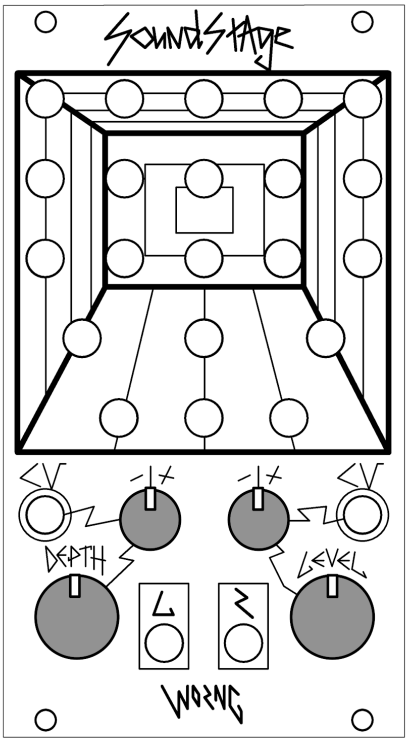
WORNG Electronics SoundStage manual

Thanks for purchasing a WORNG Electronics SoundStage module, we hope it breathes new life into your system!

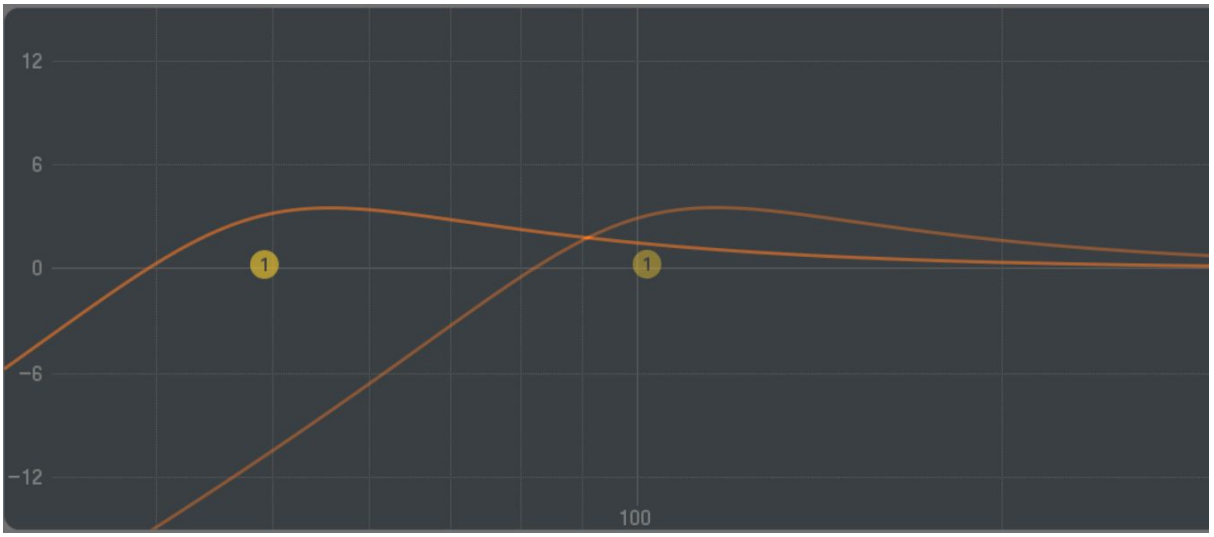


The SoundStage is the essence of a stereo mixer distilled into a powerful efficient package. It includes twenty-one inputs which pass through a combination of twenty resonant analogue filters for tonal control and mix down to a voltage controllable stereo output stage.

SoundStage forgoes level controls on each input as this can be done with the VCA stage of the voices it's being fed. Rather than having a pan control per input, each input is placed in the stereo field according to its position left to right on the panel. The horizontal rows indicate how the inputs are filtered into overlapping Low, Low-mid, Mid, High-mid and High bands. The Depth control allows you to control the depth of the filtering, from unfiltered on the left to hard filtered on the right. Like the stereo output level, Depth can be controlled with a CV.

