

Sound Splash is a calculator to design custom diffusers such as Schroeder diffusers, Huffman sequence diffuser, etc. Sound Splash is capable of making combinations of one dimensional QRD, PRD, LSD, PWRD, Huffman sequence (non-integer based sequence) and two dimensional QRD, PRD, LSD, Huffman. A sub-program for designing a two dimensional maximum length sequence (MLS) diffuser is also included. The two-dimensional diffusers can be calculated using array calculation (simple method) and Chinese Remainder Theorem.

Basic steps:

1. Open “build component diffusers” window to create a single diffuser.
2. Hit “send” button to transfer the diffuser data to the main window.  
You can combine different type of diffusers. When you are done, close the build component diffusers window.
3. Hit “generate complex diffuser” button.
4. Export picture, data and report
5. Hand in the data to Mr. Carpenter.

Generate the whole  
diffuser array.

This table saves the  
polar response  
calculation results.

[First step] Open  
this window to  
create single  
diffuser.

This table saves  
single diffusers  
you created from  
build component  
diffusers.

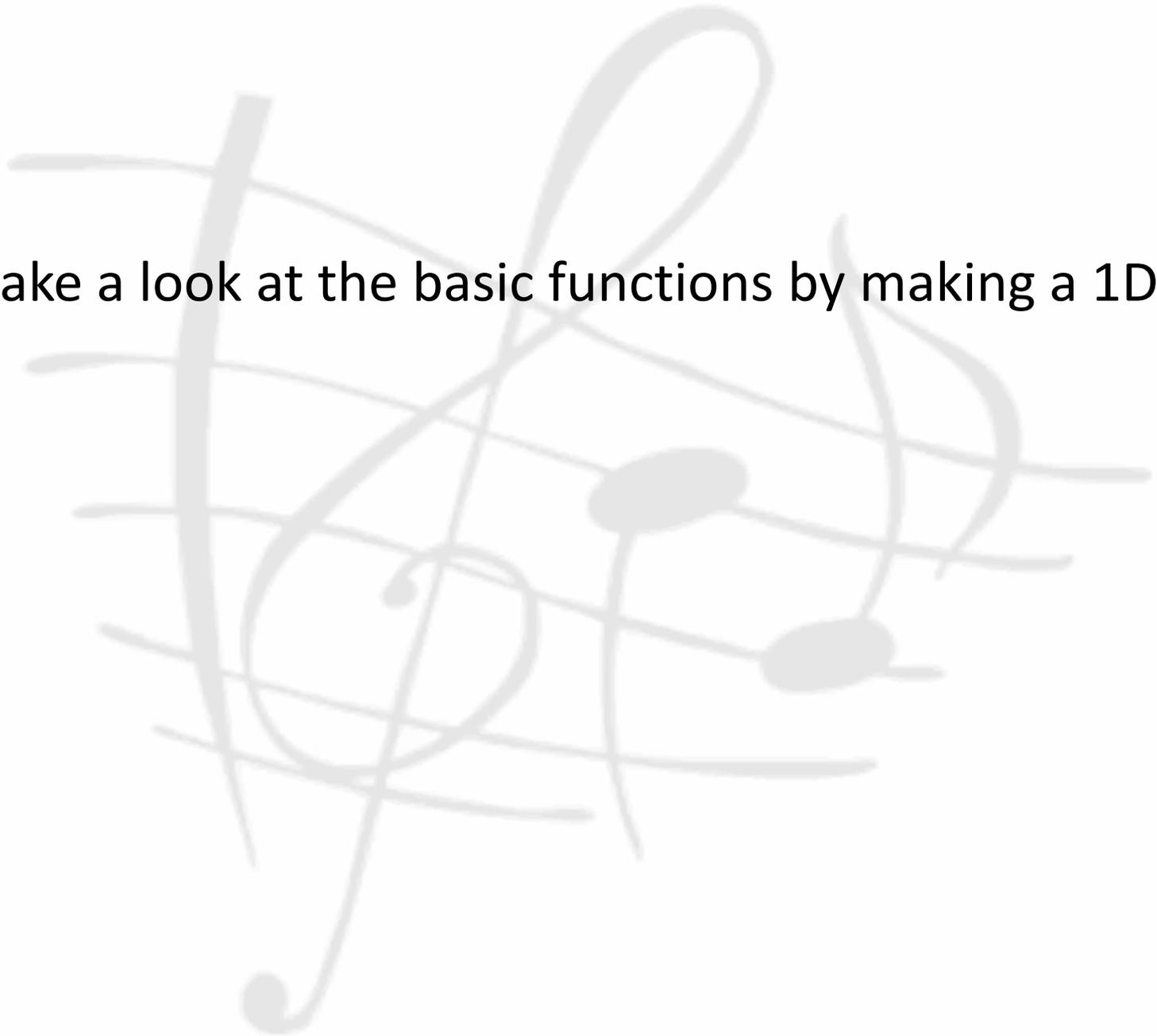
You can temporarily  
deactivate a diffuser

