

Sound Level Meter

(with 1/3 octave analysis function)

NA-28

Simplified Instruction Manual

S&V Measuring Instruments Sales Division

RION CO., LTD.

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Introduction

This device is a Class 1 sound level meter equipped with real-time octave and 1/3 octave band analysis functions. Refer to the procedures below depending on the type of measurement. First of all, press the **POWER** key to apply electrical power and make the settings indicated below.

■ Confirmation of battery power level

Confirm the remaining battery power level in the lower left corner of the screen. The remaining battery power level is displayed as 4 (Full), 3 (Mid), 2 (Low) and 1 (Nearly empty), which is followed by automatic shutdown.

When making continuous measurements for a given period of time, replace the batteries if the battery level appears to be approaching depletion during measurements. Battery life differs depending on the usage method. Refer to the Instruction Manual for details. In the case of long-time continuous use, it is recommended that you use the optional AC adaptor (NC-94A). If using the device in a location without AC power availability, using the optional battery pack (BP-21) will make it possible to operate the device about three times longer than with the internal batteries. Whether using an AC adapter or a battery pack, if the batteries are inserted, the device automatically switches to internal battery power in the event of a power failure or battery pack power depletion, enabling continued measurement. It is therefore recommended that you use the device with the batteries inserted.

■ Menu setting

◆ System setting

Press the **MENU** key to display the Menu List, move the cursor to [System] and press the **ENT** key to display the screen to the right.

CF Card Format	OFF
Read/Save Setting	▼
Time Setting	▼
Program Information	▼
Language	English
CF size	121 MByte

○ CF card format

Perform the operation below if you are using a CF card to store data. **Omit this step if you are not storing data in a CF card.**

Move the cursor to [CF Card Format], press the **ENT** key, select [EXEC] using the $\blacktriangle/\blacktriangledown$ keys and press **ENT**. “Do you want to format CF card? Yes \Rightarrow [ENT] No \Rightarrow [PAUSE]” is displayed. Press **ENT**. “Please wait” is displayed and the formatting is completed.

○ Time setting

Move the cursor to [Time Setting] and press the **ENT** key to display the current time setting screen. Using the $\blacktriangle/\blacktriangledown$ keys, move the cursor to the Year/Month/Day or Hour/Min/Sec to be changed, move the cursor to the item to be changed using the \square key to the right of the **ENT** key, make the change using the $\blacktriangle/\blacktriangledown$ keys and press **ENT**. The same procedure is used to change other items. However, when changing only the “hour” of Hour/Minutes/Seconds, also press the **ENT** key at “minutes” and “seconds.” When the setting is completed, press the **MENU** key to revert to the system screen.

○ Setting language

The display language (Japanese, English, Deutsch, Español, French) is set next. **Omit this step if the correct display language is already set.** Move the cursor to [Language], press the **[ENT]** key, make the change using the **▲/▼** keys, and press **[ENT]**. Press the **[MENU]** key to move to the Menu List screen.

◆ **Setting input and output**

Move the cursor to [I/O] on the Menu List screen and press the **[ENT]** key to display the screen to the right.

AC OUT	OFF
DC OUT	OFF
Comparator ▼	OFF
USB Communication	OFF
Remote Control	ON
Backlight Brightness	Bright
Backlight Auto-Off	30s
Beep	OFF
Index	1

○ AC Out

MAIN or SUB is used if recording data with level recorder or data recorder to be connected to AC output signals or if conducting analyses connected to a frequency analyzer. **Set it to OFF if not used.**

Move the cursor to [AC OUT], press the **[ENT]** key and select OFF/MAIN/SUB using the **▲/▼** keys.

○ DC Out

MAIN or SUB is used if using level DC output signals. **Set it to OFF if not used.**

Move the cursor to [DC OUT], press the **[ENT]** key and select OFF/MAIN/SUB using the **▲/▼** keys.

