

# Speakers

2  
The Truth About  
Loudspeakers

11  
Meaningful  
Speaker  
Measurements

13  
Interpreting  
Speaker  
Response Tests

15  
Frequency  
Response

18  
Impulse  
Response

22  
Step Response

26  
Cumulative  
Spectral Decay

28  
Conclusion

## Introduction

*This is the fifth **Audio Perfectionist Journal**. In this issue we will begin to examine loudspeakers. We'll discuss speaker accuracy because high fidelity reproduction is our stated goal and you can't have accurate reproduction without accurate speakers.*

*Speaker accuracy can be measured by objective tests. These tests can't tell you everything about how a particular speaker model will sound but they can tell you if a certain design has the **potential** for accurate reproduction.*

Speakers are very important components in any audio system. Many people believe that speakers are so important that they spend too much on them and are then forced to compromise on the quality of the components that create the signal which is fed to the speakers. These folks hope that their carefully chosen speakers will somehow improve that signal and produce good sound. This is, of course, impossible.

Good speakers can't improve the quality of a bad signal. Inaccurate speakers won't produce good sound even from a perfect signal. In fact, inaccurate speakers will produce inaccurate sound regardless of the quality of the signal that is fed to them.

Poorly designed speakers can fool all of the people some of the time and some of the people all of the time, but they can't fool all of the people all of the time. Examining speaker test graphs won't allow you to choose a satisfying speaker without listening, but those graphs may help you avoid a costly mistake. Why risk being momentarily fooled by a speaker

which can't possibly create an accurate replica of the input signal? This **Audio Perfectionist Journal** (and the next one) will help you separate the posers from the contenders.

## In This Issue

The article titled *The Truth About Loudspeakers* describes what an accurate speaker is and what an accurate speaker should do. This article discusses why most speakers are demonstrably inaccurate and the reasons why most fail to provide output response that is an acoustic replica of the electrical input signal.

The article titled *Meaningful Speaker Measurements* describes the various speaker tests which I believe are useful to consumers who are evaluating speakers for purchase. Most of us don't want to design speakers; we simply want to get the highest performance possible and the best value for our money. Measurements can tell us which products are worthy of our consideration and which are best left to those who listen only to background music at elevator levels.

The article titled *Interpreting Speaker Response Tests* explains how to interpret the graphs that various magazines use to dress up their reviews. These graphs are designed to add a sense of scientific credibility to reviews written by people who seldom have any real technical knowledge but, if you learn how to interpret the test graphs, you may actually benefit from the data they contain.

Most magazines don't want you to know too much. If they would fully explain what their test graphs mean they could risk offending big advertisers whose poorly designed speakers are often exposed by the measurements that accompany the rave reviews they publish. After you read this **Journal** you'll be able to interpret the measurements published by the magazines and come to your own conclusions.

### Coming Up

This **Journal** is all about speakers. The popular speakers which are measured and discussed in this issue are demonstrably inaccurate in one way or another. In the next issue we'll continue to examine speakers, but the models measured and discussed in **Journal #6** are demonstrably accurate within all the currently accepted "objective" parameters. After you see that many available speaker models can accurately reproduce the input signal, we'll talk about sound. Yes, even those speakers which are truly accurate don't all sound alike.

You can eliminate the poorly designed products, and those products which are skillfully designed to be inaccurate on purpose, by examining objective test results. Tests won't define all the audible differences between those speaker models which are competently designed to be accurate electromechanical transducers. Even skillful engineering requires a balance of compromise. In **Journal #6** we'll compare some accurate speakers and examine the various compromises chosen by their designers. I'll tell you what I hear when I compare these speakers but you'll have to listen for yourself to determine whether any of these models will satisfy your personal tastes.

In this **Journal** you'll see that spending a lot of money doesn't guarantee that you'll get an accurate, well designed product. In the next issue you'll discover that truly accurate speakers can be purchased for less than one thousand dollars a pair and that some of the finest speakers available can be owned by regular people like you and me without taking out a second mortgage.

All the information in **Journals #5 & #6** is specifically about the speakers used as a stereo pair or for the front left and right channels in a home theater system. In future **Journals** we'll discuss speakers for home theater center channel and surround use.