# the stereophile

Vol. 1

### For the High-Fidelity Stereo Perfectionist

No. 8



As We See It

### <sup>the</sup>stereophile

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# The Cover

The trend toward ever more ambitious "console-lype' systems continues unabated, but we doubt that Ampex's Signature V "home entertainment console" will be topped for some time to come. Complete with a video recorder and camera, color receiver (with tube), a second black-and-white receiver, an audio recorder, and stereo amp, preamps, tuner and speakers, the Signature V was introduced as an "exclusive" for Dallas's Neiman-Marcus department store, with a modest \$30,000 price tag. We were informed that there is no discount for quantity purchases. **Don't Just Sit There!** 

Like every sensible publication, THE STEREOPHILE keeps track of the questions raised by readers who write to us, so we can get some idea of what most of you would like to see in future issues of the magazine. To date, the list looks like this, in order of diminishing interest: transistor amps and preamps, loudspeakers, pickups, tape equipment, tuners and, way at the bottom of the list, recordings. We are devoting most of this issue to a discussion of commercial recording practices.

This is not because we are just naturally perverse. It is because we have the unusual (in publishing) idea that, when there's a choice between something our readers are curious about and something they should know, we are inclined to give precedence to the latter.

Okay, so you're more interested in components. Fine, so are we. But above all, we are interested in hearing really musical, natural — all right, we'll use the term — high-fidelity sound. And this is one thing that the record manufacturers seem determined not to give us.

Face it, equipment has been improving during the past few years. Pickups are smoother, more compliant, lower in mass and better in tracing ability than they've ever been. Some of the new ones surpass even the old Weathers FM pickup when it was working right, which is saying something. And the new ones are stereo, too. The best transistor amplifiers are cleaner and more lucid-sounding than most of the tube amplifiers that used to lead the field, and speaker systems like the KLH 9 and the experimental Harned full-range electrostatic are setting new standards for detail and transparency.

But look at what's been happening to the stuff we play on these improved components: the commercial discs and tapes. What's new in recordings?

Apart from a brief flurry of 45-rpm stereo discs, there has not been a single move to produce for the consumer higherfidelity recordings than he was getting five years ago. Instead, the existing media have been getting worse (See the article in this issue), while the only new media that have been introduced represent steps backward in sound quality.

Stereo recordings on tape and disc have, with but few exceptions, been getting increasingly gimmicked, and bear less and less resemblance to live musical sound. The only truly significant technical advance in the disc field — Dynagroove's predistortion technique, which appreciably reduces high-frequency tracing distortion from an average disc — was adopted by the sales and promotion interests as a means of cutting unprecedentedly higher levels on the discs without incurring more distortion than before. What about the new media, then? Revere-3M introduced a tape cartridge system some time ago that ran at  $1\frac{1}{6}$  ips, and it was a big step backwards, sonically speaking. Now Ampex (UST) announces a new series of 4-track tapes of music at  $3\frac{3}{4}$  ips (for the new Ampex automated recorders), and while these sound much better than Revere's cartridges, they aren't as good as the  $7\frac{1}{2}$ -ips tapes, either.

So, equipment improves while the recordings deteriorate. And the better our equipment, the more it reveals the flaws in the recordings. Few of us, as a matter of fact, have any idea how good our music systems really are, because there is not, to our knowledge, a single commercial stereo recording on the market that portrays a symphony orchestra as it actually sounds from a good seat in a concert hall. The millennium of high fidelity might be with us already, for all we know. But we won't find out until we start getting recordings that are equal to the quality of our systems.

If you don't mind being cheated blind by record manufacturers, then just sit back and be happy with what you're buying in the name of high-fidelity recordings. If you do care, we'd suggest you read the article that starts on the opposite page, work up a good head of steam over it, and then take some concrete action, as suggested, to do something about the situation.

### Help, Dammit!

Several loyal subscribers have brought it to our attention that a number of their friends *borrow* their copies of THE STEREO-PHILE instead of paying for them. To all persons guilty of this dastardly practice, we point the bony finger and say For Shame! You could put us out of business this way.

When we say, incessantly, that we need subscribers, we kid people not, to paraphrase somebody. All of our income must be from subscriptions, and since this estimable publication costs about \$1,500 per issue to produce, for printing and promotion alone, we need more than just a little income to keep paying for it. As long as we carry a horde of nameless readers who enjoy the magazine without assuming any responsibility for it, we can't hope to continue publishing for very long.

The reader reaction to date indicates that you *do* enjoy THE STEREOPHILE, but moral support isn't quite enough. If you want to see us continue, and haven't yet done your bit to help make that possible, then please do. We're trying to help you; please help us, even if you can only afford a \$4, 6-issue subscription.



A small but enterprising record manufacturer played host to a nearriot some years ago when it unveiled a new "compatible stereo" disc system before a gathering of musicians, magazine editors, recording engineers and record reviewers. The compatible stereo disc was received with mixed feelings, but it wasn't the demonstration that caused the ruckus; it was the ensuing questionand-answer period that, in the words of one observer, "had aspects of a street brawl at times."

One reason for this was that many of the "outsiders" present — that is, people who weren't actually associated with record companies — had evidently been under the impression that all records made since 1955 were equalized to complement the "industry-standard" RIAA playback equalization curve, and were serenely confident that today's records were as hi-fi as the state of the art would permit. So when they heard manufacturers of some reputedly super-fi records admitting unabashedly that they messed around with the frequency response, dynamic range, stereo separation and orchestral balance on all their discs, the "outsiders" disillusionment was abetted by an uncomfortable feeling that they had been the victims of a grand hoax. The record critics were particularly miffed about it, probably because they recalled the reviews they had written extolling the magnificent fi of these discs that had just been revealed as cleverly contrived artifices. Yet when they voiced their objections, the record manufacturers seemed honestly surprised that anyone would question their sonic shenanigans on the grounds that they degraded fidelity, since the manipulations were done solely to make the records sound better.

"Sonic enhancement," otherwise known as "artistic engineering," has always been a part of the record maker's bag of tricks. Early recording and playback equipment was not capable of approximating a broad, smooth frequency response, so the recording engineer had to augment his craft with a great deal of art in order to make the end result sound similar to the original.

By the mid-1940's, though, high fidelity from discs was beginning to look like a real possibility. The general public was still getting pretty shoddy sound for its record dollar, but research labs were turning out some amazingly good disc sound, and a few avant-garde record buyers were discovering that imported English Decca ffrr 78's had sound on them that put our domestic releases to shame. It was, in fact, just about this time that audiophiles discovered that the equalization on the best discs was accurate enough that the discs sounded most natural when reproduced via an accurate complementary curve, and were demanding equalization controls on their preamps. With the advent of the LP disc, in late 1948, the last remaining technical problem - surface noise - was pretty much solved, and by the time heated styli and feedback cutters came into widespread use, the disc medium

had reached the stage where it could transcribe, and play back, just about anything that the best microphones could pick up.

Up until that time, the objective of audio was absolute fidelity: sound that was indistinguishable from the original. Recording engineers worked to re-create the illusion of listening to a live orchestra from "the best seat in the house," and the better discs from the late 195Cs were evidence that the recording art was really starting to approach its ultimate goal. But somewhere along the line something The record industry conwent amiss. tinued to talk in terms of concert-hall realism, but there was an increasingly false ring to all the passionate avowals of absolute fi.

A couple of quotes from a recent article by Hans Fantel<sup>1</sup> serve to illustrate the notso-subtle changes that have been taking place. Mr. Fantel states that "The novelty of stereo has worn off. Record buyers are tired of hearing music jump back and forth between speakers. Realism, not ping-pong sound, is the new goal." Then, to illustrate this new goal of realism, Mr. Fantel quotes "a technician" as saying "It's like being all over the place at once. Till now, we were satisfied if we could make the listener feel he was hearing the music from the best seat in the house. Now with the new multichannel methods we can do better than that. No seat in the house gets as much of what's going on musically as (does) a multi-mike pickup. That's like having extra ears everywhere.'

This is realism?

The "classic" two- or three-mike stereo recording setup in a concert hall passed into limbo years ago, except among small, dedicated record companies that still believe that realism will sell records. This simplest of mike techniques yields the most natural stereo illusion, but the majority of record companies demand something that will give them much more control over instrumental balances, timbres, and the acoustical environment. Hence, the multi-channel recording system.

In multichannel recording, the performing group is divided into its basic instrumental or vocal sections, which are then spread out all over the floor of a large studio or hotel ballroom. (Concert-hall stages are too small.) Each section is assigned its own microphone and, because of the directionality of the mike and the physical isolation of the different sections, that mike picks up practically nothing but its own section. In some cases, there may also be a pair of general-pickup mikes, to pick up the blended, reverberant hall sound and add over-all perspective, and every microphone (and there may be as many as fifteen of them) feeds a separate input on a comprehensive control console. Each input has individually adjustable equalization, artificial reverb, and volume, while so-called "pan pots" allow each signal to be fed in any desired proportion into the two main stereo channels, to "place" the section anywhere across the "stereo stage." This wondrous array of controls is presided over by one or more

1. Hi-Fi Tape Systems, 1964 Edition, page 125.

technicians, under the supervision of a supreme commander, called the recording director, who decides which instruments shall be spotlighted, which ones need extra reverberation, which ones will be placed where on the stereo stage, and what tonal corrections are needed to produce a "good" recording.

This is a case where the techniques of recording are being used to create, almost from the ground up, something whose resemblance to the real thing is, frankly, a fabrication; the real thing does not exist to begin with. The "hall" is not a concert stage, the placement of the performers is not like that at an actual performance, and the balances and timbres of the instrumental sounds are almost entirely under the control of the recording engineers, who may or may not have the same ideas about such matters as the conductor or the composer. If the recording director knows his stuff, and really tries to turn out a natural-sounding recording, the multichannel technique can still yield a very natural-sounding recording. Vanguard uses multichannel recording, and the results have often been very musical and startingly realistic. But as Mr. Fantel's "technician" implied, natural sound does not seem to be of much concern to the

average recording director.

Many recording engineers feel that, since music is comprised of instrumental (or vocal) sound, the more instrumental sound they can record, the more music they are bringing to the record buyer. (This explains why so many recordings seem to put every instrument in the orchestra under a sonic microscope, revealing every subtle rasp, scrape and wheeze that is the inevitable byproduct of music These "raw" instrumental making.) sounds serve as the building blocks from which the recording engineer assembles the total musical sound, adding brilliance here, accentuation there, and reverberation all over, to "enhance the intent of the music." Evidently, the conductor is not felt to be capable of doing this, and the listener is believed incapable of perceiving it. for the "enhancement" is rarely subtle. Triangles clang, violins shriek, and trumpets and woodwinds zoom to the foreground for their moment of glory and then recede into the ranks again.

This "re-forming" of the original musical sounds, the better to "project the musical ideas" (to quote RCA's "Dynagroove" press releases), is a perfectly valid approach, in principle. But since its purpose is to point out, as it were, every

### A Portrait of the Recording Engineer



An engineer is supposed to be an intelligent, logical individual, acting on principles of scientific knowledge and common sense. Below is a brief catalogue of recording practices that make us wonder about the practitioners.

 It is considered Standard Operating Procedure at most major studios to monitor recording sessions at ear-shattering volume levels. Engineers explain that this is necessary because the car's frequency characteristics are less linear at reduced volume levels, but the practice has several other interesting results. Fust, it provides listening conditions totally unlike anything heard either in the concert hall or in the home. Second, it drives the listener's ears to such high levels of distortion that they are incapable of perceiving even moderate amounts of distortion in the program material. And finally, it is likely to cause progressive deafness in those who constantly expose themselves to this kind of aural trauma - an impairment that recording engineers, of all people, should try to avoid.

• Excessively close miking of vocal soloists with mikes having a peaked high end causes exaggeration of vocal sibilants. The industry has attempted to solve this problem, not by using smoother mikes, but by designing costly electronic devices to limit the amplitude of sibilant sounds

in the recorded signal.