The ideas behind the SoundStage have been developing for a few years now. Before founding WORNG Electronics I worked for many years as a sound engineer and learned a lot of tricks for getting sounds to fit together in a mix. Early on I learnt that panning is a powerful tool for separating instruments in a mix, likewise filtering instruments to they sit in their own space in the frequency spectrum.

One of my favourite mix tricks is to use resonant HPFs on kick drum and bass, tuned so the resonant peak of the bass filter is sitting in the dip of the kick drum filter.



A few years ago I read a great article about the design of the E-Mu SP1200 (http://privateprogram.blogspot.com/2012/11/sp-1200-pt-2-memory-and-hagiography.html) which discussed how that machine has different filters on the voices which help place the samples in the spectral field so tracks made with that machine already start to sound mixed straight out of the machine.

These ideas have come together into the module you've now got in front of you, we hope that it helps your tracks step up a level and saves you time panning, filtering and EQing things in a DAW so you can focus on the fun stuff, making sounds with your modular!

SoundStage essential concepts:

Panning

Panning in SoundStage is simple, if you patch in on the left hand side of the module your sound will be panned to the left, similarly patching in on the right pans right. However no sounds are hard panned, even if

patched to a far outside input the signal will appear panned slightly between the speakers to create a more natural soundscape.

The only inputs which are panned on top of one another are the centre inputs of each row, the other inputs are arranged so that the upper row has the widest panning, with panning becoming more narrow as you go down rows. This is so that each non-central input has its own unique space in the stereo field, which helps bring separation between voices while still gluing them together nicely. The circuit uses equal power panning to ensure the apparent level doesn't change depending on where the voice is positioned.

The human ear is more able to pinpoint the direction of a high frequency sound than a low frequency one, so the high frequency row has wider panning. Conversely, low frequency signals are perceived as less directional and also require more energy to reproduce from your speakers, so are panned more centrally. Also for people putting their material out on vinyl it helps to have low frequency elements panned centrally, to stop the needle being thrown out of the groove.

It's worth noting that although SoundStage has 21 inputs it wasn't envisioned that they would all be used at once, which is why they're so densely packed together. The circuitry has been designed so that you can use a lot of inputs at once (the actual number will vary depending on the signals themselves) but you may find that you're able to clip the circuit. If this occurs and you don't like the colour which the clipping introduces it's recommended that you decrease the levels of the voices you're inputting.

While the vast majority of recorded (and live) music has fixed pan positions for the individual voices, some people may find the fixed panning of the SoundStage to be a limitation. To patch voltage controlled panning while also using the filtering of SoundStage simply use a stereo panning VCA and patch the two outputs to the far left and

right inputs of a row of SoundStage. The pan position can now be finely controlled with either a static offset or control voltage.

Filtering
Each frequency row goes through a stereo pair of resonant high pass filters and then a pair of low pass filters, with specially selected cutoff frequencies which interact to mix your voices together in a way which emphasises the frequencies of that row, and filters out frequencies outside of that range of emphasis. This is particularly useful with a lot of the modern digital percussion modules which put can often take up a lot of space in your mix by using a lot of the spectrum, which can lead to a muddy indistinct mix.

The SoundStage filters are inspired by a few things, the SP-1200 voice filters mentioned previously being one of them, also the way a guitar or bass amp shapes the spectrum of the signal being fed into it in a way which lets them sit together in a mix in a natural way. Lastly the old mix trick of using EQ during mixdown to remove parts of the spectrum of some sounds to leave room for others to occupy, for example using a HPF on all drums apart from the kick so that the kick has all that low frequency to itself. Likewise the technique of EQing the kick drum and bassline so that each has a cut where the other's fundamental frequency sits.

The frequency bands are, from top to bottom, High, High Mid, Mid, Low Mid and Low. As a rough guide to describe the voicing you can think of them as follows:
High for the sizzle of cymbals
High Mid for the bite of a lead line
Mid for a full pad
Low Mid for a tight bassline
Low for the thump of a kick drum

Note that while there are five inputs for the Mid to High bands there are only three for the Low and Low Mid. This is because too many low

frequency elements can make your mix sound muddy and indistinct, so fewer inputs are needed.

