

User Guide to VST™ plug-in

AmbiophonicDSP^{version 1.1}

for hearing great sound from loudspeakers



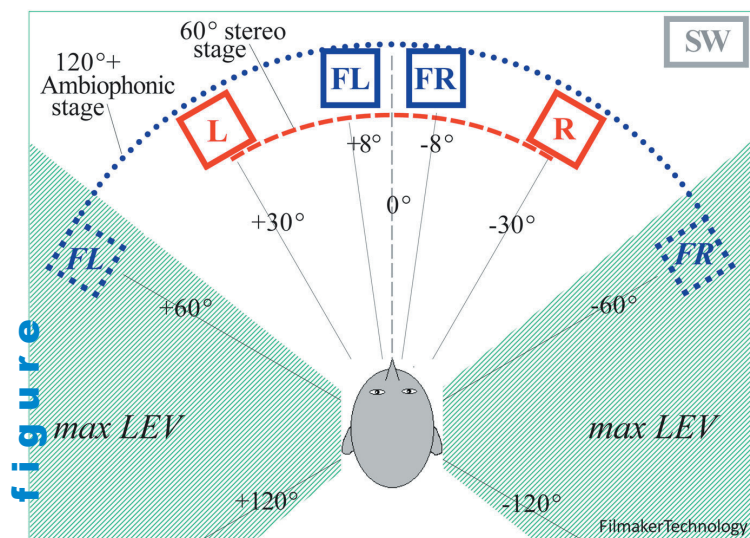
Ambiophonic DSP in your PC audio player renders sound previously unheard, awaiting in your recording collection. Sounds are no longer confined to the two speaker boxes; they and the entire front wall “disappear,” and you feel magically transported to the concert/movie/game scene.

Ambiophonic DSP-revived sound delivers astonishing realism, restoring the original 120° wide recording perspective compared to 60° stereo (see Figure) – with life-like imaging, spatiality, and tone color (timbre). Ambience achieves *listener envelopment* (LEV), though from stereo recordings and only two speakers. Individual voices have clarity and space, like surround sound. Solo voices are adjustable in the mix, are free of the coloration of stereo’s comb-filtering, and are free of the perceptual confusion when central sounds come from speakers not actually in front.

AmbioDSP unveils sonic images, previously dormant or distorted at the loudspeaker-listening stage, using two closely-spaced speakers and digital signal processing (DSP). Laptop and desktop speakers already approach the “16 Degrees of Separation” that is ideal (see Table). For papers and sample recordings, go to www.ambiophonics.org and www.filmaker.com.

New to AmbiophonicDSP?

AmbiophonicDSP (or AmbioDSP for short) is an Effect VST™ (Steinberg GmbH) plug-in that boosts performance when listening with loudspeakers. For most existing music recordings,



Dramatically improving upon stereo speakers L & R, **Ambiophonics'** speakers FL & FR recreate a stage extending to virtual FL & FR, with uncolored center voices, and maximum listener envelopment (LEV).



movies, or games, AmbiophonicDSP works by emulating human perception more than with conventional stereo speakers. Hosts range from a professional Digital Audio Workstation (DAW) to consumer software for entertainment listening, such as Winamp.

See **Installing** overleaf for the steps for hosting the software. Consult the www.electro-music.com **Ambiophonics Forum** for troubleshooting installation and operational support. *Note: For home stereo use, you can incorporate AmbioDSP easily, inserting it between your A-V receiver's tape output & tape monitor inputs. Also, you can maintain both 16° Ambiophonic and conventional 60° stereo speaker sets, wiring as "Speakers A" and "Speakers B".*

"Pop" – favored by co-developer Howard Moscovitz for popular music, emphasizes fullness of sound, and allows correcting for the drop in level of center sounds that typifies crosstalk cancellation-based processors. Adjust *Zentrum* to make central voices advance or recede (see *Controls* section).

"Electro/game" – for synthesized music and gaming, co-developer Howard Moscovitz prefers this more controlled patch, with full sound and *Zentrum* adjustability of voices.

"Jazz/acoustic" – preferred by co-developer Robin Miller for acoustic music such as jazz. A transparent algorithm with low coloration along with widening of the reproduced stage. Adjust *Zentrum* to make central voices advance or recede.

"Classical/movie" – preferred by co-developer Robin Miller for classical music and movies, this neutral algorithm combines lowest coloration with substantial widening of the listening stage for natural sound. Also called "RACE version G," *Recursive Ambiophonic Crosstalk Eliminator* has been implemented (as prior version F) in TacT® pre-processors, pro audio workstations, and recording/broadcast monitoring.

"Wareing" – compare this simple crosstalk-cancellation solution by Wareing and others with the advanced Presets, above, implemented exclusively in AmbiophonicDSP.

"Bypass" – turns processor OFF to amaze your friends.

Begin using the Presets...

AmbioDSP has both user controls and internal algorithms to revitalize program material in several genres called *Presets*. From the upper drop-down menu, recall a Preset for the material you want to listen to. Because recordings vary in technique, you might find another preset works better. Enjoy amazing results while you fine-tune the controls, below. (For many users, clicking a Preset, finding the correct *Delay* and *Balance* settings, and advancing *Volume* may be all you need.) Save AmbiophonicDSP settings in your own User Presets. Next time, you might discover a preferred combination. AmbiophonicDSP's Presets are above.

continues overleaf

AmbiphonicDSP controls...