• Much of the "professional" equipment used by recording studios is inferior in some respects to the best home equipment. RCA Victor's John Pfeiffer, in explaining the "Dynagroove" system, said "Even the finest of microphone preamplifiers, studio consoles and their associated amplifiers and tape machine electronics, along with the tape itself, have frequency response personalities which under the best of circumstances influence the quality of the (musical) instruments as they are performing." There are home-type preamps and amplifiers that do not have audible "frequency response personalities;" why shouldn't professional equipment be at least as good?

• The best available tape recorders produce a minimum of 1% IM and 0.5%harmonic distortion — as much as a good amplifier on the verge of overload. Yet most record companies cut their discs from *copies* of the master tapes, stoutly maintaining that the copying has no effect on the sound.

• It is almost universal practice, in record processing, to play the metal mother all the way through (to check it for cutting and plating defects). Unfortunately, a certain amount of groove deformation inevitably takes place, and this is flawlessly conveyed to every vinyl pressing that ends up in the record shops. detail of the musical score, with shadings dictated by the "meaning" of the music, it deprives the listener of his right to interpret the music according to his own tastes, and it does *not* produce what could be considered a sonic replica of *any* concert-hall sound. In short, it lifts recordings out of the realm of reproductions and into the category of original creations, whose resemblance to natural concert-hall sound is purely incidental.<sup>2</sup>

Popular music and that vast area of bland noodlings known as background music have their own special recording requirements. Most of these discs are played on the worst imaginable phonographs, they must of necessity have very restricted dynamic range (so they'll always be loud or soft, depending on where the listener sets his volume control), and since much of their desired effect is achieved through electronic "distortions" of various kinds, it is pointless even to consider them in terms of the original. It is equally futile to apply such idealistic standards to stereo show-off records the ones Mr. Fantel stated, optimistically, that the public is becoming tired of because these are intended to startle and to entertain, rather than to convey any illusion of reality.

There are, however, certain kinds of musical material that, having been carefully planned to yield a certain sound in live performance, are best reproduced as realistically as possible. Intrinsically fine voices, good jazz performances, and most classical music fall into this category, and here is where high fidelity finds its realindeed its only, meaning. Yet material like this has suffered just as much as the fun-and-effects stuff at the hands of the compulsive dial twisters.

John G. McKnight (of Ampex Corporation), writing in the *Journal of the Audio Engineering Society*,<sup>3</sup> said "Although we might have difficulty in finding anyone who would admit it, it is not uncommon practice in (cutting) disc masters to use a 70-cps high-pass (bass cutoff) filter, except for organ recordings. It is generally found that the elimination of these very low frequencies gives an improvement in over-all sound quality, since the low-frequency noises (in and about the studio) are eliminated, and no significant musical content is removed."

This deserves some comment. First, it is a simple matter for the home listener to kill "low-frequency noises" with a rumble filter or certain types of bass control, but if the extreme bottom isn't on the record at all, there is no possible way of recovering it at the listening end. As for the "improvement in over-all quality," and the lack of "significant" musical content below 70 cps, these are matters of opinion. There is a considerable amount of program material below this frequency – one third of the string bass's total range lies below 70 cps – and composers who wrote

2. It is rumored that the recording director of one major record company was fired for permitting a piano recording to sound like a real piano, but this has not been confirmed.

3. April 1962, page 107.

double-bass passages for this low range presumably would not have bothered to do so had they felt the deepest notes were not "significant." This is only a specific objection to bass restriction, though. Of more fundamental interest to us is the fact that many of the recording companies have taken it upon themselves to dictate to the record buyer what fraction of the total original sound he will get when he buys a "high-fidelity" recording. So, where does this leave the "industrystandard" RIAA equalization curve? The record industry's attitude toward this was evidently pretty well summed up by an executive of one major company who we talked to in connection with this article. "Yes," he said, "we do use the RIAA curve to cut our discs, but it's all a big laugh because the master tapes have their frequency response doctored up all over the place." (to next page)

### More Dope On Dynagroove

The April 1964 issue of the Audio Engineering Society journal carried a detailed article by RCA's Dr. Harry F. Olson\* which shed considerable new light on the controversial RCA-Victor Dynagroove system. On the basis of this, plus some other recent articles on the subject, THE STEREOPHILE is now obliged to retrench on one point with which we originally took issue, but we are even more firmly convinced that most of the other aspects of the system represent a giant backward step in the recording art.

The predistortion phase of Dynagroove the adding of complementary distortion to offset the effects of stylus tracing distortion - appears now to be based on sound engineering principles, even though the amount of predistortion that is added is predicated on the normal amount of tracing distortion produced by a 0.7-mil stylus, a size that has been generally abandoned by the high-fidelity industry. The IM that results when the predistorted groove is traced by a smaller stylus is, however, still less than that obtained when the same stylus traces a normal groove. This has been proven mathematically and demonstrated subjectively.

We applaud RCA's extraordinary efforts to eliminate acoustical problems in their recording studios (even though "well engineered" studios have a reputation for being characterless and antiseptic-sounding), and we are impressed by the measures



RCA took to avoid overmodulation of their discs. But we continue to be appalled at the reasoning behind the "Dynamic Spectrum Equalizer."

The three response curves shown above

\*Director, RCA Acoustical and Electromechanical Labs, Princeton, N. J.

(Figures 1 to 3), which were included in Dr. Olson's article, represent the tonal compensations that are added automatically to Dynagroove discs (and 4-track tapes) for three different intensity levels of orchestral playing, ranging from almost full-orchestra volume (100 db) to quiet solo-instrument volume (40 db). These curves are added to the RIAA recording curve, so when a Dynagroove disc is reproduced via the "industry-standard" playback curve, the over-all response of the signal will be as shown, according to the volume at which the orchestra is playing. At no time is the resulting playback response even remotely linear.

According to Dr. Olson, these tonal corrections are added to offset (1) the low-frequency masking effects of background noise in the average listening room, (2) the fact that home listeners listen at lower-than-concert-hall volume levels, (3) the



Figure 4

tendency for an average listening room to exaggerate bass response, and (4) the tendency for the average loudspeaker to radiate its treble in a narrow beam rather than a broad field. Dr. Olson then goes on to explain that the loudspeaker used as RCA's "reference system" in a "typical" room was an RCA LC-1A, whose performance characteristics, as reported in the article, reveal neither a low-end rise nor a tendency to beam treble.

All of which leads us to the conclusion that people who like the sound of Dynagroove recordings must either have very, very average systems and listening environments, as described by Dr. Olson, or are very poor judges of natural sound.

Incidentally, one of the basic requirements listed by Dr. Olson for the Dynagroove system was that the recording microphones should have response characteristics falling within the limits of the curves shown in Figure 4, above. Please note that these allow for a response deviation of almost 5 db — a total variation of nearly 10 db — with all of the deviations as bass attenuation and treble accentuation. We have often remarked, half jokingly, that the engineering mind deems it better to be up 10 db at 10,000 cps than down a half a db. Suddenly, we don't think that remark is very funny.

This is as though someone had crept into your living room in your absence, loosened your preamp's tone control knobs, and re-tightened them in different positions, so that when they said Flat, the response was far from flat. The record's jacket notes never specify what tonal "corrections" were used, and it would be impossible for any home playback system to correct for them anyway. The recording studio's resonant equalizers can produce response-curve shapes that no conventional R/C tone controls can complement, and even if we did use studio equalizers at home, no playback curve could restore the signal to flat response. Different amounts of equalization are used in each individual mike channel, so once the channels are mixed into the final left- and right-hand stereo channels. there is no way of separating them again for individual tonal corrections. And audio perfectionists worry about maintaining preamp equalization to within plus or minus a half a decibel! The recording executive was right; it's all a big laugh, except to those who still believe reproduced music should sound like the real thing.

To the high-fidelity perfectionist, the most infuriating thing about all this is the fact that modern recording and playback equipment could reproduce virtually all the frequency and dynamic range of a live orchestra to within a decibel or so, if given half a chance. A super-disc like this, with  $\pm 1$  db 30-to-15,000-cps response and 50 db dynamic range, would reproduce more cleanly and more realistically through good, modern playback systems than anything we've ever heard. Yet what do we get for our hi-fi record dollar? Typically, a frequency response of  $\pm 6$  db from 60 to 10,000 cps, with negligible response below 60 cps and a total dynamic range of less than 20 db! And it's all done intentionally, in the name of better recordings.

The one consistency underlying all this appears to be the prevailing idea that whatever *sounds* good is high fidelity. Since it is generally conceded that the end result — the sound — is the only criterion by which we can judge the fi of a disc, anyone responsible for the sound of a disc feels he has the prerogative, if not the obligation, to do to it whatever he feels is necessary to produce a "good" recording. And this is where all the trouble starts, because "good" does not necessarily mean "high-fidelity."

High-fidelity sound is, literally, highly accurate sound — sound that is very similar to that heard under actual liveperformance conditions. Thus, a highfidelity music recording would be one carrying information which, in playback, is translatable into sounds that are an accurate replica of those that might have been heard in the concert hall.

Fidelity is accuracy, and has little to do with personal preference. "Good" implies a value-judgment of liking, as opposed to non-liking. Consequently, any sound that creates a pleasant impression on a listener may be judged by him as "good" sound. The fact that he may not *like* the actual, live sound of a violin means that he would judge a high-fidelity reproduction of it as being bad, whereas a muffled, low-fi reproduction, erasing the gutty sheen that he dislikes, would be adjudged a "good" sound.

By the same token, a "good" recording may embody other positive virtues that have little to do with its actual sound. A disc that skips grooves on most phonographs, or has inadequate stereo separation, or becomes inaudible some of the time may be judged a "poor" record, even though the disc itself may have the potential of producing virtually perfect fidelity.

The record manufacturers realized some time ago that, since John Q. Public had learned that hi-fi was desirable, he expected his records to sound good. This posed a dilemma, for the most intrinsically perfect record in the world would *not* sound as good on the average phono as would a disc with carefully built-in "corrections" to compensate for the phonograph's short-comings. In fact, our ideal disc might not even track on JQP's console, and it doesn't take a sophisticated longer considered the end result of the record maker. Instead, it succumbed to Organization Thinking and became part of a *system*, whose ultimate objective was to reproduce *music* — not the concert-hall sound of music, but the "totality," the *meaning*, of the music.

This "systems" concept reached its culmination with RCA Victor's "Dynagroove" system.<sup>5</sup> which considered everything-from the musical score to the ambient noise in the listener's home - in terms of its effect on the ultimate musical "projection." This vast amount of data was poured into the hopper, as it were, and out came a formula for producing the optimum "projection of the musical ideas" under all these varied and conflicting conditions. The recording director consults with the conductor, to see whether they agree about the meaning of the music, but he is, in effect, the ultimate artistic arbiter of the music. This leaves the conductor and the musicians in the position of being little more than production-line workers, cranking out the raw materials from which the music is ultimately shaped by the computers, the recording director, and his banks of complex manual controls.

The only trouble with this "systems" approach is that really good playback



A 22-channel input mixer for multi channel recording. (Courtesy RCA Victor Records.)

listener to know that groove-skipping ain't hi-fi.

Since record making is, first, and last, a business, it is not surprising that the majority of record manufacturers decided to make a few compromises with perfection, in deference to JQP. Low-frequency amplitudes were held to within limits that his pickup could track. stereo spaciousness and separation were juiced up so they'd be audible from his closely-spaced loudspeakers, and a few db's of treble boost were added, to brighten up the dull top from JQP's console.

Unfortunately, though, once the first of these compromises had been made, the dam was breached. If it was all right to do these things just a little bit, why not do them even more? After all, they did make the records sound more natural on the majority of phonographs, and wasn't it the whole idea of high fidelity to produce natural sound? The answer, clearly was Yes on both counts, but this was the turning point in high fidelity: the realization that carefully calculated deviations from the *intrinsic* fidelity of a recording could yield truer sound, under *average* conditions. The recording itself was no systems, which are capable of reproducing virtually everything on a disc, will show up every one of these built-in "compensations" to whatever degree they were added. Lacking its own built-in deficiencies, it will reproduce every bit of treble boost, bass boost, and shift in over-all instrumental emphasis, and since each of these leftover "enhancements" represents something that would not be heard in a concert hall, the unnaturalness of the reproduced sound will be heard in a direct relationship to the quality of his system. The audio perfectionist would, it seems. do better to ditch his costly component system and buy an "average" console phonograph (whatever that might be). were it not for the fact that the resulting sound would still not be nearly as good as is obtainable from a top-notch system with ungimmicked program material.

