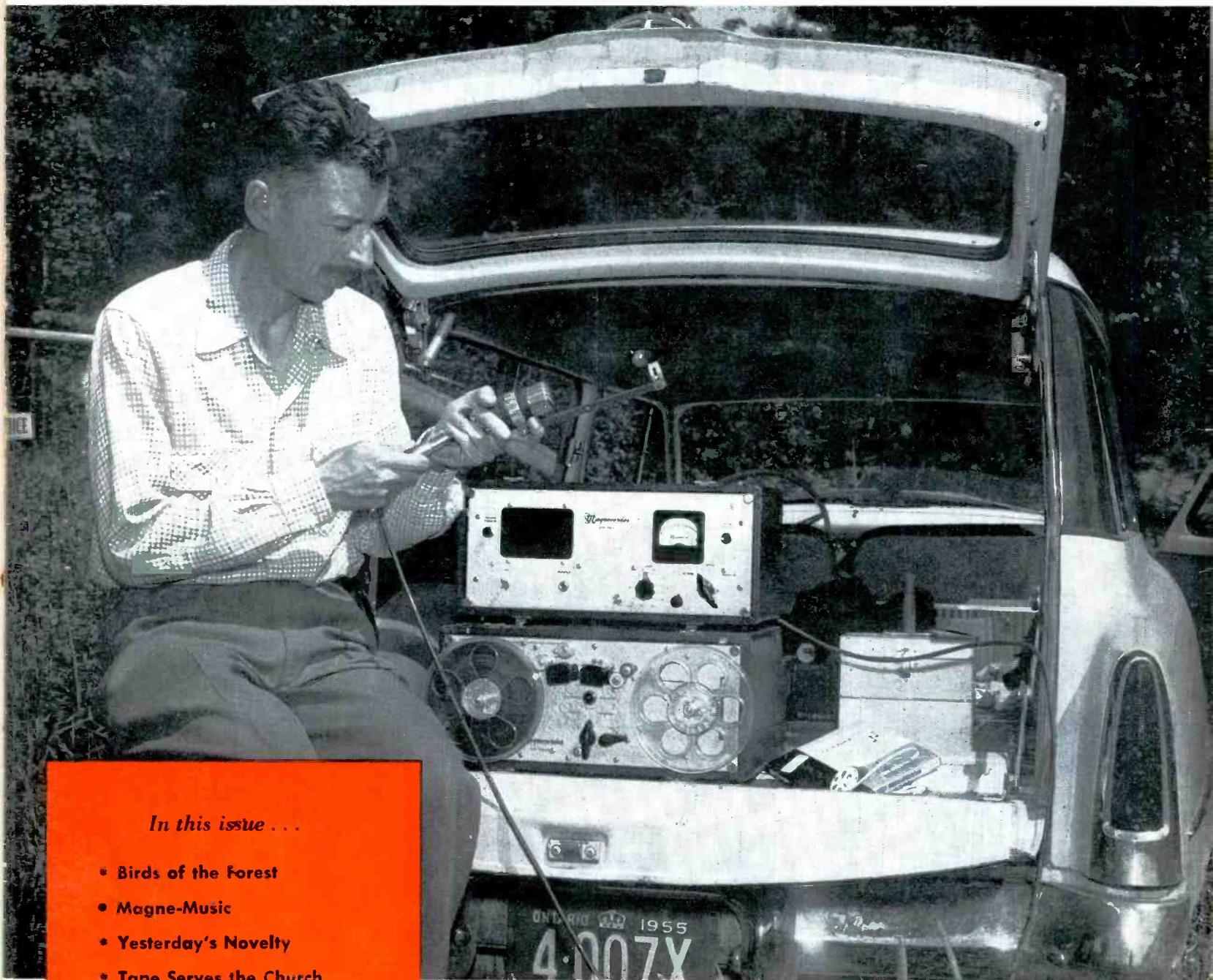


Jan.-Feb., 1956, Vol. 12, No. 1

audio record

Published by
AUDIO DEVICES, INC.
444 MADISON AVENUE, N. Y. 22, N. Y.

audiorecords
audiotape
audiofilm
audiopoints



In this issue . . .

- Birds of the Forest
- Magne-Music
- Yesterday's Novelty
- Tape Serves the Church
- Electronic Echo Chamber
- New Study of Recorder Bias

To Dr. W. W. H. (Bill) Gurn, naturalist extraordinary, tap recording for the birds. Here he sets up his equipment for another Audi-tape bird-song recording in Canada's famed Algonquin Park. Story on Page 2.

