

MAGNETIC FILM &

TAPE RECORDING



JUNE 1954

**TAPE PIERCES THE IRON CURTAIN • WHAT'S A DB? • CROSBY VIDEO TAPE RECORDER • RECORDING CHORAL GROUPS
TAPE CLUB NEWS • HOW TO START A TAPE LIBRARY**

35c

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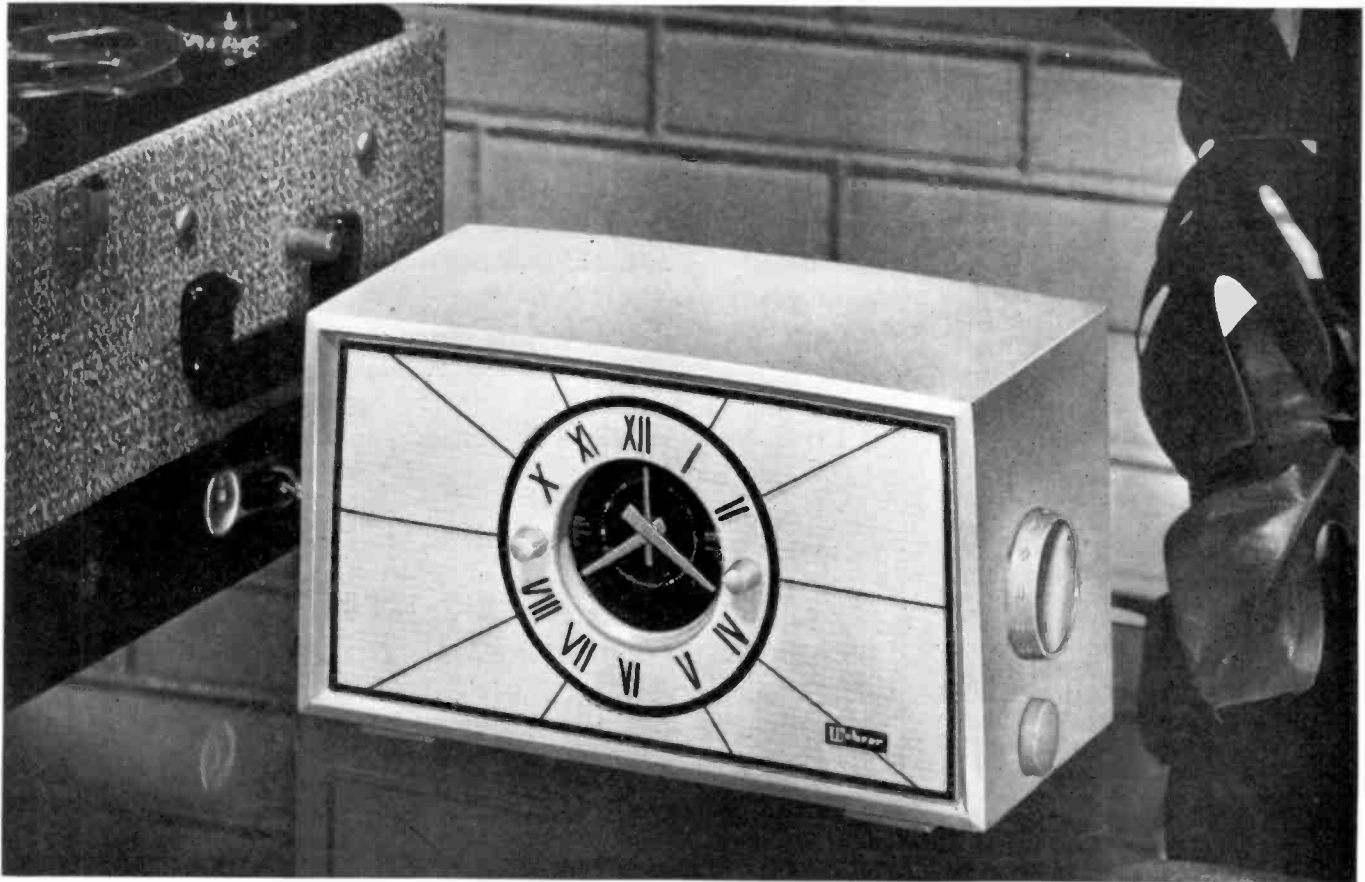
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AUDIO DEVICES, Inc.

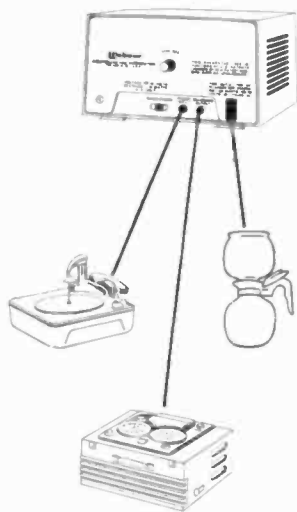
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WEBCOR

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SWAIN'S Tips on Tapes

Vol. 1 No. 3

ANNOUNCEMENT of two things! Swain-A-Fonic MUSIKON TAPES are now produced in *three* types. 1st, for the superlative in HI-FI quality and true fidelity, in 7½ IPS SINGLE track, 1200 ft., 7" reel @ \$9.85 each; 2nd, for standard quality at a popular price, in 7½ IPS DUAL track, 600 ft. 5" reel @ \$6.85 each; 3rd, for those playbacks which operate only at 3¾ speed, in 3¾ IPS SINGLE track, 600 ft. 5" reel @ \$6.85 each. (I do not recommend, nor produce, 3¾ IPS DUAL track, as reproduction of programs is not the best). All programs are a full half hour long. My SINGLE track tapes are full width, and will play on dual track machines. DUAL track tapes will NOT play on single track machines.

Announcement No. 2 is a new half hour program "Special Selected Selections." Its ten selections taken from six of the regular programs. Sort of a "sampler" which shows the full scope of our tapes from piano classical to the red-hot "Wabash Blues" in the MULTEE-TRAK manner. Not only does it demonstrate our tapes—it's a good "test" one to check range and tonal values of equipment. Manufacturers and dealers think it's wonderful! 7½ IPS, SINGLE track ONLY @ \$9.85. Order #D.R., please.

Absolutely FREE—a full list of all tapes available will come to you upon request. Just address Dept. TR, P. O. Box 2384, Sarasota, Florida.

Note to Dealers: I have just issued a new revised proposal which has brought a lot of inquiries. Have YOU written me about an authorized dealership? Sales are growing by leaps and bounds. Pleases me a lot. *Nice to chat with you again!*

Hack

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MAGNETIC FILM &

TAPE RECORDING

VOL. 1 NO. 4

MAY-JUNE, 1954

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Magnetic Film & TAPE RECORDING is published bi-monthly by Mooney-Rowan Publications, Inc., Severna Park, Md. (Severna Park 548). Application for entry as second class matter at the Postoffice in Severna Park, Md. is pending. Eastern Advertising Representatives: J-V Associates, 274 Madison Ave., New York 16, N. Y. (ORegon 9-0050). Midwestern Representatives: Cole and Mason, 605 N. Michigan Ave., Chicago 11, Ill. (SUperior 7-6558). Pacific Coast Representatives: Brand and Brand, 1052 W. Sixth St., Los Angeles 17, Cal. (Michigan 1732). Subscriptions, U. S. and Possessions, Mexico, Central and South America, \$2.00 for six issues, Canada add \$.25 a year; all others add \$.50 a year. Contents copyrighted by Mooney-Rowan Publications, Inc., 1954. Printed in U. S. A.

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NEW TAPES

THIS is the year of decision in the tape recording field. The boom is about to burst!

Somebody let the word get around that people have been buying tape recorders at a remarkable rate (more than a million to date), and that many of these people seem to like music.

A considerable number of these same people have also developed some strange habits. They have taken to recording live FM concerts, and even some recorded ones, onto their own tapes, thereby providing the means for building quite a substantial library of high-fidelity recordings. Other, less scrupulous, music lovers have taken to forming gangs for the express purpose of buying one well recorded disc between them and reproducing it on a dozen or so tapes. The tapes are played, the disc stored away as a master for future use.

Of course, the great majority of us have merely been clamoring, for some time now, for music to be made available on tape for playing in the home. Not just any old music, but *good* music with good orchestras, good conductors, standard repertoire and, most of all perhaps, packaged for us, at a price we can afford.

As I said, somebody let the word get around, because the following companies have gone, or are about to go, into the pre-recorded tape field: RCA Victor, Columbia, Westminster, Minnesota Mining & Manufacturing Company, Audiosphere, Pentron, and Webcor. That's in addition to the old standbys like Hack Swain and AV Tape Libraries. A formidable list, to be sure.

Two of the new entrants have sent me early releases for review and they set a mad pace for the others to follow. An old hand in the field, AV Libraries, 730 Fifth Ave., New York, is issuing popular music on tape on a 3 inch reel, playing time somewhat longer than the conventional disc, at a price of ninety-nine cents a reel! Sorry Dad, either you will have to become a two recorder family or let daughter use the present one.

If any of the readers of this column are still skeptical of the sound of music on tape attend, if you can, an Audio show when this phenomenon takes place in your city. Find a tape demonstration like that prepared by ORRadio Industries, to demonstrate their IRISH tape. This tape I have heard many times and find its presence effect uncanny at each hearing.

If the standards set by the tapes I have heard recently are maintained, I can only predict a bright and happy future, not only for the manufacturer but for the music lover as well. There is music here as well as just pure sound for sound's sake. Which could mean that the experimental days are past; we can now turn to the sum and substance. So saying, let's!

AUDIOSPHERE

Livingston, New Jersey
FLORENCE MAY FESTIVAL SERIES
(Binaural or Monaural: 7.5 IPS and 3.75 IPS)

These tapes were issued cautiously, as

Hear music as the maestro hears it...



AMPRO
"HI-FI"

TAPE RECORDER
with "Podium Presence" tone

Clear, liquid trebles, full-bodied resonant basses—every gradation of tone and volume is reproduced flawlessly by this superb instrument. You hear "living" music as the maestro hears it . . . as you would hear it were you standing by his side at the podium. Electro-magnetic "Piano-Key" controls for fingertip operation!

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"HI-FI" with radio 274.50

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PENTRON 3-SPEAKER TAPE RECORDER

opens a whole new world of high fidelity sound.



Model HT-225
Complete \$225

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Unique Mobile Speaker Adds New Dimension to Sound!

Pentron offers music lovers a new listening thrill—the first tape recorder that achieves true stereophonic sound. Pentron features a separate "roving speaker," with individual volume control, for reproducing high notes.

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a market test. So cautiously, in fact, that the masters were turned over to another company so that records might be issued at the same time. After hearing them several times, it is my humble opinion that Audiosphere should throw caution to the four winds and do a hot promotional job on these releases. Offerings like these on tape could create a demand for tape recorders just as the LP created a demand for new record players.

Here are carefully recorded, well reproduced examples of what can be done with tape. Recorded binaurally in Florence, Italy, the tapes represent a perfect liaison between musician and recording engineer. Two days were expended just balancing the orchestra. Further, the tapes were edited and played back on the spot, thus insuring a musical as well as engineering approval of the final result.

Audiosphere might have been satisfied to turn out superlative engineering, and let it go at that. But no; they procured the services of a large and magnificent orchestra, conducted by one of Europe's most able conductors, seventy-year-old Vittorio Gui. They then chose a repertoire of standard classics: the music that most people want to hear most. If ever there was a potential commercial recording success, this is it. For example:

Reel #701
Schubert—Symphony No. 8 in b.
Sibelius—Finlandia

Gui conducts this overworked "Unfinished" Symphony as though it had never been played before. The score has never, to me, sounded so fresh, so alive. The work has never found its way into my record library because I had grown tired of it through the years. For a period in my life it was everywhere, in the movies, on radio, in concert and at the homes of friends. But listening to this recording was like listening to a piece of new music. From the romantic era, to be sure, but new nevertheless.

The thematic material in the first movement is still as familiar as ever, but the delicate approach to it is so different that it never really intrudes as it seems to in so many interpretations.

It is in the second movement that strange things begin to happen. The first hearing was a purely emotional experience very much akin to the April day on which I heard it; soft, warm and imbued with the spirit of "God's in his heaven, all's right with the world."

I have not heard all of the recordings of this work, but I have heard a good many of them and this is far better than any I have heard. If there exists another someone without the "Unfinished" in their library, I say get this one by all means. If, on the other hand, you do have a copy but are tired of it, then get this one, you'll find it a pleasant and enlightening surprise.

Finlandia is a strange companion-piece to what has gone before and I suggest that you stop the tape for awhile, before playing it. It is a complete antithesis to the "Unfinished Symphony" and is likely to introduce a jarring note.

Taken alone, however, the recording serves to demonstrate that Gui can handle this stormy northern music with as much

ease as the preceding romantic symphony. This reading of Finlandia has all of the depth and power that should be afforded this nationalistic music of one of Finland's greatest patriots.

Reel #702
Wagner—Tannhauser Overture
Wagner—Flying Dutchman Overture

Wagnerian music should sound Wagnerian, and this Wagnerian music sounds as Wagnerian as Wagnerian music should sound!

Reel #703
Mussorgski—Night on Bald Mountain
Borodin—Polovetsian Dances
Sibelius—Valse Triste

What Reel #701 is to music, this reel is to high-fidelity. This should get a well play around the Audio Fairs for some time to come. Make no mistake, this is music, but *what* music. And *what* reproduction!

Perfect orchestral balance, leaping chromatics, chest thumping bass, hair raising flute runs and dynamic crescendi all combine to make this the demonstrator's dream.

During the "Polovetsian Dances," the percussion instruments sound somewhat muddy. This is on the monaural recording. I imagine that, binaurally, they would sound well back in the orchestra.

In this tape, as in the others, the tour de force is the conducting genius of Vittorio Gui. Someone suggested recently that I get more critical in these reviews; "Stop liking everything." In defense, let me say that I love controversy, would like to get critical, but how can I in the face of such overwhelming odds? When I listened to these tapes it was for the express purpose of finding fault. But I couldn't; they're good. Imagine how they will sound to the completely unprejudiced mind.

MINNESOTA MINING AND MANUFACTURING CO.

St. Paul 6, Minn.
DESERT SUITE, selections from Walt Disney's "The Living Desert."
(3.75 IPS, 7.5 IPS and 15 IPS at a price of \$3.30, \$4.40, and \$8.40 respectively)

This ambitious tape is the 3M company's first venture into the pre-recorded tape field. They say that the recording is intended to show "just how good mass-produced recordings on tape can be." Fine idea, except that we have been shown, as I have attempted to explain up to this point.

The principal appeal of this tape is not that it is recorded any better than the others reviewed in this issue, but what it contains. The tape is well recorded, but what is recorded on it sort of over-shadows the flawless engineering technique.

The score, composed by Paul Smith, is truly American in flavor. It is modern music, good music and should have a universal appeal. Anyone who has ever enjoyed a Walt Disney film will enjoy this recording.

It is voice annotated by a narrator which, far from being distracting, adds much to the enjoyment of the music. Who, for example, can resist such an introduction as the one to the fifth vignette: "A side-winder, lying in ambush for a kangaroo rat, is out-manuevered by a clever rodent, causing the

side-winder to side wind." And you can no more resist the music that follows such an introduction.

As I said, it should have universal appeal. All sorts of strange noises for the high-fidelity fan, including bass flutes, Persian finger cymbals, English horn (which is not a horn and not English!), big cymbal clashes and bursts of tympani. All sorts of fine music for the lover of fine music, and enough humor to amuse and educate the children.

HACK SWAIN PRODUCTIONS
Sarasota, Florida
Program #508 (Rhythm Reel)
Hammond organ—Piano, 7.5 IPS

Here are fifteen popular melodies, played with enthusiastic, high good humor by Hack himself. Four of them are recorded in the unique multi-track manner, labeled SWAIN-A-FONIC.

If you are old enough to remember these numbers first hand, this recording is going to make you feel old indeed. Move over gramps! Included on the tape are such "classics" as "Hindustan," "Who," "Girl Friend," "Coquette," "Shiek," "Ain't She Sweet," "Five Foot Two," and "Cecelia."

They are recorded in the polished, high level manner that has come to be a trademark of the Swain organization. On the tape is a reminder that Hack will dedicate these tapes to people for a small additional fee, and I must admit that hearing your name on a commercial tape comes as quite a surprise. If you are interested in having this personal service performed, the address is:

Hack Swain Production
P. O. Box 2384
Sarasota, Florida

If you don't want the service performed, serve yourself to a copy; you'll be glad you did.

As we go to press we have received news that the Livingston Electronic Corporation is releasing four popular "albums" on tape. The tapes are on 7 inch reels, duplicated one to one and are available in both full track monaural and binaural for the staggered head spacing employed by Magnecord.

The new releases include Erskine Butterfield's album—Just For Kicks, the Barbara Carroll Trio, Lenny Herman and the Mightiest Little Band in the Land, and Josh White. Playing time of the reels varies from 25 to 30 minutes each.

According to the company this initial release is in direct answer to repeated demands for popular material on tape.

Charles D. Sigbee

Don't miss reading the
Column on Page 4—

"TIPS ON TAPES"

It's the latest news on

**SWAIN-A-FONIC
MUSIKON TAPES**

Hack Swain

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Complete push-button operation—error-proof tape slot—positive record-lock mechanism make the RCA Tape Recorder your buy for easy, sure operation.

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When you buy the RCA Tape Recorder, you know you're getting the finest at a price you can well afford. Behind the RCA Tape Recorder stands the extensive RCA background in top-quality electronic products.

TRY THE RCA TAPE RECORDER at your RCA Dealer's. (And don't forget to stock up on low-cost RCA Sound Tape.)



RADIO CORPORATION of AMERICA

As you know...

YOUR HI-FI RECORDING SYSTEM IS ONLY AS GOOD AS YOUR MICROPHONE!

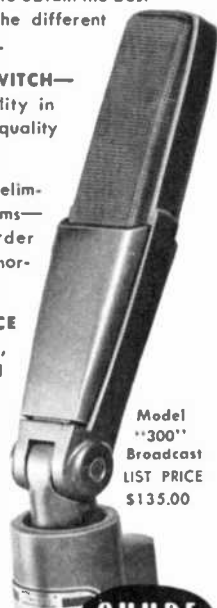
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HIGHER FIDELITY MICROPHONE

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Model S33 Desk Stand LIST PRICE \$15.00

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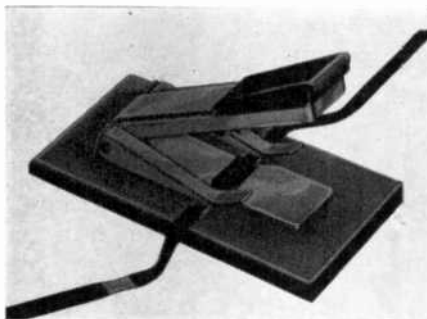
NEW PRODUCTS

TELEPHONE PICKUP



The Permoflux Telephone pickup is a lightweight device which attaches to the earphone of the telephone headset. Its output may be fed to the high impedance input of any type of recorder. No electrical connection to the phone is necessary and the one type fits all telephones. It is claimed that the output is higher than that obtained with the under-the-phone pickups. Write Department T, Permoflux Corporation, 4900 W. Grand Avenue, Chicago 39, Ill., for full details and price.

