

**MAGNETIC FILM &**

# **TAPE RECORDING**

**TAPE TIMES  
THE ICE SHOW**

**THE NAEB  
TAPE NETWORK**

**HOW TO  
ERASE TAPE**

**CHOOSING AND  
USING A MIKE**

**NEW PRODUCT  
REPORTS:**

**CONCERTONE  
1501 RECORDER**

**PENTRON  
TAPE MATES**



**DECEMBER, 1954**

**35c**

new type

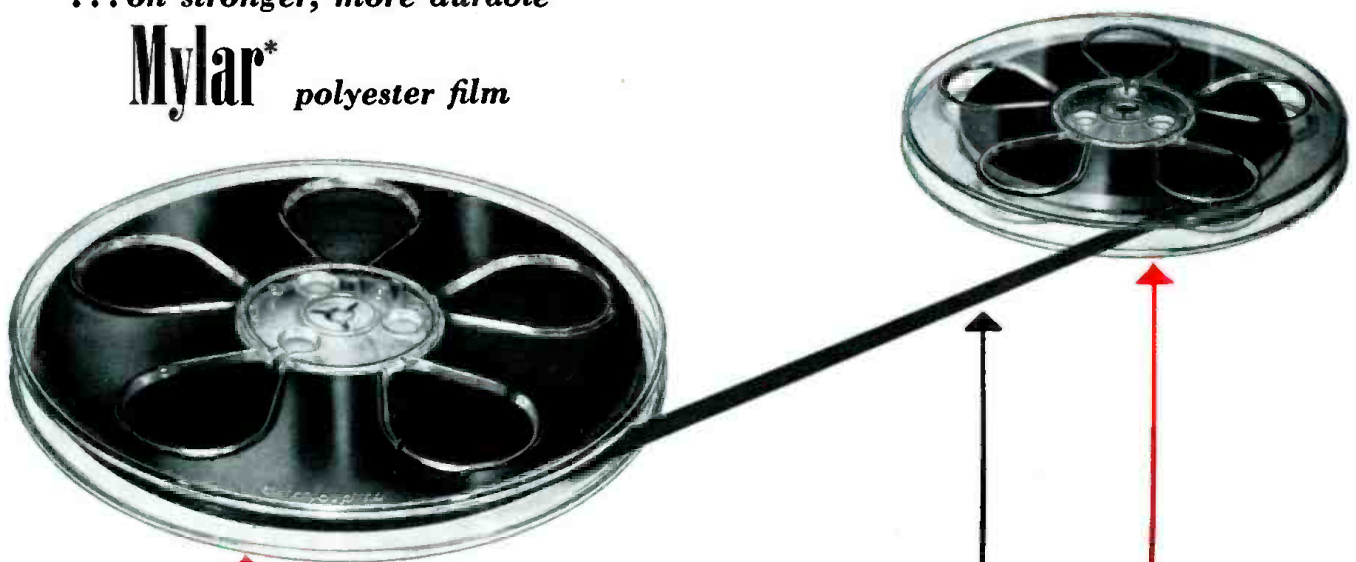


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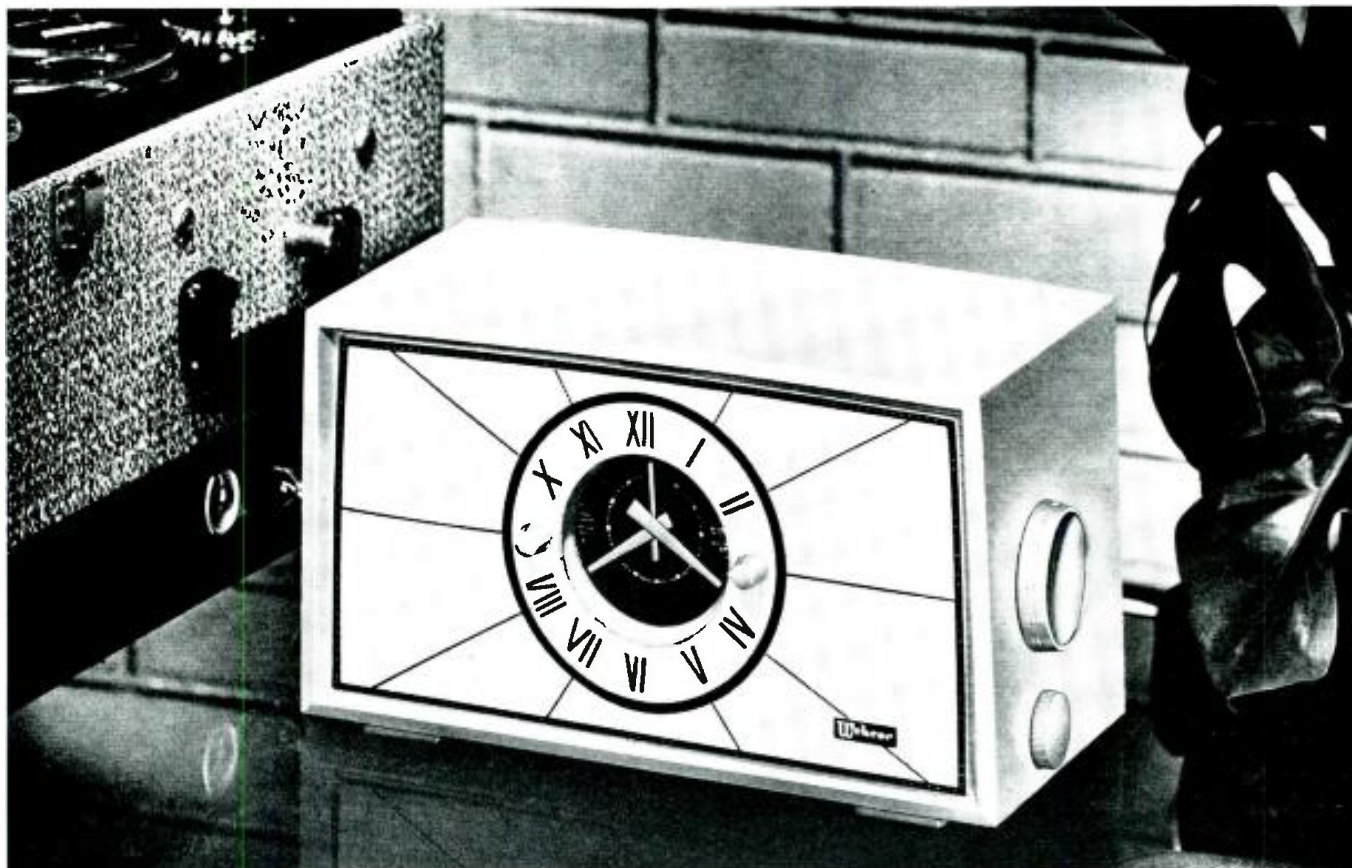
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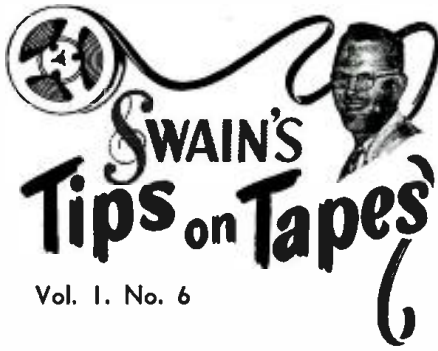
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Vol. 1. No. 6

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Hack



## MAGNETIC FILM &

# TAPE RECORDING

VOL. 2 NO. 1

NOVEMBER-DECEMBER, 1954

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Cover, Jinx Clark and Rudy Richards of "Holiday on Ice."

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 9-0030). 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. (MADison 6-1371). 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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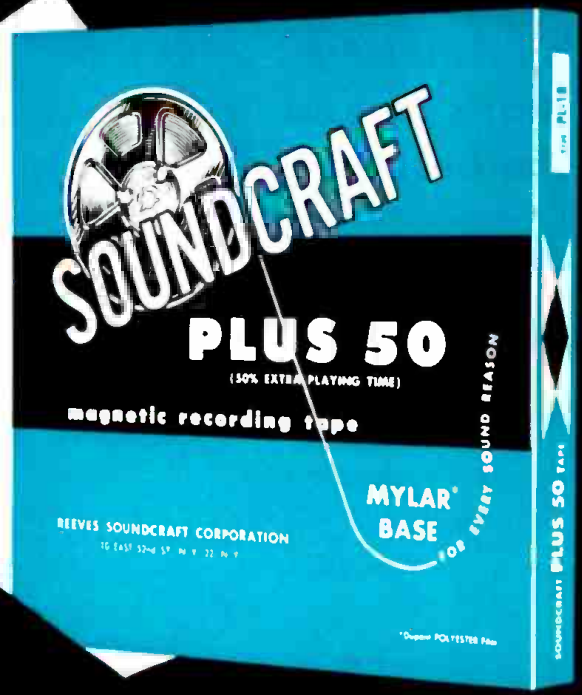
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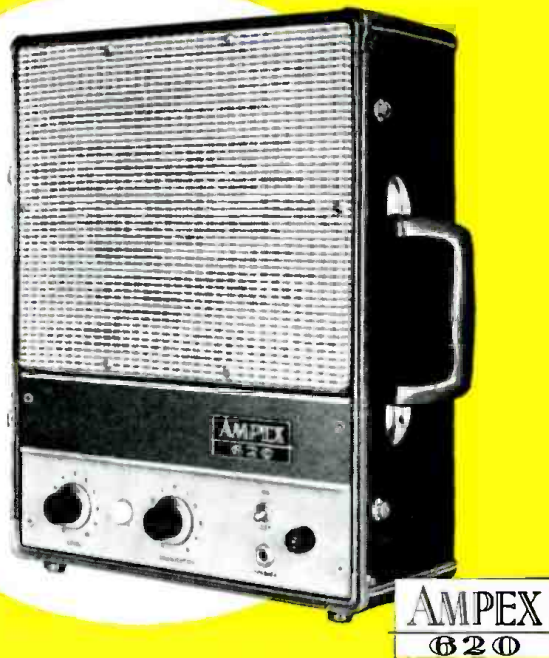
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# NEW TAPES

By Charles D. Sigsbee

**W**E are happy to report that the Magnetic Recording Industry Association has taken some much needed action in its meeting at the New York Audio Fair. This group, which is comprised of most of the tape and recorder manufacturers, has established committees to solve what appears to this writer to be one of its most pressing problems—standardization.

The record industry has been plagued for years by the use of different equalization curves for recording and playback and the tape industry has resolved not to fall into a similar trap, which causes great inconvenience to the buyers of its products.

It was agreed at the meeting that speed was essential in setting the standards and, as was brought out, the problem may be solved relatively soon because many of the manufacturers of both machines and tape records have already chosen to follow the same standard.

C. J. Le Bel, of Audio Devices, was appointed to head a general committee to look into existing standards and to determine the order of procedure.

Russ Tinkham, of Ampex, is heading a ten man committee to conduct a preliminary survey to set equalization curves for all tape speeds. This committee will hear from all pre-recorded tape and machine makers. Clarence Sprosty, of the Brush Electronics Company, heads the committee on head placement and specifications, and Arnold Hultgren, of American Moulded Products, is committee chairman for the group that will set reel and tape standards.

The industry is to be congratulated for its foresight.

Appearing in the reviews to follow, you will find a Haydn, C Major Concerto recorded by A-V. This is a recently discovered work and has never before been recorded, a fact I discovered by querying the company concerning the accuracy of the label.

Which leads me to the point of suggesting that the tape record people add concert notes to their product. Disc record people have done this for years and many a well informed music lover has received his musical education entirely by this method. The cost of such an innovation would not be great, because on nearly every metropolitan newspaper exists an overworked, underpaid musicologist, employed as music critic, who would be happy to do this work for a modest sum and the satisfaction to be derived from seeing his creative efforts gain such a wide circulation. It's worth a try.

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**CONCERT CLASSICS**  
Philharmonia Orchestra of Hamburg  
Hans-Jurgen Walther, Conductor  
Weber—Oberon Overture  
Beethoven—Symphony #2 in D  
Respighi—Pines of Rome  
Beethoven's Second-Symphony is paradoxically nicknamed, "The Happy Symphony."

It was written in the summer of 1802 in the little village of Heiligenstadt, outside of Vienna. The Giant had been ordered to go there by his doctor as a protection for his ears which had already begun to turn deaf.

This Symphony also marked the first major break from the classicism of Haydn and Mozart. The influences are still much in evidence in the music but one can plainly detect the evolution of the style which was to manifest itself in the "Eroica."

The North German conductor presents a lively and vigorous interpretation of the work, almost a definitive one, except that his handling of the beautiful slow movement is a trifle too deliberate, it's texture should be more delicate. Before you reach for the catalogue, however, let me remind

you that none of the current recordings of the Second Symphony can be called definitive and this one has something that they generally seem to lack: vitality.

Students of interpretation are certainly going to enjoy the way in which Walther handles "The Pines of Rome." Respighi's impressionistic tone-poem is given such a full Germanic treatment that one can't help but feel that the Valkyries ride again! Of course, even the Italian conductors (Quadri and Toscanini) disagree on the matter of interpretation but I like both of their versions and must admit that I like this one too, Wagnerian or not.

The people who have written to me about the difference in sound quality between the best LP's and 7.5 IPS tape, should hear this

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tape from A-V, it rivals the best recordings in all media. The string tone is superb and the low register, particularly in the "Pines," causes woofer cone oscillations in enough quantity to satisfy even the most avid fanatic; I was.

Catalogue #1029—7.5 IPS, Single or double track

### CONCERT CLASSICS

Philharmonia Orchestra of Hamburg  
Hans-Jurgen Walther, Conductor  
Haydn—Piano Concerto in C Major  
Haydn—Emperor's Hymn

(From String Quartet D)

Corelli—Suite for Strings

Bach—Suite #3 in D Major

A neat baroque package that contains a delightful a sampler of classical music on one recording as one could hope to find. The whole is well done although, musically, I prefer the Corelli and Bach.

After almost three hundred years Corelli's music is as fresh and vibrant as if it had been written yesterday. Of course, the excellent string tone of the recording, as well as the understanding treatment given the composition by Walther, has much to do with it. So contemporary does it sound that one unfamiliar with the music could well imagine the Gigue to be a modern transcription, by Vaughn-Williams, of an English folk tune. And it would not surprise me at all if the Badinerie were not still being played by rustic fiddlers in the hills of Tennessee.

The Bach Suite is of sterner stuff, and more recognizable, containing, as it does, the familiar "Air for G String." Once again, Walther manages his orchestra well and turns in a performance as good as one is likely to hear. It is interesting to note that this recording is not scored for the large orchestra of the Respighi composition, mentioned earlier, but for orchestras of the baroque period, the possible exception being the piano in the Haydn Concerto.

The Movement from the Quartet is played by the first chairmen of the orchestra and is of particular interest to the casual listener because the melody later became the German Anthem, "Deutschland Uber Alles."

The sound again is that formerly heard only at greater tape speeds and I feel confident that even the most biased discophiles will be greatly impressed. It is to be hoped that this indicates a trend from A-V.

Catalogue #1510—7.5 IPS, single or double track

### SHOW MUSIC

Orchestral arrangements of selections from

Porgy & Bess—Arr. by Robert Russell Bennett  
South Pacific—Arr. by Robert Russell Bennett

For several bars at the beginning of this tape I thought that I was listening to the score from "Victory At Sea," but it turned out to be Gershwin's folk opera after all and a fine Bennett arrangement of it. The nameless orchestra is a large and good one, capable of meeting the demands of the arranger's complex scoring.

Again good fidelity throughout from A-V's engineers makes this a recording well worth having.

### WEBCOR

Catalogue #2923-1—7.5 IPS, double track

Track #1

Debussy—Quartet in G Minor, Opus 10  
Haydn — Andante from Quartet Opus 76, #2

Fine Arts Quartet

Leonard Sorkin, violin  
Joseph Stepansky, violin  
Irving Ilmer, viola  
George Sopkin, cello

Debussy' only quartet well interpreted by this Chicago group. The recording has lost a great deal of it's original luster in the transfer from the original Concertape 15 IPS, full track recording to Webcor's 7.5 IPS, half track version but not enough, fortunately, to lessen it's value as a good commercial recording. The original recording gave one the impression of being surrounded by the instruments, while the present one places the listener in a small audience. This recording is also available in a binaural version and it would be interesting to note whether this would have the tendency to restore the original presence effect.

Interpretively I can make no comparisons, having never heard the work before but on it's own merits I would rate it as the definitive work until something better manifests itself.

Track #2

Robert McDowell, Pianist

A good concert pianist playing showy virtuoso pieces by Granados, Ravel and Liszt. Reproduction is excellent for a half track recording and may be labeled as fairly high fidelity.

### AUDIOSPHERE

Livingston, N. J.

VOICES FROM VIENNA—7.5 IPS, single track

Young Vienna Choir  
Leo Lehner, conducting

Music of Strauss—Volume 1, #706

Blue Danube  
Sweets From Vienna  
Tritsch-Tratsch  
Thunder and Lightning

A spirited, high fidelity recording of four Johann Strauss works for large chorus (136 voices) and full orchestra. The waltz arrangements are somewhat lengthy but beautifully done with a lilting charm that invites their replaying again and again.

"Thunder and Lightning" is a lively polka complete with formidable tympani rolls and gigantic cymbal crashes. If you like Strauss, you'll love this recording.

VOICES FROM VIENNA—7.5 IPS, single track

Young Vienna Choir  
Leo Lehner, conducting

Strauss—Roses of the South  
Schubert—The Linden Tree  
Mozart—Ave Verum

Beethoven — Nature Sings God's Honor

Lehner—I Love You My Vienna

The same group but with a more varied program apparently designed to demonstrate their virtuosity.

The Schubert, sung unaccompanied, sounds like an alma mater song as presented reverently at the close of commencement



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The above tapes are supplied on 7" reels Dual Track 7.5 I.P.S. recorded to exacting professional standards for standard Ampex playback equalization. As with all Livingston products, satisfaction guaranteed is the basis for all sales. Full track tapes available on special order. Each program represents about one hour of playing time per reel.

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Revere, Pentron, Webcor,  
Crescent, etc., also the new  
professional "Dynachord"

- Recording tapes by Scotch, Webcor, RCA, Panacoustic, Encore, Audio, Reeves, Irish, etc., on such bases as Mylar, Soundplate, paper and plastic acetate, "EP," "Lifetime," "H.O.," "190," "Plus 50"; also colored tapes and reels. Complete stock of plastic, aluminum and fiber-glass reels.
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- Agents for "TAPE RECORDING" magazine. (Back issues available).
- Complete stock of recording blanks, cutting needles, bulk magnetic erasers, DC to AC inverters and/or for operating instruments from any voltage (including automobiles), telephone pickups, adaptors, jacks, mike mixers, patch cords, mike extension cords, earphones, microphones, stands, splicing, leader, timing tapes, splicing blocks, etc.

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## COMMISSIONED ELECTRONICS COMPANY

2503 Champlain St., N.W., Washington, D. C. (Telephone North 7-4392)

exercises. If it isn't the theme for at least one college I am greatly surprised.

The liturgical sounding selections of Mozart and Beethoven are particularly impressive and prove the group to be a versatile one. Most noticeable, perhaps, in listening to these young Viennese voices is the freshness and vitality they display. They obviously sing for the pure love of singing and this spirit has been captured on the tape. Both recordings I would consider a worthwhile investment.

Dukas—The Sorcerer's Apprentice  
Pfitzner—Little Symphony, opus 44  
This tape is unnumbered on the copy sent me but I should imagine that Audiosphere can satisfy all interested parties upon receipt of a letter. (#807 BN—Ed.)

The Dukas is another of the excellent recordings made by the Florence May Festival Orchestra under Vittorio Gui. In it the apprentice has a terrible time with that broom and everyone else has a fine time following the humorous musical antics. The separation of instruments is better on this recording than it was on previous Audiosphere offerings.

Whoever had the idea that Pfitzner fits on this tape should be ashamed of himself. Played by the Collegium Musicum Wien Orchestra strings under Kurt Rapf, it's quiet romantic style is in marked contrast to the preceding merriment.

The Pfitzner piece is a string symphony of great beauty lushly presented by the Vienna group. There are many opportuni-

ties for solo work in the symphony and all of the soloists presenting them sound like concert artists. Again, the recording is excellent and highly recommended.

### TAPE TOONS

Box 397, Smithtown, N. Y.

Ad-Lib Tape Toon #2—7.5 IPS, double track

Good organ reproduction in a potpourri of old standard melodies. By "old" I mean as old as "How High The Moon" but not as new as "Sh'boom." If you like the electric organ these are well worth your while (I should include Novachord, Solovox and piano, as these are included too).

A unique feature of this company is that they guarantee their tapes. Try one for three days, if it doesn't please you send it back for a refund. How can you lose?

### HACK SWAIN PRODUCTIONS

P. O. Box #2384, Sarasota, Florida

Musikon Tape #550

Lanny and Ginger Grey

A song team, with Hack Swain at the organ (and singing in at least one number), in a collection of all time hit songs, and some that aren't. Well recorded and arranged, the whole thing is lacking somewhere.

It somehow reminds me of a husband and wife morning show on radio, except that the patter and commercials are missing. Perhaps it's a matter of conditioning and I am not with it because, to me, the

whole thing fails to get off the ground. Difficult to put my finger on but I feel that an attempt to be clever, turned out to be merely cute, and that's a nasty word in my lexicon.