○ Comparator

Set to ON if using comparator output. **Set it to OFF if not used.**

Move the cursor to [Comparator], press the **[ENT]** key, shift to the I/O - Comparator screen, move the cursor to [Comparator], press the **[ENT]** key, and select comparator ON/OFF using the **▲/▼** keys. If ON is selected, also set the comparator level and comparator band. The comparator level can be set within the range of 25-130 dB in 1dB steps. The comparator band differs depending on whether in the sound level meter mode (SLM Mode) or analyzer mode (RTA Mode) is used and, if in the RTA Mode, it also differs depending on whether you are using 1/1 octave or 1/3 octave. The following is displayed.

SLM Mode: MAIN AP / SUB AP

RTA Mode - OCT : MAIN AP / SUB AP / 16 Hz / 31.5 Hz / 8 kHz / 16kHz

RTA Mode - 1/3OCT: MAIN AP / SUB AP / 12.5 Hz / 16 Hz / 20 Hz / 25 Hz / 16kHz / 20kHz

○ USB Communication

If the device is controlled by a PC, connect a USB cable and set to ON. **Set to OFF if not used.**

Set to OFF if used as a removable disk and using a USB printer. It can be used without installing a driver in the PC. If set to ON, you will be prompted to install a driver when connected to a PC.

Move the cursor to [USB Communication], press the **[ENT]** key and select ON/OFF using the **▲/▼** keys.

○ Remote Control

Set to ON if using remote control. **Set to OFF is if remote control is not used.**

Move the cursor to [Remote Control], press the **[ENT]** key and select ON/OFF using the **▲/▼** keys.

○ Backlight brightness

Backlight brightness is adjusted in 2 stages. **Omit this step if the current brightness is satisfactory.**

Move the cursor to [Backlight Brightness], press the **[ENT]** key and select brightness Dark/Bright using the **▲/▼** keys.

○ Backlight Auto-off

This sets the automatic shutoff time of the liquid crystal backlight and panel key light. **Omit this step if the currently set time is satisfactory.**

Move the cursor to [Backlight Auto-Off], press the **[ENT]** key and select 30s/3m/Cont as the backlight automatic shutoff time using the **▲/▼** keys.

○ Beep

Set the beep sound to ON to sound an alarm when making measurements.

Move the cursor to [Beep], press the **[ENT]** key and select beep ON/OFF using the **▲/▼** keys.

○ Index

This sets the device index number. Making this setting makes it possible to identify the source device based on the recorded data in the event that multiple devices are used. It is normally set to “1.”

Move the cursor to [Index], press the **[ENT]** key and set the device ID number within the range of 1-255 using the **▲/▼** keys.

When the settings are completed, press the **[START]** key to revert to the Measurement screen.

Sound level and sound pressure level measurement

This indicates the measurement of sound level in the MAIN channel and sound pressure level in the SUB channel. This makes it possible to obtain the results of both at one time.

■ Panel setting

◆ Setting the sound level meter mode

The setting is made so that **SLM** is displayed in the upper left area of the screen using the **SLM/RTA** key...

◆ Setting the level range

The level range is set using the **LEVEL** **▲** **▼** keys. The set level range is displayed above the bar graph. If **OVER** is displayed on the right side of the bar graph when measuring the maximum sound pressure, increase the level range using the **LEVEL** **▲** key. If **UNDER** is displayed on the left side of the bar graph, decrease the level range using the **LEVEL** **▼** key.

◆ Setting frequency-weighting and time-weighting characteristics

The MAIN frequency-weighting characteristics are set in **A** using the **FREQ WEIGHT** key. In addition, the MAIN time-weighting characteristics are set in **F** using the **TIME WEIGHT** key. As a result, **LAF** is displayed in MAIN.

■ Menu setting

◆ Store setting

Press the **MENU** key, display the menu list, move the cursor to [Store] and press the **ENT** key to display the screen on the right. The setting is made as indicated at the

Store Mode	Manual
Store Name	MAN_0001

right. Enter a random value for "0001" of MAN_0001. After completing the setting, press the **MENU** key and display the menu list. **Omit this step if you are not storing data in a CF card.**

◆ Measurement setting

Move the cursor to [Measurement], press the **ENT** key, display the screen on the upper right and make the setting as indicated on the upper right. Any value may be used for measurement time.

