As We See It

Down With Dynagroove!

In a press release dated February 8, Goddard Lieberson, president of Columbia records, aimed an unprecedented broadside at Columbia's biggest competitor, RCA-Victor. Speaking of Victor's new, flamboyantly-promoted Dynagroove process, Mr. Lieberson said, "An analysis of this so-called system by our engineers has convinced us that it represents, not a forward step in our industry, but a backward step, because it is a step away from the faithful reproduction of the artist's performance."

He went on to elucidate at length, his main point being that in applying a "continuously varying frequency characteristic" to the signal, the Dynagroove system introduces "limitations upon artistic expression." This seemed like a strange statement, coming from the head of a record company that has been souping up their highs, compressing dynamics, and manipulating spot mikes during most of their recent recordings, but after listening to three of the initial Dynagroove releases, we must say we are in complete agreement with Mr. Lieberson. Columbia has committed some monumental insults to musical taste, but on the whole, their discs have at least managed to preserve most of the original musical relationships intact. We cannot say this about Dynagroove.

Two of the Dynagroove releases we auditioned were so bad that our record critic, James Keeler, simply refused to review them. The third, an operatic recording, was less conspicuously gimmicked and was a good enough performance to draw our attention away from the constant coming and goings of bass and treble. (A review of these discs appears on page 14, and some further observations about Dynagroove occupy this issue's "Forum" page.)

But Mr. Lieberson is right in asserting that Dynagroove is inimical to musical integrity, for not only does it constantly "rearrange" the original bass/treble balance of the music, it evidently excuses the use of more dynamic compression than we have encountered since the latter days of the 78-rpm disc. If this constitutes "an evolution in the art of recording," to quote RCA-Victor, then we are obliged to incite the industry to counter-evolution, for this is one kind of hanky-panky that no home-type tone control will ever be able to compensate for.

Dynagroove discs, although allegedly intended for use on top-notch systems, are nonetheless modeled on the assumption that "nobody listens at full concert-hall volume." We do listen at concert-hall volume—at least at the volume one might hear from the twentieth row in a concert hall—and we bristle a bit at being rejected as a "nobody."

This, of course, is the old story all over again. The serious listener, who listens to music instead of using it as a pleasant background for conversation, is a nobody as far as the record industry is concerned, and does not warrant its consideration.

We hope Dynagroove is abandoned, and the sooner the better. But if it isn’t, we have two suggestions. For the serious stereophile, who is interested in getting the best available discs, we suggest purchasing them directly from dealers in Great Britain, where EMI is still cutting natural-sounding, unm gimmicked stereo discs. We have compared a number of EMI’s releases with their U.S. counterparts, and in each case, the EMI’s were cleaner, wider-range, and considerably more musical-sounding. The Gramophone, Hi-Fi News, and other British record publications available here carry ads for several mail-order record shops in England, many of which will be happy to fill orders from the U.S.

For the American record manufacturers, we suggest a premium line of stereo disc releases, paralleling the releases they now put out for the mass market, but cut with full dynamic range, full frequency range, and miked so as to produce the best stereo illusion when reproduced through speakers with adequate spacing between them. We, personally, would be happy to pay a buck or so more for recordings that would justify the expenditures we have made on high-fidelity equipment, and if the premium line wouldn’t play on the mass-market phonographs, the customers might start asking some of the right questions. Such as, why won’t a premium disc play on my Magnificent Console?
Why Hi-Fi Experts Disagree

The high-fidelity initiate, bewitched, bothered and thoroughly confused by the staggering selection of components he must choose from, often turns to a high-fidelity expert to assist him in assembling his dream system. This expert may be a local consultant, a dealer, or a magazine that the prospective buyer trusts as a source of accurate, down-to-earth information.

If this seeker of high-fidelity truth is wise, he will consult one expert and no more. The more expert opinions he gets, the more confused he will become, because every expert opinion will be different from all other expert opinions.

About the only thing that all high-fidelity experts agree about is that high-fidelity is supposed to be realistic sound reproduction. They may even agree that Marantz amplifiers are pretty good, and that Thorens makes a passable turntable. But try to pin them down about pickups, or other amplifiers, or tuners, or particularly loudspeakers, and one expert's preference is another one's anathema.

Of course, any expert worth his salt can tell you why there is so much disagreement. The reason? Well, the other experts, although very nice guys, don't really know what they're talking about. Oh, they're pretty good technical men, mind you, but they don't really have the perceptive ear that's needed for a truly valid musical evaluation of reproduced sound.

This is the crux of the matter. Measurements can help to describe a component's performance, but the final criterion for judging reproduced fidelity has always been the ear, and when we start to fall back on subjective judgments, we always end up with a diversity of opinions.

It isn't just that "different people hear things differently." Everybody who hears is responding to a set of pressure variations in the air around him, and if these are the same in the living room as they would be in the concert hall, each listener will hear an absolutely realistic replica of the original sounds, regardless of the idiosyncrasies of his own hearing. His ears may have a few response peaks and no response at all above 4,000 cps, but these weirdities will affect his hearing whether he listens to the original or to the reproduction, so they shouldn't influence his evaluation of the reproduced sound. Except for one thing: The listener with non-existent hearing above 4,000 cps will be oblivious to any system irregularities above that frequency.

The human ear differs in its degree of tolerance to distortion, too. Obviously, the person with high-frequency hearing losses will miss any distortion that is limited to the upper range, but even people with identical hearing acuity vary in their sensitivity to small amounts of distortion that fall within their range of response.

A listener can train his ears to pick out all kinds of details in the reproduced sound — peaks, dips, phase shift, imbalance and the like — but many such trained ears have never heard a live orchestra, so they are hardly qualified to tell you what is and what is not realistic. Also, if they have never heard a system with really low distortion or really smooth response (which many "experts" have not), they will be oblivious to small amounts of muddiness or roughness that will be quite evident to someone who is accustomed to listening to a truly top-quality system.

Listeners with identical hearing acuity and identical standards of judgment will usually be highly critical of different aspects of a system's performance. Thus, expert A may be terribly, terribly critical of what happens in the high treble range, expert B may be hypercritical of bass, and expert C may have a Thing about middle-range smoothness or "coloration."

We can see how this might influence their judgment of, say, a loudspeaker system. If it is a bit rough at the top, smooth through the middle range, and bass-shy, expert A won't like it much; it will offend his critical ear for treble. Expert B won't be too crazy about it either, because of the low-end deficiency, but expert B, even while admitting that "the top isn't as smooth as I have heard," and "the low end leaves a little bit to be desired," will just as likely sum it up as "one of the most natural, musical-sounding speakers" he has tested.

They can all hear the speaker's shortcomings, in the sense that the treble peaks and bass thinness will register on their hearing mechanism, but each picks out that aspect of its performance that is of particular concern to him, and tends to judge it mainly on the basis of that aspect.

No equipment critic worth his salt will judge a component solely by one criterion, but it is not at all unusual for an equipment reporter to "slant" his evaluations on the basis of a few things which he considers to be of particular importance. As a matter of fact, it is almost impossible for him to avoid doing this, at least to some extent.

High fidelity may be a science, but
it isn't an exact science. There are enough things about it that aren't understood to leave room for a
goodly amount of educated opinion.
This is one field, though, where one
man's opinion is not as good as
another's.
Many writers of books and articles
about high fidelity advise the pros-
spective buyer merely to choose what
sounds good to him. Certainly, there
is no sense in anybody's choosing a
music system whose sound he doesn't
like, but in a field where definite
standards of quality exist, simply
liking something does not necessarily
mean that it is good, by those stand-
ards. A person who likes abstract
art, for instance, may be judging it
by any number of criteria, but re-
semblance to the original scene is not
one of them. If it were evaluated on

the basis of its "fidelity," or re-
semblance to the original scene, it
would have to be adjudged a very
poor copy. Similarly, the listener
who prefers his sound shrill and
brassy is perfectly entitled to his
preference, but he is not choosing on
the basis of fidelity, either.
This raises the old question of
whether high-fidelity can, or should
be, better than the real thing. Cer-
tainly it can be made to sound richer,
or bigger, or more highly detailed in
a recording than it ever is in the con-
cert hall, and the net result may
actually be more exciting than any-
thing heard at a live performance.
The gimmicked recording may even,
on occasion, serve the intent of the
music better than a concert hall per-
formance, but whether it sounds
better or worse than the original, it
is not true to the original, and thus
cannot be considered as a high-
fidelity reproduction.
Sound recording may eventually
become a creative art in its own
right, producing musical sounds that
bear no relation to any natural