Compensatory recording can give an illusion of wider frequency and dynamic range and improved sonic detail, but the illusion is never as convincing to the ear as the actuality. Besides, no amount of compensation on a disc can offset the high IM distortion, the poor transient response 6

<sup>4.</sup> The "overcutting" that causes distortion from most modern discs is mainly the effect of excessive treble boost, which causes groove accelerations that no stylus has low enough mass to follow

<sup>5.</sup> See page 5.

and the generally muddy sound of a typical console phonograph. The basic situation hasn't changed from what it was twenty years ago; the most realistic sound is still obtained from the best playback equipment, *if* the recordings themselves contain the most natural sound that the manufacturers can get onto them.

The concept of concert-hall realism the sound of an orchestra as heard in a concert hall — is necessary to provide a standard for evaluating reproduced sound. But the "best seat in the house" may still not be as good a listening location, from the standpoint of musical enjoyment or understanding, as, say, a spot eighteen feet in the air above Seat 46, Row D. Some concert halls don't have a passably good listening seat in the whole building, so should the recording engineer use the best seat in these houses as his sound standard? We should hope not. Yet once he decides that no seat in a given house is good enough, he is entirely justified in trying to create the illusion of listening from a "perfect" seat, which doesn't exist anywhere. And, once again, we're at the mercy of the recording director's own concept of what the music listener should hear from the orchestra. (to next page)

# **Stereophile Record Ratings**

Every record company turns out an occasional lemon and an occasional masterpiece, and most of them manage to produce passable discs most of the time. Some, however, have an unusual record for producing substandard or better-than-average discs, and it is on the basis of each firm's average output that we have prepared the following list of record ratings, with record brands listed in order of descending quality, on the basis of the criteria discussed in the article on these pages.

### **BBC Broadeast Transcriptions**

Without a doubt the most realisticsounding, musically natural recordings we have heard. Extremely wide dynamic range, full frequency coverage, and a minimum of audible gimmickry. Some of these have set standards that no other commercial discs have approached. Unfortunately, they are available only to radio stations; consumers can't buy them.

### English Columbia/EMI

Similar in over-all sound to the BBC discs, but with rather less dynamic range. Quiet surfaces.

### Vanguard

Natural, musical-sounding, with very wide frequency range and fairly wide dynamics. Good surfaces, few tracing problems. Most Vanguards have an easy, ungimmicked quality that allows the listener to enjoy the music without having his attention continually drawn to the fact that he is listening to a "hi-fi" recording.

### Deutsche-Grammophon

Generally good balance, with nice sense of perspective and wide frequency range. Dynamic range moderate (comparable to domestic Columbia). Surfaces very good, generally clean tracing.

#### London

Some high-end tip-up and low-end boost, with obvious but not usually offensive evidence of multimiking. Very wide dynamic range; widest dynamics of any commercial firm. Full-range, very slickly recorded, not entirely natural-sounding but, in general, musically appropriate. Very quiet surfaces.

### **RCA** Vietor

Until Dynagroove came along, Victor was close to the top of the list for sound quality among U. S. manufacturers. Some sizzle at the high end of most discs, but sound was generally natural and rich, with good low-end range and fairly wide dynamics.

### Dyer-Bennet<sup>1</sup>

This label must be included here for the simple reason that Ye Editor is responsible for the mastering and processing of folksinger Richard Dyer-Bennet's records.

All of Dyer-Bennet's discs, from Number 1002 to the latest, were taped and disced "straight," without any tonal compensation of any kind (except for RIAA equalization). Differences that exist between different discs stem from the use of different microphones, different recording locations, and different disc mastering services. The latest two releases — Numbers 9 and 10 — have the best sound on them, although they are quite dissimilar. Number 10 is probably closest to being a perfectly natural representation of the singer's voice.

#### **Rittenhouse**<sup>2</sup>

This small, shoestring operation has produced only two discs to date, one on mono only, the other on mono and stereo. Neither one has fully captured the sound of the master tapes (which we had an opportunity of hearing), but they both have a sense of spaciousness and openness that indicate that the producers are definitely trying to make honest, natural, musical-sounding discs. The stereo disc (of Dubois' "Seven Last Words of Christ") has a more natural illusion of depth and spaciousness than any commercial disc we have heard for a long time.

### Карр

Brilliant, razor-sharp sound, but surprisingly natural nonetheless. Fairly wide dynamic range, good surfaces, realistic stereo illusion. Recordings are larger than life, but appropriate to the music,

### Westminster

The first releases from this company were excellent on all counts. Later efforts, particularly the more recent stereo releases, have been very variable, ranging from quite natural but rather lacking in depth, to shockingly gimmicked, with sudden and drastic manipulations of instrumental balance.

Surfaces generally good, tracing generally clean, over-all frequency range good but not spectacular. Dynamics about on a par with domestic Columbia.

### **Command Classies**

Super-high-powered sound, but not very natural. Low bass attenuated, highs hard and wiry, with frequent tracing problems. Little or no sense of instrumental perspective. Excellent surfaces.

### Mercury

Rather close-up, hard sound, with slightly steely high end and rolled-off low end. Wide dynamic range (almost comparable with London's discs), quiet surfaces, and nearly always some tracing problems, particularly in inner grooves.

#### Everest

A few of these are excellent, but many are plagued with very severe distortion, which sounds like a combination of tracing problems (due to poor cutting or processing) and plain, ordinary electrical overload distortion. Wide dynamic range, good surfaces, but generally hazy, grainy sound despite razor-sharp highs.

### **Domestie Columbia**

Very variable. The best are rich, warm, and very natural-sounding, with fairly respectable dynamic range. The average is shrill, steely, and plagued with shockingly conspicuous manipulations of microphone balances. Surfaces only moderately good.

#### Angel

Much the same as Capitol, but with good sense of perspective. Surfaces generally good.

#### Capitol

Relatively limited dynamic range, thin low end, and an artificially brilliant, steelysounding high end, with tracing problems. Surfaces variable. Orchestral sound has no perspective.

#### Vox

This firm has the dubious distinction of having never produced a really good recording. Stereo illusion is often good, but all Vox discs we have heard have had a grainy, veiled quality and limited dynamic range.

### **RCA Vietor Dynagroove**

These have varied from horribly shrill and distorted to quite pleasant-sounding, but none of them has ever come close to re-creating the sound of a live orchestra. Surfaces good, tracing clean (most of the time), and dynamic range almost nonexistant.

<sup>1.</sup> Box 235, Woodside 77, N. Y.

<sup>2. 405</sup> S. 21st St., Philadelphia 46, Pa.

Obviously, we can't ask that the recording directors and engineers be abolished. Their judgment is needed in such matters as mike placement and instrumental balances, and they are expected to do as good a job as they can. What is necessary, though, if we are ever to have recordings that do justice to good reproducers, is a return to the old idea that the ultimate quality of the sound in the home should be the responsibility of the consumer, not of the record manufacturer.

The RIAA standard equalization curve was not intended as a standard for disc recording; it still left a manufacturer all the leeway he wanted for boosting treble or "adjusting" separation or compressing dynamics. But — and this is the crux of the whole problem — it did specify that every disc was to be made for *playback* via the standard RIAA curve.

The assumption was that, as long as a disc was reproduced on a system providing accurate RIAA equalization (and this would include the "equalization" effects of speakers, pickups, etc.), it would sound the way the manufacturer intended it to sound. It was up to the manufacturer to equip himself with the finest playback equipment he could obtain, so that he could evaluate what was going onto his discs, and it was left to the consumer to chocse playback equipment that would re-create as much of the inherent quality of the disc as he cared to hear. It was this philosophy that gave impetus to the whole high-fidelity movement, and it is the death of this philosophy --- the abandonment of the high-fidelity listener in favor of his know-nothing, care-nothing brethren - that could well flush the whole highfidelity business down the drain.

Increasing numbers of high-fidelity perfectionists complain that they are "confused" by the plethora of new components, conflicting claims, non-committal equipment reports and recurrent disappointments with purchases of newer, supposedly better components for their systems. No wonder they're confused! Every time they improve their systems, they uncover more and more of the sonic "enhancements" in their program ma-The sound is cleaner and more terial. transparent, yet it seems to become less and less natural, until they happen to listen to one of those rare FM broadcasts of ungimmicked tapes or discs.

The Boston Symphony Orchestra broadcasts, for instance, or of some of the fantastic BBC transcriptions, can restore The Faith of the most cynical high-fidelity listener, but they only aggravate his dissatisfaction with the sound from commercial recordings. They are, however, concrete evidence that tapes and discs can be extraordinarily realistic, when heard through a good system. Yet there is no way (short of taping off the air) for the critical listener to come by them. They are unavailable to the general public; who must be satisfied with the complex of compromises and "artistic creations" foisted on him by the commercial recording firms. Even 4-track tapes, which command premium prices because of their

supposedly superior sound quality, are usually subject to the same "enhancements" as their corresponding discs — the fluctuating balances, the tipped-up high end, the volume compression, the overlyclose miking, and all the rest of it.

Commercial tapes still have some inherent performance limitations, but discs are capable of extremely high quality now, which is what makes the sound of most of them so intensely frustrating to the high-fidelity perfectionist. For it isn't the state of the recording art that's the stumbling block, it's the art of recording. It must, of course, be an art, but if we are to preserve any semblance of sanity in the high-fidelity field, the recording companies are going to have to stop trying to assume responsibility for the buyer's refusal to equip himself with half-decent equipment. Recordings must be evaluated in terms of how they will sound on the best available equipment, and should be made to sound as realistic as possible on such systems, because as long as better systems yield worse sound, there is not going to be any incentive for advancing the audio art.

If a particular record manufacturer feels better qualified to interpret a piece of music than the conductor and his orchestra, this is his privilege. But whatever he chooses to do to the sound, he should judge the result in terms of the re cording itself, *not* in terms of how it will sound on some statistically average phonograph.

Record companies that have sufficiently strong feelings about the limitations of the average phonograph to continue treading a path of placation could make available at least a limited number of "deluxe" recordings for the person who has paid through the nose for good equipment and wants to hear really good sound from it. Most of us would gladly pay a dollar or so extra for discs or tapes that we could trust to be ungimmicked and worthy of the quality of our systems, yet these discs would cost less to make than the average commercial products. The orchestra would already have been paid for (for the "main" recording session), and the deluxe recording would not need the constant ministrations of a host of dial twisters and high-salaried "musical technicians" imposing their judgments on the music. Good microphones, properly placed, judiciously mixed, and then left strictly alone for the entire recording session would often yield just the kind of recordings we're after - ones in which the conductor and the musicians would determine the accents and shadings in the musical sound.

Even better, perhaps, would be a series of releases of live performances of some of the country's major orchestras. These are often taped for broadcast, the sound quality is sometimes extraordinarily good, and some of the performances are considerably more spontaneous and exciting than the ones that the same groups turn out at recording sessions. Financial and legal considerations are obviously no insurmountable obstacle here, for RCA Victor was able to arrange for the release of several of Arturo Toscanini's broadcast tapes. The sounds of the audience, including the final applause, would tend to add rather than detract from the impact of the **per**-formances.

Ungimmicked, full-range discs of, say, some of the recent Boston Symphony Orchestra broadcast tapes could provide a level of quality that would set the high fidelity field, first, on its ear, and then, very probably, back on its feet again. But it is very unlikely that we will ever get discs like this unless we make it clear to the record makers that there's a demand for them. There are several ways you can help to do this.

First, and most important, support to the best of your ability those American record companies that have earned a reputation for unusually natural-sounding recordings. These would include the ones listed near the top of the rating list on page 7.

Second, patronize the European record manufacturers whenever possible, which is likely to be quite often. English Columbia releases practically everything that's available here on Capitol, and EMI/HMV releases many of the works that appear on Columbia in the U. S. Deutsche Grammophon, Parlophone, etc. release works that are generally not available in the U. S. on any domestic label.

Third, explain to your record dealer what you're doing and why you're doing it, and ask him why more American firms

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### From the Top of the Pile

A brief listing of some old and new recordings that show what can be done with the medium, when anybody bothers to try.