Wind Screen Correction	ON
Measurement Time	010 s
Back Erase	OFF
Delay Time	0 s
Lmax/Lmin type	
Trigger Mode ▼	OFF
Diffuse Field Correction	OFF
SUB Channel ▼	ON

In SUB Channel measurements, press the **ENT** key, display the screen on the lower right and make the setting as indicated on the lower right. "Z" may be used at this time for frequency-weighting characteristics.

In addition, any value may be used for Lpeak/Ltm5. After completing the setting, press the **MENU** key twice and display the menu list.

SUB Channel	ON
Frequency Weighting (SUB)	C
Time Weighting (SUB)	F
Lpeak/Ltm5	Lpeak

◆ **Display setting**

Move the cursor to [Display], press the **ENT** key, display the screen on the right and make the setting as indicated on the right. After completing the measurement, press the **START/STOP** key and return to the Measurement screen.

MAX Hold		
Leq		OFF
LE		OFF
Lmax		OFF
Lmin		OFF
LN1	L 05	OFF
LN2	L 10	OFF
LN3	L 50	OFF
LN4	L 90	OFF
LN5	L 95	OFF
List		OFF
Time-Level		OFF

■ **Calibration**

Implement calibration while referring to p.16.

■ **Measurement**

Secure the NA-28 sound level meter on a tripod and place it in front of measurement subject. The displayed value is the measurement value. A- weighted sound level is displayed in the MAIN channel and C-weighted sound level is displayed in the SUB channel.

Environmental noise measurement 1

This indicates the case when L_{Aeq} , L_{Amx} , L_{Amin} , L_{A05} , L_{A50} and L_{A95} are measured for a period of 10 minutes every hour on the hour from 8:00 in the morning until 8:00 in the morning three days later and the results are recorded in a CF card.

■ Panel setting

◆ Sound level meter mode setting

Make the setting so that **SLM** is displayed in the upper left area of the screen using the **SLM/RTA** key.

◆ Level range setting

The level range is set using the **LEVEL** **▲** **▼** keys. The set level range is displayed above the bar graph. If **OVER** is displayed on the right side of the bar graph when measuring the maximum sound pressure, increase the level range using the **LEVEL** **▲** key. If **UNDER** is displayed on the left side of the bar graph, decrease the level range using the **LEVEL** **▼** key.

◆ Setting frequency-weighting and time-weighting characteristics

The MAIN frequency-weighting characteristics are set in **A** using the **FREQ WEIGHT** key.

In addition, the MAIN time-weighting characteristics are set in **F** using the **TIME WEIGHT** key.

As a result, **LAF** is displayed in MAIN.

■ Menu setting

◆ Store setting

Press the **MENU** key, display the menu list, move the cursor to [Store] and press the **ENT** key to display the screen on the right. The setting is made as indicated at the right. Enter a random value for "0001" of AU2_0001. After completing the setting, press the **MENU** key and display the menu list.

Store Mode	Auto2
Store Name	AU2_0001

◆ Measurement setting

Move the cursor to [Measurement], press the **ENT** key, display the screen on the upper right and make the setting as indicated at the upper right.

In the trigger mode, move the cursor to Trigger Mode, press the **ENT** key, display the screen on the lower right and make the setting as indicated at the lower right.

After completing the setting, press the **MENU** key twice and display the menu list.

Wind Screen Correction	ON
Measurement Time	010 m
Back Erase	OFF
Delay Time	0 s
Lmax/Lmin type	
Trigger Mode ▼	Time
Diffuse Field Correction	OFF
SUB Channel ▼	OFF

Trigger Mode	Time
Trigger Start Time	11/06 08:00
Trigger Stop Time	11/09 08:00
Interval Time	1 h
Sleep Mode	OFF

◆ Display setting

Move the cursor to [Display], press the **[ENT]** key, display the screen on the right and make the setting as indicated at the right. It is possible to change the values after L in the center column, i.e., LN1, LN2, LN3, LN4 and LN5, within the range of 01-99. To view the results list or time-level graph, set them to ON. After completing the measurement, press the **[START/STOP]** key and return to the Measurement screen.

MAX Hold	OFF	
Leq	ON	
LE	OFF	
Lmax	ON	
Lmin	ON	
LN1	L 05	ON
LN2	L 10	OFF
LN3	L 50	ON
LN4	L 90	OFF
LN5	L 95	ON
List	OFF	
Time-Level	OFF	

■ Calibration

Implement calibration while referring to p.16.

