ONO SOKKI

LA-2111 LA-5111 and LA-5120 Sound Level Meter

Measurement by 1/1 Real-time Octave Filter

ONO SOKKI CO., LTD.

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Measurement by 1/1 Real-time Octave Filter

Attachment of the optional 1/1 real-time octave analyzer (LA-0563) enables the following frequency analysis based on the 1/1 octave filter.

- Measurement of instantaneous values
- Measurement of equivalent continuous A-weighted sound pressure level/ Single event sound exposure level
- Measurement of NC (Noise Criteria) value

Precautions list

- Please purchase the optional 1/1 real-time octave analyzer (LA-0563).
- The 1/1 real-time octave filter has a gain of 10 dB.
- During calculation, the 1/1 real-time octave filter cannot be selected.
- When the dual calculation mode is selected, the 1/1 real-time octave filter cannot be selected.
- In wide range mode, the 1/1 real-time octave filter cannot be selected. To select the 1/1 real-time octave filter, set to an appropriate range other than wide range in advance.
- ALLPASS1 signal is outputted from the AC/DC signal output terminal of the Sound Level Meter.
- ALLPASS refers to the level of the signal without octave filter.
- ALLPASS1 refers to the main screen and ALLPASS2 refers to the sub screen. Dynamic characteristics setting cannot be made independently.
- Frequency analysis is made for ALLPASS1.

Measurement of instantaneous values

Follow the steps below to measure instantaneous values using the 1/1 real-time octave filter.

◆**Operation procedure**

   1. Set the measurement condition of the instantaneous value.

   Frequency weighting: Arbitrary (Panel switch [A/C/FLAT])
   Dynamic characteristic: Arbitrary (Panel switch [F/S/IMP])
   Measurement mode: Instantaneous value (INST) (Panel switch [Tact Max])
   Level range: Other than wide range (Panel switch [LEVEL▲ ▼])

   2. Select the 1/1 real-time octave filter.
   When press the panel switch [THRU/FILTER], 1/1 real-time octave filter is selected and the screen is changed to the 1/1 real-time octave normal screen (bar graph screen). When the other options are installed, press the panel switch [1/1 1/3 R.T] after pressing the panel switch [THRU/FILTER].

3. Change the frequency weighting of ALLPASS2.

First, move the cursor to ALLPASS2 on the 1/1 real-time octave normal screen (bar graph screen) which appears in above step. To move the cursor, press the panel switch [FILTER FREQ]. Then, press the panel switch [A/C/FLAT] to switch the frequency weighting of ALLPASS2.

4. Read the displayed instantaneous value.

When you move the cursor, bar graph data which the cursor is currently positioned can be read. The bar graph screen of the measured instantaneous value data can be changed to the list display screen by pressing the panel switch [LIST].

Normal measurement screen

Normal measurement screen   List screen-1   List screen-2
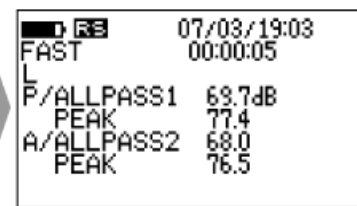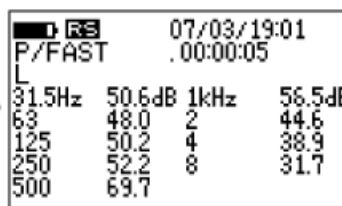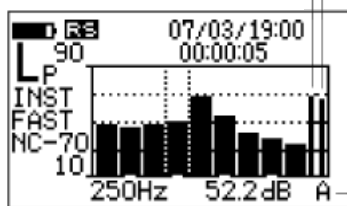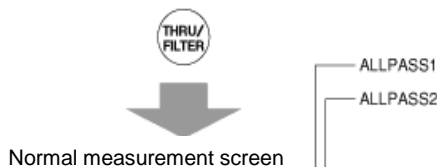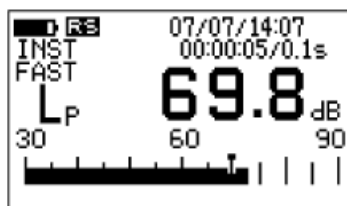
A: A-weighting

C: C-weighting

P: FLAT

*The 1/1 real-time octave instantaneous value display screen is changed as follows each time the panel switch [LIST] is pressed.

