

CF-7200 Portable FFT Analyzer

Sine Sweep Output Operation

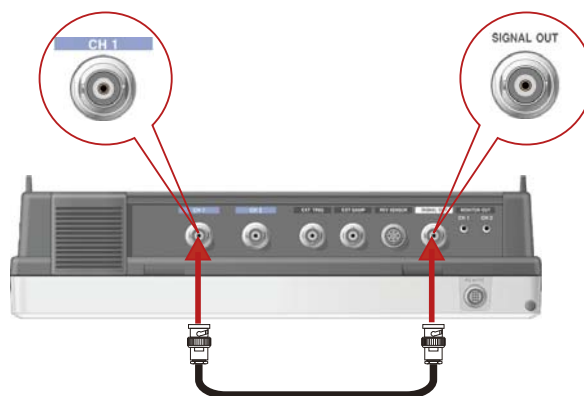
This document explains the operating procedure for outputting the linear sine sweep signal using CF-0771 signal output function (option). The logarithmic sine sweep signal output is not equipped in the CF-0771 signal output function (option).

[] stands for software key operation, and “ ” stands for button operation on the operation panel. In the sentences, “Key” is the software key, and “Button” is the button on the operation panel.

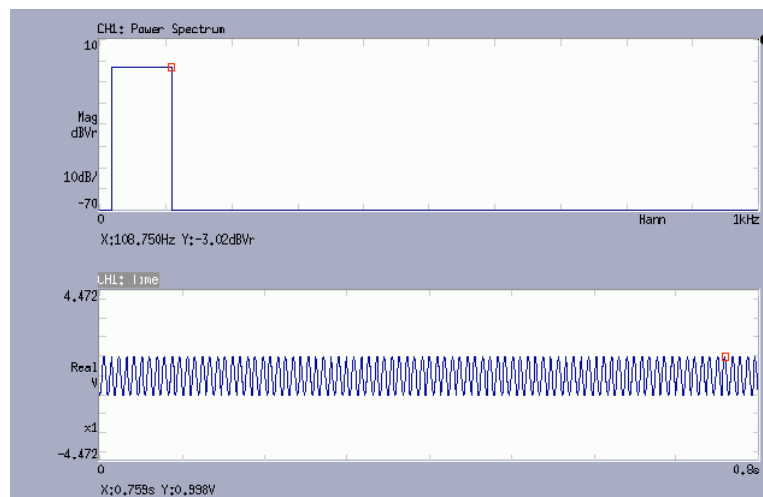
■Operation Procedure

1. Output Signal Check

For checking the sine sweep output signal, connect the signal output terminals (SIGNAL OUT) and CH1 signal input terminals of CF-7200 using a BNC cable, and check the waveform and spectrum of ch1 on the monitor.



The chart below shows an example of checking the status of sine sweep output with the power spectrum of CH1. The SWEEP average is adopted for sine sweep output. In the SWEEP average, whenever the sweeping frequency steps up the new frequency spectrum is displayed together with the remaining old spectrums, showing as if the spectrum is extending in the direction of higher frequency.



2. Set Up of Linear Sine Sweep Signal

-1. Linear Sine Sweep Signal Frequency

The frequency of linear sine sweep signal is determined as the X-axis frequency of the spectrum (resolution). When sampling is complete with the setup number of samples, the frequency will be stepped up for the next frequency. For example, with a setup of 10 kHz and number of samples 2048, the frequency resolution becomes $10 \text{ kHz} / (2048/2.56) = 12.5 \text{ Hz}$. The sine waveform of minimum 12.5 Hz will be held until the completion of acquisition of 2048 samples, then the frequency will be stepped up to 25 Hz. Similarly, 25 Hz will be held until the completion of next acquisition of 2048 samples. The step-up continues until the frequency reaches maximum of 10 kHz and ends the signal output. The set-up for starting and ending frequency can be defined in the range of 12.5–10 kHz.