■ Measurement

Secure the NA-28 sound level meter on a tripod and place it at the measurement location.

Trigger standby starts when the **[STORE]** key is pressed and measurement starts at the set trigger starting time and automatically stops at the trigger stop time. The measurement results are recorded in the CF card and are confirmed by either of the methods given below.

- Press the **[MENU]** key, display the menu list, move the cursor to [Recall], press the **[ENT]** key to display the file selection screen, move the cursor to AU2_0001 on the CF card and press the **[ENT]** key to display the results data.
- Remove the CF card and insert it in a PC card reader or, alternatively, connect the NA-28 to the PC using a separately purchased USB cable (the CF card of the NA-28 is recognized as a removable disk) and open the recorded data in the PC using Microsoft Excel or other application.

Environmental noise measurement 2

This indicates the case in which the results of simultaneous octave and 1/3 octave analysis recorded in a CF card every 100ms from 8:00 in the morning until 8:00 the following morning.

■ Panel setting

◆ Analyzer mode setting

Make the setting so that **OCT&1/3OCT** is displayed in the upper left area of the screen using the **SLM/RTA** key.

◆ Level range setting

Set the level range using the **LEVEL** **▲** **▼** keys. The set level range is displayed above the bar graph. If **OVER** is displayed on the right side of the bar graph when measuring the maximum sound pressure, increase the level range using the **LEVEL** **▲** key. If **UNDER** is displayed on the left side of the bar graph, decrease the level range using the **LEVEL** **▼** key.

◆ Frequency-weighting and time-weighting characteristics

The MAIN frequency-weighting characteristics are set in **A** using the **FREQ WEIGHT** key.

In addition, the MAIN time-weighting characteristics are set in **F** using the **TIME WEIGHT** key.

As a result, **LAF** is displayed in MAIN.

■ Menu setting

◆ Store setting

Press the **MENU** key, display the menu list, move the cursor to [Store] and press the **ENT** key to display the screen on the right. The setting is made as indicated at the right. Change the sampling period depending on the purpose. After completing the setting, press the **MENU** key and display the menu list.

Store Mode	Auto1
Store Name	AU1_0001
Sampling Period (RTA)	100 ms

◆ Measurement setting

Move the cursor to [Measurement], press the **ENT** key, display the screen on the upper right and make the setting as indicated at the upper right.

In the trigger mode, move the cursor to Trigger Mode, press the **ENT** key, select Time in the trigger mode, press the **ENT** key, display the screen on the lower right and make the setting as indicated at the lower right. After completing the setting, press the **MENU** key twice and display the menu list.

Wind Screen Correction	ON
Measurement Time	024 h
Back Erase	OFF
Delay Time	0 s
Lmax/Lmin Type	Band
Trigger Mode ▼	Time
Diffuse Field Correction	OFF
SUB Channel ▼	OFF

Trigger Mode	Time
Trigger Start Time	11/06 08:00
Trigger End Time	11/07 08:00
Trigger Interval	
Sleep Mode	OFF

◆ Display setting

Move the cursor to [Display], press the **ENT** key, display the screen on the right and make the setting as indicated at the right. After completing the measurement, press the **START/STOP** key and display the Measurement screen.

MAX Hold	OFF	
Leq	OFF	
LE	OFF	
Lmax	OFF	
Lmin	OFF	
LN1	L 05	OFF
LN2	L 10	OFF
LN3	L 50	OFF
LN4	L 90	OFF
LN5	L 95	OFF
List	OFF	
Time-Level	OFF	

■ Calibration

Implement calibration while referring to p.16.

■ Measurement

Secure the NA-28 sound level meter on a tripod and place it at the measurement location.

Trigger standby starts when the **STORE** key is pressed and measurement starts at the set trigger starting time and automatically stops at the trigger stop time. The measurement results are recorded in the CF card and are confirmed by either of the methods given below.

