

Portable FFT Analyzer Model CF-7200

How to measure the time-series spectrum in specific (partial/overall) frequency range

Using the time schedule function of the optional tracking analysis software CF-0722, you can measure the spectrum change over time. This function is called time-tracking analysis. In this operation, it is also useful to combine the record memory function of the tracking analysis software (i.e., off line analysis). For example, after recording the measurements in the 20-kHz range, you can analyze the data by changing the frequency range to 5 kHz when reproducing the data.

While you can analyze the data in real-time (i.e., online analysis), the measurements to use the record memory function are described here.

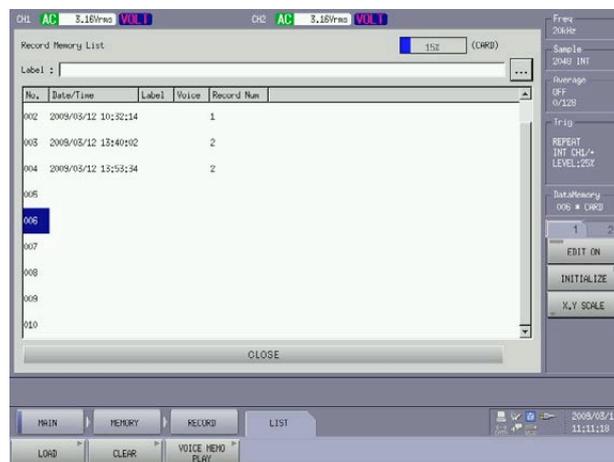
Note that the record memory data files (extension: .orf) can be analyzed using the tracking analysis software DS-0222 (also required the FFT analysis software DS-0221).

Throughout this document, the name of any soft key on the screen will be presented in square brackets (e.g., [MAIN]), and the name of any operation button on the panel will be enclosed by single quotation marks (e.g., 'START'). In the text, "key" means a soft key on the screen and "button" means an operation button on the panel.

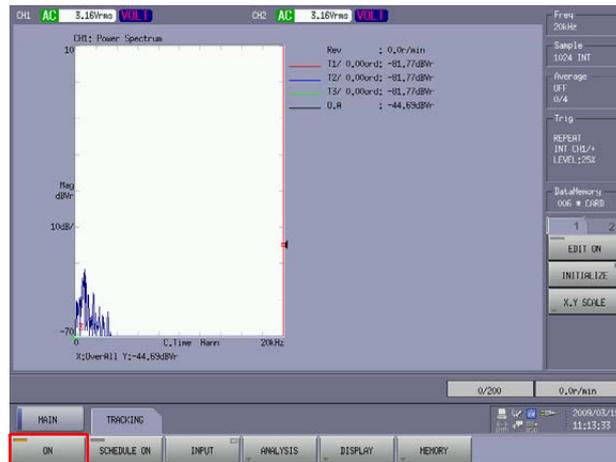
■ Operation Procedure

1. Data recording

- 1. Press the 'CH1 SPECT' button to show the single window display.
- 2. Observe the time waveform after properly selecting the frequency range (e.g., 20 kHz) and the voltage range.
- 3. Press the keys in the order [MAIN], [MEMORY], [RECORD], and [LIST] to show the list of record memories (hereafter, the term "memory number" may be used). Touch an unused memory number (here, No. 6). The data will be saved with this number.



- 4. Click the keys in the order [MAIN], [TRACKING], and [ON]. The lamp on the [ON] key turns on and the tracking analysis function is enabled.

