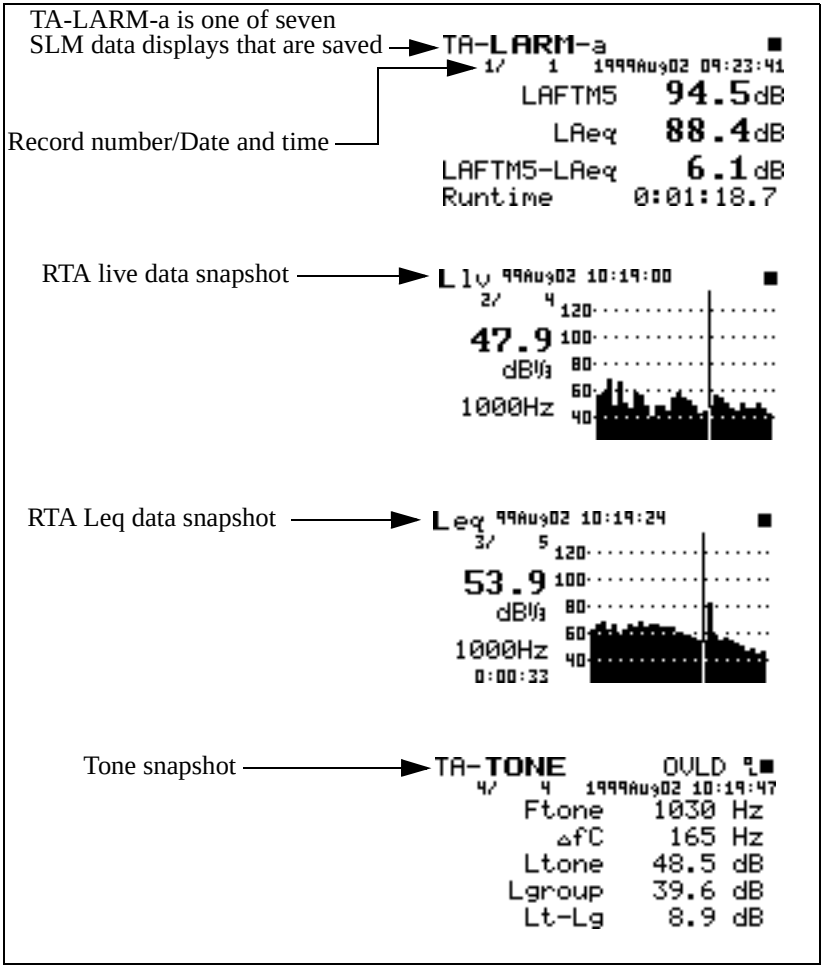


To access the Snapshot data, press the View 👁 Key. The following menu will appear:



Highlight "Snapshots" and press the Check ✓ key to access the snapshot data.

Below are some examples of snapshot data:



Use the up ⏶ and down ⏷ arrow keys to scroll through each record.

In the SLM snapshot (such as TA-LARM-a), use the right ⏵ and left ⏴ arrow keys to view all seven snapshots including the 6 Ln values.

The **date** and **time** records when the snapshot was taken.

Snapshot Check Menu

To access the snapshot check menus, press the Check ✓ key while viewing any of the snapshot data.

If viewing **SLM snapshot** or **Tone** data, the following menu will appear after pressing the Check ✓ key:

The check menu offers the following options:

*Press the right ▶ arrow key to access the **Locate** menu.*

- **Locate -** Locate Snapshot record

  - **First** - The first Snapshot record
  - ***Last*** - The last Snapshot record
  - ***Find*** - Finds the Snapshot record

If viewing the RTA Live snapshot data, the following menu will appear after pressing the Check ✓ key:

The check menu offers the following options:

- **Leq Spectrum -** View the Leq spectrum
- **Locate -** Locate Snapshot record

  - ***First*** - The first Snapshot record

- ***Last*** - The last Snapshot record

- ***Find*** - Finds the specified Snapshot record

- **Graph** - Adjusts the graph scale and offset (See 824 Reference Manual)

  - ***Graph Level*** - Allows numerical entry of graph level in dB.

  - ***Graph Scale*** - Allows numerical entry of graph scale

If viewing the RTA Leq snapshot data, the following menu will appear after pressing the Check ✓ key:

The check menu offers the following options:

- **Live Spectrum -** View the Live spectrum

- **Locate -** Locate Snapshot record

  - ***First*** - The first Snapshot record

  - ***Last*** - The last Snapshot record

  - ***Find*** - Finds the specified Snapshot record

- **Graph** - Adjusts the graph scale and offset (See 824 Reference Manual)

  - ***Graph Level*** - Allows numerical entry of graph level in dB.

