PAMA



Simon Ratcliffe invented the PAMA (Prototype Atmospheric Microphone Array) for the ECHO project.
Its unique details distinguish it from other ECHO project arrays.

The setup starts with a light stand, a red ball, and five rods: three 26 cm rods and two 50 cm rods.

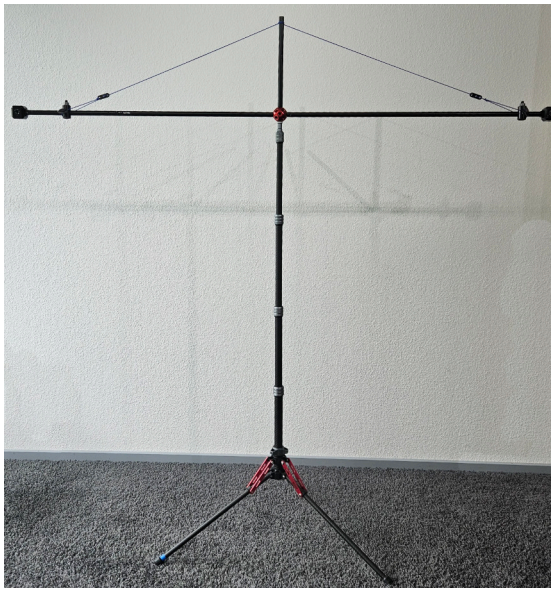
One 26 cm rod is screwed into the red ball from the top. The other 26 cm rods and the 50 cm rod are screwed symmetrically into the ball, as shown.
The blue nylon string is attached to the upright 26 cm rod with a knot.

Attach a rapid adapter to each side, then sling the string around the rod as shown. This will ensure the string stays in place, even when straightened tight.



Now your setup should look like this. You may bring the rapid adapters already into their final position, but you may do this later.

The center of the rapid adapters must be 76 cm aways from the middle of the upright rod in the red ball.



We ask that you read this passage thoroughly because the next step will be challenging.

We need 4 rods of 50 cm length and two 26 cm rods.



Now screw the 26 cm rod in the middle of the 50 cm rods. This is for convenience only, as you will see very soon.

Attach two rapid adapters on each set of rods.



Then screw in a 3/8“ male/male thread adapter into a cube and the end of the rods as shown in this picture. Screw it tight, but make sure, your cube is in a position, so you can screw in the other stands.
Now you should have to sets of rods as shown.
It’s important to attach the nylon strings on the top side of the rods as shown. You can’t do it later!!!
Before we go on, its time to setup the two other light stands and bring them about the same hight as the front light stand. Put them into the expected position.

Now take one set of rods and screw it carefully into the cube of the front rods. Keep the balance!
When you have screwed in the rods take the light stand and screw it into the downside of the cube. Repeat with the other side.



Now your setup should look like this.

You may now screw in the front rods. Take an 8 cm and a 26 cm rod, screw them together at finally screw them into the front side of the red ball.



Depending on the length of your microphones, your mileage may vary. Then you may need another 8 cm or just two 26 cm rods. The goal is to have the front microphone 50 cm away from the front bar.



Insert two additional 26 cm rods into the top of the cube, as shown, and two 8 cm rods into the ends. Attach another rapid adapter and the string as shown.
This step is optional, but it protects the entire system from start to swing if you have your microphones attached with additional windscreens and there will be some wind outside.



Next screw in another 3/8“ male/ male adapter into the end of the upright rod and add another microphone clamp. Make sure, it is on the inner side of the system.

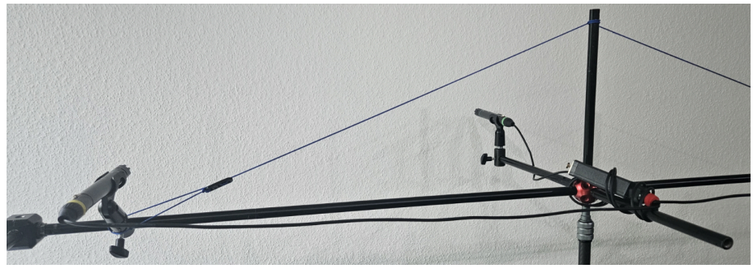
On the picture you see the hyper-cardioid microphone in its final position. It leans inwards and is poiting a little bit do left-back side.

The same applys for the other side accordingly.



Because we now have a well-balanced array, we can screw in another 26 cm rod into the red ball. This will take the front multicore splitter as we’ll see in a second.

You also can see the center microphone. It is 50 cm away from the center of the upright rod.

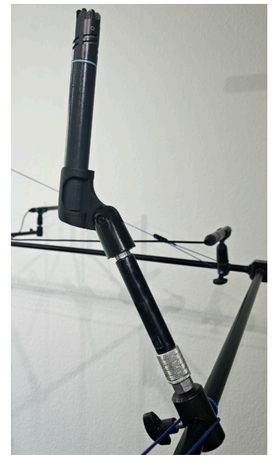


The length of the splitters cables is just about right for this setup. But it’s scratching the limits.
We connect the L, C, R microphones to this splitter. You may use the fourth channel for a geophone, if you like or just leave it unused. Make sure, it doesn’t swing around.



It’s time for measuring.

As the microphones are a little bit above the rods (~ 10 cm), the upper microphones must be put higher by the same amount.
So the 30 cm Trr/Trl cardioids must not only be 30 cm high, but additional 10 cm. Which results in 40 cm. The same apply to all other microphones. Keep an eye on this detail!



It does look a little weird, but it's the best available compromise between positioning the microphone correctly and saving as much weight as possible.

Your setup may look differently if you are using shorter microphones. Then you have to extend the 8 cm rod with additional thread adapters (silver) or another 8 cm rod.



Attach the other micophones as described and connect them.

We use 4 channel mulitcores. So there is one in the front and another on each side.

We recommend to use the same schema of colors on each side, so you can find an error much faster.

Of course you can also use regular microphone cables as well. In this case we would like to mention, that many cables bring many grams, so you should keep an eye on the maximal load of your light stands!

Now we come to the „outrigger“ microphones. We think, the best compromise is to use very light weight tripods, you can get for little money almost everywhere. On top we screw a 1/4" to 3/8“ adapter and attach a 26 cm rod with a male/male 3/8“ thread adapter and a microphone clamp.







Yes! This isn’t the most stable solution, but it works!

The outriggers shall be placed 180 cm from the middle of the array and 90 cm behind the front bar.

For more flexibility we connect them with seperate microphone cables.

Below the complete gear is shown. (Well, except the backup batteries! Never forget them!!)



It’s almost unbelievable, but it fits all into our backpack







Now comes a major **BUT** …

… the total weight is 23,3 kg, which are about 51 pounds.

This is ... heavy ... in the sense of heavy.

To avoid damaging the backpack, we decided to carry the three multicores by hand. This reduces the total weight of the backpack to about 18.5 kg (~41 pounds).
We think this system touches the limits of what can be built with the available gear.

It should also be noted that the maximum height of the array above the ground is around 1.55 meters (~ 5 feet).

If you want to go higher, you definitely need stands that can carry a heavier load and are more stable. The "price" is that they are either heavier, more expensive, or both. Anyway!

Have fun and make some awesome recordings!