sounds. Indeed, some branches of it
— pops and so-called electronic music
—are already well on their way in
that direction. This is not high
fidelity, though, and there's no sense
pretending that it is.
As long as we are concerned with
the realistic reproduction of sound,
the original sound must stand as the
criterion by which the reproduction
is judged, and most hi-fi experts
agree that this is as it should be.
The problem, however, lies in de-
fining this original that is to be
duplicated.
First, take one symphony orchestra, place it on-stage in one
concert hall, and then try listening to it from (a) the front row, (b) the
twentieth row, and (c) the fourth
row of the second balcony (or peanut
gallery). The orchestra will sound
quite different from each location, so
which of its sounds is the one that
best represents the orchestra? Obvi-
ously, the sound that is heard from
the best seat is the best representa-
tion of the orchestral sound, but who
is going to claim that _his_ preference
for a seating location is the only
valid preference, and that anyone
who prefers to sit elsewhere has bad
judgement? Nobody but a dyed-in-
the-wool nut will take this attitude.
You may prefer a close seat because
you hear more sonic detail from
there. Somebody else will prefer a
more distant one because the sound
blends better farther out in the hall.
Another may choose the balcony be-
cause, in that particular hall, the
brasses or the strings or the wood-
winds come through more clearly or
more richly when heard from a high
vantage point. In other words, your
best seat is best _for you_, but not neces-
sarily for everyone else.
Where does this leave us? Well, it
leaves us on slightly less firm ground
when it comes to judging the original
sound. There _is_ an out here, though.
If a system reproduces a recording the
way it was intended to sound — that
is, if it makes distant miking sound
distant and close miking sound as
close as it actually was — then we
can justifiably say that the system is
reproducing this aspect of the record-
ing with fidelity. If the other aspects
of the sound — frequency range, in-
strumental timbres and so on — come
through as they were recorded, then
the reproduction is a high-fidelity
one.
In other words, as far as the repro-
ducing system is concerned, it is
fidelity to the recording that counts,
rather than fidelity to the original
sound. In order to judge how accu-
rately the system is reproducing the
recording, it is necessary to know
precisely how the recording was
made, and how the recording micro-
phones affected the sound (which
they always do to some extent).
These, though, are things that are
almost impossible to find out about
commercial recordings, which is why

equipment testers who are really
serious about their calling make
their own recordings, using the best
microphones and recorders they can
lay their hands on, and use these re-
cordings for judging the playback
equipment they are testing.
A tape that is recorded through
microphones of known character-
istics, and is then played back
through a carefully calibrated pro-
fessional-quality tape recorder, will
provide the most dependable audio
signal source available for listening
tests. The reproduction will never
sound exactly like the original, be-
cause no living room has the same
acoustics as a concert hall, but or-
chestral timbres should sound natu-
al, the full frequency range of the
orchestra should be there in proper
balance, and the sound will be clean
enough to reproduce without muddi-
ness on a system that is free from
distortion.
Discs cut from such a tape, under
carefully controlled conditions, can
provide a pretty good test for pickups
and pre-amps, too, but there is less
certainty about the sound of a disc,
because too many variables — proc-
essing problems and playback styli,
to name but two — can affect the
way it will reproduce.
It is entirely possible to assemble a
very fine-sounding system from com-
ponents that are intrinsically third-
rate, by balancing one component's
colorations against those of another.
But replace any of these components
with one that is actually superior, in
that it introduces _less_ coloration than
the "standard" unit, and the system will sound worse than it did before. Much the same thing can happen if a mediocre loudspeaker, which was effectively masking distortion that was being fed to it, is replaced by one with wider range and better transient response. The better speaker, revealing all the sonic flaws that the other one obscured, will sound worse than the mediocre speaker.

This is how many experts get themselves in trouble. They assemble components that compensate for one another's deficiencies, with the result that each time they substitute a new one for comparison purposes, their judgments of it are valid only insofar as that component is related to the rest of their own particular system.

Non-sonic factors, like durability, control flexibility and appearance will often influence a reporter's feeling about a new component, too, even if he doesn't happen to have any private axes to grind.

The few experts in the field who do have axes to grind are of little value to the seeker of advice, because they think in terms of their own interests rather than in terms of your needs. Axe-grinders are pretty easy to spot if you know what to look for, though.

The slide-rule worshipper, for example, believes that fine measurements are conclusive evidence of fine performance, so he chooses and recommends components solely on the basis of their test results. His system sounds terrible to people who aren't impressed by its wonderful specifications.

The drum beater tested several components a few years ago that were all made by one manufacturer and were all quite good, and ever since then, he has remained staunchly loyal to that brand, even though the manufacturer's recent products may have become very mediocre.

The I-am-more-musically-sensitive-than-thou expert attends concerts regularly, always sitting in the same seat in the same hall, and assembled the only really musical reproducing system in existence back in the early days of monophony. He usually hates stereo because "it is so unmusical," and is prone to writing impassioned, dogmatic letters to newspapers and magazines, condemning everything.

The I-have-found-the-answer expert assembled his dream system in the mid-1950's, and if there is a better one, he would rather not know about it. Like the musically-sensitive expert, he is agin' stereo, but not passionately so. He is often partially deaf in one ear.

So much for the people who can't help you. Who can? Professional musicians aren't as much help as one might think, for most of them are less critical of fidelity than the average high-fidelity enthusiast, and those that are critical generally prefer the kind of close-up, high-powered sound one hears from the middle of the orchestra.

Recording engineers generally have very well-trained ears, and are among the best judges of reproduced sound. Their main shortcoming is their lack of familiarity with currently available home-type components.

The listening panel -- a multi-threat symposium of "selected" listeners, may turn in some excellent judgments or may be hopelessly misguided, depending on who comprises the panel. A mixture of audio engineers, concertgoers and serious audio enthusiasts will, if they agree about anything, come up with about as good an evaluation of reproduced sound as you can get, but they will be judging the end result rather than the individual components involved. They may be just as easily taken in by a balanced system of poor but complementary components as may the lone equipment reviewer.

Audio dealers can be an excellent source of dependable information, but they can also be as crooked as a dog's hind leg. It is difficult to tell whether a dealer's component recommendation is based on honest conviction about its worth or stems from more commercial considerations such as high profit margin or overstocking or rumors about impending obsolescence. Even in establishments where the owner is basically sincere, some salesmen may misdirect you simply because they collect a "fee" (known as a spit) from certain manufacturers for each one of their products they can sell you. In general, a dealer who services the equipment he sells will at least try to steer you to equipment that is dependable, if not sonically excellent, because he must put up with your subsequent harrasing if the stuff acts up on you. If he has no service facilities at all, he is not likely to feel much responsibility for the equipment he sells you.

The best source of information about equipment is someone who (1) attends concerts fairly regularly, (2) uses good master tapes of his own making for listening tests, (3) has the equipment and the know-how to check measurements against subjective reactions, (4) has frequent access to new components, preferably on the service bench, and (5) has the good judgment to know that his taste in sound may not be the same as yours.

This seems like a tall order, but there are many such experts to be found in the better hi-fi shops and behind the pages of some hi-fi publications (such as The Stereophile, of course).

The best that any expert can do is to lead you to components that are intrinsically excellent. You will still have to make up your own mind about such matters as cost and appearance and flexibility, and you should try out a few different loudspeakers in your home to find out which ones suit your acoustical environment and your taste in reproduced sound. The expert cannot, and will not if he has any sense, choose the components for you, because your ear is the final judge in the last analysis. If no combination of really good components sounds good to you, then you probably don't really want high fidelity, and can forget all about the expert opinions. They don't agree anyway.
De-Fluttering the Ampex 601

In all respects but one, the Ampex 601 and its stereo cousin, the 601-2, has stood for some years as the best nonprofessional tape recorder available at any price. Its triple head lineup, fully adjustable electronics, and professional-type monitoring facilities combine to produce tapes that are indistinguishable from those made on the big studio Ampexes at 7.5 ips, most of the time. The rest of the time, the 601 produces some of the most horrible flutter heard from any tape recorder, which is one reason the machine has not gained the acceptance it could have among critical users.

Any recorder will flutter if oxide lumps are allowed to build up on its capstan, or if its braking tensions get too much out of adjustment. But the flutter that afflicts 601 decks is intermittent, it is not curable by adjusting operating tensions, and it is appallingly pronounced. Fortunately, it is remediable, by two fairly simple measures that should have been done by Ampex in the first place.

Two things are likely to cause the flutter: slippage of the holdback brakes and cinching of the tape on the supply reel. Eliminating both of these faults will do away with about 99% of the 601's flutter problems.