GIBSON GIRL SPLICER



Yale Industries Corporation, 82-09 251st Street, Bellerose 26, N. Y., is marketing the Yale TS-4 "Gibson Girl" splicer. The splicer cuts the tape in a neat miter, the splicing tape is applied and the splicer will then trim the tape with rounded indentations so no adhesive can touch the heads. As little as 1/4-inch of tape is removed in making a splice. Write for price and details.

REPLACEMENT HEAD CHART

A handy reference guide for distributors, servicemen and experimenters is available from Shure Brothers, 225 West Huron Street, Chicago 10, Ill. The chart lists the Shure replacement heads for a number of different recorders. It also includes head dimensions, technical data and a numerical listing of Shure heads. Copies are free on request.

IRISH SETS NEW PRICES

ORRadio Industries, Opelika, Alabama, has announced new price schedules for their Green Brand and Brown Brand tapes. The new prices will be standard for all types of outlets and represent a reduction on both types of tape. The 1200 foot rolls of Green Brand, for instance, have been reduced from \$5.50 to \$3.30.

DISC JOCKEY



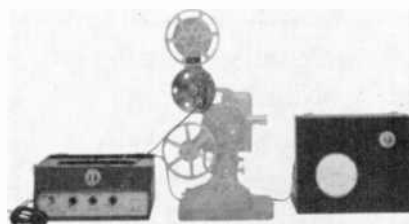
The Calvin Company, 1105 Truman Road, Kansas City 6, Mo., has announced the new "Disc Jockey" which has three speeds and a built-in 3-channel mixer. The dual turntables permit continuous music or sound effects to be recorded. The pickups are sapphire-tipped. The 3-channel mixer permits mixing the output of the two turntables and one microphone. Any type of high impedance mike may be used with it. Turntables may be operated independently. For price and full details write to the firm.

AUDIO VENDOR



Cousino Visual Education Service, 2325 Madison Ave., Toledo 2, Ohio, is marketing the Audio Vendor, a device which will fit most tape recorders and will repeat messages, signals or music up to 15 minutes. Separate models are available for clockwise and anti-clockwise recorders. All units are loaded with Cousino Friction Free Double Magnetic Coated Tape, a lubricated tape especially developed for continuous playing. The unit lists for \$39.50. Write Cousino for specifications.

ADDS SOUND TO FILMS



The Foto Corporation of America, 169 Lexington Avenue, New York 16, N. Y., has announced the Cinesone Magnetic Film Adapter unit. The new device offers mag-

netic sound on film to owners of any kind of silent projector, either 8 or 16mm.

The complete unit consists of the adapter, which fits on the projector, microphone, 5-tube amplifier and a 6" PM speaker. The complete outfit costs \$199.75. For those who have a tape recorder, only the adapter itself need be purchased at \$99.75, cords and connectors included. It will record on any standard magnetic track and has an automatic subducer to permit recording a new track over an old without erasure. Write to Department T for full details and specifications.

MAGNETIC DISC RECORDER



A new machine which will record and playback on a magnetic disk as well as play any ordinary disc record has been announced by Magnetic Recording Industries, 30 Broad Street, New York, N. Y. The unit, called the Magneticon, is a three-speed portable phonograph that instantly converts to a magnetic recorder by plugging in a magnetic needle. The magnetic disc can be replayed an indefinite number of times and can be erased and used over again. The firm also makes a Magneticon attachment which will use existing phonographs for making magnetic recordings. Prices start at \$69.50. Write for details.

EKOTAPE OPERATES PROJECTOR



Webster Electric Co., 1900 Clark Street, Racine, Wisconsin, has announced the Model 207 recorder which is designed to operate in conjunction with an automatic slide projector. The unit provides up to an hour of uninterrupted continuity without the attention of an operator. The control signal to change slides is placed on one track and the associated commentary on the other. It may also be used as a low-power public address system. Two speeds, 3¾ and 7½ inches per second, are available. Price and details on application.

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They record their music faithfully

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Dynamic Microphone

• Staff artists of the American Broadcasting Company in Chicago, the Fine-Arts Quartette is known for its unsurpassed tone quality and technical perfection. Consistent recording of all rehearsals has helped this renowned quartette achieve the high standards of perfection for which it is known.

High-fidelity enthusiasts, as well as professional recording artists, are using the "Sonodyne" in ever-increasing numbers. Home users of tape-recorders are finding that the "Sonodyne" reproduces voice and music with a remarkable degree of "naturalness." It makes the "Sonodyne" the ideal high-quality, moderately-priced replacement for the conventional microphones supplied with tape recorders.

Model "51" Sonodyne. List price \$47.50. Available at Shure Distributors everywhere.

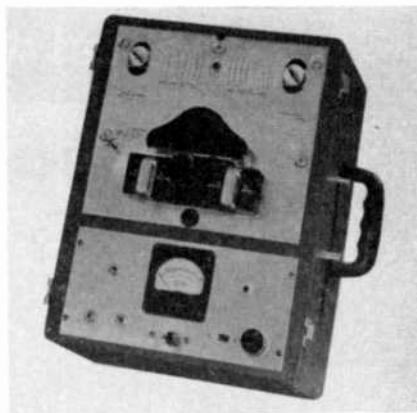


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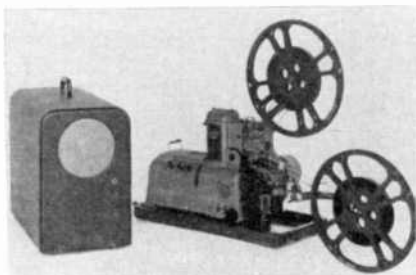
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PENTRON HI-FI RECORDER



Pentron Corporation, 221 E. Cullerton Street, Chicago 16, Ill., has just announced the new Pentron Deluxe High Fidelity recorder, Model PMD-1. It consists of the new preamplifier HFP-1 intermatched with the 9T-3M tape transport mechanism. Frequency response is 50 to 12,000 cycles plus or minus 3 db and it has an illuminated VU meter. Recording heads have removable pole pieces for easy replacement. Controls are jet black with a brushed copper panel. Price is \$134.50. Full details from Pentron.

TRANSISTOR PROJECTOR



Ampro Corporation, 2835 N. Western Ave., Chicago, Ill., has produced the first motion picture projector to use a transistor. The Model 477-R, which is minus recording equipment, is designed primarily to play back film with magnetic sound tracks or silent films and optical sound film. A still picture button will hold one frame on the screen for discussion. The film capacity is 2,000 feet. Distributed through Ampro's audio-visual dealers, the unit lists for \$725. Full details from Ampro.

KARLSON KIT HORN

Karlson Associates, 1379 E. 15th Street, Brooklyn 30, N. Y., are marketing the Karlson Ultra-High-Fidelity kit. The kit comes ready to put together with all 34 pieces precision cut to size. It is of rough plywood to allow the application of veneer or other finish. The kit, the Model 15PK, is furnished with a hole cut for a 15-inch speaker. Adapters are available to take a 12-inch speaker. The enclosure will extend the bass range of a coaxial speaker to 25 cycles while providing a flat response throughout the entire range of the speaker. Construction plans are available on request. Mention Tape Recording Magazine when writing.



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NEW CATALOGS



Magnecord, Inc., 225 W. Ohio Street, Chicago 10, Ill., has issued two new, comprehensive catalogs; one a full-line catalog for professional use and the other a catalog for High Fidelity fans. The catalogs contain numerous listings and comparisons which will be of interest to professional and amateur. Copies may be obtained free by writing to the firm.

BATTERY OPERATED PORTABLE



The Amplifier Corporation of America, 398 Broadway, New York 13, N. Y., has announced the Magnemite 610-A battery operated portable tape recorder. It operates at a tape speed of 15/16 inches per second and has a frequency response of 300 to 2,500 cycles. It measures only 5" x 8" x 11" and weighs but 12 pounds including batteries. A spring motor is used for tape transport. Full details and price from the Magnemite Division of the Amplifier Corporation.

COMMERCIAL MUSIC

Magne-Tronics, Inc., 122 E. 42nd Street, New York 17, N. Y., has announced a full line of tapes for background music in hotels, restaurants, industrial plants, etc. The music is completely programmed and will play for up to eight hours without attention. Each tape carries 160 selections of good music. The tapes may be leased on a contract basis through the Graybar Electric Company with outlets in more than 100 cities.

Sensational News!



for every
tape recording fan
You can own the best NOW!
Contact your local photo dealer
for information about the

EICOR Easi-Buy Plan



This Message is Written to You

Perhaps you, like so many tape recording fans, have waited a long time to buy your first machine. You have used magnetic recording in your business office, or perhaps you've enjoyed using a friend's machine, but you've always waited for just that certain tape recorder to come on the market that will combine the many advantages you've looked for with a low, low price. You needn't wait any longer! EICOR'S EASI-BUY PLAN in conjunction with your local photo dealer enables everyone to own the finest in tape recording equipment at the lowest price. Should your particular dealer be unfamiliar with the Eicor plan, send the coupon below and let us tell you how you can use this plan to purchase Eicor's Model 400, one of the finest magnetic recording instruments available today. Please don't delay. The facts are so remarkable you'll be glad you acted at once.

THE FAMOUS EICOR 400, LIST PRICE: \$119.50!

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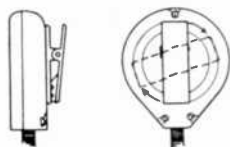
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that grips from any angle . . .



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Model L-100 (with clip and 20-ft. cable) List Price-----\$12.50

Model 100 (with clip and with 7-ft. cable) List Price-----\$8.00



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Please send me complete information
on your new Models L-100 and 100.

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TAPES TO THE EDITOR

When sending tapes to the editor please use the 3" reel and indicate the speed at which it was recorded and whether it is dual or single track. We will listen to your tape, make notes from it for use in this column and then reply on your tape. Please keep tapes reasonably brief.

If you do not own a recorder a letter will be acceptable. Address tapes or letters to: The Editor, Film and TAPE RECORDING, Severna Park, Md.

To the Editor:

How can we prod some manufacturer into producing the ideal tape recorder? It should be a two-speed, dual track machine with 7500 cycles response at 3¾ speed and 13 to 15,000 at 7½. It should take 10½-inch reels to provide adequate time to record symphonies or over 30 minute shows. Inputs and outputs should be readily accessible, not in the back and the use of an external amplifier should be permitted. It should look more like a table or console model than a suitcase, there are enough suitcase models on the market now. It should take the place of a record player, and be priced from \$200 to \$250.

I do not think I am asking too much as all of the features mentioned above now can be found on individual machines of different makes. Some manufacturer is going to combine all the good features and sell a lot of machines.—*Vernon C. Seaver, Chicago, Ill.*

To the Editor:

The first issue of TAPE RECORDING arrived here today safe and sound. I have found it "just what the doctor ordered" with regards to useful information and data on tape recording. Not being a technical man, I have found the magazine really interesting and easy to follow. I am looking forward now to the next and following issues.

I wonder if I am one of, or the only, reader outside the U. S. who gets this magazine? After reading it I shall pass the news to the other tape recordists about this magazine in this country. May I wish you the best of luck.—*M. H. Nicholls, Pietermaritzburg, Natal, South Africa.*

You are "one of" the readers outside the United States. TAPE RECORDING Magazine has subscribers in all 48 states and in more than 25 foreign countries. You can qualify as one of the most distant, discounting India and Hong Kong.

To the Editor:

We were particularly happy to read the article by Ronald Anderson entitled "Binaural Sound with Two Recorders." The sense of musical reality that can be achieved through methods Mr. Anderson has described so well is amazing.

However, we would like to clarify one point regarding the record and erase heads. Pentron recorders are equipped with record and erase heads designed and manufactured by Pentron.

Incidentally, since all Pentron heads have removable pole pieces, the pole pieces may be replaced when desired rather than the entire recording head thus reducing the cost of replacement about 80%. — *Martin Mann, Advertising and Promotion Manager, The Pentron Corporation, Chicago, Ill.*

To the Editor:

Enclosed is a check for a year's subscription to TAPE RECORDING Magazine. I found a copy of the February issue on the newsstand last week and it is just the kind of magazine I have been looking for.

I have a Webcor Model 210 tape recorder and the matching portable amplifier. I would sometime like to see in your magazine a comparative analysis of all the tape recorders in the popular price class. This would be a valuable guide.

Count on me as a regular reader as long as you put out a magazine of the same quality as the one I have read.—*Myles H. Walburn, Chicago, Ill.*

Thank you for your kind words; we'll do our best to continue to deserve them. One by one we are doing reports on recorders in all price ranges and we hope these analyses will serve the purpose.

To the Editor:

I have noticed that the tape enthusiasts that write to your column are very willing to help each other so perhaps you will be able to help me.

I would like to contact someone who has been recording the Saturday afternoon operas with program notes by Milton Cross, who would be willing to lend me their tapes so that I could re-record them. I have accepted employment overseas for an American company but the area to which I will be sent is rather isolated so I decided to take my own cultural interests, in the form of Met opera, with me. I have only had my recorder a few months and have missed parts of two operas due to intermittent failure of a condenser. I haven't much to offer anyone in return but perhaps I will be able to do some service for them in the future.—*George Bach, 5634 Northumberland Street, Pittsburgh 17, Pa.*

To the Editor:

We read the article "Binaural Sound with Two Recorders" with considerable interest.

We think, however, that the author is going about it the hard way. We gave up the idea of turning the heads on the recorder and now use double-coated tape with two recorders.

By giving double-coated tape a 180-degree turn between the recorders we are able to use two recorders without modification other than removing the pressure roller, or, in some instances, by simply threading the tape behind the pressure roller.

We had the tape made to order for us and if any of your readers would like to try it we can supply it at \$6.50 for a 7-inch reel. Because of the added thickness the reel holds only 1000 feet. The tape may be used to record in one direction only as the sound will print through from front to back.—*W. A. Yoder, Motion Picture Supply Co., 714-16 Cleveland Street, Richmond 21, Va.*

QUESTIONS & ANSWERS

Questions for this department may be sent on tape or by means of a postcard or letter. Please address your queries to, "Questions and Answers," Film and TAPE RECORDING, Severna Park, Maryland. The most interesting and widely applicable questions will be used in this department and all inquiries will receive a tape or letter reply.

Q—Less than a month ago I purchased a recorder and already I have a problem. Using the microphone supplied with the recorder I get fine results. Likewise, if I use my own mike by itself I get the same fine results. But when I use both together by means of a multiple extension cord, the quality of the recording goes way down. Everything sounds like a telephone conversation. The same goes when I record directly from a phonograph and leave a mike plugged into the other receptacle. What's the trouble? Any remedy?—A. J., Syracuse, N. Y.

A—Two different types of microphones cannot be connected together as you describe without affecting the quality of output from both. You can connect two mikes of the same type together with good results. The same goes when feeding a mike and phono input into the same channel. The power delivered by the phono cartridge will be much greater than that of the mike. To mix them successfully an electronic type mixer must be used which will amplify the mike signal to match that of the phono. Two different types of mikes may also be combined if an electronic mixer is used.

In a future issue we plan to give the directions for building an electronic mixer but meanwhile there are a number of good units available at your recorder dealer.

Q—Referring to your recent article on "How to Check Your Recorder," by H. D. Weiler, he expressed the importance of removing any accumulation of airborne dust and microscopic particles that are present on the record-playback head with a cotton swab saturated with alcohol.

Assuming that alcohol is absolutely harmless no matter how often applied, would it not be advisable to clean the sound head on my recorder once a week to assure maximum performance? I use the recorder about six hours per week.—R. De S., Long Island, N. Y.

A—Once a week cleaning of the recording head certainly will not be harmful and it will guarantee top performance of your unit. We would suggest that any recorder owner would do well to review the maintenance instructions given in the booklet that comes with the recorder and follow them to get maximum results. A periodic checkup is good for all mechanical things from your car to your vacuum cleaner—and that includes tape recorders.

Q—I am interested in acquiring either a high-fidelity phonograph or a good quality tape recorder and am having difficulty deciding which will best suit my purpose—music listening.

I very much like some of the features about a tape recorder. They are versatile, one can take advantage of the record libraries

by transferring them to tape and the cost of the music is much less for a comparable amount of time on phonograph records. Still I am rather in doubt on some points and I'm hoping you can give me the dope.

First, it seems the tape recorders are in a period of rapid development. Of course I realize that industries are always making improvements. My point is that improvements are always much more rapid at first, tapering off after a time to a comparatively slow progress and improvement. I would like to buy a recorder but don't want it outdated in a year or two. I should also like to know how long a recorded tape will last before it begins to fade and can I get good recordings at the 3¾-inch speed?—C. McR., Monterey, Cal.

A—We may be slightly prejudiced but we would advise that you get a good recorder without further delay. The present machines are capable of doing what you require and we do not feel they will be outdated in a year or two.

It is our opinion that we are beginning to see the end of the phonograph record. With the increasing number of companies entering the field of pre-recorded tape, including RCA Victor in a month or so, there will be more than adequate selections of material of pre-recorded music. In addition, every major record producer puts the music on tape first, then dubs it to records. It was tape that made the present LP records possible. The lack of wear, the extremely high-fidelity and quiet operation that is characteristic of tape cannot be matched on a disc. You can also record your own music from either AM or FM at the cost of the tape itself.

As you know, every time a record is played it loses some of its quality, no matter how fine the stylus. Tape will retain that original quality indefinitely and will not fade. In fact, some record enthusiasts clean a new record thoroughly then play it onto tape.

You should be able to get good recordings at the 3¾-inch speed but the 7½ is the best for music as it gives a greater frequency range.

Q—Some friends who claim to know something about sound reproduction tell me that I will get better reproduction of the voice if I use another microphone other than the one supplied with the recorder. I was told the same thing by dealers. What do you say?—E. F., Hollywood, Cal.

A—Both the friends and the dealers are correct. The mikes supplied with tape recorders are of good quality for average use but finer results especially on music can be obtained by using a better microphone. Either of those you mentioned in your letter are good. We think you will be more pleased with your recordings after you try a new microphone.

SOUND Advice from... the SOUND Experts

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by H. D. Weiler

Story of high fidelity—clearly told, easily understood tells what to buy and what to do. HIGH FIDELITY MAGAZINE said of this book—"We could make this just about the shortest book review ever written by saying only: 'This book fulfills its title'!"

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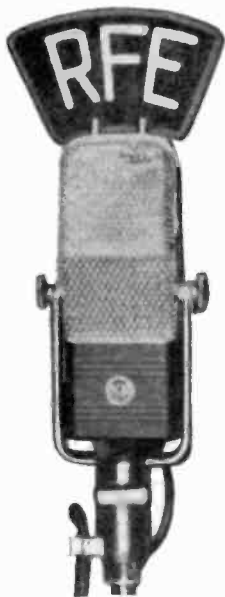
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"... Excellent streamlined guide to theory and practice of high fidelity sound. Circuits with constants, enough theory, descriptions of components with some guidance to the selection of working units . . ." says Radio Electronics

Buy these books from your jobber, local bookstore or write directly to JOHN F. RIDER PUBLISHER, INC.



