

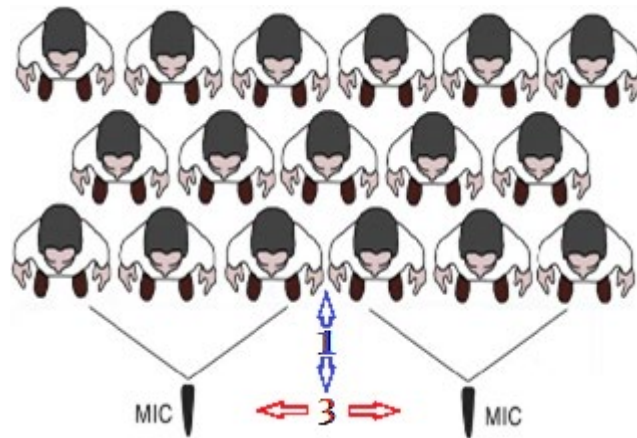


Microphone Stereo Placement

✝ Church Audio ✝

By using two microphones, in certain configurations, we can create a powerful sense of depth and space. Using a Stereo Microphone technique, it is possible to capture large groups particularly well, but using the method on single musical instruments has become very popular as well. Ideally you should use identical model (matched pair) microphones. Small diaphragm condenser microphones are preferred for stereo micing, however, use whatever you have a pair of!

Spaced Pairs (A-B)



Two microphones are placed in parallel, both aiming straight ahead. This setup will provide a powerful stereo image, with very strong separation between the two zones. It will also have a good sense of ambience. Place the two microphones carefully so there is no loss in the central area where sounds will otherwise be slightly softer and unfocused. Because of the possibility of phasing (one microphone becomes out of phase with the other causing cancellation eg. *hollow sounding*) be sure to follow the rule: **1 out 3 across**. If the microphones are back from the source 1 metre, make them 3 metres apart, phasing errors solved!

Near-Coincident (ORTF) (NOS)



ORTF technique

Devised by Radio France... *Office de Radiodiffusion Télévision Française* (ORTF).

It uses two cardioid microphones spread to a 110° angle, with their capsules spaced 17 cm apart (basically imitating the human ears). The result is very realistic, and it has an acceptable compatibility with mono playback (very little phasing). Since the cardioid polar pattern rejects off-axis sound, less of the room ambience is picked up, and the mics can be placed farther away from the sound source, letting you control the blend between direct sound and room reverb.

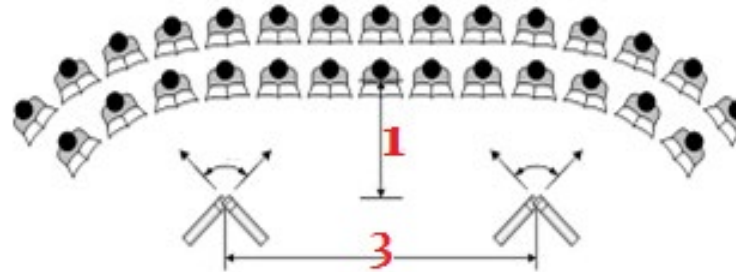
In the 1970's at an AES convention ORTF was voted as the best micing technique for stereo (L-R) image and clarity.

NOS technique

Devised by Radio Holland... *Nederlandse Omroep Stichting* (NOS).

It is very similar to the French method but uses a 90° angle (completely phase-safe) and 30cm between capsules. Because it has a greater angle between the capsules, it has a wider sense of space.

Coincident (X-Y)

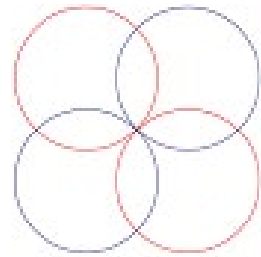


This technique places one cardioid capsule on top of another other (to eliminate phasing). Angle from about 90° on out to a workable angle of about 135° (after which you would risk becoming out of phase as you approach 180°).



Two cardioid microphones, with their capsules placed vertically on top of each other, are said to be in coincidence with each other. It means that they will have no phasing problems because the sound will arrive at both capsules at the same time. This technique will give you a good stereo image with very little room reverb, though the stereo separation is not as good as some of the other techniques. It is good for small ensembles, and great for close-micing of solo instruments.

Coincident (Blumlein Pair)