Britten: Four Sea Interludes and Passacaglia from "Peter Grimes." London mono, LL-917.

Britten: A Ceremony of Carols (and Carols of Many Nations). Rittenhouse mono, RM-1001.

Shostakovitch: Symphony No. 5. Westminster mono, XWN-18001.

Virgil Thomson: Suite from "The River," and "The Plow that Broke the Plains." Vanguard stereo disc, VSD-2095, or tape C-1642.

Music for Bang, Baaroom and Harp. (This is a stereo showoff disc, but the sound is stupendous. Stereo is hyped, but the frequency response does not appear to be.) RCA Victor stereo disc, LSP-1866.

Vaughan Williams: A London Symphony. Vanguard stereo disc, SRV-134SD,

A Journey Into Stereo Sound, London stereo disc, PS-100.

Rachmaninoff: Piano Concerto Number 2. RCA Camden stereo disc, CAS-475.

Mahler: Symphony Number 1. Columbia stereo disc, MS-6394.

**Dubois:** The Seven Last Words of Christ. Rittenhouse stereo disc, RS-1002.



### Those Service Monsters by Robert J. Kerr

The scene is an obscure room in the depths of the Ajax Products Company complex, the time, midnight. Outside the door stands an alert, steel-faced guard, his right hand resting on the butt of his .357 magnum, the keeper strap loosened for a quick draw.

Out of the shadows, two figures approach. One is a nervous businessman in a gray flannel suit. He glances furtively into the murky darkness around him. The other is a tall, thin man in a trench coat, his pulled-up collar and low-drawn hat brim surrounding his features in dark obscurity.

The guard examines their papers and passes them into the Inner Sanctum. A large man with a big cigar looks up from a dimly-lit table in the middle of the room. The nervous one addresses him. "Here he is, Boss, the best in the business. He's so good he once smuggled Martin Luther King into a Ku Klux Klan convention in a topless bathing suit!" The fat man removes his cigar. "Good, I'm glad you could come, Mr. -." he says. his voice trailing off. The man in the trench coat glowers at him. There is an awkward silence. "Oh, I'm sorry," 'says the Boss. "You're Mr. X to us. Well then, let's get to work," he says with forced joviality.

Hours later, they straighten up with an air of satisfaction. The Boss speaks. "Excellent job, Mr. X. I think we're all ready for the final production design. We'll hide the top panel screws under this escutcheon, as you suggested, and glue it down with epoxy cement. It will look lovely, and nobody will ever figure out how to get it apart. Of course, we won't breathe a word about it in the destruction manual; we'll let Howard Sams figure it out. Anyway, even if anybody does sleuth it through, we've got some more booby traps. This screw over here - the only one that's visible - loosen it three turns and it drops the whole mechanism onto the speaker cone. Now the tube access panel we'll put in at such an angle that only someone with double-jointed fingers will be able to get at the tubes. And when they do, the rectifier's a real surprise; you can't get at it without touching the power supply connections. And the speaker wires - we'll make them just short enough that you can't possibly get the unit far enough out of the case to reach the speaker plug. Mr. X, you're a genius. We can't thank you enough, and we're confident that your invaluable contribution to this design will endear you to service technicians all over the civilized world. We'll hope to see you again next year when we get ready for the new model."

This little dramatization may give the impression that I'm bitter. Well, I am! Consumers have allowed the perverted disciples of Raymond Lowey to bilk them out of thousands of dollars a year in unnecessarily high maintenance costs. The corder servicing requires a technician with a good mechanical sense, in addition to a sophisticated knowledge of special recorder electronics, qualifications which are not necessary for a serviceman working primarily on TV, radio, amplifiers and so on. Why, then, should the job be made more difficult than it has to be? It is more the rule than the exception that most of the labor cost of recorder repairs represents time spent in the disassembly and assembly of things that shouldn't have to be disassembled at all if the unit were properly designed.

As a group, the Europeans (the English excepted) produce the hardest-to-service radios and tape recorders. The mechanisms are difficult to remove from the case, and parts are fragile and are distributed in and around the mechanism on a multitude of interconnected and inaccessible subchassis. Japanese products are variable, but generally much better in this respect. And because Japan follows the same basic EIA standards for electronics as does the U. S., many more of their repair parts are available locally.

My complaints would have very little force were it not for the fact that there exist two outstanding examples of good design for maintenance. The first is the whole line of Ampex home-type recorders, from the original "A" Series machines



An Ampex 1260, stripped for servicing. Removing the top panel and chassis cover exposes virtually all electronic and mechanical parts, and allows all service adjustments to be made with the recorder operating normally on the test bench.

product that our conniving conspirators were cooking up was a tape recorder, but the same things seem to apply to a greater or lesser degree to almost all consumer products, be they mechanical or electrical.

A tape recorder, by nature, requires more routine maintenance per hour of operation than most other audio, TV or other electronics products, and good tape recorder servicemen are hard to find. Very few electronics service organizations specialize enough to be well equipped or trained to cope with tape recorders. Rethrough the current-model F-44. All their mechanical and electrical parts are readily accessible, and the machines can be serviced electrically and mechanically with all covers removed, while operating in their normal position, right on the workbench. The electronics are fully exposed for measurement and signal tracing or parts replacement, so a complete repair, checkout and calibration can be run on these machines at less labor cost than a belt replacement in many other machines. (*to page 15*)



Stereophile Reports on Equipment are primarily subjective reports, based on actual use of components in the home. Components for testing are taken from dealers' stock or, when not available locally, are obtained from the manufacturer, and only one sample is tested unless indications are that it is defective. If a retest is necessary, our experience with both samples will be reported. The manufacturer is sent a copy of the report prior to publication, and may if he wishes append a manufacturer's comment. He cannot, however, demand that the report be changed or that it not be published. Stereophile Reports on equipment are copyrighted, and may not be reprinted or quoted in whole or in part without the written permission of the publisher.

### Electro-Voice Models Six and Two Speakers

SPECIFICATIONS (furnished by manufacturer): Model 6-Four-way system with 18inch woofer, 8-inch conc-type mid-range, and horn-loaded compression tweeter and supertweeter. Frequency response: 30 to 20,000 cps. Power eapaeity: 35 watts program, 70 watts peak. Nominal impedance: 8 ohms. Dimensions: 30" H x 32 W x 17<sup>1</sup>/<sub>2</sub> D. Price: \$300. Model 2-Two-way system with 12-inch woofer and horn-loaded compression tweeter. Frequency response: 30 to 15,000 cps. Power capacity: 30 watts program, 60 watts peak. Nominal impedance: 8 ohms. Dimensions: 14" H W x 131/2 D. Price: \$120. MANUFAC-TURER: Electro-Voice, Inc., Buchanan, Mich.

These are two of Electro-Voice's "middleground" speaker systems, filling the quality (and price) range between the huge Patrician 800 and the diminutive Coronet system.

The Model 6 is a rather large four-way system employing an 18-inch woofer with a half-inch-thick cone of light, rigid foam plastic (See "Farewell to the Paper Cone," in Volume 1 Number 1 of *The Stereophile*), an 8-inch paper-cone driver for the lowermiddle range, and compression-type horn units for the upper ranges. Crossovers are at 250, 800 and 3,500 cps. A fiveposition rotary switch provides treble adjustments in steps of about 2.5 db, hinged at about 1,500 cps. Position 3 is the Normal response setting, which we used for our tests.

Oscillator checks on the Model 6 revealed something we had never before encountered: The system's subjective response seemed to agree almost exactly with the manufacturer's published response curve! The same was found to be the case with the Model 2, so we are publishing the manufacturer's own response data with this report as an aid in interpreting our comments about the sound of these systems. Like the other subjective response curves published in recent issues of *The Stereophile*, these curves have their vertical scales adjusted



so that a response deviation that is barely perceptible to the eye will be barely perceptible to a critical ear.

No spurious sounds were evident when sweeping the oscillator through the speaker's middle and upper ranges, but at frequencies below 50 cps, some harmonics were audible even at moderate input power levels. At levels corresponding to fairly high listening volume on program material, harmonic content was readily apparent below 40 cps.

On music, the E-V 6 sounded big, rich, and markedly boomy. The boominess sounded like the result of underdamping



### E-V Model Six.

of the woofer, since it seemed to be induced by any deep bass note instead of by a narrow range of frequencies. As a result, the entire bass range was somewhat obscure and deficient in detail, and the very deepest notes (and some of them were *very* deep) were significantly masked by the higher-pitched boominess.

The system, like all E-V speakers we have heard, was an excellent reproducer of brass instruments, and at low-tomoderate volume levels, it was judged completely free of the raucous brilliance we have heard from early E-V speakers. There was very little coloration, and what there was consisted of a slight "snarl" in the upper middle range and some mild sizzle up around 10 kc which tended to exaggerate record surface noise and added a subtle wiry quality to string tone. The tweeters were quite directional, providing subjectively uniform treble over a range of only about 40 degrees, so stereo center fill-in was not very good until the speakers were placed fairly close together. The accompanying instructions show the optimum speaker spacing.

Sonic details were fairly well reproduced, but transient response was not comparable to that of a good electrostatic system. At higher-than-moderate listening levels (in an 8 by 20 by 13-foot room), the Model 6 took on an edge of shrillness and added an odd gargling quality to the sound, as though some of the elements associated with the upper range were tending to ring or to go into marginal overload.

For \$300, we would have expected more of this system. Admittedly, we have not heard another system in this price range that we would consider as good as the E-V Model 6, but on the other hand, we have heard less costly ones that, to us, are better-sounding. For example, \$240 will buy a Janszen four-element electrostatic tweeter and its mating 350 woofer, with a suitable enclosure. And although the Janszen tweeter, too, leaves something to be desired for stereo reproduction (because of its multiple treble beams), the over-all system performance would, in our opinion, be superior to that of the E-V 6.

The E-V Model 2, at \$120, has even stiffer competition than the Model 6, for there are more high-fidelity speaker systems in this price range than in any other, and some of them are very, very good. The Model 2 has a 12-inch highcompliance woofer in a sealed enclosure, and a horn-loaded compression tweeter for the range above 800 cps. A threeposition slide switch controls treble



E-V Model Two.

balance above about 1,500 cps, in increments of about 5 db (at 10 kc) above and below normal level.

Oscillator checks on the Model 2 did not reveal any marked response irregularities throughout the audio range, and no distortion products were audible above 50 cps. Below this frequency, the woofer in the Model 2 seemed actually to have less distortion than that in the Model 6, at equivalent output levels. Only at quite high levels was some distortion evident from the woofer, and this was audible as a slight fluttering modulation rather than as perceptible harmonic tones.

The Model 2's over-all sound was similar to that of the Model 6, with somewhat less high-end detail and less low-bass output. The differences were



Model Two frequency response.

not, however, as pronounced as the differences in their response curves would suggest, and frankly, we rather preferred the Model 2's softer high end, as it did not emphasize surface noise and it lacked the slight wiry quality that the Model 6 imparted to string tone. Like the Model 6, the E-V 2 was quite boomy, and this may have helped to account for the relatively small difference we observed between the low-bass output of the two systems.

The Model 2 has a quality of "aliveness" and presence (and we don't mean that in its derogatory sense) that is somewhat lacking in direct-radiator systems, and many listeners may prefer it. We would still choose the Janszen Z-500 as the best unit in this price class, if only because our long-time exposure to good electrostatic sound has spoiled us for anything with less over-all transparency and detail.

### Neumann DST-62 Stereo Pickup

SPECIFICATIONS (furnished by manufacturer): Frequency range: 30 to 15,000 cps. Output: 0.5 m/@ 5 cm/sec. Channel balance: within  $\pm 2$  db, entire range. Separation: 25 db at 1 kc. Compliance: 3.6 x 10<sup>-8</sup> cm/dyne. Recommended tracking force: 4 to 6 grams. Harmonic distortion at 1 kc (14 cm/sec.): below 2%. IM Distortion (4000/400; 1:4): below 2.5%. Tip radius: 0.55 mil. Price: \$79.50. DISTRIBUTOR: Gotham Audio Corp., 2 West 46th Street, New York 36, N. Y.