- Press the **MENU** key, display the menu list, move the cursor to [Recall], press the **ENT** key to display the file selection screen, move the cursor to AU1_0001 on the CF card and press the **ENT** key to display the results data. The cursor can be moved by using the **</>** keys. The cursor frequency and level can be read. The results data storage time can be changed using the **▲/▼** keys.
- Remove the CF card and insert it in a PC card reader or, alternatively, connect the NA-28 to the PC using a separately purchased USB cable (the CF card of the NA-28 is recognized as a removable disk) and open the recorded data in the PC using Microsoft Excel or other application.

Analysis of stationary sound

This indicates the case in which stationary sound is analyzed by octave and 1/3 octave.

■ Panel setting

◆ Analyzer mode setting

Make the setting so that **OCT&1/3OCT** is displayed in the upper left area of the screen using the **SLM/RTA** key.

◆ Level range setting

Set the level range using the **LEVEL** **▲** **▼** keys. The set level range is displayed above the bar graph. If **OVER** is displayed on the right side of the bar graph when measuring the maximum sound pressure, increase the level range using the **LEVEL** **▲** key. If **UNDER** is displayed on the left side of the bar graph, decrease the level range using the **LEVEL** **▼** key.

◆ Frequency-weighting and time-weighting characteristics

The MAIN frequency-weighting characteristics are set in **A** using the **FREQ WEIGHT** key.

In addition, the MAIN time-weighting characteristics are set in **F** using the **TIME WEIGHT** key.

As a result, **LAF** is displayed in MAIN.

■ Menu setting

◆ Store setting

Press the **MENU** key, display the menu list, move the cursor to [Store] and press the **ENT** key to display the screen on the right. The setting is made as indicated at the

Store Mode	Manual
Store Name	MAN_0001

right. Enter a random value for "0001" of MAN_0001. After completing the setting, press the **MENU** key and display the menu list. **Omit this step if you are not storing data in a CF card.**

◆ Measurement setting

Move the cursor to [Measurement], press the **ENT** key, display the screen on the right and make the setting as indicated at the right. After completing the setting, press the **MENU** key and display the menu list.

Wind Screen Correction	ON
Measurement Time	030 s
Back Erase	OFF
Delay Time	0 s
Lmax/Lmin Type	Band
Trigger Mode ▼	OFF
Diffuse Field Compensation	OFF
SUB Channel measurement ▼	OFF

◆ Display setting

Move the cursor to [Display], press the **ENT** key, display the screen on the right and make the setting as indicated at the right. If there are required operation results here, set the relevant item to ON. After completing the measurement, press the **START/STOP** key and display the Measurement screen.

MAX Hold	OFF	
Leq	ON	
LE	OFF	
Lmax	OFF	
Lmin	OFF	
LN1	L 05	OFF
LN2	L 10	OFF
LN3	L 50	OFF
LN4	L 90	OFF
LN5	L 95	OFF
List	OFF	
Time-Level	OFF	

■ Calibration

Implement calibration while referring to p.16.

■ Measurement

Secure the NA-28 sound level meter on a tripod and place it in front of the measurement subject. Measurement starts when the **START/STOP** key is pressed and stops automatically when the set measurement time elapses. If you press the **MODE** key, L_{Aeq} measurement value is displayed. The cursor can be moved by using the **</>** keys. The cursor frequency and level can be read.

Analysis and measurement of fluctuating sound in the trigger mode

This indicates the case of the results of 1/3 octave analysis of generated sound recorded in a CF card every 10ms in the trigger mode. This makes it possible to record 1/3 OCT analysis results in a CF card every 10ms from the time when the AP level exceeds the trigger level until it drops below the trigger level or until the elapse of the set measurement time (10m in this example).

■ Panel setting

◆ Analyzer mode setting

The setting is made so that **1/3OCT** is displayed in the left side of the screen using the **SLM/RTA** key.

◆ Level range setting

The level range is set using the **LEVEL** **▲** **▼** keys. The set level range is displayed above the bar graph. If **OVER** is displayed on the left side of the bar graph when measuring the maximum sound pressure, increase the level range using the **LEVEL** **▲** key. If **UNDER** is displayed on the left side of the bar graph, decrease the level range using the **LEVEL** **▼** key.

◆ Frequency-weighting and time-weighting characteristics

The MAIN frequency-weighting characteristics are set in **A** using the **FREQ WEIGHT** key. They are set in C or F depending on the purpose.

