WORNG Electronics SoundStage II manual

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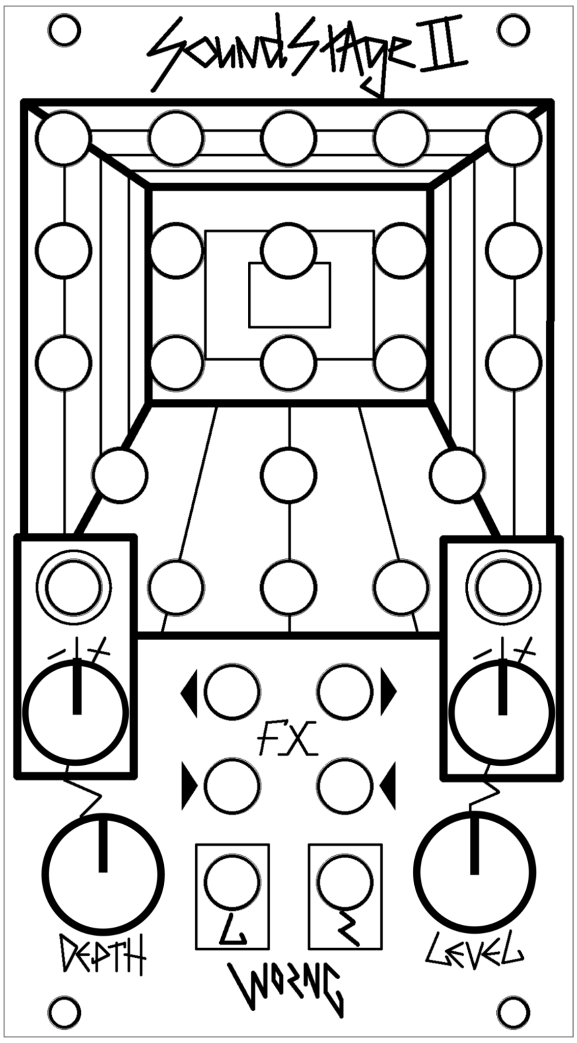
Thank you for purchasing a WORNG Electronics SoundStage II, we know it's going to breathe new life into your modular system!



SoundStage II builds on our groundbreaking SoundStage module with a number of additions and improvements, while keeping the core functionality that made the SoundStage a must-have module for anyone who wants to make finished tracks with their modular.

The SoundStage II is the essence of a large mixing console, trimmed down to the powerful core functionality needed in a modular system and designed to keep you in the flow state of creating music. SoundStage II lets you place each element of your mix in its own space both in the stereo field and the frequency spectrum. The twenty-one inputs are panned in the stereo field and then pass through twenty carefully tuned resonant analogue filters to define where the different voices of your patch sit in the mix, via techniques gleaned from years of sound production experience.

There's no level control on each input as level control is best handled with VCAs in a modular environment, and adding another gain/level stage to a mixer just gives an opportunity for added noise and distortion caused by poor gain staging. Rather than having a pan control per input, each input is placed in the stereo field according to its position left to

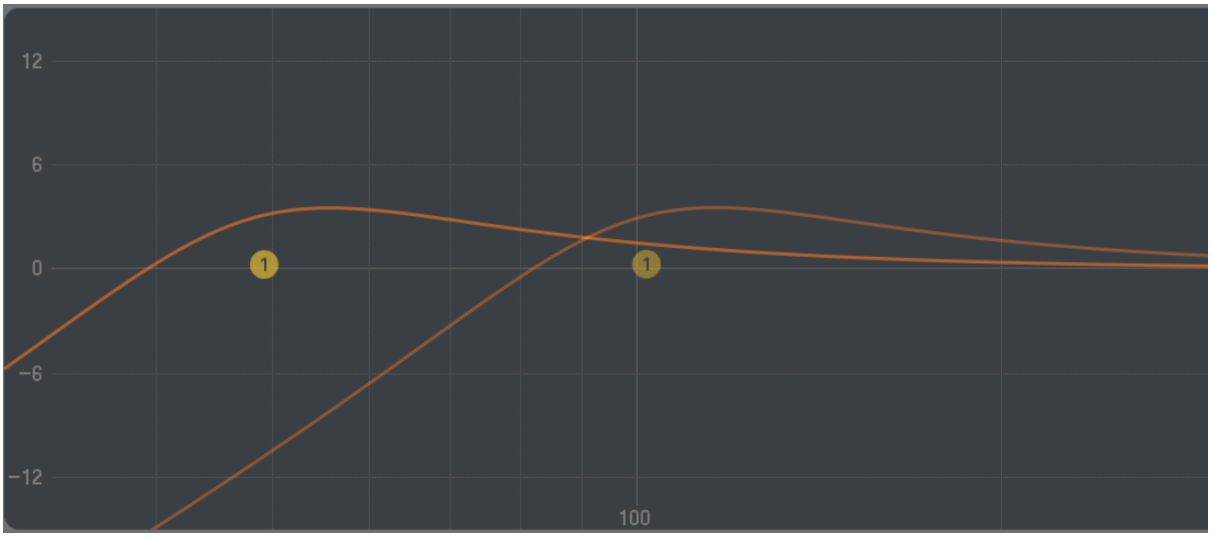
right on the panel. The horizontal rows indicate how the inputs are filtered into overlapping Low, Low-mid, Mid, High-mid and High bands. The Depth control allows you to control the depth of the filtering, from unfiltered on the left to hard filtered on the right. Like the stereo output Level, Depth can be controlled with a CV. The stereo FX send gives you a fully filtered stereo mix to send to your fx unit of choice, and then patch back to the stereo FX return. Both send and return can be used in mono if only the left channel is used, but we highly recommend working in stereo as much as you can to get the full power of SoundStage II.