All may not be lost, however, because I think that the same team, with clever patter and a collection of gay 90's songs would make a refreshing half-hour package. Why not try again?

**SPIRITUAL RECORDINGS, UNLIMITED**

1425 N. W. 39th Street  
Oklahoma City 3, Oklahoma

Preserving on tape some of the great spiritual voices of our time is the unique and fascinating business of Mr. and Mrs. Charles Hoeffle of Oklahoma City.

Mr. Hoeffle, who began making tape recordings of inspirational messages as a hobby, now heads the non-profit, religious foundation which is inter-denominational in purpose. Funds above operating costs go to religious projects supported by the speakers.

Such recordings are extremely useful to prayer groups, hospital missions, homes of invalids, shut-ins, etc.

The recordings may be ordered separately, or used in series, and are available for rent or sale.

In the more than 700 talks in their library are included such people as Dr. Leslie Weatherhead, Dr. John Gayner, founder of Fellowship of St. Luke and Mrs. Peter Marshall.

**MARVIN CAMRAS HONORED**



... Inventor Camras

Adjusting the film in a projector adapted for magnetic sound is Marvin Camras, the inventor of modern magnetic recording who is slated to receive the \$1,000 John Scott Award for scientific achievement. Mr. Camras is senior physicist at Armour Research Foundation of the Illinois Institute of Technology and joins such notables as Thomas Edison, Orville Wright and Madame Curie who also have won the award.

The 138-year-old award consists of \$1,000 cash, a copper medal and a scroll, all of which will be presented to him by the City of Philadelphia, trustee of the award.

Camras developed the first practical wire recorder which was widely used during World War I. He is also responsible for the development of magnetic sound on film and made the first magnetic movie.

**"Tested in the Home"  
report available**



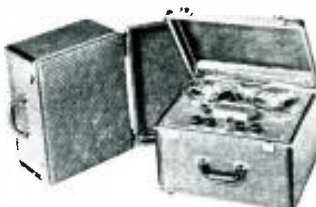
**Crestwood goes to the heart of sound**

At the great Hi-Fi Shows in Chicago, Boston and New York... in homes and offices across the country... in critical tests made by experts... CRESTWOOD 303 rates as a truly exceptional tape recorder.

Used with Hi-Fi Systems, CRESTWOOD 303 offers smooth, wide-range frequency response... separate bass and treble controls... professional type recorder "red heads"... an all-important monitor jack ahead of power output and speaker for easy connection into Hi-Fi Systems.

For all-round tape recorder use, CRESTWOOD 303 is a self-contained package... ready to record and play back with breathtaking realism. Simple connections permit professional quality recording from microphone, TV, radio or phonograph. Tone touch controls allow nine response characteristics. But the heart of CRESTWOOD 303 popularity is performance. Sounds come through with lifelike fidelity—so crystal-clear that only hearing is believing. Ask for, and insist upon, a CRESTWOOD demonstration at your dealer's store—or write for the address of your nearest CRESTWOOD dealer.

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**Hi-Fi Crestwood 400's**  
Model 401 (Recorder) \$199.50  
(Frequency response: 30 to 18,000 cycles + or - 2db at 7 1/2" per second tape-speed)  
Model 402 (Power Amplifier and Speaker) \$100.00

**Crestwood Model 303**  
Tape Recorder \$199.50  
(Slightly higher in Denver and West.)

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WITH **Dactron** BINAURAL STEREOPHONIC **Microdaptor** FOR

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Authorized Factory Service



- Complete accessories available
- Standard factory guarantee

For name of nearest dealer, write or phone:

## SIGMA ELECTRIC COMPANY

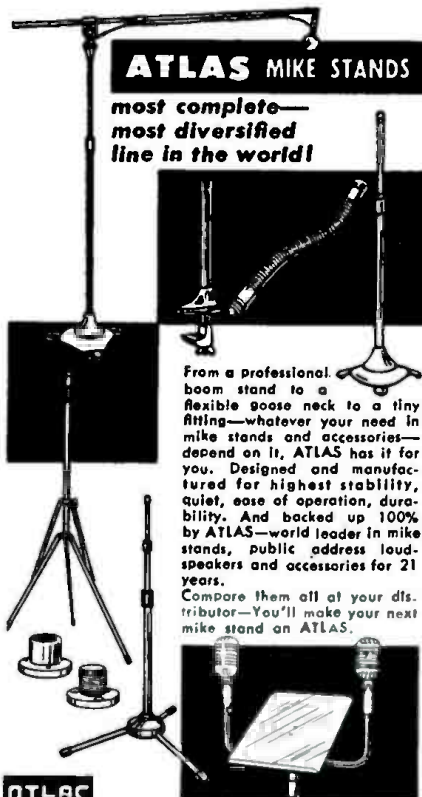
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for every application...



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most complete—most diversified line in the world!

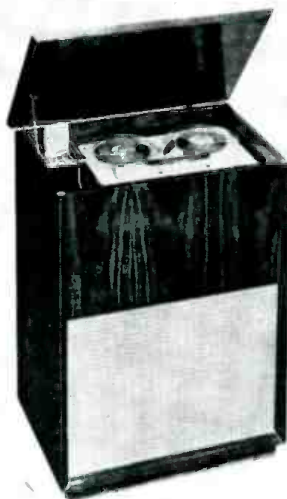
From a professional boom stand to a flexible goose neck to a tiny fitting—whatever your need in mike stands and accessories—depend on it, ATLAS has it for you. Designed and manufactured for highest stability, quiet, ease of operation, durability. And backed up 100% by ATLAS—world leader in mike stands, public address loudspeakers and accessories for 21 years. Compare them all at your distributor—You'll make your next mike stand an ATLAS.



**ATLAS SOUND CORP.**  
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In Canada: Atlas Radio Corp., Ltd., Toronto, Ont.

## NEW PRODUCTS

### CRESTWOOD CONSOLE



The Crestwood Division of the Daystrom Electric Corporation, 837 Main Street, Poughkeepsie, N. Y., has announced the Crestwood Console Recorder. Both of Crestwood's Push-Button "300" and the Hi-Fi "400" series are offered in these high grade wood cabinets which are made to fit any living room decor. The console units contain extended range dynamic speakers fully baffled for complete range music reproduction. A 10 watt amplifier provides adequate volume for the 30 to 13,000 cycle range of the 401. Consoles are available in Walnut, Mahogany and Korina Blond. The

"300" in a console cabinet is \$299.50, the "400" is \$399.50. Full details and specifications from Crestwood.

### NEW ALLIED CATALOG



Allied Radio Corporation, 100 N. Western Avenue, Chicago 80, Ill. has just released their 1955 general catalog #140. It contains 308 pages and over 25,000 items. Of special interest to tape recording fans is the listings of tape recorders, components for custom installation and all types of tape recording accessories. Included are numerous pages of hi-fi equipment including speakers, tuners, enclosures, pickups, cabinets, record changers, etc. Also of interest to tape recordists are the listings of microphones, kits and supplies, books, manuals, diagrams, tools and hardware. The catalog is free for the asking. Write to Allied Radio, Department TR-11.

**BERLANT BROADCAST**



The new Berlant Broadcast Recorder has been made to meet the specific needs of the professional user. It is designed for rack mounting or may be mounted in a console or carrying case. The BR-1 has provision for up to 5 heads which makes possible the simultaneous recording and playback of two different signals or the use of the machine for both dual and single track operation. All clicks and noises are eliminated when making A-B tests from source to recorded signal. A simply operated unified control combines all mechanical operations. Full details and price from Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Cal.

**METAL CANS FOR TAPE**



Carston Studios, 215 East 88th Street, New York 28, is the distributor for Magna-Reel tapes and cans. The tape, supplied in metal containers is at standard list prices or the 5 or 7 inch cans may be bought separately. The chest, holding a number of either size reels is all metal. Full details and prices from the above.

**NEW IRISH TAPE**

Irish Sound-Plate Mylar tape is the newest addition to the Irish line, made by ORRadio Industries, Opelika, Alabama. It is a completely new tape, including base formulation, coating technique and "Ferro-Sheen" which imparts a mirror finish as smooth as glass. Unlimited frequency response is claimed by the manufacturer as well as a drastic reduction in head wear, from 40 to 100%. The price will be the same as for regular Mylar tape. Full details and specifications from ORRadio Industries, T-120 Marvyn Road, Opelika, Alabama.

**NEW LANGUAGE TAPES**

The Living Language Library, 806 E. 7th Street, St. Paul, Minn. has announced a



**Dictate Reports Accurately-Promptly!**

**make your car,  
boat or plane  
a "rolling  
office"**

with



**INVERTER**

for changing your storage battery current to A. C. Household ELECTRICITY

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ATR INVERTERS . . . especially designed for operating standard 110 volt A. C. . . .

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# New Tapak "Narrator" TALKS RIGHT OUT LOUD!



## TAPAK, THE WALKIE TAPE RECORDER THE BROADCASTERS USE

Records with spring-power up to 50 continuous minutes and plays back to room-size audiences without electricity. Tapaks (tape-packs) are standard with most networks for capturing authentic radio and film sound under appalling field conditions: wind, noise, rain, darkness, crowds, and bouncing vehicles. Unusual programs have been Tapakked in jets, dugout canoes, mines, diving bells, combat trenches, and even on camelback.

Use this check list of standard Tapak features for comparison:—

- ✓ Automatic erasing
- ✓ Battery checker
- ✓ Outside control for use with closed cover.
- ✓ FAST, INSTANT POWER REWINDING.
- ✓ LOUDSPEAKER REPRODUCTION built-in.
- ✓ No extras; everything in fitted case.
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Trials available on qualified inquiries. Write for brochure and prices.

**Broadcast Equipment Specialties Corp.**  
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Now available for  
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VU meter, full track heads, 10 tubes,  
.8 motors, 3 speed, 9 watt speaker

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### EXPERT DUPLICATION

We specialize in copying tapes to tape,  
tape and/or wire to unbreakable discs. Any  
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The Sanders Recording Studios—Est. 1935  
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### BACK ISSUES AVAILABLE

Vol. #1—Nos. 1, 4, 5 & 6  
35c each while they last

TAPE RECORDING SEVERNA PARK, MD.

new series of graded tape recordings in Latin and French. They are designed for classroom use under teacher supervision. Tapes on German and Spanish will be available soon. Each recording is 15 minutes long. Prices are \$3.50 per reel at the 3¾ speed and \$4.50 for 7½ ips. Full details and listings from the firm.

## AMPEX AMPLIFIER



Ampex Corporation, 934 Charter Street, Redwood City, Cal. has brought out a companion piece to their excellent Model 600. The new item is a portable amplifier of 10 watts housed in an acoustically correct case. The response is flat from 60 to 10,000 cycles and the whole unit weighs only 25 pounds. Called the model 620, it will be useful in improving the quality of sound from record changers, TV sets and tape recorders. It may also be used as a portable PA system, as a monitor unit for broadcasters, as an auditioning unit for ad agencies and as a sound demonstration unit for music stores. It is priced at \$149.50. Full details from Ampex.

## MAGNETIC DISC RECORDER



The U. S. Time Corporation, 500 Fifth Avenue, the largest manufacturer of wrist watches has entered the magnetic recording field with their new Timex Magnetic Disc Recorder. Intended chiefly for home and family use the unit will record on a magnetic disc up to 3½ minutes. It may also be used as a 45 rpm phono by inserting a phono cartridge in place of the magnetic head. The unit will sell for \$59.95.

## COLORED TAPE PRICES DOWN

Lower prices for colored Audiotape a new product introduced earlier this year were announced by Bryce Haynes, vice president of Audio Devices. The colored tape will now be sold for the same price as the clear base tape. For full details write Audio Devices, 444 Madison Ave., New York 36, N. Y. The colored tapes are used for coding and color cueing. Manufacturing economies provided the lower prices.

## NEW RCA RECORDERS



Three new RCA recorders have been announced including the lowest priced model ever marketed by the company. The three models are the DeLuxe (SRT-401) at \$169.95, the Senior (SRT-402) a two-speaker type at \$199.95 and the Executive (SRT-403) pictured above, with three speakers at \$229.95. All models have a remote control attachment. Both the Senior and the Executive models have footage counters and the Executive has a 7 watt power amplifier to feed the three speakers. Full details and specifications from RCA, Engineering Products Department, Camden 2, New Jersey.

## WEBCOR PLAYHOUSE



Containing individual scripts for the cast of a one act mystery, plus a 78 rpm record of all necessary sound effects, this Webcor "Playhouse Package" promises fun for recorder owners. Priced at \$2.95 it is available from Webcor dealers or from Webcor, 5610 W. Bloomingdale Ave., Chicago, Ill.

## CROWN BROADCASTER RECORDER



International Radio and Electronics Corporation, South 17th Street and Mishawaka

Now available: Binaural, and Monaural full-track tapes, faultlessly reproduced for the discriminating listener to take full advantage of the specific technical requirements of your tape playing equipment.

# WEBCOR TAPE LIBRARY

**BINAURAL** prerecorded tapes of this series are custom produced for either staggered or colinear head-spacing.

**MONAURAL** tapes of all selections available in full-track, 7½ IPS.

## WEBCOR Tapes—

"The finest in music tape recording and duplicating."

—Robert Oakes Jordan, Downbeat

### Representative Tapes Available

#### FINE ARTS QUARTET

A treasury of the string quartet literature. Haydn, Mozart, Brahms, Debussy, Dvarak, Mendelssohn, Schubert, Boccherini, Tschaiakowsky — Superbly performed by this greatest of all American string quartets.

#### SORKIN SYMPHONETTE

A group of the country's finest string players in a performance of Mozart's Eine kleine Nachtmusik, Tschaiakowsky's Serenade for Strings, Vivaldi's Concerto Grosso.

#### SPECIAL INSTRUMENTAL

Piano—Violin and Cello solos by outstanding artists.

#### JOHN HALLORAN CHOIR

The most beautiful and exciting choral music on tape. Standard favorites, folk songs, secular and religious works.

#### LEONARD SORKIN STRINGS

All-time orchestral hits from the musical shows: Rodgers and Hammerstein, Cole Porter, Gershwin, Coward, Schwartz, and many others.

Each Tape 7-inch reel 7½ IPS One-half Hour of Music \$12.00.

For Hours of Sheer Listening Pleasure Start Building Your WEBCOR Library now.

Write today for complete catalog.

## Concertapes, Inc.

224 South Michigan Ave., Chicago 4, Ill.

### Concertapes, Inc.,

224 South Michigan Ave.,  
Chicago 4, Ill.

Please send your latest catalog of WEBCOR high fidelity tape recordings.

Name .....

Address .....

City ..... Zone ..... State .....

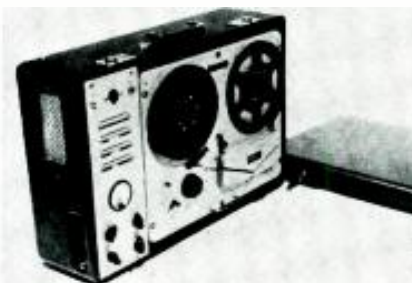
Road, Elkhart, Indiana is marketing the Crown Broadcaster. The recorder, priced at \$399.50 has nylon bearings, requiring no oiling and tape alignment is the only adjustment necessary on the entire machine. Forced air cooling permits continuous operation. It will take 7½ inch reels and has a db meter. Half or full track heads are optional. The firm also has two other models, the DeLuxe at \$349.50 and the Imperial at \$449.50, all prices net. Write for full details.

### COLLECTOR'S CABINET



ORRadio Industries, T-120 Marvyn Road, Opelika, Alabama has announced the Irish "Collector's Cabinet." The cabinet contains three 600 foot reels of Green Brand tape, a roll of splicing tape, 150 feet of leader stock, 20 Irish reel tabs, an empty 600 foot reel and an empty 150 foot reel. The cabinet is in a dark green, leather-like finish. It is priced at \$8.95 complete. Available at Irish dealers or direct from ORRadio.

### FEN-TONE VORTEXION



The Fenton Company, 15 Moore Street, New York 4, N. Y. is marketing the Fen-Tone Vortexion two-speed recorder which is built around the Wearite Series 2A Tape Deck and the Hi-Fi Vortexion amplifier. Plug in sockets for record changer, tuner, mike and external speaker allow it to be used as a hi-fi radio-phono or sound amplifier, independently of the tape deck. Sufficient power is available for disc recording, either directly or from the tape without additional amplifiers. It will operate in any position, including closed and face down on its lid. It is dual track with speeds of 3¾ and 7½ ips. Write for details.

## WEB BACKGROUND ORGAN MUSIC TAPES

Each tape is 1200' 7½ips • FULL HOUR • dual track. Each contains 20 numbers ALL brand NEW possible future "hits" (new Web Policy enables WEB TAPE OWNERS to "pre-view" all its NEW numbers on WEB BACKGROUND ORGAN MUSIC TAPES before release to radio, TV and public performance).

Enjoy relaxing, soothing, (and occasionally a little lively) strains of the ORGAN while dining, at gatherings and on other occasions where the use of background music is desirable.

May also be used by Restaurants, Hotels, Motels, etc., for there are no ASCAP or BMI fees to be considered. This music is licensed for YOUR use. Tape player *only* is required (with suitable amplifier if establishments are roomy)—and we shall be glad to recommend and quote on equipment without charge.

Perfect for Gym classes in schools.

We now have tape No. 102 and tape No. 104. Both are 20 number tapes (each with different numbers). These two may be spliced by users that have 2400' reels for a two-hour program. Our third release is scheduled for December 1st, and others will follow each two months. Start your collection of WEB BACKGROUND ORGAN MUSIC TAPES now, with 102 or 104, or both and follow up with each future release.

\$9.85 (Each)

At leading electronic, department, music or record stores. If not available in your locality, we will ship postpaid on receipt of remittance (NYC, please add 3% tax.)

### WEB MUSIC PUBLISHING CO.

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CHRISTMAS SPECIAL — ALL CHIMES — HOLIDAY SEASON NUMBERS — 30 Mins. — 600 ft., 7½ ips, Dual Track. \$6.85 pp.

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**New VU Magnemite\***



**Spring-Motor  
Battery-Operated  
Magnetic Tape Recorder**

Now you can consistently make professional recordings under the most gruelling field conditions. Tapes will faultlessly play back on all professional and home recorders. Ruggedly designed for maximum dependability and top-notch efficiency. Combines unlimited versatility of performance with extreme simplicity of operation. Choice of fourteen models available for every conceivable application.

Incorporates a multi-purpose VU monitoring meter for precise setting of recording level without earphone monitoring. Meter also accurately indicates condition of "A" and "B" batteries. Five single speeds as well as two, three and 4-speed models available. Units weigh only 19 lbs. with batteries and measure 6½" x 9½" x 14¼". Higher speed models meet NARTB standards. All recorders are guaranteed for One Full Year.

Write for complete technical specifications and direct factory prices to Dept. TR

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## The NEW PRO-TEX

Non-Magnetic  
**REEL CLIP**

for tape and 8 mm film

- Snaps into place without picking up reel
  - Keeps tape and film neatly wound
  - Durable. Fully guaranteed
- For 5" reels 45¢ ea.  
For 7" reels 50¢ ea.  
Postpaid. Enclose check with order.

**PRO-TEX REEL BAND CO.**

247 Film Building, Cleveland 14, Ohio

## SPLICES MAGNETIC TAPE

Neatly - Quickly - Easily

Kit includes plastic splicer which adheres to recorder or worktable, generous supply of pre-cut tape splicing tabs, handy blade, instructions and plastic case. Only \$1.50 postpaid. If your dealer can't supply you, order from ...

**COUSINO, INC.**

2558 Madison Ave.

Toledo 2, Ohio

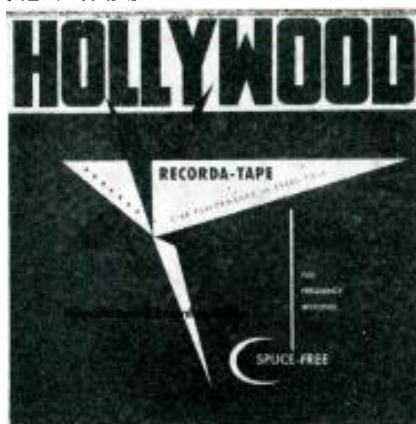
## WORLD'S FINEST SELECTION OF RECORDED MUSIC ON TAPE

Opportunity of entering Future Hits Contest. Write today for your catalog of Listening Pleasure. Hack Swain, A-V Tape Libraries, Audiosphere, Web

**EFSCO SALES COMPANY**

270 Concord Avenue West Hempstead, N. Y.

## NEW TAPE



A new entry into the field of magnetic tape manufacture is Ferroprint, 7273 Santa Monica Blvd. Hollywood 46, California who has brought out their Hollywood Record-a-tape. The tape is available in the standard size reels and each box contains self adhesive labels for reel and box identification. The 7 inch reel has the standard 2¼" hub. The tape has a pre-coated base for greater strength and the coating thickness is controlled to within plus or minus .00002 inch. It is given a "hard coat" treatment that eliminates squeal, tackiness and curl. The firm also markets Ferro Ink, a solution which when applied to the tape makes the sound track visible. It does not damage the tape in any way, is non-toxic and non-inflammable. It is useful in head aligning and editing. A four ounce bottle sells for \$1.25. For full details on the Hollywood Record-a-tape or Ferro ink write to address above.

