Section M9   Audio effects blocks

These blocks appear at the top of the simulation area

| Table of blocks	
Block notation	Description
DTMF tones	Generates Dual Tone Multi Frequency tones
MIDI	Generates MIDI sounds
Echo	Generates echo effect of the input signal
Reverb	Generates reverb effect of the input signal
Reverb Demo	Simulates five specific reverb types

Block name :   DTMF tones   **Notation**:   *DTMF tones*

Description: Generates dual-tone-multi-frequency (DTMF) tones used in landline telephony applications. This block generates a single tone of length: 256 (1 frame), 1280 (5 frames) and 8192 (32 frames) samples. It also generates a sequence of pre-recorded tones. The sampling frequency is 8KHz. The tones can be played back using the J-DSP provided sound player, and used in a DSP simulation.

Pin assignment:
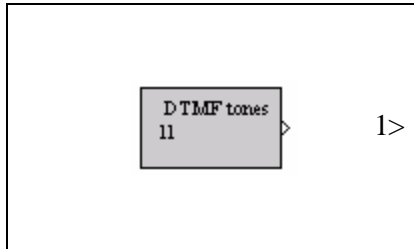
DTMF tones 11	1>

Pin	Description
1	DTMF tone
2	
3	
4	
5	
6	

Dialog window(s):

(a)DTMF tones dialog window

Script use:
        Name: DTMF
 Example code: <param name="3" value="B0-DTMF(3,1)">

Equation(s) Implemented :

$$y = \cos(2\pi f_1 nT) + \cos(2\pi f_2 nT)$$

where f_1 and f_2 are chosen from the tone frequencies (697, 770, 852, 941, 1209, 1336, 1477 (Hz)). The sampling frequency is 8 KHz, i.e., T = 0.125ms

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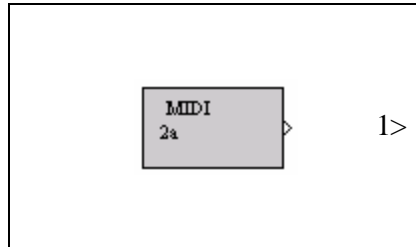**Block name** :   MIDI   **Notation**:   *MIDI*


Description: Simulates a piano keyboard and generates Musical Instrument Digital Interface (MIDI) sounds at the frequencies described by the MIDI standard. The MIDI block can generate a single tone of length: 256 (1 frame), 1280 (5 frames) and 8192 (32 frames) samples. It can also generate a sequence of pre-recorded tones. The sampling frequency is 8KHz. All the tones can be used in a DSP simulation and are audible using the J-DSP provided sound player.

Pin assignment:

Pin	Description
1	MIDI tone
2	
3	
4	
5	
6	

Dialog window(s):
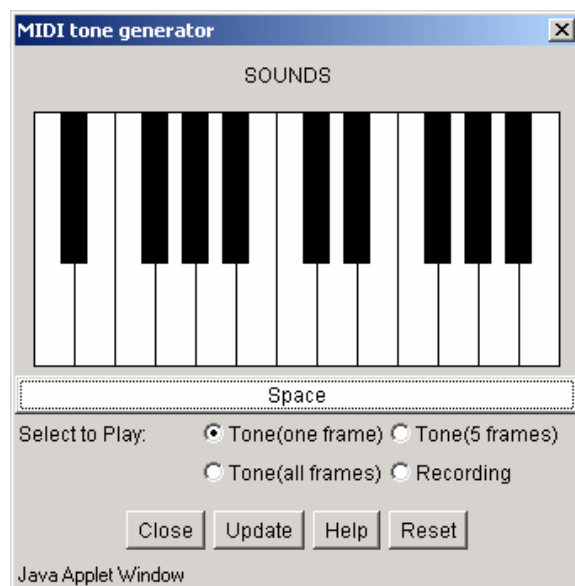
(a)MIDI dialog window

Script use:
        Name: MIDI
 Example code: <param name="1" value="B1-MIDI(2,1)">

Equation(s) Implemented :

$$y = \cos(2\pi f n T)$$

where f is taken from a MIDI standard table [www.midi.org]

M9.3

**Block name** :   Echo   **Notation**:   *Echo*

Description: This block generates the echo effect of the input signal. The echo effect is obtained by mixing the input signal with its delayed version. The proportion of the delayed signal to the "clean" original signal determines how obvious the echo is, and the delay signifies the echo period.