TAPE PIERCES THE IRON CURTAIN

by

Charles H. Malmstedt

formerly Assistant Studio Manager
Radio Free Europe

Taped broadcasts in many languages bring hope and courage to the people behind the Iron Curtain. Here's a dramatic bit of the story of tape and Radio Free Europe.

ON A summer day not very long ago a Czechoslovak train threw the communist border guards into a state of panicky consternation. It did this by simply thundering through the closed border, carrying with it a group of Czechs who had chosen the West and had decided to do something about it.

Since that time, others behind the Curtain have done the same thing by somewhat different means. A transport plane was commandeered in mid-flight and directed to land in the western zone. It did. A home-made armored car, reportedly held together by little more than baling wire and determination, rumbled its defiant way across the same closed border, delivering another group to freedom. And, before and between and after these and other spectacular episodes, there were, and are today, the multitudes who, alone or in small groups, carrying little more than courage and the rags on their backs, brave both the elements and

communist guns in a determined bid for a better way of life.

Why they want to do it, we of the West know well enough. But what gives them the courage to do it, the impetus to start? What turns the clenched fist of thwarted defiance into determination to act?

A big part of the answer is—tape; the voice of the West on tape broadcast by Radio Free Europe.

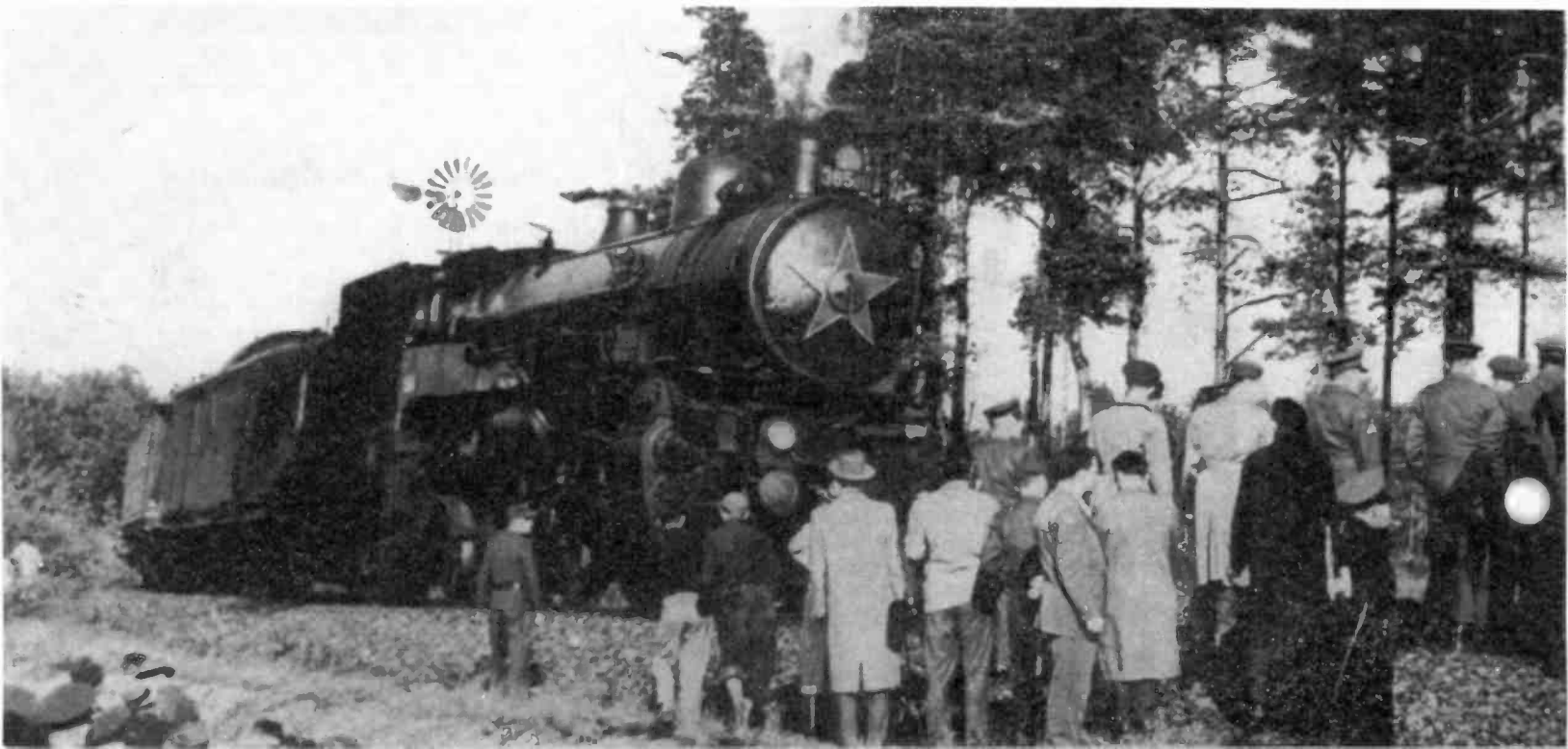
What RFE puts on these tapes, and how it does it, constitutes perhaps one of the most unique and, often, exciting series of operations in the world of tape recording and broadcasting.

One of the most notable of such operations began on a cool summer day in Munich.

Outside the Regina Palast hotel on Maximiliansplatz a hail storm was in full blow, the pellets striking the sidewalk, glistening among the dozens of feet making their way

German-Czech border, U. S. Zone. This is the four car train aboard which 31 Czechs fled to freedom. It was returned to the Czech authorities by a U. S. delegation consisting of an army captain and 20 enlisted men. A group of German civilians line the RR tracks to watch the return of the train. Radio Free Europe taped the story of the escape and the voices of the refugees who had fled in the train and then broadcast the messages back past the Iron Curtain so that others might take courage and keep alive their hopes.

International News Photo



rapidly from automobiles into the lobby. Teeming with well over a hundred people, the auditorium beyond the lobby—in normal operation a night club—soon resembled a convention hall, except for perhaps one thing—a tense expectancy of an unknown that might not be without its dangers. Meanwhile, on the fringes of Munich's Englischer Gartens RFE's European headquarters was in hectic last-minute technical preparations. A small Volkswagen bus stood by, hardly bigger than our panel trucks and, on the outside, no different from any other vehicle of its type. Inside it, however, was a different story: a mobile studio complete with microphones, mixers, amplifiers, and a bank of tape recorders, among them rack-mounted Magnecords, portable Magnecords, and several small, almost tiny mini-tape portables, completely self-powered.

In the Regina auditorium Mr. C. D. Jackson, the then President of the National Committee for a Free Europe, faced the speakers' microphone and in a quiet voice began his introduction to Operation Winds of Freedom.

In an hour the briefing was over and there filed out the participants—directors, engineers, announcers, newsmen, meteorologists and myriad technicians whose specialties and immediate assignments were still a mystery even to those of us who had just been briefed. We knew only that they would depart in two giant trailer trucks full of equipment. The rest of us would go in a dozen sedans, all leaving independently, to rendezvous somewhere in the night, far to the northeast, so close to the Iron Curtain that no mass roadside rendezvous could be risked even at night.

—II—

The big trailer trucks took off first, into the teeth of gale-whipped hail turning to rain. Then the mobile studio and equipment vans left and, last, the faster sedans took off into the night. All headed first for the *autobahn*, each with its rendezvous reference points, one man in each car carrying a map marked with still-somewhat-cryptic red circles, triangles, squares and crosses.

The next hours were full of suspense, which is not entirely new to RFE personnel. Other things had been as hectic: the wild dashes to various parts of the frontier country to record the voices of escapees just reported over the border and the equally wild rushes back to the English Gardens with the tape reels. Then the quick editing, cutting and splicing to get these voices on the air so that anxious friends and relatives left behind, listening to concealed radios, would know as soon as possible of the break-through's success, suspense too in the one-minute-notice tape recordings of the voices of presidents, premiers, and diplomats; the pursuit of refugees and escapees in far corners of Europe, to tape their comments, the stories of their escapes, and, not infrequently, to enlist their services in further aiding the work of RFE.

Our sedan had not yet left the designated exit on the *autobahn*, when our group was asked:

"Have all here left their credentials behind?"

One man had neglected to do so—and was immediately instructed to conceal them in the car in such a way as to make them difficult or impossible for strangers to find. The reason for this precaution soon became apparent from a study of our map markings. We were not many miles from the Red-controlled border and, when the *autobahn* was left behind, the signs at road junctions became indistinct or nonexistent. And the first rendezvous point was still some distance off.



Refugees being interviewed at Camp Wels by a Radio Free Europe reporter. The tapes made in the portable machines are played over the air to the villages from which the people fled to freedom. That the broadcasts are heard has been proved by refugees who said the programs gave them the courage to try crossing the border.

There was occasion to become concerned about the mobile studio and its crew of German engineers, and to recall Red radio Bratislava's threatening boast: "the first task of our forces liberating western Europe will be to execute all European employees of Radio Free Europe." There was also reason to recall that not much later the Red forces had offered to free newspaper man Otis (then still held by the Reds) if RFE would close shop and comply with the communist cry: "Go Home Ami."

But there was also cause to remember the other side of the ledger. And, despite frequent and excruciating heartaches, we of the technical departments, among others, had quite a ledger to look at with satisfaction.

From a woodland collection of portable equipment in the Rhine country, we had, in several acrobatic leaps and bounds grown to a position favorably comparable to some of the major networks' installations in the States, but with more unique and complex daily problems to solve. Considering that at RFE five nationalities, and sometimes more, work hand in hand, not least among these problems was the one of languages. But still the growth had been little short of phenomenal. With 23 transmitters now in operation, some of them on the intermediate frequencies of the European broadcast band and others on short waves, RFE is indeed a major network. Preparing and feeding program material to these stations is the organization in Munich. Here, tape is both king and servant; and few servants have



RFE Photo

the capacity to serve democracy as well as this magnetized youngster barely out of its teens. At RFE it is quite a youngster. It rises early and retires late, seeing service during most of RFE's approximately 2500 weekly hours on the air, speaking in Hungarian, Czech, Polish, Rumanian, and Bulgarian, to say nothing of English and the many other tongues in which news and information for RFE use is recorded all over the world. RFE recorders can be found at international conventions; at meetings of the United Nations; at press conferences from Stockholm to Shanghai; at festivals from Venice to Camp Valka, where refugees and escapees (some of whom have joined RFE's staff) await rehabilitation.

Most of the equipment used in recording, editing, and air sessions is standardized. Console Ampex machines play the biggest part in both recording and playback. In the studios these are fed to and from Western Electric 25-B consoles at which tape and disc as well as other program components are mixed. In the modern master control room, predominantly of German design, and in the special recording, editing and playback rooms, rack-mounted Magnecords and Ampexes, along with some German machines, do the job—aided by some ingenious devices created on the spot by the engineers of German, and other, nationality who comprise the bulk of RFE's European technical staff. Their diligent cooperation is in no small way responsible for what has been achieved. In field operations, minitape does a part of the job, being later put on the standard tape, most of which is Minnesota Mining's No. 111, of which RFE's comprehensive tape library has such a gigantic recorded supply that it would take a catalog the size of a metropolitan telephone book to list all according to topics covered.

Regensberg, Germany. Six of the eight Czech refugees who fled their native land are shown with the vehicle that carried them across the border on July 25 under the eyes of the communist patrol. In the foreground is Mrs. Libuse Cloud, wife of a Sioux City army vet., who was once stationed in Czechoslovakia. The men are Josef Pisarik, left and Aaclan Uhlik who is handing one of the children to Mrs. Uhlik. Their other child is on top of the tank. Uhlik built the "tank" in secrecy and it took him three years to complete the job.

Via tape recorder and RFE, the Uhlik family and their friends who escaped from Czechoslovakia in an improvised armored car last summer broadcast back to their homeland and tell the people what it is really like in America. The Uhlik's are shown here upon their arrival at the home in Springfield, Massachusetts, which was provided for them by the people of that city. The Uhlik's are in America under the auspices of the Crusade for Freedom which enlists the moral and financial support of the American people for Radio Free Europe.

—III—

To us approaching the rain-washed border area in our sedan the topic of our particular recording mission was still a considerable mystery. Our Regina briefing had covered little more than the bare essentials necessary to get us on location with personnel and equipment ready for "a big job; an important job."

Needless to say, we had speculations. Had our multi-thousand dollar monitor station picked up something hot about an impending border incident of unusual importance? There was one in our group who asked:

"Just what are the big trucks for? And I saw a lot of sand in one of them. And metal buckets."

Another replied: "Maybe to make a path through a wall of fire."

"For people to run through?"

"Maybe," was our map-holder's reply.

After that we drove in silence for some minutes. The rain and hail had stopped and a high wind had risen as we came to a four-way road junction. No signs.

"Regensberg," the man with the map said. "Toward Regensberg now."

"That means we turn south here."

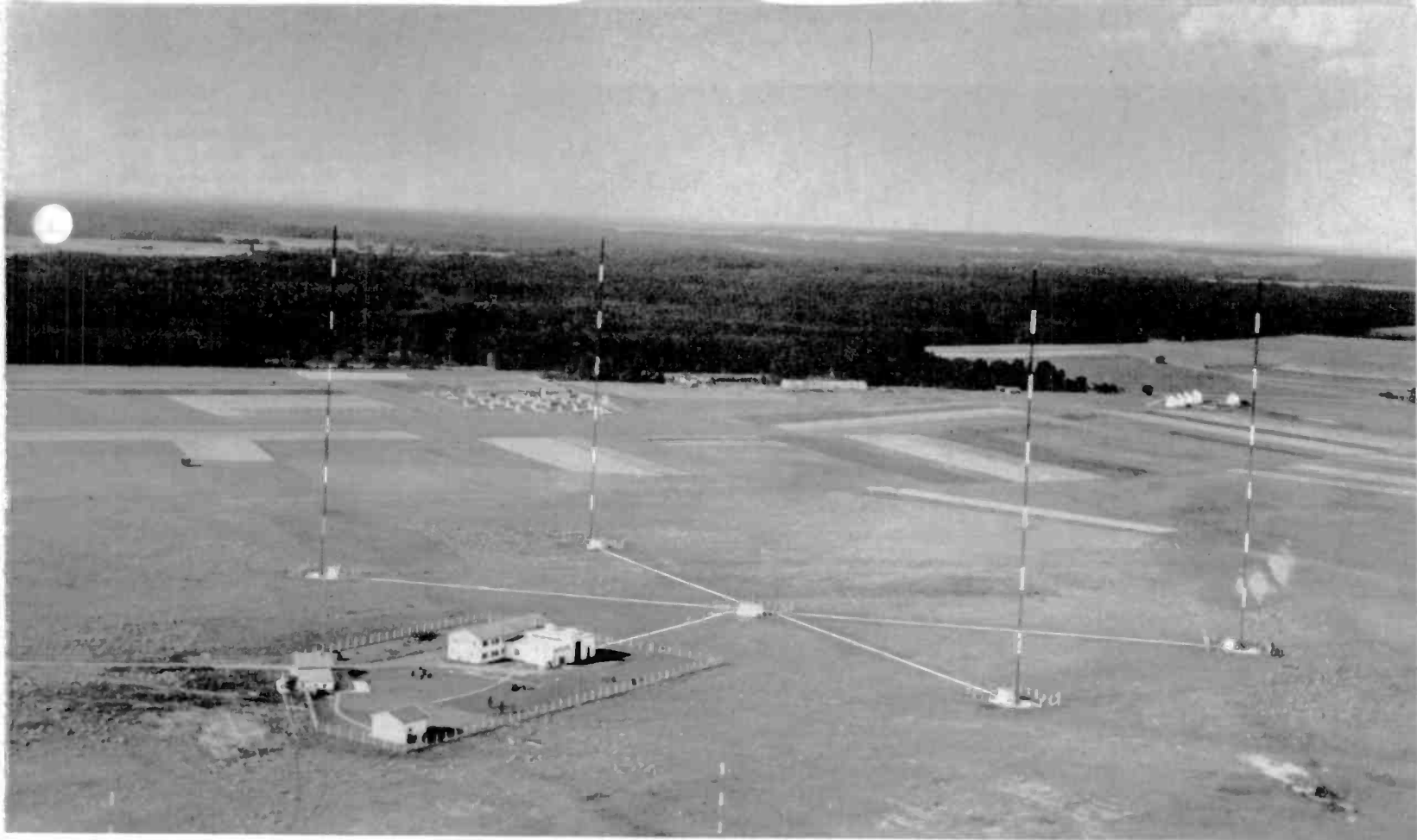
Which way was south? We took a guess, turned, and went on—but without conviction of having made the right guess. Was the junction the one we thought it was? If so, another five miles should bring us to the first rendezvous reference point, with one of RFE's cars there to direct us further.

Going on, the speculations returned and soon were vocal about Otis. "Do you suppose he's escaped and Schleissheim got wind of it?" asked an engineer.

Schleissheim, in the suburbs of Munich, is the location of RFE's monitor installation. Employing banks of diversity receivers and associated selector, amplifier and communications equipment, the monitor station, are housed in a specially-constructed building. They utilize a maze of custom-tailored antennas and keep tabs on just about everything

International News Photo





RFE Photo

This is one of RFE's network of 22 transmitters ringing the iron curtain. This transmitter is at Schleissheim, Germany, and is just one part of RFE's technical installations. The other transmitters are located in several parts of Germany and Portugal.

emanating from stations behind the Curtain.

Here, again, tape plays the major role. Fed from outputs of the diversity receiver installations, the tape recorders are located in "language booths" in which satellite countries' nationals of RFE's staff check on every item received, and record those portions deemed most vital in countering communist falsehoods. Supplementing the main diversity installation, all-wave receivers in the booths enable monitor personnel to reconnoiter over a vast spectrum of frequencies. The tape recorders before them are always ready for immediate operation: to record, to edit, and play back into amplifiers feeding the English Gardens' lines. There the master control room can instantaneously route the received taping to any one of several dozen points where the information may be needed—to become a vital part of a program then rehearsing or recording; to go on the air immediately, or to become a spliced-in part of a program package taped in RFE's New York studios and rush-flown across the Atlantic.

Little wonder that listeners behind the Iron Curtain often are reported astounded at the rapidity with which RFE's transmissions expose Red falsehoods and double-dealing pronouncements.

Schleissheim, however, occupied our minds but for a minute as we neared the five-mile point on the road we had chosen. We reached it. There was, however, no point, no junction, no signs. Obviously, we had chosen the wrong road, or had misidentified our point of departure. One remark was expressive of the thoughts of all of us:

"If we've been going *east* instead of south, we must be only a few miles from the border."

"About four," one said.

"Not more than seven," said another.

We stopped the car in the middle of the road. It was starting to rain again. One of the engineers, who once had been involved in some celestial navigation, got out and began to scan the skies. From the car, all looked bleak, wind-swept and uninhabited. We waited, and the engineer came back.

"All closed in," he announced. "Not a star in sight."

"So?"