## NEW REEVES TAPE

Reeves Soundcraft, 10 East 52nd Street, New York 22, N. Y. has announced their new "Plus 50" long playing tape. One reel equals 1½ reels on either recording or playback. The full depth coating is coated on 1 mil DuPont Mylar base. No machine adjustments are needed to use the new tape and it may be spliced with other tapes with no change in level. The 5" reel containing 900 feet of tape lists at \$4.40 and the 7" reel holding 1800 feet for \$7.95. Other

# TAPE CLUB NEWS

### Tape Replaces Flower

A reel of recording tape provided a quick and appropriate means of identification for two Voicespondence Club members who were seeing each other in person for the first time.

When Voicespondent Erik Lindgren of Lund, Sweden, made his first visit to England during his vacation he arranged to meet Voicespondent Leslie Murray of London in the busy railroad station. Instead of the conventional flower in the button-hole, Murray carried a seven inch reel of tape in his hand as he walked the concourse. Lindgren spotted the tape quickly and introduced himself.

So warm are the friendships formed through voicespondence that Murray is now visiting Lindgren in Sweden during his vacation.

### Goetz Operation Success

Fred Goetz, secretary of Voicespondents International, is now out of the hospital and on the road to recovery from a serious operation. Fred is gradually getting up steam but it will be some time before he will be able to work more than an hour or two a day. He asks the kind indulgence of the club members during the convalescent period.

### Wants Statewide Club

Col. John W. Kearney, 913½ Main Street, Daytona Beach, Florida would like to start a club in Florida. Those in the Daytona Beach area could meet for regular sessions. Those interested write to him at the address given.

(Continued Next Page)

reel sizes are available. Write the company for full details.

## BINAURAL HEADS



The Dactron Distributing Company, 104 Spruce Place, Minneapolis, Minnesota is marketing the new Dactron Binaural Stereophonic Microdaptor. The new unit converts any tape recorder into a binaural recorder which will play the binaural tapes now on the market. This new Hi-Fi development utilizes the recently released Dynamu miniature high fidelity magnetic record and playback tape pickups manufactured by Maico. The company states that it makes possible for the first time the use of a binaural sound attachment for home recorders with a frequency response available from 20 to 15,000 cps to the input of the amplifiers at 7½ ips tape speeds.

The only tool needed to attach the unit is a screwdriver. Various models have been designed for the different makes of recorders. In addition to the binaural tapes, the heads will play standard half-track tapes. Marching accessory pre-amplifiers and professional quality record-playback amplifiers are also being offered. The price for the model to fit the Webcor is \$49.00 with other models varying slightly from that. Full details and free brochure from Dactron.

## TAPE RECORDER DIRECTORY ISSUE

The September-October issue of Audio Record, published by Audio Devices, 444 Madison Avenue, New York 22, N. Y. contains a rundown on many present day recorders including pictures, specs and prices. Copies are free for the asking.





Don and Millie Edwards add the third voice.

Most persons who have more than one recorder have experimented with multiple recording but this voicespondence club group made multiple recording in three different states.

Bob Crouse, of Littlestown, Pennsylvania made the original tape by singing while accompanied by his church pianist. The tape was then mailed to Lil and Wally Koechel of Maywood, New Jersey where Wally, with the help of his two recorders added Lil's voice to Bob's. The new tape, now containing two parts was then sent to Millie and Don Edwards in Fort Wayne, Indiana so that Don, with his two recorders could engineer the addition of Millie's voice in order to complete the trio.

#### Wants to Start Local Tape Club

Harry W. Tuckey, 1275 Geary Road, Walnut Creek, California would like to hear from recorder owning residents of Contra Costa County, California with the purpose in mind of starting a local club to swap recordings, discussions. Write to him at the above address if you are interested.

#### Tips from Tape Topics

Tape Topics, the paper of World Tape Pals mentions that the Rev. W. R. Phinney of New York has found that 8 mm. movie film reels are the same size as the 3 inch tape reels and may be had for the asking from plants who process movie film. Also, the metal tape boxes in which adhesive cellophane tape is packed by Scotch brand are ideal for mailing the small reels.

#### ROSTER OF CLUBS

Write to the club of your choice for full details and dues. Corresponding via tape is a heartwarming experience. Try it.

The secretaries of the tape correspondence clubs will deeply appreciate receiving a self-addressed stamped envelope from those making inquiries about membership. As most of the clubs' expenses are caused by postage anything that will lessen the burden will be helpful. So when writing, slip in some extra stamps.

#### 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

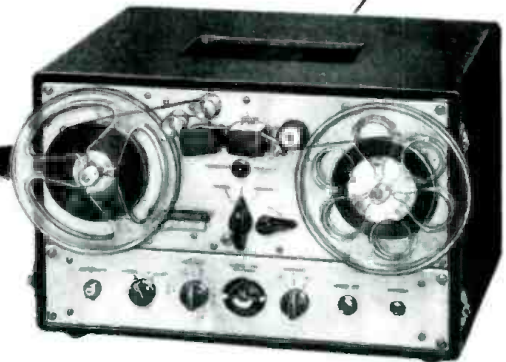
#### TAPEWORMS INTERNATIONAL

Art Rubin, Secretary  
546 Ocean Point Ave., Cedarhurst, L. I., N. Y.

the finest  
gift you  
can  
listen to!



## the New M30 and M33 Magnecorders



*Magnecord... the professional's choice in tape recorders. Now, the M30, priced for home use.*

Listen to everything you love to hear — preserved with true-to-life, full-range brilliance on tapes that never wear out. Only the M30 and M33 Magnecorders can give you *full* listening pleasure from tape at home-use cost. Magnecord makes the most widely used professional tape recorders in the world. Your Magnecord dealer is listed in the classified telephone directory — see "Recorders."

M30  
only  
**\$299**

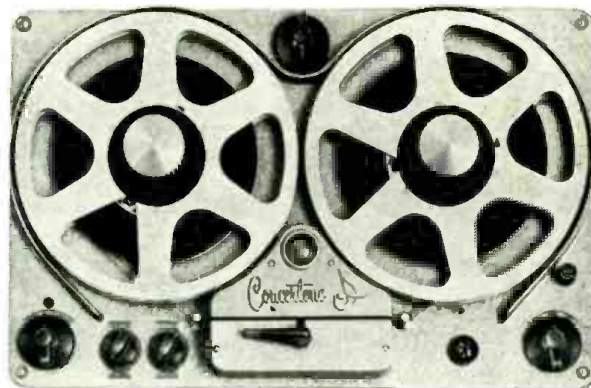
**magnecord, inc.**

1101 S. KILBOURN AVENUE, CHICAGO 24, ILLINOIS • Dept. MF-11

*the professionals are adding*

## **CONCERTONE**

*for Christmas...* ❄️



**BECAUSE** it completes  
the home audio system.

- it's the lowest priced tape recorder with *all* of the listening and operating qualities of costly professional models.
- up to 2 hours continuous recording.
- monitors from tape while recording.
- flawless tape motion—3 separate heavy duty motors; 2-speed direct drive—minimum wow and flutter.
- horizontal or vertical operation.

**BECAUSE** with Concertone; "... just like being there!"

**AND BECAUSE** until Christmas 1501 Concertone is priced at \$345, CARRYING CASE INCLUDED!

WRITE FOR BROCHURE NO. 11 N

### **SPECIAL HOLIDAY GIFT OFFER:**

Handsome carrying case  
(Model 505C, user's net \$47.50)  
free with any 1500 Series recorder.

Models 1501 and 1503,  
Fair Traded at professional  
users' net (including case)— **\$345**  
Model 1502 (including case)—\$445.

SUPPLIES LIMITED. OFFER MAY BE WITHDRAWN AT ANY TIME WITHOUT NOTICE.



# Berlant & Concertone

4917 W. Jefferson Blvd., Los Angeles 16, Calif.

*Manufacturers of Berlant studio recorders and accessories*

THE FOLLOWING FRANCHISED DISTRIBUTORS ARE FEATURING THIS SPECIAL PROMOTION:

#### **BALTIMORE**

Hi-Fi-Shop, American Distrib. Co., 2 No. Howard St

**BELLINGHAM, WASH.**

Wolikus Supply, 110 Grand Ave.

#### **BEVERLY HILLS**

Talk-O Communication Co., 407 Commercial St.

#### **CANTON**

Groshan Camera Center, 331 Cleveland Ave. No. W

#### **CHICAGO**

RPO Arthur Hagel, Inc., 918 E. 55th St.

Voice and Vision, 53 E. Walton Place

#### **CINCINNATI**

Customcrafters Audio, Inc., 2259 Gilbert Ave.

#### **CLEVELAND**

Olson Radio Warehouse, 2020 Euclid Ave.

Pioneer Electronic Supply, 2115 Prospect

#### **COLUMBIA, S.C.**

Dave Radio Supply, 1628 Laurel St.

#### **DETROIT**

K.L.A. Laboratories, 7422 Woodward Ave.

#### **GLENDALE**

Glendale Recorders Co., 319 No. Central Ave.

#### **GRAND RAPIDS**

Radio Parts, Inc., 542-548 So. Division

#### **HOUSTON**

Wrye Co. Ltd., 2045 Welch

Audio Center, Inc., 1633 Westheimer

#### **JAMAICA, N.Y.**

The Audio Exchange, Inc., 159-19 Hillside Ave.

#### **JUNEAU, ALASKA**

Alaska Radio Supply, Box 2538

#### **LOS ANGELES**

Gateway to Music, 3089 Wilshire Blvd.

Los Angeles Portable Recorders, 521 No. La Cienega

#### **MINNEAPOLIS**

Paul A. Schmidt Music Co., 88 So. Tenth

#### **NASHVILLE**

Nicholson's High Fidelity, 105 Eighth Ave. North

#### **NEW YORK**

Goody Audio Center, Inc., 235 W. 49th St.

Grand Central Radio, Inc., 124 E. 44th St.

Heins and Bole, 68 Cortlandt St.

Leonard Radio, 69 Cortlandt St.

Peerless Camera Stores, Inc., 415 Lexington Ave.

Sonocraft Corp., 115-117 W. 45th St.

Terminal Radio Corp., 85 Cortlandt St.

#### **OAKLAND**

W. D. Brill Co., 10th & Jackson Streets

#### **PITTSBURGH**

Radio Parts Co., 929 Liberty Ave.

#### **RENO**

Art Rempel Sound Service, 460 Wells Ave.

#### **SAN DIEGO**

Breier Sound Center, 3781 Fifth Ave.

#### **SAN FRANCISCO**

High Fidelity Unlimited, 211 So. San Mateo Dr.

San Francisco Radio Supply, 1282 Market St.

#### **SEATTLE**

Seattle Radio Supply, Inc., 2117 Second Ave.

Western Electronic Supply Co., 717 Dexter Ave.

#### **SPOKANE**

20th Century Sales, Inc., 1021 W. First Ave.

#### **ST. LOUIS**

Aeolian Co. of Missouri, 1004 Olive St.

#### **TORONTO, CANADA**

Custom Sound and Vision, 390 Eglinton Ave. W.

#### **TUCKAHOE, N.Y.**

Boynston Studio, 10 Pennsylvania Ave.



## *Tape Times the Ice Show*

by  
*Bert Ennis*

... the gay extravaganza of "Holiday on Ice" is perfectly timed by magnetic tape.

**T**HE whirling, dashing figures in the 10th Anniversary edition of "Holiday on Ice" are examples of precision timing akin to that of acrobats. Skaters traveling at high speeds in the interlocking movements of the extravaganza must be where they are supposed to be—when they are supposed to be. A failure in timing may mean a spill that breaks the mood of the show, or worse, an injury to a valuable star.

For perfect timing the management of the show has turned to tape and to the Altec Service Corporation for one of the most elaborate tape consoles in show business. It is practically failure proof, with two of everything, including feed power lines.

Because the music to which the skaters move may be variable when a live orchestra is used, the whole performance has been put on tape—and the live musicians play along with the recording.

Following the selection of a particular story theme to be interpreted via blades by the cast of "Holiday on Ice", a series of meetings takes place between the choreographer,

the musical arranger and the orchestra conductor, in collaboration with the skating master. The theme for the current edition of the show is the famed musical comedy "The Merry Widow." The entire score is played and musical excerpts selected which will fit precisely the movements of the skaters.

A tempo is chosen to permit fluidity of skating movement. A rough tape recording is then made of the musical excerpts and tried out. Bars of music are then deleted at various points on the tape to more perfectly synchronize the movement of the skaters with the musical score. Sometimes the skating formations are lengthened to coincide with the recorded music.

A completed tape recording is then made and re-recorded, at which time a six beat tempo is added ahead of the

The "East Indian Fantasy" is part of the 1955, Tenth Anniversary Edition of "Holiday on Ice" the show that is timed by tape. An Altec Cyclosonic control console sets the pace for the production.



Equipped with a head set and chest plate mike, Wayne Thompson, master of ceremonies of "Holiday on Ice" operates the Cyclosonic audio control console. The unit has a dual amplification system permitting interchangeability in case of a component failure.

opening notes of the entire musical score. The number one recorder is threaded and made ready for operation and the auditorium loud speakers are muted so the recorded beat is audible only to the conductor through the headphones which he wears during the entire performance.

At the conclusion of the sixth recorded beat, alerting the conductor, he raises his baton as a signal for the live orchestra to synchronize their playing with the recorded music. When the music on tape comes up in volume over the speakers, live and recorded music are in perfect synchronization and in perfect time. By means of this procedure, the vocals and instrumentation on tape may supplement the music produced by the show's orchestra or vice versa.

The master of ceremonies who operates the audio console is equipped with a chest mike for loudspeaker announcements and he also wears a set of headphones which enables him to hear the sounds received by the musical conductor.

The chest plate mike is also used for the vocals contributed throughout the performance by the master of ceremonies. His introductions of show numbers, running comments and the promotion of program sales, etc., are also picked up by the mike.

The console is completely portable and moves with the

show from city to city. Usually it is set up near the bandstand so the master of ceremonies can keep an eye on the whole performance.

The speakers are also carried along and set up in each arena or hall to give the best possible sound reproduction. As no two auditoriums are alike, the engineers must figure out the best positions for the #600 Altec Lansing loud-speaker systems in each location.

Basically there are two types of auditoriums in which the show appears, one, where the length is greater than the width and the other where the width is greater than the length. If the auditorium is longer than wide, the speakers are placed so that the axis of each unit is parallel to the edge of the ice. The sound distribution of the speakers will then fill the auditorium.

When the auditorium is wider than long, the speakers are set up to give a "cross fire" pattern. The right hand speaker system thus points to the extreme left-hand corner of the auditorium and the left-hand speaker to the extreme right-hand corner. The only controlling factor is the amount of volume that can be applied to the speakers before feedback begins to occur through the mikes.

Careful records are kept on the placement of the speakers in each location so that when the show returns for another

engagement the units can be placed without loss of time in experimenting to find the best location.

The Cyclosonic console is a marvel of complexity in its switching circuits yet may be controlled easily with but a few switches. It is equipped with two power line inputs which are metered to assure the correct voltage is present before the amplifiers are switched on.

Two Ampex 350 tape mechanisms feed to separate pre-amp and power amplifier systems. There are two separate and distinct tape reproducing systems controlled by the switches in such a manner that either may be used in its entirety or any major component may be switched into the other. In unit number 1, for instance, there is the tape recording and reproducing mechanism which feeds the pre-amplifier number 1. This in turn is connected to power amplifier number 1 and thence to the speakers. The set-up is exactly duplicated in unit number 2.

If anything should go wrong, say a tube in pre-amp number 1 should blow, it can be switched out of the circuit in an instant and replaced by pre-amp number 2. The same holds true for the other components.

In addition to the tape recording and reproducing systems the console also controls the output volume of the speakers,

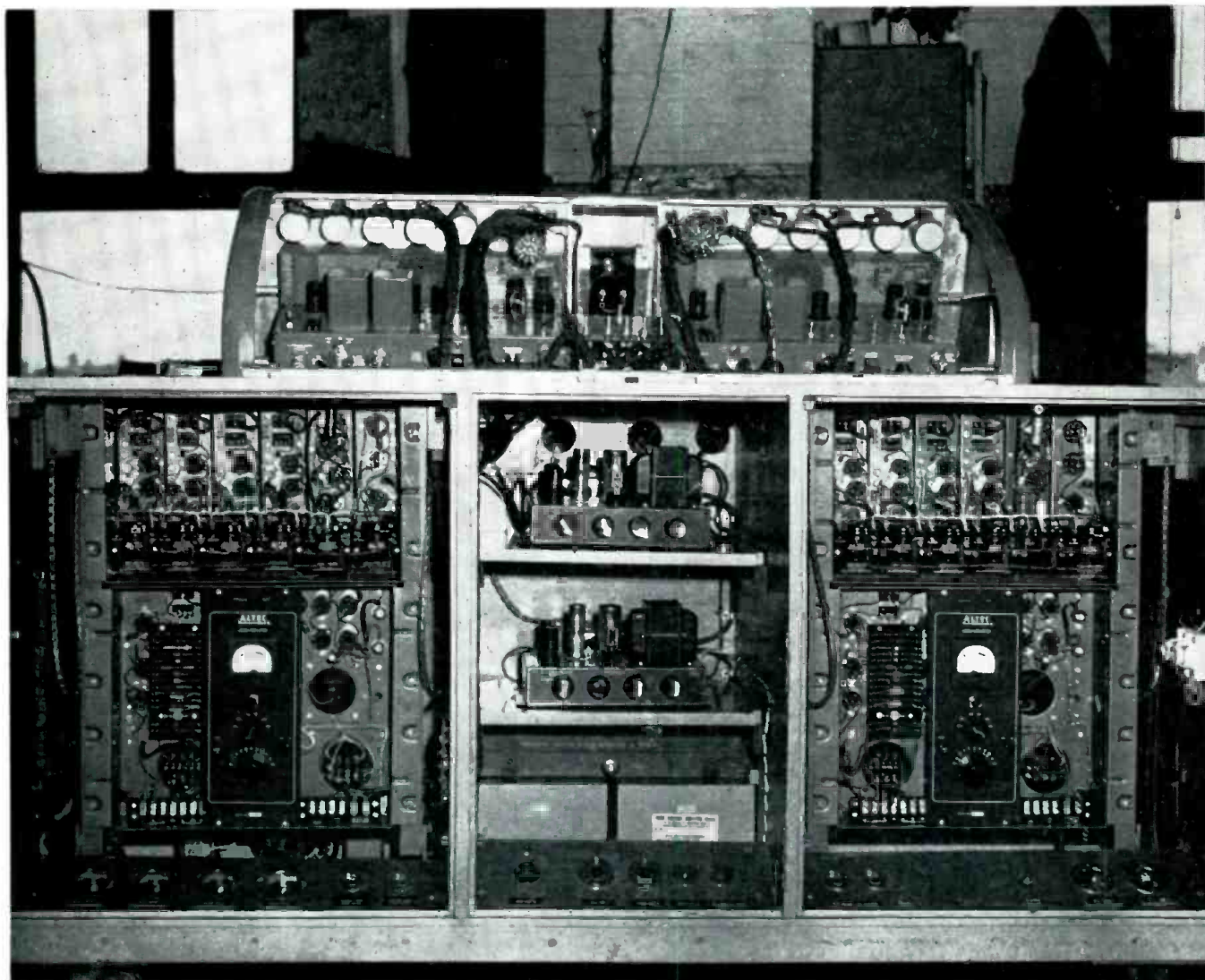
the switching from one mike to another, the changing from record to playback on either or both machines, and the monitoring by both the master of ceremonies and the orchestra conductor.

