This document presents the list of OSC commands accepted by the Binaural test Application (BITA), which is a demonstrator of the 3D Tune-In library.

The 3DTI Toolkit is a standard C++ library for audio spatialisation and simulation using headphones initially developed within the 3D Tune-In (3DTI) project (http://www.3d-tune-in.eu), and evolved within the SONICOM project (http://www.sonicom.eu), which aims at using 3D sound and simulating hearing loss and hearing aids within virtual environments.

Technical details about the 3D Tune-In Toolkit spatialiser are described in:

Cuevas-Rodríguez M, Picinali L, González-Toledo D, Garre C, de la Rubia-Cuestas E, Molina-Tanco L and Reyes-Lecuona A. (2019) 3D Tune-In Toolkit: An open-source library for real-time binaural spatialisation. PLOS ONE 14(3): e0211899. https://doi.org/10.1371/journal.pone.0211899

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3DTI-Toolkit OSC commands

Table 1 shows the complete list and format of the OSC messages supported by the 3DTI Test Application. All messages in the table are to be concatenated to the string **/3DTI-OSC/v2/.** For example: /3DTI-OSC/v2/play.

OSC ADDRESS STRING (after /3DTI-OSC/v2)		PARAMETERS	DESCRIPTION	EXAMPLE
/play			Start playing all sources.	`/3DTI-OSC/v2/play`
/pause			Pause all sources.	`/3DTI-OSC/v2/pause`
/stop			Stop all sources, resetting each playing position to the beginning of the clip.	`/3DTI-OSC/v2/stop`
/record		`String folder, string filename, Boolean overwrite, Float seconds`	Records a clip of the specified duration with the spatialized sound corresponding to playing all sources from the beginning. The folder must exist. The file name should not include extension which will be added by the application (.wav). If a file with that name already exist and overwrite is true (1), the content will be overwritten. Otherwise, it will be appended at the end. If a relative path is used it will be calculated from the executable path. For example, in Windows, "bin/data/Recorded", for recording in the default folder of recordings.	`/3DTI-OSC/v2/record c:/tmp recording 1 30`
/loadSoundscape		`String soundscape_path`	Loads a soundscape configuration from the file path specified in soundscape. If a relative path is used it will be calculated from the <app_folder>/bin/data folder. Example, "soundscape1.xml" will look for the file in "<app_folder>/bin/data/soundscape1.xml", and "/Soundscapes/soundscape2.xml" will look for the file in "<app_folder>/bin/data/Soundscapes/soundscape2.xml"	`/3DTI-OSC/v2/loadSoundscape /Soundscapes/scene.xml`
/loadSource		`string source_path int source_id`	Loads a new .wav file from the specified source path and assign an identifier to it. If there is already another source with the same identifier, it is substituted by the new one. Otherwise, a new source is created.	`/3DTI-OSC/v2/loadSource speech.wav 0`
/source<X> (being <X> the source_id sent with /loadSource. Sources loaded through the GUI start with X=0 and increase X++ for further sources)	/play		Plays source <X>	`/3DTI-OSC/v2/source0/play`
	/pause		Pauses source <X>	`/3DTI-OSC/v2/source0/pause`
	/stop		Stops source <X>	`/3DTI-OSC/v2/source0/stop`
	/mute	`Boolean m`	If m is true (1), mutes source <X>, if m is false(0), unmutes it.	`/3DTI-OSC/v2/source0/mute 1`
	/solo	`Boolean s`	If s is true (1), makes source <X> to sound alone, if s is false (0), returns to the previous configuration where all running sources which are not muted are sounding.	`/3DTI-OSC/v2/source0/solo 1`
	/loop	`Boolean l`	If l is true (1), sets loop mode on for source <X>, which means that, when reaching the end, it will start again.	`/3DTI-OSC/v2/source0/loop 0`

				If it is false (0), loop mode is set to off, which means that when reaching the end, the source will stop.	
	/seek	/seconds	`float time`	Jumps the playing position to a specific time in the track (expressed in seconds)	`/3DTI-OSC/v2/source0/seek/seconds 10`
		/position	`float p`	Jumps the playing position to a specific position in the track (0.0 means the beginning and 1.0 the end)	`/3DTI-OSC/v2/source0/seek/position 0.5`
	/gain		`float g`	Set source gain id dB$_{fs}$	`/3DTI-OSC/v2/source0/gain -20`

	/location		`float x,`
			`float y,`
			`float z`
				Set location of source <X>. Position is set in global x,y,z coordinates, expressed in meters	`/3DTI-OSC/v2/source0/location 2 0 0`