  - ***Graph Scale*** - Allows numerical entry of graph scale

File Storage

To store all the data to a file, press the Data key. The following menu will appear:

If no other data has been stored, “Store File” will be highlighted. Press the Check key to store the data. The following data will be stored:

- All snapshots
- Current SLM data
- Current RTA data
- Current tonality data

WARNING! An overall Reset will clear all time history and snapshot data that has not been stored to a file.

APPENDIX

A TAL Specifications

The specifications contained in this chapter are subject to change without notice.

These specifications are valid for all System 824's using the following options:

- PRM902 preamp
- 2541 (or 2560) free-field or random high sensitivity microphones
- 2540 (or 2559) free-field or random normal sensitivity microphones

Note: Where possible, tests were performed electrically using an AD005 microphone adapter (18 pF).

Standards Met

- IEC 60651
- **DIN 45681** for Tonality
- **DIN 45680** for Appraisal of low frequencies

The SLM specifications for the TAL instrument are the same as the LOG instrument. (See the 824 Reference Manual, Appendix D)

RTA Mode Specifications

Filter types:	1/3 octave filters (digital filters)
1/3 octave filter time weighting	Slow (1/8 second, exponential) Fast (1 second, Exponential)
Linearity range:	> 80 dB 1/3 octave
Reference level range:	0 dB gain
Sample rate:	16,128 Hz
1/3 octave band frequencies:	8.0 Hz - 12.5 kHz (33 filters)
Filter integrated response:	≤ ±0.15 dB for all filters
Real-time operation:	≤ ±0.3 dB error for all filters tested with a swept sinusoidal input
Anti-aliasing:	≥ 80 dB
Summation of output signals:	≤ ±1.0 dB (±0.4 typical)
Octave frequency ratio	Base 2 (IEC 61260)

Measurement Range (RTA mode only)

	0dB Gain				10dB Gain				20db Gain				30dB Gain				40dB Gain				50dB Gain			
	NF	Start	End	Range	NF	Start	End	Range	NF	Start	End	Range	NF	Start	End	Range	NF	Start	End	Range	NF	Start	End	Range
1/3 Octave Filters																								
8.0	6	44	128	84	8	34	118	84	8	31	108	77	7	32	98	66	7	32	88	56	8	32	78	46
10.0	4	44	128	84	6	34	118	84	6	26	108	82	6	28	98	70	5	29	88	59	5	29	78	49
16.0	2	45	128	83	2	35	118	83	1	25	108	83	2	25	98	73	-1	28	88	60	1	23	78	55
31.5	3	43	128	85	1	35	118	83	1	23	108	85	2	25	98	73	-4	22	88	66	-4	23	78	55
63.0	4	40	128	88	0	33	118	85	1	23	108	85	0	22	98	76	-7	15	88	33	-7	18	78	60
125	2	40	128	88	-2	27	118	91	-3	28	108	80	-2	18	98	80	-9	11	88	77	-8	8	78	70
250	3	37	128	91	-3	25	118	93	-3	15	108	93	-4	15	98	83	-10	8	88	80	-9	8	78	70
500	12	33	128	95	4	25	118	93	-3	15	108	93	-4	13	98	85	-10	6	88	82	-10	8	78	70
1000	10	32	128	96	2	20	118	98	-4	15	108	93	-5	13	98	85	-10	6	88	82	-10	8	78	70
2000	15	32	128	96	6	20	118	98	-2	15	108	93	-5	13	98	85	-8	8	88	80	-8	8	78	70
4000	14	32	128	96	7	20	118	98	0	15	108	93	-2	13	98	85	-6	8	88	78	-6	8	78	70
8000	14	32	128	96	7	20	118	98	1	15	108	93	-1	13	98	85	-2	12	88	76	-3	13	78	65
16000	15	36	128	92	9	25	118	93	2	15	108	93	1	15	98	83	0	15	88	73	1	18	78	60

400 Line FFT

Averaging:	Count
Window:	Rectangular or Hanning
Linearity range:	>85 dB with Hanning window, 20 kHz bandwith, and PRM902
Dynamic range:	>100 dB
Flat SPL linearity range:	>75 dB

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