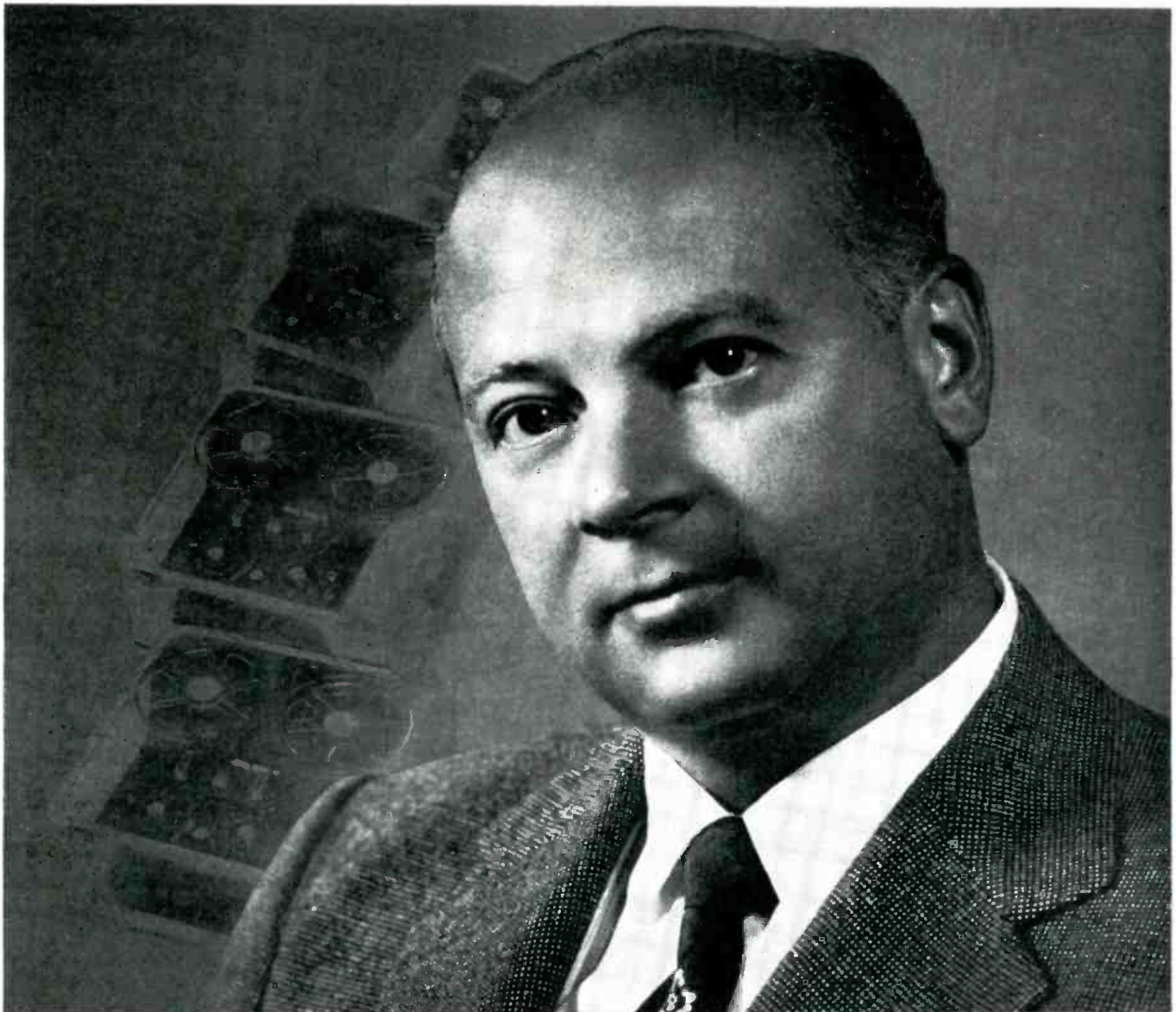
The problem of servicing has been well thought out with the consequence that all parts are readily accessible for quick action. The panels which hold the pre-amplifier and power amplifiers are on a pivot arrangement so that they can be swung down to a horizontal position where they are held by a chain. This permits servicing both sides of the panel with maximum ease.

The Cyclosonic control console will also permit the re-recording of tapes when it is desired to add additional selections or vocals to the existing reel. The reel is placed on machine number 1, which is then played into machine number 2 in record position. The mike inputs are mixed with the signal to make a new tape.

Another very convenient arrangement, and one which permits the interchangeability of the two units is the fact that once the volume levels have been set on machine number 1, the controls for machine number 2 when set at the same positions will give exactly the same output. Tapes can be run through synchronously for instant switchover or two

The rear of the Cyclosonic, which is exclusive with "Holiday on Ice," shows the details of the dual amplification system. In the turret on top are the amplifiers for the twin Ampex recorders. In the compartment at the left is a complete set of Altec pre-amplifiers and power amplifiers, which is exactly duplicated in the compartment on the right. In the center is the monitor system.





*Irving Rossman*

President - The Pentron Corporation  
Largest Exclusive Manufacturer of Tape Recorders

**REASONS WHY MR. IRVING ROSSMAN USES**

**STERLING PERFORMANCE!**

Encore is the newest of all recording tapes...scientifically developed for brilliant, artistic sound reproduction.

**LABORATORY QUALITY!**

Every inch of Encore Tape is precision-tested and laboratory bonded for uniformity, freedom from noise and distortion, and unvarying output from reel to reel.

**EXCLUSIVE SCIENTIFIC MANUFACTURING PROCESSES!**

These insure optimum sensitivity, without loss of quality, adherence of oxide coating, maximum tensile strength, longest shelf-life and splice-ability.

**BUILT-IN CONVENIENCE AND EXTRA VALUE!**

Without extra cost, Encore Tape provides the "extras" needed to preserve superior audio performance. Every reel is packed in a polyphane bag, with spliced color-coded leader for extra cue time, and 5 full inches of Encore splicing tape—a complete recording package!

**Encore**  
**RECORDING TAPE**

Developed and manufactured by  
the Electro-Magnetic Products Division,

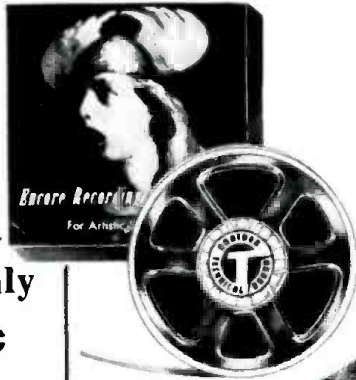
**TECHNICAL TAPE CORP., Morris Heights, New York 53, N. Y.**  
Distributed in Canada by Canadian Technical Tape, Ltd., 5541 Papineau Ave., Montreal



*Encore means more in recorded results — Just try it!*

.. THE ULTIMATE .. PRESENTS A UNIQUE IDEA ...

# The First Encore Treasure Tape



A memorable achievement on tape ... **NOT** for sale in any other manner, at any price!

You pay only **50c** Returnable  
 (if you wish) with the purchase of a standard 5", 7" or 10 1/2" reel of Encore Recording Tape — the same quality as Treasure Tape.

An excerpt from the master tape of Westminster Recording Album WL5282 containing: 1812 Overture Romeo & Juliet March Slav

## WHAT IT IS ...

Simply stated—this is an excerpt duplicate of the actual master tape from which one of the finest high fidelity records now on the market has been made...

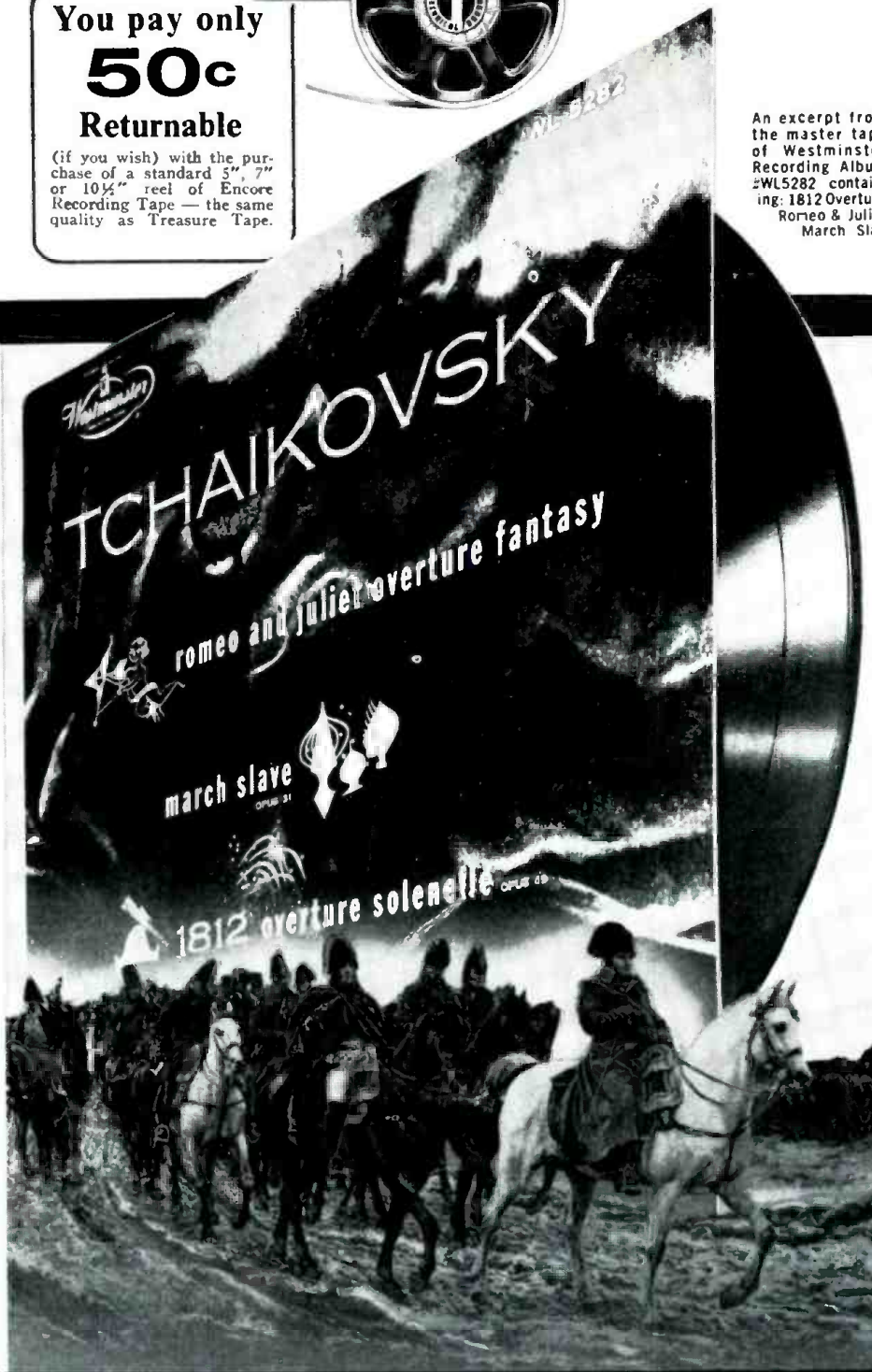
### WESTMINSTER'S magnificent recording of the 1812 OVERTURE by TCHAIKOVSKY

played by the London Symphony Orchestra Conducted by Hermann Scherchen

Of the more than 12 long playing versions of this beloved music which are now available, we have no doubt that a huge percentage of the public and experts alike will consider this the finest! Westminster's entire reputation and meteoric success have been built upon recordings of such startling musical quality and realistic, "balanced" reproduction!

Now—to prove the superiority of *Encore* over all other recording tapes, regardless of price — we offer you a full 9-minute excerpt from this Westminster Album, made on the same tape recorder which processed the original master with a frequency response to 15,000 cycles! This *Encore* "Treasure Tape" is not "for sale" in the ordinary sense. Its purpose is to prove that you can obtain excellent results with your own tape recorder, on *Encore* Tape.

If you are fortunate enough to have a record player and a tape recorder, buy the Westminster Album, No. WL-5282 and enjoy the full 50 minutes of music it contains. Then compare the sound with this *Encore* Treasure Tape. You will never tire of the experience! Play the Treasure Tape and compare the sound with any other tapes you have used. Let the *Encore* "Treasure Tape" be the yardstick to measure the results you can achieve with your own tape recorder, on *Encore* Tape and *Encore* Tape alone!



## HOW YOU GET YOUR ENCORE TREASURE TAPE ...

The series of Treasure Tapes (this is the first) are not for sale in any other manner than as stated in this advertisement. Go to your nearest high fidelity dealer and ask for one. It will cost you 50¢, which is returnable, on the purchase of any standard reel of *Encore* Recording Tape. If your dealer cannot provide the Treasure Tape, or is "sold out," mail the coupon. Send no money. We will supply a list of dealers who will be glad to serve you with this and all future Treasure Tapes.

**IMPORTANT!** *Encore* is not a pre-recorded tape. *Treasure Tapes* are not for sale, except as a demonstration of the recording quality you can obtain using your own tape recorder.

For list of dealers — mail this coupon — Send no money!

**SPECIAL OFFER:**  
 You pay only 50¢ returnable (if you wish) with the purchase of a standard 5", 7" or 10 1/2" reel of *Encore* Recording Tape—the same quality as your *Treasure Tape*.  
 Because of the anticipated demand, this offer is necessarily subject to cancellation or

**TECHNICAL TAPE CORP.** Dept. MF12  
 Morris Heights, New York 53, N. Y.  
 Gentlemen:  
 Please send me a list of dealers who carry the series of *Encore* Treasure Tapes.

Name: .....  
 Address: .....  
 City: ..... Zone: ..... State: .....



It takes timing as accurate as an acrobat's to swing stunts like this and the taped music of the show provides the steady, even tempo necessary. This bit is from Paul Hagen's hilarious skit, "Ho, For the Life of a Sailor." Joan Hagen of the "Glamour Icers" is doing the swinging.

different tapes may be used.

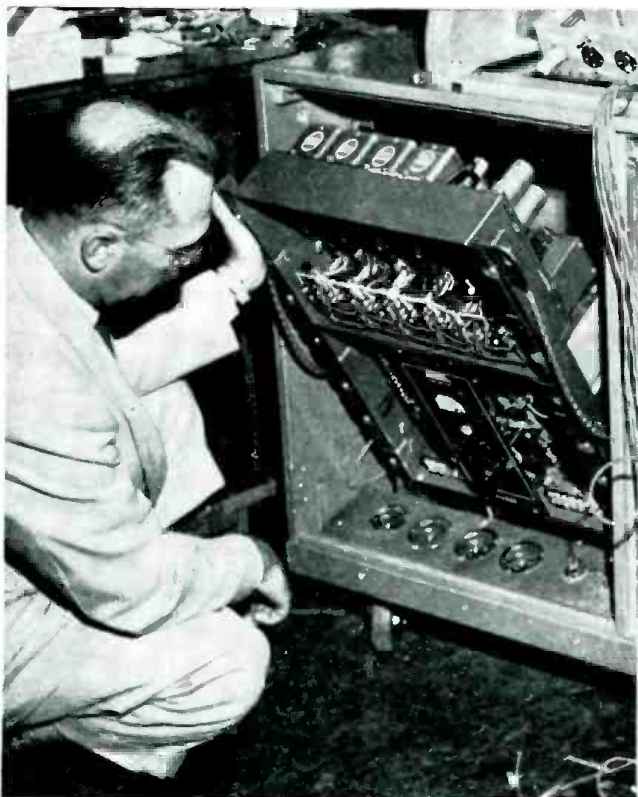
While the home recordist will never make a rig as elaborate as this for his own recording activities it does contain a few ideas which he can use, especially if he is a two recorder man.

By making a panel board, properly wired and shielded the same sort of switching over and mixing of mike and recorder inputs can be used. This will enable him to make

multiple track tapes, to re-record from tape to tape, or add comments to an existing tape by the re-recording method.

The layout of the Cyclosonic, its neatness and workability can also serve as a model of the way things should be done.

When you go to see "Holiday on Ice" as it visits your town, keep an eye out for the Altec Cyclosonic console—if you can take your eyes from a perfectly timed ice show—thanks to tape.



The amplifiers are pivoted for instant servicing or adjustment. Here Altec engineer Martin Bender shows how the unit swings down.



Jinx Clark stars in Franz Lehar's "The Merry Widow," secure in the knowledge that the music on tape will keep the time perfectly.





Seymour N. Siegel, Director of the Municipal Broadcasting System, WNYC, New York, originator of the educational tape network.

# The NAEB Tape Network

by  
Mildred Stagg  
New York Editor

. . . the best in music, the best in drama is the goal of this unique radio network that uses tape instead of wire circuits. It was created to satisfy the 30% to whom regular radio did not appeal

**A**MONG the milestones in the history of popular education, tape already occupies a prominent marker. Along with the invention of printing, tape recording is skimming off the cream of Western civilization and putting it into permanent form. But unlike the famous five-foot shelf of books that often gathers more dust than readers, tape recordings of the best in the arts and sciences make fascinating listening. The Tape Network has accumulated a library of 900 masterpieces. These are constantly in demand, yet the general public is still far from fully aware of all the treasures they can hear from their non-commercial broadcasting stations. And few tape recording enthusiasts realize the unique opportunity that is theirs to record rare and valuable material that is available only to the Tape Network.

The "Tape Network" is operated by the National Association of Educational Broadcasters. This is a non-profit organization composed of institutions, school systems, groups and individuals engaged in non-commercial educational broadcasting. This network is a dream come true for Seymour N. Siegel, the director of the Municipal Broadcasting System, WNYC of New York City. This dedicated young man declared that tape alone enabled the NAEB to assemble these programs and to offer a library of them to members of the Association.

The enterprise started with Siegel's acquisition of a paper tape recording machine back in 1946. The instrument just sat around and gathered dust for awhile. No one realized its possibilities until Siegel thought of recording some music that wasn't available in disc form. The tape machine was a pilot model of the Brush Sound Mirror and it really deserves a place in the Smithsonian. It was the nucleus of an idea that has developed into a method of immortalizing the evanescent arts. Through this kind of tape recording the network has made substantial gains in building and cementing relations among the thinking men of good will throughout the world.

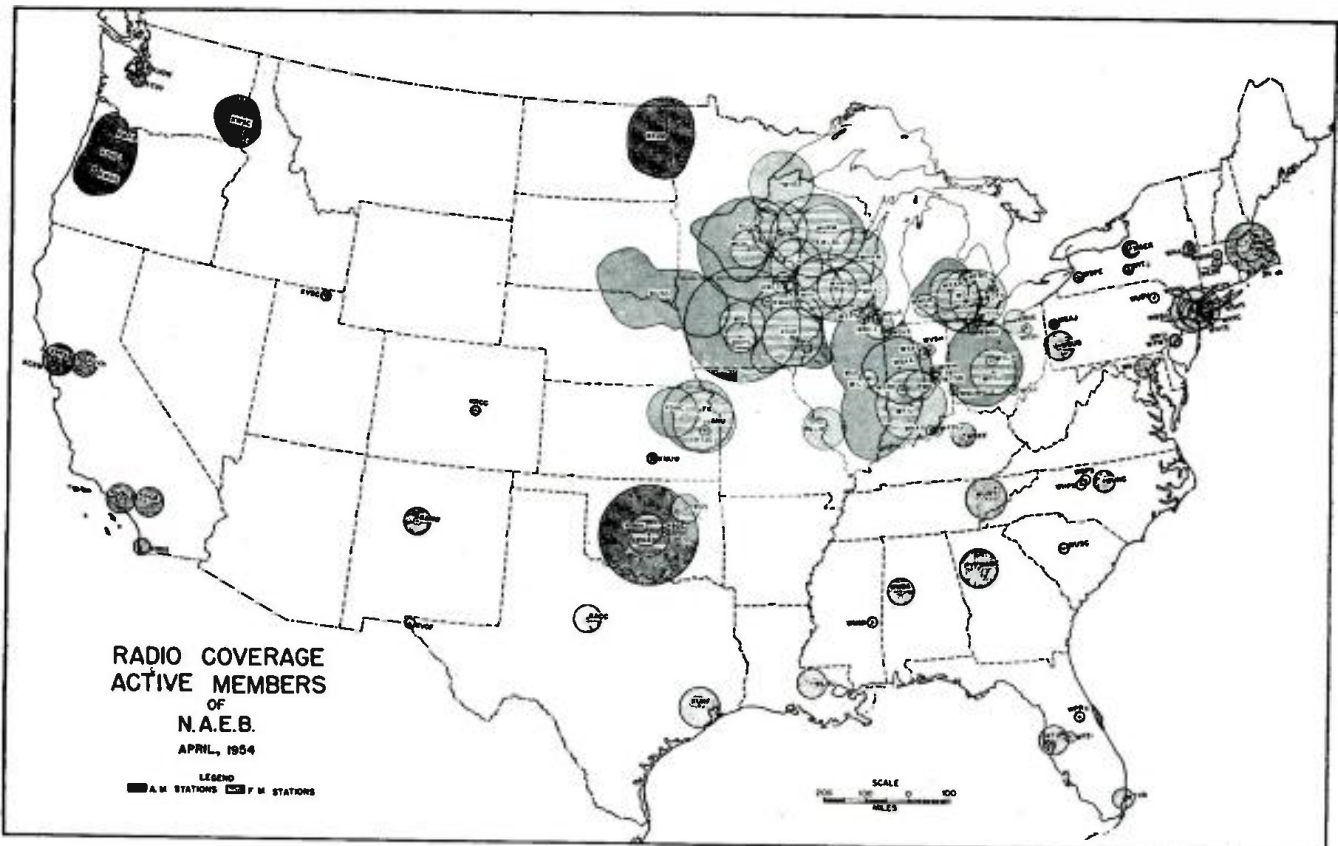
You may ask where an audience can be found with an appetite for this rather intellectual mental food. You may even quote the survey that discovered the intelligence quotient of the average radio listener equalled that of a 12 year old child. Well, it was precisely such a survey that

started Seymour Siegel thinking about an audience in exalted terms. This survey was undertaken in 1949 by commercial radio. The question asked was "What do you think of radio?"

70% of those interviewed said "Superlative!" "What about the other 30%?" was the educational broadcasters' answer. "Why not look out for the interest of the third of the nation that's dissatisfied." So WNYC became a station dedicated to the minority, those who demand more than mere entertainment and advertising in return for their listening time. It is for this select group that Sir Cedric Hardwicke, Vanessa Brown and Mildred Dunnock come to station WNYC to read their favorite poems. They choose, prepare and rehearse the poems themselves; and they neither expect nor receive compensation. And for this same audience three Fulbright scholars interview the finest minds in Rome, London and Paris on their specialities. For a report on England's economic situation, for instance, the authority was Lord Beveridge, the savant who founded the current British financial structure. The tape recording fan can make any of these features his own to enjoy, to study and to share with likeminded friends.

But we're ahead of our story. The tape network came into being because Seymour Siegel was deeply impressed by a series of programs that WNYC had broadcast called "We Human Beings." He thought that other non-commercial stations might also like to put them on the air. When he queried some other stations the response was so great that the group multiplied like rabbits rather than the human beings in the title. The Cooper Union Foundation gave them about \$600.00 worth of tape and WNYC did the routing. Instead of the few stations that Siegel hoped might take advantage of his offer, within six months there were 35 stations using the service.