This table gives  
the full view of the  
generated diffuser.

Please click "Build Component Diffusers" button to add diffusers, then click "Generate Complex Diffuser".

This area shows the  
polar response \*Sound  
Splash does not use BEM

Let's take a look at the basic functions by making a 1D QRD.



1. Click here to open the component diffuser window.

2. Define diffuser's general parameters.

3. Select a diffuser type and define the specific parameters.

Sound Splash - 1D Schroeder Diffuser Builder

File Build Setting Help

Build Component Diffusers Generate Complex Diffuser

Component Diffuser Summary

Unit	Type	Freq(Hz)	N	Width(cm)	Active	Phase	Reverse

Polar Response Control

Freq (Hz) 500

Data	Show	Color	Title

Build Component Diffuser

File

Design Freq (Hz) 500

Prime Number 7

Well Width (cm) 5.00

Out of Phase  Reverse

Complex Unit

QRD PRD LSD PWRD HSD

QRD Integer Constant 0

QRD Optimizer

Refresh Send Close

Well	Schematics	Well Depth (cm)	Wood Depth(cm)
1		0.00	19.67
2		4.92	14.76
3		19.67	0.00
4		9.84	9.84
5		9.84	9.84
6		19.67	0.00
7		4.92	14.76

-30

-60

-90

Sound Splash LT

Please click "Build Component Diffusers" button to add diffusers, then click "Generate Complex Diffuser".

Data of the single diffuser. Depth is relatively drawn in scale.

Build Component Diffuser

File

Design Freq (Hz) 500

Prime Number 7

Well Width (cm) 5.00

Out of Phase  Reverse

QRD PRD LSD PWRD HSD

QRD

QRD Optimizer

Refresh Send Close

Well	Schematics	Well Depth (cm)	Wood Depth(cm)
1		0.00	19.67
2		4.92	14.76
3		19.67	0.00
4		9.84	9.84
5		9.84	9.84
6		19.67	0.00
7		4.92	14.76

Transfer data to the main window.

Hit refresh to apply changes. Shortcut: Enter or double click.

After you are done, close this window to return to the main window

Build Component Diffuser

File

Design Freq (Hz) 600

Prime Number 13

Well Width (cm) 5.00

Out of Phase  Reverse

QRD PRD LSD PWRD HSD

QRD Integer Constant 4

QRD Optimizer

Refresh Send Close

Well	Schematics	Well Depth (cm)	Wood Depth(cm)
1		8.83	8.83
2		11.04	6.62
3		17.66	0.00
4		0.00	17.66
5		15.45	2.21
6		6.62	11.04
7		2.21	15.45
8		2.21	15.45
9		6.62	11.04
10		15.45	2.21
11		0.00	17.66
12		17.66	0.00
13		11.04	6.62

Let's create a QRD with  $N=13$ , design frequency=600Hz, well width=5cm, Integer constant=4. Hit Refresh and Send (once). You should see the diffuser is listed in the main window, and hit "Close" button to return to the main window.

Click here to calculate the total diffuser

You will see the newly created diffuser(s) here.

