Subject: Re: Time alignment vs reality
Posted by Paul C. on Tue, 09 Jul 2002 00:50:49 GMT
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In a concert hall,listening to live instruments, each individual instrument reaches your ears "time aligned". Its fundamental, middle, and upper harmonics arrive to your intact. But a speaker system breaks this into parts, ALL of the instruments suffer from the crossover effects. Fortunately, your ear is used to hearing room resonances and dips, and the brain sets up a sort of reverse filter to compensate, as much as possibleNow, the individual instruments DO come to you with slightly different times... they coordinate, or try to, with the conductor, yet their distances, to any one listener, are different.Where this can really get sticky... a drum and bugle corp or band on the football field at a ball game. As they get spread out, the tendency is for the musicians to try to listen to each other, and as they do, the delay due to speed of sound can really get things screwed up. What they must do is listen to the drum section, positioned in the middle. The drummers WATCH the conductor (drum major), and play with him/her. The drum major must have a good sense of tempo and totally ignore the sound of the band, and just conduct. Otherwise if the drum major synconizes with the band, the whole thing will get slower and slower, and bog down. I know, having been both a player and conductor in these bands, and on stage with concert bands and orchestras.Another effect you may not be aware of... close micing vs distance micing. The low frequencies travel farther, easier, than high frequencies. High frequencies in the tone, known as "edge" among musicians, gives projection to the tone. Yet, too much gives a coarse, grating tone.The overtone spectrum of an instrument changes as the volume level the musician plays is changed. It is not the same as just turning the volume knob on the amp higher or lower.When a musician plays in a large theater/concert hall, if he knows what he is doing, he plays with a bright, edgy tone. A fine symphony cellist, for example, sounds like a buzz saw up close. He MUST play with this type of tone, or he could not be heard past the third row. BUT, out in the audience, the tone will be sweet and mellow, rich sounding. The "edge" disappears with distance, leaving the mellower fundamental and middle overtones. Musicians speak of "theater tone", "studio tone", or distainfully, "parlor tone". Students and many teachers do not understand this effect. A student with a very pretty, sweet, dark tone in the practice cubical, or the teacher's studio during a lesson, cannot be heard on stage for his solos or exposed passages.It is a characteristic of musical instruments that when they play very softly, only their fundamental and first few overtones are present. As they play louder, more overtones are generated, and at higher levels. A sax, which has both even and odd overtones, playing very, very softly, will only produce the fundamental and only 2 or 3 overtones at pp (pianissimo, very soft) levels. At mp (mezzo piano, or medium soft) there will be about 7 overtones, yet the fundamental and first two overtones are no louder than at pp. At f (forte, loud), there will be maybe 14 overtones, the middle overtones stronger, yet the fundamental and first two overtones are no stronger than when played pp or mp. At ff, (fortissimo, very loud), there may be as many as 28 overtones generated, but still the fundamental and first two overtones are no louder than at previous volume levels.This is typical of most all musical instruments, when playing louder, it is in the number and intensity of overtones that make it sound louder. (source: The Saxophone Is My Voice, Ernest Ferron: similar observations by Dr. Arthur Benade in his many papers and books)So, there are many effects working in live music vs close mic'ed recorded music.