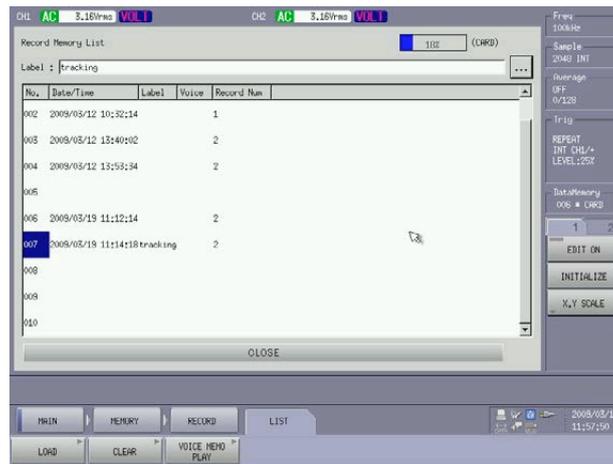


- 5. Press the 'REC' button on the operation panel to turn the red lamp on. The system is now in the standby state for data recording.
- 6. Pressing the 'START' button on the operation panel to turn on the red lamp will start the data recording. For example, you can record the measurement data while the target device (e.g., a motor) is started up, run in the steady state, and stopped.
- 7. Press the 'STOP' button on the operation panel to turn on the red lamp. The measurement and recording will stop.
- 8. Repeat the above steps 6 and 7 to record the data for the second time. The records will be numbered as Rec01 and Rec02, and you can store multiple records with the same memory number.
- 9. Press the 'REC' button on the operation panel again to turn off the red lamp. The data recording is terminated. The data stored during this period is saved in a file with the extension .orf.
- 10. By repeating the above steps 3 to 9, you can record the data using a new memory number.

2. Time tracking analysis after reading recorded data

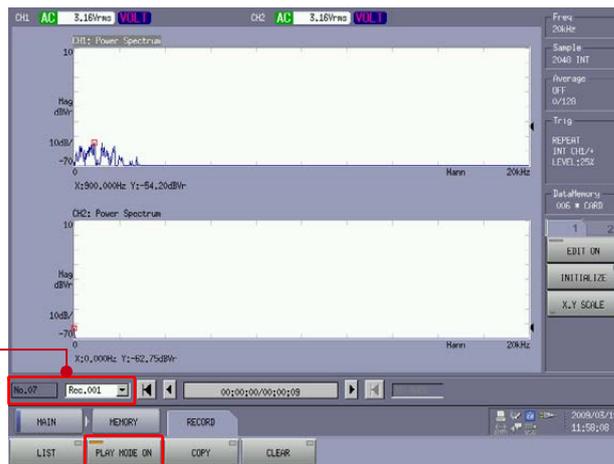
- 1. Press the keys in the order [MAIN], [TRACKING], and [ON]. Check that the tracking analysis function is enabled, i.e., the lamp is on.
- 2. Press the keys in the order [MAIN], [MEMORY], [RECORD], and [LIST] to show the list of memory numbers.

- 3. Touch the memory number (here, No. 007) of the data to be analyzed.

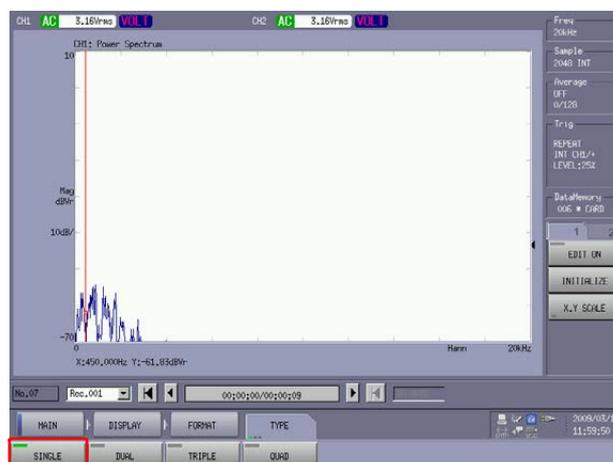


- 4. Press the keys in the order [MAIN], [MEMORY], [RECORD], and [LOAD] to read the data. It will take some time before the data is fully read. When the data is read, the memory number and record number will be displayed. The [MAIN], [MEMORY], and [RECORD] keys will be shown and the lamp on the [PLAY MODE ON] key turns on.

