



NEW STATE-WIDE PROGRAM GIVES MINNESOTA SCHOOLS TAPE RECORDINGS AT ROCK-BOTTOM COST

Mail-Order Tape Service opens vast new field for use of educational recordings

It all began last spring — at the Spring English Conference held at the University of Minnesota. Here, teachers made a strong plea for a lower cost source of recorded material for classroom use. Particular mention was made of the many radio programs on the air which would be of great educational value if they could be brought into the classroom at times when their message or content would be most appropriate.

Since this Conference left no doubt as to the need for good recorded material—at a price within the range of even the smallest schools—the Minnesota Department of Education decided to do something about it. So, with the help and cooperation of the University of Minnesota and a private business concern, a radically new system of making and distributing recordings has been established. This program, organized on an experimental basis, is now in full swing—offering a unique, low-cost recording service to all of Minnesota's 7000 schools.

Final details of the program were worked out largely by Richard C. Brower, audio-visual-radio director for the Minnesota Department of Education, and Betty T. Girling and other staff members of the University of Minnesota Radio Station KUOM. Here's how the program works.

The state education department is building up an extensive library of master tape recordings — covering the complete range of subjects appropriate for classroom use. These recordings are being secured from Station KUOM, from the networks, and through the U. S. Office of Education in Washington, D. C. A catalog of the available recordings, with monthly supplements to keep it up to date, is distributed to all interested schools.

In order to participate, the only investment required by the individual schools is the purchase of suitable tape recorders and reels of recording tape. A teacher desiring



Mrs. Marjorie Taylor uses new system in District 14 Country School near Zimmerman, Minn.—leading her class in singing, with a recording of top quality chorus of voices. (Photo, courtesy of The Minneapolis Star).

What Do Users Think About Audiotape?

They "speak for themselves"—in these comments on the performance of the free samples we sent out

A Radio Station: "Superior in every way to any tape we have used so far."

A College: "Found your tape a very excellent product, and plan to stock it exclusively. Lower hum level most noticeable improvement."

A Vocation School: "Of several brands of tape tried 'Audiotape' has the lowest consistent noise level. Response is exceptionally constant for all parts of each reel."

A Radio Station: "Have tried the plastic tape — find it equal or better than other makes. We are now regularly using it for all tape recording work."

An Industrial Firm: "Thanks for the sample of plastic base Audiotape. I find

that it excels all other makes now on the market in quietness, range, and easy handling. Have disposed of all other makes and am using only Audiotape."

A High School: "Have tested the samples of Audiotape and we are much pleased with it. For our machines your red oxide paper is as satisfactory as the plastic tape we had been using. Our school system is now using this red oxide paper tape as an economy measure over the other plastic."

A Church: "Your tape is excellent and we will buy it from now on. Also thanks for the 'Audio Record' with articles on tape recording."

A University: "After trying samples of your paper tapes, ordered 20 rolls. I believe they are the best buy in paper tapes now available."

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audio record

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Minnesota Schools

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any of the listed subjects simply fills out an order form specifying the programs wanted, the type of machine on which they will be reproduced, and the desired recording speed in feet per second. This form is then sent in to the Department of Education, together with the required number of reels of "blank" tape. The desired selections are then recorded from the master tape onto the "blank" reels, which are promptly returned to the teacher.

The recordings thus made can be used by the school as desired—either played back and then erased, kept on file for future reference, or transcribed onto discs for permanent record. Thus, the actual cost for obtaining these educational recordings is only the required postage and the tape itself.

As a result of this program, the world's outstanding authorities are now doing important teaching jobs in the Minnesota schools—via low-cost, high-fidelity tape recordings.

Comments on Audiotape

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A Radio Station: "It is the best tape on the market to date—less noise and under a microscope it is the cleanest tape I have seen. It is the tape we will use here you can be sure of that."

A Broadcasting School: "Thank you for the Audiotape samples. They are the best we have tried to date. Same high quality as your Audiodiscs. Will order more locally."

A College: "The plastic base tape I requested was completely satisfactory. There was a distinct reduction in amplitude modulation of high frequencies over a similar competitive tape."

A Film and Sound Service: "Received sample tape; our findings show after being put through the 'acid test' that Audiotape is far superior to anything we have used yet and we have pretty well covered the field. Prefer the black oxide for excellent bass frequency response."

A High School: "Excellent— I use recordings in my English classes and find your tape of unusual fidelity."

CLEVELAND JOBBER'S NEW QUARTERS SIMPLIFY PURCHASE OF AUDIO COMPONENTS

The Radio & Electronic Parts Corp., Cleveland, Ohio, has recently moved to a completely new building which has been specially designed throughout to give better "Service to the Customer."

