



NEW SOUND MOVIE IN COLOR TELLS THE INSIDE STORY OF AUDIOTAPE

Have you ever stopped to wonder *how* Audiotape is made? If you visualize the process in its simplest terms, you may think it's just a matter of applying a magnetic coating to a suitable base material. Yet that's only *part* of the story. For the manufacture of Audiotape actually involves more care and precision than practically any other product that is made today. It's a fascinating story—and one of great interest to all users of magnetic recording tape.

The story of Audiotape has now been told on film—in a new, full color, 16mm sound moving picture. This film, entitled "Audiotape Speaks for Itself," takes you on a personally guided tour through the modern plant where Audiotape is made. You see actual laboratory demonstrations of how the magnetic oxide is formed, dried—ground—mixed—and applied to test samples on miniature, pilot plant equipment. After the test samples are carefully checked for physical and magnetic properties, the ingredients tested are released for

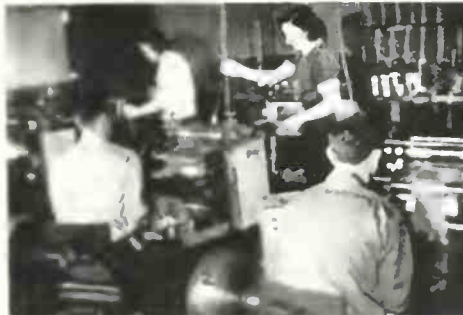
(Continued on Page 2, Col. 1)



Laboratory demonstration showing precipitation of magnetic oxide used in Audiotape coating.



Batch mixing of magnetic oxide and binder preparatory to ball milling.



Part of the slitting room, where the large coated rolls are slit to the required width and wound on reels or hubs.



A section of the electrical testing laboratory where finished tapes from every batch must measure up to the highest standards of performance.

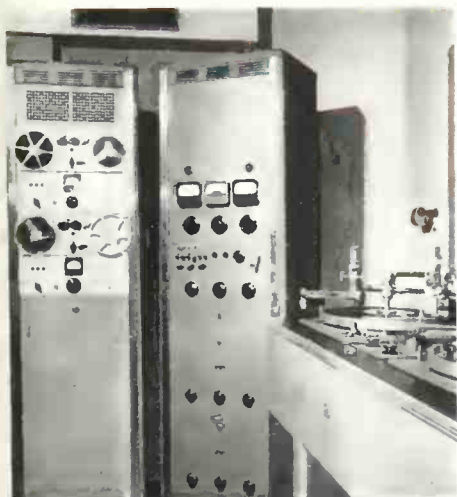
Discs and Tape Play Major Role at Moody Bible Institute

by Lorna Lee Macfarlane
Moody Bible Institute
Chicago, Illinois

Radio Station WMBI—owned and operated by the Moody Bible Institute in Chicago—enjoys the unique distinction of having been on the air for a quarter of a century, with never a paid advertisement. From the time it first went officially on the air, with a 500 watt AM transmitter in 1926, the Institute station has been run completely by the gifts of friends. The ensuing 25 years have seen much expansion in the radio department, and today the Moody Bible Institute operates both a 5 kw AM and a 46 kw FM station.

Throughout the eventful quarter century of WMBI's history, sound recordings have played an ever increasing role in producing effective program material. In its early days, the station had two portable disc recorders, then a dual recorder in the control room, and after that a separate recording room. Now they are using Presto Type 6N recorders with Presto Model 88 recording amplifiers. The continuous recording set-up includes facilities for cutting separate programs simultaneously, and this has proved to be a big boon in the preparation of recorded program material. Through the use of high fidelity recordings, WMBI is able to originate broadcasts of the highest quality.

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The "business end" of WMBI's sound recording room, showing rack mounted Magnecorder tape machines, audio amplifier equipment and two Presto disc recorders.

audio record

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Audiotape Moving Picture

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production use. Then you are taken out into the plant itself, to see Audiotape actually being made—batch mixing, ball milling, coating, monitoring, slitting, production testing, and packaging for shipment.

We believe that this new film will give a much better understanding of *how* and *why* Audiotape has achieved the recognized superiority that has made it the first choice of so many professional recordists. It shows how the extra care and precision in formulating and applying the coating produces a magnetic recording tape that is unequalled in fidelity of reproduction and uniformity of output.

The new 20-minute film, "Audiotape Speaks for Itself," was produced by John S. Martin, of "JM Productions." Photographed in Commercial Kodachrome, it reproduces with sparkling, life-like, full color realism. Sound reproduction, too, is of the finest quality obtainable, with the original recording made on Audiotape. Prints of this 16mm sound film will be loaned without charge to interested recordists and educational institutions. Requests should be mailed to Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.



Microscopic examination of production sample of Audiotape—checking for particle size, uniformity of dispersion and freedom from "clumping".