No one replied. We lit cigarettes and sat there, and the rain began to thrum on the car's top, and soon it was a thick downpour that the headlights would penetrate for only ten feet or less. We pulled to the side of the road. After a while an engineer said:

"I don't think it's about Otis." No one commented on that, and he added: "But we've got enough tape to run for days, and a mile of mike cable."

Another wanted to know: "Why are Harold Stassen and Drew Pearson here? And that bus load of newsmen from a dozen countries?"

At that moment we were, however, more interested in where they were than why, and a few minutes later the rain let up a little and the navigator-engineer got out again. Returning, he reported: "Found a break in the clouds— with Orion smack in the middle of it. And, guess what?"

We switched off the headlights and went out and the



RFE Photo

Special reportage on the German-Czechoslovakian frontier is afforded by this RFE Mobile Unit camouflaged to depict a fruit truck. The vehicle is shown at the border. Inside are tape recorders and other gear to make on the spot reports of people crossing the frontier.

engineer pointed up. "See that? It always points approximately north!"

He had made his point: the road we were on went east. In the car we consulted the map again. Any way you looked at it, we could not be more than three or four miles from the Red border.

"Oh, wouldn't they love to get this carload like they got Otis and Vogeler!" the engineer said.

We turned around and headed back.

—IV—

A half an hour and three road junctions later we found the first rendezvous point and one of the RFE cars was there to direct us, asking us if we had seen several other cars that were still unreported. We had not, but twenty minutes and two reference points later we arrived at the site of Operation Winds of Freedom.

It was hill-and-dale country and the rain came down in torrents, driving against the trucks that had started and arrived hours earlier, and against the Volkswagen that it was a relief to see.

Other cars arrived. Men scurried in the rain. Rain-protected movie cameras were already at work, filming the preparations on the floodlighted hillside. We late arrivals were soon apprised of the full score of our objective, the first Operation Winds of Freedom. This would inundate Czechoslovakia with messages that neither jamming nor threats could keep from reaching their destination; messages that would remain for days, weeks, or even months; messages to augment radio in telling those behind the Iron Curtain that the world outside had not forgotten them—printed messages falling like snow from the skies. On each was a message including a list of American, British, French and other western radio stations, with frequencies and times of transmission given for each station.

Our part, then, was to tape the entire launching proceedings—and to get the tapes back to the Munich studios with dispatch. As the leaflets rained down from the morning skies behind the Curtain, those who already were RFE listeners would simultaneously hear this unique method of communication between East and West, as would the rest of the world on both sides of the Atlantic.

This left us with no time to spare. But obstacles hit home immediately, despite the fact that the mobile studio had been there for some hours. The mixer-amplifiers would not work. They overheated rapidly, all of them. The power source was checked; the voltage was okay. Amplifiers and mixers were substituted; no improvement. Time was drawing short; the meteorologists announced that soon there would be a break in the heavy rain. Aloft, they added, the winds were right and strong. Men in the trucks were rapidly readying the two types of balloons to be used. One type would, after a predetermined time aloft, land intact with its messages inside. The other type, wind-carried at high altitudes, would burst over its destination area, scattering leaflets for miles around. This was one-way traffic, the balloons propelled by the prevailing westerly winds, with no possibility of the communists reversing the process.

Our technical troubles, however, still persisted. The tape recorders would work, but not the mixers. Power supply was switched from the local power lines to the mobile gas-driven generator. No good; the load on it was already too great, with all the electrical equipment on the whole hillside fed from it. Meanwhile, balloons were already beginning to ascend into the slackening rain, and the speakers, including Messers. Stassen and Pearson and notables from several countries, stood by at handkerchief-covered microphones.

With only minutes to go, the cause of our difficulties was found. It was not the sort of thing often encountered in the States even by men with 20 years in the radio and recording business. A frequency meter told us the sad tale:



RFE Photo

As the tape reels spun in the truck, eager voices described the ascent of the first balloons in "Operation Winds of Freedom." They burst at 30,000 feet scattering the leaflets over the communist-controlled countryside. RFE listeners were able to hear the taped account of their release and be on the lookout.

the local power supply was AC, all right—but of only 43 cycles! The tape recorders, however, were taking it in their stride. There was only one thing to do—eliminate the mixers; quickly rig up a system permitting rapid switching of microphone feeds direct from one recorder to another, and hope for the best as regards speed relationships between 43-cycle recordings and headquarters 60-cycle playback.

The nimble fingers of the mobile unit crew quickly had the new hookup in working order. The tape reels spun and flashlight signals to the speakers at the microphones gave them the cue to start.

Balloons by the hundreds were rising into the winds that

would carry the messages of friendship and hope over the Iron Curtain. As they rose and disappeared into the darkness, the story went on tape. The minute that the last words had been spoken the tapes were rushed back to the studio so the world could hear of Operation Winds of Freedom.

The messages scattered far and wide would enlist more listeners to the miles of magnetic tape that daily spin from reel to reel on Radio Free Europe's recorders, a narrow band of oxide coated plastic that connects the peoples of one world with the peoples of another in the belief that men, under whatever oppression, will always turn in hope toward the promising voice of liberty.

RFE KEEPS REDS ON THE JUMP

RFE, by its efficient methods is able to destroy the effects of planned propaganda. Reports from behind the curtain testify to its effectiveness. When Radio Free Europe exposed the inefficiency rampant in a large Budapest electrical plant, a worker reported the following results. "The factory ran wild. Commies ran in and out. Conferences were held all day long. Suspicion was rampant. Work practically stopped.

Secret agents and informers are constantly exposed and rendered useless to the Party. In many cases they were made the objects of violence and were dismissed from their jobs.

When fictitious statements by fictitious characters were cited, by RFE as proof of the mendacity of the Polish Communists, regime newspapers "interviewed" these imaginary persons and published "denials" of their statements as quoted by RFE.

Radio Free Europe's headquarters is at 110 W. 57th Street, New York, N. Y. and the work is supported entirely by contributions from the American people to aid the nationals of suppressed countries and sustain their hope of gaining their national freedom and individual liberties.



What's a "db"?

by
James H. Mills, Sr.

Here's a basic explanation of a very important unit of measurement

IN almost every audio device you buy, a recorder, microphone, amplifier or speaker, you'll find somewhere in the specifications a very innocent term called the "db."

Usually there is a plus-minus sign before it and in microphones the db rating is always "down."

Let's say you are considering the purchase of a recorder or amplifier and find the specification sheets state that the response characteristics are 70 to 7000 cycles \pm 3 db.

Is that good, bad, or indifferent?

If you turn to a reference book on audio, or radio, you'll find the "db" shapes up into something formidable. It turns out to be $10 \times \log_{10} \times \frac{E_1}{E_2}$ or $20 \times \log_{10} \times \frac{P_1}{P_2}$ together with a lot of hocus-pocus that is quite likely to leave you cold, confused and disgusted.

Actually the decibel (the "db's full name) is a much valued quantitative unit. Most of the misunderstandings and difficulty of understanding have come about through the fact that it is used as a universal unit.

First, we'll restrict its application to audio. That leaves

half the confusion behind us at one blow. While our definitions are not going to be precise or theoretically correct, they will prove understandable and workable to the layman in 95% of the cases. In the remaining instances they'll only be a little off.

Secondly, we will avoid such generalizations as dbv, dba, or db anything. For us the db will actually be the dbm of the sound engineer which is the power ratio based on one milliwatt (the m in "dbm") of power which represents zero decibels when it originates and terminates in a 600 ohm load. This is the usual audio impedance found in recorders, lines, etc. The term "impedance" is just a word that is used instead of resistance because you are dealing with alternating currents.

Even so it sounds confusing, doesn't it? But wait, you learned to use the Fahrenheit thermometer and you can learn to use the db the same way. Here's a practical comparison.

When Fahrenheit invented his scale he picked a workable "zero" point. Zero degrees F. isn't anything specific—

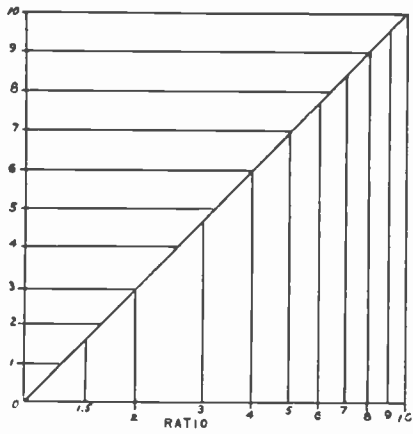


Fig. 1

Facing page: the gear used by the staff to measure the response of recorders. Left to right: signal generator, volume indicator, recorder, oscilloscope, and power measuring set (db meter). In front of the recorder are matching coils to secure the proper impedances. The charts on this page show the ration between "times" which are arithmetical and "db's" which are logarithmic. A change in the power of a sound to twice what it was is barely perceptible to the human ear.

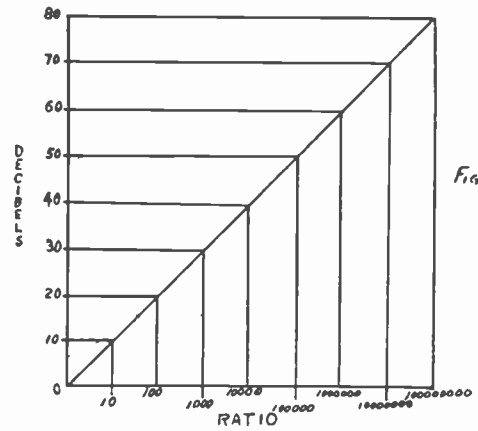


Fig. 2

water freezes at 32° above 0°F. and boils at 212° F. Zero degrees F. is neither the absence of heat which is -460° nor the greatest heat which reaches millions of degrees on the sun. Farenheit's zero was just a good arbitrary starting point for a temperature scale.

The Farenheit scale was taught to us in grammar school and we accepted it as being perfectly logical.

Radio and audio transmission engineers, faced with the problem of a logical zero for an audio scale have specified a workable unit of tone, 1000 cycles per second, at a current of 1.29 milliamperes and .774 volts. This they called a milliwatt or 0 db.

So you see that zero db is not a loud sound, nor a very weak one, just as 0°F. is neither very cold nor very hot. The threshold of sound, or practically, the absence of all noise, is 90 db below zero. When you look at it that way it loses its mystery and appears just as easy to understand as a thermometer.

In attempting to make a hearing aid to help the deaf, Dr. Alexander Graham Bell invented the telephone. That early research had an effect on the way the db is calculated for Dr. Bell found that our auditory system did not have what engineers call an arithmetical linearity to sound . . . in other words a sound that is twice as loud as another will not seem so to the ear. He discovered that the response of our ears was logarithmic instead.

If a sound is doubled, the human ear will barely notice the difference and if it is halved, the ear will barely be able to perceive that the sound is lower.

Because the human recognition of sound changes was so insensitive, a broad system of measurement was needed so the logarithmic scale was chosen.

Such a scale is shown above in Fig. 1. Let's start at 0 db which represents one milliwatt of sound at a pleasing tone, 1000 cycles per second which is easily and clearly heard in a headphone receiver.

We double the power, producing two milliwatts of sound and a barely perceptible change in loudness is noted. But by referring to the chart we find we have increased the sound plus 3 db.

We double the power again to four milliwatts and again a slight increase in loudness can be noticed but looking at the logarithmic chart we find we have increased it to 6 db. from the first level. If we double the power again to eight milliwatts we are at plus 9 db and a sixteen times increase in power takes us to 12 db and so on ad infinitum.

Also the reverse is true. Starting from the same point one milliwatt or 0 db and halving the sound power we

notice a very minor change in the headphone but the sound has dropped 3 db to minus 3 db. If we halve it again, getting one-fourth the power we will again note a slight change and we will be "down" or minus 6 db.

You can quickly see that the use of logarithms are necessary when you consider the fact that whereas ten db is ten times the power, 20 db is 100 times, 30 db is 1000 times, 40 db is 10,000 times, 50 db is 100,000 times and 60 db is 1,000,000 times. (Fig. 2)

Now let's look at a recorder, speaker, or amplifier sheet. It states that the unit has a response from 70 to 8000 cps plus or minus 3 db. That means its output volume at any of the frequencies falling between 70 and 8000 cycles per second varies from its response at 1000 cycles from one half to twice its loudness—a difference that is barely perceptible to the human ear.

Extremely high-quality gear will sometimes be held to very close tolerances, such as plus or minus 1 db while some very usable commercial equipment varies as much as plus or minus 10 db over the voice range (300 to 2500 cps) and to the uninitiated will still sound intelligible.

So the db is simply a measurement of sound power that is akin to the degrees on the thermometer with a reference point of zero. Minus or "down" db's indicate how much below the reference point the sound lies, plus db's how much above.

The measurement of sound power requires specialized signal generator equipment and measuring equipment connected in specific circuits, but by using pre-recorded test tapes or records with a thermocouple type power meter calibrated as a volume indicator satisfactory checks on your equipment may be made. Keep in mind that the gear must be terminated in its proper impedance. If this is done, the volume indicator will record the variations in power output and thus indicate the quality of the equipment. Usually it can be taken for granted that the stated requirements of the specification data sheet are correct for new equipment.

In making checks for the "New Product Report" feature of this magazine, the equipment test section checks these requirements with calibration type measuring instruments. Such measurements, with the proper equipment, are surprisingly simple to make—and the results cannot be disputed.

So long as you know what the data means and how it affects the quality you are paying for, you can check and determine to your own satisfaction that you are getting what you desire.

YOUR TAPE

If You're Not Sure You Really Need

It started with the peas, or maybe it was the non-chocolate flavored milk. At any rate, Johnny refused to eat any more, but "could he please have the dessert now." The answer from the Home Government was a bluntly worded ultimatum.

"Eat up," said Mother, "or there'll be no dessert tonight."

Johnny entered a bitterly worded protest but with only negative results. His voice grew progressively louder until it blossomed into a lusty yell, complete with giant-sized teardrops.

The storm subsided, Johnny was led into the living room where he heard his voice, rivaling even the better Congressional efforts. Brushing away a straying tear, Johnny stared in amazement at the slowly revolving reels of rust-colored plastic tape. Even plugging his ears did not shut out the voice, loud and angry in its defiance.

Thoroughly startled and amazed at his own violence, Johnny returned to the dinner table to meekly finish the remaining portion of his dinner.

While we cannot help but sympathize with Johnny in his frightened amazement, the solving of household discipline problems is fairly typical of the use being made of tape recorders in thousands of American homes.

Johnny had been repeatedly reminded that his actions were not only disobedient but even, perhaps, a little silly. Nevertheless, despite hours of his parent's persuasive arguments he was still convinced that his highly vocal protests were logical and justified. Once, however, his tantrum was

recorded on tape and played back for him to hear as the rest of the family had heard him, all defenses crumbled. Convinced but humiliated, a similar occurrence was unlikely to occur for some time.

The tape recorder is also serving as an impartial, objective arbitrator in family quarrels and disputes. When Jane and Sally both simultaneously claim the right to bathe the same doll, a tape recorded version of the argument will produce an immediate settlement, sometimes on compromise terms.

Harry, Jr. made a point of treating his parents with kind affection. There was one principle, however, on which Harry was inflexibly firm. Once tucked in bed, he insisted on hearing a story from his Daddy about two imaginary characters, Ogo and Smogo. After many pairs of bruised shins and broken glasses, Harry became a name to be feared by the neighborhood baby sitters. Since Harry's Daddy and Mother were also convinced they deserved an occasional evening out, a solution was eventually found. Harry, Jr. now permits himself to be tucked into bed by his baby sitter while listening to his Daddy's bed time story on the family tape recorder.

A sorcerer's box of magic, tape recorders are never ceasing to amaze their owners with unlimited applications and unique possibilities. While the tape recorder is still relatively new in the American home, it is a household appliance that is rapidly growing in popularity. Well informed industry sources estimate that by the end of 1954 one and one quarter million home recorders will be owned by American families, nearly 500,000 units to be sold this year alone. Next year, if plotted curves of projected sales growth prove correct, the 1954 figure should be doubled. Tape recording is well on its way to being adopted as a national pastime hobby.

The tape recorder's ascent in home popularity, however, has not been entirely smooth. Ranging in list price from \$99.50 to \$299, home-type tape recorders have represented to some people an insoluble electronic mystery, something akin in complexity to the atomic bomb. Naturally, nothing could be further from the truth. Virtually all tape recorders are easy to operate. Many of them are controlled by push-button keys, are as simple to run as turning on the radio, and completely fool-proof. People whose knowledge of electronics has been limited to flicking on a light switch gasp in surprise at how simple it is to make breath-taking clear and distortion-free recordings.

For the tape recorder to be used fully in the home, imagination is required, coupled with a pioneering spirit.

Only by lifting the cover of the magic box housing the

"Did I say that?" Johnny looks in amazement at the little band of 1/4 inch plastic tape that convinced him his argument sounded very silly. Tape recorders can be of great aid in training children.



RECORDER

by Jeffery Grant

a Recorder—Read This!

recorder and giving it a job to do, can the tape recorder go to work. Families that sat down, paper and pencil in hand, and listed the different ways they could use the recorder, were rewarded beyond their most optimistic hopes. New uses and applications sprang up from every direction.

Many families are stirred to tape record their first album of precious memories by the impending arrival of a new child. At the same time a layette is purchased, the tape recorder is cleaned and readied for action and a new stock of magnetic tape laid in. Doubtless many parents-to-be are currently exploring the possibility of following the example of a Madison, Wisconsin couple whose obstetrician served as a medical Edward R. Murrow, recording in radio's best special events style the entire birth. Broadcast later on Station WISC in Madison, the tape recording was edited to 30 minutes and issued by Capitol Records in disc form.

It is an unimaginative or unresponsive Papa who, having a tape recorder, does not begin to record the career of his child on tape. From the first lusty yell in the hospital crib to graduation from college, tape captures every sound perfectly and will preserve it intact through the years. No less than England's Queen Elizabeth and Phillip, the Prince Consort, are avid tape recording enthusiasts. They have filled Buckingham Palace with batteries of recorders.

Tape recording novices express surprise at how easy magnetic tape is to edit. All that is required is a pair of scissors and a roll of special splicing tape whose white, thermosetting adhesive will not ooze and cause sticky splices within the reel. Sentences, words or even syllables can be snipped out, transposed at will and spliced back in the tape again without so much as an audible tick or pop during playback. Unscientific minds are also staggered when first learning that magnetic tape can be erased on all home machines simply by recording new sound over the old.

Children are one of the big beneficiaries of tape recording. Potential space explorers, big game hunters and counter spies are prevailing on indulgent Daddies to tape record background sound effects to give their make-believe games an authentic air of realism. All that is required are a few simple household gadgets to duplicate sounds that will delight the kiddies for hours.

In busy homes the tape recorder serves as a message center for the entire family, taking the place of a hastily scribbled note that is easily overlooked or a framed slate hanging on the kitchen wall. For example, if Mama will still be shopping when the kids return from school, a tape recorded message might say, "Children, I'll be home by five. There's a slice of cake for each of you in the refrigerator and don't forget to pour yourselves a glass of milk. And

Jackie, please, please promise Mama you will practice the piano this afternoon." Trapped, Jackie dutifully plays Chop Sticks and records it, too, because evidence will be required.