One of the first things that Repco patrons are impressed with is the large parking lot planned for their convenience—a distinct contrast to the Company's previous quarters in the heavily congested, traffic-choked downtown area. And, once inside the building, it is evident that this same spaciousness and convenience has been followed through in every detail of planning. The main salesroom (where you can buy anything from an Audiodisc to an Audiopoint—and a few million other things) has large, roomy aisles, a variety of self-service island displays, and 60 feet of counter space.

Repco's sound department is of particular interest. Located on a mezzanine extending the full length of the building, it is based on the idea that the best way to give the customer exactly what he wants is to demonstrate it in actual operation. Here, the prospective purchaser can see and hear practically any conceivable combination of audio and video components. Antennas, tuners, amplifiers, microphones, speakers and recorders can be quickly hooked up as desired and demonstrated on the spot. The arrangement provides for instantaneous switch-over from one com-



L. W. Schwartz, Repco president (right) explains his sound-room setup to Al Kahn (left), president of Electro-Voice, Inc., and William J. Doyle (center), sales manager of the Astatic Corp.

bination to another, giving an accurate comparison of the relative merits of the different components. Take TV antennas for example. There are eight different antenna installations on the roof of the building, and the salesman can show a customer the differences in the various models as a function of the image on the television tube.

Radio and Electronic Parts Corp. has been a distributor of Audio Devices products for the past ten years. They now handle the full line of Audiotape, Audiodiscs and Audiopoints.

A Radio Station: "Like your plastic tape. It does a *much* better job than any other tape that we've used. Audiotape gets our bid!"

A Sound Studio: "It was immediately apparent after initial comparisons that paper Audiotape is of a far superior quality. Have been using it exclusively where a paper base tape was indicated. Reels are not subject to scraping or damaging of tape as often the case with other brands."

A Radio Station: "Very well satisfied with your tape, particularly the plastic. Have the assurance of our chief engineer that we will be in a position to use your plastic tape exclusively when our tape recording operations get into full swing. Our tests indicate that plastic Audiotape is superior in every way to any other."

A College: "We are using your plastic base Audiotape exclusively for the original recording of our radio programs. We find that there is practically no loss from dubbing from tape to disc."

A Radio-Ham: "Have used the plastic base tape with surprisingly excellent results.

Recordings made of organ music on Audiotape were transferred to discs with no discernible loss of fidelity. Your product is what the trade calls 'a fine article', and in the words of one radio-ham friend who sees a good thing, 'I'll buy some of that!' Thanks again."

A Research Lab: "Have found your recording tape to be the best for my recorder. Very low noise level and very uniform characteristics are its outstanding qualities. The price is also attractive."

A Radio Station: "We have found that the samples of Audiotape meet all the claims you have made for it. We are using some of your plastic tape, which we purchased on the strength of your name and advertisements alone, and have found this tape superior to any we have ever used at this station."

To date we have received many hundreds of these cards commenting favorably and enthusiastically on the performance of Audiotape. The remarks quoted above are typical. We wish to thank all of these users for the overwhelming vote of confidence.

audio pointers for the Recordist

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

MORE ON MODULATION NOISE

Tape machine noise is a highly variable factor — it seems to increase under these many changes in condition: from the factory test floor to the recording room, during recording room use, and from one make of machine to another. Since these increases range from 5 to 25 db, they are not to be ignored.



C. J. LeBel

Some increases reflect changing amounts of hum, but much results from an increase in tape hiss. We propose to examine the reasons why a given tape may be so much quieter on one machine than on another; or so much quieter in one recording room than in another, on the same type machine.

Most of the increases referred to result from a change in the character of the effective bias on the tape. Particularly, we believe that they reflect an increase of modulation noise¹ caused by a dc component of bias flux; or by its equivalent, asymmetrical distortion of the bias flux. An actual dc component can originate in dc leakage through one of the head coils, or in permanent magnetization of the core of a head; asymmetrical distortion arises in the bias oscillator or its amplifier, particularly when not push pull.

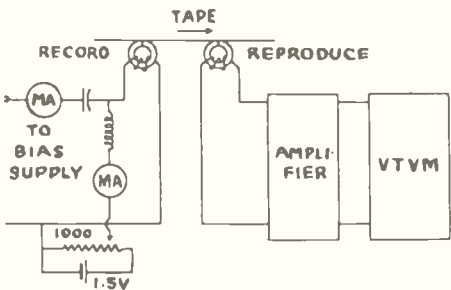


FIG. 1 — Test Circuit for measuring the effect of dc bias component on noise.