Part of the Audiotape packaging department, where reels are boxed and packed in cartons, together with actual Esterline Angus output curves of one of the five reels in each package.

Moody Bible Institute

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One of the full-time jobs at WMBI is making tape recordings. Using Audiotape exclusively in portable equipment, five or six programs are recorded and presented each week. WMBI also uses battery-operated portable tape recording equipment for on-the-spot interviews and descriptions in unusual places. This helps beautifully on the special events news program. Whenever something exciting or out of the ordinary occurs, the tape man hustles out for an on-the-spot description. During a recent eclipse of the moon, a program was recorded at Chicago's well known Adler planetarium, including an interview with Adler's assistant director.

On another occasion, Chicagoans not only read in their local papers of an exciting 4-alarm fire, but by tuning in WMBI heard a true-to-life tape recording of the milling crowds and an at-the-scene description of the thrilling rescues. Another popular taped program is "Your City and Mine," a public service feature.

Of course, these aren't the only uses for tape. Dr. Irwin A. Moon, director of Moody Institute of Science, recently flew to Mexico and South America to take colored movies of tribal customs and practices. This modern method gives Christians here at home a better understanding of what the missionary faces in reaching these primitive people. Shots of a tribal dance of the Shipibo Indians in the Peruvian jungles were made even more realistic in "To Every Creature," the Moody film, by the actual tribal music taped on-the-spot.

Battery operated recorders are also being used in far-away mission fields where missionaries describe their immediate surroundings and the types of problems they face. Friends and relatives in scattered areas, later tuning in on WMBI, have the special treat of listening to loved ones' voices that were taped thousands of miles away.

The Institute has an amateur radio club operated by WMBI technicians, faculty members and students of the Missionary Technical Course. The "ham" station, W9LLW, is used to converse directly with Moody alumni and other missionaries on the foreign field. Since Institute graduates like to hear news about their alma mater, Dr. William Culbertson, Institute President, and others have taped words of greeting and news that can be played to missionaries on the field when contacted.

The tape habit has spread from the top floor radio studios down to "faculty row" and into the classrooms. Aspiring speech students and those in Bible story telling class check up on mispronounced words, too slow or rapid spacing, and monotony of pitch, and notice (and henceforth eliminate) those pesky "ah's" that have a habit

More About Hot Stylus Recording

So far there has been only one serious repercussion to the article on Hot Stylus Recording which appeared in our October-November issue. That was in reference to the assumption that a stylus with burnishing facets offered higher resistance to lateral movement than a wax-cutting stylus which does not have such facets.

Mr. William S. Bachman, Director of Engineering and Development, Columbia Records, Inc., does not feel that this assumption is warranted—particularly when applied as an explanation of decreasing high frequency response at the smaller groove diameters.

We quote from Mr. Bachman's letter as follows:

"In the second paragraph of the third column on page 2, it is stated 'that the burnishing facets introduced additional resistance to lateral movement of the cutting tool.' I am not at all sure that there is any truth in this statement."

"It is further stated that 'this would also explain why the response tended to fall off more sharply at reduced groove diameter.' In my paper (Audio Engineering, June, 1950) I pointed out that 'to get good data, therefore, it was necessary to use a cutter having high mechanical impedance or to monitor the motion of the recording stylus by means of an FM calibrator or the equivalent.' Having thereby established that the cutting stylus was executing the required displacement, the effect of the presumed 'additional resistance to lateral movement of the cutting tool' is avoided. Other workers also have reported a loss of high frequencies at reduced diameters, determined optically as well as by playback, even though the motion of the cutting stylus was consistently maintained."

Since Mr. Bachman is one of the Country's leading authorities on hot stylus recording, we are very glad to have his views on this subject, and to pass them along to you. Also, we will welcome any other comments from our professional readers on this or any other subject discussed in Audio Record.

of cropping up. Teachers can decide by playback whether or not their voices lull to sleep rather than provoke attention or interest. Music students catch that flat A and note whether they need more warmth and expression in their singing or playing.

All in all, discs and tape (Audio, of course) have proved friends indeed at Moody Bible Institute, both in radio and class room efforts—a friendship that will no doubt increase as time goes on.

audio pointers for the Recordist



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

FOR EDUCATORS ONLY

We hate to desert our engineer friends, even for a month, but this article is pointed straight at teachers using magnetic recorders. There is no justification for an engineer reading this item, and we apologetically suggest that he keep it in the top desk drawer for the next time his teacher friends come to visit.