In addition, the MAIN time-weighting characteristics are set in **F** using the **TIME WEIGHT** key. They are set in 10ms (τ) depending on the purpose.

As a result, LAF is displayed in MAIN. ■ Menu setting

◆ Store setting

Press the **MENU** key, display the menu list, move the cursor to [Store] and press the **ENT** key to display the screen on the right. The setting is made as indicated at the right. Enter a random value for "0001" of AU1_0001. Change the sampling period depending on the purpose. After completing the setting, press the **MENU** key and display the menu list.

Store Mode	Auto1
Store Name	AU1_0001
Sampling Period (RTA)	10 ms

◆ Measurement setting

Move the cursor to [Measurement], press the **ENT** key, display the screen on the upper right and make the setting as indicated on the upper right. Any value may be used for measurement time. After completing the setting, press the **MENU** key and display the menu list.

Wind Screen Correction	ON
Measurement Time	010 m
Back Erase	OFF
Delay Time	0 s
Lmax/Lmin Type	Band
Trigger Mode ▼	Level2
Diffuse Field Correction	OFF
SUB Channel ▼	OFF

In the trigger mode, move the cursor to Trigger Mode, press the **ENT** key, select Level2 in the trigger mode,

Trigger Mode	Level2
Trigger Level	70 dB
Trigger Band	MAIN AP

press the **ENT** key, display the screen on the lower right and make the setting as indicated at the lower right. Set the trigger level to an appropriate value depending on the level of the sound being measured. After completing the setting, press the **MENU** key twice and display the menu list.

◆ Display setting

Move the cursor to [Display], press the **[ENT]** key, display the screen on the right and make the setting as indicated at the right. After completing the measurement, press the **[START/STOP]** key and display the Measurement screen.

MAX Hold	OFF	
Leq	OFF	
LE	OFF	
Lmax	OFF	
Lmin	OFF	
LN1	L 05	OFF
LN2	L 10	OFF
LN3	L 50	OFF
LN4	L 90	OFF
LN5	L 95	OFF
List	OFF	
Time-Level	OFF	

■ Calibration

Implement calibration while referring to p.16.

■ Measurement

Secure the NA-28 sound level meter on a tripod and place it in front of the measurement subject.

Trigger standby starts when the **[STORE]** key is pressed and measurement starts when the level exceeds the set trigger level and automatically stops when the level drops below the set trigger level or at the elapse of the trigger stop time. The measurement results are recorded in the CF card and are confirmed by either of the methods given below.

Press the **[START/STOP]** key to conclude the measurement. The measurement results are recorded in the CF card and are confirmed by either of the methods given below.

- Press the **[MENU]** key, display the menu list, move the cursor to [Recall], press the **[ENT]** key to display the file selection screen, move the cursor to AU1_0001 on the CF card and press the **[ENT]** key to display the results data. The cursor can be moved by using the **</>** keys. The cursor frequency and level can be read. The results data storage time can be changed using the **▲/▼** keys.
- Remove the CF card and insert it in a PC card reader or, alternatively, connect the NA-28 to the PC using a separately purchased USB cable (the CF card of the NA-28 is recognized as a removable disk) and open the recorded data in the PC using Microsoft Excel or other application.

Calibration

■ Calibration using the sound calibrator

Calibration using the sound calibrator NC-74 calibrates the device including the microphone and preamp. Set the Level Range to 20 - 120 dB. Press the **CAL** key and confirm that [Acoustic Calibration] is displayed under the bar graph of the display screen. Press the **STORE** key if [Internal Calibration] is displayed, in order to change to the acoustic calibration mode. The NC-74 produces a level of 94.0 dB which should be displayed in the MAIN display. If required, adjust the displayed level to 94.0 dB using the Δ/∇ keys. After completion, press the **CAL** key again and [enter the measurement mode].

Other functions

■ Storing and reading measurement conditions

◆ Storing

It is convenient to store settings that are frequently used. The procedure is explained below.