In order to determine the effect of dc leakage, we set up the circuit of figure 1. An adjustable amount of dc could be passed through the recording head simultaneously with any desired value of bias, and the currents could be measured separately.

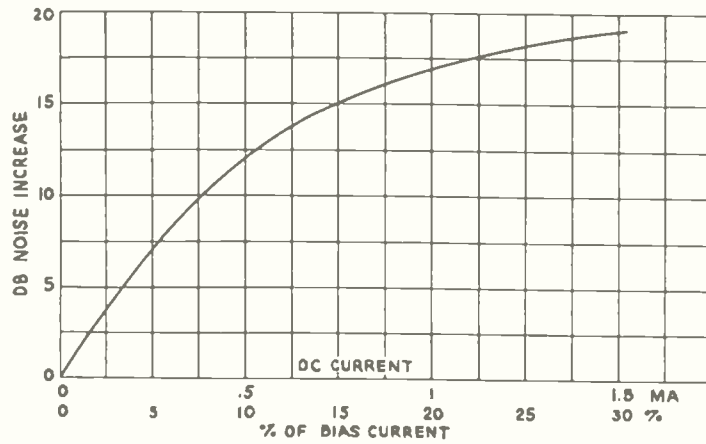


FIG. 2 — Effect of dc component on tape noise.

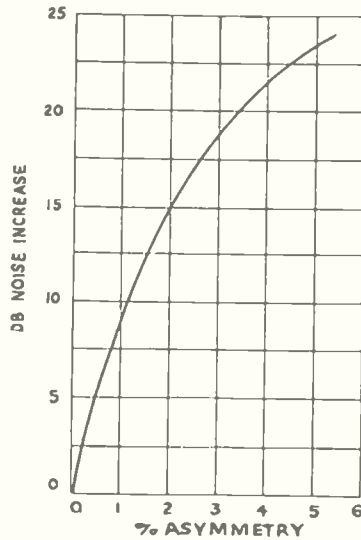


FIG. 3—Effect of bias asymmetry on noise, after Gratian.

The bias used was 5 ma at 74 kc, which was a representative bias for this type of head.² The tape used was our red oxide on plastic base. Results are shown in figure 2.

If we study this figure we note that noise increases 5db with the passage of only .2 milliamper, which with a 300 volt dc supply would correspond to a leakage resistance of 1.5 megohms. Since a number of home units have used a blocking condenser whose insulation resistance could easily fall to 1.5 megohms after a spell of humid weather, it appears that some attention to leakage conditions might be in order.

We felt that it would be interesting to compare our dc results with J. W. Gratian's work on erase asymmetry,³ so have changed his data to a db basis and replotted it in figure 3. He states that his results are applicable to bias fault as well as to erase. Both curves seem to have essentially the same shape, but Gratian's work seems to reflect much greater sensitivity. We are not sure whether this stems from the greater effect of asymmetry, or whether the use of an entirely different oxide is the cause.

In any case, we agree with Gratian's observation that bias asymmetry may be neu-

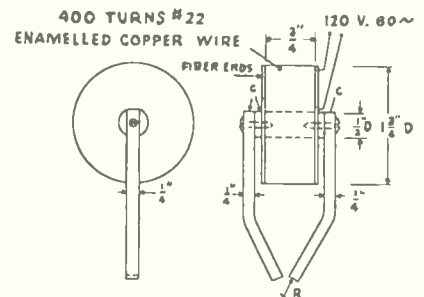
tralized in effect by the addition of proper amount of dc of correct polarity. Perhaps some broadcasters using home machines for remote pickups might use this idea to improve their signal to noise ratio.

While noise may be created by poor erase waveform as Gratian shows, we find that much of this noise is erased by the bias flux.

Another source of noise is permanent magnetization of the recording head as a result of transients in the signal. A machine may start the day with a signal to noise ratio of 61 db, and be down to 54 db by night, due to this effect. Hence, professional machine manufacturers recommend frequent demagnetization of the recording head. Usually they can supply equipment for doing this, and some machines have built-in demagnetization means. If you cannot secure a demagnetizer from the manufacturer, you may wish to have one built, like figure 4. Most of the dimensions are not critical, but the radius on the tips of the poles must be a good fit to the curvature of the recording head. The coil may be either random wound, or layer wound with .0015" glassine between layers.

To use, plug into 115 volt AC, and apply pole tips to recording head. Slide sideways and gradually remove from the head. Do not connect to the power line for over 10 seconds at a time, for the coil overheats with great rapidity.