This dynamic cartridge is a plug-in unit for use with standard tubular arms such as the SME, Ortofon and Neumann's own STA-12 arm. It has very low output—on the order of 0.5 mv—so step-up transformers (available from Gotham Audio) will be needed for use with most phono preamplifiers.

This is probably a very good pickup;

it is beautifully made and looks like a precision instrument, but it has one strike against it at the outset, and as far as we're concerned, it's a strikeout. Although very nearly the most expensive cartridge available, the Neumann requires a recommended tracking force of 4 to 6 grams! In the recommended Ortofon arm, our DST-62 took 6 grams of force to get clean tracing from most heavily cut stereo discs, and even at that force, it did not track the loudest passages quite as cleanly as does the Weathers PS-11 system at  $1\frac{1}{2}$  grams.

The manufacturer explains that, because the stylus is extremely highly polished, the reduced friction holds groove wear to the same level as that of other, lighter pickups with less perfectly polished styli. This may well be true, but it ignores such minor details as the abrasive action of surface dust, vinyl deformation due to pressure plus contact friction, and the possibility that some lightweight pickups may also have highly polished styli.

We found that the 6-gram force was high enough to hold the stylus in good contact with the groove despite a certain amount of groove wear, so that a disc sounded almost as clean after 50 plays as it did when new. But we also found that heavily cut grooves, which sounded acceptable on the Neumann after 10 plays. had gained noticeably in distortion when replayed on a lightweight pickup. On the other hand, some of our oldest, most beatup discs (dating from the era of the 15gram magnetic), and a few recent ones with misshapen grooves, sounded cleaner on the Neumann than we can recall ever having heard them, so there is an advantage to this high tracking force. But we can't swallow the claim that the DST-62 is easy on records. T'ain't so!

How does it sound? There was some high-end roughness, which aggravated the audibility of groove distortion when this occurred, but the pickup is quite neutralsounding, lucid and excellently balanced, and stereo separation seemed to be limited only by the discs themselves. We did not run objective performance tests, because our test records are in new condition, and most of the pickups we test in future will be lightweight ones. We can't afford new test records right now.

### Sherwood S-3000 V Stereo FM Tuner

SPECIFICATIONS (furnished by manufacturer): Sensitivity: 1.8 uv for 30 db quieting. Bandwidth: 200 kc. Capture ratio: 2.4 db. Frequency response: ±0.5 db, 20 to 20,000 cps mono; ±0.5 db, 20 to 15,000 cps, stereo. Distortion: below 0.3% IM at 100% modulation. Hum and noise: 60 db below 100% modulation. Output: 1.2 volts max. Separation: 30 db minimum, 40 db typical, 40 to 12,000 cps. Antenna input: 300 ohms balanced. Controls: Level and AC On-Off; Tuning; Hush (Muting) switch; Hush control. Dimensions: 14" W by10¼ D by 4 H, over-all. Price: \$165.00; with leatherette cover, \$172. MANUFAC-TURER: Sherwood Electronic Labs, Inc., 4300 N. California Ave., Chicago 18, Ill.

This all-tube FM multiplex tuner is priced competitively with the Dynaco FM-3 in ready-built form, which we have considered to be the best available at the price.

The Dynatuner had three controls, for tuning, volume and AC power. To these, the Sherwood adds a STEREO/MONO switch, a MUTING ("Hush") switch, and a threshold control for the muting function. The STEREO/MONO switch deactivates the multiplex circuits to reduce noise when listening monophonically to weak stations, just in case the main control unit doesn't include any A + B blending provision. The MUTING switch kills the loud rushing noise normally encountered when tuning between stations, and a rear-panel control enables the muting to be set right at the threshold of its effectiveness, for minimal suppression of weak stations. Even when properly adjusted, the MUT-



ING does weaken very feeble stations, so it should be switched out entirely when tuning for long-distance stations. The MUT-ING has absolutely no effect on strong stations.

The tuning indicator is a small nullcenter meter, and a tiny red light glows to indicate reception of a stereocast. The light is actuated by the 19 kc multiplex subcarrier, and does not respond to interstation hiss (as do many stereo indicators, including the Dynaco one). Also unusual is the fact that the tuning indicator, at least in our sample, agreed almost perfectly with the results obtained when tuning by ear, for minimum noise and distortion. Other individual samples may or may not be as acutely aligned as was ours. but our unit showed that the circuit design will at least allow the unit to be aligned for proper indicator tracking.

The S-3000 V does not have AFC, and it doesn't need it. Stability in our sample was rock-solid, without a trace of drift from a cold start through several hours of use. As a matter of fact, everything about the S-3000 V gave a distinct impression of smoothness and firmness, including the controls. Its sound was superb—clean, focused and transparent, at least on those stations that were transmitting decent program material to begin with. Stereo separation appeared to be limited only by the transmissions themselves.

Sensitivity was as high as that of any tuner we've tested. Our sample responded, feebly and noisily, to four distant stations that a Dynatuner couldn't pick up at all. Slightly stronger stations that both tuners barely picked up came through with equal quieting and with very low distortion on both tuners. The Sherwood's capture ratio was somewhat better than that of the Dynakit, as evidenced by its ability to pick out the stronger of two stations of identical frequency when there was only a slight difference between their signal strengths.

The Dyna stereo tuner in kit form is still by far the best we know of for the price, but if we were choosing a readybuilt tuner in the \$170 price class, the Sherwood S-3000 V would now be our first choice.

MANUFACTURER'S COMMENT: The identical circuitry and performance is also included in our Model S-2100 II FM Stereo/ AM tuner and Model S-8000 III FM Stereo receiver. The FM circuitry without the multiplex stereo circuitry is also included without variation in our Model S-2000 IV FM/AM tuner and Model S-3000 III FM-only tuner.

### Electro-Voice 666 Microphone

SPECIFICATIONS (furnished by manufacturer): Type: Cardioid dynamic. Frequency response: See curve. Output impedances: 50, 150, or 250 ohms, selectable by internal connection. Output level: -58 db (re 1 mw/10 dynes/cm<sup>2</sup>); RETMA gm -150 db. Price: \$153.00. MANUFACTURER: Electro-Voice, Inc., Buchanan, Mich.

This is a professional-type unidirectional dynamic microphone with a cardioid pickup pattern and a very high front-toback sensitivity ratio. The unit is unusual in that it derives its cardioid pattern, not from electrical cancellation between a pair of selectively misphased elements, but from *acoustical* cancellation between the front and back of a single diaphragm.

Multi-element cardioids, besides being costly, are often quite peaky and high in distortion, because the peaks and distortion products from each element are not cancelled out. E-V's "Variable-D" system uses three behind-the-diaphragm ducts and acoustical delay lines to direct rearoriented sounds to the back of the diaphragm, out of phase with the same sounds as they appear at the front of the diaphragm. The result is highly effective rear cancellation, without emphasis of response peaks or distortion in the dlaphragm itself.

The 666's pickup pattern is almost ideally cardioid at frequencies below 5 kc. Above that, the pattern becomes increasingly narrow until, at 10 kc, the pickup angle is about 60 degrees wide. This is considerably broader than the highfrequency beam of most microphones, and is one of the things that make the 666 so admirably suited for stereo recording.

Like most professional dynamics, the 666's output is quite low, but it is entirely



Published response of the 666.

# Trimming

In the report on the Ampex F-44 recorder in the last issue, we mentioned the fact that there were two simple modifications that could improve the unit's over-all performance.

The slightly rising low-end response that was reported can be almost completely eliminated by bridging a 500 pf (500 mmf) trimmer capacitor and a seriesconnected 3.3-meg  $\frac{1}{2}$ -watt resistor (Figure 1) across the first equalization capacitor (C 4) in each playback preamp stage. The resistor limits the playback bass boost below about 100 cps, while the capacitor offsets the effect of the resistor below 60 cps, to maintain flat response below that frequency.

Cut the resistor leads short (about  $\frac{1}{2}$  inch) and fasten a  $\frac{1}{2}$  inch lead to the uncommitted terminal of the trimmer. Connect the pair of components across the 1000-pf ceramic capacitor that runs from pin Number 1 of each of the two tubes



directly under the playback head trim pots (which are on a rectangular ceramic

adequate for any good tape recorder's mike preamp. Internal strapping provides a choice of three Low-Z output impedances, so recorders that lack Low-Z inputs will require a suitable matching transformer.

We used the 666 for a variety of recordings over a period of months, and found it to be an excellent dynamic. Its transient response and over-all clarity are very nearly equal to that of a good capacitor mike, and its high end is actually smoother than that of some of the most highly-touted capacitor mikes (such as the Telefunken U-47M). A subtle nasal quality was observed on certain kinds of program material (violin, voice), but the 666 was otherwise entirely free from audible colorations.

The 666 does not have quite the highend sweetness of the B&O ribbon mikes, and has noticeably less "snap" than the Sony C-37 condenser mike. At the extreme low end, the 666 has less response than either of those mikes. It is about 4 db down at 40 cps, and this (probably in-

# the F-44

plate). Using an Ampex 7<sup>1</sup>/<sub>2</sub>-ips test tape, adjust each trimmer so that the measured output in each channel is down at 50 cps



Figure 2.

by the same amount as it is up at 100 cps. The underdamping of the VU meters is remediable by bridging a small electrolytic capacitor across each meter movement. The time delay required for the charging and discharging of the capacitor provides a damping effect that is virtually identical to that obtained by mechanical means in a conventional VU meter.

Use two 15-mf 6-volt capacitors, with both of their negative leads tied together and grounded to the negative terminal of the meter. (The meter's polarity is marked on the tips of its terminal screws.) Connect one of the positive capacitor leads to the other meter terminal, and the remaining positive lead to the center terminal of the meter calibration potentiometer (next to the meter) that is closest to the takeup reel turntable (Figure 2).

tentional) rolloff is noticeable as a loss of foundation when taping pipe organ and symphonic material. Most professional users evidently prefer mikes with some low-end rolloff, but we would prefer to see this done (if it must be done at all) in the associated equipment. On the other hand, the 666's slight bottom loss could be easily equalized in the associated equipment, too, so we won't guibble.

This is undoubtedly one of the best cardioid dynamics on the market. It may well be the best of its type; we haven't yet encountered another one that can touch it, and while we've tested most of them (including RCA's premium-priced line), we haven't tested them all. Choosing between the 666 and its closest competitors (as mentioned previously) would be a difficult task on the basis of quality alone, for the B&O miles are bidirectional (figure-8) and are susceptible to damage from severe jarring or from outdoor breezes, while the Sony costs \$150 more. The choice would have to be on the basis of individual requirements and price.



### BEETHOVEN: Concerto No. 2 in B Flat; Concerto No. 4 in G

Julius Katchen, London Symphony Orchestra, Pierino Gamba, conductor. London tape LCL-80142, \$7.95.

Considering the differences between these two recordings, it is hard to believe they are the work of the same performers and the same record manufacturer. The second concerto is light, zestful and thoroughly ingratiating, with recorded sound that is quite appropriate to the music. There's a nice sense of depth and distance, stereo spaciousness is optimal, instrumental balances and timbres are natural and appropriate, and the piano seems to have just the right amount of weight.

The Fourth, on the other hand, strikes me as being less satisfactory on all counts. The performance is hurried and nervous, and the sound is entirely too heavy, particularly with respect to the piano pickup, which is almost soddenly muffled. True, the Fourth does call for a richer texture than the Second, but to me this recording overdoes the richness almost to the point of turgidity. There is no denying that the orchestral sound *is* gorgeous, but it is just a shade too gorgeous for the music.

My review copy was very, very clean, lucid and quiet, but then this is generally true of London's recent tapes anyway. J.G.H.

### **BRAHMS:** The Four Symphonies

L'Orchestra de la Suisse Romande, Ernest Ansermet, conductor. London "Twin-Pak" tapes, LCK-80134 (First & Second symphonies), and LCK-80136 (Third and Fourth), \$11.95 each.

These are sweetly lyrical performances, but they lack the excitement that most people who like Brahms like about Brahms. This is Brahms in the style of Debussy. J.G.H.

### DVORAK: Symphony No. 4 in G, Op. 88; Seherzo Capriceio

Halle Orchestra, Sir John Barbirolli, conductor. Vanguard Everyman stereo disc, SRV-132-SD, \$2.98. A comfortably straightforward, lyrical reading of what I still feel to be the most enjoyable of Dvorak's symphonies, topped off by a sprightly, zestful *Scherzo Capriccio*, and splendidly recorded besides.