- Set frequently used settings. Take care to avoid setting errors, omissions, etc.
- Press the **MENU** key and display the menu list, move the cursor to [System] and press the **ENT** key to display the screen to the right. Move the cursor to the Read/Save Setting and press **ENT**.
- It is possible to store a maximum of 5 setting conditions

CF Card Format	OFF
Read/Save Setting	▼
Time Setting	▼
Program Information	▼
Language	English
CF Size	121 MByte

- in the device's memory. The procedure is explained below. The conditions of the settings are saved in memory at this time by number. They are stored by moving the cursor to any of the following [No.1 ---] - [No.5 ---] and pressing the **STORE** key. To overwrite settings already stored in memory, move the cursor to the setting to be overwritten and press **STORE**. Press the **ENT** key when the overwrite confirmation message with “yes → [ENT] and no → [PAUSE]” is displayed at this time. To delete stored setting conditions, move the cursor to the setting and press the **CAL** key. Press the **ENT** key when the delete confirmation message with “yes → [ENT] and no → [PAUSE]” is displayed.
- If the 5 types of settings stored in internal memory are insufficient, they can also be stored in the CF card, in which a maximum of 500 different settings can be stored. The procedure is explained below. The conditions of the settings are saved in memory at this time by group number and individual number.
- First of all, store the entire content already stored in internal memory as described above in the CF card. Move the cursor to [Group Save for CF card] and press the **ENT** key. Press the **ENT** key at [---(new)---] to display [Setting group name SET_0000] below the screen. Enter a random number in “0000” and press the **ENT** key. This stores the above settings in the CF card. Next, repeat the storage of settings in the internal memory as indicated above and then store them as a group in the CF card. This operation can be repeated a maximum of 100 times and enables the storage of 5 settings x 100 times = 500 settings. To overwrite a setting already in memory, move the cursor to the setting and press **ENT**. Press **ENT** when the confirmation message “This group already exists. Overwrite it? Yes → [ENT], no → [PAUSE]” is displayed.

◆ Reading

- After powering up, press the **MENU** key and display the menu list, move the cursor to [System] and press the **ENT** key to display the above screen. Move the cursor to Read/Save Setting and press **ENT**.
- If there are any conditions that are to be reflected in the settings on the No.1-No.5 setting condition list, move the cursor to the item and press **ENT**. Press **ENT** when the reflect confirmation message with “yes ⇒ [ENT] and no ⇒ [PAUSE]” is displayed. The setting is now stored in internal memory.
- To set it in content stored in the CF card, move the cursor to [Group Loading/Delete for CF card] to display a list of set group names, move the cursor to the group to be read and press **ENT**. Press **ENT** when the “read set group in internal memory” confirmation message with “yes ⇒ [ENT] and no ⇒ [PAUSE]” is displayed. Press the **MENU** key and revert to the system setting screen to display the read setting list. Move the cursor to the setting to be read and press **ENT**. Press **ENT** when the reflect confirmation message with “yes ⇒ [ENT] and no [PAUSE]” is displayed. The setting is now stored in the CF card.

■ Printing

In order to print out measurement screens and data, it is necessary to use the optional manufacturer-designated USB printer (BL-112U1) and USB cable (CC-97).

Measurement screens are hard copy of screens and measurement data are hard copy of stored data.

◆ Printing measurement screens

Press the **MENU** key while a measurement screen is displayed to display the menu list. Move the cursor to [Print] and press the **ENT** key. Press **ENT** when the print-out confirmation message with “yes ⇒ [ENT] and no [PAUSE]” is displayed. Printing is now executed.

◆ Printing measurement data

Press the **MENU** key to display the menu list. Move the cursor to [Recall] and press the **ENT** key to display the Recall screen. Move the cursor to the data to be printed and press **ENT**. Since the menu list displayed when the **ENT** key is pressed, move the cursor to [Print] and press **ENT** to display the print screen. To print the screen, move the cursor to [Screen Print] and press **ENT**. To display the [Print Start Address] and [Print End Address] setting screens, move the cursor to [Data Range Print] and press **ENT**. Move the cursor to [Print Start Address], press **ENT** and set the address. Next, move the cursor to [Print End Address], press **ENT** and set the address. Move the cursor to [Execute Printing] and press **ENT**. Printing is now executed.

■ Storing

Measurement data can be stored in either the internal memory or CF card.