Audiotaped Nature Recording Series

"BIRDS OF THE FOREST"

Wins International Award

Outdoor tape recordings of Canadian bird songs feature the radio program "Birds of the Forest" which was recently awarded the 1955 Italian Press Association prize for documentary programs in the Italia International Competition for radio works. The award carried with it a cash prize of 1,000,000 lira (\$1,500.00) to the Canadian Broadcasting Corporation which entered the program.

The program was produced and narrated by Thom Benson of the CBC and was heard originally in the radio series *Canadian Scene*. It has also been broadcast twice on the British Broadcasting Corporation, twice in Italy, and in the U. S., Switzerland and Belgium.

Thom Benson is producer in the Outside Broadcasts Division of the CBC. In addition to being a regular contributor to the *Canadian Scene* broadcasts, he has to his credit a number of outstanding broadcasts of such special events as visits of the Royal Family to Canada and the West Indies, the British Commonwealth Games at Vancouver, and the World Championship Hockey Series in West Germany.

The tape recordings of bird songs were selected from the library of Dr. William Gunn, field secretary of the Federation of Ontario Naturalists. Dr. Gunn specializes in making tape recordings of the sounds



Thom Benson, producer, Outside Broadcasts Division of CBC.



Dr. William Gunn, field secretary of the Federation of Ontario Naturalists, adjusts the parabolic microphone reflector to "focus" on a feathered songster. The reflector strengthens the primary signal, permitting reduced recording level and lower background noise.

of birds and other animals and in five years has built up a library of more than 250 7" reels of outdoor recordings. These recordings are being used for lectures and other educational purposes. They are also becoming a useful reference source for authentic sound to accompany nature and outdoor films.

Some of these recordings are now available on long-play discs in a series "Sounds of Nature" being published by the Federation. The first of these, "Songs of Spring," features songs of 25 common Ontario songbirds and the second, entitled "A Day in Algonquin Park," is a nature symphony of the sounds of a summer's day, beginning with the dawn chorus of birds, frogs and insects, and ending with the eerie calls of a loon echoing across a moonlit northern lake. A characteristic of these first two discs is that no human voice appears on the disc itself, commentary being restricted to a play-by-play description on the jacket.

Other discs are in the preparation stage and the next to be published will probably be the award-winning "Birds of the Forest" program. Some consideration is being given to the reproduction of these record-

ings on tape as well as disc.

For equipment in making these outdoor recordings, Dr. Gunn relies chiefly on a tape recorder of professional standards installed in a station-wagon and operated from batteries and a power converter. Long shielded cables are used to reach the locations selected for low impedance dynamic microphones. A 36-inch spun-aluminum parabolic reflector is frequently used in conjunction with the microphone to strengthen the primary signal and reduce background level. A portable battery-operated tape recorder is proving a useful auxiliary for locations which cannot be reached from the station-wagon.

In either case, a tape speed of 15 ips is used to give greater fidelity in the higher frequencies reached by many birds and most insects.

"Half the battle," Dr. Gunn says, "is on becoming familiar with the lives and habits of the animals you are trying to record. The other half comes in using the best equipment you can get—so that when the right opportunity does come along, you make the most of it."

audio  record

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JAN.-FEB., 1956

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.

Magne-Music . . . by Magnecord and RCA



Early in 1955, Magnecord, Inc. introduced a new concept in background music for business and industrial applications. Basically, the idea was to provide a music service which would be "custom tailored" to suit the specific requirements of each user—and to give him complete, on-location control of both program selection and program timing. This involved two separate problems—the development of suitable automatic tape reproducing equipment and the compilation of an outstanding library of professionally programmed, high-fidelity, pre-recorded tapes to meet all foreseeable requirements for various types of background music.

To Magnecord, the *equipment* aspect of the program was actually no problem at all. Using basically standard and time-tested Magnecord tape recorder components, the Magne-Music continuous tape reproducer was designed to meet the specific requirements of this type of service. It is fully automatic in operation, can be operated by unskilled personnel, and provides up to 8 hours of playing time without interruption.

The program problem, too, was solved to excellent advantage—with the cooperation of RCA, one of the great names in music. All Magne-Music tapes are professionally programmed by RCA, selected from their vast storehouse of fine recorded musical selection and recorded on tape with the finest professional equipment by skilled audio engineers. It was decided, also, to standardize on plastic-base Audiotape for all of the Magne-Music pre-recorded tapes, supplied on standard 5000-ft., 14" NARTB reels.

This unique, personalized background music service met with immediate and enthusiastic acceptance, and Magne-Music installations sprang up all over the country—in stores, banks, restaurants, cocktail lounges, doctors' offices, hotels, motels, factories, passenger trains, and even on ocean-going passenger vessels. All of these ma-

Professionally programmed high-fidelity background music, pre-recorded on plastic-base Audiotape, completes first season with remarkable record of trouble-free performance.

chines are run for many hours a day and their geographic distribution throughout the country covers the complete range of climatic and temperature conditions. Yet the hot, humid 1955 summer was completed without a single reported tape failure on any Magne-Music installation. We believe that this record speaks well for the strength and durability of our standard plastic-base Audiotape.