Sound is natural, rich, and wide-range, with fairly respectable dynamics and excellent stereo distribution. The sound in the *Scherzo* seems somewhat more transparent than that in the Symphony, suggesting that it may have undergone one less tape duplicating cycle between the original master and the final disc, but both are far above average in over-all sound, and are clean to the last groove, largely because of rather conservative cutting levels. J.G.H.

### The King of Instruments

Catherine Crozier, Program No. 1 (Reubke: Sonata on the Ninety-Fourth Psalm; Langlais: Arabesque sur les Flutes, Dialogue sur les Mixtures; Alain: Deuxieme Fantaisie, Postlude pour l'Office de Complies), Aeolian-Skinner tape ASC-502, \$7.95.

Two Great Organs: Philharmonic Hall, N. Y. and Asylum Hill Congregational Church, Hartford, Conn., (Dupre: Preludio, Deuxieme Symphonie; Buxtehude: Prelude & Fugue in D Minor; Bach: Kyrie, God Celestial Fire; Langlais: Ave Maria, Ave Maris Stella; Willan: Introduction, Passacaglia & Fugue; Handel: Suite in G Minor); Aeolian-Skinner tape ASC-501, \$7.95.

When the first Aeolian-Skinner-Washington records were released some time ago, record critics went into ecstasies over the sound thereon. I was never that impressed with the discs for, although they *were* very clean and had unusually wide dynamic range, the surfaces on my copies weren't so terribly good, and the recordings lacked the full, massive low end that makes the pipe organ such a hackleraiser. I always had the impression that the discs didn't quite do full justice to the original master tapes. These 4-track tapes have confirmed that impression.

These do have the genuine "organ sound" — really deep, rich, floor-shaking pedal bass and even more awesome spaciousness than was on the discs, which is saying something!

The performances are exemplary on both

tapes and, but for some slight low-bottom mud and some perceptible flutter, the recordings too are superb. The mud appears to be an inherent shortcoming of commercial tapes — they all have it to a greater or lesser degree, but few loudspeaker systems have sufficient low-end detail to reveal it, so it rarely bothers anyone. The flutter, too, is understandable, since certain pipe organ stops are far more susceptible to tiny amounts of flutter than is piano sound, even though the latter has earned the reputation for being the most flutter-prone material of them all.

Hiss was a bit higher than normal on my copy of this tape, but it was within the range of tolerance, at least until the volume was cranked up to very high levels. Unfortunately, most organ-sound devotees like to listen loud, so they'll have to exercise a bit of psychological rejection to derive full enjoyment from these otherwise superb recordings. J.G.H.

SCHUBERT: Symphony No. 9 in C Major (The "Great"); Symphony No. 8 in B Minor (The "Unfinished"); Overtures "Des Teufels Lustschloss" & "In the Italian Style."

Vienna Philharmonic Orchestra, Istvan Kertesz conductor. London tape LCK-80141, \$11.95.

Although well represented in the record catalogues, the Schubert 9th symphony has not had what I would consider a completely satisfying performance on stereo to date. As far as I'm concerned, though, this Kertesz release is the best one I've come across.

The interpretation and execution are a bit on the heavy side — more so than in the old mono one by Barbirolli and the Halle orchestra, which is still my favorite — but I still find this to be a very satisfying performance, and the recording, for once, has just the right amount of weight for the music. Far too many releases of this symphony have been marred by overblown sound that confused the details in the scoring and destroyed the essential lightness of much of the music.

Technically, the recording is one of London's best latter-day efforts. Timbres are natural, balances equitable, and there does not appear to be any restriction of low end. There's a nice sense of spaciousness, little depth, but a generally natural, musical sound. Hiss was unusually low.

The 8th, so-called "Unfinished" symphony is a contender for the dubious title of the most hackneyed symphony in the standard repertoire. It is an absolute must for every record company's classical catalogue, and some major firms seem to have a policy of releasing at least one new "Unfinished" every year. Under the circumstances, it is hardly surprising that most available performances of this work are dull, stodgy, or elaborately dramatized. Mr. Kertesz plays the work as if it is a fresh, new composition, and the result is an unalloyed pleasure.

The recording, which was presumably (?) made some time after that of the 9th, is even better. The sound is generally a bit smoother (better microphones perhaps), there's somewhat more sense of depth and an over-all naturalness that does full justice to the music. Dynamic range is staggering — it sounds as if there is practically no volume compression — yet tape hiss on my sample was, if anything, lower than on the reverse tracks.

The side fillers are delightfully done and equally well recorded. This tape has that rare combination of top-notch performances and recordings. Get it. J.G.H.

### SIBELIUS: Symphony No. 1 in E Minor

Halle Orchestra, Sir John Barbirolli, conductor. Vanguard Everyman stereo disc SRV-132-SD, \$2.98.

I have always considered the best recorded performance of this to have been the old Ormandy one with the Minneapolis Symphony on 78s (*That's* going back some years!), but was willing to acknowledge that the more recent Anthony Collins one on London mono was probably the best combination, to date, of good recording and satisfactory performance. Now I've switched allegiances again.

This is not likely to be the definitive recorded Sibelius First - the Scherzo is taken much too slowly, for instance - but I feel it is the best performance we are likely to have for some time, and the recording is one of the finest Vanguard has turned out, which is strong praise. This has some of the deepest, richest low end I have heard from any recording, disc or tape, and the rest of the range is beautifully natural, spacious, and rich. Stereo distribution across the "stage" is excellent, there is virtually no "hole in the middle, and the total result is a recording that can be enjoyed for its musical values as well as for its sound.

Despite fairly conservative cutting levels (which result in *very* clean crescendos) and unusually wide dynamic range, surface noise on our sample disc was quite low. As a matter of fact, this recording and the Vaughan-Williams one reviewed below sound remarkably like the "deluxe" discs referred to near the end of the article on stereo discs in this issue. Everyone who is seriously interested in really good, musical sound owes it to himself to listen to at least one of these two discs. J.G.H.

### FERNANDO SOR: Twenty Studies for Guitar

John Williams, guitar. Westminster tape, WTC-168, \$7.95.

Considering the Ho-Hum title of this tape, it was a pleasant surprise. The "Studies" are delightful in their utter simplicity and tunefulness, and the playing is superb, both technically and interpretively. The recording is excellent, and is something that should be heard by anyone who still thinks stereo is futile when directionality is unimportant.

Oddly, this is one of the few recordings I've heard that serves equally well for attentive listening or for light conversational background. J.G.H.

### TCHAIKOVSKY: Symphony No. 5 in E Minor

### SIBELIUS: Symphony No. 1 in E Minor

Vienna Philharmonic Orch., Lorin Maazel, conductor. London "Twin-Pak" tape, LCK-80137, \$11.95.

These are mannered, highly dramatic readings of two popular symphonies and, to my taste, both of them come off quite well. The Tchaikovsky is reminiscent of Beecham's last 78-rpm effort, which I've always liked. The Sibelius, which is treated in somewhat the same manner, benefits less well therefrom.

The recording is rich, fat, and almost overblown, but with a light veil of haziness over it. Other taped copies may be better than mine; the stereo discs almost certainly would be. J.G.H.

### VAUGIIAN-WILLIAMS: Symphony No. 2 (A London Symphony)

Halle Orchestra, Sir John Barbirolli, conductor. Vanguard Everyman disc, SRV-134-SD, \$2.95.

This is undoubtedly the best *London* Symphony that's been committed to stereo to date, and I wouldn't be surprised if it held top place for years to come. I can find nothing to criticize about the performance, and the recording is awe-inspiring — rich, warm and natural, with some phenomenally low bass and *very* wide dynamic range, yet without the slightest audible trace of breakup during crescendos.

Technically, the only problem turned

out to be a direct result of two other things that make this such a superb recording in all other respects: namely, its wide dynamic range and its conservative cutting levels. Holding the modulation to within fairly cautious limits permits clean crescendos, but it forces the entire signal further down toward the residual surface noise that is on every disc. This one has less actual surface irregularity than most, but the wide dynamics drop the quietest sections down to where they start to compete with the normally inconspicuous ticks and pops of microscopic dust particles. Noise was not a problem with this disc, but it uas higher than on some discs with equally wide dynamic range (but higher peak cutting levels).

I refuse to quibble over the slight noise increase, though, when everything else about this disc is so good. Highly recommended. J.G.H.

### Ansermet Conducts Wagner

### Lohengrin — Prelude to Act 1; Gotterdammerung — Siegfried's Funeral March; Die Meistersinger — Overture; Parsifal — Prelude; Good Friday Musie.

L'Orchestre de la Suisse Romande, Ernest Ansermet conductor. London tape LCL-80140, \$7.59.

This is a curiously patchy collection of Wagner readings. The more peaceful of the works — the Lohengrin Prelude and the two Parsifal excerpts — are superbly done. Yet when the score calls for a touch of the old Teutonic fire and thunder, Mr. Ansermet and his orchestra don't seem quite able to rise to the occasion. The proper dynamics are observed, the tempi seem right, and the recording is certainly no hindrance, but the total effect never quite makes it.

Otherwise, these are lyrical, moving performances, with some of the richest, fattest, most robust sound London has given us to date. The extreme low end is practically absent, but instrumental timbres and balances are eminently natural, dynamic range is wide, and stereo spread is excellent. My copy was a bit hissy, but then that's the usual price we pay for wide dynamic range on 4-track commercial tapes. J.G.H.

### WAGNER: Overtures (Rienzi, Flying Dutchman, Siegfried, Lohengrin)

Munich Philharmonic Orch., Hans Knappertsbusch, conductor. Westminster tape, WTC-169, \$7.95.

An unusually good, clean recording, but distressingly stodgy and unsatisfying performances. J.G.H.

### **On Tape** (from page 9)

The second example - the Wollensak recorders, are all the evidence we need that ready serviceability can be built into moderate-priced equipment. At first glance, the Wollensaks appear rather difficult to service, but with two practice runs, a good man can strip one completely for service in three minutes and reassemble it in five. The electronics chassis is a complete sub-unit which can be serviced independently of the mechanism. Flywheel replacement does require major disassembly, but all commonly replaced mechanism parts require only minor disassembly. To cap it off, the machines are extremely rugged and dependable.

Unfortunately, the examples cited above are unusual. Most American designs are only slightly easier to service than the European ones. The electronics sections are generally fairly accessible and, once gotten to, are easily serviced, but mechanisms of many well-known low-cost recorders are, in my opinion, outright botches of design and serviceability.

Of the best-known foreign machines, the Tandberg is very difficult to service when parts need replacement, even though it *is* partly redeemed by virtue of the finest service manual I've seen for some time. Sony's recorders vary from fairly easy to moderately difficult to service, but the Norelco is a veritable monster to repair properly, because many of its parts are buried under others. The Grundig is a nightmare, as are most other German machines.

The high resale value of the Ampex home-type recorders and the Wollensak machines is largely due to their ability to be readily restored to new-performance condition. They are the best buys today in used machines, which is why I was so surprised and disappointed at the lack of attention given to serviceability in the new Ampex 1000 and 2000 series machines. They are excellent performers, and the most refreshing approach to recorder design in recent years, but I hope they won't need much maintenance, because it's going to be rough sledding if they do.

The consumer product industry's lack of concern with serviceability could. I feel, be reversed if pressure were applied by publications such as Consumer Reports,



which are the buying bibles for many people. Except for automobiles, Consumer's Union now gives little attention or rating weight to the ease with which complex home mechanical/electrical devices can be serviced, even though the best-performing device loses much of its value if it can't be kept that way or readily restored.

When buying a tape recorder, pay careful attention to the accessibility of the parts for maintenance, noting particularly the accessibility of those adjustments that may have to be touched up fairly frequently (such as the bias and equalization controls). THE STEREOPHILE will be glad to advise you about this sort of thing, as members of our staff (or their associates) have had experience with almost every home tape recorder made.



can't make really high-fidelity recordings. Send frequent cards, letters, and assorted missives to the Sales Managers at RCA Victor, Columbia, London, Capitol (Angel Division), Westminster, and Mercury.<sup>6</sup> saying much the same thing, and urging them to make at least some no-holdsbarred discs available in the U. S.