WNYC bore the entire burden. Soon it reached a point where everyone at the station had two jobs, a regular 8 hour stint on his own work, and another full time chore for the tape network. The overtime was rated at 1½ times regular pay, and 1½ times nothing was what they all received. Only an offer from the Division of Communications of the University of Illinois saved the program. The university offered free space and the headquarters were moved



If you live within one of the circles above on the map you can hear the treasures on tape broadcast by the NAEB tape network.

**ALABAMA**

University WUOA (FM) 91.7 mc

**CALIFORNIA**

Berkeley KPFA (FM) 91.4 mc  
 Los Angeles KUSC (FM) 91.5 mc  
 San Bernardino

KVCR (FM) 91.9 mc  
 San Diego KSDS (FM) 88.3 mc  
 San Mateo KCSM (FM) 91.1 mc  
 Stockton KCVN (FM) 91.3 mc

**COLORADO**

Colo. Springs KRCC (FM) 91.3 mc

**FLORIDA**

Lakeland WFSI (FM) 88.1 mc  
 Miami WTWS (FM) 91.7 mc  
 Tampa WTUN (FM) 105.7 mc  
 Winter Park WPRK (FM) 88.1 mc

**GEORGIA**

Atlanta WABE (FM) 90.1 mc

**ILLINOIS**

Chicago WBEZ (FM) 91.5 mc  
 Elgin WEPS (FM) 88.1 mc  
 Evanston WNUR (FM) 89.3 mc  
 Urbana WILL (AM) 580 kc  
 Urbana WIUC (FM) 91.7 mc

**INDIANA**

Bloomington WFIU (FM) 103.7 mc  
 Gary WGVE (FM) 88.1 mc  
 Greencastle WGRE (FM) 91.7 mc  
 Huntington WVSH (FM) 91.9 mc  
 Indianapolis WAJC (FM) 91.9 mc  
 Lafayette WBAA (AM) 920 kc  
 Muncie WWHI (FM) 91.5 mc  
 New Albany WNAS (FM) 88.1 mc  
 New Castle WYSN (FM) 91.1 mc  
 Wabash WSKS (FM) 91.3 mc

**IOWA**

Ames WOI (AM) 640 kc  
 Ames WOI (FM) 90.1 mc

Decorah KWLC (AM) 1240 kc  
 Des Moines KDPS (FM) 88.1 mc  
 Iowa City WSUI (AM) 910 kc  
 Iowa City KSUI (FM) 91.7 mc  
 Waverly KWAR (FM) 89.1 mc

**KANSAS**

Lawrence KFKU (AM) 1250 kc  
 Lawrence KANU (FM) 91.5 mc  
 Manhattan KSAC (AM) 580 kc  
 Ottawa KTJO (FM) 88.1 mc  
 Wichita KMUW (FM) 89.1 mc

**KENTUCKY**

Lexington WBKY (FM) 91.3 mc  
 Louisville WFPL (FM) 89.3

**LOUISIANA**

Baton Rouge WLSU (FM) 91.7 mc

**MARYLAND**

Baltimore WBJC (FM) 88.1 mc

**MASSACHUSETTS**

Amherst WMUA (FM) 91.1 mc  
 Boston WBUR (FM) 90.9 mc  
 Boston WGBH (FM) 89.7 mc  
 Springfield WEDK (FM) 91.7 mc

**MICHIGAN**

Ann Arbor WUOM (FM) 91.7 mc  
 Detroit WDTR (FM) 90.9 mc  
 Detroit WDET (FM) 101.9 mc  
 East Lansing WKAR (AM) 870 kc  
 East Lansing WKAR (FM) 90.5 mc  
 Flint WFBE (FM) 88.9 mc  
 Kalamazoo WMCR (FM) 91.1 mc

**MINNESOTA**

Minneapolis KUOM (AM) 770 kc  
 Northfield WCAL (AM) 770 kc  
 Northfield WCAL (FM) 95.7 mc

**MISSISSIPPI**

Meridian WMMI (FM) 88.1 mc

**MISSOURI**

St. Louis KSLH (FM) 91.5 mc

**NEW JERSEY**

Newark WBGO (FM) 88.3 mc  
 South Orange WSOU (FM) 89.5 mc

**NEW MEXICO**

Albuquerque KANW (FM) 89.1 mc

**NEW YORK**

Bronx WFUV (FM) 90.7 mc  
 Brooklyn WNYE (FM) 91.5 mc  
 Floral Park WSHS (FM) 90.3 mc  
 Ithaca WITJ (FM) 91.7 mc  
 New York WNYC (AM) 830 kc  
 New York WNYC (FM) 93.9 mc  
 Springfield WSPE (FM) 88.1 mc  
 Syracuse WAER (FM) 88.1 mc  
 Troy WHAZ (AM) 1330 kc

**NORTH CAROLINA**

Chapel Hill WUNC(TV) Ch. 4  
 Chapel Hill WUNC (FM) 91.5 mc  
 Greensboro WGPS (FM) 89.9 mc  
 High Point WHPS (FM) 89.3 mc

**NORTH DAKOTA**

Grand Forks KFJM (AM) 1440 kc

**OHIO**

Athens WOUJ (FM) 91.5 mc  
 Bowling Green  
 WBGU (FM) 88.1 mc  
 WBOE (FM) 90.3 mc  
 Columbus WOSU (AM) 820 kc  
 Columbus WOSU (FM) 89.7 mc  
 Delaware WSLN (FM) 91.1 mc  
 Kent WKSU (FM) 88.1 mc  
 Oxford WAUB (FM) 88.1 mc  
 Toledo WTDS (FM) 91.3 mc

**OKLAHOMA**

Norman WNAD (AM) 640 kc

Norman WNAD (FM) 90.0 mc  
 Oklahoma City

KOKH (FM) 88.9 mc  
 Shawnee KBGC (FM) 89.9 mc  
 Stillwater KOAG (AM) 840 kc  
 Tulsa KWGS (FM) 80.5 mc

**OREGON**

Corvallis KOAC (AM) 550 kc  
 Eugene KWAX (FM) 88.1 mc  
 Portland KBPS (AM) 1450 kc

**PENNSYLVANIA**

Grove City WSJA (AM) 1340 kc  
 Philadelphia WPWT (FM) 91.7 mc  
 Philadelphia WRTI (FM) 90.1 mc  
 Pittsburgh WDUQ (FM) 91.5 mc  
 Scranton WUSV (FM) 89.9 mc  
 Pittsburgh WQED(TV) 210-216 mc

**SOUTH CAROLINA**

Columbia WUSC (FM) 91.1 mc

**SOUTH DAKOTA**

Vermillion KUSD (AM) 690 kc

**TENNESSEE**

Knoxville WUOT (FM) 91.1 mc

**TEXAS**

Abilene KACC (FM) 91.1 mc  
 El Paso KVOF (FM) 88.5 mc  
 Houston KUHF (FM) 91.3 mc

**WASHINGTON**

Pullman KWSC (AM) 1250 kc  
 Seattle KUOW (FM) 90.5 mc  
 Tacoma KTOY(FM) 91.7 mc

**WISCONSIN**

Madison WHA (AM) 970 kc  
 Madison WHA (FM) 88.7 mc

**PUERTO RICO**

San Juan WIPR (AM) 940 kc

to Urbana, Illinois.

Then the Kellogg Foundation gave \$279,000.00 which paid for a mass duplicating machine and established a headquarters. After a good deal of experimenting with the pilot model, headquarters now owns two duplicating machines, each producing 66 tapes per hour. Approximately 27,000 reels are distributed around the country, either in the mails, at stations or being duplicated. Some 90 stations are serviced for about 10 hours a week.

Programs are selected by a program committee composed of representatives of member stations in various parts of the country, and assembled at network headquarters where they are duplicated just for the tape network.

A. Alan Levin, assistant program director of WNYC, insists that lack of money is a contributing factor to the success of the tape network and WNYC. Ingenuity replaces the large budget enjoyed by programs sponsored commercially. Many innovations that were begun by the station with more ideas than dollars have been picked up and copied by commercial broadcasters. The educational foundations have endowed the network generously although the largest contribution ever received wouldn't pay for a single TV commercial spectacular. Nevertheless these non-commercial tapes eventually reach an enormous audience. But WNYC can't even afford a clipping service to keep its staff informed of the nice things that radio and music critics say about the programs.

One series of programs has even reversed the usual procedure of adapting radio dramas from books or plays. This series is the "Jeffersonian Heritage." The programs were written by top radio writers, and edited by Professor Dumas Malone of Columbia University as consultor. It starred Claude Rains. All 13 programs in the series were broadcast on the tape network here and abroad. Since the series is historic, it can be repeated forever. And because of the success of the radio series, Professor Malone has published a book of the same name using much of the identical material.

The series of which the "Heritage" is a part was undertaken in a grant from the Fund for Adult Education established by the Ford Foundation. It was intended to study the basis of foreign policy *toward* the U. S. A. rather than the other way around. Conferences were held with British and Canadian broadcasters. Although the difficulties were great each agreed to produce a program to suit the theme.

While he was abroad on this mission Siegel took a trip to the continent. In France he learned that French radio had a series of 10 minute speeches made by some of the finest minds in the country. Commercial radio had rejected the programs, but the tape network snapped it up. Another feat that Siegel accomplished in France is even more staggering. He thought the tape network might be able to secure international coverage as well as national. When he first sought international cooperation he used an unusual approach, and it may be responsible for his success. He asked the Europeans to do something for us instead of offering to give them something for nothing!

The French thought so well of this unique reversal of position that they offered him the entire, unabridged repertoire of the Comedie Francaise, 39 full length plays on tape. Can you imagine hearing the entire repertoire of the French state theatre, acted by the best actors and actresses in France? Few native Frenchmen have had an opportunity to hear all the plays—but any American within earshot of one of the 90 stations of the tape network can hear them.

Better still—you can tape any or all of them for your own use or the use of your friends who may be studying the language. You and they can learn to speak French as it is spoken by those whom the French use as a pattern for correct enunciation, by the Barrymores of the French theatre. And that doesn't even take into account the content of the plays, just about the greatest array of writing talent that the French theatre can boast!

When Siegel told the network about the prize he'd acquired, he hoped that at least five of the stations might take a chance and play some of the French masterpieces. 70 stations asked for all of them! Those 39 plays are a part of the tape network repertoire now as well as that of the Comedie Francaise. In addition, Siegel asked for—and received—tapes from all over Europe and England. He is now working on an exchange of tapes with Japan. Among the other masterworks that Americans can enjoy and tape at home are the Salzburg Festival from Austria.

An exchange of tapes, in Siegel's opinion, means just what it says. It's neither a one-way route with Europe offering the culture and the U. S. A. the audience nor vice versa. Foreign networks and stations are eager to play cultural non-propaganda tapes originated and made in this country. In the music world WNYC originated a program that is listened to by music lovers all over the world.

The station has conducted a music festival for more than 15 years. Universities, musical conservatories and private groups are invited to send tapes to the station for the festival. All other programs are either removed or made to conform to the musical theme of the day. The musical theme is a thread tying together all the programs during the festival.

The American Music Festival is broadcast in the period between Lincoln's and Washington's birthday. More American music is presented by WNYC at this time than can be heard in all the concerts, networks, Carnegie Hall or opera houses in the country in a year. Although Mr. Siegel concedes that some of the music should never have been heard at all, it's true, that works of Aaron Copeland, Morton Gould, Leonard Bernstein, Walter Cowell and many others were given their first public performances during the WNYC music festival.



Glen Blackburn makes a new "master" tape which will father the many copies sent out to NAEB Network member stations. Mr. Blackburn is in charge of production at the NAEB headquarters.



Left to right: Diane Aronovsky, seated, wipes the incoming tapes clean on a Cinema tank-tape eraser, while Kitty Schneider prepares the tapes for re-recording and another trip out. Center, Kitty Schneider makes copies of the programs on the erased tapes. On this mass duplicator, eleven copies of half-hour programs can be made in ten minutes. Right: tapes are sorted by stations.

The musical quality is high enough to attract the attention of music lovers here and abroad. England, France, Italy, Denmark and Israel all play works of American composers from tapes made for the WNYC music festival. What's more, the leading critics form the metropolitan dailies and national magazines cover the entire series, an honor seldom given to radio broadcasting of music.

The tape musical library at WNYC, which is available to the tape network also contains special performances given by nearly every major musical artist. Yehudi Menuhin and Enzo Pinza have made tapes for the station and they made them without compensation. James C. Petrillo, President of the American Federation of Musicians and the leader of local 202, cooperates wholeheartedly with this free educational enterprise. In fact all union officials are in favor of the network's ideals and performance.

So are personalities in the arts. Clifton Fadiman, book critic, master of ceremonies and personality of radio and TV, commands a healthy figure for appearing at a commer-

cial mike. When he makes a recording for the tape network, this is what happens. Fadiman arrives with a sheaf of typed material, mounted on cardboards so they won't rustle, plus a stop watch. At a signal from the engineer he starts his stop watch and his speech. Fadiman needs no further coaching. He consults his own watch and either speeds up or slows down according to the time allotted him. All this preparation is worthwhile, in his opinion, because he knows the type of audience he is reaching and he wants to play to them.

One of the reasons that the tape network can offer these unique recordings is its non-commercial standing. Artists who expect huge fees for a concert, appearance or lecture, are willing to come to a Municipal building that houses a local station, WNYC, because it represents the voice of the biggest city on earth and is part of a network that serves the 30% of the nation that probably includes its most intellectually appreciative citizens.



John Holt, net manager, Rosaline Biazon, traffic manager and Harold Hill, associate director, NAEB, discuss the network production and distribution schedule which is worked out months ahead.



When all programs have been recorded they are taken from the bins, packed in mailing cartons and sent to the participating stations. Here are a week's recordings about to be put in the mail.

# Choosing and Using a Microphone

by Jeffery Grant

Part II of two parts

*Editor's note: In the first part of this article Mr. Grant told of the construction and characteristics of various types of microphones. This appeared in the October issue.*

**I**N response to numerous requests for more information on the subject of lower cost microphones as supplied with tape recorders, the relative merits of the three most popular types are summarized as follows:

## CRYSTAL

Best frequency response (widest range and flattest), highest output. Sensitive to shock, damage through rough handling, temperature and humidity changes.

## VARIABLE RELUCTANCE

Only fair frequency response since not as wide as crystal at the low and high end. However, this microphone has a certain amount of resonance at low frequencies which gives the illusion of more "bass" on most home recorders. While this may not be called "better" low frequency response as stated in the previous article, the reluctance microphone's lower high frequency response and resonance in the bass region, gives a mellow, "booming" sound, pleasing to many people. Its output compares favorably to the crystal microphone. However, the microphone is susceptible to stray magnetic hum fields from nearby power equipment. Extremely rugged, it is virtually free from shock damage and insensitive to temperature and humidity changes.

## CERAMIC

Although not mentioned in the first article, this is a newer type microphone now appearing as original equipment on several of the 1955 home recorders. Frequency response good (but not as good as crystal—being limited more on the high end and generally having a slight rising characteristic in mid-frequencies). The output is considerably lower than both crystal and reluctance type microphones (6 to 10 db lower). It is rugged and insensitive to humidity and temperature changes.

A still further classification of microphones falls into two broad categories: high impedance and low impedance.

All home-type tape recorders use high impedance microphones. Professional recording equipment uses low impedance microphones. In addition, there are microphones available that have a switch, enabling them to operate at either high or low impedance output. The advantage of high impedance microphones is that the cost of one transformer is saved. The disadvantage is that it is not possible to safely run more than 10 to 20 feet of microphone cable without adversely affecting the high frequency response. The microphone line connecting directly to the amplifier input is the most sensitive part of the whole recording system. If the cable is near AC power cords there is a good chance it will

pick up induced hum. Low impedance microphones can use a balanced line, canceling out hum. High impedance lines are unbalanced, with one side grounded. The greater the length of cable used with a high impedance microphone the greater will be the high frequency attenuation.

Crystal microphones are always of the high impedance type. Having a high electrical impedance, the microphone cable is therefore coupled directly to the grid of the first vacuum tube in the amplifier.

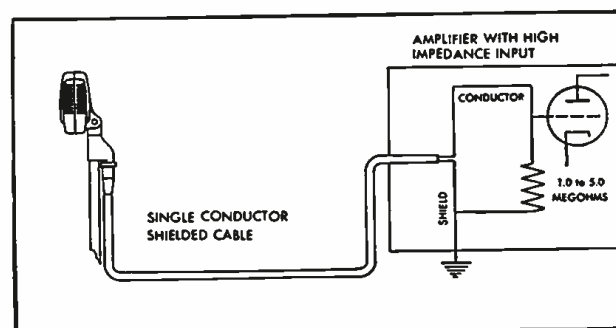
Dynamic microphones can be made to have almost any impedance output. The most common electrical impedances are 50, 250, 500, and High Z (around 100,000 ohms). With low impedance microphones (50-500 ohms), a transformer is used to couple the output of the microphone to the grid of the input tube.

The electrical impedance of ribbon microphones is very low, being about one-fourth ohm. Therefore, a transformer is located in the microphone case to step up the electrical impedance to a value suitable for transmission over a line to the vacuum-tube amplifier (50, 250, 500 or High Z).

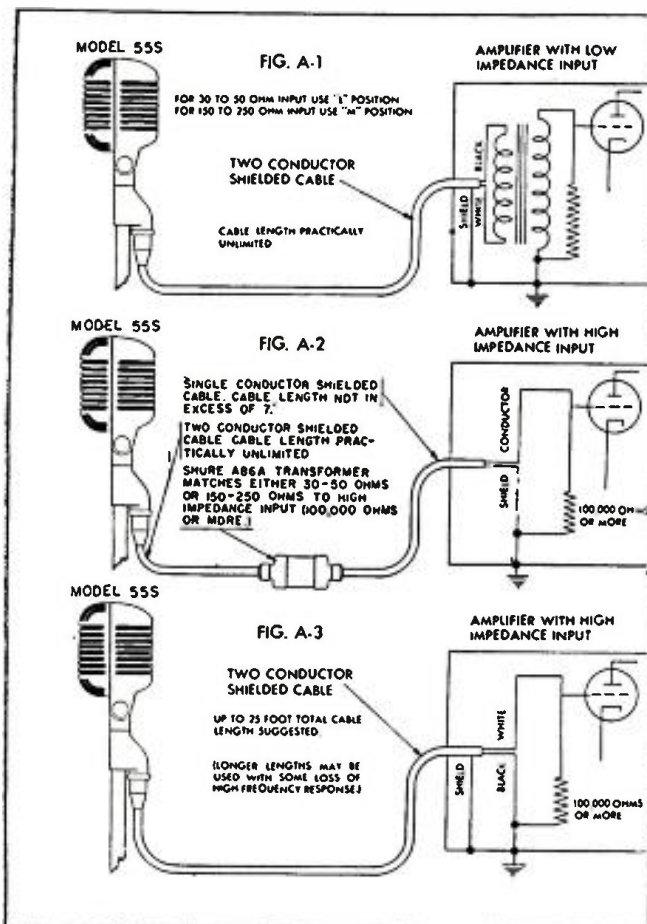
These microphones must be used with an amplifier which has an input impedance that will match the output of the microphone. A 50 ohm microphone should be connected to an amplifier having 50 ohm input. If a high impedance microphone is connected to a low impedance input amplifier, distortion will result.

The classification of microphones may again be subdivided into directional characteristics. Microphones are available in unidirectional, bidirectional, or nondirectional types. In many instances it is possible to obtain any desired "pick-up" pattern by the simple expedient of turning an adjustment screw to the desired position.

The pick-up pattern of a unidirectional microphone is approximately heart-shaped or cardioid. It will vary from this pattern, to a limited extent, in different makes of microphones. The unidirectional pattern, however, is of sufficient width at a normal microphone distance to allow three or



This illustration shows how a high-impedance microphone is connected to a home type tape recorder. Because the mike is high impedance it is coupled directly to the grid of the first vacuum tube in the amplifier which is also a high impedance load.



If the recorder has a low impedance input, as many professional recorders have, then it is connected as shown in the top illustration, using a transformer inside the recorder to match the grid. In the second drawing, a low impedance mike has been connected to a home type recorder with a high impedance input through the use of a matching transformer in the mike cord. The lower drawing shows how the connections must be made when long mike cables are used. The cable shield is grounded to the recorder chassis and the two wires carrying the mike current are fed to the grid.

possibly four people to use it simultaneously. The unidirectional microphone is perhaps the most useful, covering nearly 90% of regular daily recording needs. This is a particularly useful microphone in excluding audience participation and background noise, reproducing only the voice of the performer. Another typical application for the unidirectional microphone is in location interviews, excluding all extraneous street noise. Unidirectional microphones also eliminate the possibility of feedback. Manifesting itself by a squeal from the loudspeakers, feedback occurs when an electrical sound circle is formed. By orienting the microphone, it is possible to pick up only the voice of the performer with no possibility of the sound from the loud-speaker feeding back into the microphone. Most home tape recorders have a jack for earphones which automatically disconnects the loud-speaker when the earphone plug is inserted.

The nondirectional microphone will pick up sound from all directions. It is desirable in a panel discussion, when it is necessary to record a number of voices or sounds surrounding the microphone. Greater care must be exercised when using a nondirectional pattern because of the danger of feedback.

The bidirectional microphone will pick up sound in two directions. Application of the microphone is particularly useful in recording voices of two people across a table, as

well as a multitude of similar uses. The bidirectional pickup pattern was first introduced with the ribbon microphone.

