

MDX 0408

FIR Filtres Creation User Manual

User Manual – Version 1.0



FIR filter and applications

When user uses PEQ to adjust audio signal and set a linear magnitude, he can find the phase of signal changed, due to IIR filter. However, DSP products provide user a useful tool FIR filter to adjust audio signal with a linear phase.



Some calculation:

Frequency resolution = Sampling/Taps

Available min. frequency ≈ Frequency resolution*3

Means when use adjust audio signal with 48kHz, 1024 taps, FIR filters will take effect in frequency above 141Hz of audio signal. The taps value more high, the FIR filter curve more steep.

FIR filter processing audio signal will produce a certain delay: Delay = (1/Sampling Hz)*Taps/2

*Outputs 7 and 8 do not support 512 taps

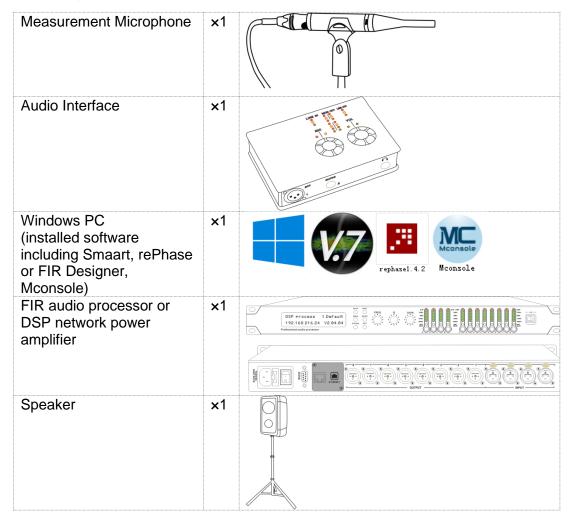
Taps		48kHz	96kHz
	Sampling		
256		2.67ms, LF 563Hz	1.33ms, LF 1125Hz
512		5.33ms, LF 279Hz	2.67ms, LF 558Hz
768		7.99ms, LF 188Hz	4.00ms, LF 375Hz
1024		10.67ms, LF 141Hz	5.33ms, LF 281Hz
2048		21.33ms, LF 70Hz	10.67ms, LF 141Hz

Applications:

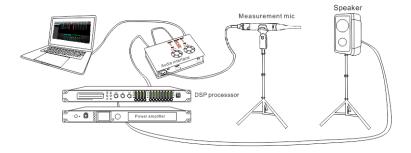
- Linear of the phase curve of the speaker;
- Match the phase and magnitude of different speaker models within the same product line, as well as different speaker models in the installation project to make it easier to debug speaker groups and arrays;
- Dealing with linear array systems (for audience area coverage optimization);
- Frequency division optimization to improve the consistency of frequency response of multi-division speakers over their coverage Angle range.



Devices required:



Connection schematic diagram:



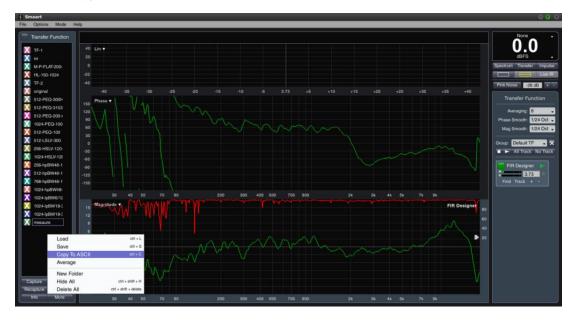
Using third party software to set FIR magnitude and phase

Step 1: measure phase curve of speaker in Smaart V7



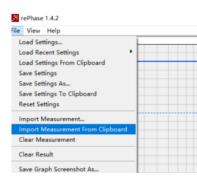


Step 2: copy curve to ASCII in Smaart V7

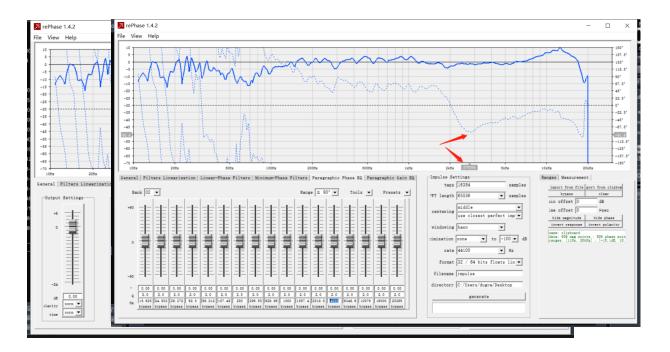


Step 3: copy curve to software rePhase

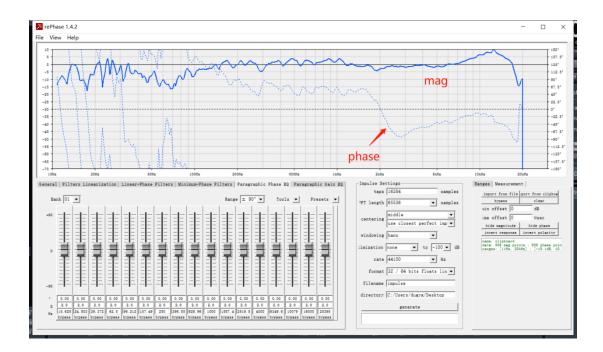
"Import Measurement From Clipboard"