There are 3 different storage methods, Manual, Auto 1 and Auto 2. It is necessary to set these before performing measurements.

With the Manual method, measurement results are stored by pressing the **STORE** key. Therefore, it is recommended that you press the **PAUSE** key and stop the measurement before storing.

With the Auto 1 method, instantaneous values of sound are stored at the specified time interval.

With the Auto 2 method, operation results are stored.
Refer to the Instruction Manual for details.

Menu Settings

■ System

- CF Card Format: Executes CF card formatting
- Read/Save Setting: Stores and reads setting conditions
- Time Setting: Sets the current time (year/month/day, hour/minutes/seconds)
- Program Information: Displays device and optional software type and version
 - Optional program: Displays optional program type and version
- Language: Selects display language
(Japanese, English, Deutsch, Espanol, French)
- CF size: Displays remaining capacity of the inserted CF card

■ Display

- MAX Hold: Sets whether or not to display maximum data values, analysis mode only
- Leq: Sets whether or not to calculate Leq
- LE: Sets whether or not to calculate LE
- Lmax: Sets whether or not to calculate Lmax
- Lmin: Sets whether or not to calculate Lmin
- LN1: Sets N of LN and whether or not to calculate it
- LN2: Sets N of LN and whether or not to calculate it
- LN3: Sets N of LN and whether or not to calculate it
- LN4: Sets N of LN and whether or not to calculate it
- LN5: Sets N of LN and whether or not to calculate it
- List: Sets list display ON/OFF
- Time-Level: Sets time-level display ON/OFF

■ I/O (Input/Output)

- AC OUT: Sets whether or not to execute AC output from OFF/MAIN/SUB
- DC OUT: Sets whether or not to execute DC output from OFF/MAIN/SUB
- Comparator: Sets comparator output ON/OFF
 - Comparator Level: Sets level at which comparator is activated
 - Comparator Band: Sets band at which comparator is activated
 - SLM Mode: Band selection: MAIN AP / SUB AP
 - OCT mode: Band selection: MAIN AP / SUB AP / 16 Hz / 31.5 Hz / / 8kHz / 16kHz
 - 1/3OCT mode: Band selection: MAIN AP / SUB AP / 12.5 Hz / 16 Hz / 20 Hz / 16kHz / 20kHz
- USB Communication: Sets USB communication ON/OFF
- Remote Control: Sets remote control ON/OFF
- Backlight Brightness: Adjusts backlight brightness

- Backlight Auto-Off: Sets backlight automatic shutoff from among 30s / 3m / Cont
- Beep: Sets beep sound ON/OFF
- Index: Set index number within the range of 1 to 255

■ Store

- Store Mode: Sets the store mode from among Manual / Auto1 / Auto2
- Store Name: Sets store file name as a 4-digit figure
- Sampling Period (RTA): Sets sampling period every 10ms, Auto 1 only;
set at 100ms in the case of SLM

■ Measurement

- Wind Screen Correction: Sets wind screen correction ON/OFF
Set to ON when using the device with wind screen installed
- Measurement Time: Sets measurement time
- Back Erase: Sets back erase function
- Delay Time: Set measurement start delay time in 1s units in the range of 0 to 10s
- Lmax / Lmin Type: Sets Lmax and Lmin calculation from AP/Band, analysis mode only
- Trigger mode: Sets trigger mode from among Level 1 / Level 2 / Time / EXT
 - Level 1: Sets trigger level, trigger band and slope
 - Level 2: Sets trigger level and trigger band
 - Time: Sets trigger start time, trigger stop time, trigger interval, sleep mode;
trigger interval only when the store setting is Auto 2
 - EXT.: External trigger
- Diffuse field correction: Sets diffuse field compensation ON/OFF
- SUB Channel: Sets sub-channel display ON/OFF
 - Frequency Weighting (SUB): Sets SUB-channel frequency-weighting characteristics
 - Time Weighting (SUB): Sets SUB-channel time-weighting characteristics
 - Lpeak / Ltm5: Sets SUB-channel Lpeak / Ltm5; only in sound level meter mode

■ Recall: Reads and displays stored data

■ Printing: Prints displayed screens