SoundStage II features an improved Depth control circuit to allow for more consistent operation over different output levels. The filters in the low band have been tweaked for more consistent low end filter response and an always-on low EQ bump even when the Depth is reduced to zero, for a cleaner low end and increased headroom. The output Level control now has a logarithmic response for more natural sounds when used as a VCA or compressor. The most obvious improvement over the original SoundStage however is the FX send and return added to the module, without increasing its size. This allows you to use an effect like a reverb on your mix without needing to patch up complicated sends and returns and stereo summing.

Some notes from the designer:

The ideas behind the SoundStage developed over several years, 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. A key element of building a great mix is that panning is a powerful tool for separating different voices, likewise filtering can allow them to 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.



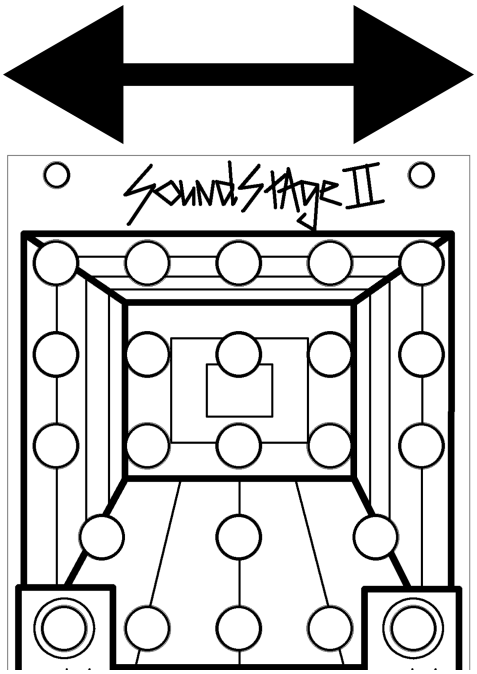
A few years ago I read a great article about the design of the E-Mu SP1200 (http://privateprogram.blogspot.com/2012/11/sp-1200-pt-2-memory-and-hagiography.html) which discussed how that machine has different filters on the voices which help place the samples in the spectral field so tracks made with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

Another great technique which is introduced in the second iteration of SoundStage is pre-processing effects sends. Hard filtering elements that are sent to a reverb or delay means that only their definitive essence is sent to the effect, cleaning it up for more definition in the tail and allowing more of the atmospheric effect to come through without clouding up the original signal.

These ideas have come together into the module you've now got in front of you, I 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 with 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 results in panning to the 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 glueing them together nicely. The circuit uses equal power panning to ensure the apparent level doesn't change depending on where the voice is positioned.

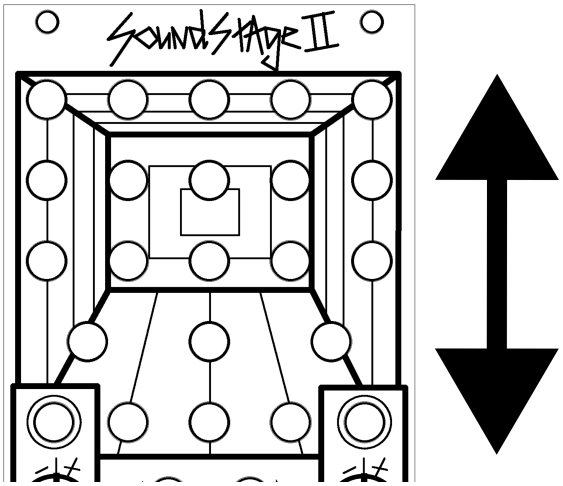
The human ear is more able to pinpoint the direction of a high frequency sound than a low frequency one, so the high frequency row has wider panning. Conversely, low frequency signals are perceived as less directional and also require more energy to reproduce from your speakers, so are panned more centrally. 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 like the Vertex 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 modern digital percussion modules which often take up a lot of space in your mix, leading to a muddy indistinct mix.

