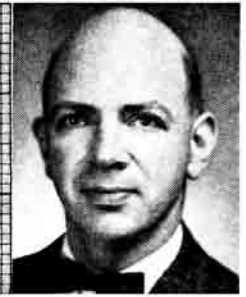


TECHNICAL TALK

By JULIAN D. HIRSCH



● **AUDIO AGNOSTICISM:** I have commented in the past on the insatiable need many audio enthusiasts seem to have to be told in definite and uncompromising terms which is "the best." For example, the comprehensive cartridge reports just published in *HIFI/STEREO REVIEW* (July, 1965) prompted some readers to complain that I did not come out and say, unequivocally, that "cartridge X was the best of the lot." I would recommend that they re-read the last paragraph of the introduction to the report, and take my words at face value.

The entire problem of correlating measurements with the verdict of our ears is a vexing one, and is not easily solved. The difficulty is not merely one of making accurate measurements, since any problems that arise in this area are always resolvable by known, accepted calibration techniques. The real difficulty is that in some cases (perhaps in many cases) we are not really sure *what* factor to measure.

It may seem strange to the non-engineer, but it is a fact that the usual measurements of harmonic and intermodulation distortion, frequency response, and so forth may actually have little to do with the subtle differences in sound that are sometimes observed among very high quality amplifiers and tuners. In other words, a measurement may be perfectly accurate, but at the same time give little indication of how the component will *sound* in an actual listening situation. There is, I am sorry to say, no universal agreement as to what the truly significant factors may be. There are probably as many theories as there are "experts." The elusive quality-determining factor has been variously claimed to be the degree of phase shift, ultrasonic frequency response, ability to handle high-frequency, high-level transients, high peak-power reserve, overload recovery characteristics, percentage of very high-order harmonic distortion . . . and many others.

I feel that some of the theories are patently absurd, and seem to have been pulled out of thin air, so to speak, to suit a particular manufacturer's marketing philosophy. In short, I have never seen any report in the technical literature of a truly scientific and impartial test that established a reasonably high correlation between any one of these factors and the actual sound characteristics of a particular component.

As for myself, I remain an audio agnostic, open to any convincing argument, but still requiring proof. For what it may be worth, it is my opinion that a combination of several of these factors may be involved. But I have no idea as to how they may be measured in a meaningful manner with any reasonable amount of available test equipment.

Speakers and phono cartridges are far more difficult to evaluate than an amplifier or tuner. This is strange, in a way, because the individual colorations of speakers and cartridges are far more prominent than any that may occur in the purely electronic portions of a reproducing system.

A comparison of the frequency-response curves of a number of cartridges shows that they are basically very similar, with most of the differences occurring in the highest frequencies, between 10,000 and 20,000 cps. The lack of significant musical material in this range, plus the gradual loss, with age, of high-frequency hearing exhibited by most adults, causes most cartridges to sound alike. On occasion I have heard differences between cartridges that I cannot explain in terms of my measurements. Although these are usually minor, the fact remains that I apparently am not measuring the significant factor, whatever it may be, that accounts for these differences.

Speakers are quite impossible to rate by measurement alone. The difficulty here is that one simply cannot define

what is to be measured. Our ears hear the total output of the speaker, in all directions, modified by absorption and reflection within the room, as well as the masking effects of ambient noise. For this reason, measurements made in an anechoic chamber or out-of-doors are not as helpful as they might be for

revealing subtle colorations that may ultimately determine the overall quality of a speaker system. Measurements *are* useful, however, for grading the overall sound of a speaker in a gross sense.

My indoor frequency-response measurements, admittedly crude, come a little closer to showing how much power a speaker delivers over its frequency range in a closed room of normal size. But since they do not show how much energy arrives at one small area of the room (simulating a single listener), they do not of themselves tell us much about how the speaker sounds. And, of course, it will sound different in each different room in

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●
Oki 555 Tape Recorder
Euphonics CK-15-LS Cartridge
●

which it is installed, or in different parts of the same room. Combined with tone-burst and distortion measurements, my frequency-response data serve as a "back-up" for what my ears tell me—and my ears render the final verdict.

In the absence of accepted test procedures or suitable instrumentation, I inevitably prefer to place my ultimate trust in the human ear. This highly refined acoustic transducer, evolved over a million years or more, working in conjunction with the most sophisticated computer known to man (the human brain), can detect and evaluate small differences in sound that at the present time cannot be analyzed by any man-made instruments.