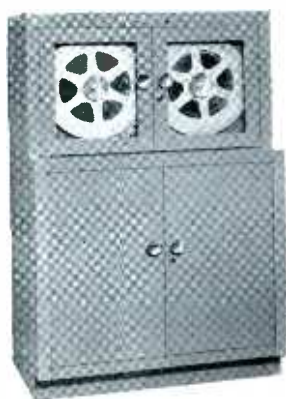
In addition to providing background music, Magne-Music is also being used as an effective selling tool. The reproducer console can be supplied with a built-in "Add-O-Matic" recorder-playback unit, on which the user can record his own sales message, for automatic playback between musical selections or at any pre-determined time intervals. This sales message is not spliced into the music tape, but is kept separate on its own continuous-loop tape cartridge. Sales messages can be erased and re-recorded as often as desired. Also, the Magne-Music installation can be used as a PA system, with push-button cut-in for live sales messages, paging announcements, etc.

Performance specifications for the tape player unit are as follows. Tape speed: $3\frac{3}{4}$ " per second (with capstan change for $7\frac{1}{2}$ " /sec.). Playing time: 8 hours at $3\frac{3}{4}$ " /sec., 4 hours at $7\frac{1}{2}$ " /sec. Frequency response: 50-5,000 cps ± 2 db at $3\frac{3}{4}$ " /sec.,

50-10,000 cps ± 2 db at $7\frac{1}{2}$ " /sec. Signal-to-noise ratio: 45 db based on 3% total harmonic distortion. Flutter: less than 0.35% RMS Maximum at $3\frac{3}{4}$ " and $7\frac{1}{2}$ " per second. Adjustable automatic timer starts and stops unit on any pre-set schedule, as desired.

The Magne-Music tapes by RCA are available in a wide selection of types and themes—luncheon music, cocktail music, dinner music, after dinner music—pre-work music, rhythmic music, bright "production numbers," familiar soothing music, Pop Concert selections, pleasant melodic music, moderately rhythmic, continental, bright, sparkling or relaxing, to suit virtually every type of background music application. Tapes are catalogued according to their suitability for various types of environment and listening conditions.

Complete details on the Magne-Music service can be obtained by writing to Magnecord, Inc., 1101 S. Kilbourn Ave., Chicago, Ill.



The Magnecord Continuous Reproducer is completely automatic, stopping and starting without attention and playing for up to 8 hours without interruption.



Magnecord Continuous Reproducer console with doors open, showing component parts. The auxiliary "Add-O-Matic" recorder-reproducer, mounted at the lower right, is equipped with an intersperser which automatically inserts commercial announcements at pre-selected times between musical numbers, for advertising in supermarkets and other retail stores.

YESTERDAY'S NOVELTY — TODAY'S NECESSITY

FIRST PRIZE winning article in Audio Devices' HOME RECORDING CONTEST

by Robert W. Luebke
525 Howe Street
Green Bay, Wisconsin

"Yesterday's novelty," the magnetic tape recording machine, has become "today's necessity" in our home. It is one of the most pleasurable and useful things we own. It helps us with our work and enriches our lives as well. Our tape recorder has taken its place next to our typewriter and our camera to become another indispensable implement in our way of living.

Our greatest delight in tape recording is exchanging tapes with other people. Our tape recorder is the "magic carpet" for our armchair travels to distant places. We have frequent, friendly contacts with families in: South Africa; Chile; Tasmania; Japan; England; Sweden and several in the United States. Our family finds great adventure in making and receiving "round-table" discussions via tape; music; photos and printed matter.

We have developed a sturdy reusable shipping box for color slides and a 4-inch tape. We have boxes for either 2x2 slides or stereo slides. These boxes have enabled us to successfully send and receive interesting photos with commentary from several places.

With the help of suggestions from our foreign correspondent friends we have come to adopt a somewhat standard for-



Little voices don't stay little very long. The tape recorder enables us to file away "impressions-of-the-ear" just as we put photos in the family album. Here you see Martha Luebke (my youngest daughter) as she records a lusty "Jingle Bells" to add to our permanent collection.

mat for these exchanges. We use a 7-inch reel of tape; one side at $3\frac{3}{4}$ i.p.s. and all talk; and the other side all popular music at $7\frac{1}{2}$ i.p.s.