The tape recorder can even serve as a nursery watch-bird. Families having a tape recorder can place it plus a microphone in the nursery upstairs. Downstairs an extension speaker will reproduce any sound baby might make while stirring in its crib.

Long distance telephone bills become an important budget item when every member of the family insists on getting a word in edgewise. Magnetic tape "talking letters" are proving the perfect answer when Dad's work takes him out of town for weeks on end or if Junior goes off to college. Through magnetic tape the whole family can still remain a tightly-knit group. "Talking letters" are proving themselves far more practical than the written variety. Since most people like to talk but dislike the effort of taking pen in hand, far more information and feeling is compressed into a fifteen-minute tape than would end up in an entire year of pen-and-ink correspondence. During the Korean war, G.I.'s caught a glimpse of life at home through "talking letters," brought to them by the American Legion's Hometown, USA project.

"Talking letters" are also the medium of exchange among a number of tape correspondence clubs. These organizations issue directories of the memberships which list the name, occupation and interests of all who belong to the clubs. As the lists are world wide in scope, you can have voice cor-



Salesmen and travelers are finding increasing use for recorders in sending reports back to the home office. The tape can carry the full details and save endless hours of bothersome report writing.



Like to dance? Your recorder will furnish uninterrupted music of the kind you prefer. You can tape your own tunes right from the radio or TV and make separate reels for waltzes, foxtrots, etc. America's largest dance studios have switched from records to tape because of the convenience and the better quality of the music afforded.

respondents in many foreign lands. One talking letter will hold 2500 words and costs only 12 cents to send overseas. Shut-ins, invalids and the blind find talking letters a blessing, keeping them in voice contact with many friends.

Chances are that if this year his parents buy a tape recorder, Junior will be able to give Mom and Dad pointers on microphone placement and a few other recording details. More than one-third of the nation's schools are already using tape recorders to help overcome overcrowded classrooms and the current teacher shortage. (There are, incidentally, already more tape recorders in school classrooms than phonographs. One manufacturer estimates he will sell 50,000 recorders to schools alone this year.) Twenty-four states have tax-supported Tapes for Teaching duplication centers in operation. Without charge, state schools send in unrecorded reels of tape to be duplicated with material to supplement class studies, everything from nursery rhymes for the kindergarten to Chaucer and Shakespeare for senior high school. Also, numerous pre-recorded educational tapes are available through commercial sources.

In addition to the educational tapes, such organizations as Portable Church Services of Philadelphia, are prepared to furnish not only an entire church service on tape from the prelude to the benediction but the tape player as well. For isolated communities this is a Godsend enabling them to hold services and have a fine sermon—all on tape. The cost is within the reach of any group.

The voice of Peter Marshall can still be heard through the medium of tape. The Union Theological Seminary in Richmond, Virginia has a number of his sermons recorded on tape. These are available for the cost of postage, or they will supply a duplicate tape at nominal cost which you may keep.

If Junior should be ill, arrangements can be made to have his teachers tape record every lesson for him to play at home. If he wants to qualify for the school orchestra or band, a tape recorder is a faithful but uncompromising critic in practice sessions, and will even serve as an accompanist.

Tape recording short wave foreign language broadcasts will help Junior master his Spanish course, since he can replay the tape time and time again. He can even compare his voice with the native speaker, too, right on the same tape.

If Mom and Dad want to supplement Junior's school work, younger children can be taught to tell time, the calendar months and how to make change, all with a tape recorder. In teaching children how to tell time, a tape recorder is even more effective than the promise of a Mickey Mouse wrist watch. By recording the ponderous hour strokes of the grandfather clock in the hallway, the hour chimes are first captured on tape in their correct sequence, twelve o'clock, one o'clock, etc. Next the hours are varied to circumvent alert memories. Then the half hour strokes are recorded, followed by the quarter hour strokes. Although telling time is a difficult concept for most children to grasp, the tape recorder makes it an exciting and challenging game. As so frequently happens when real learning progress is being made, the dividing line between "study" and "play" is often non-existent.

While party fun can be secretly recorded on tape and later played back for laughs, that is but an insignificant role being played by the tape recorder in modern parties. Actually, the tape recorder makes possible a wide variety of games to be played by both grown-ups and kiddies alike. The voice of famed actors, politicians and public figures can be recorded and played back for grown-ups to guess, while the unidentified voices of Roy Rogers, Gene Autrey and Captain Midnight will make the small fry scratch their heads. Naturally, the winner guessing the most voices gets the prize. A variation of this guessing game is to record varied sounds such as a nail being pounded into wood, the sound of eggs and bacon sizzling in a frying pan. Still another game is "tape roulette" in which a series of numbers or names are recorded on a reel of tape. The tape is run in fast forward and suddenly stopped. The name or number on which the recorder stops is declared the winner.

Many families are making their own "Hear It Now" albums by recording historic speeches, sports events and special happenings. After a period of a year, the recordings can be edited down to a truly significant documentary on a single reel of tape. Saved year after year, the collection of tapes will be a priceless inheritance for children in future years. Incidentally, there need be no fear of missing important broadcasts since a clock-radio will record any desired program at the appointed hour. Some folks keep a tape "guest book" of all visitors.

Almost everybody suppresses a yawn when looking at even his best friend's photographs of that trip to Europe or Yellowstone. While the photographs may be sharp and clear, there is often no experience to share. They suggest nothing as to how your friend felt at the time he clicked the shutter. But looking over your own photo album of vacation trips after an interval of a year, you will likely feel the same way about your own snapshots, too. Photographs of vacation trips are similar to those pictures that fill every travel magazine: lifeless, dull, static, a reproduction of life frozen in time. With a tape recorder, however, holiday travelers are discovering a way to truly capture the spirit and memorable events of their trip. With a tape recorder it is possible to bring back a collection of sounds and voices that will be as appealing after ten years as the day they were recorded. On a trip to the continent, for example, one can capture the songs, the honking of taxi horns, the tolling of cathedral bells, the excited dialect of the guides that are

bound up in the tinselled package Americans call "Europe."

The portable battery-operated or spring-wound tape recorder has proved itself best for vacation recording. A variety of portable models are available at reasonable prices. A tape recorded commentary with "real life sound" for motion picture film or 35 mm color slides gives new life and meaning to the pictures. For home movies a magnetic sound stripe can be inexpensively laminated on the film for playback through a projector with a magnetic head. For silent projectors, a magnetic adaptor is available. Also, a special stroboscopic tape is sold through camera shops for synchronizing magnetic sound with motion pictures.

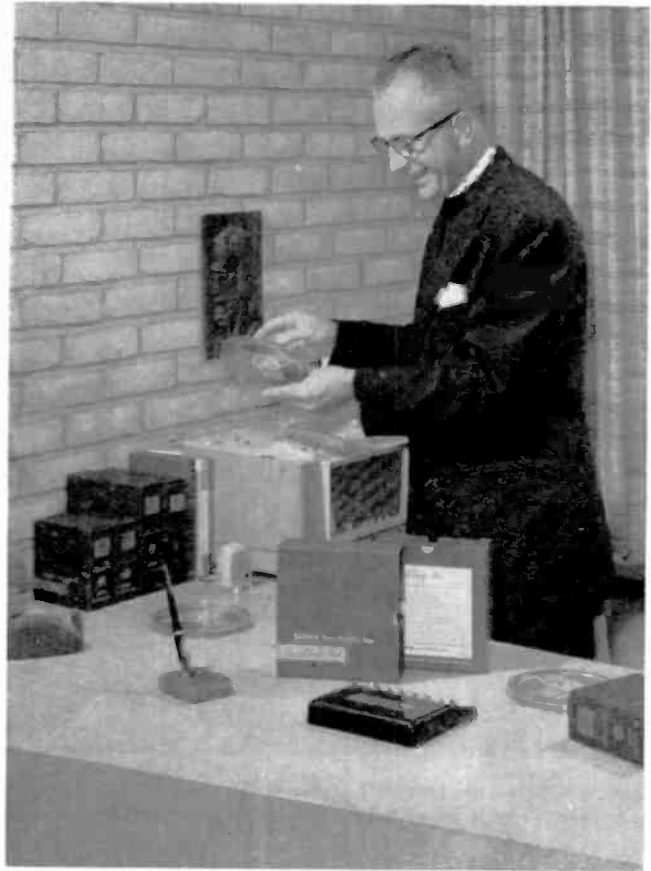
There is scarcely an industry in America that is today growing at the leap frog pace being maintained by the magnetic recording business. The technical director of one of the large manufacturers of magnetic tape estimates that almost 80% of the country's research laboratories are now at work on developments involving magnetic recording or are using magnetic tape in development work. The first three months of 1954 alone saw the introduction of 47 new types of magnetic recorders, some of which were designed primarily for industrial applications. Magnetic tape, for example, is running tool and die machines and stamping presses in automatic factories, serves as a "memory" for giant computing machines, records data relayed to earth during guided missile flights, serves cardiac specialists by recording a permanent record of heart beats.

Among the more interesting new magnetic recorders marketed so far in 1954 are these: A magnetic "talking dictionary" through which are run cards with correct pronunciation recorded on tape laminated to the card. A tape recorder that will play for 16 continuous hours on a single 7-inch reel of magnetic tape. A pocket tape recorder the size of two cigarette packs which will record conversations up to one hour. A conference recorder that is automatically started by voice and continues to record as long as speech continues. A three-speed portable phonograph that instantly converts into a magnetic recorder by plugging a magnetic needle into the place of the phonograph needle. A two channel recorder that permits language students to listen to a native speaker on one channel while using the other channel simultaneously for their own recording practice.

The greatest potential for magnetic tape in the home lies in the direction of video tape recording. Most major corporations in the electronic field are working on the project on a 24 hour 'round the clock basis. In video recording, both visual images and sound are simultaneously recorded on standard magnetic tape and can be played back instantly through a television receiver. The picture quality will be equal to "live" TV programs. Eliminated is photographic film and the costly, time-consuming developing process.

Next year the first video tape recorders will be commercially available to the major television networks for use during delayed broadcasts. The initial asking price will be approximately \$50,000 each. Shortly thereafter, if industry predictions are realized, less expensive video recorders will be available to local television stations and local motion picture theatres for projecting Kinescope films and Hollywood release prints, then on magnetic tape.

No longer in the realm of Buck Rogers, within ten years home-type video recorders will be available for recording one's favorite television programs off the airwaves for later playback. At what is now known as the local "record shop," anyone can buy his favorite opera or Broadway hits video tape recorded for playback through the family television set.



Churches are finding increased use for recorders. They are helpful in bringing church services to shut-in members and many ministers use them for improvement in their sermons. Tape libraries, such as the Union Theological Seminary and Portable Church Services have not only famous sermons on tape, including such men as Peter Marshall but have reels which have a full service from prelude to postlude for use by groups too small and isolated to have a church of their own. Below: businessmen find recorded discussions helpful in reviewing facts and having clearly understood agreements. Some firms specialize in transcribing conference and convention notes from tapes.





There are more tape recorders at use in the schools today than there are record players and the number is increasing. More than 40 states have tape libraries of material available to teachers. Recorders are also used for speech correction and language studies in the schools.

Although the photographic industry shudders at the thought, it will be also possible within the next few years to take home movies through the video tape recording process. The corner camera store proprietor would experience a cold chill run up and down his spine if he could read the following recent comment in *RADIO & TELEVISION NEWS*: "There is little doubt that our future home movies will be photographed on magnetic tape and that the visual and audio information will be played back through our TV sets for the entire family to see and hear."

A more immediate and realistic question is: "How soon will magnetic tape replace phonograph discs in the home?"

Magnetic tape has many obvious advantages over phonograph discs, but the most important is: tape sounds better. Without exception, every disc manufacturer makes his original recordings on magnetic tape. In addition, tape never wears out; discs deteriorate in sound quality on the very first playing, rubbing off high frequencies and adding scratch.

While many tape recorders are frankly not high fidelity instruments, magnetic tape makes possible noise-free recordings that can be played with no loss of quality whether one hundred or one thousand times. Discs, however, develop scratches on the first playing, with an ever increasing noise level each time they are subsequently played. Those tape recorders that are designed for high fidelity home use produce superlative sound. It is possible to build a home high fidelity installation about a tape recorder. Using a recorder, all that is necessary to complete a hi-fi system is an AM-FM tuner plugged into the recorder's radio-TV input.

In 1953 more than 200 record companies enjoyed one of their best profit years, with a disc sales volume of \$225 million. Since disc sales have been holding up, many com-

panies have been reluctant to bow to the inevitable and begin putting out musical selections on magnetic tape. With a large supply of masters on magnetic tape, most record companies are watching the field closely, ready to move at a moment's notice.

However, RCA will be first among the major disc companies to enter the pre-recorded tape field with the initial release of 12 7-inch reels very soon. Westminster is reported to be readying a series of high-fidelity classical tapes. Minnesota Mining has introduced "Desert Suite" on magnetic tape, "The Living Desert." Webster-Chicago and Audiosphere have also entered the field. Many other companies already marketing pre-recorded tapes are experiencing a brisk business and predict a bright sales future for themselves, among them Hack Swain who specializes in electronic organ tapes. One firm, A-V Tape Libraries, is marketing a series of 99¢ fifteen-minute tapes of popular tunes, offering substantially more playing time than a similarly priced conventional disc.

Several tape units to be marketed this year will be playback only, with the recording mechanism eliminated, selling up to \$50. Another tape player, selling for \$99.50, will play any pre-recorded tape, whether monaural or binaural, at a speed of either $3\frac{3}{4}$ or $7\frac{1}{2}$ inches per second.

Despite standardization problems such as speed and single vs dual track recording, leading disc dealers across the country are laying careful plans for merchandising pre-recorded tapes. The industry has resigned itself to the gradual supremacy of tape over discs, although no one will publicly guess how long before discs become a candidate for the museum. The comment of one disc retailer is typical, "Tape is coming. After all, it sounds better, and that's what the public wants. We're getting ready now."

Tape Club News

COMMITTEE ESTABLISHED FOR INTER-SCHOOL EXCHANGES

TAPE RECORDING FAMILY



Jack Stimson and family are avid tape respondents and members of Tape Respondents International. Jack is an Ampro distributor on the west coast and practices what he preaches.

HUNTS GHOSTS WITH A RECORDER

Mr. and Mrs. Bernard Payne are using their recorder for an unique purpose, according to "Tape Topics" the paper of World Tape Pals. In England, where haunts and haunted castles are a dime a dozen they go ghost hunting, using the recorder and cameras with super-sensitive film. So far the Paynes have not met up with any ghosts who wish to speak for the record or who would pose for pictures. Meanwhile they are having a lot of fun trying—in a eerie sort of way.

Ghost hunting is purely a hobby with the Paynes although should they manage somehow to make a ghost to ghost recording it would probably be worth plenty to broadcasters.

THAT SCREAM AGAIN

Last issue in this space we told of a member of the Voicesspondence Club who, being fed up with the noise issuing from a nearby body shop, played the terrified scream of a woman out the window on his recorder, put the machine away and went back to bed. The police, investigating, could find no foul play but discovered the noisy shop and stopped its illegal night-time operation.

Charles Owen, VS Associate dubbed the same scream, copy of which he had received from the original scream-player into a tape to a correspondent. The results were almost as good as the first time.

He had sent the reel to a VS member who was on a trailer trip to Florida. At Emporia, Virginia the recipient stopped for the night at a motel. He hooked up the recorder in his cabin and listened to the tape. About half-way through, with the gain riding high, out came the woman's scream. The results were spectacular, with the motel owner and several guests rushing over to see what was wrong.

RECORD-O-CLUB DOES IT DIFFERENTLY

The Record-O-Club of New York City is doing things a bit differently. Groups of six are formed among the members and tapes are duplicated at club headquarters or transferred to wires, for distribution among the various members of a group.

The groups are made up on the basis of common interests and tapes must be returned before a member can receive a new one, thus keeping slow correspondents on their toes. To help defray expenses a small charge is made for each reel sent in. The club pays the postage around the circuit from the fee. The club is operated by three amateurs who spend many hours duplicating the tapes and wires for the members.

JUVENILE TAPE CORRESPONDENTS LEARN OF OTHER LANDS



Billy Cope and recorder

A typical Junior Member of the Voicesspondence is Billy Cope, age 7, son of Ella and Charles Cope of Philadelphia. His dad is often called upon to play for Billy one of "his tapes" before bedtime—in place of the usual bedtime story. Billy's tapes are larger reels made up of selected excerpts from recordings he has received from his little friends, children of his parents' voicesspondents and special stories and messages sent to Billy by grown-up friends—all transferred from the original tapes by Dad with his two recorders. Not only does this save work for Mom and Dad in thinking up stories each night but it greatly extends Billy's understanding of people in other parts of the world. And, of course, Billy talks to his friends too, and gains valuable experience in poise and speaking.

You Can Subscribe To TAPE RECORDING Through Your Club.

ROSTER OF CLUBS

A letter or postcard addressed to the club of your choice will bring you full details regarding membership, dues, etc. A self addressed stamped envelope will be appreciated by the secretaries.

TAPE RESPONDENTS INTERNATIONAL

Fred Goetz, Secretary
P. O. Box 1404T, San Francisco, Cal.

THE VOICESPONDENCE CLUB

John M. Schirmer, Secretary
1614 N. Mango Ave., Chicago 39, Ill.

WORLD TAPE PALS

Harry Matthews, Secretary
P. O. Box 9211, Dallas, Texas

GLOBAL RECORDING FRIENDS

Alfred L. Sferra D.D.S., Secretary
125 Hamilton Street, Bound Brook, N. J.

RECORD-O-CLUB

c/o Accessory Office Service
Dolores Franco, Sponsor
111 W. 23rd St., New York 11, N. Y.

WORLD TAPE PALS SPONSOR PROJECT "TAPE BANK" SET UP

The interest shown by teachers and students in classroom tape exchanges has led to the formation of the International Committee on World Tapes for Education.

By using the committee as a clearing house, a tape may be enjoyed by hundreds of students in dozens of schools in addition to the school to which it will be sent.

To make the project possible, a Tape Bank has been established under the wing of Allan P. Boyles, P. O. Box 4081, Lubbock, Texas, assistant Chief Engineer of Station KSEL, Lubbock, Texas.

Donations of tape or cash to the bank will be welcomed and will provide more tape for the international exchanges.

Heading the committee is Richard W. Morton, audio-visual director of the West Hartford, Connecticut public schools. Other members include: Lloyd P. Resweber, principal of Central Junior High School, Bastrop, La.; Robert Heinich, visual education coordinator and Philip B. Tinney, junior high teacher, both of Colorado Springs, Colo. public schools.

All teacher and student members of World Tape Pals are urged to use the committee to widen their classroom tape exchanging field. Students of junior and senior high school level in languages, geography, civics, music, etc. will find they are able to make interesting tapes during their regular class work.

Teachers or students who are interested can secure full details by writing to World Tape Pals. See address in box on this page.

SHARE YOUR RECORDER

Fred Goetz, Secretary of Tape Respondents International, whose membership is open to everyone, whether they own recorders or not, suggests that recorder owners share the use of their machines to bring to more people the joys of tape responsiveness.