Sound Splash - 1D Schroeder Diffuser Builder

File Build Setting Help

Build Component Diffusers **Generate Complex Diffuser**

Component Diffuser Summary

Unit	Type	Freq(Hz)	N	Width(cm)	Active	Phase	Reverse
U1	QRD	600	13	5.00	<input checked="" type="checkbox"/>	+	No

Polar Response Control

Freq (Hz) 500

Distance (m) 100.0

Min. Value (dB) -60.0

Refresh

Polar Response

90 60 30 0 -30 -45 -60 -90

Sound Splash LT

Please click "Build Component Diffusers" button to add diffusers, then click "Generate Complex Diffuser".

Component Diffuser Summary

Unit	Type	Freq(Hz)	N	Width(cm)	Active	Phase	Reverse
U1	QRD	600	13	5.00	<input checked="" type="checkbox"/>	+	No

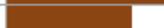
Polar Response Control

Click here to calculate the polar response

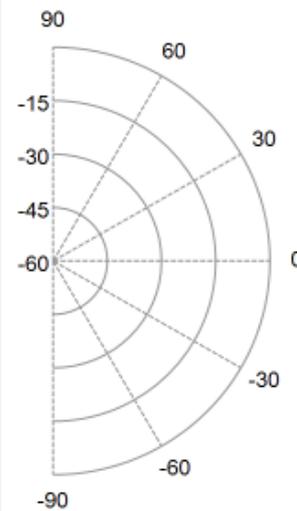
Min. Value 60.0

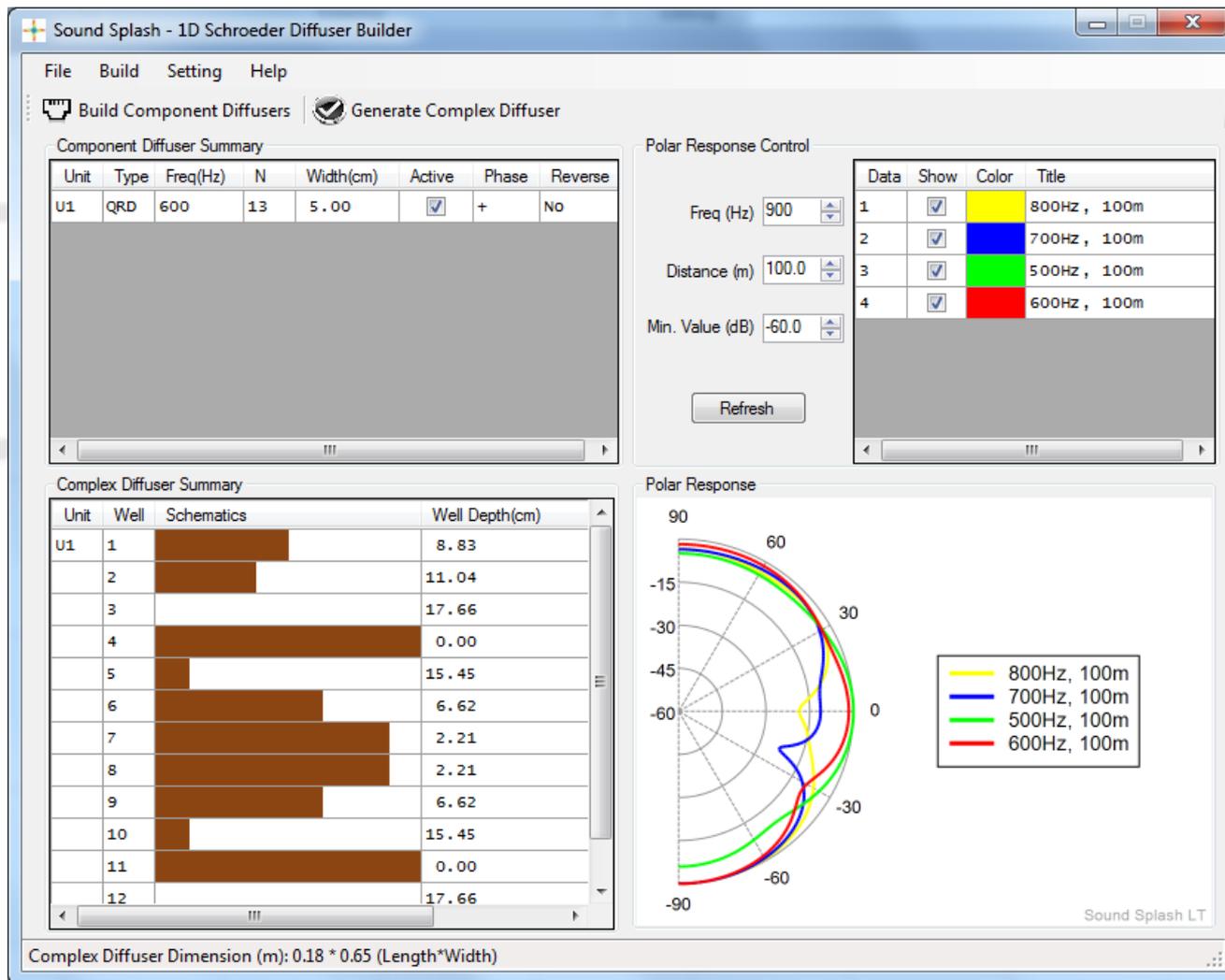
Refresh

Complex Diffuser Summary

Unit	Well	Schematics	Well Depth(cm)
U1	1		8.83
	2		11.04
	3		17.66
	4		0.00
	5		15.45
	6		6.62
	7		2.21
	8		2.21
	9		6.62
	10		15.45
	11		0.00
	12		17.66

Polar Response





Try changing the polar response frequency to 500Hz, 600Hz, 700Hz and 800Hz and overlay all polar curves.

Sound Splash - 1D Schroeder Diffuser Builder

File Build Setting Help

Build Component Diffusers  Generate Complex Diffuser

Component Diffuser Summary

Unit	Type	Freq(Hz)	N	Width(cm)	Active	Phase	Reverse
U1	QRD	600	13	5.00	<input checked="" type="checkbox"/>	+	No

Polar Response Control

Freq (Hz) 7800

Distance (m) 100.0

Min. Value (dB) -60.0

Refresh

Data	Show	Color	Title
1	<input checked="" type="checkbox"/>	Black	7800Hz, 100m
