

# 13 FILE EXPORT AND IMPORT

## 13.1 GENERAL INFORMATION

With the use of the **Shift-F2** hot key, which is active in almost all of CLIO's control panels, CLIO exports measurements in an ASCII text file format, with .txt extension, that is useful in a great number of cases. The main purpose of this feature is the exchange of data with other programs, particularly simulation and modelling programs. Because there is no particular standard that can be used, we would like to emphasize that the evaluation of compatibility of the generated files with other programs is strictly left to the user. However, because these files can be edited using any ASCII text file editor, it is fairly easy to perform those modifications necessary to make an exported file compatible with another program. In some extreme cases it may also be relatively easy to write a custom conversion program to help automate this task. Examples of each available export files will be given below. Should be pointed out here that every simulation programs we are aware off has a dedicated section in its user manual. Several has a dedicated import option for Clio. The ones we tested are Calsod, NetCalc, SoundEasy and WinCross (\*). Also the files format is only one problem to deal with. For acoustic measurements where phase has relevance, Clio works in a "what you see what you export" way. That means that the phase response exported is the same you see on the screen. As a typical case you might be interested in performing a quasi-anechoic frequency response and export it for your simulation program. You can obtain this response either with an MLS measurements or with a Sinusoidal frequency response with gating. In both cases you can get several response which are the same in modulus but very different in phase response depending on the start point of the transformation windows in MLS and the delay time in Sinusoidal gating parameters. You must be completely confident on what means removing the group delay on your response. No simulation program can be aware if you did this correctly and in the same way for each speaker of the complete system, which is the most sensitive topics for correct simulation results. Some simulation program simply ignore the phase response imported and recalculates it as Hilbert transform of the modulus. This greatly simplify your job but you might think that phase response is not so important if it can be calculated afterwards; unfortunately the Hilbert transform of the modulus yields to the correct phase response only if the system is a "minimum-phase" one. To explain in detail the theory behind this statement is beyond the scope of this user manual and you can find several source in the bibliography. It is enough here to say that most, not all, of single loudspeaker are minimum-phase devices in their frequency response, most of loudspeakers systems are not, most of impedance responses of single loudspeaker are not. This is why other simulation programs do not make minimum-phase assumption and leave to the user the heavy job of getting a correct and coherent phase response that is used as it is. Finally exporting impedance file do not have phase ambiguity problems as there is not group delay to remove.

## 13.2 EXPORT

Follows detail on each export file of CLIO.

### 13.2.1 FFT

The export data structure depends on the settings you have from within this panel, that is FFT Size, one or two channel display, linear or log magnitude and so on. An example for each possible combination is not possible. The following example refers to the settings as in Fig. 13.1.

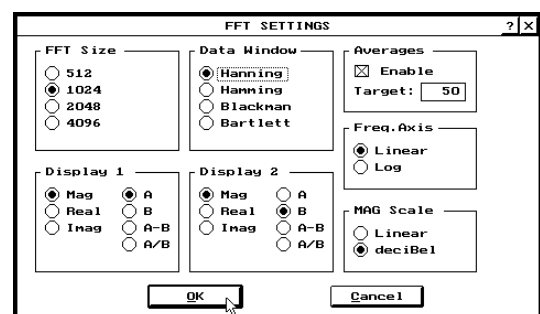


FIGURE 13.1

```

[FREQ]      [CH A MAG dBV]
50.0        -75.77
100.0       -75.39
150.0       -75.72
200.0       -75.63
250.0       -77.14
.....
.....
19850.0     -90.41
19900.0     -90.19
19950.0     -89.34
20000.0     -89.34

```

### 13.2.2 MLS

Both Frequency and Time data can be exported from here. Frequency data are exported with **Shift-F2** from the MLS Frequency Response control panel while Time data from within the Impulse response one. Frequency data are 540 lines of logarithmic spaced frequencies. First and last frequency depend on both the sampling frequency of the measure and the Frequency Scale selected from the MLS settings control panel.

```

      Freq      dB      Phase
20.00      75.15      35.46
20.26      75.18      36.26
20.52      75.23      36.65
20.78      75.28      37.04
.....
.....
18761.39    89.12     -33.89
19002.93    88.94     -33.05
19247.58    88.95     -34.92
19495.38    88.49     -38.57
19746.38    87.69     -39.12