-2. Number of SWEEP Average

The SWEEP average is adopted for linear sine sweep signal output. If the number of averaging is only one, the measuring will be conducted as explained in item-1 above. If the overlap is 0 % (the rate of using first time sample data) and the number of averaging is set as two, the frequency steps up to the next frequency when averaging is complete using the first and second FFT computation, after FFT computation on second 2048 samples following the FFT computation on first 2048 samples. The time required for holding a frequency will be extended as long as the required time for averaging process.

The type of output linked with FFT analysis that holds (does not vary) the output frequency until the completion of sampling of that frequency allows a precise analysis. It has to be noted that more sampling time is required for lower range frequencies.

-3. Zooming Function

To raise the frequency resolution, a similar signal output is available using zooming function. Please set up the operation as follows:

i. Set up the averaging of power spectrum in SWEEP

Select in the order below:

[MAIN] -> [ANALYSIS] -> [AVERAGE] -> [MODE] -> [PWR SP] -> [SWEEP]



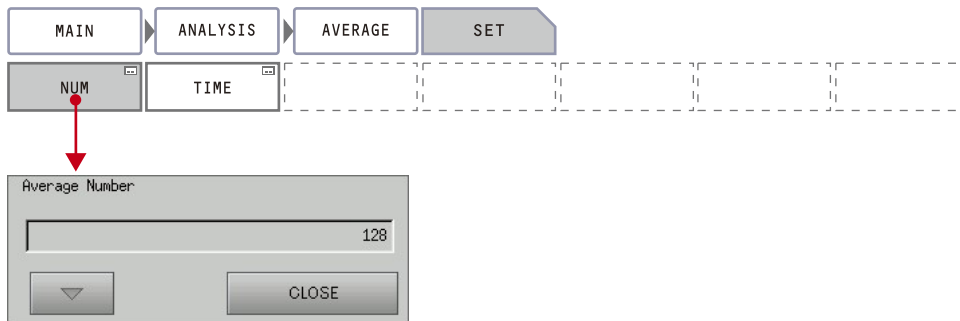
ii. Set up the number of averaging

The sine frequency will be held constant until the completion of averaging. If averaging is not required, set to “1”

Select in the order below;

[MAIN] -> [ANALYSIS] -> [AVERAGE] -> [SET] -> [NUM]

and set up the number of averaging in the displayed [Average Number] dialog box.

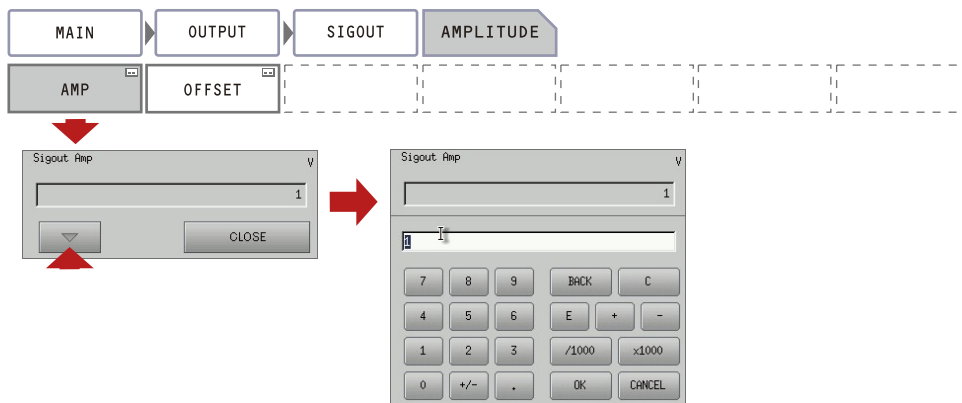


3. Set Up Sine Vibration Amplitude Voltage

Select in the order below;

[MAIN] -> [OUTPUT] -> [SIGOUT] -> [AMPLITUDE] -> [AMP]

and set up the sine vibration amplitude in the displayed [Sigout Amp] dialog box.