2	<input type="checkbox"/>	Yellow	800Hz, 100m
3	<input type="checkbox"/>	Blue	700Hz, 100m
4	<input type="checkbox"/>	Green	500Hz, 100m
5	<input type="checkbox"/>	Red	600Hz, 100m

Complex Diffuser Summary

Unit	Well	Schematics	Well Depth(cm)
U1	1		8.83
	2		
	3		
	4		0.00
	5		15.45
	6		6.62
	7		2.21
	8		2.21
	9		6.62
	10		15.45
	11		0.00
	12		17.66

Polar Response

Print Table

Export Schematics as Picture

Complex Diffuser Dimension (m): 0.18 \* 0.65 (Length\*Width)

Using right mouse button, you can print this table, or export picture.

More functions under the file menu.

Right click this window to see more functions such as adding extra well to make a symmetrical construction.

Sound Splash - 1D Schroeder Diffuser Builder

File Build Setting Help

- Open
- Save Project Ctrl+S
- Print
- Export Pictures
- Export Report as Text File
- Exit Ctrl+Q

Generate Complex Diffuser

h(cm)	Active	Phase	Reverse
0	<input checked="" type="checkbox"/>	+	No

Polar Response Control

Freq (Hz) 7800

Distance (m) 100.0

Min. Value (dB) -60.0

Refresh

Data	Show	Color	Title
1	<input checked="" type="checkbox"/>	Black	7800Hz, 100m
2	<input type="checkbox"/>	Yellow	800Hz, 100m
3	<input type="checkbox"/>	Blue	700Hz, 100m
4	<input type="checkbox"/>	Green	500Hz, 100m
5	<input type="checkbox"/>	Red	600Hz, 100m

Complex Diffuser Summary

Unit	Well	Schematics	Well Depth(cm)
U1	1		8.83
	2		11.04
	3		17.66
	4		0.00
	5		15.45
	6		6.62
	7		2.21
	8		2.21
	9		6.62
	10		15.45
	11		0.00
	12		17.66

Polar Response

90 60 30 0 -30 -60 -90

7800Hz, 100m

Sound Splash LT

Complex Diffuser Dimension (m): 0.18 \* 0.65 (Length\*Width)