Normal screen > List screen-1 > List screen-2 > Normal screen > ・・・・

Measurement of equivalent continuous A-weighted sound pressure level/ Single event sound exposure level

Follow the steps below to measure equivalent continuous A-weighted sound pressure level/ single event sound exposure level using the 1/1 real-time octave filter.

<Notes>

- Neither band peal nor time-rate sound level can be measured.
- For peak value, only ALLPASS1 and ALLPASS2 are available.
- The AC signal output terminal outputs the ALLPASS1 signal.
- In dual calculation mode or wide range mode, the / real-time octave filter cannot be selected.

◆**Operation procedure**

1. Set the measurement condition of the instantaneous value.

Frequency weighting: Arbitrary (panel switch [A/C/FLAT])

Dynamic characteristic: Arbitrary (panel switch [F/S/IMP])

Measurement mode: Instantaneous value (panel switch [Tact Max])

Level range: Other than wide range (panel switch [LEVEL▲ ▼])

Measurement time: 100 hours or less (panel switch [MEAS TIME])

2. Select the 1/1 real-time octave filter.

When press the panel switch [THRU/FILTER], the 1/1 real-time octave filter is selected and the screen is changed to the 1/1 real-time octave normal screen (bar graph screen). When the other options are installed, press the panel switch [1/1 1/3 R.T] after pressing the panel switch [THRU/FILTER].

3. Change the frequency weighting of ALLPASS2.

First move the cursor to ALLPASS2 on the 1/1 real-time octave screen (bar graph screen) which appears in above step. To move the cursor, press the panel switch [FILTER FREQ]. Then, press the panel switch [A/C/FLAT] to switch the frequency weighting of ALLPASS2.

4. Start measurement.

After setting the measurement time with the panel switch [MEAS TIME], press the panel switch [START] to start the measurement. The measurement execution mark is appeared while measuring and measurement elapsed time is displayed in the measurement time setting display.

5. Read the measured value on the digital display.

When the setting measurement time is elapsed, the measurement is finished. To change the measured data, press the panel switch [LP/Leq···]. When you press the panel switch [FILTER FREQ] to move the cursor, the selected bar graph band data can also be read. The bar graph screen can be changed to the list display screen by pressing the panel switch [LIST].

Normal measurement screen

```
┌─────────────────────────┐
│ ■□ RS    07/07/14:41    │
│ L  80    00:00:05       │
│  Aeq                    │
│ INST                    │
│ FAST                    │
│                         │
│ 00                      │
│   1kHz    57.1 dB   C   │
└─────────────────────────┘
```
ALLPASS1
ALLPASS2

A: A-weighting
C: C-weighting
P: FLAT

List screen-1

```
┌─────────────────────────┐
│ ■□ RS    07/07/14:41    │
│ A/FAST   00:00:05       │
│ Leq                     │
│ 31.5Hz 23.3dB 1kHz 57.1dB│
│ 63     30.5   2    67.8 │
│ 125    37.8   4    44.1 │
│ 250    47.0   8    36.5 │
│ 500    45.4             │
└─────────────────────────┘
```

List screen-2

```
┌─────────────────────────┐
│ ■□ RS    07/07/14:41    │
│ FAST     00:00:05       │
│ Leq                     │
│ A/ALLPASS1    68.0dB    │
│   PEAK HOLD   77.3      │
│ C/ALLPASS2    69.0      │
│   PEAK HOLD   80.8      │
└─────────────────────────┘
```

Normal measurement screen

```
┌─────────────────────────┐
│ ■□ RS    07/07/14:41    │
│ L  80    00:00:05       │
│  AE                     │
│ INST                    │
│ FAST                    │
│                         │
│ 00                      │
│   1kHz    64.1 dB   C   │
└─────────────────────────┘
```