Our children's most recent and most ambitious schoolwork project involved a United States high school student (Our son Bill); a family in Chile; and a Spanish language textbook. Bill read Spanish lessons from his textbook on a 3-inch tape; then we photographed these pages and airtailed them and the tape to our friends in Chile. They listened to his halting and faulty Spanish; then they, to whom Spanish is the native tongue, read the very same pages back on the tape. The project was completed in 17 days and was enthusiastically received by Bill as well as by his Spanish class in school.

The children have also used the recorder for:

Text assignments; questions and answers.

Our son has worked out a method for finding the exact answers to difficult assignments in General Science. He reads the day's assignment of several pages on the tape. As this reading plays back he makes written answers to the questions.

Making sound effects for skits in English class.

Learning to read with expression.

Memorizing a poem.

The children recite what they have learned, then listen; then recite again and listen; over and over again until the poem has been memorized.

Mastering the Amateur Radio code.

My son and I have found the tape recorder useful in helping us learn the Amateur Radio code. We use the recorder to send messages to each other as we prepare to step up from "Novice" to a "General" class license.

We also use our recorder for:

Taping radio programs we are unable to listen to direct.

Recording special music from the radio.

Preserving voices of our family.

Playing music from foreign countries for clubs and church groups.

Playing tape received from the University of Wisconsin tape service.

Once we almost succeeded in producing a 12-month closed itinerary "talking book" scheme. The idea being that each one of 12 people would read a book on a tape then ship it forward to the next person on the itinerary. Each month each person would receive a talking book and each month he would ship one forward. In this



Lois Luebke (my oldest daughter) demonstrates our prize gadget, the "rambling speaker." The speaker itself forms the reel for the long wire that enables us to listen to a tape in almost any room of the house. There is never any messy left-over wire because only as much as is needed is taken off the reel. The speaker is equipped with a "closed circuit" jack that permits the use of earphones.

way each person in the scheme would have a book read to him each month for a whole year, in exchange for his effort of reading only one on tape. We had to abandon the experiment because we could not find enough enthusiastic people to participate in it.

Our equipment is adequate but not extensive. We use a Pentron 9T-3C recorder equipped with dual track heads and speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ i.p.s.

We made a recording bench to support the recorder; a 45 r.p.m. record player and an old broadcast receiver. By means of "patch cords", jacks and switches we can do a variety of recording jobs.

Our most prized gadget is the "rambling speaker" we developed. It enables us to listen to a tape in almost any room of the house.

To help us with content and continuity in our tapes we have developed a system of making notes on separate slips of paper. We have a plywood board on which we have fastened a small paper clamp for each one of the several people with whom we correspond. Between tapes, as topics come to mind, we write them on separate slips of paper and put them on the board. Then

(Continued on Page 6, Col. 1)

How Tape Recording Serves The Church

FIRST PRIZE winning article in Audio Devices' CHURCH RECORDING CONTEST

by Wm. R. Phinney
88 Main Street
Stamford, N. Y.

Rarely does a church or a pastor conceive of the many possibilities for a tape recorder when the purchase of such a piece of equipment is made. Quite possibly the most obvious uses to which the recorder can be put are uppermost in the minds of the new owners: the preparation of sermons, the recording of choir anthems, the making of services available to shut-ins.

It is not long, however, before a multitude of uses are found for the equipment. It may be a devastating experience for a choir to hear itself; but a single recording may tell the members far more than a director can in a year, and there is little opportunity to discount the stark reality of the played-back anthem! Yet a church can give encouragement to its choir by creating a small library of recordings of its own better sung anthems. Pastors serving two or three small churches are able thru the medium of recordings to share the music of his principal church with the one too small to afford a choir.

One of my choir members, who frequently does solo work, one Christmas time wanted to present her mother with a disc containing two or three pieces she liked to sing. The church recorder made possible the tape from which the disc was cut.

I have written to missionaries of my church to arrange for tapes describing their work. Such tapes should contain some sound effects to help the hearers to visualize the situation, and some singing by those helped by the mission. There should be samples of native speech, and excerpts from a service. A tape returned to the mission can be used to take back greetings and a message to any group there from a corresponding one at home.

Now and again I come across materials on the radio which I can use in preparing a group to conduct a forum. Since a recording is far more realistic and accurate



William R. Phinney operates the slide projector while the tape recorder delivers the commentary.

than any notes I might make, and since I can lay by the material I gather for future reference, I consider these taped programs a valuable part of my resources. Quite naturally, a play back of the recording of the forum later on gives the participants an opportunity for self-criticism.

In preparing a play or a pageant for presentation, a recorded rehearsal may be very revealing to the ones involved. Several of my youth once entered a speaking contest sponsored by my denomination. Their practice with the recorder gave them confidence in themselves; it did even more: it showed them their infelicities.