Ampex Corporation has, wisely, always avoided using pressure pads to maintain contact between the tape and the heads. Tape contact is obtained by arranging the heads in a slightly curved line, wrapping the tape around the curve, and applying holdback braking to the supply reel (Figure 1).

In the 601, this holdback braking is applied by a toothed metal wheel on a pivoted bracket, mounted so that it rides on a rubber-tired drum that is slip-clutch coupled to the supply reel shaft. When the supply reel turns in one direction — when rewinding — the toothed wheel is pushed away from the drum (Figure 2). When the reel reverses, in the record or play mode, the toothed wheel, which itself is not free to rotate, catches on the tire and swings in against it, becoming jammed between it and the bracket’s pivot (Figure 3). This is supposed to lock the rubber-tired drum to prevent it from turning, while the slipping clutch applies the holdback tension to the unwinding supply reel. Usually, the drum does remain immobilized, but sometimes the toothed wheel will slip on the tire, allowing the drum to rotate momentarily. This loss of grip causes a sudden loss of holdback tension, followed by a sharp jerk on the tape as the drum locks in place again. The result is a severe speed interruption, sometimes accompanied by a signal dropout as the tape loses its intimate contact with the heads.

Examination of the toothed wheel will readily reveal the cause of the trouble: The teeth are little more than ridges across the wheel, and are barely capable of gripping the rubber tire, even when jammed against it. The solution here is obvious: Sharpen the wheel’s teeth.

To do this, remove the recorder mechanism’s bottom frame plate (as described in the 601’s service manual), and detach both of the brackets holding the toothed wheels. Mark each wheel with a penciled L and R before removing it, because although...
they are identical at this point in the proceedings, it is essential that they go back in the same locations they came from.

Hold the wheel marked L with its lever tabs away from you, and use a square jeweler's file to shave a little bit from the right-hand side of each tooth, as shown in Figure 4.

Hold the wheel marked R with its lever tabs toward you, and do the same thing to the right-hand side of each of its teeth. Finally, replace both assemblies in their original locations, as shown in Ampex's mechanical assembly drawing.

Supply reel cinching is a bit more difficult to cure, but it can be done by adding a device that Ampex normally includes in their more expensive recorders: a flutter filter.

Like most high-quality recorders, the 601 rewinds tapes under rather light tension, to minimize head wear and to prevent the wound layers from buckling due to changes in temperature and humidity. When the supply reel's holdback tension is applied, however, the loosely-wound tape will sometimes slip, layer on layer, feeding the tape out in a series of jerks while the supply reel stands still. The resulting flutter is shockingly severe, but it lasts only until the tape has tightened somewhat on the reel and the reel has started to turn again. This cinching may occur several times during a single reel, causing bursts of flutter that disappear as suddenly as they start.

The cinching problem could be eliminated by using higher rewind tension or by easing off on the holdback tension, but either of these solutions would cause other troubles. The ideal answer, and the one adopted by most designers of professional recorders, is to provide a means of absorbing the jerks in the tape before they can reach the head assembly. A suitable flutter filter is a spring-loaded guide post (Figure 5) that puts a kink in the tape path between the supply reel and the main head guide assembly.

The kink slightly lengths the tape path when the tape is feeding smoothly, but each time a jerk is imparted to the tape, the spring-loaded guide swings out to relieve the extra tension, rather than passing it along the length of the tape to the head assembly.

Since there is little space available to install the flutter filter, its dimensions are rather critical. The filter arm should be cut from 21-gauge sheet steel, and shaped exactly as shown in Figure 6. Cut the piece out by means of a hack saw, and then bring it to its final shape with a file. Metal shears will bend the piece and will curl its edges, and it is important that the arm be as straight and flat as possible.

The guide post is made from a 3/32-inch-thick brass machine screw, lathe-turned or shaped with a file as per Figure 7. This fits into hole B on the filter arm, and is sweated into place with solder applied from the other side of the hole. It is essential that the guide post stand vertically from the filter arm, otherwise it will twist the tape that passes over it, throwing it out of alignment.

The round washer must be barely thicker than the filter arm. The 21-gauge sheet steel is 33/1000 inch thick, so the washer should be about 35/1000 or 36/1000 inches thick. This dimension is best obtained by starting with a washer that is too thick and shaving it down to the proper thickness on an oilstone. Use the oilstone to remove any roughness from the edges of the washer, and check it for fit in the filter arm's hole A. It should fit easily but without excessive play. The spacer washer,
spring, listed in the 601's service manual as part #9368-1. The other end of this spring fastens to a solder lug of the size shown in Figure 6. The lug is held by the corner mounting screw for the 601's deck assembly, thus allowing for some adjustment of spring tension.

To install the filter, remove the 601's ball-bearing guide assembly (at the left of the head assembly), and discard the bottom one of the steel guide bars, and all of the small metal washers on the screw. Use a fine flat file to smooth off the wrinkled surface that mounts the guide assembly. Loop one end of the spring through the arm's hole C, and assemble the parts as shown in Figure 8. Start the mounting screw into its threaded hole in the recorder's top plate, and draw it up until it starts to tighten. If the arm is not free to move, work it over its center washer to free it, and turn the flat-sided washer until it fits into the groove in the motor plate. Then orient the filter arm and the top steel guide strip as shown, and tighten the screw. Finally, apply three drops of fine machine oil (3-in-1 will be fine) between the filter arm and the surface behind it, and work the arm back and forth to spread the lubricant.

Figure 6. Actual-size details of the filter arm and washers. Hole A should fit easily but without excessive play around the round washer. Hole B should be a snug fit for the guide post. All circular dimensions are diameters.

Figure 7. Detail of the guide post. The only critical dimensions here are the 0.270" and 0.165" ones.

Finally, place a full reel of the tape on the supply reel, and thread it as shown in Figure 9. Run the machine in the play mode, and notice the angle of the kink in the tape. This should be as shown. If it isn't, loosen the screw holding the solder lug and rotate the lug until the tape follows the path shown. This completes the assembly.

The flutter filter will not entirely eliminate all severe irregularities in tape feed, but it will do away with the vast majority of them, it will greatly reduce the severity of the worst ones, and it will eliminate most of the problems that normally arise from sticky tape splices. The result will be a 601 whose mechanical stability matches its excellent electronic performance.

Figure 8. Assembly of the flutter filter. The spacer fits into the recess for the discarded guide bar.

**The Gospel According to Commerce**

- Stereo is better than mono because it costs more.
- Two distorted channels are more saleable than one clean channel.
- Women control the purse strings, so all high-fidelity equipment must be designed for them.
- Three full-color advertisements are more persuasive than a demonstration.
- Tell a man he's an expert and he'll have the perspicacity to buy your product.
- It is better to be 10 db up at 10 kc than 1 db down.
- It takes 50 watts per channel to play Mantovani as conversational background.
- It is considered Good Business to give a lifetime guarantee on a product that will be obsolete in two years.
The FORUM

This is a column of controversy, wherein anyone with a legitimate point to make can do so as he sees fit. The STEREOPHILE refuses to assume any responsibility for anything said in the "Forum," for it is the writer's privilege to say what he wants. We offer him this freedom in the hope that his views will inspire discussion, comment, and a rebuttal from anyone who feels like taking issue with him. Continuing exchanges between contributors will be welcomed until we feel the subject has been resolved or, unresolved, has been beaten to death.

The Dynagroove System

RCA-Victor terms their Dynagroove process "the most significant advance in the recording art since the introduction of the L.P." Significant it may well be, but whether or not it is an advance is another question altogether.

In response to a telephoned query, RCA-Victor's recording department filled us in on some details about their new Dynagroove recording process. Allowing for the possibility of some confusion on our part, here is the story we got.

In a nutshell, Dynagroove is a process for correcting automatically certain "inherent" deficiencies in the tracing and the aural balance of disc recordings.

A cutting stylus, having chisel edges, can cut modulations that are smaller than the radius of the playback stylus. In playback, the stylus cannot trace these modulations, but simply bounces over the high spots, causing distortion and rapid disc wear. Dynagroove's computer modifies the signals that would normally create these untraceable modulations, and converts them to modulations that the playback stylus can trace, and which elicit from the pickup signals similar to those it should produce from these signals. This sounds like a good idea, in theory at least.