List screen-1

```
┌─────────────────────────┐
│ ■□ RS    07/07/14:41    │
│ A/FAST   00:00:05       │
│ LE                      │
│ 31.5Hz 30.3dB 1kHz 64.1dB│
│ 63     37.5   2    74.8 │
│ 125    44.8   4    51.1 │
│ 250    54.0   8    43.5 │
│ 500    52.4             │
└─────────────────────────┘
```

List screen-2

```
┌─────────────────────────┐
│ ■□ RS    07/07/14:41    │
│ FAST     00:00:05       │
│ LE                      │
│ A/ALLPASS1    75.0dB    │
│   PEAK HOLD   77.3      │
│ C/ALLPASS2    76.0      │
│   PEAK HOLD   80.8      │
└─────────────────────────┘
```
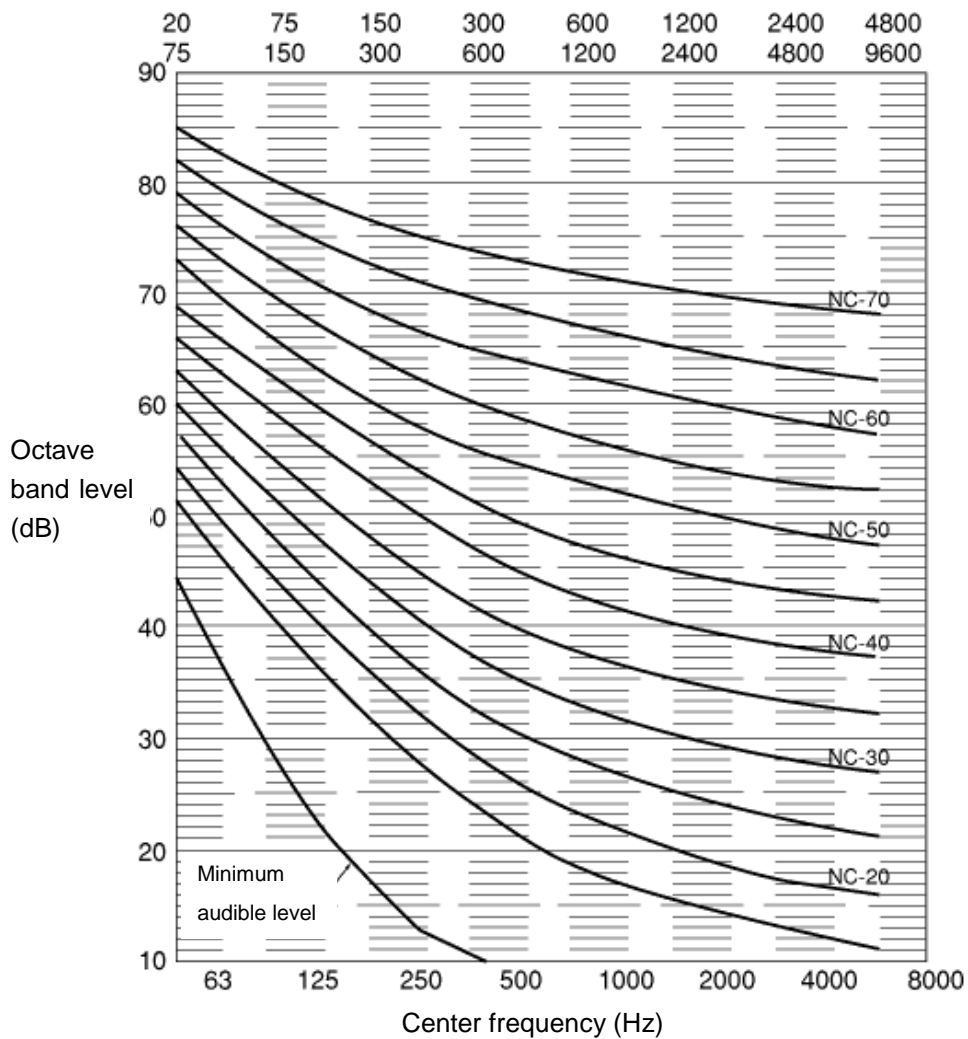
* The 1/1 real-time octave instantaneous value display screen is changed as follows each time the panel switch [LIST] is pressed.