C. J. LeBel

In starting, we might recall the axiom that no piece of equipment lasts forever; in fact its useful life will be very considerably less than forever if proper maintenance attention is not given regularly. The car owner knows that it must be serviced every 500, 1,000, or 2,000 miles, and the musician (as R. D. Darrell has pointed out) has a guilty feeling if his piano is not tuned regularly. But put either in school and give him a tape recorder, and there is no thought of maintenance till the machine fails completely. Years ago schools ran on the theory that only pencils, chalk, and erasers wore out, but times have changed. The advent of audio-visual aids, public address systems, broadcasting, and the audiometer have enforced some concessions to technological change, but not enough. The average Board of Education still wants to see the newest technical improvements in use, without ever realizing the need for the regular maintenance that is the cornerstone of modern technology.

In a busy modern school the tape recorder is in use for four to eight hours at a time, as long as the average radio station's period of use. The professional user will check his equipment quantitatively at least once a day, for bitter experience has taught him that a machine which still emits sounds is not necessarily useful. Is the teacher doing a job which calls for such precision of result? In many cases, his requirements equal those of the radio station's studio equipment, and in the remaining instances he is working at a level close to that reached by the station's portable equipment!

Types of Maintenance

The work herein considered is *preventive* maintenance, catching a fault before it has become bad enough to stop operation. In some cases, the remedy is within reach of the school's ability—like putting in a new tube—but in other cases a factory overhaul is suggested, to be accomplished during a vacation period.

The most common maintenance is of a mechanical nature, such as:

1. Cleaning of heads every 5 or 10 hours of use.
2. Checking of tape tension every 10 or 20 hours of use if friction clutches tend to change in adjustment.
3. Lubrication as prescribed by the manufacturer.

Electronic maintenance should start with quantitative measurement of performance, for the serviceman's check of operating voltages is a very poor index to quality of result. These measurements should be made:

1. Frequency response
2. Distortion
3. Signal to noise ratio
4. Head alignment

From this data one can appraise the need for head alignment, tube replacement, etc.

Who Should Execute Mechanical Maintenance

The mechanical maintenance listed is very simple, and thoroughly within the reach of the average person. One who has polished a silver spoon, used a postal scale, and lubricated a sewing machine would find head cleaning, tension-checking, and lubrication simple. If your fingers are all thumbs, then the large elementary school generally has a science or shop teacher who likes machinery. In the large high school the physics department has a laboratory assistant who is very adept at equipment maintenance, and the large system generally has an instrument maintenance man. If you are in a 200 pupil school, on the other hand, you just have to master the technological world yourself. This is still a simpler world than the old one where a knowledge of Latin outranked the ability to use a screwdriver.

Electronic Maintenance

Measurement of electronic performance calls for the use of an audio oscillator, a gain set, and a distortion and noise meter. The lab assistant and the instrument repair man can handle equipment of this sort with very little instruction, but the private music teacher and the small school have neither available.

Hence, they have to rely on outside assistance, and several alternatives are available. First, try your local radio parts jobber—the source of your discs and tape. If he does not have a service department, he

should be able to put you in touch with a qualified man. If this proves inconvenient, try the nearest recording studio or radio station. It is sure to have at least one man who is, *de facto* or *de jure*, the audio equipment specialist. He may have the title of audio facilities engineer, studio maintenance supervisor, or chief engineer, or he may merely be the owner. You will have to fit your needs into his time schedule, of course. If it is a well run radio station or studio, then oscillator, gain set, and distortion meter will always be at hand and ready for use.

As a last resort, try to find a radio service man who has made a specialty or a hobby of recording. While his electronic knowledge will be good, in too many cases it will not be supplemented by adequate test equipment. Nevertheless, he is much better than no maintenance at all.

Repairs

Some repairs can be made by your maintenance man. For example, many professional machines have plug-in heads, and a worn head is easily replaced. Distortion in a home type machine is often caused by inadequate bias, and changing an oscillator tube is very simple. For more complex problems the manufacturer's repair department is always available.

Conclusion

With war conditions and material shortages approaching, it becomes even more necessary to prevent little faults from developing into major breakdowns. A good schedule of preventive maintenance will be excellent insurance against this.

REFERENCE

1. C. J. LeBel, *Standards for Educational Recording Machines*, Quarterly Journal of Speech, Vol. 36 No. 4, pp. 520-523, December 1950. Reprints of this are available.

New Audiotape Movie To Be Shown at IRE Exhibit

The Audio Devices booth at the IRE Show this year will be even more interesting than usual. For, in addition to a complete and up-to-the-minute display of Audiodiscs, Audiotape, Audiofilm, and Audiopoints, there will be a private, sound-proof studio where the new Audiotape moving picture will be shown. There you can rest your weary feet and enjoy a 20-minute "trip" through the Audiotape plant—at the first public showing of the new, full-color sound film, "Audiotape Speaks for Itself."

Be sure to look us up at the IRE Show, Grand Central Palace, New York City, March 19-22. We'll be in Theatre No. 316.

NEW DISCS FOR OLD!