The second function of Dynagroove is to provide what was described as a sophisticated variety of "automatic loudness compensation," which is supposed to correct for the ear's changes in frequency response at different volume levels. When the orchestra plays softly, the Dynagroove computer boosts bass response. As the orchestra plays more loudly, the bass boost is removed and the upper frequencies are boosted. The adjustments are made almost instantaneously, so that a single bass note in the brief pause between two loud trumpet notes is boosted.

The loudness compensation is evidently intended as a means of restoring some illusion of wide dynamic range to a disc with rather narrow dynamic range on it, but if this is its intent (that is, if we got the story straight), there would seem to be some errors in Victor's reasoning, because Dynagroove's action would tend to reduce the illusion of wide dynamic range.

Manipulating frequency response in accordance with the Fletcher-Munson constant-loudness curves could help to give an impression of more dynamic range than is actually present, by introducing the response changes that the ear would normally exhibit with large changes in volume. But this would call for increasing bass during crescendos and reducing it during soft sections. Dynagroove does just the opposite, although it does boost highs during loud passages, which is consistent with the Fletcher-Munson curves.

We were assured that Dynagroove was not predicated on the limitations of the average low-fi phonograph, but the fact that these compressed Dynagroove discs do fare so well on limited-fi phonographs (we tried them on a boom-box and a portable stereo set) makes us wonder about discs are played on a good system.

One thing is clear, though. The "loudness compensation" is an attempt to offset the subjective effects of extreme volume compression, which in turn is predicated on Victor's contention that, and we quote: "Nobody listens at concert-hall volume." Our comments about that are reserved for the editorial in this issue. If we have misunderstood RCA-Victor's intent or reasoning anent Dynagroove, we hope to publish their side of the story in the next "Forum" column.

Paper Cone Wrapup

The discussion about paper cones versus plastic cones in the preceding three issues of The STEREOPHILE proved inconclusive, mainly because of a semantic misunderstanding. Most of the criticism aimed at Mr. Fried's original exposition attacked his contention that plastic cones produce less breakup at low frequencies.

Messrs. Allison and White pointed out that cone breakup is a function of middle and upper frequencies. Evidently, what Mr. Fried called breakup was a phenomenon of flexion, where the flexibility of the cone prevents some voice-coil movement from being imparted to the entire cone area, and allows the perimeter of the cone to vibrate independently of the voice-coil region. This is an acknowledged problem, regardless of what you call it, and foam plastic cones, being stiffer than paper, would flex less than paper cones.

Besides that one point, however, it was not proven that plastic cones have any inherent advantage over paper cones, so the success of the new material will depend upon how well specific formulations of it can achieve this rigidity without incurring more problems in the higher frequencies than are encountered in paper-cone designs.
Choosing a Tape II

Joel Tall is no longer writing for us, so this and subsequent "On Tape" columns in the foreseeable future will be written by Ye Editor, who already has his hands full, thank you!

It will not come as news to most of us that some tapes do a better job of recording than others, but one thing that is not widely understood is the fact that many of the "poor recording" problems encountered with some tapes are due to nothing more than incompatibility between the tape and the recorder's electronic adjustments.

At slow running speeds (and 7.5 ips is still considered slow) a tape's performance is drastically affected by the bias current fed through the recording head. A tiny change in bias current will produce a marked loss of or increase in treble response, so the recording bias must be very accurately set in order to get flat response from the tape.

So critical is this adjustment that minor differences between oxide coating formulations will produce audible changes in treble response, so if a recorder is set up for flat response from one kind of tape, other kinds probably won't give flat response. Consequently, a recorder that was adjusted in the factory to yield flat response from a specific tape must be used with that tape only, otherwise its treble response will not be flat.

Unfortunately, recorder manufacturers do not specify the tape they adjust to, and few of them take the trouble to warn users of what will happen if they use different tapes, so the average user finds the recorder boosting treble like mad or rolling off all his precious highs.

Since these problems vary appreciably from tape to tape, he is likely to conclude that most tapes are really pretty horrible. Eventually, he will find a "good" tape and will thereafter recommend that brand to all his friends, none of whose recorders are set up as his is, and none of which will work properly with that tape.

To the recordist who has neither the equipment nor the inclination to adjust his recorder's bias (and equalization, if adjustable), finding the best kind of tape is purely a matter of trial and error. If his recorder happens to be made by a firm that also makes recording tape (Ampex, for instance), the choice of tape is a simple one. Ampex machines are set up for Ampex (and Irish) tape, so that is the tape to use with them. When in doubt, though, the only thing to do is to buy one reel of each kind of tape that meets your requirements for playing time and base material, and try each one on your recorder. One, or possibly two, will outperform all the others, deciding the issue for you once and for all.

A simple listening test will determine which tape is best suited for your recorder. Select a disc recording with plenty of massed violin passages on it, and run off about five minutes of this on tape. Then play both the disc and the tape, as nearly synchronized as you can get them, adjust both to the same volume, and switch back and forth between the disc and the tape copy, listening particularly for any difference in the sound of the string passages. If the recorder is good, at least one kind of tape that you try will produce almost exactly the same high-end balance as the disc, and this is the tape you should use.

If you have on hand an audio signal generator and a VTVM, and are not averse to digging into the inner workings of your recorder, you'll be able to adjust your recorder for optimum performance from any kind of tape, so you can afford to be choosy about the relative quality of different brands.

Adjusting record bias and equalization is no problem on a machine that has a separate head and preamp for playback, for changes in output level can be observed directly as they occur when the adjustments are made.

For bias adjustment, the VTVM is hooked to the playback preamp, a 500-cps signal is fed to the record amplifier at Zero-db level on a VU meter (or at slightly below the "Normal" level on a machine with a "magic eye" or neon bulb indicator), and the bias is adjusted to produce maximum output from the tape. This should be done extremely carefully, for a ½-db deviation in measured output, due to bias change, will cause several db of deviation at 10,000 cps.

If the recorder has adjustable playback equalization, this should be checked next with a standard test tape (such as the Ampex #5563 for 7.5-ips machines) and adjusted for maximum response linearity. Then the recording equalization control (if any) should be adjusted until the measured output at between 8 and 10 kc is the same as at 500 cps.

The equalization adjustment, as well as all other frequency response measurements, must be conducted with the recording level set at least 15 db below Zero level, to avoid saturating the tape at high frequencies, where there is appreciable treble boost when recording. (This is automatically rolled off in playback by the head itself.)

If you have a well-trained ear, a (to page 16)
Four-Track Crosstalk
When are tape manufacturers going to do something about the interference between reverse channels on their tapes?
Nearly every one of the four-track tapes I have bought is plagued with this, and in some cases it is bad enough to spoil the tapes. I know it isn't the fault of my tape deck (a Heathkit) because the tapes I make myself don't have any of this trouble at all.

Chad Smith
Milwaukee, Wis.

This may still be the fault of your recorder, and probably is, because most current commercial four-track tapes are adequately free of crosstalk interference.
Your trouble is more than likely due to vertical misalignment of the record/play head or the tape guides. There is very little space between the tracks on a four-track tape, so all it takes is a tiny

Vertical misalignment of a 4-track head brings its pole pieces in contact with the reverse tape tracks.

vertical shift to bring the edges of the reverse tracks into contact with the head's pole pieces. The tapes you make are recorded from these same pole pieces, so these will be in perfect alignment when played on that head, which explains why they are free from the crosstalk.

There is an adjustment on the Heath recorders for head height. Set this for minimum crosstalk from a half-dozen or so commercial tapes. Then, if you find the recorder no longer erases its own tapes completely, adjust the height of the erase head until it does.

Presence Switch
I recently bought a used mono preamplifier (a Fisher) that came without its original instruction manual. I have had no trouble doping out most of the inputs, outputs and controls, but one switch puzzles me. It is labeled, simply, PRESENCE, and turning it on makes the sound more brilliant, as if the middle highs are peaked.

What does this switch do, and why?
R. M. Meeker
Chicago, Ill.

It makes the sound more brilliant, by introducing a broad resonant peak in the middle highs (centered around 3,000 cps). This is supposed to bring the sound forward, as it were, to give it more intimacy or "presence."
Most loudspeakers don't need any more presence than they already have. A few just might benefit from the use of the presence switch, but think twice before you decide to use it most of the time, for it will exaggerate record surface noise and distortion as well as intimacy.

Warped Discs
Has anyone devised a safe way of straightening warped records? I have several discs that are in need of attention, not so much because they are badly warped, but because my lightweight pickup's force is already so low that a little warpage interferes with its tracking.
Can you recommend a technique that will remove the warp without hurting the records?
R. Benner
Hartford, Conn.