	/anechoic	/enable	`boolean a`	If a is true (1), activates the rendering of the anechoic path for source <X>. if a is false (0), anechoic sound is not included.	`/3DTI-OSC/v2/source0/anechoic/enable 1`
		/spatialisationMode	`int s`	Spatialisation mode of the anechoic path. Depending on the value of s: -0: no spatialisation. Plain sound is delivered from the anechoic path. -1: High performance mode. Spatialisation is performed using a snowman head model. -2: HighQuality. Spatialisation is performed convolving with HRTF	`/3DTI-OSC/v2/source0/anechoic/spatialisationMode 2`
		/nearfield	`boolean n`	If n is true (1), a near field correction is applied to source <X>. If n is false (0), that feature is disabled for source <X>	`/3DTI-OSC/v2/source0/anechoic/neadfield 1`
		/farfield	`boolean f`	If n is true (1), a far field correction is applied to source <X>. If n is false (0), that feature is disabled for source <X>	`/3DTI-OSC/v2/source0/anechoic/farfield 0`
		/distance	`boolean d`	If true (1), anechoic path of source <X> is attenuated/amplified according to distance	`/3DTI-OSC/v2/source0/anechoic/distance 0`
		/propagationDelay	`boolean p`	If true (1), anechoic path of source <X> is delayed	`/3DTI-OSC/v2/source0/anechoic/propagationDelay 1`
	/environment	/enable	`boolean e`	If e is true (1), activates reverberation for source <X>. If e is false (0), source <X> has not reverberation	`/3DTI-OSC/v2/source0/environment/enable 1`
		/distance	`boolean d`	If true (1), reverb path of source <X> is attenuated/amplified according to distance	`/3DTI-OSC/v2/source0/environment/distance 1`
		/type	`string`	Sets the reverberation algorithm to this source according to the string: - "convolution": convolutional ambisonic reverb - "ISM": Image source method - "SDN": Scattering Delay Network (Not available int the publicly distributed version)	`/3DTI-OSC/v2/source0/environment/type convolution`
/anechoic	/attenuation		`float a`	Sets how many dB every source anechoic path is attenuated every double distance. This only applies to those sources with distance emulation for the anechoic path enabled	`/3DTI-OSC/v2/anechoic/attenuation -6`

/environment	/room		`float length,`
			`float width,`
			`float height`
				Set room dimensions. It is supposed to be a shoebox room. Dimension is expressed in meters. This is only relevant when using ISM reverb	`/3DTI-OSC/v2/environment/room 10 10 3`

	/convolution	/attenuation	`float a`	Sets how many dB every source reverb path is attenuated every double distance. This only applies to	`/3DTI-OSC/v2/environment/convolution/attenuation -3`

				those sources with distance emulation for the reverb path enabled	
		/loadBRIR	String brir	Loads a new BRIR from the specified local file path contained in BRIR string	/3DTI-OSC/v2/environment/convolution/loadBRIR /BRIR/room.sofa
		/order	String order	Sets the reverberation order: - "0D": omnidirectional (W) - "2D": bi-dimensional (WXY) - "3D": three-dimensional (WXYZ)	/3DTI-OSC/v2/environment/convolution/order 3D
		/gain	float g	Sets overall reverb gain	/3DTI-OSC/v2/environment/convolution/gain 0
	/ism/	/order	int order	Sets ISM reverberation method order according to the integer	/3DTI-OSC/v2/environment/ism/order/ 3
		/absorption/	float a	Set surfaces absorption coefficient (percentage of energy which is absorbed). 0.0 means pure reflective and 1.0 means total absorption as in an anechoic chamber)	/3DTI-OSC/v2/environment/ism/absorption/ 0.3
	/sdn/	/walltype/	int w	Sets the walls material. Allowed values are 0 to 5. (Not available in the public version)	/3DTI-OSC/v2/environment/sdn/walltype 2
/listener	/location		float x, float y, float z	Set position of the listener in global x,y,z coordinates, expressed in meters	/3DTI-OSC/v2/listener/location 0 0 0
	/orientation		float pitch, float yaw, float roll	Set orientation of the listener by rotating it in pitch, yaw and roll from the original orientation. Angles expressed in radians.	/3DTI-OSC/v2/listener/orientation 0 0 0
	/orientationQuaternion		float x, float y, float z, float w	Set orientation of the listener by quaternion elements.	/3DTI-OSC/v2/listener/orientationQuaternion 0 0 0 0
	/loadHRTF		String hrtf	Loads a new HRTF from the specified local file path contained in hrtf string	/3DTI-OSC/v2/listener/loadHRTF /HRTF/hrtf.sofa
/HL	/left	/enable	boolean lhl	if lhl is true (1), the HL simulator is enabled for the left channel, keeping the right channel unaffected. If false (0), the left channel HL simulator is disabled keeping the right one unaffected	/3DTI-OSC/v2/HL/left/enable 1
	/right	/enable	boolean rhl	if rhl is true (1), the HL simulator is enabled for the right channel, keeping the left channel unaffected. If false (0), the right channel HL simulator is disabled keeping the left one unaffected	/3DTI-OSC/v2/HL/right/enable 1
/HA	/left	/enable	boolean lha	if lha is true (1), the HA simulator is enabled for the left channel, keeping the right channel unaffected. If false (0), the left channel HA simulator is disabled keeping the right one unaffected	/3DTI-OSC/v2/HA/left/enable 1
	/right	/enable	boolean rha	if rha is true (1), the HA simulator is enabled for the right channel, keeping the left channel unaffected. If false (0), the right channel HA simulator is disabled keeping the left one unaffected	/3DTI-OSC/v2/HL/right/enable 1

Table 1. Supported OSC commands.