

SPAT Devices by Music Unit



Credits

SPAT devices development & spatial music mixing: <u>Manuel Poletti</u> and <u>Music Unit</u> team: <u>Carmen</u> <u>Alexandre</u>, <u>Martin Antiphon</u>, <u>Jérôme Boivin</u>, <u>Alexandre Chaigne</u>, <u>Julien Chirol</u>, <u>Pierre Luzy</u>.

The SPAT devices were developed in close collaboration with the <u>Acoustic and Cognitive Spaces</u> <u>research team at IRCAM</u>: Olivier Warusfel, Markus Noisternig, Thibaut Carpentier, Benoît Alary, Isabelle Viaud-Delmon.

SPAT is a bundle of Max For Live devices powered by IRCAM's *Spatialisateur* sound processor and developed by Manuel Poletti at Music Unit, from the Spat Max library developed by the Acoustic and Cognitive Spaces team at IRCAM. The bundle is proposed as one sole complete pack or as two separate packs - one multichannel pack and one stereo pack.



Spat (or *Spatialisateur* in French) is a real-time spatial audio processor that allows composers, sound artists, performers, and sound engineers to control the localization of sound sources in 3D auditory spaces. In addition, Spat provides a powerful reverberation engine that can be applied to real and virtual auditory spaces. The processor receives sounds from instrumental or synthetic sources, adds spatialization effects in real-time, and outputs signals for reproduction on an electroacoustic system (loudspeakers or headphones).

Its modular signal processing architecture and design are guided by computational efficiency and configurability considerations. This allows, in particular, straightforward adaptation to various multichannel output formats and reproduction setups, over loudspeakers or headphones, while the control interface provides direct access to perceptually relevant parameters for specifying distance and reverberation effects, irrespective of the chosen reproduction format.

Another original feature of Spat is its room effect control interface relying on perceptive criteria. This allows the user to intuitively specify the characteristics of a specific room without having to use an acoustic or architectural vocabulary.

The SPAT devices collection from Music Unit aims to bring to the Live community a unique audio technology dedicated to spatial audio, invented at IRCAM music research institute and developed for three decades.

PACK 1: SPAT Multichannel devices

This pack is dedicated to artists, producers and sound engineers who use a multichannel sound diffusion system in their studio or venue. The devices can feed sound systems including up to 32 satellite speakers. The pack contains three spatial audio processing devices. Each device includes many popular speakers setups ready to use - from simple quadriphonia to 3D Dolby Atmos configurations -, which can be selected via a simple popup menu. An additional Speaker Editor device allows the customization of standard speaker setups.

SPAT Spatial MC ("MC" stands for "multichannel")

The SPAT Spatial MC device is a multichannel spatial audio processor that allows the localization of a stereo sound source in a 2D or 3D auditory space, and includes a high quality virtual room processor.

The localization of the sound source can be optimized according to the type of input sound - from solo instrument to field recording - thanks to different panning techniques such as "VBAP" (for "Vector Based Amplitude Panning"), "KNN" (for "K Nearest Neighbour") and "HOA" (for High Order Ambisonics). The sound source's position and radiation can be graphically manipulated in a floating window called "Panner".





SPAT Room MC ("MC" stands for "multichannel")

The SPAT Room MC device is a multichannel standalone version of the virtual room processor that powers the SPAT Spatial MC device, with more detailed settings for each section of the reverberator.

The device includes the same speakers configurations (5.0, 7.0, 7.0.4...) as found in the SPAT Spatial MC device, and can be used just like a classic reverberator - typically available from an auxiliary Return track, for a global reverberation applied to a mix.



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SPAT Multiverb MC ("MC" stands for "multichannel")

The SPAT Multiverb MC device is a multi-band version of the virtual room processor that powers the SPAT Spatial MC and SPAT Room MC devices. The main difference with the SPAT Room MC device is the posiibility to adjust the reverberation decay time of up to 30 frequency bands separately, thus allowing the design of custom reverb sounds.

The device includes the same speakers configurations (5.0, 7.0, 7.0.4...) as found in the SPAT Spatial MC and SPAT Room MC devices, and can be used just like a classic reverberator - typically available from an auxiliary Return track, for a global reverberation applied to a mix.



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SPAT Speaker Editor

The SPAT Speaker Editor device is a utility that allows the customization of standard speaker configurations and the creation of new configurations. This device does not produce sound but can at any time be inserted on any track of a Live session . It can be used to easily share speaker setups with the SPAT Spatial MC, SPAT Room MC and SPAT Multiverb MC devices in a same Live session.





PACK 2: SPAT Stereo devices

This pack is dedicated to artists, producers and sound engineers who don't use a multichannel sound diffusion system in their studio or venue, but still wish to integrate quality spatialization tools in their stereo productions. The pack contains the same three spatial audio processing devices as in the SPAT Multichannel pack, available here as stereo-only versions.

SPAT Spatial

The SPAT Spatial device is a stereo spatial audio processor that proposes a convincing localization of a stereo sound source in a 2D or 3D stereophonic auditory space, and includes a high quality virtual room processor.

The device includes advanced stereo panning techniques ready to use: Angular (classic intensity panning), XY, AB and MS (simulate the recording of XY-coincident, AB-ORTF and MS microphones), Binaural (3D audio over headphones) and Transaural (3D binaural audio over two speakers).





SPAT Room

The SPAT Room device is a stereo standalone version of the virtual room processor that powers the SPAT Spatial device, with more detailed settings for each section of the reverberator.

The device can be used just like a classic reverberator - typically available from an auxiliary Return track, for a global reverberation applied to a mix.



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SPAT Multiverb

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