There is absolutely no safe way of straightening warped discs, because the straightening requires that the disc be warmed, and the resulting softening of the vinyl makes it extremely susceptible to scratching until it has cooled again.
One technique that works, and is about 90% safe, calls for two 12-inch aluminum-base recording blanks (available from any large radio parts store) and about 16 spring-type clothes pegs.
Make sure the warped record and one side of each of the blanks is free from dust, and then sandwich the record between the clean sides of the blanks. Place two clothes pegs on opposite edges of the sandwich to hold it together, and then fasten the rest of the clothes pegs around the rim of the sandwich, spaced about an equal distance apart. Finally, clamp the center of the sandwich between a large

The de-warping sandwich is held together with clothes pegs and a bolt, bolt and nut, drawing the nut finger tight.
Light a kitchen stove burner and hold the sandwich flat about 1½ feet above this until the bottom blank becomes warm to the touch. Turn the sandwich over and repeat this. Expose each side about five times in this way, and then lay the sandwich on a nonconducting surface (such as a book) in a cool (but not cold) place. Leave it there for about six hours, by which time it will have hardened about as flat as you're going to get it.

Visual Balancing
I have noticed a device on the market that uses a meter to allow for visual balancing of stereo channel levels and phasing. How effective is this? It is relatively inexpensive, and looks as if it might be a useful addition to my system.

Charles Andrea
New York, N. Y.

Perhaps we are being a bit sticky about this, but it is our contention that if a stereo system doesn't sound out of balance, it doesn't matter whether it is or not. If it does sound unbalanced, then you don't need a meter to correct the condition.
Phase checking is no longer essential in a stereo system. Out-of-phase discs, tapes and stereocasts are extremely rare these days, so once a system is phased for (to page 16)
Dynaco-B & O Portable

SPECIFICATIONS (furnished by manufacturer): Type: 12-transistor, battery-powered. Wave bands: FM--88-108 Mc; AM Std--540-1600 Mc; SW 1--2.5-4.2 Mc; SW 2--6.2-18 Mc.


Several transistor portables have appeared in recent years with FM facilities, but their sound has never been much to interest the serious audiophile. The B&O portable is the first exception to this rule that we have found to date.

One of its most unusual features is the versatile antenna setup. The telescoping antennae are pivoted at the bottom, so they may be swung outward in line with one another. Spring-loaded detents hold them in place.

The pushbutton channel selectors automatically connect the appropriate antenna array for the chosen band. Depressing the fifth pushbutton connects the external antenna socket to the FM and standard AM inputs, and the receptacle just happens to be the standard type used in automobiles. A special felt-lined bracket is available for installing the set under an auto dashboard, and the set can be installed in or removed from this in a matter of seconds, without tools. Thus, it can easily double as a regular portable radio and an auto radio.

A small meter serves as both a tuning indicator and a battery condition indicator. When tuning stations, maximum deflection indicates on-the-nose tuning. Depressing two of the channel selectors at once connects the meter to read battery condition.

The manufacturer claims 200 to 300 hours of battery life, depending on the average volume at which the set is run. We used it at a variety of levels, and after a total of about 100 hours, the batteries showed hardly any loss of voltage.

Using its own antennae, the set received, and easily separated, standard AM stations from all over the continental U.S. and Canada. Short-wave reception was less impressive, although local transmissions and some powerful overseas stations were pulled in satisfactorily. A larger external antenna improved SW reception to the point where the radio compared favorably with a moderately-priced communications receiver. We encountered a few local AM broadcast stations on the SW 1 band, indicating that some image interference was taking place.

On FM, with the dipole fully extended, the B&O portable pulled in every FM station within about a 30-mile radius, with exceptionally low distortion and full quieting.
detuning brought in satisfactory high-end response.

There is adequate power for full-level listening in a car with its windows shut or travelling at moderate speeds, but 1 watt is not enough to compete successfully with loud wind or traffic noises when driving with the windows down. A large external speaker can provide a considerable improvement in bass response, but the set cannot be expected to drive an inefficient speaker to anything like full room volume.

The tape output is at too low a level to feed the line input of most recorders, and is too high to feed to most microphone preamplifiers. The best idea would be to pad it down to about 5 millivolts and feed it to a Hi-Z mike input. FM signal output from the Tape Out jack is a bit tipped up at the high end (no de-emphasis), but is otherwise indistinguishable from that of a top-notch component tuner. AM output has the same hollowness that was noted previously, but almost adequate high end.

This is no substitute for a good component tuner, but it is the only transistor portable we’ve found that we would even bother to compare on this basis. The price is steep, but good sound is never inexpensive. We stretched a point and bought one. We like it.

MANUFACTURER’S COMMENT: The report is eminently fair, and the last paragraph sums up our own feelings. The separate tone controls are particularly useful in suppressing interference, or for boosting the treble to compensate for the downward-facing speaker in a car. The tape recorder jack, or tuner output as it would best be described, has adequate level to drive the high-level inputs of a preamplifier or the typical European tape recorder for which it was admittedly designed. Although a remarkably versatile receiver, it was expressly designed as a high-quality FM portable, and the prospective purchaser should so evaluate it.

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Gallo FM Antenna

**SPECIFICATIONS** (furnished by manufacturer): Type: Non-directional indoor FM antenna system. **Power requirements:** 110 VAC, 60 cps, 1 watt. **Transistor preamp:** one 2N94. **Dimensions:** 6 1/2' L by 3 3/4' W by 1 1/2' D. **Price:** $29.95. **Manufacturer:** Gallo Electronics, Inc., 12 Potter Ave., New Rochelle, N. Y.

This is an omnidirectional FM antenna system with a built-in transistorized booster preamp, for use in place of conventional dipole or yagi antennas. The unit is powered from the AC line, and its output terminates in three spade lugs, two for connection to the antenna terminals and the other to the tuner's chassis.

**ADDENDUM:**

For optimum pickup of one station, and it will bring in most of the others equally well. The transistor preamp is used to overcome the loss of signal level due to pickup of only a portion of the transmitted wave. We tried the Gallo FMS-101 in a center-city apartment and a suburban home, comparing it with a simple indoor dipole antenna made up from twin-lead cable. In the apartment building (where rooftop antennas are not permitted), the Gallo unit ran circles around the dipole. There were so many reflections and interference patterns in the apartment that the dipole had to be reoriented for optimum reception of several stations. Locating the Gallo unit for optimum pickup of one mid-band station brought in the rest of them with no trouble, although its sensitivity appeared to diminish slightly near the upper end of the FM band. At best, its output level was comparable to that from the dipole in its best location, and there was no evidence of overloading from the strongest stations.

In the suburban location, about 15 miles from center-city, it was another story. Here, reflection interference was less severe, and nearly all desired stations were off in the same direction, so a single location of the dipole brought in all stations very well. The best position we found for the Gallo yielded good results, too, but it was located from slightly higher (in the middle and lower parts of the band) to slightly lower (in the upper range) than that from the dipole.

Multipath distortion was no more or no less from the Gallo than from the dipole in the suburban location, but the dipole did a better job of pulling in distant upper-band stations.

As a final check, we tried the Gallo with a tuner that had previously been operated only with its own "line cord" antenna, in the same suburban area. Here, the improvement was astonishing, but again, we found that a simple dipole did equally well with most stations.

The Gallo FMS-101 is probably the best antenna you can use in a city, where signals are strong, stations are off in all directions, and landlords may prohibit rooftop antennas. There may also be some cases where it will outperform a dipole in outlying locations, but whether or not the improvement would be worth the wide difference in cost is another matter. It is however sold with a money-back-if-not-satisfied guarantee, so there is nothing to lose by trying it in circumstances where it might be the best antenna for your location.

**ADDENDUM:**

Regarding your comments about the sensitivity of our unit on the high end of the band, we think you must have received a unit which was imperfectly tuned at the factory, because the FMS-101 has shown itself to be very effective from 103 MC to 108 MC. We would like to send you another unit if you’d care to test it.

Most important is the reference to its power to pull in suburban areas. You may have followed the instructions and used the terminating resistor in all cases. This would have a detrimental effect upon the signal gain. Our new instructions indicate that the user is not to attach the resistor unless signal overload appears. The new instructions also spell out the positioning of the antenna in a more lucid fashion.

Testimonial letters from other editors, consumers, radio stations, and customers of ours seem to prove that the Gallo will pull effectively on monaural up to an average of 70 miles with excellent reception, and up to an average of 30-40 miles on stereo. We would like you to give it a distance test again, although we are quite pleased with the thorough and professional test to which you have put our product.