**Two
Figure-of-8
Microphones**



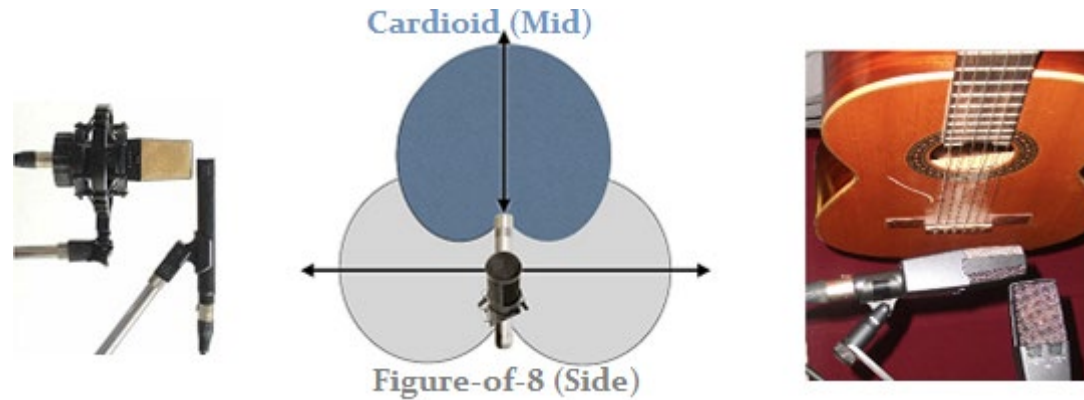
Devised by Alan Blumlein. He suggests using two bi-directional (figure-of-8) microphones, set up in coincidence (one above the other), and angled at 90° . The Blumlein pair produces an exceptional sense of space and ambience, and although it isn't a true stereo image, it has a stunning sense of depth.

Large Diaphragm Condenser or Ribbon microphones are ideal here. At the mixer, one microphone is panned to the left, and the other to the right.

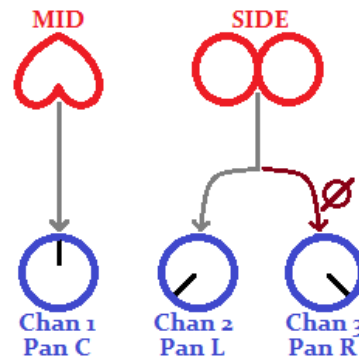
When listening through stereo loudspeakers, or headphones, you can hear the exact position where each musician is sitting, and how far back they are.



Coincident (Mid-Side) (M-S)



This uses a Cardioid and a Fig-of-8 microphone. The cardioid mic faces straight ahead (we call it **Mid**) and collects the complete sound (sum) in front of it. The fig-of-8 mic (we call the **Side**) captures the “difference” between the left and right side. From the sound data collected with these two microphones you can extract a full sense of 270 degrees. Basically, you need to add the Mid mic to the Side mic and pan the result left, then add the mid mic to an inverted version of the Side mic (this actually subtracts the mid from the side) and pan the result to the right. $L = M+S$ $R = M-S$



How you can do it at the Mixer: Pan the Mid microphone to the centre (so it arrives in both the L and R output). Split the incoming Side microphone on to two channels. Pan one of the Side channels to the left (which will simply add to the Mid). Flip the phase on the other Side channel and pan it right (because it is inverted it will subtract from the Mid).

Like the Blumlein pair, **M-S** stereo micing provides excellent stereo imaging and localization.

Commercial Stereo Microphones



Manufacturers offer us stereo microphones with the two capsules in one microphone body (and two cables connected), good if you use stereo mic a lot. Some models have adjustable capsules, so you can aim them to suit each situation. The capsules are basically of a “coincident” configuration, close together, ensuring sounds arrive at both capsules at more or less the same time, minimising phasing problems.

Binaural



Many creative methods have been explored to capture a stereo sound that imitates how a human would hear it.

Devices deploy two microphones (the distance of human ears) and provide a circular barrier for the sound to wrap around, like a human head. One way is to place tiny condenser microphones in a real person's ears.

Actually, you can imitate the acoustic shadowing caused by a human head quite successfully just by placing an absorbent disc between the two mics. You could space the microphone capsules to human head-width (about 17cm) but actually that doesn't give the best result. Double the mic spacing to about 34cm and it works really well. Alan Blumlein and Jürg Jecklin both experimented on the use of an absorbent disc. Alan faced his microphones forward, Jürg angled his by 30°.

Binaural technique sounds amazing in headphones.

CREDITS

This material is offered freely to the Christian Churches; downloadable at Pietango.com

Text: *Original, by the Author, a Christian Recording Engineer.*

Images: *Designed by the Author. Some photographs were sourced from the Internet, then re-worked.*

Ever since the creation of the world, God's invisible attributes and divine nature have been evident. They are clearly understood through his workmanship, and all the wonderful things that he has made. Therefore, those who fail to believe and trust in him are without excuse, or defence. **Romans 1:20**

All of us have sinned and fallen short of God's glory, but God treats us much better than we deserve.

Because of Christ Jesus, he freely accepts us and sets us free from our sins. God sent Christ to be our sacrifice. Christ offered his life's blood, so that by faith in him we could come to God. **Romans 3:23**

If you declare with your mouth, "Jesus is lord," and believe in your heart that God raised him from the dead, you will be saved. For it is with your heart that you believe and are justified, and it is with your mouth that you profess your faith and are saved. **Romans 10:9**

For the Scripture (*Isaiah 28:16*) says, "Whoever believes in Him will not be disappointed." **Romans 10:11**

These things have been written so that you may believe that Jesus is the Christ, the son of God; and that by believing, and relying on him, you may have new life in his name. **John 20:31**