The tape recording enthusiast with between \$30 and \$100 to invest in a microphone has a wide variety of alternatives. Wanting a really good microphone with superior recording characteristics, his choice would logically center on two types: dynamic or ribbon. If durability was a prime factor, and further providing that the recording enthusiast was willing to sacrifice some uniformity of frequency response, he could profitably buy a dynamic microphone. However, not anticipating rough usage, he might then consider the ribbon microphone. It is interesting to note that the ribbon microphone is the most widely used in professional recording work, although the dynamic microphone is gaining fast in popularity. Dynamic microphones have been vastly improved in quality during the past few years, some models making possible exceptionally good recording results.

The repair of microphones should not be undertaken, except for limited maintenance work. To cite an example, the microphone cord may break off within the microphone shell. Repairs of a more extensive nature should generally not be undertaken. Return, instead, the microphone to the manufacturer. All manufacturers void their guarantee if the microphone has been tampered with.

If in doubt as to whether a microphone is bad, the simplest and most obvious method of determining is by substitution. By substituting a known good microphone for a questionable one and recording either voice or music, it is generally possible to quickly ascertain whether or not the microphone is defective. A more accurate method, of course, is to use an audio oscillator. Generally, however, when a microphone is damaged there is no midway point between a good and bad operating condition. Either it will not respond at all, or will be so distorted or low in volume it will be unusable.

Regardless of the quality of the microphone or the magnetic recorder, difficulties result generally from improper use of equipment. As in photographic work, it is possible to outmatch the most expensive professional equipment with a box camera, providing the equipment is being improperly used. Microphone placement is certainly all-important in magnetic recording.

The modern recording studio with its impressive, sleekly-styled equipment has an aura of romance. Photographs of the recording engineer seated in his control room have the same effect on the public's imagination as the traditional portrait of a white-coated research worker surrounded by test tubes and bunsen burners. On the surface, however, the recording engineer's job would appear to be simplicity itself. First, he selects the needed equipment and, second, he rides gain during the recording session.

Recording becomes a true creative art through microphone placement. When an artist paints in oil a picture of a lion, he need not be concerned with photographic realism. He is striving to create an over-all effect. To impress us with the ferocity of the lion, he may, for example, accentuate the beast's gaping mouth and sharp teeth, its powerful shoulders, poised ready to spring.

As the artist uses a paint brush, the recording engineer may use his microphone to create whatever artistic effect the situation demands. The recorder is essentially a passive instrument, recording whatever the microphone feeds it. To achieve truly effective microphone placement may require years of patient practice and experimentation. Space does not permit more than a brief summary of some of the basic

guide posts for the audiophile to follow in microphone placement.

Frequently people have a tendency to record too far away from the microphone which results in an excessive amount of room reverberation or reflected sound, making the recording difficult to understand. Also, the uninitiated recording enthusiast will frequently attempt to record in too "live" a room which, because of its size and acoustics, also results in too much reverberation. However, the acoustics of an empty room change when filled with an audience.

If a recording is made in a room that contains an excessive amount of reverberation, captured on the magnetic tape will be both the original recording combined with the room reverberation. Compounding the reverberation of the room in which the recording was made during playback, the extra reverberation of the playback process is added to it. Under these conditions the reverberation of the original recording is frequently more than doubled.

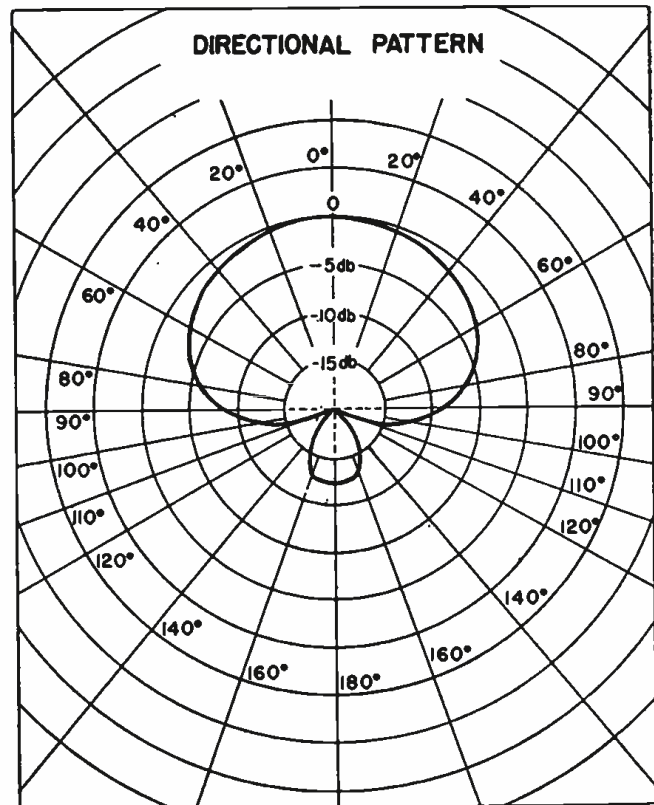
Original recordings should be made in a "dead" room in quiet surroundings, with background noise held to the lowest possible level. Reflections off hard surfaces such as the ceiling, walls and floor should be avoided. If a voice recording must be made in a room with reverberant conditions, one way to cure the difficulty is to talk as close as 12 inches to the microphone. Thus a person's voice is substantially stronger than the surrounding noise. There is danger in working too close to the microphone, however, in picking up sibilants, tongue clicks and breathing, in addition to an accentuation of the bass. Working too far away from the microphone, the voice will be weak contrasted to the total noise in a reverberant room.

Reverberation when it is properly controlled is, however, an important recording tool. The ratio between reflected sound and direct sound has a vital effect on liveliness and blend of the recording. Timbre is dependent on the number and relative intensity of the overtones recorded. Balance assures the correct relative loudness among all sound sources.

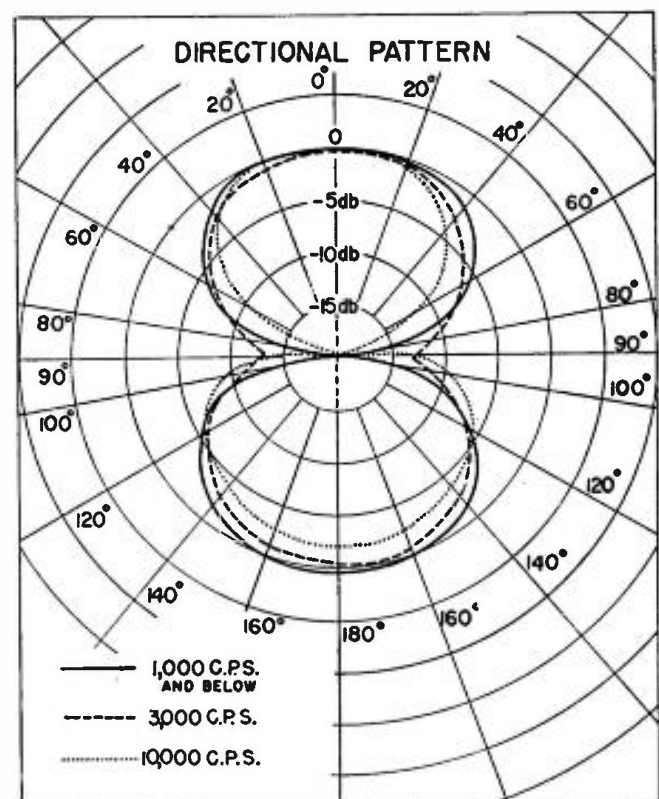
We hear with both ears, a positive advantage over using but one ear in liveliness and brilliance of tone. Listening with both ears enables us to locate sound and automatically relegate extraneous background noise to its proper perspective. But hearing with only one ear accentuates noise out of all proportion, losing the perspective of location and depth. Monaural reproduction is similar to hearing with one ear. Special effort in microphone placement is required to simulate the closest monaural approximation to binaural listening effect with timbre, liveliness, blend and balance.

Normally, it is desirable to make a number of preliminary tests in order to get the "feel" of the microphone. As someone speaks into the microphone, the recorder's volume level should be carefully controlled. Next, an assistant should walk back and forth before the microphone, step toward it and away from it. Carefully note the "pick-up" pattern of the microphone, particularly noting its sensitivity, the "live" and "dead" areas, its tendency to accentuate unwanted reverberations. It may be necessary to move the microphone from side to side until a point of proper "balance" is achieved. A test recording should then be made.

The technically inexperienced recording enthusiast would do well to make his recordings with one microphone, even for large orchestral or vocal groups. Superlative results are often obtained using only one microphone. Excluding binaural work, even the professional recording engineer follows the principle of using as few microphones as possible.



This directional pattern chart shows how a uni-directional mike picks up sound. The radial lines indicate the angle from dead center in front of the mike and the circles the amount of db. The heart-shaped, or cardioid, pattern shows that the mike picks up best from straight ahead and will pick up sound effectively up to 90° on either side. Past that point the sound pickup falls off. Only a very slight pickup is made from the rear. A mike like this is useful in cutting down background noise.



This shows the pickup pattern of a bi-directional mike, the Shure Brothers Gradient 300. Note the high front and rear response and the "dead" areas on the sides. A mike having this pattern would be excellent for recording groups as both sides may be worked.



## MAKING SANTA TALK

*... you may not have to voice a 35 foot Santa but here's a way to turn your recorder on and off or make it repeat messages.*

**by Paul Dunstan**

**T**WAS a month before Christmas and all through the house, not a creature was stirring—when suddenly there boomed out of the darkness a hearty, 'Ho ho, ho!'

I didn't rise from my bed to see what was the matter. I knew. Santa's voice was beginning to get monotonous. But it had to be perfect to go in the 35-foot-tall Santa Claus on the Mall at Northgate in Seattle—one of the largest suburban shopping centers in the country. Since I was handling Northgate's advertising, and since I had had considerable experience with tape recorders, I had volunteered to provide a Santa voice that would repeat a Christmas message to shoppers at regular intervals, day in and day out, for several weeks before Christmas.

My first break had come when I looked for and found an endless tape recording reel, manufactured in Seattle. It was simpler in construction and less expensive (\$12.50) than other types. Thus the necessity for a person's climbing up in the Santa and changing tapes was eliminated.

The next problem was that the recorder would be used outdoors during cold weather over a period of almost a month. By experimenting I found that the tape would 'check' in very cold weather and would not operate properly

on the endless tape rig from a cold start. So I built a large box to hold the tape recorder and other mechanisms, and wired a 100-watt light in series with a 110-volt mercury thermostat to keep the box at a 70-degree temperature night and day.

I was afraid that friction on the tape, with it running endlessly, might cause the tape to break. I was also apprehensive that the recorder might be damaged by overheating. So in order to automatically stop the recorder when the shoppers left the Northgate Mall at 9:30 at night and turn it on again at 9:30 in the morning, I purchased a day-night clock and wired it in.

But there was still the problem of synchronizing the tape itself, so that the message would be repeated properly each time with no snipping off of words at beginning or end. Santa's greeting to the Northgate shoppers consisted of a two-minute spiel on a three-minute tape, after I had hired radio talent and had the voice recorded. There were to be twelve minutes of silence between the messages.

Even though the machine was to be off each night, I was afraid of overheating or tape breakage, with it running twelve hours straight each day. So instead of splicing in



twelve minutes of clear tape, I decided to use only three-minute tape and find a clock device to start and stop it automatically at regular intervals.

But what a search I had for the right clock! Finally I bought one from a factory representative—an interval timer which I could set to open the circuit for three minutes and close it for twelve.

I thought I was all set. But after wiring the clock in, I found that the running of the recorder didn't synch with the clock, since my recorder had no solenoid for disengaging the flywheel and the tape would run for varying fractions of a second when the machine was turned off. These time intervals added up fast in inches of tape on each start, making frequent resetting necessary.

There was another search, and this time it ended with a washing machine distributor! But I had found the solenoid I wanted. I took the control knob off the recorder and replaced it with a metal arm. Mounting the solenoid to one side of the arm and at the appropriate length from the fulcrum on the control allowed the solenoid to start the machine at the proper time as regulated by the interval timer, and then springs mounted on the opposite side worked to pull back, stopping the machine.

I synchronized the machine with the clock by setting the clock for three minutes, then noting in inches on the tape from a marker (a piece of splicing tape) at the starting point. It was a simple matter, then, to add or cut the tape for synchronization.

Finishing touches were added, including an 18-watt amplifier, and the first week in December the big Northgate Santa became articulate. The external speaker in his head was wired to the amplifier in the tape recorder box in the lower part. Santa could go three days at a time without the tape's having to be re-synchronized.

Still I wasn't satisfied. I knew there must be a device somewhere to make *perfect* synchronization possible. Toward the end of December I found it. It was a General Controls clock that would start the system on a clock impulse and, working through a double-throw switch mechanism, would stop from a secondary impulse, then start again on the clock impulse. Either by notching the tape an eighth of an inch and reinforcing the narrow part with mending tape—

or by folding a piece of copper foil over the tape at one point—the tape, riding between two brushes, would make contact at that point. Whenever the notch or the copper came by the brushes, the contact would be made and the machine would stop. The clock would keep the machine in the 'off' position for the desired length of time and then would start it again. In this way there would be no possibility of the tape's wandering, and no need for repositioning. This also would eliminate the necessity for the solenoid. Another advantage to this setup is that several different messages could be put on the same endless tape reel with appropriate stops.

However, it was too late in December to change the Northgate Santa. I will use the device outlined when I use my rig for other promotions. There are many possible uses for this message repeater (which, incidentally, can be quickly reconverted into an ordinary tape recorder). Some of the possible applications are:

(1) In any retail store—repeating periodic commercials for the 'special of the day'.

(2) To repeat a merchandising message, rigged in connection with a proximity device in front of a store or counter (electric eye, pad on the floor, or proximity field).

(3) For special functions of organizations, such as carnivals and bazaars, where spiels at intervals attract attention to booths, refreshments, etc.

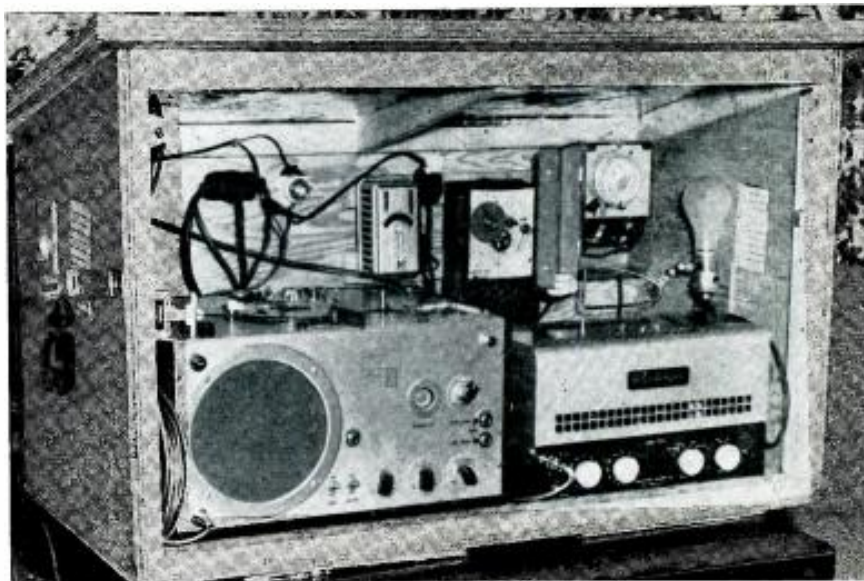
Many commercial repeating outfits do not have the reliability, tone quality, volume, or flexibility of an ordinary tape recorder. And a tape recorder owner, at a nominal expense, would be able to use the recorder as a message repeater and again, as none of the converting devices need be fastened permanently in any way to the machine.

The necessities would be:

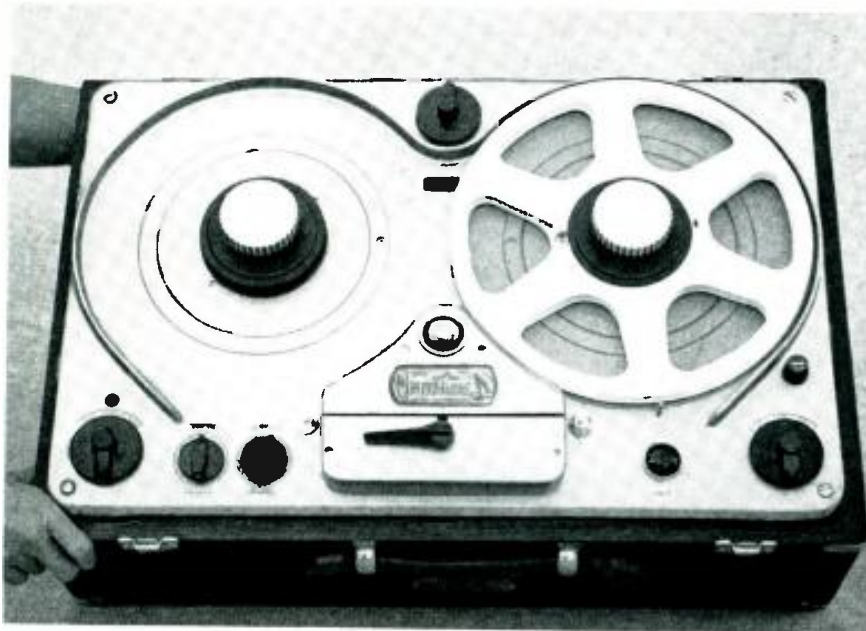
1 General Controls clock	\$30.00
Wire and 2 brushes	2.50
Endless tape reel	12.50
	<hr/>
	\$45.00

Unless used outdoors the necessity for the box, light bulb, and thermostat, would be eliminated. Under ordinary circumstances, such as inside a store, the amplifier would also be unnecessary.

Facing page: the giant 35-foot Santa Claus at Seattle's Northgate Mall which spoke to the public via tape. Right: Santa's "voice." The power line input was wired directly to the light and thermostat to provide constant heat. Another switch was inserted in the line to cut off everything except the heat. A day and night clock took care of the time when Santa was "on the air" and an interval timer started and stopped the machine. The recorder is at the left and was operated by a solenoid for quick starts and stops. The power amplifier can be seen to the right of the recorder. An endless tape reel was used for message repeating.



# NEW PRODUCT REPORT



## THE CONCERTONE 1501

... can use either 7 1/2 or 10 1/2 inch reels. With case it becomes a complete recording and playback unit.

**T**HE Concertone 1501 by Berlant Associates is a fine machine. The price seems surprising for a unit with so many accomplishments.

In appearance it is impressively sturdy and simple and is not heavier than the regular semi-professional types of recorder. The case measures 24 x 16 x 10 inches and the machine with case, weighs in the neighborhood of 60 pounds.

We found it to be well built mechanically. Electronically it is well shielded and equipped with three oversized motors for the tape transport, takeup and rewind. Some idea of the capabilities of the motors is indicated by the fast forward and rewind speed of 2500 feet in one minute. The tape transport is arranged for either standard size reels up to 7 inches or the 10 1/2 inch reels using hub adapters which are supplied as standard equipment with the recorder.

The erase, record and playback heads are individual units mounted on a single base and may be had in either dual or single track types. Heads may

be changed simply and quickly and once installed require only lateral adjustment.

Electronically, the preamplifier recorder amplifier provides approximately 85 dbm of gain to a Hi-Z input for normal recording level. The playback amplifier provides one volt output into a 20,000 ohm load.

In our field operation tests we found that the 1501 meets AA program requirements at 7 1/2 ips and comes so close to meeting the AAA or studio primary requirements that we might as well say it does. It fell a tiny bit short of meeting the rigid requirements on signal to noise ratio versus harmonic distortion crossover minimums above 13,000 cycles per second.

To meet the AAA rating is quite an achievement for even a studio recorder working under good conditions. The 1501 was tested by us in normal use but with laboratory calibration type equipment.

The results of the tests are far in excess of the semi-professional expectations and in most cases would be ac-

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

Product: Concertone 1501

Price: \$345 including case, microphone, etc. extra.

Manufacturer: Berlant Associates,  
4917 W. Jefferson Blvd.,  
Los Angeles 16, Calif.

ceptable in broadcast uses.

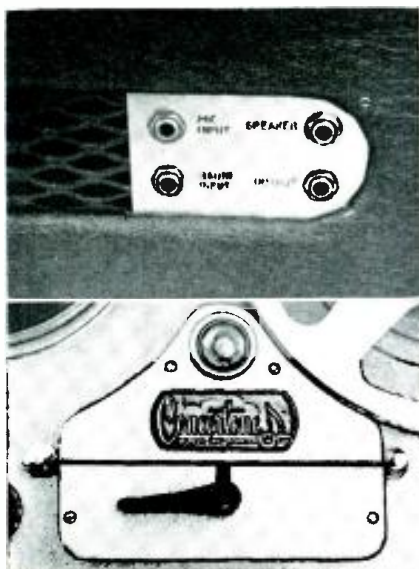
Many applications and variations can be accomplished with the machine. Through operation of a record player or tuner to the amplifier, with or without recording on the tape can be accomplished. In the "standby" position, the machine is ready for immediate recording. When mounted in the 504 carrying case, loudspeaker monitoring is possible.

The operation of the recorder is extremely simple and sure. Necessary maintenance is fully covered in the operation manual. Also included with the machine are several other pamphlets of interest.

The recorder consists of a base plate on which are mounted the drive mechanism, power supply and amplifier chassis. The baseplate is rigid and all units are wired so that the recorder may be used as soon as plugged into the power supply.