**REVIEWER'S ADDENDUM:** We will retest a second FMS-101 antenna and report our findings in the next issue.
BEETHOVEN: Symphony No. 9 in D Minor (67:43)

A Pierre Monteux Documentary (27:42)

London Bach Choir and London Symphony Orchestra; Elizabeth Soderstrom, soprano; Regina Resnik, contralto; Jon Vickers, tenor; David Ward, bass; Pierre Monteux, conductor.


Were it not for the fact that Pierre Monteux is the conductor of this new set from Westminster, this recording would be disqualified from serious critical consideration by virtue of its inept engineering and flawed processing. Let it be said, however, that from a musical point of view, at least what can be heard of it through the wall of engineering folderoll, this reading by Monteux is of a calibre one would expect from such a master, and deserves to be counted among the finest interpretations the work has ever had on records.

But, and this is a very big "but", Maitre Monteux and his forces have been dealt such a disservice by the engineers and those responsible for the purely physical processing of the discs that this recording cannot be considered competitive with the other stereo versions, including those of Reiner, Szell and Krips, let alone the classic mono recordings by Weingartner, Toscanini, Furtwaengler and Kemperer.

Let's consider first the more obvious processing flaws. Surfaces throughout are noisier than I have heard in years — pits, ticks, swishes — you name them; they're there. Side one, which contains the first two movements and runs to over 27 minutes, is so plagued with groove echoes or something that each sudden increase in dynamics is aggravatingly anticipated by a harsh crackling sound. Let it be said however, that tracking is generally good, but this may just be a result of the lack of any deep bass, rather than because of any miracle wrought by the cutting technicians at Westminster.

But now, to the real fun. In the folder bound into the album is, first, a diagram of the seating arrangement used for the orchestra. Unconventionally, the cellos are seated to the left of the conductor, in front of the first violins, while the double basses are placed to the right of the conductor in front of the second violins. This is the way the recording sounds.

But now, turn the page in the folder and look at the picture of the orchestra and soloists during the recording session. The seating arrangement, diagram to the contrary, is the one Monteux always uses: first and second violins disposed to the right and left of the conductor, cellos to the right of center, with double basses to the right rear. Maybe that's the way they actually were, but that's not how they come through on the records. But, then, what do conductors know about stereo recording anyway? That, it seems to me, was the attitude of the engineers throughout this session.

Balances are repeatedly upset by the sudden accenting of inner voices. Here and there I detected spots where someone apparently forgot to turn on the accent mikes for the first violins, and then suddenly remembered that they are important and brought them in with all the subtlety of a bulldozer. For all that, however, they always remain in back of the cellos. On occasion the tympani blanket the sound with a wooly muddle which just serves to emphasize the recording's lack of true bass.

Middle distance is the general run of perspective here, and there is nice, unexaggerated spread to the orchestra and large chorus. Soloists, when their mikes are turned on (!), are at a good distance, but they are so widely spaced across the stage that you wonder how they could keep together. At one incredible moment the contralto seems to run from one side to the other, perhaps looking for the baritone and tenor who seem to have retreated suddenly to the back-stage area.

Well... why labor the point? I have but two questions to ask, though: How, with the art of recording at its present state, can an atrocity like this be perpetrated? And second, and more to the point, how could Pierre Monteux have sanctioned the release of this grotesque recording?

The rehearsal segment, which ends with a none-too-rousing performance of La Marsillaise, is a frustratingly brief sample of something we still do not have on records: a document of a great conductor building a performance from the ground up. Like other similar issues, this one is an inadequate montage which whets our appetite for a complete rehearsal series beginning at the moment the conductor steps on the podium for the first time, and ending as he says: "Now I am ready to record." J.W.K.

MAHLER: Symphony No. 1 (52:52)

Boston Symphony Orchestra, Erich Leinsdorf, conductor. RCA-Victor disc LSC-2642, $5.98.

PUCCINI: Madama Butterfly (2:8:23)


RAVEL: Bolero (15:02); Pavan for a Dead Princess (5:33); La Valse (10:58)

Boston Symphony Orchestra, Charles Munch, conductor. RCA-Victor disc LSC-2664, $5.98.

The inner sleeve for these first Dynagroove records carries a long discoue entitled "Dynagroove—What It Is and What It Does." I read it through twice, but all I could glean from it was that Dynagroove (1) adjusts the shape of the cutter modula-
rions so that the groove shape conforms to the tracking requirements of the playback stylus, and (2) applies some kind of signal level control that is supposed to compress the dynamic range without making the signal sound compressed.

Both "explanations" raised more questions than they answered. A phone call to Victor provided some further details, which are the basis of this issue's "Forum" piece, and which may or may not elicit further discussion. Certainly the sound of Dynagroove is open to some discussion, for of these three discs, two were pretty miserable and one was quite good.

To be specific, both the Munch-Ravel and the Leinsdorf-Mahler discs sound shockingly gimpicked. During low-level passages, the sound is rich, warm and transparent, with the full, deep low-frequency response I normally associate with original master tapes. But the louder the orchestra plays, the worse the sound gets. Bass becomes increasingly thin, high start to scream, and there is a progressive increase in electrical distortion—muddying bass and fuzzing highs—as the recorded level increases. This might be understandable were RCA-Victor laying an unprecedented amount of dynamic range on their new discs, but the fact is, these have less dynamic range on them than was on some 78-rpm discs that Victor released in the early 1940s.

The Puccini is no better, as far as dynamic range is concerned, but its lack of dynamics is much less distressing than in, say, the Bolero, which is supposed to be a continuous crescendo. The Puccini is also far cleaner-sounding than either of the others, its tonal gimpicking is less pronounced, and the performance is so movingly beautiful that the whole thing emerges as a very enjoyable recording. Puccini and Dynagroove are reasonably compatible, because the score puts most of the heavy bass notes on the off-beat during loud sections, so Dynagroove's computer can let the bass through when it isn't clamping down on the loud strings and brasses. There is still no deep bass during orchestral tutti, but the recording managed to come off convincingly, albeit despite of, rather than because of, Dynagroove.

RCA-Victor asks that Dynagroove be compared with "the best possible disc recording available by any label, anywhere," I compared, using the Puccini as the "standard," and as far as I'm concerned, Dynagroove lost out to a number of Londons, Columbias, Vanguard, Mercury, and Deutsche-gramaphons, not to mention a few "old-fashioned" RCA-Victor discs. If Dynagroove is the sound of the future, I'm going to become a fanatical reactionary.

J.G.H.

MUSIC FOR STRINGS

Couperin: Concert Pieces for Cello and Orchestra (13:05); Mozart: Divertimento in D, K. 136 (11:21); Corelli: Concerto Gross No. 4, Op. 6 (9:05); Britten: A Simple Symphony (15:25)

Solisti de Zagreb, Antonio Janigro, cello and director. RCA-Victor disc LSC 2653, $5.98.

From the standpoint of content and musicianship this is a superb collection of delightful music performed with the consummate authority and artistry for which Mr. Janigro and I Solisti de Zagreb are justly famous. The recording too, while by no means perfect, is at least pre-Dynagroove, which as far as I'm concerned is now a compliment to any RCA-Victor release.

Surfaces are immaculate and, despite the well-filled sides, I found no noticeable inner-groove problems. The low end is firm and full, and the dynamic range is adequate for the music. But someone on the engineering staff decided that here was a chamber orchestra which could be easily made to sound larger, and so what we hear is not unlike the sound of a full string orchestra. As a result, the delicacy of the performance is spoiled by a cavernous acoustical environment that would be ideal for a recording of The Planets, but is hardly appropriate to this kind of music.

Directionality is unobtrusive, and the placement of Anton Heiler's harpsichord during the Corelli concerto is well thought out. But the first violins suffer from a case of zips which is only partially correctable by means of the left-channel treble control.

In the Couperin pieces there is a gross miscalculation in balance. Mr. Janigro's cello is placed right in our lap, while the orchestra is much too far in the background. In addition, the violins always sound as if they are coming from a much greater distance than the lower instruments of the orchestra. Despite all of this, I am willing to put up with the recording because of the music contained thereon and in view of the wonderful playing of the Solisti de Zagreb.

But is it too much to ask that RCA-Victor stop sticking their technical fingers in every musical delicacy they serve us? J.W.K.

TCHAIKOVSKY: Symphony No. 7½ ("All Is Lost") (13:20)

Sibling and Leblanc, balalaikas. Pletora disc PS-100547, $5.95.