My contact with church workers at quite some distance has made it possible for me to get recordings of church school conventions and other materials particularly useful in the training of teachers. For me to bring experts into my village church would be virtually prohibitive. Tape as a medium of communication helps me to put my teachers in touch with some of the best instruction available.

As part of my church school program, I frequently use film strips with records. At times it has not been convenient for me to get the use of a record player for a given situation. By transferring the rec-

ords to tape, I have found a greater versatility possible, for I could take the tape recorder wherever I wished. Besides, I need not stop in the middle of the presentation of the film strip to turn over a disc.

If the pastor or an interested member of the church happens to be a camera enthusiast, it is possible to accumulate a considerable library of color slides: scenic, historical, copies of great paintings, views from the mission field, transparencies showing charts, church symbols, and the like. The pastor or capable church school worker can put these slides together in a variety of ways, preparing and recording scripts which when played on the recorder can be illustrated with slides put through the projector.

Every pastor needs the self-discipline of listening to himself as he delivers a sermon, as he reads, and as he prays. While he may not be able to be wholly objective, nevertheless hearing himself will be as close as he can be to achieving objectivity. Mannerisms, careless pronunciations, and all the other faults of which one is guilty will be there awaiting to be detected on the recorded tape.

I had occasion one time to put together the history of a church in which I was serving as pastor. The church records revealed many of the necessary facts. But in order to get the available unwritten information, it was necessary for me to interview a number of the older people in the community. It was here that the recorder was of particular help. To try to remember all that is said in an informal interview is not satisfactory. To take notes openly may be embarrassing and is likely to lead to a stilted conversation. By employing the tape recorder, the whole of what is often a rambling series of reminiscences could be set down accurately for future sifting and reference.

The new parish house of the church where I am serving is soon to be dedicated, and I intend to record on tape the entire proceedings, believing that the resulting tape will be as interesting as a motion picture documentation of the event.

On occasion I attend church assemblies of one sort or another, taking my tape recorder along to record the addresses. These records are available later for review, or to share with my congregation if I think them of sufficient general interest.

Some day I intend to submit a tape as
(Continued on Page 6, Col. 1)

YESTERDAY'S NOVELTY — TODAY'S NECESSITY

(Continued from Page 4, Column 3)

when a tape arrives we make notes on slips of paper as we listen to it and combine these with any that might have accumulated on the board. Because these notes are on separate slips of paper they can easily be arranged in a pleasing sequence. Stapled together, these slips can be filed as a written record of what was sent.

We do not own a good record player or record collection. Therefore, our planning and hopes for the future are directed toward a file of pre-recorded tapes of good music; a good amplifier and a good speaker. When we have achieved this our tape recording machine will indeed have become indispensable!

CHURCH RECORDING (Continued from Page 5, Column 3)

my yearly church report, each officer and church organization being given time to record the salient features of the year. Still another project is to tape music to be broadcast from the church tower at Christmas time, when I may not care to spend my time changing a series of discs. I am going to initiate the practice of recording a church school class session for the purpose of allowing the teacher to hear the play-back, quite possibly in private, that he may attempt a personal evaluation of his class work. If I were to be assigned a busy city church I should try placing my microphone near the church door so that as I greeted my people as they left, I could take down scraps of information which I should want later on: names and addresses of newcomers, names of sick members, all sorts of details which would assist me in my parish work. I should find it necessary, no doubt, to repeat clearly the details I especially wanted to record in order that they might be distinct enough to be heard above the murmur of conversation likely to be crowded on the tape. I shall some day make a recording of a typical wedding, to be played later for the benefit of prospective brides and grooms.

Having had some experience in using the recorder in church work, I believe it desirable to set down several personal observations for the benefit of those who may wish to adopt this useful tool. The most desirable recorder will have at least two speeds, $3\frac{3}{4}$ and $7\frac{1}{2}$ inches, the slower speed being satisfactory for everything save a musical program where fidelity is especially desired. It will be more economical to use a dual rather than a single track recorder. It is false economy to purchase the least expensive machine on the market, for a tape recorder is a precision instrument and generally one gets what one pays for.

Various grades of tape are on the market and the temptation is to secure that which is least expensive. A person can manage

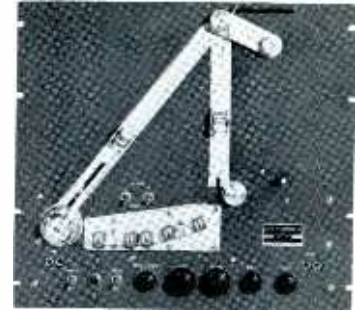
fairly well with recording the speaking voice on inexpensive tape; but to use such tape introduces a serious limitation: the better tape may not be at hand at the right time and one must substitute the poorer, and thus something is lost in the fidelity; or else the better quality tape gets used for speech. Before one knows it, the tapes become hopelessly confused. Any serious user of the tape recorder must employ high quality tape that is known to be uniform in performance. In recording anything to be preserved through the years one should employ one of the newer Mylar base tapes which will last indefinitely.