This share-the-recorder idea is especially applicable to foreign countries where recorders are more sparse than in the United States.

GLOBAL RECORDING FRIENDS GROWING

Global Recording Friends, the formation of which was mentioned in these columns, last issue, is growing nicely according to Dr. Alfred L. Sferra, DDS, the club secretary. Anyone interested in helping the new club to grow is cordially invited to join. Send a card or letter to Dr. Sferra at the address given in the box.

WANTS TO START LOCAL CLUB

Art Ruben of 546 Oceanpoint Avenue, Cedarhurst, Long Island, N. Y. would like to hear from readers living nearby who would be interested in forming a local club for discussions, tape swaps, etc. Those interested please contact Mr. Ruben directly by card or letter.



Bing Crosby looks over the blueprint for the new Video Tape Recorder together with John T. Mullin, chief engineer, Frank C. Healey, executive director and Wayne Johnson, project engineer. Bing Crosby Enterprises is perfecting the new device for early commercial use.

A New Video Tape Recorder

Bing Crosby Enterprises method reduces tape speed to 100 inches a second with improved definition. Brings video tape recording one step nearer for Army and TV stations.

BY the use of an ingenious switching device and the use of twelve tracks on one-half inch tape, Bing Crosby Enterprises has brought the tape speed of video recording down to 100 inches a second. In addition, reasonable sized reels will hold up to 16 minutes of ordinary thickness tape allowing enough lap over for two machines to record a continuous performance. With the thinner Mylar base tape it is expected that a longer recording and playing time will be available on the same size reels.

In addition to the reduction of the tape speed, the new unit has only 9 controls, most of which are normally locked in position. This is in contrast to the 52 controls with which the recorder was equipped at the start of their research in 1948.

Not only has the tape speed been improved but definition of the picture is superior to that of the Kinescopes now used commercially. It is expected that shortly the entire recorder and mechanism will be placed in a cabinet that occupies only 26 x 40 inches of floor space and which now contains only the drive mechanism.

As noteworthy as the improvements themselves, is the promise of a video tape editor which will hold one picture on its screen for as long as the picture editor desires and, at the same time will play the sound associated with that frame. This will make the editing of tape easier than the editing of motion picture film. In regular photographic film, the sound is 24 frames away from its associated picture. In the Crosby VTR the sound and picture are side

by side and one snip of the editor's scissors edits both picture and sound.

The recorder at present is exclusively for black-and-white pictures but construction of the first color VTR is in progress and it will employ the same basic principles as the black-and-white recorder.

Although some minor problems are yet to be corrected, Crosby Enterprises are now ready to produce units for certain military applications.

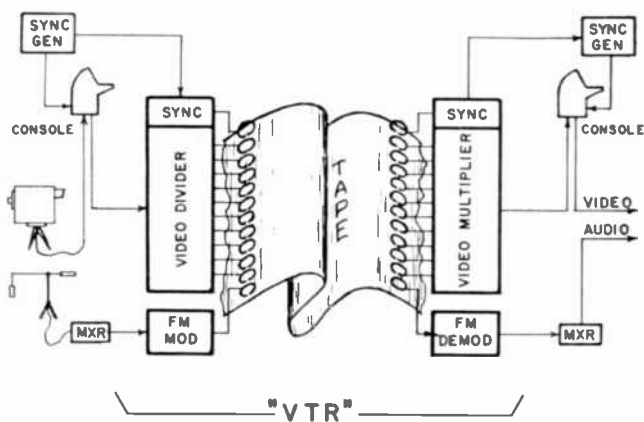
One of the first uses will be in delayed television broadcasts. A program requiring delay will be fed directly into the VTR which operates with minimum attention. The operator will be able to observe the recorded picture and sound instantaneously, as the show is recorded. This is effected by having a playback head immediately following the recording head. Since the operator actually sees and hears the completed recording it is necessary only to rewind the Videotape awaiting re-broadcast. No further checks or inspection is necessary.

Another decided advantage to VTR is the use of "stop and go" technique in program production. This will mean that an entire production often may be recorded in a single day's shooting time, effecting great economy. Primarily, this will be made possible by the feature of being permitted to immediately examine the results of each sequence or "take." After a series of takes, a producer can immediately examine them by a playback wired from the VTR recording booth to a monitor tube and speaker at his chairside. He can select the scene he prefers and proceed to the next scene, confident that a sequence to his liking is "in the can." Such benefits, combined with control board effects such as cuts, wipes and dissolves, as well as the simultaneous use of several cameras (which only TV techniques can provide) will give the producer complete efficiency and flexibility in his work.

VTR recordings will be duplicated by the simple process of re-recording. In contrast to film printing, where only a single copy at a time may be made from the original, numerous tape copies can be recorded simultaneously from the master.

It its ultimately developed state, VTR can replace any photographic motion picture method.

The drastic reduction in tape speed (another method uses 30 feet per second) came about by abandoning the



The 12 heads each produce a separate track on the tape. One channel is for the sound and another for the synch signal. The remaining 10 carry the 3,390,000 cycle picture signal divided between them.

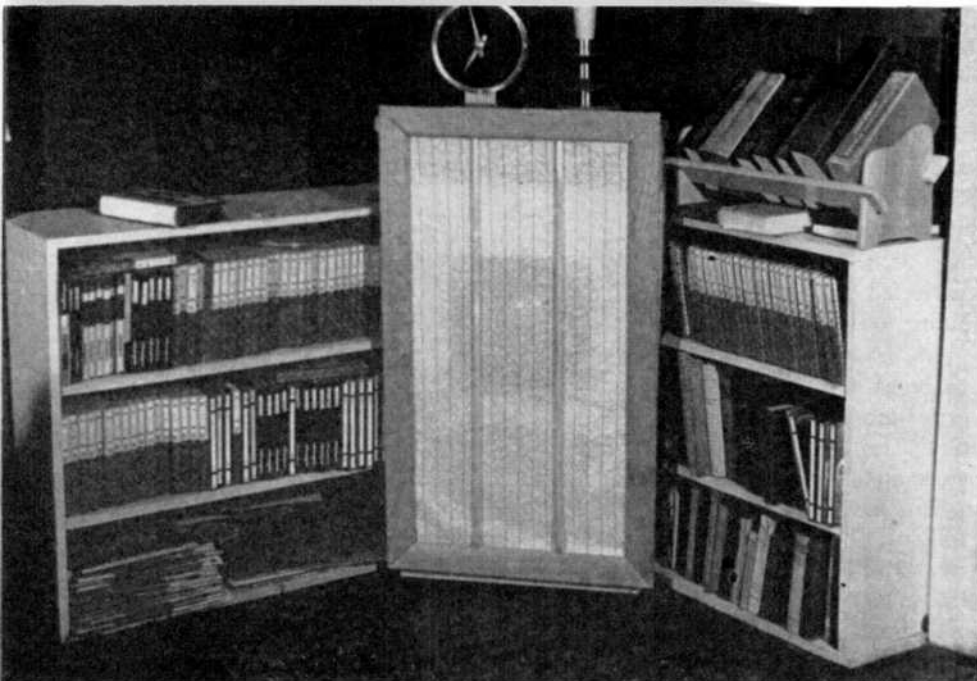


Top: the VTR for recording TV pictures and sound on tape. The complete recording and playback unit will be contained in a cabinet of the approximate size of the one now used for the tape transport alone (at left of picture). Below: the tape drive mechanism for the 12 channel, one-half inch tape running at 100 inches per second.

preconceived idea of recording one track on the tape and using high tape speed to get the necessary frequency response. In TV this is up to 3,390,000 cycles per second.

In place of the one recording head and high speed tape, the Crosby VTR employs ten heads to record the TV picture signal. An electronic switching system feeds each of the heads in turn at the rate of 339,000 times a second. As the current reaches the head, it creates a tiny bar magnet on the tape, about the length of the head gap, then the next head is energized. After all 10 heads have had their turn on any one cycle, the current flow is reversed and the process repeated. This results in an alternating current being impressed on the tape. As each head impresses 339,000 bits of picture information on the tape and there are ten heads, the result is a total of 3,390,000 bits per second, or video signal information up to 1.69 megacycles.

On playback, the 10 playback heads function in a reverse manner and their separate outputs are fed into one circuit which is a recreation of the original video signal and is suitable for broadcast or the operation of a monitor or monitors. The remaining two tracks of the 12 track tape recording are used respectively for the sound which goes to 15,000 cycles and the synchronizing signal.



by John J. Stern, M. D.

A library of tapes of your own choosing on making can provide hours of pleasurable listening and a very enjoyable hobby as well. Here's some good advice on getting off to a flying start.

How to START A TAPE LIBRARY

WHEN the first thrill of recording your own voice has passed, when you have become adept in regulating volume, splicing tape, and have become familiar with the controls, the time has come to sit back and make a plan for the future use of your tape recorder. After all, it seems wasteful to use such a magnificent achievement of electronic engineering just for having fun and startling your friends with secret recordings of their unguarded remarks. With a tape recorder you can create a unique collection of music, much more exciting than any record collector can ever hope to have.

First, some technical remarks. Don't try to pick up your music from the radio speaker with a microphone. It can be done, but the results are disappointing. Besides picking up all noises in the room, the imprint on the tape will reproduce and even exaggerate the imperfections of your speaker and the microphone. The way to do it is to connect two clips to the speaker coil terminals, or better yet, connect a shielded wire to the detector output of your radio.

Your tape recorder will have a good little speaker, but if really fine results are expected, it should be played back through a first class speaker arrangement. Modern tape and recorders are capable of much higher fidelity than a small built-in speaker can reproduce. Tape recorders have output plugs for external speakers, and the internal speaker can be disconnected.

If you have a radio and a tape recorder, there is a duplication which can be avoided: both instruments contain an amplifier section. One of them is unnecessary. The ideal is, therefore, either to use an AM-FM tuner (the radio frequency detector stage of a radio receiver) and a tape recorder with its own built-in amplifier, or a complete radio with detector and amplifier stage and a tape-recording mechanism (the tape transporting mechanism without amplifier stage). In the latter case you might have to use a pre-amplifier between recorder and amplifier. The wiring is, in either case, the simplest thing in the world.

As an example I shall describe the arrangement I am

using—I may add, with complete satisfaction. AM radio is received by a well-made table model, connected to the tape recorder from its detector output. FM reception is obtained from a FM tuner, also hooked up to the recorder. From the recorder a 12 inch speaker and tweeter, mounted in a home-made folded horn enclosure, are fed. For radio listening, the motor of the tape recorder can be switched off (merely to save wear and tear). For recording, all I have to do is to put a tape on, switch the motor on and start the forward control. It will be seen that I use the amplifier of the recorder for radio listening. As it happens, the recorder-amplifier is of excellent quality and I do not miss a better one; all the same, a high-fidelity amplifier might be preferable for certain recorders to obtain the ultimate in reproduction. A record player is mounted separately nearby and can also be played through the tape recorder amplifier.

Modern tape recorders cover a treble frequency up to 8,000 cycles per second at a speed of 3.75 inches per second, and up to 12,500 cycles at 7.5 inches. This coincides pretty well with the range of AM and FM respectively, and tape can be saved by using the lower speed for AM recording, if the recorder has both speeds.

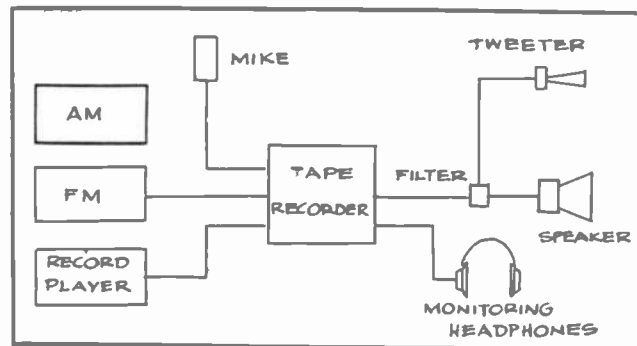
Well, we seem to be ready now to start recording. What are we going to record? That depends, of course, first of all on our taste. But let's assume you like "good" music, as I do. No slight intended—there is no "bad" music, really, as the term would seem to indicate, only music of different degrees of emotional and intellectual content. In the beginning you will be tempted to record simply everything you like. That's fine, but soon you will find yourself loaded with symphonies, operas and what-have-you, all the "war horses" of our orchestras and opera houses, and find out soon that you will hardly ever listen to your recordings after the first excitement of a good "take", because your collection consists of things you hear anyway in concerts and on the radio all year long. Fortunately it doesn't matter. If you collect anything else, paintings, stamps or match-books, and find that you don't care for your latest acqui-

sition, you are probably stuck with it, for better or for worse. Your tape recorder, on the other hand, has a wonderful little button marked "erase." If you caught in the ocean of radio waves a fish that you don't want, you press the little button, or rather just record over your previous recording, and the unwanted catch will be automatically erased before you put on the new selection. So let's think it over once more. It seems clear that you want collector's pieces, things which are rare or unique. Obviously, my advice must become very general at this point. If I am immensely pleased with a fine tape recording of Bruno Walter's interpretation of a work which he has not put on gramophone records, you, on the other hand, might get a kick out of a broadcast jam session of your favorite band which has a spontaneity which none of their conventional records show. If you are an opera fan, you might easily find that the broadcast of a live opera, complete with the tuning of the orchestra, the coughing and the applause of the audience and even the whisper of the prompter has more excitement and beauty than the highly polished, minutely rehearsed performance made especially in a recording studio. You might find your favorite orchestra, or your favorite conductor, or, imagine, both together, perform a work which has been recorded many times, but never in just this combination. I could cite examples for all this. I have a tape recording of the American premiere of Stravinsky's opera *The Rake's Progress*, recorded directly from the radio during the broadcast, which I cherish much more than the studio performance on records. Then, there is something else. Everybody except the most violent Wagnerite (are they still around?) will admit that some Wagner operas have rather lengthy, empty parts which we can do without. The same goes for some other operas. Nothing is easier than stopping your recorder when you find, following the score, that such a cold spot is approaching. You can avoid abrupt, clicking transitions by reducing volume before you switch off, and start the next selection with the volume control way down, increasing it gently to normal. This way it is possible to collect your own edited versions of opera broadcasts and shorten a 5 hour performance of *Tristan und Isolde* to 2 hours without hurting anybody's feelings.

Piano scores and librettos can be found in most Public Libraries. Librettos can also be obtained at a nominal cost from the Metropolitan Opera in New York.

Finally there is the recording of rare records played on radio programs, or borrowed from friends and played over a record player, connected with your recorder, or you can even put your own valuable records on tape, so that they can be preserved without needle damage and still be enjoyed.

Facing page: the speaker and the tape library. A conventional bass reflex enclosure has been revamped into a back-loading folded horn and masked with a home-made frame. It houses an Altec 12" Duocone speaker and a University Dual Tweeter. Right: The tuners and a tape recorder are mounted in a cedar chest at convenient armchair height. This makes for ease of recording and playback.



There is no need for more than one amplifier to serve the radio, phono and tape recorder. Here is how the author has hooked up his equipment to provide a completely flexible, easy-to-operate system.

Unfortunately, very few pieces of music last just the length of a tape reel—thirty minutes or one hour. Some recorders allow reversing the direction of the tape without taking it off the machine after the first half of a double track tape is recorded. Many don't, and the tape has to be taken off and reversed manually. If this happens in the middle of a movement, it is very annoying, and doing it under pressure can lead to trouble and a tantalizing loss of time. This could be avoided if we knew the exact timing of the piece we record. Unfortunately I have been unable to locate a book supplying data on average playing times for each movement of symphonies, concertos etc., although it ought to exist. Some information may be gathered from catalogues, music guides etc., but frequently one has to rely on luck and good judgement. If I tape a symphony from the air and get to the last third of the reel at the end of the second movement, I don't force my luck and try to get the third movement on the same side. I rather turn over between movements, and the unused tape can be cut off and spliced together with other leftovers to make a new tape. I have practiced the changing over so that I can do it in less than 10 seconds, which is usually ample for the pause between two movements. If I'm unlucky and miss a few bars, I try and copy them from an existing record and splice them to my tape. Sometimes it may be possible to time a piece on an existing record before it is broadcast and arrange the tape recording accordingly.

And if you are so inclined, you can record History in the Making—speeches by statesmen, sports events, historical broadcasts as the Coronation of Queen Elizabeth.

My advice, then, is *not to* record merely *what you like best*, but *what you like, and are least likely to be able to hear again.*



NEW PRODUCT REPORT



THE WEBCOR 2030 RECORDER

. . . . a new three-speaker recorder
with four watts output.

THE Webcor Model 2030 recorder is a three-speaker machine that employs the basic mechanism of the regular 2010 model but has a power output of four watts. The three speakers are mounted inside the case on the right, left and front positions respectively.

An examination of the recorder revealed that it is powerfully equipped and sturdily built. Two 4-pole, shaded pole induction motors, electronically balanced, provide smooth and quiet tape transport. No sacrifice in quality of components has been made to reduce the weight of the recorder, which is fairly heavy.

The mechanism is enclosed in a strong, wooden suitcase type enclosure covered with a grained plastic material. In appearance it is quite pleasing and should blend well with most room furnishings. The lid is detachable and the recorder may be placed on a stool near the radio or TV set for making recordings off the air with great convenience.

For transporting the recorder, a handle is provided on the front of the case. The unit, when closed looks like a large suitcase.

Inside the lid are cleats for storing the microphone and line cords and pins to hold reels of tape. The recorder accommodates the 7 inch, 1200 foot reels and the lid may be closed



The lid of the recorder may be removed for use in the home. Here the recorder is placed on a stool next to the television set.

S T A **F** O K S T E D

Product: Webcor 2030 Three Speaker Recorder

Price: \$239.50, complete with microphone, tape reel and tape, line and input cords.

Manufacturer: Webster Chicago Corp., 5610 Bloomingdale Ave., Chicago 39, Ill.

with the reels either in playing or storage position.

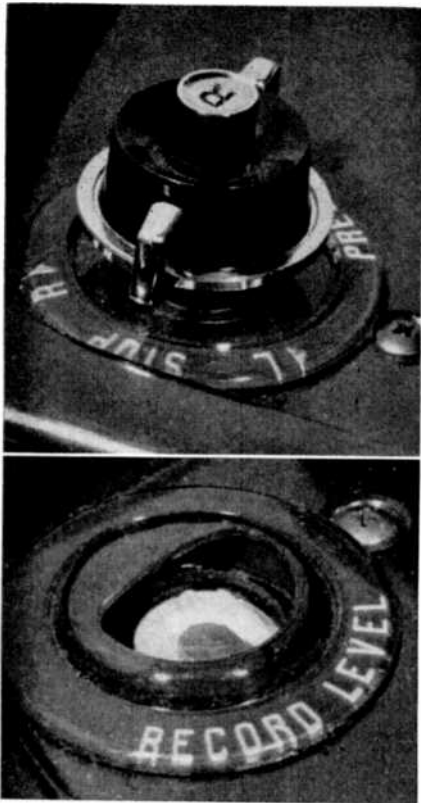
The 2030 is larger and heavier than the regular 2010 model, measuring 10½" high x 15" deep x 20½" long. The increase in size was made necessary by the inclusion of the three speakers.