Published one year after his controversial seventh symphony, the "All Is Lost" symphony is most remarkable for having been composed eight months after Tchaikovsky's death. The theme of this monumental work for chorus, solos, and full orchestra is the futility of practically everything, including this performance by Sibling and Leblanc. The arrangement of the original score for two balalaikas leaves something to be desired, in this critic's opinion.

Incidentally, this a comparable stereo disc, in which sounds from the left and sounds from the right are mixed together so they all come from the middle. A.F.*

Once Over Very Lightly

A couple of items that should have been mentioned in January-February's "Once Over Lightly" report are mentioned here and now, to correct the oversight.

Beyer DT-48 Headphones: Probably the highest-priced headphones available ($79.50 plus $18.50 each for matching transformers), these German-made audiometry phones are reasonably comfortable to wear, and except for some low-end loss, will put the best loudspeaker systems to shame for naturalness and smoothness. Each phone has 4 ohms impedance, and their matching transformers raise this to 2,000 ohms, for bridging a 600-ohm line.

Heathkit Test Instruments: A blanket recommendation here, for a line of moderate-cost test equipment that has not to our knowledge included one lemon. Many high-fidelity equipment manufacturers use Heath test equipment for their design and production testing, which is endorsement enough.

* April Fool!
Tape (from page 10)  
simpler but equally effective way of adjusting record equalization is by feeding FM interstation hiss through the recorder at about 15 db below normal record level, adjusting the input and playback signals to the same measured level, and switching back and forth between them, varying the record equalization until their high ends sound as similar as possible.

Recorders which do not have a separate playback head and preamp are a major problem because they must be rewound and played every time something is adjusted, in order to observe the effects of the adjustment. The service manuals for these machines generally recommend setting the bias by a direct measurement of the bias voltage appearing across the record head, but this does not take into consideration differences in oxide formulation from one tape to another, so it's a pretty hit-and-miss way of doing things.

The best way of adjusting a two-headed recorder is in conjunction with another recorder. By using two machines, in tandem, the second one can be made to play back from the tape while the first is recording. Thus, the bias adjustment on the first machine can be made while watching the output level from the second one. When using this arrangement, it is advisable to deactivation the second machine's pinch wheel by propping it slightly away from the capstan, so that if there are any differences between the speeds of the recorders, they won't stretch the tape or spill it all over the floor.

This is not the way to conduct equalization tests, though, for recording equalization must be matched to the particular record/play head that's in the circuit, and a different head, as one on another machine, will yield confusing, not to say irrelevant, measurements. Recording equalization adjustments on these machines must be made by adjusting, recording, and playing back a sample of program material, comparing it with the original, and making repeated A-B tests until B sounds like A.

Once you've set up the recorder for the tape, copy off a variety of program sources containing deep bass, solo instruments, percussive treble and massed violin passages, and run the recorded tape onto a small reel, for future reference. Then play the whole thing back, listening critically for such things as fuzziness in the middle range, roughness at the upper end, and muddiness or fluttering sounds in the lower range. If the tape compares unfavorably with the original, lay it aside and repeat the foregoing adjustments and tests on one of the other kinds of tape you're considering. If all the tapes you try sound pretty sick, you need a better recorder. If you don't notice enough difference between tapes to worry you, choose your tape on the basis of price or some other non-performance factor like packaging or reel shape.

Baffle (from page 11)  
the bulk of program material, phase checking and switching is rarely necessary again.

Electronic Crossover  
I would like to biamp both channels of my stereo system, but my Bozak speakers require 6 db/octave crossover slopes and I have been unable to locate an electronic crossover of this type. So, I was wondering if you could suggest one or give me the schematic of one. The system is 8 ohms throughout, and requires crossovers at 400 and 2,500 cps.

R. V. Borden  
Tulsa, Okla.

Here is the schematic for a "dry" electronic crossover providing 6 db/octave slopes from 400 and 2,500 cps. So-called dry (or passive) networks are superior to tube types for gradual-slope crossovers, as they introduce no distortion and are entirely trouble-free.

The network can be built into a small "Mini-Box" and located beside each pair of power amplifiers. Output leads must be fairly short to avoid cable losses.

To obtain other crossover values, change the values of the capacitors. The crossover point will occur at that frequency at which the capacitor's reactance equals the resistance of the resistor having the same number designation on the schematic.

For capacitive reactance values, see Stereophile Chart File No. 1.

No Wear Nohow  
Has anyone ever determined how lightly a pickup must track before it ceases to wear records?

R. Clement  
West Chester, Pa.

There has not been a definitive study made of record wear, but indications are that wear drops off very sharply when a pickup's stylus is light enough and compliant enough to allow clean tracking at 1.5 grams or less.
Flutter Follow-Up

Sirs:

In re-reading your report (on the Hartley 220-MS speaker), I came across one item that we followed up and solved, thanks to your mention. I refer to the flutter you reported at 35 cps, which was traced to an excessively dense grille cloth. We have changed this to one that is better-looking and more open, and the improvement is marked.

Fortunately, only four systems had gotten out in the field when we made the change.

Best wishes, and may your circulation climb.

Robert Schmetterer
Hartley Products Co.
New York, N. Y.

Stereophobia

Sirs:

I say that stereo is a first class fake and the biggest fraud ever put out by American Mfr. I have never found anyone who knows audio engineering or music that did not agree with this. All those who disagree just don’t know enough to know the truth or they are liars engaged in selling stereo equipment. The only reason that most people have gone for stereo is that they have not had time, and will not take the time to get all of the facts, so they are victims of advertising, the biggest con game in the world, and I am not so sure that they don’t deserve what they get.

What I think about stereo is based on the engineering facts, not on my opinion. You should know that just to begin with it is impossible to even hear stereo except with earphones. If you don’t know this I suggest that you get all of the facts. Then you will have an accurate basis to start off on your evaluation of stereo versus mono.

In any magazine the man who writes the ans to the technical questions sent in by the readers does not know it all and he usually knows only a very small part of it. If he knew it all he would be a very high paid designer for some mfr or have his own factory. And that is why these published ans to technical questions are as bad as the advice given by the newspapers to letters sent in. The people who ans them are just not qualified to ans them, if they were they would not be doing such a job.

Anyone who thinks that you can tune a spk cabinet with a flashlight battery should not be permitted to publish anything. Just to begin with you need to know the fall-off rate of the woofer as well as its free air resonance and frequency response curve. Then you have a starting point to pick out the frequency that you want to tune it for.

You also have to know the best shape for the type of enclosure you are going to build, and take into consideration that there will be a peak in the frequency response curve at a half wave length of every measurement of the inside of the cabinet.

Then you have to know what shape to make the opening or openings and where to locate them. You must not only tune the cabinet you must also correctly dampen it (which requires a 'scope). And if you tune it too low you loose the mid range bass of the woofers response.

P. S. Montgomery
Oklahoma City, Okla.

Good grief, Charlie Brown!

Fried and Service

Sirs:

If Irving Fried’s head, though bloody, is still unbowed, I hope you will encourage him to speak his mind on other matters in the future. He’s inclined to go overboard at times, but he is obviously competent and dedicated, and the controversy he evoked (“Farewell to the Paper Cone,” etc.) made for reading that was not only interesting but informative.

Mr. Teesdale’s “Service, You Jest!” touches on something that is indeed a problem. You ought to dig into your readers the fact that their best long-range interest lies in buying their equipment from a nearby competent audio specialist (assuming of course that there is one nearby). We approach the problem by considering access to servicing as part of a “package” the customer pays for when he buys equipment from us. What we sell, we service. Labor charges are nominal, and all kits are checked free after completion to see that they meet specs. Service is prompt, because our shop isn’t cluttered with stuff we didn’t sell, and because everything we work on is something in which we have a personal interest. We would hate to think that we are unique.

William H. Burke
The Sound Room
Kalamazoo, Mich.

Unique, no! Unusual, sir!

Call for Condemnation

Sirs:

One reason I subscribed to your magazine was because I hoped you would tell the truth about all the crummy equipment that is on the market, but I have yet to see you call any product really bad.

I thought that, having no advertisers, you would be able to do this, but all your equipment reports to date have ranged between raves and semi-raves. Is it that you have not yet tested any poor equipment, or are you afraid to condemn something bad when you come across it? Let’s see you put some teeth in your test reports. The manufacturers of cheap junk have been protected for entirely too long by all the audio publications, but you have no excuse for doing this.

R. Schwenk
Allentown, Pa.

We don’t have the space to devote to reports on junk, and we do not believe our readers are interested in junk. We do not see our equipment reports as a medium for venting our spleen, but rather as a means of alerting our readers to components they might be interested in.