Pin assignment:

>1   Echo   2>
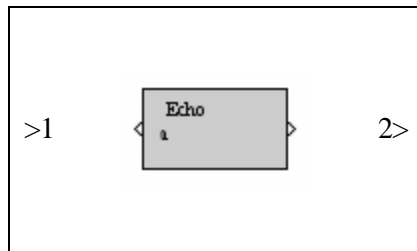
Pin	Description
1	Input time-domain signal
2	Output signal with echo
3	
4	
5	
6	

Dialog window(s):

Echo   ✕

Delay: |500   Gain: |0.75

Close | Update | Help

Java Applet Window
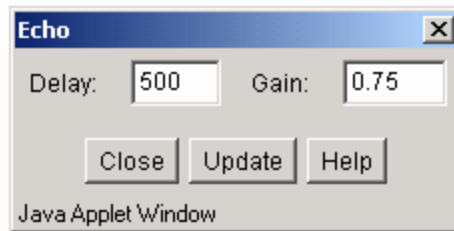
(a)Echo dialog window

Script use:
        Name: Echo
 Example code: <param name="2" value="B2-Echo(1,4)">

Equation(s) Implemented :

$$y(n)= x(n) + b\ x(n\text{-}R)$$

R = the number of echo delay in samples. In order to have a distinguishable echo, R should be relatively large. b is the attenuation constant ($|b| < 1$). Recomended values to perceive an echo are b=0.75 and R=500
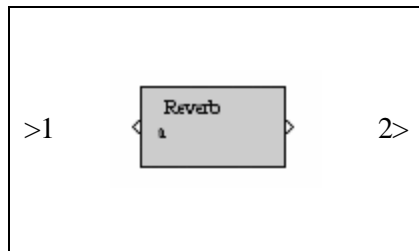

Block name :   Reverberation   **Notation**:   *Reverb*
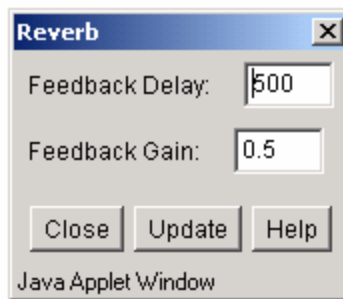
Description: This block implements a reverberation effect on the input signal. Reverberation is obtained by mixing the input signal with the delayed versions of its feedback. The effect of the feedback results in multiple echos.

Pin assignment:

Pin	Description
1	Input time-domain signal
2	Output signal
3	
4	
5	
6	

Dialog window(s):

(a)Reverb dialog window

Script use:
        Name: Reverb
 Example code: <param name="3" value="B3-Reverb(2,4)">

Equation(s) Implemented :

$$y(n) = x(n) + b\ y(n\text{-}R)$$

R = feedback delay in samples. b is the attenuation constant ($|b| < 1$).
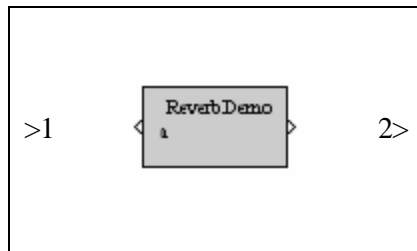
M9.5

**Block name** :   Reverberation Demo   **Notation**:   *Reverb.Demo*

Description: This block is a demonstration of the reverberation effect, simulating five specific cases given by, "Cavern" (delay=600, gain=0.7), "Dungeon" (delay=160, gain=0.8), "Garage" (delay=240, gain=0.4), "Acoustic Lab" (delay=128, gain=0.6) and "Closet" (delay=40, gain=0.1).

Pin assignment:

>1 ReverbDemo 2>	

Pin	Description
1	Input time-domain signal
2	Output signal
3	
4	
5	
6	
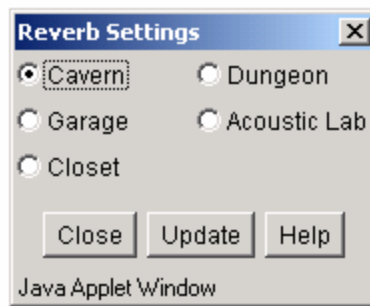
Dialog window(s):

(a)Reverb.Demo dialog window

Script use:
        Name: ReverbDemo
 Example code: <param name="4" value="B4-ReverbDemo(4,3)">

Equation(s) Implemented :
$$y(n) = x(n) + b. y(n\text{-}R)$$
R = feedback delay in samples. b is the attenuation constant ($|b| < 1$).