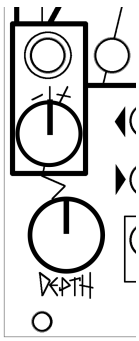
The SoundStage filters are inspired by a few things, the SP-1200 voice filters mentioned previously being one of them, also the way a guitar or bass amp shapes the spectrum of the signal being fed into it in a way which lets them sit together in a mix in a natural way. Lastly the old mix trick of using 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. It's also worth noting that different styles of music are mixed in different ways and SoundStage accommodates this, for example you may want a deep subby bass and tighter punchier kick so you would patch the bass to the **Low** row and the kick to the **Low Mid**.

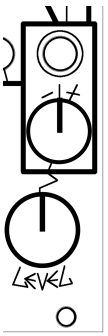
Filter Depth



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 during mixdown can be quite extreme it's useful to blend some of the unfiltered signal into the mix, to go from a hard filtering response to something more like a group of high and low shelf EQs. 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.

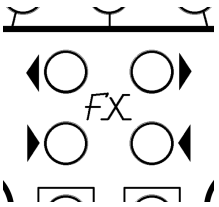
The filter depth also can be modified with a control voltage, through an attenuverting input. This allows for some exciting creative uses of the SoundStage's filters, for example rhythmic chopping of the spectrum by controlling filter depth with gates or LFOs, or more extreme effects such as patching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

Output Level



The output level controls a logarithmic stereo VCA on the stereo mix and can be used as a master volume control, to set your levels to match other voices if you're using SoundStage II to submix, or for more creative uses such as a stereo VCA or as a bus compressor. There is a CV input with attenuvertor also, this is where you can patch those creative effects up.

FX Send and Return[



The FX send and return are a new addition to SoundStage II. The send is a fully filtered stereo mix controlled by the main Level control, so the output here is the same as having the Depth control fully clockwise, regardless of its actual position.

The return is mixed down to the main stereo outs after the Level control, allowing you to use it as an Aux stereo input to mix multiple voices together as well as allowing through reverb and delay tails when the Level control is being used to gate or VCA the mix.

Because there are still some effects out there which aren't stereo in, the FX send can be used in mono if just the Left send output is patched. Similarly the Left return input can be used to send a mono signal to both left and right main outs. If you happen to find yourself in a situation of using the FX send and return in mono you could consider patching up a LRMSMSLR or MidSide+ between the SoundStage II and your mono

effects unit, trying out some of the Mono to Stereo effects patches they excel at.

It's worth noting that if you're using the FX send and return with a digital effects unit you should have that unit's output set to 100% wet. This is because passing through the ADC and DAC of a digital processor introduces latency to the signal, meaning that the dry signal will be slightly delayed coming back to the SoundStage II and when mixed in will introduce comb filtering, just like on any analogue mixing console. Instead of using the wet/dry amount use the input gain of the effects unit to control the amount of the effect. If the effects unit doesn't have an input gain control then a stereo VCA can be patched in to do the same thing.

Patch ideas:

Mixdown
The "standard" use for SoundStage II 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.

Adding Accent to your modular drum patch

One classic feature of many vintage drum machines like the TR-808 and TR-909 is an Accent track, which allows you to sequence rhythmic volume increases, or accents, to the entire mix. If you've patched up your own drum machine from modules this can be missing if you're just mixing them all with a standard mixer, but SoundStage allows you to add it back in. Simply sequence your accent track in your sequencer and patch the gate output to the SoundStage's Level CV input. Add a small amount of positive modulation (try around 1 o'clock to begin with) to the Level CV attenuvertor and decrease the Level control to allow room for the level boost, say to around 4 o'clock. The gate input will give an abrupt level change, try experimenting with an envelope between the gate and CV input for a smoother result.

Parallel or "New York" compression

Patching a stereo compressor over the stereo FX send and return allows you to do parallel compression on a fully filtered version of the mix, while controlling the Depth of the uncompressed mix. This allows you to compress the filtered mix extra hard and have it sitting behind the uncompressed mix providing a super thick base to make your mix really pop. The super-defined, hard filtered, hard-compressed mix is an even more extreme version of the New York compression technique that's all over your favourite records.

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 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.

Stereo filter pings

This patch takes advantage of the resonant analogue filters get plucky pings from the SoundStage II. Patch some clocks, triggers, and/or gates to the inputs of SoundStage II and then mult the output back to a pair of inputs. Adjust the Level control so that the output isn't constantly feeding back, it's just adding length and definition to the pings. You'll find that the input chosen for each trigger will cause the ping to happen in the corresponding frequency band and stereo space, and the inputs used will also change the response. Experiment with different input choices, remembering that the Left output patched to an input panned further left will feed back more readily, and vice versa.

Tuned feedback/distortion

A great way to get more dirt into your mix is to take the FX send or 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!