```

Time data are the one selected with the time window in the Impulse Response control panel. If you want to export the whole impulse press the **I**nit button to remove window. In this case the exported file will be quite big (circa 180K).

```

Time[ms]      Level[Pa]
0.000000      0.000079
0.078125      0.000042
0.156250      0.000060
.....
.....
30.312500     -0.001667
30.390625      0.003288
30.468750      0.002333
30.546875      0.000110
30.625000      0.006599

```

### 13.2.3 SINUSOIDAL FREQUENCY RESPONSE AND IMPEDANCE

Data exported here depends on Measure Settings, not on the display ones, that is start and stop frequency and resolution. If THD button is active 2<sup>nd</sup> and 3<sup>rd</sup> harmonic value are exported.

Freq	dB	Phase
10.0	-70.56	-28.9
10.6	-68.70	-33.0
11.2	-66.90	-37.8
11.9	-65.08	-42.0
12.6	-63.29	-46.7
13.3	-61.52	-51.4
14.1	-59.84	-56.1
15.0	-58.17	-60.7
15.8	-56.49	-65.5
16.8	-54.85	-70.2

.....

16788.0	-6.84	-98.6
17782.7	-7.43	-101.7
18836.4	-8.04	-104.9
19952.5	-8.68	-108.0

Freq	dB	Phase	2nd	3rd
10.0	-226.00	0.0	-219.98	-219.98
10.3	-226.00	0.0	-219.98	-219.98
10.6	-226.00	0.0	-219.98	-219.98
10.9	-226.00	0.0	-219.98	-219.98
11.2	-226.00	0.0	-219.98	-219.98
11.5	-226.00	0.0	-219.98	-219.98

.....

7718.0	89.81	21.5	37.10	47.10
7943.3	91.41	67.7	37.52	49.33
8175.3	91.84	117.5	36.96	-226.00
8414.0	89.70	158.3	39.32	-226.00
8659.7	91.52	-146.0	39.67	-226.00
8912.6	92.09	-92.3	40.58	-226.00
9172.8	91.13	-57.1	43.09	-226.00
9440.7	91.97	6.8	42.67	-226.00
9716.3	91.70	67.8	45.39	-226.00
10000.1	93.02	115.6	46.31	-226.00
10292.1	93.64	-176.5	46.38	-226.00
10592.6	94.19	-128.6	48.84	-226.00
10901.9	95.40	-70.6	49.34	-226.00
11220.3	94.13	-16.5	50.37	-226.00
11547.9	94.98	52.8	50.08	-226.00
11885.1	93.93	113.5	53.69	-226.00
12232.2	95.72	176.8	-226.00	-226.00
12589.3	93.51	-122.3	-226.00	-226.00
12957.0	93.48	-39.7	-226.00	-226.00
13335.3	92.10	31.3	-226.00	-226.00
13724.7	93.15	120.7	-226.00	-226.00
14125.5	93.37	-173.9	-226.00	-226.00
14538.0	91.92	-77.0	-226.00	-226.00
14962.5	94.53	7.9	-226.00	-226.00
15399.4	93.78	92.0	-226.00	-226.00
15849.1	96.43	-173.8	-226.00	-226.00
16311.9	96.88	-108.4	-226.00	-226.00
16788.2	95.18	-17.9	-226.00	-226.00

17278.4	94.99	86.4	-226.00	-226.00
17782.9	95.30	177.2	-226.00	-226.00
18302.2	93.81	-97.2	-226.00	-226.00
18836.6	91.79	16.0	-226.00	-226.00
19386.7	90.92	136.0	-226.00	-226.00
19952.8	91.24	-112.5	-226.00	-226.00

Freq	Ohm	Phase
10.00	4.15	34.20
10.29	4.22	34.91
10.59	4.28	35.64
10.90	4.36	36.36
11.22	4.44	37.09
11.55	4.52	37.83
11.89	4.61	38.56
12.23	4.71	39.29

.....