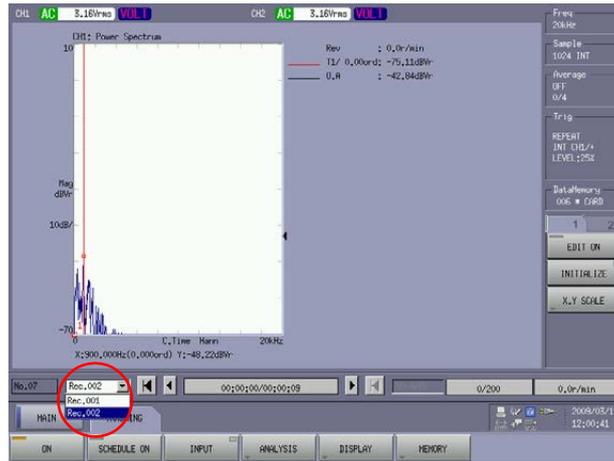
Memory number and record (Rec) number



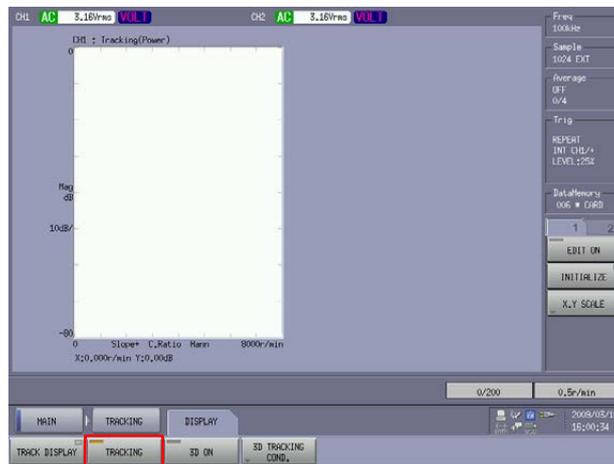
- 5. Press the keys in the order [MAIN], [DISPLAY], [FORMAT], and [TYPE]. Press [SINGLE] to turn it on. The single window display of CH 1 will be shown.



- 6. Select the record number of the record to be analyzed.



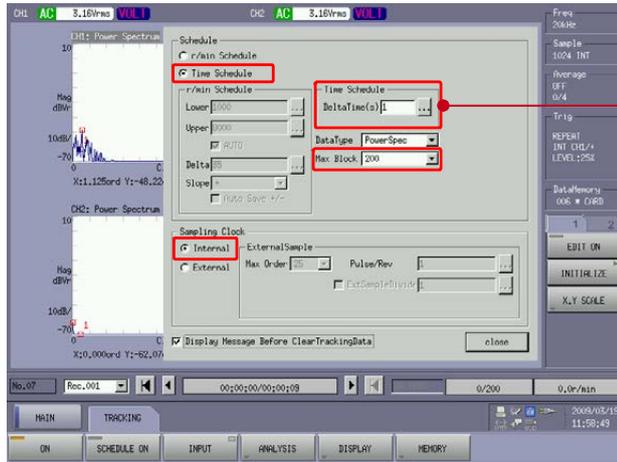
- 7. Press the keys in the order [MAIN], [TRACKING], and [DISPLAY]. Press [TRACKING] to turn it on.



- 8. Press the keys in the order [MAIN], [TRACKING], and [INPUT] to show the "Schedule" dialog box. Then, select "Time Schedule," set "Delta Time (i.e., time interval)," select "Max Block (i.e., maximum analysis blocks)," and select "Internal" for "Sampling Clock". The measurement (analysis) time is determined by the following equation:

$$\text{Measurement time} = \text{Delta Time} \times \text{Max Block}$$

If the recorded data is shorter than the measurement time, it will be limited by the duration of the recorded data.



Minimum value of "Delta Time" to be set:

- On-line analysis: 0.1 s
- Off-line analysis: 0.01

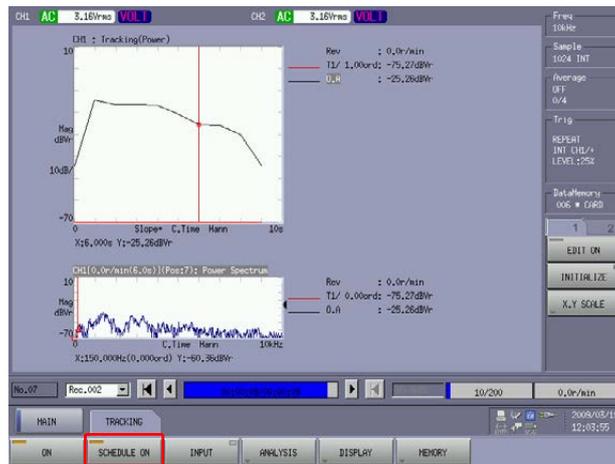
- 9. Press the keys in the order [MAIN], [TRACKING], and [SCHEDULE ON] to turn on the schedule function (i.e., turn on the lamp).
- 10. Set the analysis frequency range to 10 kHz.