Except for those which are in use from day to day, I believe all tapes should be stored in metal — or plastic if they ever become available — cans, stored in a cool place where the humidity is not great. Dusty tapes are bound to have an undesirable effect on recording and play back heads. I believe it to be highly desirable to attach leaders to all tapes, as a protection to the tapes and to assist in the threading of the tape. In a dark place, a white leader tape is much more readily seen than is the red oxide tape end.

There is likely to be a tendency in church organizations to allow a variety of persons to use the recorder. It will be wise to restrict the operation of the recorder to two or three well informed users. It cannot be said too often that the recorder is a delicate precision instrument and it should always be treated as such. It is not only expensive to repair a recorder constantly; it is exceedingly annoying to need the instrument and to find that it is not operating properly and that no one took the trouble to report the fact.

The assembling of these remarks about the use of a tape recorder in church work by no means exhausts the subject. Only by an actual trial of the recorder will one discover its possibilities for one's individual situation.

ELECTRONIC "ECHO CHAMBER"



This magnetic tape reverberation unit, on a compact 19" panel, provides a flexible and convenient means of adding any desired amount of reverberation to any program or recording, without the difficulty and expense of maintaining an echo chamber of adequate proportions.

The signal to be "reverberated" is recorded on a continuous-loop, multiple-head mechanism, then reproduced by several magnetic heads at different time-lag intervals. The reproduced signals are returned to the recording head and passed around the loop again with lesser amplitude, thus duplicating the diminishing effect of sound reflections from the walls of a studio. Reverberation time and ratio of reverberant to direct sound may be varied over a wide range. For complete information, write to Audio Instrument Company, Inc., 133 West 14th Street, New York 11, N. Y.



VOLUME INDICATOR FOR TAPE RECORDERS

The low-cost vacuum tube volume indicator shown above makes it possible to add an accurate volume level meter to any recorder which is equipped only with a neon tube or "electronic eye" type of indicator. Unit is provided with connecting cables and adapters which slip under the appropriate tube in the recorder. Complete details can be obtained from the manufacturer, Kilpatrick Electronic Laboratory, Box 61, Norristown, Pa.

New Directory of RECORDED TAPES

The first issue of The Harrison Catalog of Recorded Tapes recently made its debut. Published thrice yearly, this complete directory appears to fill a long-felt need, listing all available selections in 34 different labels — plus interesting editorial material on the subject.

(N.B. Fourteen of the most popular pre-recorded tapes are on Audiotape.) Catalogs can be purchased in quantity at considerably lower prices.

If you are interested in building a library of fine pre-recorded tapes, this book is essential reading. The next edition is scheduled to appear in March. Watch for it at your Dealer's. If he does not carry it, send 25¢ to the publisher, M & N Harrison, Inc., 274 Madison Ave., New York 16, N. Y.

BOOK REVIEW

REUBEN LEE: *Electronic Transformers and Circuits*, Second Edition; \$7.50; John Wiley & Sons, Inc. (New York, N. Y.)

Those who found the first edition of Mr. Lee's book useful will welcome the advent of the new, enlarged second edition. Others who missed the first edition will discover that the newly added material includes data on magnetic amplifiers, toroidal cores, and transformers with unusually wide frequency range.

The book begins with a discussion of transformer construction, and continues with a study of rectifier transformers and circuits. The latter sections contain useful graphical data. Next comes a section on amplifier transformers and circuits — the latter topic is touched on mainly as it reacts upon the transformer design.

Then comes the previously mentioned section on higher frequency transformers, which applies to units, in the carrier frequency range and above. This is followed by a discussion of transformers for use in thyatron controlled circuits, and for use as current limiters or in regulating circuits. Next come magnetic amplifiers, pulse and video transformers, and pulse circuits.

The audio engineer will find the sections on transformer construction, rectifier and amplifier transformers and circuits of interest. The treatment is realistic, quantitative, and no more mathematical than the subject matter in hand justifies.

C.J.L.



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

NEW STUDY OF RECORDER BIAS

Over six years ago our Director of Research devised a new method of measuring the intensity of the bias field during recording, and measurements were made of the effective ac bias in a number of makes of recorders* and in various recorders of the same make and model. Since then our laboratory has continued to use this two-oxide method of measurement as various new recorders were produced. Recently we felt that the advent of so many recorders offering over one kc per inch per second of tape speed made a new survey desirable, involving at least several machines of each popular make.