18302.20	19.22	53.70
18836.63	19.56	53.92
19386.68	19.88	54.13
19952.78	20.24	54.36

### 13.2.5 SINUSOIDAL PARAMETERS

MANUFACTURER : KEF                      MODEL : B110-B

#### IMPEDANCE

Freq	Ohm	Phase
10.00	9.29	27.51
10.29	9.38	28.01
10.59	9.48	28.52
10.90	9.57	29.03
11.22	9.68	29.53

.....

18302.20	42.19	44.04
18836.63	42.84	44.07
19386.68	43.46	44.09
19952.78	44.12	44.10

#### PARAMETERS

Re	7.20	[ $\Omega$ ]
Fs	52.74	[Hz]
F1	31.62	[Hz]
F2	89.13	[Hz]
Zm	50.62	[ $\Omega$ ]
D	88.00	[mm]
Qms	2.28	
Qes	0.38	
Qts	0.32	
B1	8.28	[N/A]
L1K	0.00	[mH]
L10K	0.00	[mH]
Ms	10.89	[g]
Vas	4.32	[l]
dBSpl	84.65	[dB]

Cms 0.84 [mm/N]

### 13.2.6 SINUSOIDAL DISTORTION

Lev [W]	Dist [%]
0.37	0.27
0.40	0.30
0.44	0.32
0.49	0.34
0.53	0.36
.....	.....
12.19	0.42
13.37	0.45
14.66	0.49
16.07	0.53
17.63	0.56
19.32	0.60
21.15	0.67
23.22	0.97
25.27	2.62
27.21	6.71
29.24	13.06

### 13.2.7 SINUSOIDAL POLAR

Test Frequency	
3000	
Angle	dBSp1
0	92.46
5	92.50
10	92.43
15	92.21
20	91.86
25	91.38
.....	.....
.....	.....
330	90.29
335	90.91
340	91.41
345	91.80
350	92.10
355	92.34

### 13.2.8 RTA

Freq	dB
20	75.07
25	80.02
31	82.67
40	83.90
50	85.98
63	87.34
80	90.32
100	92.45
125	90.32
160	88.33
200	87.02
250	89.01
315	91.21
400	92.90
500	92.92
630	92.29
800	90.32
1000	89.23
1250	88.31
1600	87.90
2000	86.71
2500	85.45
3150	85.32
4000	86.21
5000	84.99
6300	83.23
8000	82.21
10000	81.21
12500	81.01
16000	80.21
20000	73.34

### 13.3 IMPORT

From the Sinusoidal Frequency Response control panel, with the hot-key **Shift-F3**, is possible to import measures saved as ASCII files in the same format Clio uses for export. This allows for example to import MLS exported measurements and compare them with Sinusoidal ones, to visualize hand edited responses, responses produced by other programs, as well as files used for the **GenEq** option. Once you have imported the file it is possible to save it as a Clio's internal format **.frs** file. Regarding the **GenEq** option we remind that importing this files allows to visualize the response and eventually modify it using the **Math** option. This is how the file `riaa.txt` was obtained (see section 11.2.4). As the RIAA pre-emphasis ranges from about +20dB to -20dB and Clio can generate up to +12dB you should type the file as it is from the standard, import it, shift it 8dB down using **Math** option and re-export it.

(\*) References for the cited software:

#### **CALSOD**

AUDIOSOFT - 128 Oriel Road, West Heidelberg 3081, Melbourne, Australia  
Fax: +61-3-94974441

#### **NETCALC**

AUDIO COMPONENTS - UssenStraat 2A, 5341 PM Oss, Holland  
Tel: +31-412-626610 - Fax: +31-412-633017

#### **SOUNDEASY**

BODZIO SOFTWARE - P.O. Box 3176, Whellers Hill 3150, Vic. Australia  
Tel.: +61-3-95621224 - Fax.: +61-3-95613575

#### **WINCROSS**

TECHNIMEDIA - Via Carlo Perrier 9, 00157 Roma, Italy  
Tel: +39-6-418921 - Fax: +39-6-41732169

