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Conductor Howard Mitchell and the National Symphony Orchestra listen to playback of their own performance just recorded on Audiotape at the Soundorama Concert in Constitution Hall. Story on Page 2.

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"SOUNDORAMA" concert dramatizes flawless perfection of Audiotape recordings



By M. Robert Rogers
President, Station WGMS
Washington, D. C.

A length of magnetic recording tape was subjected to a crucial and nerve-wracking test recently in Washington. In effect, on this tape rested the reputations of one of America's major symphony orchestras and of WGMS, the Good Music Station of Washington, D. C. This tense moment took place as the feature attraction of the National Symphony Orchestra's Soundorama Concert, produced by WGMS. The tape chosen for the test, and which came through with flying colors, was Audiotape.

The Soundorama Concert, believed to be the first of its kind ever presented, was conceived primarily as a means of introducing the sound of good live music to audiophiles, and concurrently to introduce hi-fi to uninitiated music lovers. As the head of a radio station specializing in transmitting good music, I have become pointedly aware of the fact that many more people today hear good music in some reproduced form than ever hear a live performance. Although this is very good for my business, and certainly a tribute to it, I am painfully aware that a public served entirely by reproduced music and uninterested in live performances will soon dry up the sources of supply that make reproduced music possible.

Dr. Howard Mitchell, brilliant conductor of the National Symphony Orchestra who is himself a high-fidelity owner, was sympathetic to the project, and agreed to conduct his splendid orchestra in Constitution Hall for the occasion. Our faith in the project was more than justified. On the evening of November 13th, 4000-seat Con-



Suspense runs high as Avery Fisher, right, delivers opening remarks at the WGMS-Soundorama concert. The banks of speaker cabinets are shown in the background.

stitution Hall was filled for this unique demonstration. They saw and heard a great symphony orchestra dissected before their eyes and ears. Each of the component instruments was demonstrated individually with its characteristics explained, and then the whole orchestra was put together to play pieces representative of the development of the modern orchestra.

The electronic side of the concert brought to Constitution Hall the biggest assembly of home-type hi-fi components ever assembled for such a purpose. These components were selected by the famous high fidelity pioneer, Avery Fisher. Mr. Fisher provided his own splendid 50AZ amplifiers and secured ten Jensen Imperial speaker systems. These were ranged behind the orchestra on the stage of Constitution Hall, each speaker fed by a Fisher amplifier. The Audiotape was recorded on and played back through Berlant BR-1 recorders. If the reader is awestruck by the magnitude of this equipment, he will probably be stupefied by the statistics of the hall it had to fill. Constitution Hall is America's largest hall devoted primarily to concerts.

It has fifty percent more seating capacity than Carnegie Hall or Philadelphia's Academy of Music, and because it has a stadium-type auditorium, performers, live or electronic, have to fill one million cubic feet of space.

The hi-fi demonstration of Soundorama included two major chapters. The first had mystery, the second suspense.

The piece chosen to demonstrate the orchestral brass, which like the military brass is meant to be heard, was a Fanfare by Paul Creston. The audience evinced pleasure as the horns, trumpets and trombones sounded their stirring harmonies. And the audience was momentarily mystified when the musicians lowered their instruments after a couple of minutes while the Fanfare blared merrily on. It had been pre-recorded on Audiotape, and although Mario Lanza had gotten in a lot of trouble under similar circumstances, our friendly listeners applauded us for tricking them.

Such an illusion could never succeed unless every component in the array gave flawless performance. It is clear that the key component is the magnetic recording.

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Published by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

If the tape material was faulty, if it contained unwanted hiss or other noise factors or produced interferences, then the best reproducing equipment in the world could not fool an audience.

These demands plus an added one of complete dependability had to be met in connection with the second aspect of Soundorama's hi-fi demonstration. We had advertised that one feature of the concert, indeed the climax of it, would be a simultaneous recording and immediate playback right from the stage of Constitution Hall. Dr. Mitchell chose the first movement of Rimsky-Korsakov's "Spanish Caprice" for this recording. Here we would all be in an exposed position, and I was frank to let the audience in on the risks involved. Any one of a number of things could go wrong, especially with the tape itself, and yet we were pledged to make a recording of a symphony orchestra and play it back before we heard it ourselves and to an audience which had just heard the live performance!