Fourth, tape some of the Boston Symphony Orchestra and BBC transcription broadcasts, and play them for your friends, to try and get them on the agitation bandwagon too.

And finally, let the FM stations know, by phone or letter, how much you enjoy these broadcasts, and ask for more of the same. There's no need to make a point that you're taping them; station managers don't like this, and although they assume people are doing it anyway, there's no need to rub it in.

High-fidelity perfectionists are few and far between, but if we make our demands known loudly enough and often enough, and explain to our less knowledgeable friends how they're being bilked of fidelity on the records they buy, the major record companies are going to start taking note and, eventually, doing something about the situation. After all, they're giving us the kind of records they are because they think they have to do this to sell them. If they thought really top-quality discs would sell, that's what we'd get. It's our job, as potential buyers, to convince them.

6. RCA Victor Records, 155 E. 24th St., New York 10, N. Y.; Columbia Records, 799 Seventh Ave., New York 19, N. Y.; Lottdon Records, 539 W. 25th St., New York 1, N. Y.; Angel Division, Capitol Records, Hollywood & Vine, Hollywood 28, Calif.; Westminster Records, 1501 Broadway, New York 36, N. Y.; Mercury Records, 745 Fifth Ave., New York 22, N. Y.

### Put Up Or Shut Up?

We've raised such a stink in this issue about what *could* be but isn't being done with the disc medium that we are tempted to put out a disc to demonstrate what could. We have some fantastic tapes in our office collection; how many readers would be interested in paying for a disc of the highlights of the best of them?

We could sell the thing for \$4.00 per pressing, if we could get enough orders to warrant pressing it. If you're interested in the idea, please drop us a card to that effect. The card wouldn't obligate you to buy the disc, but if we got the impression that enough people were interested, we'd ask for advance orders, and that would obligate you. The disc cuts would include a few mono but mostly stereo excerpts, and we can assure you there would be absolutely no allowances made for the shortcomings of available playback equipment. All we could guarantee would be that the disc would be playable, and cleanly, on a top-notch system. We would not assume responsibility for your system's inability to cope therewith.

Who's interested?



"I still think you'd do better with Unity coupling."



### **Disc Sound**

The article "The Disc Sound" in the last issue brought in more letters than any piece we have published to date. We are printing a representative number of them, with comments (in italics) by co-authors Lew Brown and John Koval. If any of these letters, or the replies, raise any further questions or comments, send them along to us and we'll answer them as best we can.

The first of these letters is from a design engineer employed by one of the firms whose pickup specifications were "questioned" in the article. Other letters of interest that were received too late for this issue will be printed in STEREOPHILE Number 9.

### Sirs:

The article on pickups by Lew Brown and John Koval sets a new high-water mark for competence, common sense, and combat against lies and myths. Sincere workers in the transducer field must be impressed by the honesty and factuality of this article, for they also know the truth. But they must hold their tongues or be clubbed out of their jobs. This is the age of the ad-writer and the big lie.

There is no sense in compliances of the order of 30 and  $40 \times 10^{-6}$ , as claimed by some manufacturers. Such high compliances, if they *did* exist, would only create a host of problems. Compliance specifications on this order are nothing more than wild exaggerations, based on each manufacturer's conviction that, to sell his product, he must specify something better than his competitors. So, each one tells a little lie, the next down the line tops it by just a little bit, and so it goes until all semblance of factuality is left by the wayside.

We strive for high compliance in order that we may have less groove wear, since higher compliance allows for lower stylus force for the same tracing ability. We must limit compliance to some reasonable value, though, in order to keep the stylus vibrating about its normal "at-rest" position. But even with this limitation, it is possible to design a pickup that will allow 200 plays of a disc without any detectable deterioration of the groove. Except for juke boxes, I cannot visualize any record being useful after 200 plays, since by that time, the accumulation of dust, abrasions, and wear and tear due to handling has destroyed the virginal cleanliness.

There is always some optimum compliance for every tone arm. Prof. F. V. Hunt suggested that this optimum should establish a system resonance at between 15 and 18 cps, so with most arms, this would call for a cartridge compliance of The point I want to emphasize is that pickup compliances above  $12 \times 10^{-6}$  do not exist; that manufacturers' specifications deliberately exaggerate, and that pickups that *did* actually have these high compliances would cause more problems than they would solve. Stylus forces of 1 gram or less simply do not allow distortionless tracking at all recorded groove velocities.

Saul J. White White Plains, N. Y.

The horizontal frictional drag of our tone arm is only 15 mg, referred to the stylus tip (including wire drag). For a compliance of  $40 \times 10^{-6}$  cm/dyne, the moving system would be skewed 0.0006 cm, or only 12% of the maximum groove displacement on records. Thus it is apparent that high compliance is not a problem in this respect. However, we agree that, with most arms, very high compliance would set the system resonance much too low (typically 4-5 cps) to provide adequate stability against mechanical shocks, warps, and eccentricities. To place the resonance in the 15-18-cps region with a compliance of  $40 \times 10^{-6}$  cm/dyne would require an effective head mass of about 2-3 gms! We doubt that design engineers will achieve this in the near future. So, we must agree with Mr. White that such high compliances are not practical and really not necessary.

We must point out, however, that perfect tracking at all frequencies at 2 to 3 grams is not assured simply by choosing an optimum compliance. The mechanical impedance of the stylus assembly (which includes not only the compliance but also the effects of dynamic mass, damping and cantilever resonances) must be low, particularly at high frequencies where the role of compliance is a minor one.

### Sirs:

Your article did not mention either of the two most highly publicized recent developments in the pickup field: the elliptical stylus and the 15-degree vertical tracking angle.

Since you tested the pickups listed in your article, have you had a chance to test any others which you feel to be equal to or superior to the London Professional?

Do you believe the elliptical stylus improves the performance of the pickups on which it is available? Similarly, do you feel the 15-degree vertical tracking angle to be a desirable feature in a pickup?

Walter Diehl

Great Neck, L. I., N. Y.

The article as submitted was very long, so much material had to be edited out to fit space, including some comments on recent developments.

Since the article was written, we have tested the London Professional Mark III, Shure V-15, Weathers PS-11, and the Neat VS-2000D. We also gave the Ortofon a brief listening test. As of now, we would rate them as follows: London Professional Mark II and Mark III first, with the Shure V-15 a moderately close second. The rest were markedly inferior to the V-15 in tracking ability, but were relatively similar to one another. In order of quality: The two Ortofons, Weathers PS-11 and LDM, and the Neat VS-2000D (which was slightly inferior to the Empire 880p).

The improvement afforded by the elliptical stylus is limited and, in some cases, is negated by other problems which it brings on. Generally, it provides cleaner sound (simply because of its smaller tracing radius), and tends to impart to breakup distortion (when this occurs) a more "delicate," higher-frequency quality which makes it less offensive to the ear. However, the reduction of translation loss in inner grooves brings out the radius compensation on the disc, causing an additional high-end rise. We are in favor of standardizing the stylus size at 0.5 to 0.7 mil, and using predistortion (a la Dynagroove) in the recording process.

Standardization of vertical tracking angle will produce a measurable reduction in tracing distortion, but distortion from other sources will have to be reduced before the effect of the vertical angle will start to become audible. We're in favor of standardization, though, and we do feel that some standardized vertical tracking should be adopted.

### Editor's Note:

I agree that the Weathers PS-11 has finally been bumped from its top place. but am not sure I agree with the relative ratings of the pickups that bumped it. I have yet to hear all of the competing pickups in my own home, but I have heard all but the Neat one on other systems. The London does sound cleaner than any of the others but, to my ears, it has slightly less output at the extreme high end (regardless of the measurements). The Ortofon SPE/ GT elliptical is not quite as clean-sounding as the Shure V-15, but then its sound seems to have more "life" and transparency than the Shure, and this could account for the difference that was observed. To me, the Ortofon elliptical sounded better, on more discs, than did the V-15. Detailed results of my own listening tests will be reported in the next issue.

One thing Messrs. Brown and Koval neglected to mention was the fact that monophonic discs sound cleaner with the elliptical-stylus pickups than with any spherical types that have ever been built (including the Weathers FM). An additional objection to them, though, is the fact that their very small contact radius increases the pressure against the groove walls for a given tracking force, so they must be tracked very lightly to avoid groove damage. In some designs (the Shure V-15, for instance), this maximum permissible force is barely enough to allow the pickup to trace heavy, deep bass.

Sirs:

What was the nature of the low-pass filter you used with the Weathers LDM to obtain flat frequency response? Did you make comparative listening tests, with and without the filter?

Other questions: You made no com-

ments about the bass response of the cartridges tested. Were they all alike?

Doesn't the Ortofon SPU/GT use a 0.5-mil stylus? If so, its maximum tracking force should be 2.75 grams, not 3 to 5 grams. Have you tested the new ADC Point 4?

### John L. Hodge New Haven, Conn.

Evidently we did not sufficiently clarify the purpose of the filter referred to in the article. This served only to prevent harmonics (due to mistracking) from reaching the test equipment and giving erroneous readings. It did not affect the sound.

The output meter used for the frequency response tests cannot distinguish between the fundamental frequency of interest and the harmonics that may accompany it, so the harmonics may produce a falsely high reading. Since mistracking was a serious prohlem only above about 10,000 cps. the first harmonic would be at 20,000 cps, and only harmonics above that - which are inaudible would be removed by the filter. The actual frequency response of the pickup within the audible range is unaffected by the filter (if one neglects ultrasonic mixing in the preamp, a phenomenon which we have neither verified nor disproved), while the measured response in this range is unaffected by spurious harmonics.

To answer your other questions: In general, the subjective bass performance of all pickups lested was in correlation with the response curves.

The Ortofon SPU/GT has a 0.7-mil stylus. The 0.5-mil figure published in the "Consumer Reports" writeup was incorrect.

We have not evaluated the ADC Point 4, but hope to do so in the near future.

### Sirs:

I believe that the so-called "cantilever effect" is simply the high vertical compliance associated with cantilever styli. If the London (Decca) Professional had as much vertical compliance, it too might sound "fuzzy" on certain passages. As you know, Walton believes that the vertical compliance of stereo pickups should intentionally be kept low.

When you speak of the "raw" curves of the pickups, do you mean that these were made with a near-infinite load resistance, or did you load each pickup with the value recommended by the manufacturer for smoothest response?

### Bernard A. Engholm San Diego, Calif.

We don't feel that the vertical compliance of any of the modern pickups is so high as to cause fuzziness due to poor tracking. Walton's prime concern in keeping the vertical compliance low is to enable the pickup to serve as a filter for vertical rumble; frequencies below the arm's mass/compliance resonance are altenuated.

By "raw" curves, we simply meant that all of the "wiggles" in the curves were left in. There was no "judicious smoothing" of the curves, as is often done. The manufacturer's recommended load values were used in all cases.

### Morality or Legality?

The following was in response to Special Projects editor Philip C. Geraci's article on the legalities of tape recording, in STEREO-PHILE Number 6.

Sirs:

The sad thing about Philip C. Geraci and others like him is not so much that he spent all that time and energy trying to determine how dishonest he could be without being illegal, but that he was willing to admit to STEREOPHILE readers that he would give serious thought to this kind of thievery.

Is Mr. Geraci a shop-lifter? In a legal sense, probably not. He can walk up one aisle and down another in any opencounter variety store without stuffing his pockets. That merchandise belongs to the store manager, who paid for it, and walking out with something one hasn't paid for is stealing. Unless it's musical performances.

A composer earns his living by writing music. He may be paid in a lump sum by his publisher or, more likely, he may get a partial payment, with the rest coming from royalties on the performances of his composition. If he is a composer of serious music, he has not only talent but also a considerable *investment* in musical training.

A conductor is also a man with considerable musical training, plus a gift of interpreting the ideas of the composers, and of leading a large group of musicians in the execution of these ideas. The conductor gets a nominal fee for conducting an orchestra, but must often augment this with royalties from recording sales.

A symphony orchestra requires the services of a great many talented and highly trained musicians. Smaller groups, such as chamber orchestras, do not require so many musicians, but demand even more competence of their members. If these musicians are to earn a living even remotely concomitant with their ability, the proceeds from their concerts must be supplemented, principally by private music lessons given to younger people and by royalties received from the sale of recordings.