C. J. LeBel

Accordingly, our tireless Andreas Kramer has completed a series of tests on 17 different makes, of 37 different models, making a total of 57 machines tested. Almost all tests were made at 7 1/2 ips, and the number of machines of a given make tested depended on the relative popularity. Separate data were often taken on amateur and professional machines. Only the 7 1/2 ips data have been tabulated here.

The result in each case is the number of milliamperes of bias thru the record head of our laboratory recorder, to produce the same effect on the tape as the current actually flowing thru the record head of the recorder under test. Average currents are given, as well as readings on individual machines. The phrase "1/2 db below peak" means a bias current reduced, below the value for peak output at 1 kc, by an amount sufficient to reduce output 1/2 db. The phrase "1/2 db above peak" means a bias current increased, above the value for peak output at 1 kc, by an amount sufficient to reduce output 1/2 db. "Peak" means the bias for peak output at 1 kc. All measurements were made at a signal level 30 db

TABLE I
Home Machines

Make	Individual MA	Average MA	db above or below peak
A	15, 15, 17, 17	16	1/2 db below
B	17	17	
C	17		
D	15, 16, 21		
E	13, 13, 17, 17, 25.5		
F	19, 21	20	peak
G	19, 23.5	21	
H	21, 21, 21, 21		
I	{ 17, 18, 21, 24.5, 25.5 } { 25.5, 25.5, 26.5 }	23	1/2 db above
J	25.5, 26.5, 27.5	27	1 1/2 db above
K	26.5		
L	31	31	
M	29, 30.5, 30.5, 40.5	33	

TABLE II
Professional Machines

Make	Individual MA	Average MA	db above or below peak
A	16	16	1/2 db below
B	17, 18	17	
C		20	peak
D		27	1 1/2 db above
AA†		32	

*Old mod

†

below than distortion a output, and

A little study value of bias of produced falls v. though italicized n outside this range.

Professional records, though well over 50% c present production averages within the 1/2 db limits. A great deal of older equipment is still in use, the average falling in the range of 1/2 db below peak to 3 db above peak.

The standardization of effective bias which seems to be proceeding, on a de facto basis, is all to the good. If manufacturers will now standardize the bias of individual recorders, as well as the average value, results will be more uniform. As will be shown in a subsequent article, the presently remaining ± 1/2 db variation can produce a variation in 15 kc response of 10 db, and a 3:1 variation in distortion at high output.

REFERENCE

*C. J. LeBel: A New Method of Measuring Bias, Audio Record, vol. 5, no. 6, p. 3, June-July 1949.



Ampex



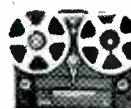
Ampro



Bell



Bell & Howell



Berlant-Concertone



Columbia



"Crestwood"



"Crown"



De Jur



DuKane



"Educorder Dual"



"Ekotape"



"Electro-Dual"



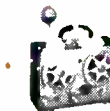
EMC



Fairchild



FME



"Magnemite"



"Masco"



"Memocorder"



"Midgetape"



"Reporter"



Revere



Stancil



"T"



"Tonic"



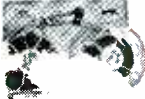
TDC "Tone"



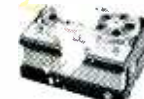
"Telectotape"



"Tri-Fy"



"Vig"



V-M



Warren



"Webcor"



audiotape

TRADE MARK

gives you these important advantages

STANDARD PLASTIC-BASE AUDIOTAPE
the standard of quality the world over

"LR" AUDIOTAPE ON 1-MIL MYLAR*
50% more recording time per reel

AUDIOTAPE ON 1 1/2-MIL "MYLAR"
super-strength professional tape

"SUPER-THIN" AUDIOTAPE ON 1/2-MIL "MYLAR"
2400 ft on a 7-inch reel

*Trademark, DuPont polyester film

BALANCED FREQUENCY RESPONSE for most life-like reproduction throughout the complete range of audible sound.

MOISTURE-REPELLENT BINDER assures smooth, silent tape travel even under hot, humid conditions.

ANTI-TACK AGENT prevents sticking on hot erase and record heads. Especially important on older type machines.

SPECIAL DRIER-TYPE FORMULA greatly reduces danger of oxide rub-off, even on dirty heads.

MAGNETIC ORIENTATION of oxide parti-

cles for higher sensitivity, lower distortion and improved output.

LOWER BACKGROUND NOISE through improved dispersion of finer oxide particles.

These Audiotape features, developed and perfected through years of research and production experience, assure the finest recording and reproduction on any type of machine. It is this performance which has made Audiotape the first choice of so many critical professional recordists throughout the world. Join the trend to Audiotape. IT SPEAKS FOR ITSELF!