Normal screen > List screen-1 > List screen-2 > Normal screen > ・・・・

Measurement of NC (Noise Criteria)

NC value is the quantity for evaluation which was proposed by Beranek, L. L. (American) in 1957. The quantity was based on a large scale survey of noise in offices and questionnaire survey on the staff working there. The object was the steady noise such as air-conditioning noise. For the object noise, the sound pressure level of each octave band was measured and compared with the following NC curve. When the measurement is lower than the curve for all octave bands, the value of the curve is chosen as evaluation quantity (NC value).

■NC curve

Octave band level (dB) vs Center frequency (Hz)

Top axis frequency ranges:
20/75, 75/150, 150/300, 300/600, 600/1200, 1200/2400, 2400/4800, 4800/9600

Curves labeled: NC-70, NC-60, NC-50, NC-40, NC-30, NC-20

Minimum audible level

Center frequency (Hz): 63, 125, 250, 500, 1000, 2000, 4000, 8000

■Measurement method

◆Operation procedure

1. Set the measurement condition of the instantaneous value.

Frequency weighting: (panel switch [A/C/FLAT])

Dynamic characteristic: Arbitrary (panel switch [F/S/IMP])

Measurement mode: Instantaneous value (panel switch [Tact Max])

Level range: Other than wide range (panel switch [LEVEL▲ ▼]

Measurement time: 100 hours or less (panel switch [MEAS TIME])
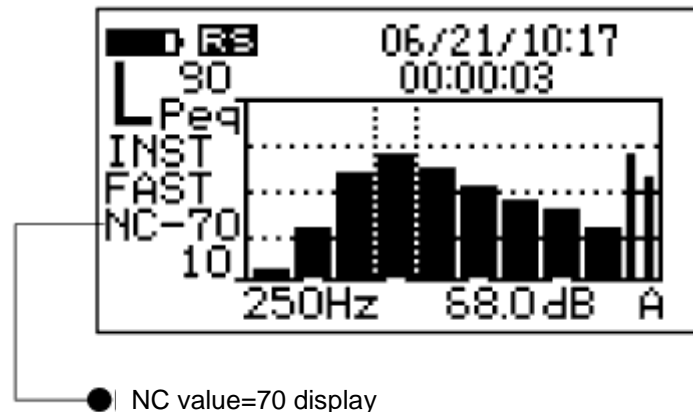
2. Select the 1/1 real-time octave filter.

When press the panel switch [THRU/FILTER], the 1/1 real-time octave filter is selected and the screen is changed to the 1/1 real-time octave normal screen (bar graph screen). When the other options are installed, press the panel switch [1/1 1/3 R.T] after pressing the panel switch [THRU/FILTER].

3. Start measurement.

After setting the measurement time with the panel switch [MEAS TIME], press the panel switch [START] to start the measurement. The measurement execution mark is appeared while measuring and measurement elapsed time is displayed in the measurement time setting display.

4. Read the measured value on the digital display.

When the setting measurement time is elapsed, the measurement is finished. The following is a display example when measuring NC value 70.

● NC value=70 display

Memory operation

In this section, the procedure to store the data measured with the 1/1 real-time octave filter in the memory as well as the procedure to recall thus stored data.

<Note> Data cannot be stored when the calculation data is not real-time data.

■Storing method of measured data

The data measured with the 1/1 real-time octave filter can be stored with the following procedure.

◆Operation procedure

1. Activate the memory mode (FSCAN).

Press the panel switch [Mem Mode] to activate the memory mode.

2. Set the memory address to be stored the data.

The address is incremented or decremented each time you press the panel switch [Address ▲・▼].

mark is displayed after the address number which has been already stored the data.

