What is SAM (Spatial Angle modulation™) and How Does it Compare to Hemi-Sync?

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How do SAM and Hemi-Sync® compare?

Both are Monroe audio technologies designed to lead listeners into targeted brain-mind states for the purpose of exploring and expanding the uses and understanding of consciousness.

Hemi-Sync is produced using binaural beats and introducing different frequencies to each ear, for example, 2000 HZ (hertz) in one ear and 2004 HZ in the other. What is perceived in one's brain is the difference—that is, 4 HZ. There is no "movement" other than the value of the frequency difference being presented to the listener. Hemi-Sync guides listeners into specific states by layering and blending these frequencies—over the course of an exercise.

SAM is made up of two basic components: A **carrier (or base) frequency** that carries the sound to the listener, and a **modulation frequency** that controls the rate of the carrier frequency.

For the carrier, think of a piano keyboard (or any audible music note) and pick one. For example, use the well-known middle C, which is "C4." Using a "frequency for equal-tempered scale" where A4 = 440 HZ, C4 would be 261.63 HZ—the carrier or base frequency.

If you're not a musician, forget the bit about A4= 440 HZ and just go with C4 = 261.63 HZ. The rest was necessary so those who are musically trained understand how the value for C4 was derived, but it's not important in understanding how SAM is created.

Next, a modulation frequency is selected based on the brain state that the person meditating would like to achieve. For instance, if the meditator would like to dwell in the somewhat dreamy to somewhat drowsy but awake state, a frequency of 8 HZ could be chosen, which is the bridge between Theta and Alpha states.

With the carrier and a modulation frequency selected, the next step is to use a bit of math and formulas to have the modulation frequency (Mod Freq) move the base or carrier frequency at the rate defined by the Mod. Freq.

For SAM to work, three values are determined to create the impression of the sound moving in an arc from the perspective of the listener. The three values are—

1. Arc Location (relative to the listener's head)
2. Arc Size (how "big" the arc is in which the sound "moves")
3. Arc Starting Position (the point from which the sound begins to move)

By defining how "big" it is and where it starts, the "stop" location is automatically defined.

For purposes of using SAM for meditation, the sound is set to move back and forth between the listener's ears and in front of the head. This is done by defining the center of the arc as being located directly in front of the person, the arc's size as being 180 degrees, and its starting position as being at the person's left side. The sound then moves from left to right and back again and repeats at the rate defined by the modulation frequency that was selected, i.e., in this case 8 HZ, meaning it would move left to right and back again 8 times every second.

Apparent movement is achieved by redefining the position incrementally over the 180-degree arc selected, starting at the left ear and moving it digitally in equal increments through the 180-degree arc and back again 8 times per second (the modulation frequency selected).

Now, for advanced SAM development, visualize the meditator's head in the center of a theoretical sphere. The possibilities for future SAM research are virtually infinite. Arc location, size, and starting position can be varied throughout this sphere searching for improved and more beneficial results.

All SAM arcs do not have to be 180-degree center arcs, starting on the left. This start point and configuration is based on research done in earlier SAM development where the majority of the people tested preferred it.

Depending on the intent or purpose of the meditation, SAM values can be selected to "encourage" the brain to be in the desired state—deep meditation, expanded consciousness, higher processing, deep sleep, problem solving, or many others.

Through integration of SAM with technologies such as electroencephalograph (EEG) measurement of brainwaves and time correlation of these with specific meditation events, quantitative, valid, reliable, and credible comparative data is acquired.

For those not familiar with some of the frequencies generated in our brains and their apparent relation to cognitive processing, a brief review is presented below:

frequency Names	HZ	Functions	Description of Consciousness State
Gamma	40 - 100	Higher Processing Tasks, Universal Love, Higher Values, Spiritual Awareness & Emergence	Binding senses, Cognition, Information Processing, Learning, Perception, REM sleep.
Beta	12 - 40	Awake, Normal Conscious, Focused Mental Activity	Memory, Problem Solving
Alpha	8 - 12	Bridge between Conscious and Subconscious	Calm, Deep Relaxation, Awake but drowsy.
Theta	4 - 8	Day dreaming, sleep, REM, Deep Meditation	Creativity, emotional connection, intuition, relaxation. Reduced consciousness, Deep Meditation. Deep Spiritual Connections
Delta	0 - 4	Deepest Meditation & Dreamless Sleep, Restoration & Healing	Immune System Involvement

In the chart, the content is somewhat arbitrary but generally agreed upon by those performing investigative research. Depending on the source, one is likely to observe some divergence.