The output of four watts is adequate for the home living room, club room or business conference room. There was no distortion at this level.

We found the audio gain of the recording amplifier is more than adequate for high impedance microphones and is sufficient for some types of dynamic mikes which use line transformers or integral matching devices. These better quality microphones have a lower db rating than the mikes usually furnished with recorders and require greater pre-amplification of the signal.



The line and microphone cords are wrapped on cleats in the lid and extra reels of tape are stored on the spring pins.



Top: the master control provides forward and back motion at regular or fast speeds and also contains the "record" button to record in either direction. Below: the magic eye is used to indicate the proper recording level.

In testing the response characteristics, (see page 22 for a picture showing the test gear), we found that the unit performed in excess of the claims made for it on the data sheet.

Webcor claims a frequency response of from 70 to 4000 cycles at the 3-3/4 inch per second speed and 70 to 7500 cycles at the 7 1/2 inch speed plus or minus 3 db. Our measurements on the unit showed an excess over these figures. At the 3-3/4 speed the frequency response of the output was greater than commercial "A" program requirements and at the 7 1/2 speed, in excess of the "AA" requirements.

The signal to noise ratio is likewise better than commercial requirements for broadcast transmission.

The component parts of the recorder, most of which are made by Webcor, are designed for heavy duty. Operation of the machine is very quiet and there is no danger of picking up recorder noise in the microphone.

It is our opinion that both electronically and mechanically this recorder gives somewhat more than you might expect in its price range.

The recorder features a number of handy arrangements. One of these is the 500 ohm output which may be fed to an external speaker if a 500 ohm to voice coil matching transformer is used. The same output may be used to feed a transmission line if necessary.

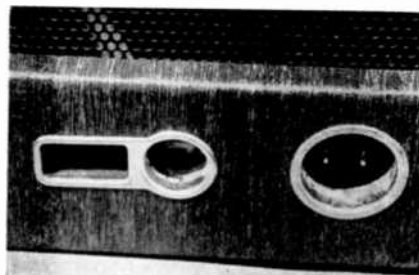
Another provision is the monitoring arrangement which provides sound from the recorder's speakers when recording program material off the air or when making live recordings. The shows from the air should be recorded by connecting the cord across the volume control terminals of the radio. When making live recordings the volume of the monitor should be kept low and the mike placed far enough from the recorder to avoid feedback. Should the volume be too high or the mike too close, squeals may result.

Two other features that are useful are the automatic stops which turn off the motor and amplifier at the end of the tape run and the ability to record or playback without turning over the reels.

The automatic stop is actuated by two small pins which are at the ends of the tape slot. By forming a loop in the end of the tape which will press against the pin as the tape comes to an end a shutoff of both motor and amplifier is obtained.

This is useful when recording a radio program from a clock radio which will turn on the recorder in your absence and record the show for you. Most clock radios, however, will not turn things off and it is here that the automatic shutoff feature is valuable. It is also useful in preventing the end of the tape from passing through the slot, necessitating rethreading.

The only difficulty we experienced was in playing the small 3 inch reels.



Above: the connection outlets are on the back of the recorder. Right: the pins which will shut off the recorder at the end of the tape if a loop has been formed around the hub of the reel.

Due to their small hub diameter, the shutoff would sometimes operate when the tape was low on the reel.

The ability to continue recording without turning over the reels enables the operator to record up to two hours at the 3-3/4 inch speed or one hour at the 7 1/2 inch speed without a break. The change is accomplished merely by using the reversing switch.

On first impression the recorder seems overly complicated with three control knobs but this impression is not borne out in actual operation.

One knob is for output selection. On position 1 the recorder speakers are connected for playback; position 2 connects the amplifier to the external output receptacle; position 3 is used to feed the output of the recorder to a public address system, hi-fi amplifier, etc., and position 4 is the monitoring position.

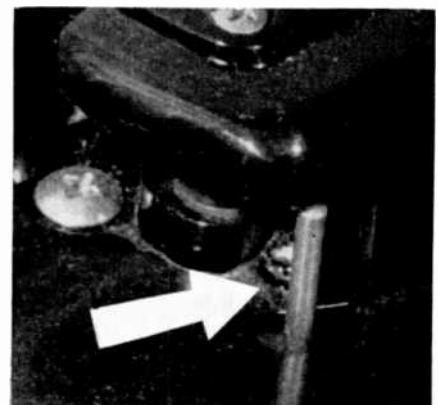
The second control knob is the usual combination of on-off switch, tone and volume control.

The third knob is the heart of the control set-up. Turned either to left or right in normal position it will play either track on the tape. If the outer knob is depressed and then turned it provides fast forward or rewind. Depressing the "R" button and turning the control records on either track.

A coin-slot type screwhead works the speed change mechanism.

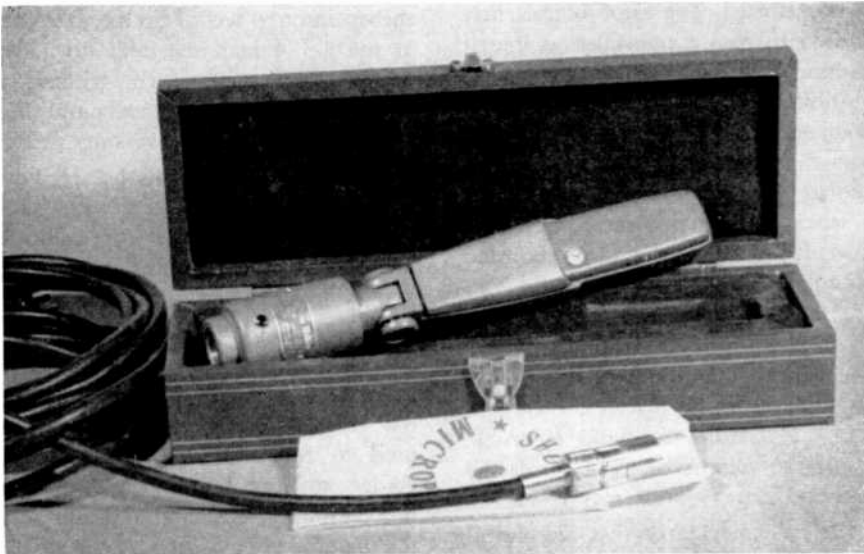
The recorder was tried under test in all its functions from making recordings in the usual way to taking programs off the air and using the low-level, high-quality microphones. It performed satisfactorily on all counts during an extended period of use.

We believe the Webcor 2030 to be worthy of your consideration if you are planning to purchase a machine.



NEW PRODUCT REPORT

S T A **OK** S T E D



SHURE "300" BROADCAST MICROPHONE ... a multi-impedance mike with a voice- music switch; bi-directional, anti-blast

THE Model 300 is a studio-quality broadcast microphone of extremely broad frequency response (40 to 15,000 cycles) and our tests revealed that it is "flat" all the way to the limit.

We found it to be highly versatile, being equipped with components to change its impedance to match 30 to 50 ohms, 150 to 250 ohms and high impedance inputs. In addition it has a voice-music switch which acts as a low frequency boost for maximum voice response.

Although the output level is high for this type and quality microphone, averaging about minus 59 db, we would not recommend its use on a low gain recorder without a pre-amplifier unless the sound source is but a couple of feet away and of good volume.

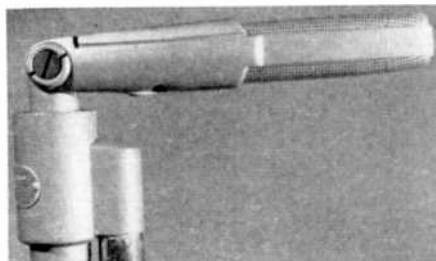
However, we definitely recommend its use with high-quality or professional type recorders and for broadcasting and telecasting.

The bi-direction pick-up pattern, combined with the flexibility of the swivel mounting make this instrument adaptable to dual operation when used on a stand and the shock mounting swivel base makes it equally adaptable

to close-up work mounted on a desk mount, under a grand piano, etc.

The "figure 8" pattern of the pick-up range makes it especially suitable for use with P.A. systems. The covering is a fine grill which is designed to cut down on wind or blast noise. It is equally sensitive from both front and rear.

It is slim, neat appearing and unobtrusive, not only making it less distracting in a TV picture but less formidable to the professional or



Above: The bi-directional pattern of the pickup plus the tilting feature will reduce unwanted noise and allow a PA system to be run about 6 db higher than usual when the "dead" sides of the mike are properly oriented in relation to the sound source. Right: showing the cable connection and impedance switch cover.

Product: Shure "300" Multi-Impedance Gradient Broadcast Microphone.

Price: \$135.00 complete with plush lined box, cable and cover.

Manufacturer: Shure Brothers, Inc., 225 W. Huron Street, Chicago 10, Ill.

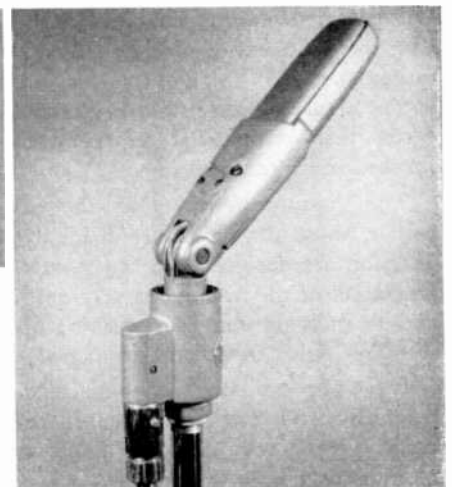
amateur performer using it. Its color is neutral so that it will not mar a TV picture.

The microphone is ruggedly built and will not be affected by humidity nor temperature changes. The live rubber shock-mount prevents the pick-up of mechanical vibrations from the floor, etc.

Under test, this microphone met all the requirements set forth in the data sheet. We found it to be a unit of excellent quality, well made and of top performance.

Its response is very smooth throughout the entire audio range. It is a velocity microphone having a sensitive metallic ribbon suspended between the poles of a magnet.

We do not have the slightest hesitancy in recommending it for use with high-quality recorders having sufficient gain in their pre-amplifiers or for broadcast or TV use.





The Chordettes singing on one side of a ribbon microphone. Proper placement of the singers is important to a balanced recording.

How to Record Choral Groups

by
L. L. Farkas

Proper placement of the vocalists in relation to the microphone is fully explained in this clear-cut article.

THERE is nothing more beautiful than a good tape recording of a choral group. The blended voices swell and soften in well-balanced complex chords; they divide into harmony and counterpart; or they take the lead with piano or organ accompaniment. To record all these effects to best advantage entails two separate considerations: the pick-up and balance of the various voices in the chorus; the pick-up of the accompanying instrument and its overall balance with the chorus.

Considering first then the pick-up and balance of the chorus, we find such a group very much like an orchestra. It consists of a number of voices, each with a different pitch and intensity, which must be picked up correctly in order to produce a good musical blend on the recording. These voices may be set up for either a close or distant—

perspective effect—that is, the singers can be grouped closely in front of the microphone for an intimate “on mike” pick-up, or set quite a way “off mike” for a distant choir effect. Generally a small group will sound best if kept in close focus to the microphone, while a larger chorus permits a choice of either the close or distant type of pick-up.

Since the intimate pick-up requires that all voices sound directly on mike, the members of the group should form a close semi-circle in front of the microphone. The distance used will naturally depend upon the kind of singing selected. For instance, a crooning type of chorus should work approximately a foot away from the microphone; singers using fuller voices must stand back two or three feet to obtain good results.



This is the proper setup for recording a large chorus. For tighter grouping the male voices are placed on a third platform. Notice the screen placed to break up reverberations. The group is Kay Thompson and her chorus.

The surest way to check the working position of each member, not only for the correct volume, but to determine that his voice blends effectively with those of the other singers, is to have the group assume an approximate working position and then, with the recorder turned on, have each vocalist sing his part of the choral selection alone. As this is done, check the volume of the singer either by noting the amount of light on your neon bulb or by the needle swing of your volume indicator. On recorders that have no visual sound indicators the volume of the voice recorded will have to be gauged by ear; but this is not particularly difficult to do and, after a bit of experience, a fairly good estimate can be made. Now if you adjust the position of each singer so that his voice level is approximately the same as that of the other singers, permitting only the lead voice to predominate, then you can be reasonably certain that you will have a good balance in your final recording.

With small groups, containing no more than three or four voices, it is often not necessary to go through all these steps to obtain a good balance. The members of the chorus take approximate positions in front of the microphone; they sing a selection; and a test recording of their voices is made. On the playback you can then generally tell when a particular voice is either too weak or too strong, and you can correct that singer's position so that you obtain the desired blend of voices.

Once set up, the members of a small chorus should keep their heads fairly close together as they sing. This will insure that their combined voices produce a solid tone. Should the singers be too far apart, the effect will be that

of a few vocalists, each singing a distinct and separate part—an effect which is the opposite to the full and rounded chords produced by a correctly set up group. On small groups then, it is always well to remember that the closer the heads, the more solid will be the tones.

When a chorus consists of more than four or five voices, the members cannot be grouped easily in front of the microphone, especially if the particular unit used does not have a very wide pick-up beam. One way to surmount this difficulty is to make the lead voice take the center position with the two voices nearest in tone located on both sides of him, and then have the remaining members stand behind and sing past the shoulders of the first three singers. However, unless the persons in the back row have voices relatively stronger than those in the first row, it is not very easy to obtain a good choral balance. At the same time, the set-up makes it rather uncomfortable for the singers in the rear section to hold their music and maintain their position, even without taking into consideration the possible obstructions, introduced by the size of the persons in the first row, to the pick-up of their voices.

The best way to arrange such a group so that all the voices sound on mike is to stand part of the singers on the floor while the rest take their positions on a raised platform directly behind them. Generally the grouping is as follows: the sopranos are located on one side of the front row, with the contraltos on the other side. On the next level the tenors stand directly behind the sopranos, the basses take their position behind the contraltos, while the baritones take the center spot between the tenors and the basses. By then raising the head of the microphone to a height of approximately seven feet and tilting it so that it points roughly between the two groups, the distance between the persons on the two levels is kept the same, even though the singers on the floor level are only about three feet away from the microphone. In practice it may be necessary to favor the top level slightly because the high-pitched voices of the sopranos on the lower level have a tendency to cut through much more than the other voices in the chorus; however, the microphone should also be turned a bit toward the contralto and bass side of the grouping in order that these lower-pitched and therefore softer voices be picked up correctly. If the head of the microphone cannot be tilted, a similar effect can be obtained by decreasing the height of the microphone about a foot and moving it forward four to six inches. This will keep the singers in the first row within the microphone beam while still favoring the low-pitched voices of the top level.

For larger groups, from ten to sixteen voices, the microphone may be moved back six feet and raised to a height of ten feet without changing the close perspective. Here again the set-up should be made with the help of a test recording. Just as in balancing a small group, the level of each voice is recorded and the singer then positioned so that his tones will blend correctly with others, so in a large chorus the sections, such as the sopranos, the contraltos, tenors, baritones, and basses, are each recorded separately and either the position of the microphone or that of the section is adjusted so that all sections produce the same volume of sound. Of course if the blend of a separate section is not good then, as in the case of the small chorus, the singers within that section are also

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balanced. And once all sections are balanced within themselves and their level is adjusted, the overall balance of the entire group is checked by a test recording. Should then an offending voice or section be noticed, it can be shifted slightly on or off beam until the defect is corrected.

Of course when a solo voice or a particular section of the chorus is featured, the volume of that part must be raised. This can be done by having the soloist or the members of the section being highlighted move slightly toward the microphone. A change of six inches on up to one foot will generally provide the necessary additional volume to bring out the solo part without changing its perspective. The same effect can also be obtained by having the background voices decrease their volume. In this case the soloists do not have to change position, but simply maintain their normal voice level. Generally the latter method is used when a number of voices, as in a section, take the lead. When one or two singers are featured, then it is simpler to have them move toward the microphone to produce the desired effect. The exact distance the soloist should move in, or the amount that the supporting voices must drop their level behind a solo, is determined by recording the selection and listening to the results. From these the necessary adjustments can be made to assure the desired balance.

Sometimes the size of the chorus or the characteristics of the room makes a straight intimate set-up impossible. If a ribbon microphone is available, a split arrangement may be used. By utilizing the duo-directional property of the microphone and grouping the members of the chorus on both sides of the unit, a great number of singers can be positioned closer to the microphone than with a single-beam set-up, thus producing the intimate pick-up desired. The high-pitched voices are generally placed in the first row on each side of the microphone, and behind them are set the groups with the deeper voices. With a smaller chorus the top voices can be placed on one side of the microphone and the lower voices on the opposite side. In either case the head of the microphone is set vertically at a height of about five and a half feet.

If you do not have a ribbon microphone but happen to own two single-beam units, you can still make a split set-up by placing the two microphones back-to-back and combining their outputs in a mixer. The only thing that you must avoid is having the two microphones out of phase—that is, opposing each other. This condition can be readily detected by the hollow distorted quality of the recorded sound whenever the two microphones are used. If this is the case, the wires from one of the microphones should be reversed to invert the phase, thus permitting the sound from the two microphones to be mixed without distortion.

For choral groups from twenty to thirty or more voices, the close pick-up is no longer satisfactory because the pick-up beam of the microphone is not wide enough to encompass all the singers. Furthermore, with such large groups, a choir or cathedral effect is preferred and one way to obtain it is by using a distant pick-up. With the chorus arranged in the straight conventional way, the microphone is set approximately twenty feet from the first row of singers. The head of the microphone should be fairly high—from ten to fifteen feet, with its face tilted down toward the center of the group. In this way the tones of the singers will have a distant perspective and while some

of the intelligibility of the voices may be lost, the mellow embracing tone of the full chorus, aided by the natural reverberation of the room, will produce a choral effect with more brilliance and beauty than can be obtained with any other type of pick-up.

However in the use of distant perspective the control of reverberation presents a serious problem. If the walls of the room reflect no sound, either because they have been too well soundproofed or they happen to be covered by heavy drapes, then the chorus will sound dead; if the room is too live, the recording of the voices will be distorted. In the first case reverberation must be produced artificially. This can be done easily if another microphone is available. By setting it fifteen to twenty feet away from the chorus microphone, facing it in the other direction, and then turning on its control when the chorus is being picked up on its own microphone, an echo is introduced which simulates the reverberation in a large hall or church. Of course the amount of echo added will depend upon how far the microphone control of the mixer is opened, but in any event it should be kept below the point where the tones start to become hollow, otherwise objectionable distortion will be introduced. This point can always be checked by making several test recordings with the microphone control in different positions and then leaving it on the setting at which the best results were obtained.