Filter Depth
The filter depth control blends between the unfiltered signal (fully counter-clockwise) and the filtered signal (fully clockwise) using a number of VCAs. Because using filters in a mixdown can be quite extreme it's useful to blend some of the unfiltered signal in to the mix. Because all the filtering occurs in the analogue domain there are interesting phase relationships between the filtered and unfiltered signals to explore so we recommend listening closely while you adjust the filter depth control to find the perfect balance for your mix.

The filter depth also can be modified with a control voltage, through an attenuverting input. This allows for some exciting creative uses of the SoundStage's filters, for example rhythmic chopping of the spectrum by controlling filter depth with gates or LFOs, or more extreme effects such as patching bass voices to the upper inputs so they're completely high passed when the output is fully filtered.

Output Level
The output level control is primarily designed to trim the master output level so you have a usable signal whether you're inputting four voices or fourteen. However it's actually the bias control of a stereo VCA so when using it with the attenuverting CV input it can be far more creative than your average mix bus master fader.

Patching ideas:

Mixdown
The "standard" use for SoundStage is as a spectral stereo mixer to give your voices their own position in the stereo field and also in the frequency spectrum. Patch your voices in depending on where you'd like them to be panned from left to right, and where you'd like them to sit in the frequency spectrum from Low to High. Once you're patched

in, adjust the output level control so you've got a good level to feed the next stage of your signal path, then adjust the filter depth so that it sounds good to you. In testing we've found our favourite settings are often around 1 o'clock to 3 o'clock on the depth control, but your ears will tell you when you've found the right spot.

Sidechain compression

This patch expands on the Mixdown patch and adds sidechain compression functionality. Patch your voices as per Mixdown, then get the signal you want to use as your sidechain and patch it to an envelope follower. Patch the envelope to the Level CV input on SoundStage and then turn the attenuverter to the left so the sidechain signal is reducing the output level. For a more advanced compression with an adjustable threshold, use channel 1 of Maths as your envelope follower. Take the OR out of Maths to the Level CV input and use the channel 2 pot to set your threshold, turning clockwise to increase the threshold. You'll have to apply more output level on the SoundStage to make up for the level decrease of the compression, but this is a great way to get width and space and pumping for your pads or any other voices.

Rhythmic filtering

Patch an LFO or envelope generator to the Depth CV input to rhythmically control the depth of the SoundStage filtering. Because the filters are all analogue and resonant there's sonically interesting interactions of the phase relationships of the filtered and unfiltered signals around the cutoff points, which sound great when being modulated.

Wide stereo voice

If you're using one of the new breed of stereo filters in your system such as the Stereo Dipole or QPAS you can use SoundStage to help make wide stereo signals to feed them, to take full advantage of working in the stereo realm. Patch your oscillators to SoundStage and let it add depth and variation to them. Try multing an oscillator and

patching it to both a High Left input and a Low Right one, or vice versa. As well as filtering, SoundStage can change the phase relationships between the signals which can give your stereo filters something more to bite onto.

Tuned feedback/distortion

A great way to get more dirt into your mix is to mult the output of SoundStage and then feed it through a VCA and back to one of the inputs. The filtering will tune the feedback so you can decide where you want it to sit in the mix and not have it overpower everything else, and going through a VCA will allow you to have precise voltage control of the feedback. The SoundStage signal path is designed to saturate in a pleasant sounding way, but it can also be pushed into harsher overdriven tones. Experiment with crossing over the left and right signals and feeding back to their opposite sides, because SoundStage is 100% analogue there is no latency so stereo feedback of signals is possible and sounds natural.

Stereo Spectral Scanner

This patch uses the WMD Sequential Switch Matrix to flip voices around the stereo field and the frequency spectrum. Patch your voices or oscillators to the inputs of the SSM and then patch its outputs to four differing inputs of SoundStage. Switching between different Matrices in the SSM will give your signals movement, and these signals can be moving around other static voices for some really interesting creative effects.

These are just a few ways you can use your SoundStage to get more life and music and sound from your modular system, there are many more which you can find by exploring with your patches. If you come up with any cool patches be sure to let us know, we love to hear what people come up with using our modules!