Haydn, Mozart, Beethoven and many other composers were subsidized. Nowadays, few composers are subsidized, so a major part of *their* income must come from royalties. As conductors, Haydn, Mozart and Beethoven were subsidized. Which present-day conductors are? The orchestras of Haydn, Mozart and Beethoven were subsidized too. Nowadays, except for contributions from wealthy patrons who help to make up the deficits of symphony orchestras, no one subsidizes musicians.

Consider recording companies. They can, and generally do. perform a magnificent service for us listeners. They can continue to do this only while the sale of records exceeds their production costs.

So, these people in the music business have to place their wares before the public

in hopes that there will be purchasers who appreciate their products enough to make recording a profitable business for composer, conductor, orchestra member and recording company. What these people produce is the result of their labors, their stock in trade, and they are entitled to be paid for their efforts just as a TV repairman gets paid for performing his own specialized function. For a few cents royalty, a few dollars for the cost of making the recording (which includes paying the musicians a down payment), and a couple of dollars for the cost of distribution and sales, anyone buying a record has the privilege of listening for hours on end to a miraculous performance by musicians and technicians. Is this enough for Mr. Geraci? No. He also wants to share it with all his friends, so they won't have to pay anything to any of the performers.

But that's only half of it. Mr. Geraci also wants to record performances which came to him free, gratis, without even a federal tax, and peddle those, too. Not for profit, no. Heaven forbid! Unless you consider exploiting a free performance to be profit.

Obviously, the end result of the pirating activities which Mr. Geraci advocates is that, without sales of recordings, there would soon be no recording industry. And then where would Mr. Geraci be? Surely he, and others like him. realize that the only music that is recorded under any label is recorded with the hope that the sales of that recording will at least offset the cost of making and distributing that performance.

For my part, I'm going to continue to buy the recordings I want, so that the recording companies and the performers will be so prosperous they will feel they can record some of the music that may prove dubiously profitable.

> Alvin Duis Sidney, Nebraska

To which Mr. Geraci replies:

I am inclined to agree with Mr. Duis that the fate of many musicians does, indeed, rest in the hands of those of us who purchase their product. Were everything musical recorded flawlessly on discs, I should never have had the urge to record a single bar on tape. To be honest, I have not dubbed a *record* in a good many years.

Alas, the best in musical sound is not on discs, and those of us who value our "pirated" treasures value most those gleaned from off-the-air broadcasts of live performances. This, to my way of thinking, isn't chizzling. It is simply making use of the technology at our disposal, to provide a musical library equal in quality to our tastes. Most discs simply don't fill the bill.

Moreover, the performances we record are not on the market, at any price. If Mr. Duis can do anything to make them available, in *recorded quality equal to the broadcast*, he'll find me a willing customer who'll gladly pay a premium price.

The object of my research wasn't economy, it was *good recordings*. The rest was incidental.

<sup>\*</sup> This is true in America. Several European countries (and the Soviet Union) do subsidize or support entirely their serious musicians. ED,

# Miscellany

### More Errata

Well, we did it again, and twice this time. STEREOPHILE Number 7 had two errors therein, neither of them crucial, but both of them annoying, to us and, probably, to our readers too.

On Page 6, column 2, 13 lines from the bottom of the page, an entire line of type got lost. The complete sentence should have read "Even when dynamic mass is quoted, the figure may be of questionable derivation."

On page 12, the schematic diagram of the headphone control unit was a masterpiece of botchery, with the switch positions marked backwards and the wiring likewise. The corrected schematic is shown below, with dotted lines to indicate the way the original (incorrect) schematic was drawn. This should make it easier for anyone who built the original one (It would have worked, but backwards) to correct its wiring.

### **Report** Divination

We have, on occasion, heard audio enthusiasts complain that test reports in other hi-fi publications are useless because they don't come right out and label components good, bad or indifferent. Not so, we maintain. It is possible to divine the true feelings of equipment reviewers in other publications through their use of certain carefully chosen key phrases. For the benefit of those of our readers who wish to glean opinions from other equipment reports, then, we append a short glossary of equipment report doubletalk.

"A fine piece of equipment." - I can't find anything specific to criticise, but I don't like it.

"Worthy of consideration." - This is really pretty mediocre.

"Worthy of serious consideration." ---One of the best I've ever come across.

"Among the very best." - Absolutely and indubitably the best available.

"A nice component for the money." -A terrible component, but it's just what you deserve if you aren't willing to pay for good equipment.



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The Audio Mart publishes, free of charge, Buy, Sell or Swap ads from Stereophile subscribers. Ads are published as received, so we cannot be responsible for the condition or quality of the items advertised for sale in Audio Mart. Each ad received will be run once, in the earliest possible issue. Ads may be repeated any number of times, but we must receive specific notification each time you wish us to rerun your ad.

### FOR SALE

Two AR-1 speakers, blond; \$235. Bozak B-305, walnut. Two MC-30 McIntosh amplifiers; \$150. Two McIntosh preamps; \$90. Ampex 1260 4-track recorder, like new; \$360. Dr. Jerry Long, 4170 Northwest Highway, Dallas, Texas, 75220. Phone: 214-FL-2-5066.

Fairchild F-7 cartridge system. Excellent for stereo and recent mono recordings. Used inter-mittently for 4 months. \$40 postpaid. Robert Creed, 524 W. 46th, New York City, 10036. Phone: CIrcle 5-1180.

Two Acoustic Research AR-2 systems, unfinished, new, never used, in manufacturer's original cartons. Wish to trade for two new KLH Model 6 systems, or for two new AR-3's plus best offer. Peter Lampell, 789 West End Ave., New York, N. Y., 10025. Phone: UNiversity 5-2784.

CANADIAN SALE: 50% discount. JBL Metre-gon enclosure, oiled walnut, cost \$950, selling for \$475; McIntosh C-20 preamp, cost \$150, selling for \$225; Citation III multiplex tuner, cost \$500, selling for \$250; Shure 16-inch Studio Dynetic arm with 0.5 and 0.7 styli and cartridge, cost \$180, selling for \$120; two JBL N-400 (500-cps) cross-overs, cost \$240, selling for \$120. N. Metal, 1020 West 71st Ave., Vancouver 14, B. C.

14-channel computer tape recorder file. Can be 14-channel computer tape recorder file. Can be used for stereo or computer work. Complete with amplifier, read, write and erase modes, necessary tape heads, controls, rack, frame, casters, etc. Original cost approximately \$100,000. All reason-able offers considered and answered. Photo sup-plied for \$1 handling and processing charge. F. J. Jansen, 440 Ladera St., Monterey Park, Calif., Atten.: COMPUTER.

Professional recording equipment: Amoex 601-2 stereo recorder, with flutter filter (see Stereophile No. 4) and service manual, \$150; Beyer DT-18 stereo headset, \$15; Telefunken U-47M capacitor stereo headset, \$15; Telefunken U-47M capacitor microphone system, with polarizing supply, 25-foot mike-to-supply cable (with stand mount), 50-foot mike-to-supply extension cable, Cannon XLR plug to mike preamp, spare VF-14 tube, spare fuses, \$200; Capps CM-2030 canacitor microphone sys-tem, 25-foot mike-to-supply cable, polarizing sup-ply, \$100. All units slightly scratched but not dented, all in functionally new condition. Dept RP, The Stereophile, Box 187, Wallingford, Pa.

"Its sound is quite rich." - It is muffled and boomy.

"It is somewhat crisp-sounding." - It is unbearably shrill,

"Its sound is undistinguished, which of course is true of live music." - I don't like it.

"Some listeners may prefer it to most competing units." - I don't like it.

"Musically-oriented listeners will like it." — I like it.

"This would be a fine component, were it not for that one little shortcoming." It stinks.

### **Feelthy Fi**

For the benefit of those sheltered souls who haven't already heard this, we cite the report of the tourist who, on returning from a vacation in France, was accosted by a customs inspector who asked him bluntly "Are you bringing in any pornog-raphy?" To which said tourist allegedly replied "Heck no, I don't even own a pornograph."

### **Expiration Codes**

The hyphenated code number at the bottom of most subscription address labels refers to the expiration date of that subscription. For example, 1-12 means that the subscription will expire after delivery of Volume 1, Number 12.

### No Recommendations

We are omitting from this issue our usual list of Recommended Components, pending a few sweeping changes in the listings. Practically all of the items listed in categories A and B have been surpassed by units we have recently heard, but since we have not as yet determined which of the new items are the best performers in each category, we are unable at this time to provide a revised list of Recommendations.

The updated listing will appear in STEREOPHILE Number 9.

Dynaco FM-3 stereo FM tuner, with construction and operation manuals, bone white case, new-style metal front panel and metal knobs. Excellent condition, used only 3 months. Received factory alignment and test; \$90. Wharfedale 15" woofer; \$40. Karlson enclosure for 15" or 12" speaker, limed oak formica finish; \$40. Audax 16" tone arm; \$5. Fairchild SM-1 stereo cartridge; \$3. Best offer takes any of the above. Ronald W. Weinert, 651 Jacobs Bidg., Jacksonville, Fla.

Rek-O-Kut Model L-34 turntable, Fairchild arm Rek-O-Kut Model L-34 turntable, Fairchild arm and mono cartridge, mounted on sturdy mahogany base; Perfect condition, \$38 FOB. Precision Model 110 VOM, \$15; RCA Model WV-95A Master Voltohmist, with instruction manual, needs some repair but switches and movement ok, \$13 FOB; University Cobrallex 2 mid-range horn and driver, \$20 FOB. Don Spangler, 4557 Ridgebury Dr., Dayton 40, Ohio.

### WANTED

Acoustic Research AR-2 or AR-2A speaker, preferably in oiled walnut enclosure. Also, Dynaco Mark IV power amplifier. Please state price and condition, Dick Feenberg, 7123 Princeton, St. Louis 30, Mo.

No. 8



# **Record Groove Parameters**

The maximum displacement of a modulated record groove from its normal unmodulated path, and the maximum lateral or vertical speed that the stylus attains when tracing the modulation are normally specified as peak values. For a given amplitude of modulation, the time required for the stylus to travel from its atrest position to the peak of each modulation (peak displacement point) depends on the frequency of the modulation. The higher the frequency, the less time the stylus has to traverse the modulation and. hence, the higher the peak lateral (or vertical) velocity that will be attained.

This table shows the peak velocities attained by a playback stylus when a groove is modulated at different frequencies at a peak displacement of .005 cm. The practical limit is reached when the peak velocity of the modulations equals the linear velocity of the groove (the speed with which it passes the stylus). Beyond this point, the groove swings become so sharp that the pickup tends to ride up over them instead of traveling around them.

Since the turntable speed is constant, the full circumference of one groove will pass a fixed point in 1/33.3 of a second. As the circumference of each groove depends on its radius, its linear velocity will diminish as its radius diminishes. Thus, the maximum level of peak velocity that can be attained from a groove is highest at the outer edge of the disc and lowest in the extreme inner grooves. Consequently, the inner grooves will determine the maximum mid-range recording level that is used throughout most discs.

At higher frequencies, where the radius of the curves in the modulated groove becomes smaller than the tip radius of the stylus, the stylus loses its ability to follow the modulations accurately, and tends to "gloss over" them. At these frequencies, although the peak velocity of the groove path continues to increase, the peak velocity of the stylus will not increase with it, so there will be a loss of output and increasing amounts of tracing distortion. These effects set the practical limit to recorded velocity at high frequencies, although it should be noted that the smaller the stylus tip radius, the smaller the groove curvature it is capable of tracing accurately.

Again, the inner grooves impose more of a velocity limitation than outer ones, because their reduced linear speed causes successive modulations to occur closer together along the length of the groove, reducing the radius of curvature.

In practice, the theoretical high-frequency limitations of the disc medium are partially offset by the fact that musical overtones and transients are generally of much lower amplitude than the fundamental tones which are used to establish the over-all modulation level on discs.

Richard Karnette 1527 E. 7th St. Long Beach 13, Calif. 1-12

# \*\* stereophile

P. O. BOX 187 WALLINGFORD, PA.