We will report on junk products only when their advertising is so blatantly misleading as to demand refutation. We have a couple in mind, and will report on them in future issues.

Once Over Again

Sirs:

Your “Once Over Lightly” in the last issue contained the most forthright, definitive statements about components that I have ever read anywhere. I hope this will become a regular feature in every issue.

John Whipple
Rochester, N. Y.

Why in every issue? We named what we believe to be the best components available; you want a listing of seconds, thirds and fourths, too.

We are planning a “Once Over Lightly” on recordings for a future issue, but these truncated reports cannot be repeated very often, because we don’t have the staff to do all that much testing every couple of months.
**Miscellany**

**A Pause for Hiatus**

July and August are the low points of the audio year, when everyone is outdoors or away on vacation, so we too are going to observe this hi-fi hiatus by skipping an issue of The Sterophile.

Volume I Number 6, which would have been dated July-August, will be dated July-October. And with luck, it will be out by mid-August, so that you'll receive it before the end of that month. We'll have extra time to work on that issue, so we're planning some unusual features.

Our dropout will not affect your subscription, except to make it last two months longer than you thought it would. You'll still receive 12 issues for your $6 subscription.

**Cover Story**

In case you didn't notice, there's a small jarring note in our cover photo. Look carefully at the resistor(s) near the center of the picture.

In future, every conventional-looking photo on our cover will have at least some such inconsistency. We won't always call attention to it.

**Demos, Anyone?**

A press release that crossed our desk recently quoted Bill Colbert, of New York's Audio Exchange, as declaring the lack of "a demo record of top quality" for use in showing off high-fidelity (presumably in stereo) equipment. Mr. Colbert would like to see something with "about 20 bands on it," and featuring all sorts of music in short snatches and, presumably, all carefully chosen to show off such things as separation (a vocal duet), bass response (organ pedals), treble response (triangles and castanets, probably), and all the other things that the general public associates with hi-fi and stereo.

This is a fine idea, but if some record manufacturer decides to take a crack at it, let's for heaven's sake hope they do it right. Sure, put some widely-separated stuff on it, and include some bands with grunting organ pedals and scintillating percussion, but make the thing a legitimate demonstration record for really good equipment. In other words, cut it to the RIAA curve, without bass cut or extra treble boost, put some really wide dynamic range on it, and include at least a few bands of honest musical recording of the calibre that English firms give their domestic record buyers as a matter of course.

**Old Faces of 1963**

We thought readers would appreciate the smaller type face that we used in the last issue, because it gave us more room to work within our 18 pages. Judging by the letters we've received, most readers disagree. The larger type is easier to read, and since it also costs us a bit less, we won't argue. We're back with the 10-point type again, as you may note by comparing this issue with the last, and we will stay with the larger type, for the sake of consistency if nothing else.

**Martinsburg Multiplex**

A brief note from a Mr. Gollday at station WEMP-FM, Martinsburg, West Virginia, informs us that said station is slated to start multiplexed stereocasting "no later than mid-April or the first of May, 1963."

Here's some pertinent data about WEMP-FM, for the benefit of those who may be within receiving range: The station is at 97.5 Mc on the dial, with 4.7 KW power, and a transmitter location 1,550 feet above sea level. Their equipment includes Gates stereo console, turntables, dual limiters, transmitter, stereo generator and five-bay cycloid antenna. Arms and pickups are Empire units.

**Noncompetitive System**

There's a platitude in the business world that goes "It pays to advertise..."

We have tried to advertise, in the logical places where our potential readers would see our ads: in High Fidelity, Audio, and Hi-Fi/Stereo Review. Our ads were rejected. The reason? We are, and we quote, "competition" for these mass-circulation magazines.

Oh, come now!

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**Audio Mart**

The Audio Mart will publish, free of charge, Buy, Sell or Swap ads from Sterophile subscribers. Nonsubscribers may insert ads for circulation among our highly concentrated readership at a rate of 10 cents per word, including name and address. Hyphenated words count as a single word, as do initials. Ads are published as received, so we cannot be responsible for the condition or quality of items advertised for sale in Audio Mart.

SELL OR TRADE: Two "Electrostat 3" speaker-xover units. Used very little because of rotten room acoustics. Also a 78-rpm record cabinet, designed for 110 records, ten or twelve inch. This is for collectors only. Discs are held firmly yet gently in velvet-lined slots. Glass front. $100, and I pay expenses, or best offer and you do. Or will trade for blonde AR-1. B. Plotnick, 364 Woodbine Rd., Stamford, Conn. Phone 201-312-1034.

WILL SELL: either DuKane lotovac 30 speaker system (walnut, less than 100 hours use) for $125, or AR-1W-Janssen 130-B8 system (blonde) for $170. Also, Janssen 65-B8 electrostatic tweeters at $55 each. N. J. McNamara, 2 Winfield St., Staren Island 5, N. Y.

AR-1W woofers, unfinished cabinet, perfect condition. Will sell for $85, or best offer. R. W. Olsen, 1316 Barbara St., Tyler, Tex.

SOLD: Concertone NWR-1 network recorder, full-track, 7.5 and 15 ips, in two portable cases. Room for additional heads. $200. Magnecordette record-playback tape preamplifiers, 3 available at $10 each. R. C. Sherbahn, 5991-B Young Dr., Beverly Hills, Calif.

SOLD: McIntosh C-8 preamp, $35; McIntosh C-108 preamp, $20; Viking Model 83EQ recorder. $85; Heath TS-4A TV sweep generator with 10.7-Mc crystal for FM alignment, $35. All in working order, with manuals. E. Dell, 307 Dickinson Ave., Swarthmore, Pa.

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**CANADIAN SALE: The following equipment, used for two years, is available at 40% below current Canadian list prices: JBL Metrogen enclosure, oiled walnut; Two JBL T 075 tweeters, with 7-kc crossovers; McIntosh C-20 preamp; Shure M 216 Studio Dynamic arm with 0.5- and 0.7-mil stylus and cartridges. N. Metal, 2090 Comox Street, Vancouver 5, B. C.

FOR SALE: Stereo pair of Janssen "cross-fired" utility array electrostatic tweeters, from "Jankit 41" systems (same as model 65); $75 for the pair. Perfect working order. A. J. Armbrust, 1841 Lyndoon Rd., San Diego 3, Calif.

FOR SALE: Shamrock recording tape, 1800 1-mil acetate on 7" reel, $1.69 per reel postpaid. Quantities welcomed. Roger Bartlett, P. O. Box 342, Columbia, Missouri.

FOR SALE: Roberts 990 desk. three heads, automatic stop, superior quality, like new; two RA-100 recording amplifiers, excellent; all for $100. Also have Electro-Voice $30 microphone at $20. Will consider trades for amateur radio equipment. J. Foy Guin, Jr., Box 26, Russellville, Ala.
The ear's perception of loudness depends upon the frequency of a sound as well as its actual intensity. When the sound is intense, our perception of the loudness of different frequencies is almost directly related to their intensity. For softer sounds, however, the ear's sensitivity to bass and, to a lesser extent, to treble tones diminishes progressively.

The Fletcher-Munson curves of equal loudness show the tonal compensation below and above 1,000 cps that is needed to make all frequencies sound equally loud. All intensity figures on the graph are expressed as decibels above the threshold of hearing, which is taken as 0 db. Thus, the bottom curve shows the response characteristic that will make all frequencies barely audible, while the upper curves show the compensation that is needed to produce linear perceived response at levels of 10, 20, 30 etc. decibels above threshold.

Note that these are not response curves of the human ear, but are the complementary curves needed to offset the ear's own frequency discrimination. The curves represent averaged test results gleaned from a number of human subjects, some of whom had impaired hearing at very high frequencies. This explains the upward tilt at the right of each curve, in the shaded area.

The ear's response deviations are normally applied to all perceived sounds of a certain intensity, whether the sounds are live or reproduced. Thus, a sound that is reproduced at its original intensity, through a system with flat frequency response, will be heard as having the same tonal balance as the original sound. Variations in perceived balance that occur as the result of dynamic contrasts in music are, similarly, observed in both the concert hall and the home reproduction, so no tonal compensation should be applied to these, either. Only when the reproduction is louder or softer than the original do we need "loudness compensation" in order to restore to it its natural tonal balance.

The shape of the loudness compensation curve required at various playback levels can be read from the graph as the difference, in decibels, between the curves representing the intensities of the original sound and the reproduction. Relative levels of typical live and reproduced sounds will be found on Stereophile Chart File No. 5, in the next issue.
Richard Karnette
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Long Beach 13, Calif.
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