The results? Let the professional critics answer:

Paul Hume in

The Washington Post said:
"The balance was good, and the sound realistic."

Day Thorpe in

The Washington Star said:
"The audience was as responsive as any you'll see. A part of the Caprice Espagnole was recorded and played back. It sounded good."

Paul Sampson in

High Fidelity said:
"It sounded fine. The balance was good and the sound was rich and full."

Martin Mooney in

Tape Recording said:
"The balance was good and the sound was realistic and natural."

Time Magazine said:
"Listeners could hardly tell the difference between real and electronic."

While the reproduction quality that brought forth these comments was clearly the result of the components: Audiotape, Fisher amplifiers, Berlant recorders and Jensen speakers, the realistic balance of the sound was made possible by the microphone technique. The method was devised a few years ago for WGMS after a good deal of experimentation by Tom Tait, the engineer in charge of Constitution Hall pickups for the station. Mr. Tait uses the priceless Western Electric 640AA condenser mike as

his chief instrument. It is suspended about 18 feet above the conductor's head and slightly behind him. A second condenser mike on a ten-foot stand is placed in the midst of the orchestra, before the woodwinds, and cracked open ever so slightly in order to lend presence and detail to the solo winds.

WGMS has undertaken these experiments in connection with its frequent broadcasts of the National Symphony Orchestra under Howard Mitchell. Because of these and many other live high-fidelity broadcasts, WGMS broadcasts more hours of live concert music than any other station in the United States. Since 1948, the station has aired all of the chamber music concerts from the Library of Congress. These are universally acknowledged to be the finest chamber music concerts in the world today. The artists-in-residence are the Budapest Quartet and there are many equally brilliant guest artists.

In order to circulate these and other important live concerts to other cities, WGMS organized a Good Music Network. Although some of this network functions by direct FM relay, the majority of the stations involved receive the programs via high fidelity Audiotape transcriptions recorded right off the program line during the concerts. Naturally, here again the tape material must be flawless, since a missed

recording can never be retrieved and our operations don't permit the luxury of dual recording of the same show for protection.

We make all our music tapes at 15 inches per second, and in this connection the new Longer Recording Audiotape on "Mylar" is a Godsend. The economies and convenience of putting long programs on the new material are manifold.

Every week our recording activities and playback requirements are increasing. A subcontrol room that we installed a year ago for occasional taping sessions is now running fulltime. We originally equipped it with one portable recorder. It now holds three rack-mounted machines. Master control needs two rack-mounted recorders, there are two portables for field jobs, and we still frequently run short of facilities. And none of this activity has anything to do with commercial recording jobs, which we don't accept, even for airchecks of our own programs.

Since every recording we make is for broadcast to an audience that we have encouraged to be highly critical, our tape material must be of uniformly high quality and because most of the programs we record are not available for redoing, the material must be dependable. Our present requirements are met entirely by Audiotape products.



WGMS-Soundorama rehearsal from backstage, showing part of the recording setup using Berlant BR-1 recorders with 10½-inch reels of Audiotape, 10 Fisher 50AZ amplifiers and 10 Jensen Imperial speaker systems.



Pre-recorded tapes strike a new note at HACK SWAIN STUDIOS

In hi-fi and tape-recording circles, Sarasota, Florida, means more than palm trees and sandy beaches. For this city in the sunny South is the source of a popular and ever growing library of "SWAIN-A-FONIC MUSIKON TAPES" — created, recorded and released by Hack Swain of radio fame.

Of particular interest to lovers of truly unusual musical effects, are the new "Multee-Trak" tapes — all performed by Hack Swain on both the Hammond organ and a special piano electronically engineered according to Hack's unique ideas. The final release tapes in this series are produced by the skillful blending of as many as four separately recorded sound tracks. And as much as 54 hours of studio work have gone into just one "Multee-Trak" number 2½ minutes long! These "Swain-a-Fonic Musikon Tapes" in the "Multee-Trak" manner, are available for both single track and dual track recorders, at either 7½" or 3¾" per second tape speeds.