When the chorus is picked up in a very live room, such as a large hall or church with a high ceiling and numerous stained glass windows, the tones will be reflected to such an extent that serious distortion will result. Here then the voices must be picked up with the least amount of echo possible. One way is to have the members of the choir sing softly so that the sound of the voices does not bounce off the walls or ceiling; the other method is to pick up the singers at close range, even if this means using two or three microphones to cover all the sections of a large group. The difficulties in these two alternatives are obvious: in the first, the microphone must be opened fairly wide to obtain sufficient volume to record the voices properly. This may introduce microphone hiss and amplifier noise which may be just as objectionable as the echo. In the second method, the distant perspective is lost and there is also the problem of handling a number of microphones for level and balance. A compromise between these two types of set-ups can sometimes be made. The microphone is moved in so that it is from ten to fifteen feet away from the chorus. Then, by crowding the singers in as compact a mass as possible and having them keep down the overall volume of their voices, a large portion of the objectionable echo may be eliminated without appreciably affecting the recorded quality of the chorus.

Now whether the perspective of the pick-up is close or distant or whether the chorus is large or small, all the voices within the group should sound as though they originated from the same place—that is, they should all have the same perspective. Nothing mars a chorus selection more quickly than having a few voices sound very close to the microphone while the rest seem to be lost in the distance. This effect is quite noticeable on a small chorus, particularly with an intimate set-up; but it can be quickly remedied by having the singers keep their heads close together, as has already been suggested in order to obtain a solid choral tone. With large groups

using distant perspective, the actual distance of each member from the microphone is not quite as critical provided the individual sections stay at an approximately equal range from the microphone. This perspective balance can be checked on the same recording used to check the volume of sound produced by the different sections of the chorus.

Now that we have discussed the pick-up and balance of the chorus, we must turn our attention toward the instruments used to accompany choral groups.

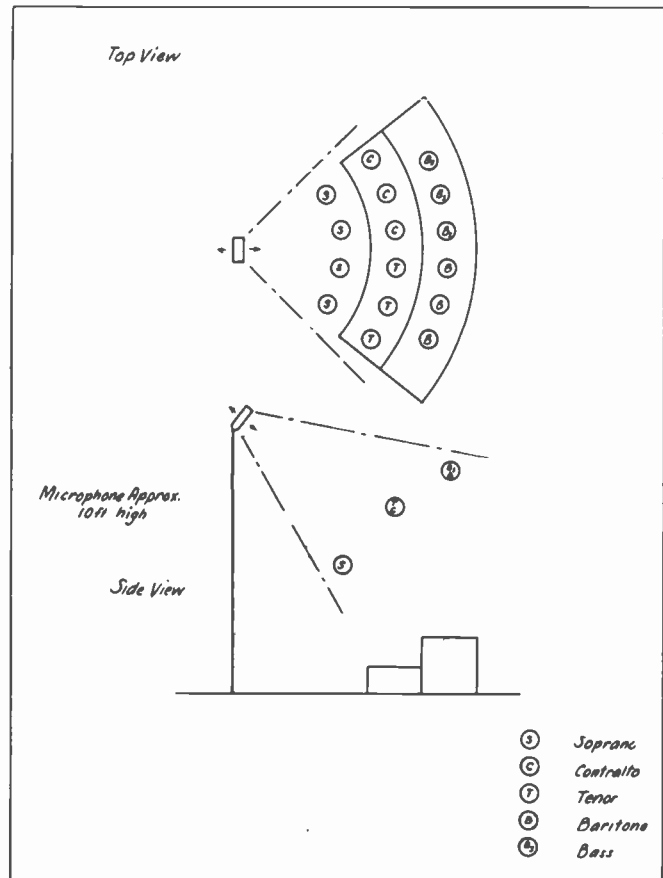
Perhaps the most widely used chorus accompaniment is piano. However, since the methods used to pick up the tones of this instrument have been described in detail in the last issue (March-April 1954), there is no need to repeat the instructions at this time beyond stating that the pick-up perspective required on the piano is determined by the perspective adopted for the chorus. Some care must be taken, especially with a distant pick-up, that the piano tones do not boom through the chorus microphone, particularly when only one microphone is used to pick up both the chorus and the piano. As this occurs most frequently whenever a very live room is used, the best way to reduce the effect, if not to prevent it completely, is to have the piano play softly. Sometimes it will be necessary to move the instrument closer to the microphone so that it will create the correct background for the voices but, provided the perspective balance is not upset extensively, the resultant lack of distortion of the piano tones will do much to make the choral rendition still effective on the recording.

Probably even more in demand than the piano for accompanying a large choral group or choir is the pipe organ.

To pick up and record faithfully all the tones of the pipe organ, the microphone must be set a good distance—generally from twenty to thirty feet, away from the organ shutters. With the microphone in this location, the organ can be played using any degree of sound intensity or extremes of pitch without overloading either the microphone or the recorder. A closer pick-up might produce a better recording on the high-pitched notes, but it would result, especially if too close, in picking up the noise from the bellows and also in distortion on the low notes. On the other hand when the microphone is too far away from the organ, then all the tones of the organ will generally sound distorted. This, as in other too distant pick-ups, is caused by an excess of room echo. The obvious remedy, of course, is to move the microphone closer or, if this is not feasible, to break up the room reverberation by placing sound absorbing material—such as drapes, along different parts of the wall, particularly in the area between the microphone and the organ shutters.

Generally if an organ pick-up and recording can be made without distortion in a certain room, chances are that a chorus with pipe organ accompaniment can also be picked up with good quality. The chorus is set up about fifteen feet away from the microphone which should be tilted toward the center of the group. The normal pick-up distance for the organ is then reduced only slightly—the microphone being set from twenty to twenty-five feet away, to compensate for the tilt on the microphone which favors the chorus.

If the room is too live, then the tones of the organ will have a tendency to swell above the voices in the chorus. One way to cope with this situation is to use two micro-



This diagram shows the placement of a group in relation to the microphone. Note the height of the mike to equalize the volume from the various voices and the placement of the different types.

phones. By placing the chorus as far as practicable from the organ microphone and then making very close pick-ups, on both the chorus and the organ, the organ tones are kept out of the chorus microphone and reverberations are reduced by the directness and closeness of the pick-up. All that is required then is to balance the volume of the chorus against that of the organ and this can be done easily by adjusting the volume controls of the individual microphones.

When only one microphone is used the problem is more difficult. The microphone must be set tentatively at different distances from the organ shutters, with the chorus arranged each time for very close perspective. Depending of course on the characteristics of the room, it is sometimes possible to find a location for the microphone from which the chorus, heard on a test recording, will sound full and the organ tones will still be reasonably close to the perspective of the voices. Again in this case the nearness and directness of the vocal sounds will decrease the possibility of distortion.

On an overall basis, whether the chorus is accompanied by piano, pipe organ, or electric organ, the points to consider remain the same. First the voices must be balanced in volume and perspective so that the recorded chorus sounds full and integrated. Second, the accompanying instrument must be picked up in such a way that its tones match those of the chorus in quality and perspective and so that they have sufficient volume to furnish the desired background for the voices. Keeping these factors in mind and making frequent test recordings the check the pick-ups should help you obtain good results with any type of choral group.

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OFF THE TAPE



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Necessity mothered a new invention recently in a remote camp in the Canadian wilds.

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Complete isolation from trained medical personnel at the tiny base 200 miles north-east of Edmonton made the first aid course a "must" for the safety of the men. They chose a 14 hour course offered by St. John's Ambulance.

The Order of St. John was unable to bring a fully qualified medical lecturer to the scene so tapes were made and flown in. When exam time arrived the men recorded their answers for an Edmonton doctor. Twenty-eight men successfully completed the course and received certificates.

REEVES WINS OSCAR

REEVES Soundcraft is to be congratulated on winning a Movie Oscar for their process of laminating a strip of magnetic material to regular professional 35 mm. film. You've probably seen "The Robe." If you haven't don't miss it. The sound is magnetic. Hazard Reeves, president of Reeves Soundcraft received the coveted award in New York.

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Bruce Roberts, a Philadelphian has invented a "talking letter." Messages are magnetically recorded on sheets of 8½ x 11 paper coated with magnetic material and two copies may be made at the same time, affording a duplicate which may be filed as ordinary letters are.

NEW KIND OF MUSIC

Tape recording is producing a new type of music which, according to the "tapesicordists" is beyond the scope of a mortal orchestra to produce. Taped music is being widely acclaimed in a number of foreign countries and is packing concert halls where the *entire stage* is occupied by *one single tape recorder!*

WE'D LIKE TO KNOW

On the first day of the Washington, D. C. Audio Fair a dozen people paid for subscriptions to Tape Recording and we'd like to know who they were. During the night the cash box was rifled and the thieves took the money—and also took the sub-

scription blanks containing the names of those who subscribed. If you are one of those folks, please drop us a card so that we can send you the copies due you.

Due to the extremely rapid growth in our number of subscribers there have been a few mix-ups. All subscriptions have now been checked and will be kept in order, however, if any or you failed to receive copies due, let us know by postcard at once so we can send them to you.

FREE AUDIO HANDBOOK

Arrow Electronics, 65 Courtland Street, New York 7, N. Y., has issued a 100-page Hi-Fi Audio Handbook. It contains a very complete listing of components in addition to an interesting section on Hi-Fi techniques. Copies free on request.

SHOP OR SWAP

Advertising in this section is open to both amateur and commercial ads. TAPE RECORDING does not guarantee any offer advertised in this column and all swaps, etc. are strictly between individuals.

RATES: Commercial ads, \$.30 per word. Individual ads, non-commercial, \$.05 a word.

Remittances in full should accompany copy. Ads will be inserted in next available issue. Please print or type your copy to avoid error. Address ads to: Swap or Shop, Tape Recording Magazine, Severna Park, Md.

FOR SALE: Barker & Williamson 400 Distortion Analyzer used only twice. Guaranteed. \$150 postpaid. Joseph E. Howell, W4SOD, 604 Carthage Road, Lumberton, North Carolina.

LP DISCS MADE FROM TAPES. Both sides: 10 inch—30 minutes, \$4.25; 12 inch—45 minutes, \$5.75. Also free bulletin—"Make Money With Your Recorder." Artistic Sound, 24110 Rensselaer, Oak Park, Michigan.

FOR SALE: Model 3F10 Deluxe Wilcox-Gay Tape Recorder. 6 Months old; like new condition. Price \$115. Inspect at express office. Request sample tape. Robert Sellon, 322 8th Street, Alamosa, Colorado.

FOR SALE: COMPLETE FRENCH COURSE, 72 practical conversations tape recorded—French players; WITH French—English texts, grammar (publ. D. C. Heath); ALL FOR ONLY \$15.00 also other languages; plays, interviews, poetry, lectures. Shakespeare Tape Library, 1818 M Street, Washington 6, D. C.

FOR SALE: Magnecordette, Mahogany case, original carton. Used very little and adjusted better than new machine. \$350. Donald Sampson, Central City, Nebraska.

FOR SALE: Webcor 210-1C Tape Recorder. Good Condition. \$100. R. F. Meyerowitz, 400 Elm, Syracuse, N. Y.

FOR SALE: 38 reels Paper Backed Tape. Used only once. Wiped clean. \$1.00 each. Call Pappacena 202-83 Rocky Hill Road, Bayside 61, N. Y. Bayside 9-0953.



SEVENTEEN YEARS OF PREEMINENCE

in pioneering electronic research, development and instrumentation in association with the medical profession has accustomed MAICO to dealing in pure science, not fiction.

MAICO maintains the largest and most diversified electronic and acoustic research, development and engineering program of any organization in its field, along with a government contracts division which holds the Army-Navy Award for Excellence.

In this tradition . . . curves and technical data on DYNAMU Magnetronics are computed and prepared for your guidance and assistance by specialist engineers on whose findings you, too, like the medical profession, can depend.

COMPLETE CIRCUITRY, PROCEDURES, TEST SPECIFICATIONS, AND ENGINEERING DATA AVAILABLE ON REQUEST SO YOU CAN DUPLICATE THESE CURVES WITH STANDARD LABORATORY EQUIPMENT.

DYNAMU Magnetronics and the MAGNETRONIC Ultralinear Recording Systems are available for installation on all standard tape recorders:

- | | |
|------------|---------------|
| Webcor | Eckotape |
| RCA | Eicor |
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| Knight | Concertone |
| Federal | Crescent |
| Pentron | Masco |
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| Arline | Bell |
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DYNAMU Magnetronics are supplied with mountings for your make and model tape recorder, complete instructions, and carry full RTMA guarantee for materials and workmanship.

WE'VE BROKEN THE SOUND BARRIER FOR TAPE!

16-20,000 cycles \pm 2db At 7.5 IPS on your own Home Recorder with distortion so low it's ONLY SEVEN TENTHS OF ONE PER CENT!

INSTALL DYNAMU magnetronics

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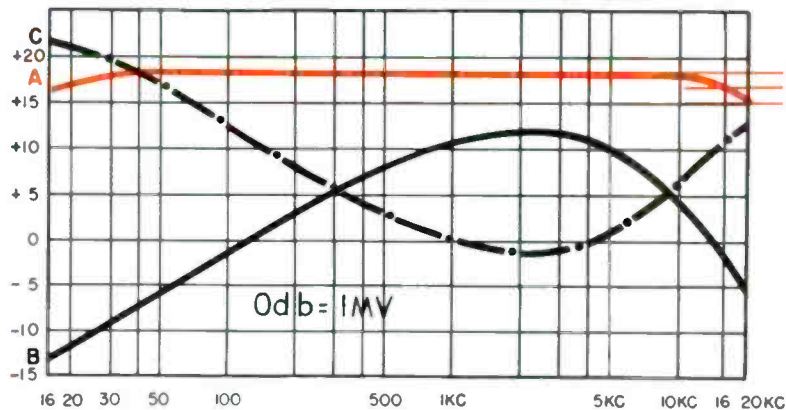
RECORD • PLAYBACK • ERASE HEADS ON YOUR TAPE RECORDER



Now, for the first time, simple inexpensive "home type" tape transport mechanisms can be easily and inexpensively metamorphosed into a magnificent Magne-

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NEVER BEFORE SUCH PERFORMANCE AT ANY PRICE.



A. Playback response D101 series using D501 bias oscillator and D540 equalizer at 8db below saturation 3M-111 tape with only .7% distortion.

B. Constant current curve D101 series unequalized pb from constant current recording 8db below saturation 3M-111 tape. Record current .06MA bias current 1.33MA at 100KC for .7% distortion.

C. Equalization supplied by D540 interstage equalizer to give playback response A.

D101 RECORD-PLAYBACK HEAD:
Track Width090
Gap Width00015
DC Resistance 300 ohms
Inductance 290 mh @ 1kc
Impedance High

D121 ERASE HEAD:
Track Width125
Gap Width008
DC Resistance 125 ohms
Inductance 50 mh
Impedance — 10K @ 30KC; 22K @ 60KC; 39K @ 100KC

D501 ULTRALINEAR BIAS OSCILLATOR



New high efficiency push-pull 100KC bias oscillator-transformer. Drives all Dynamu Magnetronics erase and record heads with minimum of 55db erase from saturation with D121 series erase heads. For use with single 6SN7; 12AU7, etc. Supplied with complete instructions. Guaranteed less than 1% total distortion.

D540 HIGH FIDELITY TAPE EQUALIZER

Recommended interstage tape equalizer for use with Dynamu Magnetronics. Gives results shown in curves above.



D541 DUAL PURPOSE EQUALIZER

Two complete equalizers in single package. Provides D540 characteristic above PLUS NARTB broadcast playback curve.

ASK YOUR RECORDER DEALER or mail inquiries to:

BRITISH INDUSTRIES, INC. — National Sales Representatives
164 Duane St. — New York, N. Y.

Please send free booklet "DYNAMU & YOU" with full information about name of my nearest Dealer.

I own a _____ Recorder.

I AM A HOBBYIST.

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Name _____

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**Now! Hear true high-fidelity sound—
the famous musical suite from...**

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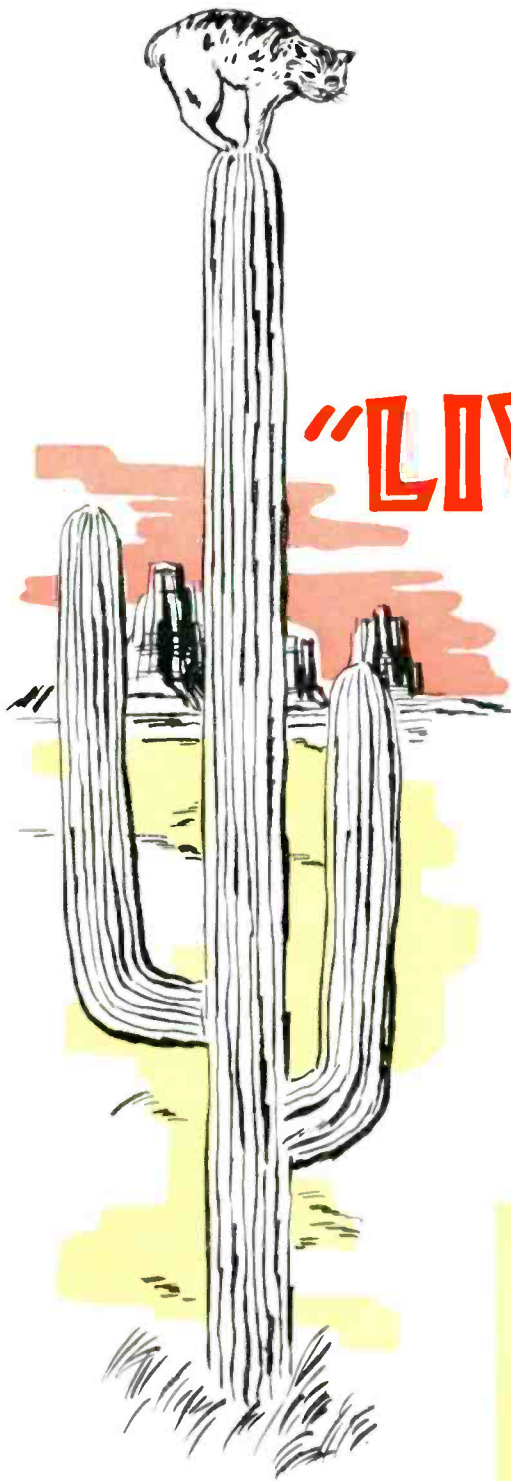
THE

"LIVING DESERT"

**Now yours to keep and enjoy on
"Scotch" Brand Magnetic Tape**

All your favorite musical selections from Walt Disney's new film hit, "The Living Desert". Hear them in their full beauty—without interruption—on "Scotch" Brand Magnetic Tape. Directed by Thomas Peluso and featuring a specially assembled symphony orchestra of 54 leading musicians, "Desert Suite" contains six sparkling musical vignettes. Delicate English horn solos, open brasses, clashing cymbals and thunderous tympani combine to create a dynamic range of sound that can be captured only by magnetic tape recording techniques. Thanks to "Scotch" Brand Magnetic Tape, you hear every note . . . every tone with breathtaking fidelity!

Hear "Desert Suite" *today!* Your nearby tape recorder dealer has this outstanding pre-recorded tape in stock now. 11 minutes playing time. In sturdy dust-proof jacket. Available in 3¾, 7½, 15 ips speeds.



*A triumph in high-fidelity
sound on—*

**Hear these favorites from Walt Disney's
Academy Award Winning
first feature-length, true-life adventure!**



- *The Mud-pots*
- *The Millepede*
- *The Burrowing Snake*
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- *Skinny and the Gila Monster*



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