The recorder is housed in an attractive case equipped with a handle for carrying. The lid lifts off for recorder operation.



Top: The input and output jacks are found on a panel at the rear of the case. Lower, volume control in recording is gauged by the use of a "magic-eye" tube. Below this can be seen the tape motion control lever.

This basic mechanism is designed to become a part of custom music systems and is placed between the sound source, such as a mike or phonograph, or tuner and the power amplifier that feeds the speakers.

If desired, the unit may be mounted in the 504 case which converts in into a portable recording or playback system.

To use 7½ inch reels on the machine the hub adapters are removed, as shown in the photo (right). The reel is then placed over the shaft and the knob screwed back on to hold it in place. The recorder will operate in either a vertical or horizontal position.

When using the 10½ inch reels, the hub adapters are placed over the shaft, the metal reels placed over them and the holding knob replaced.

Threading is quick and simple. The full reel is placed on the left-hand spindle and the tape is then drawn in front of the left-hand guide post, through the slot, in front of the right-hand guide post, behind the tape guide pin and onto the takeup reel. The tape drive control on top of the head casting should be turned clockwise as far as it will go before threading.

The controls are conveniently located and work easily. The knob at top center controls the fast forward and rewind. On the extreme left is the record-playback switch, next in order is the recording level gain control, the playback gain and the tape drive control. The recording level indicator is of the

magic eye type. A pilot light indicates when the machine is on and the speed selection control is at the far right.

The speed change is accomplished by switching the pointer to either 7½ or 15 inches per second as desired. When finished using the machine the control should be placed in the off position.

It is possible to listen to the recording as you tape it. By turning up the playback gain you will hear the program you are recording coming off the tape after it has passed from the record head. In this way you can know exactly how well you are recording.

A Sound on Sound attachment is available for the Concertone recorders which permits dubbing and the making of multiple track tapes. This is possible because the recorder uses three heads.

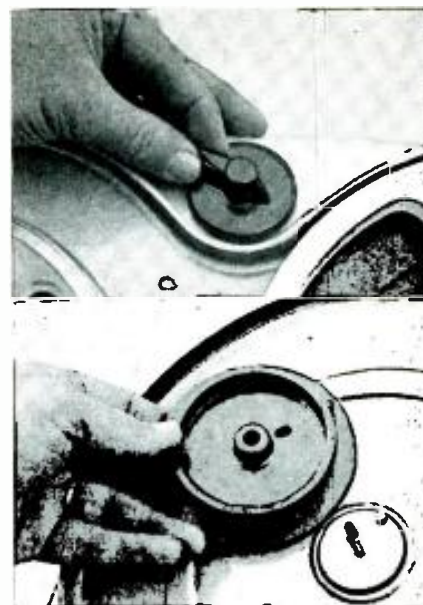
When first putting the recorder into operation, it should be run for several hours to break it in. The close fitting parts need this break-in period to bring the machine to proper operating efficiency.

A yearly replacement of the rubber drive reels is advised, as is an annual service check-up. This is good advice for any recorder owner to follow. The maximum life for the rubber drive rollers may be had by always turning the recorder to the off position when not in use. This prevents the formation of flats on the wheels and prevents the development of flutter.

The heads should be cleaned regularly with carbon tetrachloride using a pipe cleaner to reach in the slot.

If the unit is mounted in a custom mount rather than the case, precaution should be taken to make sure it has adequate ventilation. This will prevent overheating and the sticking of the tape.

On the 1501, the bearings are pour-

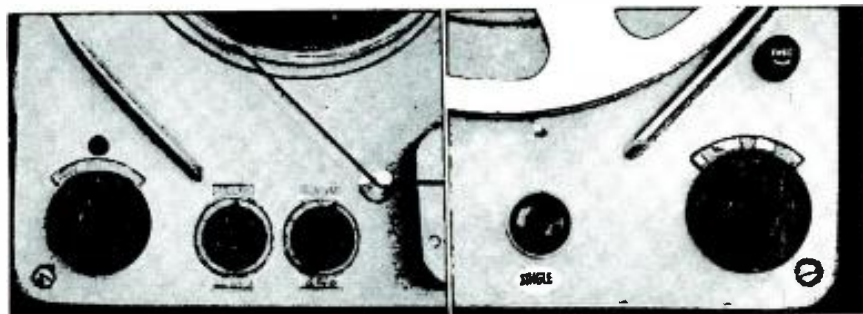


Top: Fast forward and rewind is accomplished by turning the knob at the top of the recorder. Below: the hub, furnished with the machine, which is used for the 10½ inch reels. None is required for seven inch reels.

ous metal, self-oiling. The only lubrication that is required is the application of three drops of SAE 10 oil in the hole in the top of the drive capstan every 50 to 100 hours of operation. Oil may also be applied to the brake pads if they tighten up with use.

If the recordings being made are critical as to tape speed it is always a good idea to warm up the machine first. This is done by allowing all three motors to run for 15 or 20 minutes by turning the tape drive control knob halfway toward the run position.

In our opinion this is a fine machine, well built and of good workmanship. The base plate is heavy and rigid assuring perfect alignment of components. The 1501 exceeded our expectations and will doubtless exceed yours. We have no hesitation in recommending it.



The left side of the recorder showing the record-standby-play switch, the record and playback controls. The recorder features straight-line threading which is quickly done.

The right side has the pilot light, the fuse and the tape speed control. The recorder can be changed from 7½ to 15 ips merely by changing the position of the switch.

# How to Erase Tapes

*... for a clean erasure and speed of erasing there is nothing better than a bulk-type erase magnet*

**by Harry Sackser**

*Commissioned Electronics Co.*

**T**HE proper erasing of tape is a matter of great concern to all magnetic recorder owners, because it is this unique feature that accounts for much of the wide appeal magnetic recording has. And most recorder owners tend to take the matter pretty much for granted since it seems to be performed automatically by their machines.

Although some of the more inexpensive home recorders use a small block permanent magnet for removing the previous signal from the tape, the most widely accepted method of erasure is by the use of alternating magnetic fields. Such fields are applied to the moving tape by the erase head of a recorder just prior to recording and should remove all traces of the previous recording, leaving the tape completely demagnetized and ready for the next recording.

All traces of the previous recording can be removed by saturating the tape in a very strong magnetic field. The coating of the tape can be thought of as being made up of innumerable little spots or particles of magnetic material that are called "magnetic domains." Moving the tape past the erase head in a strong magnetic field causes all these magnetic domains to be oriented in the same direction, destroying their previous orientation pattern, and thus removing any previously recorded signal.

The tape may be completely demagnetized by slowly removing it from an alternating magnetic field so that each magnetic domain is subjected to a progressively weaker force as it is being oriented first one way and then another. If the intensity of the field is diminished slowly enough, a point is reached where the force is not sufficient to affect a given magnetic domain and so the various domains are left oriented in random directions.

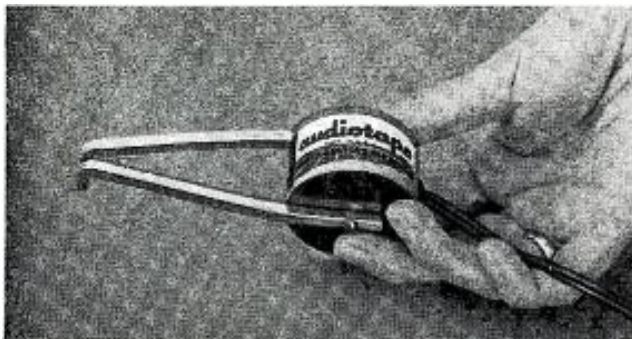
Unfortunately it is extremely difficult to obtain a magnetic field which will completely saturate the tape and remove all traces of the previous signal—especially if the previous signal is the result of severe over-recording. And so often we notice the noise level of a tape increases after many separate recordings have been made on it. This is because the intensity of the field from the erase head is just not great enough to completely demagnetize certain very strongly magnetized spots on the tape.

When this happens—and it does happen with greater frequency than most recorder owners suspect—there are several ways a more intense erase can be applied so as to leave the tape once again magnetically clean.

In the first place, the erase field may be weakened by faulty alignment of the erase head or by poor operation of the bias-erase oscillator tube and its associated circuits. The recorder should be checked to see that the head properly covers the part of the tape to be erased and to see that the oscillator tube is delivering sufficient voltage to the head.

But suppose your recorder is doing all it can to erase the tape and yet the noise level still increases. In that case a reduction in noise level and a more complete erasure can be effected by running the tape through the machine twice with the controls set to "record" but with the recording volume control at its minimum.

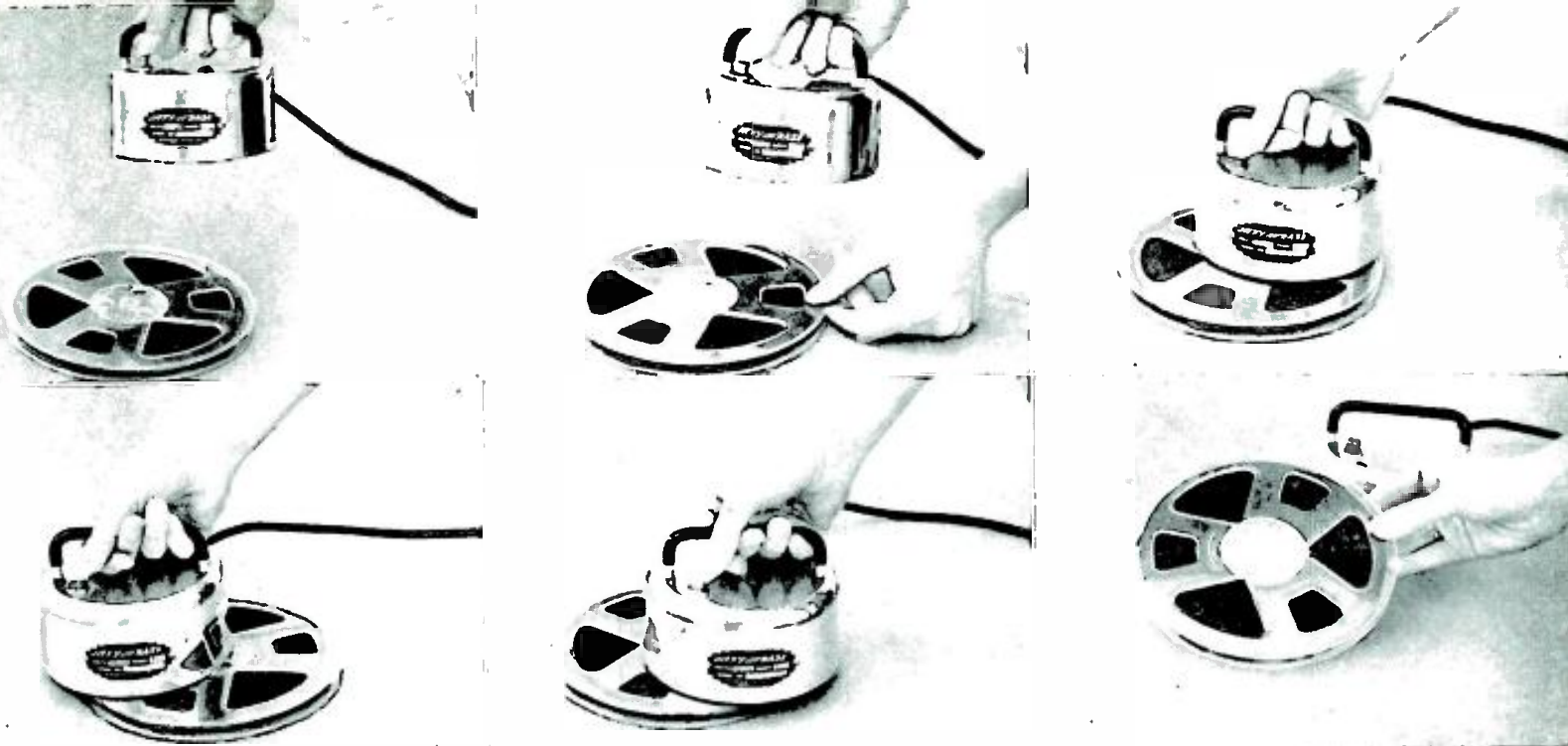
This will quite often complete the erasing of the tape, but it is inconvenient and time-consuming. And so we find that the best way to erase tape completely is with a bulk tape eraser, such as the "Jiffyrase" or "Magneraser" or "Degausser." These devices contain a very powerful electromagnet and are brought in contact with an entire reel of



The Audio-Devices head demagnetizer is small and convenient to use. The tips of the magnet should be covered with cellophane tape to prevent scratching the heads. A one second application working the tips over the head is enough to clear them of magnetism.



The tank-type Degausser is used in many places where there is a good quantity of erasing to be done, such as recording studios, radio stations, tape libraries, etc. The reels are placed on the panel, rotated and then very slowly withdrawn to complete the erase.



Hand type bulk erasers, such as the "Jiffy-Erase," shown above, or the "Magneraser," do an effective job of clean erasing. The magnet is turned on while about a foot from the tape and is lowered until it is in contact with the reel. The reel may be slowly rotated under it or the magnet may be moved over the reel in the direction of the winding of the tape. After a few seconds either the tape or the magnet is slowly withdrawn, the tape is turned over and the process repeated. The current must be on continuously during the erasing.

tape at one time, completely cleaning the whole tape.

Even the bulk eraser does not generate sufficient magnetic intensity to clean the tape satisfactorily unless it is properly used.

It has been found that there is a very definite "easy" direction of erase and that this "easy" direction is along the length of the tape rather than across it. So the reel of tape should be rotated under the bulk eraser in order that the magnetic field may be diminished along the length of the tape rather than across it. This also means that after thorough rotation of the reel of tape under the bulk eraser the reel should be removed from the erase field by sliding it slowly off to one side, while continuing to rotate it. Slow movement of the reel is essential too, both while rotating it under the eraser and while removing it, and linear motion of any part of the tape should not exceed 1 to 2 inches per second.

Under no circumstances should the reel be removed very suddenly, nor should the bulk eraser be turned off while the tape is in its field, or else the 60 cycle field of the eraser will be recorded on the tape.

Now that more and more recorder owners are obtaining greater pleasure and use from their equipment by exchanging recorded messages with other recorder owners all over the world some of them are beginning to notice another annoyance due to incomplete erasure of tapes. Many recordists, when they get back a tape from one of their correspondents, have noticed a very definite "ghost" of their own voices when they listen to the tape, in addition to the recording of their friend's voice. This is because not all recorders record on, and erase from, exactly the same width of the tape. Thus, a recordist whose dual-track machine records on almost half of the width of the tape on each track (never quite half since a small area along the center of the tape is left unrecorded so as to avoid overlapping the two tracks) will hear the unerased "ghost" of his own voice if his tape has been erased and rerecorded on a machine that uses a much narrower band along the edge of the tape.

This can be extremely unpleasant, according to Charles E. Owen, Jr., Noel, Virginia, Associate in the management of The Voicespondence Club and veteran of hundreds of tape exchanges with people in all parts of the world. "The Voicespondence Club has recommended to its members in its quarterly bulletin that all tape recorder owners inquire of their voicespondents about possible 'ghosts' and take steps to eliminate them," Owen says. "This can be done," he continues, "by passing the tape over a strong Alnico V permanent magnet, which covers the entire tape, just prior to recording the first track, or, more successfully, by use of a bulk eraser on each reel of tape before rerecording."

The cost of a bulk tape eraser may seem high at first, but such a device is well worth its cost if low background noise, quality recordings, and a great saving of time in securing complete erasure are important to the recordist. For the professional recordists and radio studios the bulk erasers are a must.

Noise can be added to the tape if the head is magnetized so it is important that both the record and playback heads be kept free of magnetism.

If the heads are suspected, the best way to find out is to apply a demagnetizer. If it fails to reduce the noise level then look for a noisy input tube, hum pickup, faulty bias or a noisy resistor or condenser in the reproducing amplifier of the machine. Your serviceman can check these points for you if you do not have the necessary know-how or test gear to do it yourself.

The Audio head demagnetizer is a small magnet that is used to clear the heads. The tips should be covered with cellophane tape before use to prevent scratches and it is only necessary to apply the tips of the unit to the head for about one second. After that the unit should be withdrawn very slowly.

Bulk erasers also come in a cabinet form, such as the Cinema Engineering Company's model. On these the reel is laid flat and rotated then slowly withdrawn from the magnetic field.

# NEW PRODUCT REPORT



## PENTRON TAPE MATES

... a set of matched components that provides the necessities for good quality records from AM or FM radio or microphone.

Many subscribers have asked us why someone didn't make an FM tuner, TV sound adapter, record-player connector, tape mechanism, etc. that could be interconnected without the hum pick-up troubles, audio impedance mismatches and all the other headaches that are sometimes involved in connecting their tape recorder to other gear.

This is an unmounted group of units that should provide the answer to those folks. The units are not only similar in physical appearance, being attractively styled with brushed copper panels and black controls but they are also matched electronically. This means that you can connect the elements together without the usual difficulties.

The units may be mounted on your present record player or you may custom tailor your own audio set-up.

If desired, a case may be purchased separately which takes the tape mechanism and pre-amplifier to provide a portable recorder.

The AFM radio unit is unique in that it not only provides for the recording of either AM or FM radio programs but has a provision for crystal pick-up from a record player. It also

has a magnetic cartridge pre-amplifier with a 3 position equalization switch.

The output is sufficient to drive either the tape recorder pre-amplifier or a public address system.

Electronically the radio unit does exceedingly well on AM considering the circuitry. It uses the minimum number of tubes possible for a superhet and we had some doubts as to its possibilities until we tried it on the air and found it much better than most compact sets regarding both selectivity and sensitivity. In our opinion only quality components could produce such a result.

FM-wise it is a full Armstrong discriminator circuit with two limiters preceding and a stage of IF amplification. It also has an untuned RF stage. All in all it is a fully equipped receiver built for minimum noise interference. An automatic frequency control helps stabilize the separate oscillator which reduces the probabilities of signals fading.

The audio output is completely resistance coupled and has cathode follower output for impedance matching the load. This provides an exceptionally broad and linear response beyond

STAFKSTED

Product: Pentron Tape Mates: AFM Tuner, Tape Transport, Preamplifier.

Price: Model AFM Tuner, \$89.95; 9T-3M Tape Transport, \$59.75; Model HFP-1 Preamplifier, \$59.75 or Model PRE-7, \$39.75.

Manufacturer: The Pentron Corporation, 777 South Tripp Avenue, Chicago 24, Ill.

the capabilities of the stations it is designed to receive.

The tone controls have approximately 10 dbm gain over 1000 cps response at 60 cps for bass and 10 k cps for treble and a de-emphasis of 15 dbm at 10 K cps for brilliance of bass or treble to your liking.

The frequency range is from 88 to 108 MC. in the FM band and from 540 to 1600 KC in the AM band.

One feature of the tuner which makes life easier is the ingenious tuning device. For ordinary tuning the knob is used in the regular way but when you want to bring in a weaker station that is located near a strong station on the dial, by merely pressing in the dial the AFC is defeated. Tuning is then done to the best of your ability and when you are satisfied, the knob is released and the AFC locks the weak station in place.

With the AFM tuner it is possible to feed a tape recorder and a speaker



The tape mechanism controls are the familiar 9T3C units which appear on a number of recorders manufactured by Pentron.



Front and rear views of the HFP-1 preamplifier. The unit is well and simply made and has an illuminated VU meter for recording level.

at the same time. The tape recorder takeoff is ahead of the tuner tone controls and thus it will deliver a flat signal to the tape. However, the listener may adjust the tone controls to suit his own preference as to what he wants to hear from the speaker.

The function selector includes a position marked "tape" which permits tape recordings to be fed through the tuner and modified by its tone controls if desired. The same knob also is used to shift from AM to FM and to select the AES, EUR or LP equalization.

In our tests we had the HFP-1 De Luxe Pre-amplifier. With the compensation switch in the flat position the unit readily surpassed the AA program requirements and was within the claims made for it (50 to 12,000 cps plus or minus 3 db).

The pre-amplifier is equipped with an illuminated VU meter for accurate recording level control. A jack for monitoring is provided and an equalization switch for either  $3\frac{3}{4}$  or  $7\frac{1}{2}$  ips.

A convenient option is provided so that radio or pickup and microphone may be run through to a power amplifier and speaker without recording by switching out the tape transport.

The input requirements are as stated in the Pentron literature. For a mike the pre-amp requires .001 volts at high impedance (60 db below 1 volt) which will take most microphones of the better quality. For radio and phono the input must be 1 volt at high impedance.

The output should be fed into a source requiring 1 volt at 10,000 ohms

or higher.

The tape transport that matches the other units is the familiar unit used in the Pentron 9T-3C recorders.

The tape transport has a brushed copper face with black controls, as do the other units of the set.

These units have low flutter and good speed stability. One of the handiest and most useful features, however, is the interchangeability of their pole pieces which may be removed and replaced as easily as changing a needle.

As only the pole pieces are changed, there is never any need to buy new heads and the recorder may be changed from a dual track to a single track just by the insertion of single track poles. This is a feature of both the record and erase head.

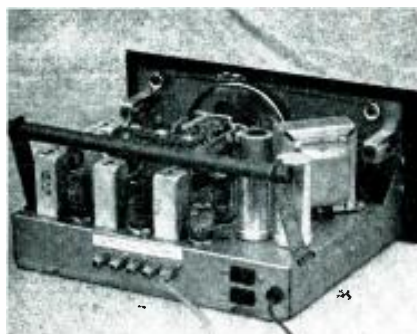
At the  $3\frac{3}{4}$  ips speed with the switch on the pre-amp in the "comp." position the A program requirements are met and the plus or minus 3 dbm limits are not exceeded to 6000 cps. from record to playback.