Audiorecoating Service Conserves Aluminum and Offers Substantial Savings to Disc Users

As most of our readers know, the National Production Authority has issued orders restricting the use of aluminum for civilian use. Needless to say, these restrictions will be felt throughout the recording industry, since aluminum is the base material from which all instantaneous lacquer-coated recording discs are made.

In order to conserve the supply of aluminum available for this purpose, Audio Devices has instituted a new Recoating Service which will enable many professional recordists to obtain a large share of their disc requirements without using any additional aluminum whatever. Old used discs which are no longer of any value can be sent to the Audio plant where they will be recoated and returned to the sender as good as new. The discs are at all times the property of the customer.

When the old discs are received at the factory, the lacquer is completely stripped off, and the aluminum base is coated in exactly the same manner as in the manufacture of new Audiorecords. As far as recording characteristics are concerned, you therefore get a completely "new" disc—made from your own aluminum base. Yet the cost of recoating offers substantial savings over the cost of new discs. For example, 16" Red Label Discs can be recoated at a saving of 20 cents per disc.

The discs returned need not be of the same "label" desired after recoating. For example, yellow label Audiorecords can be returned for recoating as red label Audiorecords, or vice versa. Audio Devices will accept for recoating all makes of professional recording discs on aluminum base in the sizes indicated in the following tabulation:

Disc Size	Type
10"	Red Label
	Yellow Label
12"	Red Label
	Yellow Label
	Single Face Red Label
	Reference Label
16"	Red Label
	Yellow Label
	Single Face Red Label
	Reference Label
MASTERS	
12"	Double Sided
	Single Face
13 ¹ / ₄ "	Double Sided
	Single Face
17 ¹ / ₄ "	Double Sided
	Single Face

All transactions involving the recoating of discs should be handled through your regular Audiorecord distributor. In shipping the discs to the factory, the distributor will specify the "label" of discs desired of recoating—i.e., Masters, red label, yellow label, single face, or reference, as desired by the customer. We will make every effort to return the discs to the distributor in the types requested. It should be understood, however, that there may be times when we cannot recoat all discs in exactly the types requested. Particularly, we cannot guarantee "reference label" discs except in small percentage of the total discs recoated. Also, we cannot accept for recoating any processed masters which have metal adhering to the aluminum.

If you have a supply of old discs that you would like to put back into use, we suggest that you see your Audiorecord distributor at once and arrange to take advantage of the savings offered by the new Recoating Service.

RCA Offers New Booklet on Disc Recording

A new 20-page booklet, published by the RCA Victor Division of Radio Corporation of America, contains a wealth of valuable information on disc recording equipment and methods—with particular emphasis on modern fine groove techniques. It describes in detail RCA's latest professional recording equipment and explains its operation with both conventional and fine groove recording. In so doing, however, it goes far beyond the usual manufacturer's equipment bulletin and takes on an aspect more closely equivalent to an

authoritative text book on disc recording science.

Profusely illustrated with photographs, charts and diagrams, this new booklet should be a welcome addition to the reference files of professional recordists—from the standpoint of both equipment details and engineering data on modern disc recording methods.

The booklet (Form 2J-6895), entitled "AM, FM and Television Professional Recording Equipment," is offered free of charge to all interested recordists in these fields. A copy can be obtained by writing, on your company letterhead, to Dep't. 552, RCA Engineering Products, Camden 2, New Jersey.

Calling All AUDIO-PHILES*



New "High-Fidelity" Magazine Will Fill Long Felt Need for the Connoisseur of Fine Recorded Music

* Audiophiles are people who enjoy the entertainment produced by truly fine audio reproduction. Usually, they are not content with ordinary commercial radios and phonographs. Most of them have—or want to have—special facilities for really high-fidelity sound reproduction. They are collectors of fine recorded music—many of them make their own recordings, too.

Heretofore, the Audio-ophile has had no competent, authoritative publication which would answer his questions—solve his problems—help him to get the most out of the fascinating science of sound recording and reproduction. Realizing the growing interest in this field, Milton B. Sleeper, publisher of "FM-TV" Magazine, has decided to bring out a new quarterly publication devoted exclusively to the interests of all Audio-philos. This magazine, entitled "High-Fidelity," is not an engineering or trade paper. It is strictly for audio enthusiasts—technically trained or otherwise. It is 8³/₄ by 11¹/₂ in. in size, profusely illustrated, and filled with new ideas and information available from no other source.

The publisher is now accepting Charter Subscriptions at the following special reduced rates:

\$3.00 for one year (Saves \$1.00)

\$6.00 for three years (Saves \$6.00)

(Prices 50¢ per year higher in Canada, \$1.00 foreign). The first issue will be out April 15th.

If you wish to be among the Charter Subscribers to this new publication, send your request, with remittance, to:

Mr. Charles Fowler, Editor

HIH-FIDELITY, Dept. R.

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