Different program material may respond better to different settings of AmbioDSP controls. For most settings, the processing is inaudible – for some material you may want to back off from extreme settings, or artifacts may intrude; for other material, you might like the effect. The powerful *Zentrum* control allows you to “remix” soloists, movie dialog & voice-overs, rock rhythm sections, or orchestral winds and interior strings without affecting Ambiphonic widening of the 120°+ stage. To set a control, *drag* (mouse over control while pressing the Left button); *shift-drag* for finer resolution. AmbioDSP’s controls are below.

Delay – calibration to set precisely the difference in arrival time at the ears from one speaker in order to focus crosstalk cancellation. See the Table for a calculated setting (varies with speaker layout and listener’s head size). *Range: 45~260μs.*

Recursion – sets RACE to “cancel the cancellation” ad infinitum. *Range: 0~99% with increasingly audible artifacts (typically inaudible up to 30% and unnoticeable up to 50%).*

Space – emphasis of spatiality and ambience, typically present in classical recordings but needed most in pop music, while not affecting widening. *Range: 0~10; increasing from no effect fully CCW (0) to maximum effect fully CW (10).*

Zentrum – bring voices closer, or send them deeper, while not, within a normal range, affecting widening. *Range: -10 ~ +10; no effect 0; increase weak voices CW; voices recede CCW.*

Balance – calibration to correct precisely for imbalance in downstream electronics, speakers, or listening acoustics. *Range: -5 ~ +5, where 0 is precisely balanced within AmbioDSP.*

Volume – adjustment of listening loudness, although it is preferable to set to 0dB fully CW and adjust volume at the amplifier. *Range: -∞ ~ 0dB.* (Note: AmbioDSP’s internal headroom normally avoids distortion at any setting of *Volume*.)

Saving your settings: User Presets...

Once you have customized controls for any Preset, the host program within which you’ve installed AmbioVST might not save these settings when your PC is powered off. Other hosts such as AudioMulch save your last settings for the next session.

You can save four User presets. In the AmbioDSP panel, click the **File** drop-down menu and select a User preset. **Do not overwrite factory presets.** In the pop-up, the current folder and selected User preset appears in the filename with .txt extension. (Re)name, and click **Save**. Label your preset by clicking on it under **File** and typing within the label box.

To **Load** a preset from a saved file, again click **File** and choose one of the **Load** options, then a desired named file. (To restore factory presets click **Load all** and select “AmbioDSPv100pre.txt”).

Terms of Use: AmbiphonicDSP is individually licensed for personal use – may be distributed or shared only with written consent of its owners.

Table: Delay control, initial setting...

Speaker distance (to listener, in.)	Speaker separation (center-to-center, in.)	Separation Angle (total)	Delay* (μs)
72 (typical room)	20	16.0°	71
72	18	14.4°	64
72	22	17.6°	78
96 (larger rooms)	28	16.8°	74
144	40	16.0°	71
24 (laptop)	11	25.9°	114
25 (desktop)	18	42.2°	185
conventional stereo (distance=separation)**			60.0° 260

*Calculated starting point for the average head. Longer delays often still work, and can comfortably enlarge the listening “sweet spot” (focus) that falls on a line equidistant between speakers (the 0° line in Figure).

**DSP and 60° conventional stereo separation give some improvement.

Installing: hosting AmbiphonicDSP in your PC player...

Winamp and Quintessential are free programs that play media files on your Windows computer – CDs, wav, mp3, ogg, and others, video as well as audio. You must have a player installed on your PC and have at least one VST plug-in (.dll file extension). To install any VST plug-in:

- 1) Purchase & download **AmbiphonicDSP** at www.electro-music.com
- 2) Download and install the Winamp **VST Bridge** plug-in, available free at <http://www.winamp.com/plugins/details/146317>
- 3) In Winamp, click **Options > Preferences > Plug-ins > DSP/Effect**.
- 4) Highlight **VST Host DSP**, then click **Configure active plug-in** at the bottom of the Preferences window
- 5) In the pop-up that appears, left-click in the little text box to the right of **VST Plugin**, and select **Load DLL**
- 6) Using the pop-up file browser, select your **AmbioDSP** VST plug-in. Voila, the VST plug-in loads and its control panel appears on-screen.

Latest <http://www.electro-music.com/forum/viewtopic.php?highlight=vst+winamp&t=27948>

Trouble: If AmbioDSP does not astound, something is wrong...

- 1) Are your speakers close together (FL & FR in the Figure), precisely the same distance from you, wired in-phase, of good quality and identical, especially in phase response through crossover region(s)?
- 2) Are sources and amplifier settings 2-channel stereo, not mono? Is the stereo source balanced? (If suspect, fix it, or try another source.)
- 3) Is your listening space reverberant? (Strong reflections from walls or furnishings interfere with crosstalk cancellation.) Except subwoofer(s), is your speaker layout symmetrical within the room acoustically?
- 4) In the controls, did you properly set *Delay* (see Table)? *Balance*? (The pros match speakers using band-pass filtered pink noise, Bypass, and an SPL meter.*) Did you select a Preset other than Bypass and Wareing?

OK, time to seek help at www.electro-music.com Ambiphonics forum.

Resources: *Tools for system calibration and testing when using AmbioDSP for critical listening and scientific papers may be found at www.filmaker.com and www.ambiphonics.org. Enjoy!

Download AmbiphonicDSP at
electro-music.com