The "Swain-a-Fonic" library of over 50 pre-recorded half-hour programs also includes many other excellent artists besides Hack Swain—Anne Mundy, powerful concert pianist; the Zany Metronomes trio; Lanny and Ginger Grey, charming vocalists; Charles Davies, gay cocktail-lounge pianist; and Jan Call, with her original piano arrangements. Tab Smith and his orchestra release exclusively on tape through Hack Swain Productions. And fourteen reels of metronome-perfect programs designed especially for skating rinks have proved exceptionally popular, not only with skating rinks but with home music enthusiasts as well.

Four new half-hour tapes of classical music from European master tapes are now ready for release. They include symphonies by Netherlands Philharmonic Orchestra; Zurich Tonhalle Orchestra, and Grant Johannsen, pianist, Ricardo Odonoposoff, violinist; Heinz Wehrle, harpsichordist and other well-known artists.

"Musikon Tapes" are available in the following three types:

Type A — Single Track, 7½ inches per second, 1200-ft. reels at \$9.85 each.

Type B — Dual Track, 7½ inches per second, 600-ft. reels at \$6.85 each.

Type C — Single Track, 3¾ inches per second, 600-ft. reels at \$6.85 each.

Classical Programs are available only in Type A (at \$10.85 per reel) and Type C (at \$7.85 per reel).

All single-track tapes will play on either single-track or dual-track machines, but dual track tapes will not play on single track (full track) machines.

Special dedications to a particular person or group can be added at the start of each reel by Mr. Swain (with his compliments) on special request.

All Swain-a-Fonic releases are now being made on the finest professional quality Audiotape.

More than 100 dealers have already sold more than 8,000,000 feet of "Swain-a-Fonic Musikon Tapes" and the dealer list is growing every day. Swain Productions will put a new dealer in business for a minimum \$50.00 stock as his only cost. Prospective dealers are invited to write for further details and program catalogs. Address requests to Hack Swain Studios, P.O. Box 2384, Sarasota, Florida.

The Hack Swain Studio is by no means a one-man operation. Hack and Marie Swain, better known locally as "Mr. & Mrs. Tape Recording" carry the load jointly, assisted by a competent technical staff.

This thriving organization started five years ago with experimental tape recordings in one corner of their Sarasota living

room. And, like Topsy, it just grew and grew — thanks to Hack's wealth of musical experience as former musical director and featured organist, composer, arranger and band instructor. His radio programs are now in their ninth high-rating year — but his broadcasting work goes back still further, when he started as a child prodigy on Station WHAM, Rochester in 1924.

While the modern Hack Swain studios at Washington Blvd. and Laurel were revamped only 18 months ago and equipped with the finest recording equipment obtainable, a building expansion program adding 4000 sq. ft. of studio and office space is already under way.

Despite their many activities, including motion picture and TV work with their associated organizations, Hack and Marie still get the biggest thrill out of the enthusiastic letters of appreciation they receive from such far-away places as Shanghai, Tokyo, Moscow, Vietnam, Sydney and a score of European and South American cities. Their tapes have achieved a world-wide audience, via the Voice of America and through their export representatives, M. Simons & Sons in New York.



The control room for Studios A and B in Hack Swain's recording facilities at Sarasota, Florida. Associates Bill Carey and John A. McGee help Hack check microphone positioning before a session.



Hack Swain at the key-boards of Hammond organ and piano make two hands sound like eight, through "Multee-Trak" method of creating new sounds on "Musikon" tape.

**New 3" Reels of
LR Audiotape
in self-mailer package
offered at special
introductory prices**

This handy, three-inch reel contains over 225 feet of Longer Recording Audiotape on 1-mil "Mylar" polyester film. Depending on tape speed and number of tracks, it provides full recording time of from 6 minutes to 24 minutes or more. Hence it is ideally suited to recording short musical selections, tape correspondence, educational progress samples and many other uses where larger size reels are neither necessary nor desirable.

Packaged in sturdy, re-usable self-mailing boxes, these reels of LR Audiotape can be mailed anywhere in the United States for only 3 cents — and no additional packaging is needed. Just place a stamp on the address side of the box and drop it in the mail. Members of tape correspondence clubs will find this a tremendous advantage, contributing to greater use and enjoyment of the friendly, *personal* tape method of communication.

The new 3" reels of LR Audiotape contain exactly the same premium-quality tape that has been widely acclaimed for outstanding performance and durability by leading professional recordists. Made on 1-mil "Mylar" polyester film, it possesses far greater tensile and yield strength than cellulose acetate of the same thickness. And under summer conditions, it actually provides much greater protection against stretching or breakage than even the standard plastic-base tape of 1½-mil thickness.

