Theile Trapezoid

The Theile trapezoid is sometimes called the "cardioid trapezoid" as well. So, there are two names for the same thing.

This array is designed to capture background or ambient noise. Direct sounds are attenuated by at least -15 dB.

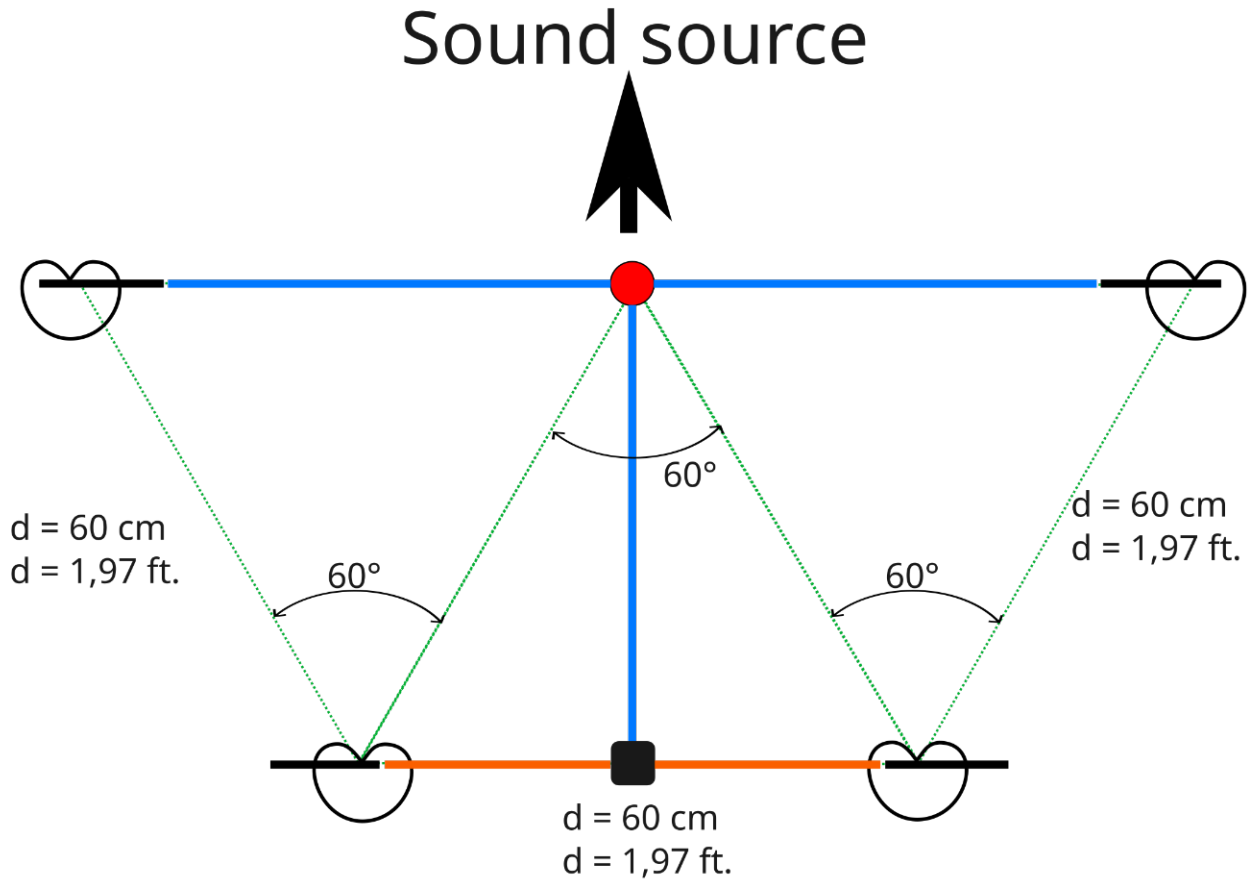
It is therefore ideal for adding a bit more spatial depth to a recording. Thanks to the cardioid microphones' high directivity, sounds coming in at an angle or from the sides are also effectively reduced.
In contrast, sounds coming from 180° (i.e., essentially from behind) are recorded with 0 dB attenuation.

We call this system "the salt in the soup". When you add just the right amount, a great recording becomes even better.

The setup is pretty straightforward. We used two stands to give the whole array more stability. Otherwise, you may hear phasing effects when it stands on just one stand and starts waving, which it does pretty easily.

The most important thing, however, is the distance between each microphone. It must be 60 cm (~ 1.97 ft), and the angle of 60° is also important. The more accurate you are, the better the sound will be.

The main "trick" is to take advantage of the fact that cardioids are almost deaf to sound coming straight from the back.



It starts with one stand, a 50-cm rod, and an additional thread cube. The rod and the cube are connected with a male/male 3/8“ thread adapter.

Make sure you extend the tripod legs as high as possible because the Theile Trapezoid is used high above the ground to minimize reflections.

You will notice that it is not very stable, so next, screw in another stand.

Now we have added two 50-cm rods in the front (red ball) and another extension with the 8 cm rod.

In the back (black cube) we added two 26-cm rods and additional two 8-cm rods.

Nothing fancy.

Here we have for rapid adapters with a microphone clamp each. Make sure, all clamps are pointing backwards.

This will give you the chance to move the capsules as far away from the rods as you like.

Now the four cardioid SDC microphones have been added. Make sure they are all pointing backwards.

You may use regular microphone cables as well, but we like to use our four channel multicores. Take what ever floats your boat.

And that is it.

Now connect your recorder, put this array into the right position and hit record.

If you want to use this array with another array, you should make sure, the recorders are timely synched or you put the inputs into the same recorder.

This array is pretty handy and can be lifted and moved very easily. Just take care of the cables.

This is all it takes. It easily fits into our bigger backpack (25 liters). It doesn't really fit into the smaller one (~ 11 liters), but it may work as well.

We use a case for the microphones, but it is not shown here.

When should the Theile trapezoid be used?

The honest answer is, "It depends!"

For example, if you want to record the cheers of a concert crowd and focus just on them, then this array is a good choice.
It's also a great option if you want to focus on the special sound of reflections from a specific wall or window and push back the direct sound.

We are confident that you will discover numerous additional use cases, and we would like to encourage you to think outside the box.

It can also combined with any array that is more focused on front sounds, like an OCT array for example.

And it isn’t written into stone, that you could use it as a „front array“ too. Just turn it by 180° and let us know how it worked for you.

Have much fun and make some amazing recordings.

We would love to hear your feedback and ideas on how to improve things.