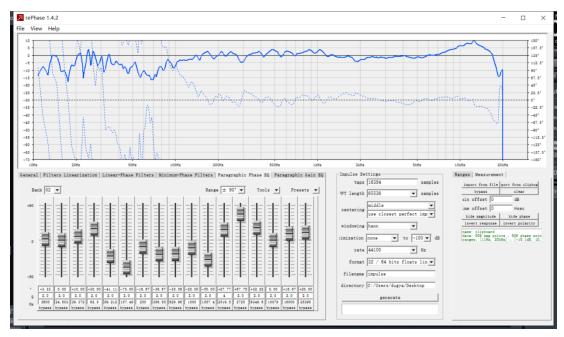


Step 4: adjust phase EQ or any other parameter in software, to match a linear phase for speaker



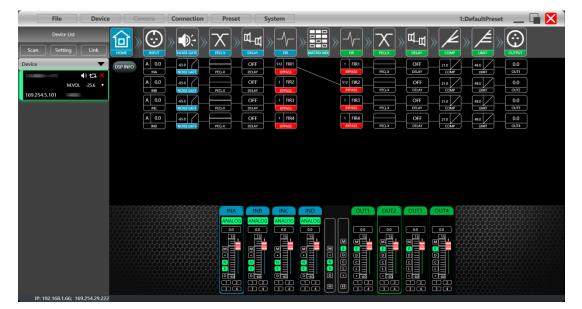


Step 5: export .txt file after setting



Marks:

- 1. Set taps in 2048/1024/768/512/256, here we set in 512.
- 2. Set rate in 48000Hz.
- 3. User can rename this file and find it easily.
- 4. Set directory for exporting file, such as C:/Users/User/Desktop.
- 5. Click "generate" to export a FIR .txt file.

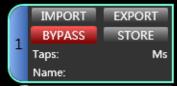


Step 6: import FIR .txt file in FIR audio processor or DSP network power amplifier



Open Mconsole software, user can choose an input channel or output channel as needed, such as FIR in output channel, it will show a FIR function window.

File Devic	e Camera	Connection Preset	eset System	🖬 🔀 🗎
Device List Scan Setting Link				
Device 🔻			FIR F	\mathbf{X}
1.device ④ 묘 X		IMPORT EXPORT BVPASS STORE Taps: 1024 10.67 MPORT EXPORT IMPORT EXPORT Taps: 0.4 10.67 Taps: 0.4 10.67	1 +36 18 2 +24 15 4 +12 12 -36 -12 00 -48 -12 00 -49 -12 00 -48 -12 00 -49 -12 00 -48 -12 00 -48 -12 00 -48 -12 00 -49 -12 00 -49 -12	در ۲۰ ۲۰ ۲۰
IP: 192.168.8.1				



press **IMPORT** to import txt. file, than press STORE to effect this importing.

	IMPORT	EXPORT
1	BYPASS	STORE
± .	Taps:	Ms
	Name:	

remember to cancel **BYPASS**.

File Device Camera	Connection Preset System	1:DefaultPreset 🔄 🔚 🗙
Device List		
Device DSPINIO () 13 X MVOL -25.5 V	HORE GATE PEQ.X DELAY DYPASS PEQ.X	Off 10 as 00 COLOR Color Color Color Off Color dis 0.0 GBAY Color UMIT 0.0 GBAY Color UMIT 0.0
169.254.5.101		
NO	Nonciality POX POX POX	
IP: 192.168.1.66; 169.254.29.222		

Step 8: measure the curve of speaker again, use can find it become more linear.





After all setting, please remember to save a preset for your hard working in the speaker.

File Device	Camera Connection	Preset System	1:DefaultPreset 🖬 🔀
		Device Preset	
	SSP INFO A 0.0 45.0 - NA 0.0 45.0 - - NOSE GATE NOSE GATE - - - NOSE GATE - -	0 Auto 1 (Default) 2 3 3 4 5 6 6 FIR-Adjust-1124 7 8 9 10 11 12 13 11 14 14	Empty NO X DAX COMP LMT Communication Device Memory IP3.X OFF COMP IB 0.0 Current OFF COMP IB 0.0 0.0 Boot OFF COMP IB 0.0 0.0 Current OFF COMP IB 0.0 0.0 Current OFF COMP IB 0.0 0.0 Current/Boot OFF COMP IB 0.0 0.0 Save Recall ID2.X OFF COMP IB 0.0 Delete Clear ID0.0 ID0.0 ID0.0 ID0.0 ID0.0 ID0.0 ID0.0 Import Preset Imp
	000000000000000000000000000000000000000	15 16 17	Export Preset
19: 192 168 1.66; 169 254,29,222			Eport Package





Av. Saler nº14 Poligono. Ind. L'Alteró. Silla 46460 VALENCIA-SPAIN Tel: +34 961216301 www.equipson.es