Recording times for a 225-foot reel of



LR Audiotape, at various tape speeds are given below.

Tape Speed	Single Track	Dual Track
7½"/sec	6 min.	12 min.
3¾"/sec	12 min.	24 min.
1⅞"/sec	24 min.	48 min.

A Special Offer

As a special introductory offer, to enable you to test the performance of LR Audiotape on your own machine, and to demonstrate the convenience of these 3" reels in the self-mailer package, they can be obtained by mail order from Audio Devices, Inc., at the following special prices:

one reel.....	\$0.70
package of 5 reels.....	3.25
package of 10 reels.....	6.00

Mail orders should be addressed to Audio Devices, Inc., 444 Madison Avenue, New York 22, N. Y., specifying the number of 3" reels of LR Audiotape desired (1, 5 or 10) and including check or money order in the proper amount. Tape will be mailed to you post paid.

This offer applies only to the standard package quantities shown above and no more than ten reels will be sold to any one person. Additional 3" reels as well as larger sizes of LR Audiotape can be obtained direct from your local Audiotape dealer.

BOOK REVIEW by C. J. LeBel

Ernest LaPrade, "Broadcasting Music", 236 pp, \$3.00, Rinehart & Co., 1947

We have often been asked to suggest material on microphone placement from the artistic (rather than the technical) point of view, and on other facets of the recordists problems not covered in technical books. Having found this book a rather useful reference in a lecture course the writer recently gave, a review seem appropriate.

The author begins with a discussion of radio broadcasting, its genesis and present mode of operation. He takes up the aspects of music production at the network headquarters and in the local station, beginning

with program planning, talent selection, and arranging. Copyright problems are discussed, then the art of musical program production, and preparation of musical continuity.

Of greatest interest to our readers are the sections on copyright, microphone placement as an artistic problem, and program building. Since Mr. LaPrade has been writing on the subject of microphone placement for years, his presentation of the NBC point of view is an effective one. The novice in recording or broadcasting will find the book of considerable value.

WATCH THAT DEADLINE

April 1 is the deadline for Audio Devices' BIG PRIZE contests for Home and Church recordists. Have you sent your entry in yet?

The race is off to a flying start — with more and more entries coming in every day. So far, the number of entries in the Home Recording Contest are leading the Church Recording Contest by over 2 to 1. That, of course, is to be expected. It is interesting to note, however, that most of the entries in the Church contest are considerably more complete and more elaborate than the majority of Home Recording entries.

These two prize contests offer both home and church recordists a chance to win valuable awards — for the best articles on "How I Use My Tape Recorder". The following prizes are offered in each contest: One FIRST PRIZE — consisting of a V-M "tape-o-matic" recorder, plus \$100.00 cash, plus twenty 7" reels of Audiotape.

Two SECOND PRIZES — each consisting of \$100.00 cash plus fifteen 7" reels of Audiotape.

Three THIRD PRIZES — each consisting of \$50.00 cash plus ten 7" reels of Audiotape.

In addition, \$25.00 will be paid for any non-prize-winning article that is published in Audio Record or any other Audio Devices publication.

If you haven't entered yet and still have time to make the April 1 deadline, run (do not walk) to your Audiotape dealer and ask for the complete contest rules. There are no strings attached and nothing to buy. *You* might be one of the lucky winners!

CORRECTION PLEASE: We have found that the "Webcor" Model 213 three-speaker portable was incorrectly priced in the Sept.-Oct. 1954 Tape Recorder Directory issue of Audio Record. The correct price for the hi-fi model is \$244.50. Readers who maintain the Directory in their active reference files are requested to make this correction on page 15.

TAPE CABINETS

available from Wallach

Wallach and Associates, 1532 Hillcrest Rd., Cleveland 18, Ohio, have announced a line of all metal cabinets especially designed for convenient storage of tape reels. Sizes include sectional cabinets for 5", 7" and 10½" reels, as well as floor type cabinets with capacities up to 384 reels. Further details can be obtained from the manufacturer.