3. Start the measurement.

4. Select the data to be stored.

Press the panel switch [Lp/Leq] to select the type of data to be stored.

5. Store the measured data.

When the panel switch [Store] is pressed, the data which is measured in the procedure 3 is stored in the memory which is selected in the procedure 1 and 2. When the data has been stored, the address number is automatically incremented by one.

■Continuous storing method of the measurement data
◆Operation procedure

1. Activate the memory mode (FSCAN).

Press the panel switch [Mem Mode] to activate the memory mode.

2. Select the memory address to be stored the data.

The address number is incremented or decremented each time you press the panel switch [Address ▲・▼]. #mark is indicated next to the address number which has already been stored data.

3. Start the measurement.

After setting the measurement time by pressing the panel switch [MEAS TIME], start the continuous measurement by pressing the panel switch [2nd] and [START].

4. Select the data to be stored.

Press the panel switch [2nd] and [Lp/Leq] to select the data to be stored.

5. Store the measured data.

When the panel switch [2nd] and [Store] are pressed, the data which is measured in operation 3 is stored in the memory address which is selected in the operation 1 and 2. When the data has been stored, the address number is automatically incremented by one. This operation is repeated until storing of all data is completed.

6. Finish the storing.

When the panel switch [2nd] and [Store] is pressed, the store operation is terminated, but the measurement is continued until the selected measurement time is elapsed. (Memory recall cannot be operated while measuring.)

If you want to recall the data immediately, press the panel switch [PAUSE].

■Recalling the stored data

The measured data which is stored in the memory can be recalled in the following procedure.

<Note> The recall data is changed when you change the address number while recalling the data.

◆Operation procedure

1. Activate the memory mode (FSCAN).

Press the panel switch [Mem Mode] to activate the memory mode.

2. Select the memory address to be recall.

Press the panel switch [Address ▲・▼] to change the address number to that in which the data to be recalled is stored. # mark is indicated next to the address number which has already been stored data.

3. Execute the recall.

Press the panel switch [Recall] to read (recall) the data stored in the memory. The recalled measurement data can be switched to the lost display by pressing the panel switch [LIST]. Also, press the panel switch [Recall] again to cancel (turn OFF) the recall operation. Followings are sample screens for recalling data from address number 2.

<Notes>

- The # mark is displayed at the address in which real-time data is stored.
- The * mark is displayed at the address in which filter scan data is stored.

Recall screen   List screen-1   List screen-2
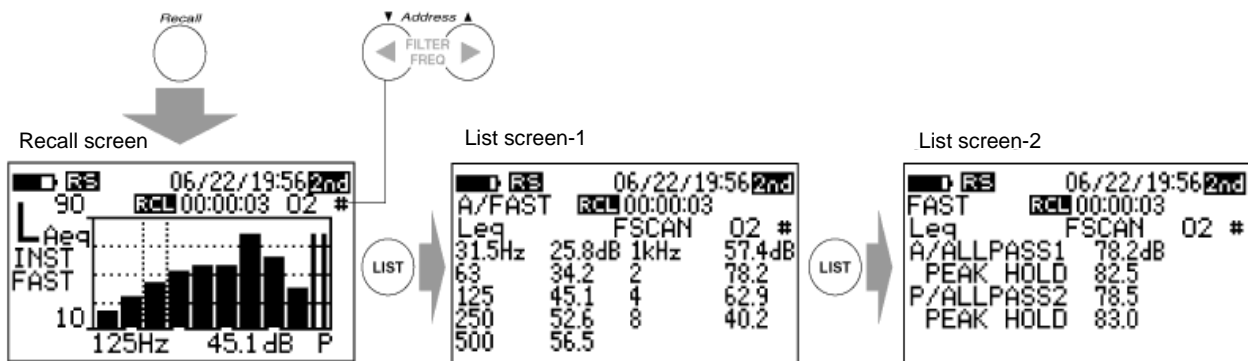
* The recall display screen is changed as follows each time the panel switch [LIST] is pressed.

Recall screen > List screen-1 > List screen-2 > Recall screen > ・・・・

End