

A Method of Testing Loudspeakers with Random Noise Input*

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BEFORE discussing the subject indicated in the title, it is necessary to answer two questions. These are: a) what is the function of loudspeakers? and b) can loudspeakers be tested for the excellence with which they perform this function?

The answer to the second question is entirely dependent on the answer to the first. If we consider the purpose of loudspeakers to be the creation of pleasant, exciting, or dramatic sounds in their own right, then it should be clear that loudspeakers cannot be tested objectively. The best of wine tasters disagree. You cannot take a wine from a particular vineyard, put it into a test tube, and do a chemical analysis that will tell you with certainty whether particular people will prefer this wine to one from a different vineyard and/or vintage.

The supposed inability of objective testing to reveal the quality of a loudspeaker has become a first principle among the "hi-fi" writers and dealers who advise the public on the esoteric mysteries of sound reproduction. Explanations usually have to do with hearing differences in different individuals, differences of taste, and differences in room environment. All of these explanations make good sense once we accept the hypothesis that a loudspeaker is a new musical instrument, a creator rather than a reproducer of sound.

On the other hand, if the function of loudspeakers is merely to recreate with maximum accuracy sounds that have already had an objective existence, the explanations of why

loudspeakers cannot be tested appear quite thin. Differences in individual hearing have no more to do with comparing a facsimile to its original than differences in vision affect the objective accuracy of a matching sample of color. The same hearing aberrations are brought into play with both the live and reproduced sound, and do not affect the process of matching. Taste may determine whether a listener prefers one or another symphony orchestra, or a small string group to a large brass band, but it cannot influence objective determination of the simple accuracy of reproduction. Room environment profoundly affects the final acoustic output of any sound-reproducing system, but this effect might just as well be used to establish the fact that amplifiers, pickups, needles, or turntables are not subject to objective evaluation. If there is to be compensation for room environment, it should not be sought in loudspeakers.

Taste can be a valid element in establishing preferences of one reproducing component over another in two instances:

1. Where the reproduced sound is accepted as an entity in itself, with little relation to the world of live concert music.
2. Where a choice must be made between different kinds of inaccuracy—for example, intermodulation distortion *vs* transient ringing.

In the late 1930's the Museum of Modern Art had a special exhibition in which American paintings were exhibited next to color reproductions of the same paintings in the same size. In many cases it was impossible to tell the difference, or the differences were very small. An observer could judge the accuracy of reproduction independently of his artistic taste, the kind of lighting employed, or whether

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