Remarks

You can use any frequency range that can be obtained by dividing the frequency range at the time of recording by an integer.

For example, if the frequency range at the time of recording is 20 kHz, you can use the range of 10 kHz (i.e., divided by 2), 5 kHz (i.e., divided by 4), and so on. You cannot select 8 kHz, because it cannot be a quotient when 20 kHz is divided by an integer.

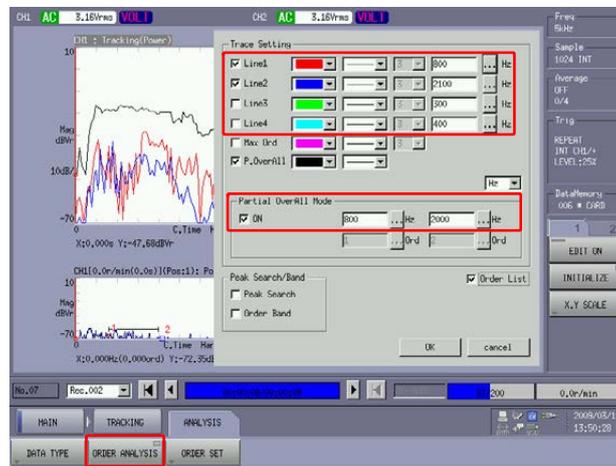
- 11. Press the 'START' button on the operation panel to turn on the red lamp and start the analysis.



After completing the analysis, touching the tracking data area (upper screen) will move the search line (red line) to the position touched and display the spectrum in the lower window. Touching the lower window will move the search line (red line) to the touched position, and you can read the spectrum

data of the position. The search cursor can also be moved by using the SEARCH arrow keys.

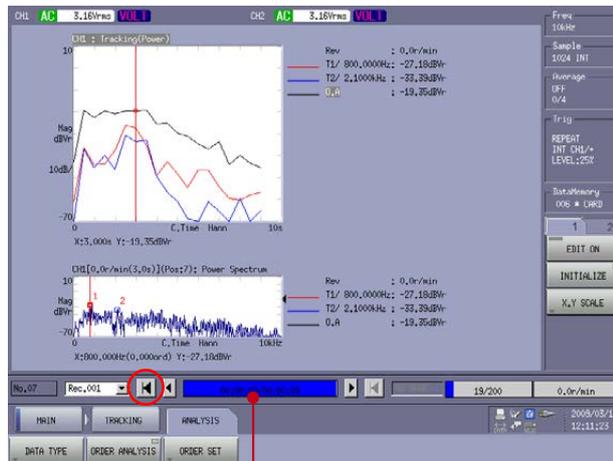
- 12. Press the keys in the order [MAIN], [TRACKING], [ANALYSIS], and [ORDER ANALYSIS] to show the Trace Setting dialog box. Then, properly set Line 1 to Line 4 and Partial Overall Mode as shown below.



In the Partial Overall Mode (i.e., frequency band) section, check the "ON" checkbox and specify the frequency range.

- 13. Here, the frequency range setting is further changed to 5 kHz.

- 14. Touch the left-end arrow button  to move to the data replay starting position.



Replay progress bar with data recording time (blue)
 Press the left-end arrow button  to return to the starting position (no blue color)

- 15. Press the 'START' button on the operation panel to start the analysis. The time course of the replay will be shown. When it reaches the end of the measurement time, the time tracking result at the specified frequency will be displayed.