4. Set Up the Conditions for Sine Sweep Signals

-1. Set up SWEEP function

Select in the order below;

[MAIN] -> [OUTPUT] -> [SIGOUT SWEEP] -> [AMPLITUDE] -> [ON]

to activate SWEEP function.



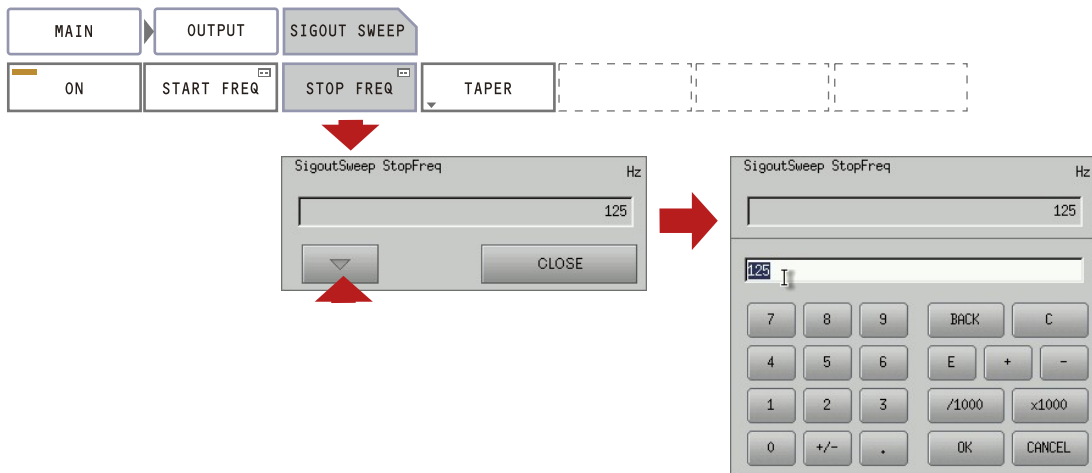
- Signal Output ON/OFF Key

-2. Set Up Sweep Stop Frequency

Select in the order below;

[MAIN] -> [OUTPUT] -> [SIGOUT SWEEP] -> [STOP FREQ]

and set up the stop frequency in the displayed [SigoutSweep StopFreq] dialog box.



[Note]

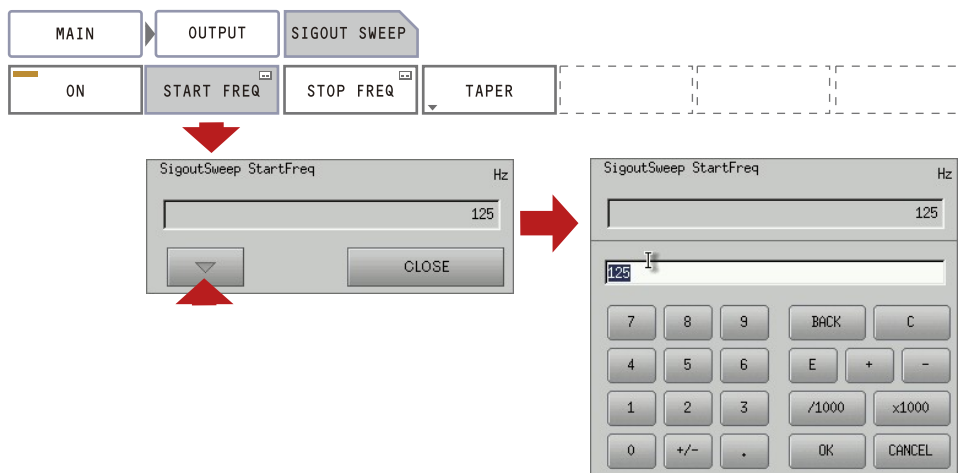
Please set the sweep stop frequency to a larger value than the sweep start frequency.