More About "Mylar" . . . from the Belgian Congo



by
Colin M. Turnbull

Ed. Note: This is the second in a series of reports by noted African explorer Colin M. Turnbull, describing his interesting and unusual recording expedition through the Dark Continent. His recordings were made on Audiotape on Mylar polyester film, under extremely adverse temperature and humidity conditions. As an indication of the ability of this tape to take severe punishment, the following quotation from the preceding article is worth repeating here. "We took advantage of the mains electricity at Accra to edit all our material to date, and were glad to find that all earlier splices were firm and intact. Each new reel of Mylar base tape that we ran through ran without any sign of sticking, but the non-Mylar tape run through when the humidity was 92, temperature 95, and left standing under these conditions for one hour (as had the Mylar test tapes) stuck sufficiently badly to make it necessary to give a fast wind through and back before a satisfactory recording could be made."*

* DuPont Trademark

The following is a continuation of Mr. Turnbull's manuscript.

"The last stretch of the eleven thousand mile journey to the Ituri forest held mixed feelings for me. I had spent happy months some three years earlier with Pat and Anne Putnam, who have given their name to Camp Putnam, famous centre of the Epulu Pigmies. There I had heard the extraordinary music of the Pigmies, and had determined to come back one day and record it. But now Pat was dead — he died at the end of 1953 — and Camp Putnam could never be the same without him. But he too had been anxious for me to record Pigmy music while it was still completely uninfluenced by any contact with Europeans, and here we were with a car load of filming and recording equipment.

The welcome given us by the Pigmies was a good indication of things to come.

They surrounded our Bedford Estate car, climbed up the sides, onto the roof, and hung on to the door handles and open windows, and followed us as we bumped our way down the forest track to Camp Putnam. And they sang. If you have never had about fifty Pigmies surrounding you and singing their heads off you don't know what noise is!

We decided to get down to our recording work right away, and we called a music festival for the coming week-end, inviting all the villages from fifty miles either side of the camp. They started coming in on the Thursday and by Sunday evening we had some ten thousand feet of the best music of the region recorded. The work was slow because after every song the people wanted to hear it played back — not once, but several times. And of course they had to be encouraged with cigarettes, palm wine and beer. It was a tremendous celebration, and it set the pace for the next four months.

We had no difficulty with recordings of tribal songs, but when it came to recording solos, and musical instruments like the flute, musical bow, and Lukembi, we ran into real trouble. The Lukembi is a beautiful instrument made from a piece of wood hollowed out, with a series of bamboo or, in these modern days, metal keys which are plucked with the thumbs.

The soloists are temperamental, and I found it useless to try and get them to do what I wanted them to do. They could never be persuaded to sit or face in one direction, and as they warmed up they would swing about with complete disregard for the microphones. I found one way of keeping them fairly consistently facing the mike was to have the recording machine at some distance behind it. They were all fascinated by the turning spools and the flicking needles and glowing lights. The only trouble with this arrangement was that I had to keep the machine running for the whole of the time the soloist was warming up — sometimes as much as ten minutes — if he saw that the spools were not turning he inevitably lost interest or became discouraged.

Then there was the problem of noise. An African will often play a lukembi for himself, or sit outside his hut twanging away at a musical bow (often his hunting bow, one end held between the toes, the other cupped in the mouth, the string tapped lightly with the end of a bow or a light stick.) But he will invariably attract a

number of people around, who will chat and make comments, and maybe hum accompaniments — and perhaps not too well. The recording machine, whenever it appeared, attracted everyone in the vicinity, stopping all other activity. If we tried to get a recording in private our artist felt self conscious and was quite useless. So with nearly all our early recordings we had to cope with a crowd of from ten to a hundred onlookers; shuffling feet, making comments, coughing, and worst of all calling to each other not to make so much noise. And even when they were quiet there were animal noises, the constant, if slight, hiss of the rapids of the Epulu river, and at night time the persistent singing of the crickets and croaking of frogs.

With some careful padding and sound-proofing we eventually hit on the solution of using the estate car as our permanent studio. With its large windows the artists could see and be seen; as many people could gather around as could stand the biting ants that covered the ground; and the recording machine outside relayed the music to a fascinated and appreciative audience.

But there were two high-lights to the four months work that stand out far above the music festival and our recording sorties to different tribes, delightful as these were.