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- R: MAKE RADIUS TO FIT RECORDING HEAD
- C: MAKE OF SILICON STEEL RELAY BAR, OR SOFT IRON

FIG. 4 — Head demagnetizer.

Unique Centralized Recording Studio Serves U. of I. School of Music



Wolfgang Kuhn, Assistant Professor of Music, turns out transcriptions on Audiodiscs in the new recording room of the University of Illinois School of Music.

Located high at the back of a large recital hall, in a remodeled projection room, is one of the most compact — and one of the busiest recording rooms in this country. It's the new, centralized recording installation of the University of Illinois School of Music.

Here, transcriptions are made from the stage of the Recital Hall — or from any class room or rehearsal room in the entire school. And facilities permit instant playback of any recording to whatever room it originated from. In addition, recorded music as well as live radio programs can be channeled directly from "headquarters" to any of the class rooms, as an aid in teaching and learning the performance of music.

This installation also serves as a remote control room for the University Radio Service, WILL, which carries weekly programs performed by the faculty and the students, and by the various choral and instrumental organizations of the School of Music.

The University of Illinois School of Music is collecting a permanent file of past

programs for reference, class-room use and future broadcast. Works already on file comprise one of the largest and most representative collections of contemporary music — as performed, during the annual Contemporary Arts Festival, by the U. of I. Sinfonetta and Orchestra, conducted by John M. Kuypers, director of the School of Music, the Walden String Quartet, and other ensembles, choral groups and famous guest artists.

The recording studio was installed last March, and has been under the able direction of Wolfgang Kuhn, Assistant Professor of Music. Since then, the demands for service from this department have increased so rapidly that now, besides Mr. Kuhn, two engineers spend most of their time at the controls.

MODULATION NOISE

(Continued from Page 3, Col. 3)

Recording heads should be demagnetized at least once a day for good results, and twice a day if the best signal to noise ratio is desired.

REFERENCES

1. C. J. LeBel, *Modulation Noise*, *Audio Record*, December 1949.
2. C. J. LeBel, *New Method of Measuring Bias*, *Audio Record*, June-July, 1949.
3. J. W. Gratian, *Noise in Magnetic Recording Systems as Influenced by the Characteristics of Bias and Erase Signals*, *J. Acoust. Soc. Amer.*, vol. 21, no. 2, pp 74-81, March 1949.

HAVE YOU READ THESE PRIZE-WINNING SCRIPTS YET?

Audioscripts 1949 is a collection of 16 complete radio scripts — written by high school and college students and selected from prize-winning entries in the 1949 Scholastic Magazines and AER contests. These scripts are essential reading for all budding script writers, and their teachers. Moreover, they make excellent material for dramatizing and recording in the classroom or at home. All sound cues and sound effects instructions are included. The contents are listed below:



SCHOLASTIC MAGAZINES' RADIO SCRIPT WRITING CONTEST

(High School Students)

Original Radio Drama

First Prize—SOMETIME TOMORROW, By Richard Jackson, Jr.

Second Prize—THE DREAM, By Neil Jackson.

Third Prize—THE JANITOR'S TALE, By Juanita Pennell.

Fourth Prizes—THE LAYING PLACE, By Richard McMahon.

ALONE, By Louis Freizer.

CHUBBY THE CARROT, By Marian E. Tyrrell.

PIER 51, By Winthrop Griffith.

General Radio Scripts

First Prize—AN IMAGINARY INTERVIEW WITH GEORGE BERNARD SHAW, By Elena Joan Svagzdys.

Second Prize—HIGH SCHOOL PSYCHOLOGY, By Mary Carol Massi.

Third Prize—THE STORY BEHIND THE LABEL, By Richard Wallace.

Fourth Prizes—DECISION, By David Kiplinger, IN SESSION, By Jim Erickson.

Radio Drama Adaptation

Fourth Prize—A PRUDENT WOMAN. Adapted from the Bible, by Mary Catherine Franklin.

A. E. R. NATIONAL RADIO SCRIPT CONTEST

(College Students)

Classification No. 5 — Scripts for Home and School Recording

First Prize HOW THE ROCKING CHAIR GOT ITS SQUEAK, By Fred A. Brewer.

Second Prize RENDEZVOUS, By Herbert Rube.

Third Prize—VALLUM HADRIANI, By Carl C. Naumann.

This collection is offered at cost — \$1.00 net each. Send check or money order to Audio Devices, Inc., 444 Madison Ave., New York 44, N. Y.

AUDIO DEVICES WILL BE THERE, of course — with an up-to-the-minute product exhibit in Booth No. 231. You'll see the complete new line of Audiotape, Audiodiscs and Audiopoints.