-3. Set up Sweep Start Frequency

Select in the order below;

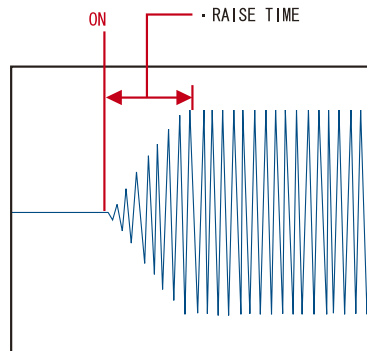
[MAIN] -> [OUTPUT] -> [SIGOUT SWEEP] -> [START FREQ]

and set up the start frequency in the displayed [SigoutSweep StartFreq] dialog box.



-4. Taper ON/OFF and Condition Set Up

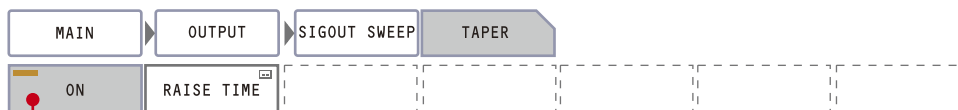
This is a function that controls the abrupt amplitude change at the signal output start and is to be set up as necessary. If the RAISE TIME in the chart below is too long, the spectrum around the starting frequency may be too small. Please set up the starting frequency with some allowance.



Select in the order below;

[MAIN] -> [OUTPUT] -> [SIGOUT SWEEP] -> [TAPER] -> [ON]

and activate TAPER function.

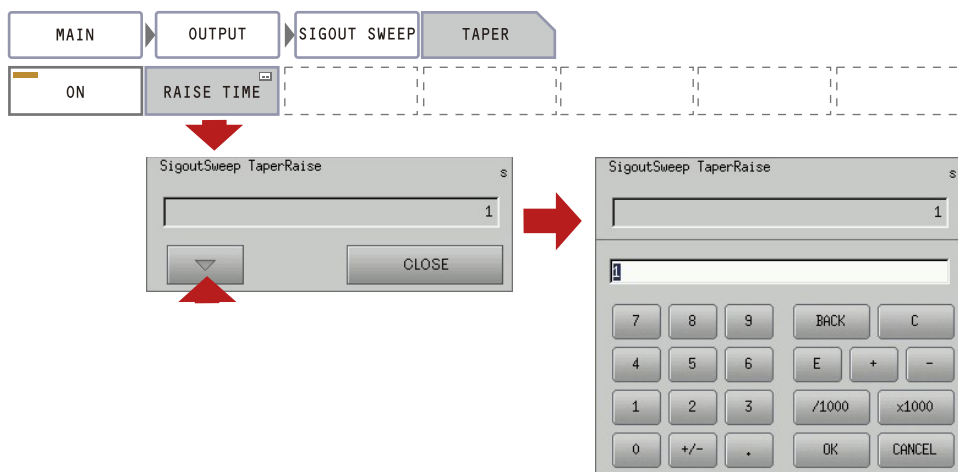


Taper output ON/OFF setting key

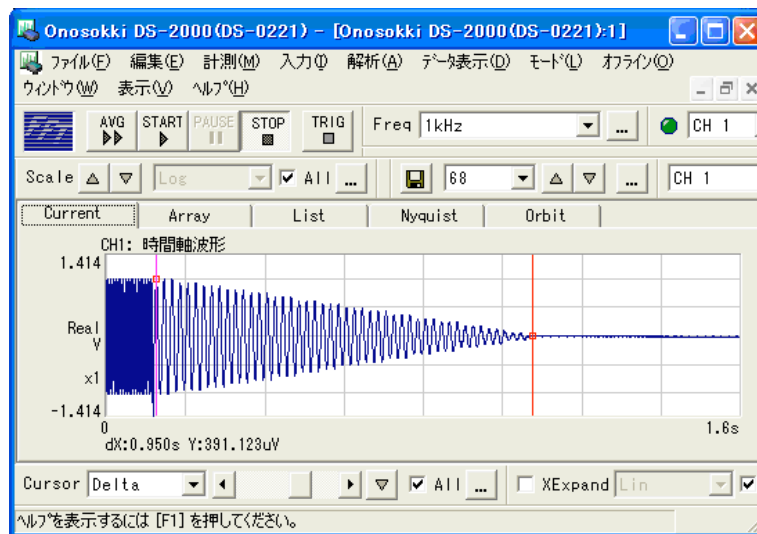
Select in the order below;