The first, and perhaps the most exciting, was a circumcision festival. On my previous trip I had come to know the Pigmies very well, and they were all delighted when they heard that I was coming back. So much so that they decided to hold off their circumcision festival until my arrival. I was invited to take part, and to live in the camp — which is normally reserved for the boys and their immediate relations only. I spent two months there, from the start of the circumcision to the end, and I was able to record most of the songs and chants and the Makata, or sacred musical sticks.

Again the recording headaches are obvious. A forced group arranged as one would like around the mike never gave anything but hopeless results, and just as you are about to get some first class recording of the real thing the group will go dancing away from the mike you have so carefully placed. But it was worth all the headaches — including being invaded by traveller ants in the middle of a recording session, discovering termite nests and fungoid growths in the equipment, and constantly worrying about the excessive humidity, averaging just over 80; with an average

temperature of about 78 (variation in temperature was between 67, which felt like freezing, and 92 in the sun and 83 in the forest — barely warm.)

But here we found that the "Mylar" Audiotape gave not the slightest indication of change in behaviour. There was no difference in performance, no tendency to stick (whereas a plastic base tape popularly used, which we brought along for comparison, was sticking badly and showed a great tendency to stretch). For three days I subjected one length of "Mylar" to a constant tension of four pounds in average humidity/temperature of exactly 80/80, and could measure no stretch and notice no tendency to curl.

The second high-light was when we were filming camp life in a pigmy camp away in the forest. We had relays of pigmies to bring our equipment, generator and all, into the forest, and there we got our best recordings. The generator we buried in a hole in the ground, which we dug out, roofed with branches and covered with earth, so that it was quite sound proof at 150 feet distance.

Here we got recordings of all the noises that go to make up a pigmy camp — the tapping of an ivory hammer as the bark cloth is pounded out; the musical yodel of the women as they call from one end of the camp to another; the singing and shouting of the children as they play their games, and the cries and songs of the hunters as they go off early in the morning and return later in the day.

And then, at night. Around the camp fire, with the pattering of the engine barely noticeable above the sound of the crickets and the night birds and animals, with an occasional shriek from a tree hyrax, the pigmies would start singing. This, the forest, is their real home, and this is where they make their real music, and this is where we got our real recordings. My only disappointment was that the women took little part, as the men were singing Lusumba songs, and the Lusumba is a sacred rite in which men only can take part.

Just towards the end we began to have trouble with short circuits caused by termites and ants making meals of insulation, but nothing serious, and the work had been done anyway. We now have some 45,000 feet of recordings, and are on our way to make the last series, in East Africa. But nothing I think will ever quite match the pleasure of listening to, watching, and recording a Pigmy as he dances in the fire-light, singing away to the friendly spirits of the immense forest that is his home."

Note: Audiotape on "Mylar" polyester film is described in Bulletin No. 211, available on request.



by C. J. LeBel, Vice President,
Audio Devices, Inc.

ORIENTATION

In the manufacture of Audiotape, we have perfected an interesting technique which increases magnetic tape output and reduces distortion. This is the process of orienting the individual particles of iron oxide so that they face in the same direction, and thereby increase their overall magnetic effect. The result is (for a fixed input) an output increase of 2 to 3 db and a reduction in the distortion at the same time (in spite of the increase of level).



C. J. LeBel

What is Orientation

The magnetic iron oxide used in tape coatings consists of a large number of elongated particles of minute size. If coated without special techniques, the individual particles are arranged completely at random on the tape, and their magnetic effects are not at a maximum, as may readily be judged from the illustration below.

If a magnetic field is applied properly while the tape coating is drying and hardening, the particles line up longitudinally. In this case, all particles have a cooperative magnetic effect and the recording characteristics are thereby improved.

Improvement in Distortion and Output

The effect on the tape sensitivity may be judged from the data in Table I.

Table I
Comparison of
Output and Distortion Changes

Input: fixed
Tape speed: 7 1/2" /sec.
Frequency: 1 kc

Bias Current	OUTPUT		DISTORTION	
	Non-Oriented	Oriented	Non-Oriented	Oriented
4 ma	57.0 db	59.5 db	4.5%	4.0%
5	59.0	61.0	3.5	3.0
6	59.0	61.0	2.3	1.9
7	58.0	60.0	1.7	1.5

It can be seen that in the normal bias range, the output increases by 2 db. At the

same time that the output is increasing, the distortion decreases to about five-sixths of its previous value. Evidently the saturation point of the coating has been increased by even more than the tape sensitivity change, so that the overload point has been moved up several db. Also, the bias curve has not shifted in position, so that no change of bias is necessary for optimum results.