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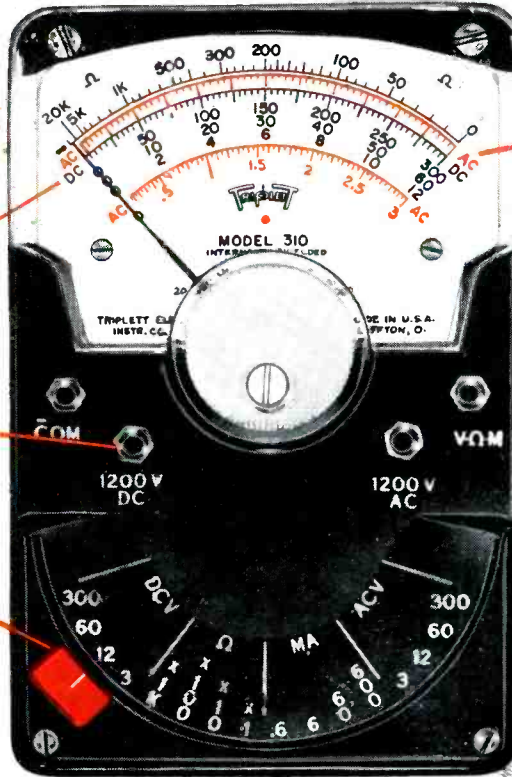
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ELECTRICAL INSTRUMENT CO.
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Model 310 MIGHTY MITE

the only complete miniature V-O-M (AC-DC)

LOOK AT ALL THESE RANGES

DC VOLTS: 0-3-12-60-300-1200 at 20,000 Ohms/Volt.
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OUTPUT: Convenient chart in instruction book.

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For Best Testing
Around The Lab,
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or Bench



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All-Purpose
V-O-M



630-A
A Good Lab and
Production Line
V-O-M



310
The Smallest
Complete V-O-M
With Switch



630-T
For Telephone
Service



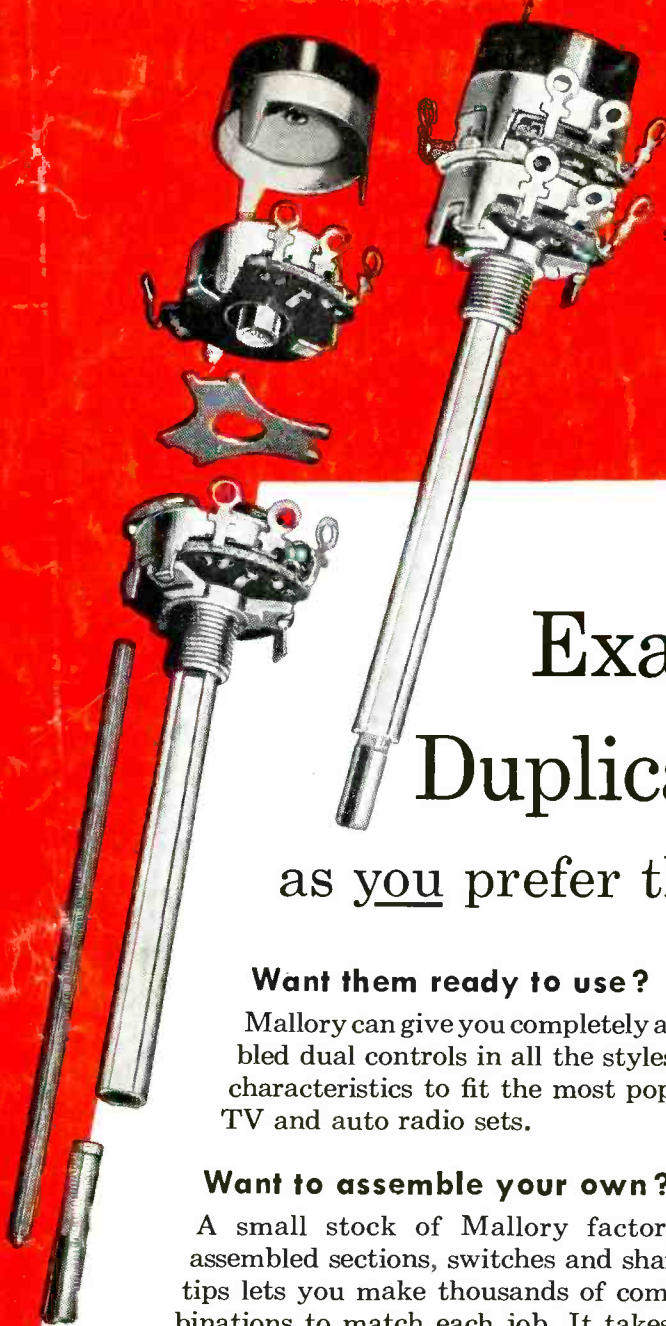
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