[MAIN] -> [OUTPUT] -> [SIGOUT SWEEP] -> [TAPER] -> [RAISE TIME]

and set RAISE TIME to an arbitrary value in the displayed [SigoutSweep TaperRaise] dialog box.

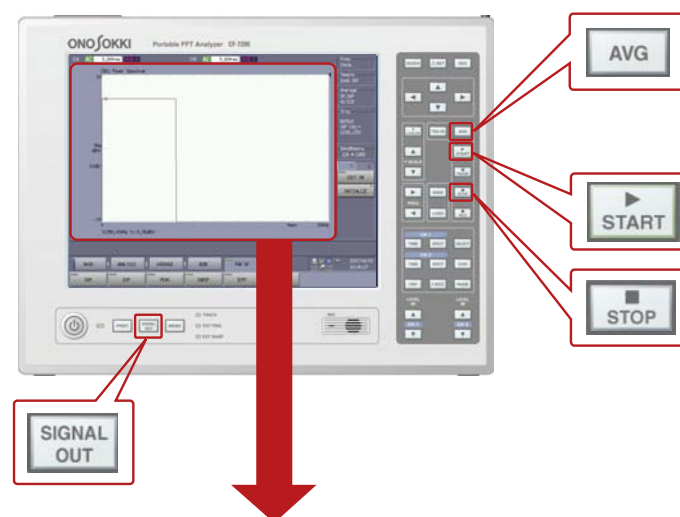


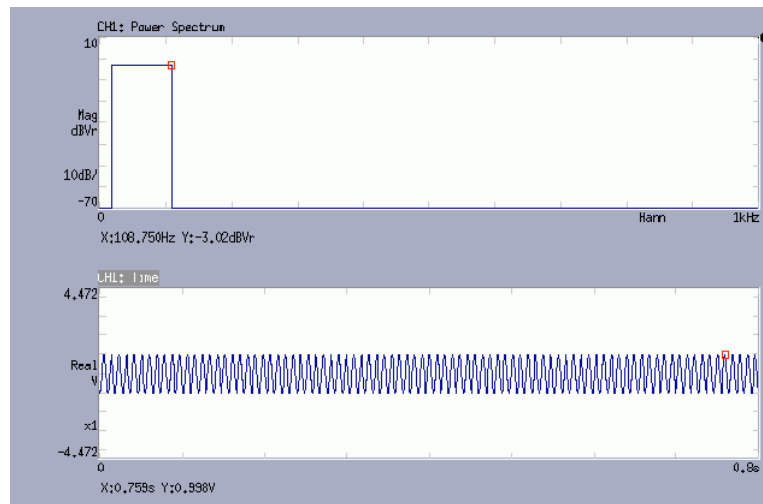
When the sweep stop frequency is reached, the frequency will return to the start frequency and the amplitude will be attenuated in about 1 second (attenuating time is a constant). The chart below shows the process.



5. Signal Output Start

- 1. Press the “SIGOUT” button and “ON” (turns green).
- 2. Press the “AVG” button and “ON” (lights up).
- 3. Press the “START” button and “ON” (lights up). The result of the sine sweep will be successively displayed on the power spectrum waveform screen in synchronization with measurement START.





- 4. If you want to stop measurement at any time, press the “STOP” button.
- 5. To measure again, please restart from the above item 5-1.

- End -
(2015/04/20)