Available as an accessory for the tape deck are adapters which enables the recordist to use  $10\frac{1}{2}$  inch reels on the unit to get up to 4 hours playing time at the  $3\frac{3}{4}$  ips speed.

In our opinion these units are well worth your consideration if you are planning to rig a home music system of any sort. All that is needed beyond these units is a power amplifier and speaker to make a complete system, and, of course, a record player if you want to go for discs also.

On the whole the units are of excellent workmanship and well put together. Because the connecting cords and plugs are furnished with the units it is very convenient to make the necessary hookups.

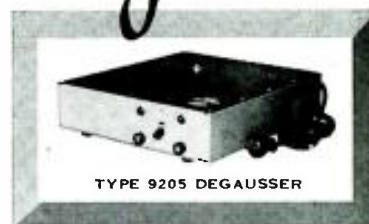
We feel the units are worth the asking price.



Rear view of the AFM tuner. Inputs and outputs are conveniently grouped on the rear of the chassis. The bar is the AM antenna.

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Model AFM

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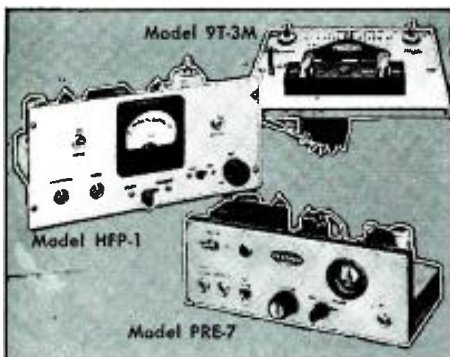
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## TAPES TO THE EDITOR

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:

This is in response to Mr. Sigsbee's editorial on tape recording and recorders in the October issue of TAPE RECORDING.

Before going on with my own reaction to your editorial let me assure you of my own enthusiasm for tape recording. My own tape library of classical music goes back to the fall of 1951 and numbers 56 ten inch reels. These are all recorded at 15 ips on dual track.

Your criticism of the articles by Mr. Darrell and Mr. Canby is justified to a certain extent. I have not read Mr. Darrell's article but I know about Mr. Canby's position through his articles in *Audio*. I am sure your opinion of him would change if you were to read and compare his articles. His last article sums up beautifully the past, present and future of tape recording and I have my own experience in tape recording and record collecting to back up everything brought up in the article . . . and my record collection goes back to 1928 and consists of over 200 LP's alone.

Tape recording is expensive. It takes the finest in record and playback equipment even to approximate the results obtained from a fine LP record. . . . Tape recording is a nuisance. My two machines require almost constant care to get the results I want and I know from my own experience that a tape recording neophyte has no idea of these fundamental procedures.

There is a vital need for standardization of equipment. Except in the most expensive recorders it is rarely possible to take a recording on one machine and play it back on another of the same make. My two recorders had to be worked on before I could interchange recordings satisfactorily.

So, as a charter subscriber to TAPE RECORDING I call on you to lead the fight on indiscriminate advertising claims and for standardization of equipment and equalization curves as a starter. Most of the other problems will undoubtedly be corrected in time but they should not be minimized or ignored.—Roger C. Terkuile, M.D., Fairfield, Conn.

*We regret that we did not have space for all of Dr. Terkuile's interesting letter. We still prefer Mr. Sigsbee's statements regarding tape and its future. As we recall, some years back when LP's first made their appearance, the prophets opined that LP's would never become popular or replace 78's. The Magnetic Recording Industry Association, to which most of the major firms belong already has a committee of engineers at work on such things as standards for tapes, equalization, etc. and we feel sure those problems will also be licked very soon. Ed.*

To the Editor:

Just read Sigsbee's editorial in the October issue and approve of it 100%. It is time someone put these boys in their places. Keep up the good work and more power to you. Hope some day soon you will be able to publish TAPE RECORDING Magazine every month.—Paul W. Curtis, Curtis Radio Service, Enterprise, Oregon.

To the Editor:

I've just read your magazine for the first time and I'm glad to see a magazine devoted strictly to magnetic recording, we needed one.

I'd like to call your attention to a problem which probably gives the same headaches to other amateur recordists too. A tape recorder is a wonderful thing and you can have a lot of fun with it, but what about the person who wants to make his own music collection. He has to rely almost entirely on his radio from which to record. In some locations, especially near streetcar lines, subways, electric trains, etc. it is impossible to get a clear, noiseless reception and make good recordings.

Since tape recording is becoming more and more popular, I suggest that the municipal administrations in the different cities set up a music library and inside it equip a separate "music hall" with booths. In the booths should be a disc-tape combination recorder so the amateur recordists won't have to bring their recorders, just the tape and record from the library's disc-records. I think a lot of people would appreciate that.—L. Lang, New York, N. Y.

To the Editor:

Delighted with your issue #3. Your tips about "How to Check a Recorder" are just what we teachers need to keep our machines in tip-top running order. Your magazine will be recommended to our students taking the seminar in Audio-Laboratory methods this summer.—Fernand L. Marty, Middlebury, Vermont.

*We are glad that you found the article of help and thank you for your recommendation to the students.*

To the Editor:

Regarding AC hum in my recorder that was present in both recording and playback we tried an isolation transformer, no result, installed complete set of new tubes, no result. Continued check showed short-circuit caused by lead from output jack to amplifier. Replaced with new lead which ended hum. Submit this for your miscellany column that it may save some other tape enthusiast this trial and error method of correcting such.—H. T. Kemp, Baltimore, Md.



# 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**—I had a connection for my recorder made on my TV set but when I use it I get a terrible hum, which spoils everything. I made a connection to the voice coils of the speaker myself which works O. K. Why the hum on the other connection?

In editing tapes from one recorder to another I cannot get as good or clear results direct from output to input. I have tried everything but with little success. What do you suggest?—H. A. W., Hazelton, Pa.

**A**—Most of your difficulty seems to lie in a difference of ground potential between the TV set and the recorder. This can be eliminated by the use of an isolation transformer. The transformer should have a 3.5 ohm side to match your speaker output connection on the TV set and a 5000 to 15,000 ohm secondary which is connected to the recorder.

When feeding from one recorder to another we would suggest that you put a 3.5 ohm resistor across the output and following the resistor connection a .01 to 1 mfd. condenser in series in the "hot" (ungrounded) wire. This should clear up the difficulty.

**Q**—I have a simple 12" speaker that I wish to mount in a speaker cabinet. My questions are these: how large, in cubic feet should the cabinet be? Do you know of any firms that can supply such a cabinet in kit form? What else should be considered in the construction of such an item?—L. T. O., Baltimore, Md.

**A**—We would suggest that your cabinet have a volume of three cubic feet, or slightly larger, say 1½ x 1½ x 1½. A bass reflex opening and column would improve reproduction but are highly complicated to construct. We would advise that you line the inside of the cabinet with acoustic paper or cloth to suppress harmonic resonance. There are a number of firms who have advertised kit enclosures including Walter Ashe Radio Co., St. Louis, Mo. and Karlson Associates, Brooklyn 30, N. Y.

**Q**—I own a Revere TR 800. As I must travel about the city with it I would appreciate knowing the name and address of a company who makes a light metal wagon, like a shopper's wagon to transport a recorder.—G. M. W., Brooklyn, N. Y.

**A**—We know of no such device at the moment and we would suggest that you contact a nearby metal working shop and have one made to your order.

**Q**—Knowing you are the leading magazine on magnetic tape recording in this coun-

try I would like to know if there is a recording machine which, when played back, will print the message rather than give it in sound.—A. G., Perth Amboy, N. J.

**A**—A machine has been developed which will do elementary translations from one language to another and the electronic computers and business machines will take tape signals and transfer them into print. But so far no one has come up with a device that will take the spoken word and convert it to writing. At the rate the tape industry is progressing, however, we wouldn't be surprised to see it announced some day.

**Q**—We possess a cutting machine as well as a tape recorder and many times cut discs for customers for their own use at a nominal cost. These records are not for additional resale and, as a rule, there is only one made for each customer.

Could you give me any information as to whether there is a need for any sort of license for this purpose?—C. G., Coatesville, Pa.

**A**—We see no reason for any type of license for the kind of work you are doing. You are simply recording a speech or other performance for the individual concerned and so far as we know, there is no restriction on it.

**Q**—I wonder if you can tell me about how many tape recorders have been sold in the U. S. to date and if manufacturers of recorders produce them as major items or as a sideline?—J. S. R., Dallas, Texas.

**A**—Best estimates place the number at 1,250,000 with from 300,000 to 500,000 expected to be added this year. Most firms "major" in tape recorders and allied equipment.

**Q**—A tape is recorded on #1 recorder which has a half track and a speed of 7½ inches per second. What happens when this tape is played back on another machine at 7½ ips but on full track? Both machines are in perfect alignment.—A. D., Norwich, Conn.

**A**—The tape will be reproduced just as though it were being played on a half-track machine — provided only one track has been used. If both tracks have been used on a dual track machine and the resulting tape is placed on a single, or full track, machine, the result is mish-mash as you then hear both tracks at once. A single track tape can be played on a dual track machine, or a dual track tape can be played on a single track machine if only one track has been recorded.

As you know...

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

*These important features  
are the reasons why the*

**SHURE GRADIENT "300"**

**HIGHER FIDELITY MICROPHONE**

is used by leading recording artists and Hi-Fi enthusiasts for consistently superlative reproduction:

✓ **REDUCES REVERBERATION** and pick-up of unwanted noises by 66%!

✓ **SMOOTH FREQUENCY RESPONSE**  
—40-15,000 c.p.s.

✓ **BI-DIRECTIONAL PICKUP PATTERN**  
—enables you to arrange the artists around microphone to obtain the best balance between the different musical components.

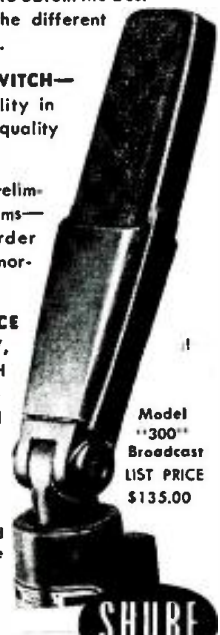
✓ **VOICE-MUSIC SWITCH**—  
for utmost flexibility in achieving highest quality recordings.

✓ **HIGH OUTPUT**—eliminates hum problems—by allowing recorder to be operated at normal gain settings.

✓ **MULTI-IMPEDANCE SWITCH** for LOW, MEDIUM or HIGH IMPEDANCE—provides added flexibility.



Model S33  
Desk Stand  
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Model "300"  
Broadcast  
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Please send me FREE Microphone Catalog 77A and list of Shure Distributors in my locality.

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TFG-11

# 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: Premier "Tapsonic" three-speed Model 70-A portable tape recorder. Professional quality. 40-15,000 cps at 15" speed, 12,000 at 7½", 7000 at 3¾". Has three motors, VU meter. 10½" reels, two mixing inputs, separate bass and treble controls. 12 watt amplifier, extended range 8" speaker. Guaranteed excellent condition. \$300.00 F.O.B. V. R. Hein, 418 Gregory, Rockford, Ill.

SYNCHRONIZER HOOKUP. Make sound movies with your tape recorder. \$10.00. Anderson, 2424 Phelps Street, Stockton, Cal.

WANTED: Trade for, lease, buy, borrow your tapes, transcriptions, phonograph records, any speed, condition of Dixieland Jazz type music. Any titles, old-time or modern artists groups. HI-FI unimportant. Building personal tape library. Have loads amateur radio (W9DPL) apparatus—swap or sell. Howard Severeid, 2431 Riverside Drive, Indianapolis, Indiana.

TAPE RECORDERS, Tapes and Accessories. Nationally advertised brands. FREE Catalog on request. Satisfaction guaranteed. Dressner, Box 66A, Peter Stuyvesant Station, New York City 9, N. Y.

REK-O-KUT 16" Model V De Luxe Recording turntable. Model M-5S Rek-O-Kut overhead mechanism. Model R-8A Rek-O-Kut Amplifier. 120 L.P.I. leadscrew, rest stand for overhead arm. No carrying case. Pickering playback arm with 78 and 33 1/3 cartridges. Used about 8 hours, like new. Ready to use. Cost \$638.15. Sell for \$500.00. H. L. Soderberg, 49 Layton Street, W. Hartford 6, Conn.

IT'S FUN to learn new foreign languages on tape. Latest in language laboratory techniques and equipment; pre-recorded tapes, discs, handbooks. Home or school use. Blank tape for sale. FREE Catalog. Language Training Aids, 12101 Valleywood Drive, Silver Spring, Md.

FOR SALE: Selling out present tape library. Used Scotch plastic base tape #111, 1200 ft. reels. Recordings of live top-notch performances, dual track 7½ ips. Symphony, concerti, chamber music of all types, mixtures, all classical, none operatic; indexed. Indicate preference. 1 for \$2.95, 12 for \$34.20, 100 for \$275.00. J. M. Davis, Rt. 1, Silver Spring, Md.

PROFESSIONAL 12" High-Fidelity LP discs, both sides, from your tapes—\$4.00. Other speeds also. Donico, Box 23, Station B, Evansville, Indiana.

PLAY 10½" reels on your recorder. Make extension arms. Complete instructions \$1.00. Le Roi Engineering, Box 251, Elmhurst, Ill.

FOR SALE: Magnecordette finest HI-FI tape machine. Used 3 hours cost over \$450.00. First \$350.00 takes it. G. Popdavid, 1255 Shadyside, Canton 10, Ohio.

WANTED: to correspond via tape in Spanish. Send tape to Nicholas Lentini, M.D., Lentini Clinic Bldg., Cheboygan, Michigan, U. S. A.

FOR SALE: Magnecord audio fair demonstrator, PT6AH & PT6J—\$430.00. Special "Mylar" tape, 1200 reels, limited quantity, \$3.30. International Audio Exchange, 1101 Lexington St., New York 21, N. Y. REgent 7-8334.

LP DISCS MADE FROM TAPES. Both sides: 10 inch—30 minutes, \$4.25; 12 inch—45 minutes, \$5.75. 78 and 45 RPM also. Send for FREE Bulletin—"Make Money with Your Recorder." Artistic Sound, 24110 Rensselaer, Oak Park, Michigan.

SERVICE counts. Our years of experience with recording equipment and professional techniques are at your disposal. Let us help you select your new recorder. Write Boynton Studio, Dept. 311, 10 Pennsylvania, Tuckahoe, N. Y.

FOR SALE: Tape recordings of rare records and transcriptions; jazz, pops, Latin-American, classical, dramatic, etc. by famous bands and stars. Johnny Argo, 60 Tolman Street, W. Newton 65, Mass.

FOR SALE: New Webcor 3 speaker tape recorder \$175.00. Neil D. Castagnaro, 1149 Hennrietta Place, Hewlett, L. I., N. Y.

FOR SALE: Masco Model 52 used recorder, New \$250, sell for \$125. Several new "Scotch" paper tapes, 1200 ft.—\$1.50 each. Kenneth H. Wait, Galway, N. Y.

FOR SALE: Elcor Tape Recorder, 7½" speed, 7" reels, \$85.00; Wagner-Nichols Microgroove Disc recorder, \$100; 10 new 7" reels Scotch red-oxide paper tape \$15; 10 new 7" reels Irish 211 RPA plastic tape, \$20; Pickering 230H preamplifier, new tubes, \$20; 132E Record compensator, \$7.50; S120M Cartridge \$7.50; Collins FM tuner \$35; Guaranteed excellent, priced F.O.B. Marilyn Phillips, 311 Penfield, Rockford, Ill.

STOLEN: Ampro HI-FI two speed recorder serial 256255. Want information leading to recovery of machine. Melrose Camera Center, 2608 Franklin Road, Nashville 4, Tenn.

TAPES professionally recorded on LP discs. Two sides, 10", \$4.25, 12" \$5.75. Mail to: Fidelity Sound Co., 1429 L Street, N.W., Washington 5, D. C.

USED but guaranteed like new. Brush BK 411, \$89.50, Revere T100, \$79.50, TDC Stereotone, \$189.50, Ekotape 114, \$127.50. Mail orders filled promptly. Camera Craft, 18 East 42nd Street, New York 17, N. Y.

FOR SALE: Webcor 2010 recorder, \$145. Model 2030, \$175, dual track, two speed, Cash, F.O.B. Want Movie Camera with lights. Quote price. Recording Ministry, 816 Madison Street, N.W., Washington 11, D. C.

HI-FI equipment for sale. Altec Lansing, Fisher, Radio Craftsman, Thorens. Will sacrifice. Send stamped envelope for list. Lance Li Calzi, Greenwich, N. J.

FOR SALE: Magnecord PT6 with Langevin amplifier, Meisner AM-FM tuner, Hand-somely rack-mounted; plus Jim Lansing D-1000 speaker, Electro-Voice 645 microphone. Cost \$1200. First offer over \$500. Telephone OXford 7-2240, New York City, N. Y.

FOR SALE: At sacrifice prices Brand New Broadcast Quality step-attenuators, 30 steps: TYPE A-600/600 ohms, 1 db/step, 30 db total, \$3.75 each; TYPE B-500/500 ohms, 2 db step, tapers to infinity on last step, Daven, \$5.95 each. Postpaid in USA if payment accompanies order, otherwise FOB. M. Conrad, 235 W. Mt. Pleasant Ave., Philadelphia 19, Pa.

EARN over \$200 weekly in spare time using own recorder—Our exclusive franchise available for your city—write. Donico Enterprises, Inc., Box 23, Station B, Evansville, Indiana.

FOR SALE: Brush BK443 as good as new \$125.00, not a penny less. Must sell this week. Write to Mirron Coleman, 601 W. 160th Street, New York 32, N. Y.

## OFF THE TAPE

As we write this our ears are still ringing from our sojourn at the New York Audio Fair where approximately 30,000 Gotham residents crowded into the four day exhibition.

We met a lot of old friends and made a number of new ones. It was gratifying to meet many of our readers in person.

For some unknown reason, many exhibitors at the fair insisted upon running their outfits with the gain wide open. If they were demonstrating how the music would sound in your home — Heaven help the

neighbors! The kettle drums blasted through an umpteen watt amplifier hit you right in the stomach.

The show had several highlights for those interested in tape recording. One was the International Scientific Industries Corporation's Isimetric Drive which keeps a constant tension on the tape and permits all tape movements and speeds to be controlled by one lever. It was of extremely clean design and we'll have more on it later. The firm's address is 3101 E. 42nd St., Minneapolis 6, Minn.

Another recorder which caught our attention was the new Warren 777-1, a portable which is completely self-contained and will operate from its own batteries or from an AC line. The J-C. Warren Co., 21 Hanse Ave., Freeport, N. Y. is the manufacturer. It will record at 3¾ ips.

Hack Swain made the most unusual sale of the whole fair. His music will be featured in the new Lampost Restaurant just opened in the Hotel New Yorker where the fair was held. So even the city's largest hotel now has its music on tape.

THE TAPE  
 THAT **MIRRORS**  
 THE ORIGINAL  
 SOUND...



THE  
**FINEST TAPE**  
 YOUR RECORDER  
 CAN USE



Available At All Leading Sound Dealers

**ORRADIO Industries, Inc.**

World's Largest Exclusive Magnetic Tape Manufacturer  
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FREQUENCY RANGE: 20-20,000 cps  
 LOWEST NOISE LEVEL • UNIFORM SENSITIVITY  
 MINIMUM AMPLITUDE VARIATION  
 LESS DISTORTION

	NET
600 feet on plastic reel.....	\$2.10
1200 feet on plastic reel.....	3.30
2400 feet on metal reel.....	7.71

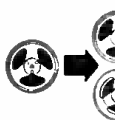


# 50% more tape on same size reel!

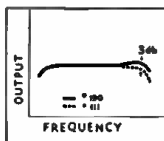
**New, thinner magnetic tape cuts time-wasting reel changes!**

No more stopping for reel change when you're recording longer sports and news events, dramatic productions and musical works. New "Scotch" Brand Extra-Play Magnetic Tape No. 190A reduces time-consuming change-over breaks by giving you 50% more recording time on each reel. Secret of new "Scotch" Brand's extra playing

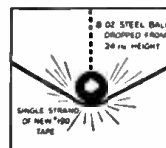
time is a more potent oxide coating which offers improved frequency response, yet is 50% thinner than many standard tape coatings. A thinner tape backing produces more uniform output — cleaner, crisper tones — while retaining critical strength factors to meet the demands of all professional recording machines.



**EXTRA-THIN.** 50% thinner, more potent oxide coating, 30% thinner backing permit more 190A tape to be wound on standard reel. One roll of new tape does job of 1½ reels of ordinary tape.



**INCREASED FREQUENCY** range of new Extra-play tape enables home machines to produce recordings with greater hi fi response than formerly possible with most conventional magnetic tapes.



**STRENGTH TO SPARE.** New 190A tape stands up under even grueling steel ball drop test. Naturally it's tough enough to withstand severe stresses of sudden machine stops, starts and reverses.

**NEW!** REG. U. S. PAT. OFF.  
**SCOTCH** *Extra Play* **Magnetic Tape 190A**  
BRAND

*At your tape dealer's now!*

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