I guess the central question would be something like "what really matters regarding low frequency reproduction, and what's the best way to get it?"

Apparently one thing that matters is the sense of spaciousness that good low frequency reproduction can impart.

I just finished reading a paper entitled "Localization and Image Size Effects for Low Frequency Sound" (118th Convention, May 2005, paper number 6325) that does a little bit of exploration into decorrelated low frequencies. I'm not quite sure of their use of terms, but they're noting that low frequency energy increases the image size (sense of spaciousness, or width of soundstage?) and then studying the effects of single sub vs two subs correlated vs two subs uncorrelated using various corner placement arrangements.

From the data, it looks to me like if you're going to use a single sub in a corner, image size is best served by placing it in a corner behind the listening position.

Two subs almost always outperform one sub in image size, which is not surprising. With two subs, it looks like correlated slightly outperforms uncorrelated, and using the front two corners slightly outperforms using other corners. But in each of these cases the two subs are equidistant from the listener, so none of them really test Earl's proposition.

Another paper I read on the subject, presented by David Griesinger of Lexicon at the May 2005 "acoustical society" meeting in Vancouver, lends greater support to the desirability of decorrelation. From his concluding paragraph:

"Although widely held to be unnecessary or impossible, reproduction of envelopment [sense of large acoustic space] at low frequencies in small rooms can be achieved, particularly with a multi-channel sound system. Successful results depend upon: 1. Having an input recording that includes at least two channels where the reverberation is independently recorded, and thus uncorrelated with the other channels. 2. The presence of independently driven room modes that overlap in such a way that the lateral pressure gradient of one mode combines with the pressure of another. In the case of two channel stereo, the best results usually occur when an asymmetric lateral mode (driven by the difference signal between the loudspeakers) cerates a pressure gradient at the listening position, and a medial mode (usually a front/back mode) supplies the pressure. Ideally both modal systems should be broad enough in frequency that there is substantial frequency overlap, as well as a spatial overlap. Such spatial and frequency overlaps occur in rectangular rooms of various dimensions, but are rare in rooms that are close to square in dimension. Putting the front speakers along the long wall of a small room can be helpful, as can a somewhat asymmetric speaker layout. In many rooms it can be helpful to place the low frequency drivers at the sides of the listening position rather than at the front of the room. Where high Q modes exist it is useful to damp the modes electronically by an inverse filter with precisely the same frequency and Q."

It sounds like Griesner is in favor of decorrelation and asymmetrical subwoofer placement,

apparently preferring subwoofers located to the sides of the listening position.   I don't think he considered using more than two subs, but I might have missed it as I skipped over some parts.

So the first paper considering only corner placements seemed to lean slightly in favor of correlated low frequencies, while the second which allowed asymmetrical placement anywhere in the room clearly favored uncorrelated bass with asymmetrical placement (though no data tables were given). In both case, I think they were trying to maximize the same quality - "image size" or "envelopment".

Do we trade off anything else that's desirable in pursuing "image size" or "envelopment" though decorrelation?

Duke
"Loudspeaker and listener positions for optimal low-frequency spatial reproduction in listening rooms"