Partial overall time trend display for the frequency range of 5 kHz

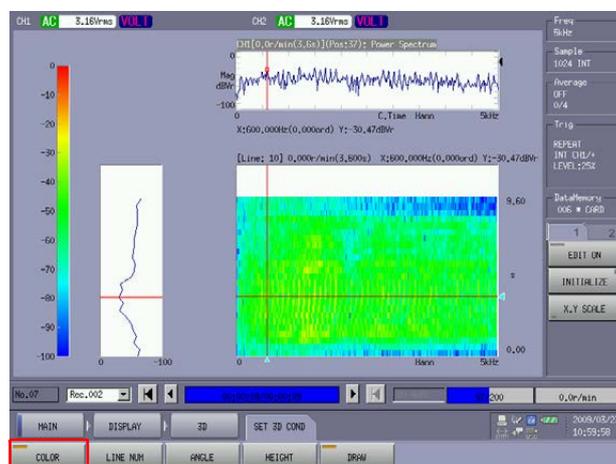
The horizontal bar indicates the partial overall frequency range set.

Indicates the replay progress and the number of analysis data.

3. 3D display

Use the following steps for three-dimensional (3D) display of time tracking data.

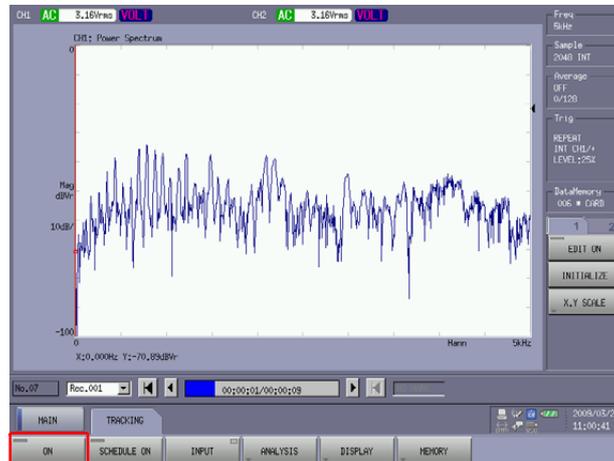
- 1. Press the keys in the order [MAIN], [TRACKING], [DISPLAY], [3D], and [ON] to show the 3D display.
- 2. Turn on the keys [MAIN], [TRACKING], [DISPLAY], [3D TRACKING COND], and [STEP AUTO ON]. It will be automatically adjusted to show all data in the 3D display.
- 3. Turn on the keys [MAIN], [TRACKING] [DISPLAY], and [3D]. Press the [ON] key to turn it off, and then press [ON] again to update the display.
- 4. Press the keys [MAIN], [DISPLAY], [3D], [SET 3D COND], and [COLOR] to turn it on. The data will be displayed in color, with frequency on the X-axis and elapsed time on the Y-axis. Clicking on the data area will move the cursor to the position, and the X and Y cross sections will be shown.



4. How to perform FFT analysis

You can use recorded data to perform FFT analysis.

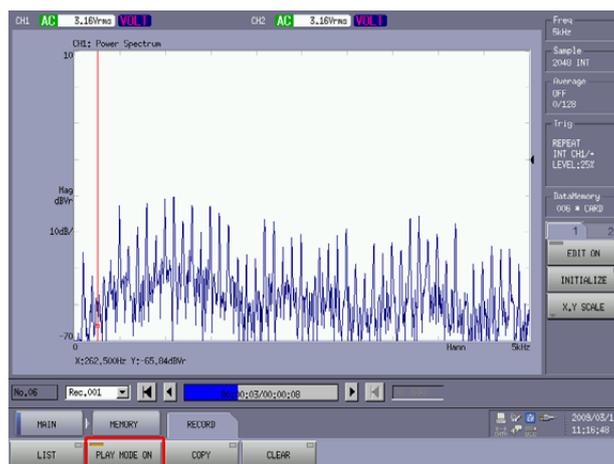
- 1. Press the keys in the order [MAIN], [TRACKING], and [ON] to turn it off.
The tracking analysis function is disabled, and it returns to the standard FFT analysis mode.



- 2. Changing the frequency range and pressing the 'START' button will start performing the FFT analysis. You can change the position to start the analysis by using the left-stop arrow button  or by touching on the desired position on the replay time progress bar.

5. Returning to off-line analysis

Press the keys in the order [MAIN], [MEMORY], [RECORD], and [PLAY MODE ON] to turn it off.



ON: Off-line analysis
OFF: On-line analysis

-End-
(2015/06/05)