Frequency Response

The interesting fact is that the sensitivity comes up at all frequencies, so that the frequency response is not significantly affected. The range of effect is shown in Table II.

Table II

Effect of Frequency on Orientation Result
Input: fixed, 30 db below 3% distortion at 1 kc on oriented tape.
Tape Speed: 7 1/2" /sec.
Bias: At output peak.

Frequency	OUTPUT		
	Oriented	Non-Oriented	Improvement
100 cps	1.0 db	-2.0 db	3.0 db
400	1.0	-2.0	3.0
1000	2.5	0	2.5
2000	3.0	0	3.0
5000	4.0	1.0	3.0
7500	5.0	2.0	3.0
10000	4.0	1.5	2.5
15000	2.0	0	2.0

It will be noted that the improvement in output is quite uniform at all frequencies, varying only a half a db from 100 to 10,000 cycles. Even at 15,000 cycles the improvement is off only one db from maximum, which, at 7 1/2" /second, is of no practical significance. Also, the test was made at a level about 30 db below that in Table I, so that the general improvement in sensitivity is slightly greater than that at the higher level.

Magnetics

The orientation process affects both coercive force and remanence, but not proportionately to the performance changes.

Conclusion

For the longitudinal recording process in general use, tape sensitivity and output may be improved, and distortion reduced, by proper orientation of the magnetic oxide particles in the coating. This orientation technique has been very successfully applied to all Audiotape production for several years.

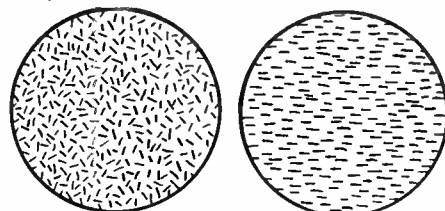


Diagram showing arrangement of non-oriented oxide particles (left) and oriented oxide particles (right).

here's why you get
EXTRA LENGTH
plus
**EXTRA
 STRENGTH**



with **LR audiotape** on **Mylar** polyester film

NOW YOU can get the *extra length* that many tape recording applications require, without any sacrifice in strength or durability. For the new Type LR Audiotape, made on 1-mil "Mylar," actually has greater impact, tensile and tear strength than even the conventional plastic-base tape of 50% greater thickness.

And because "Mylar" withstands extreme temperatures and is virtually immune to humidity, LR Audiotape stands up longer under the most severe conditions of use and storage.

This Longer Recording Audiotape is now available in 900, 1800 and 3600-ft. reels. Audio also offers a complete standard line of Audiotape on "Mylar," in 1, 1½ and 2-mil base thickness. Test it — compare it with any other tape on the market. In *performance and durability*, it speaks for itself!

HOME RECORDISTS — CHURCH RECORDISTS:

Enter Audio Devices' **BIG PRIZE CONTESTS** for the best articles on "How I Use My Tape Recorder."

WIN a V-M "tape-o-matic" recorder, plus \$100 cash, plus 20 7-inch reels of Audiotape. Ten other valuable awards, too!

Contest closes April 1, 1955. See your Audiotape dealer, or write to Audio Devices today for complete details. There's nothing to buy!

Table I TESTS AT 75°F, 50% RELATIVE HUMIDITY

	Yield Strength	Breaking Strength
1 mil Acetate	3.7 lb.	3.9 lb.
0.9 mil "Mylar"	4.2 lb.	7.6 lb.
1.45 mil Acetate	3.0 lb.	4.1 lb.

Table II TESTS AT 75°F, 90% RELATIVE HUMIDITY

	Yield Strength	Breaking Strength
1 mil Acetate	1.8 lb.	2.5 lb.
0.9 mil "Mylar"	4.1 lb.	7.6 lb.
1.45 mil Acetate	3.0 lb.	4.1 lb.

The above test data, taken under conditions of both winter and summer humidity, show the marked superiority of 1-mil "Mylar," not only over the thin cellulose acetate base, but over the standard 1.45-mil acetate as well.

*Dupont Trade Mark

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