

RECORDING THE HAMMOND ORGAN



TAPE RECORDING

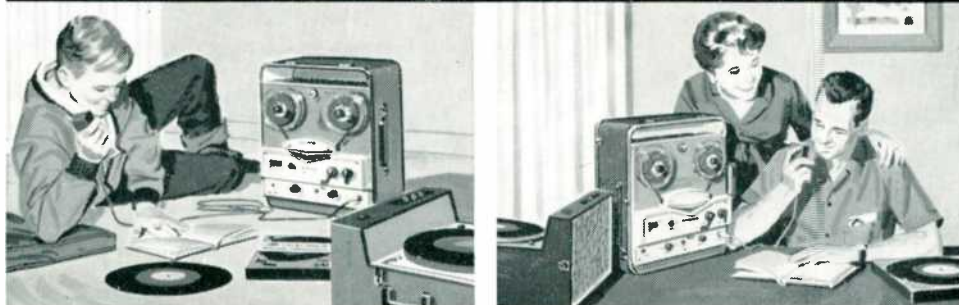


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their foreign language studies.

Never before has it been so important for Americans to learn a foreign language. With world travel so easily available to everyone today, all of us are constantly coming in contact with people—either at home or abroad—who do not speak English.

In fact, the need for a vastly increased number of Americans able to speak one or more languages was emphasized last year when Congress passed the National Defense Education Act.

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TAPE RECORDING

VOL. 7 NO. 4

MARCH 1960

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★—Fair

★★—Good

★★★—Very Good

★★★★—Excellent

CLASSICAL



Music ★★★★★
 Performance ★★★★★
 Fidelity ★★★★★
 Stereo Effect ★★★★★

HIGH SPIRITS

Strauss, Frisch ins Feld; Strauss, from Fledermaus Waltz; Beethoven, from Sym-

phony No. 1 in C Major; Tchaikovsky, from Capriccio Italien; Bizet, from Carmen Suite; Berlioz, Rakoczy March

AUDIOTAPE

2 or 4 track stereo, or dual-track monaural, 7 1/2 ips

Audio Devices, Inc., is offering this tape of glittering classics in a special bonus package, together with a 7" reel of Audiotape on a 1 1/2 mil acetate base, for which you pay only the price of the two boxes of Audiotape, plus \$1. And a better deal may not

soon be passing your way music-appreciative friends.

As its title implies, this recording is designed to lift your spirits and the well chosen works selected for this exclusive tape are inclined to do just that. They run the gamut from the light elegance of Fledermaus Waltz to the vigorous, fiery Rakoczy March. Yet there is never an imbalance in sound texture.

Again, just as with Audiotape's Blood and Thunder classics, we find no indication as to the performing orchestra on this tape. It is, however, thoroughly competent and plays with a surety apparently bred from lengthy orchestral experience.

Aurally brilliant, impeccable fidelity. No—Audio Devices has not gone into the music business, but with such tapes as the two offered in their bonus packages perhaps this would not be such a bad idea at that.

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 and Theatre Orchestra,
 Norman Harrington, Conductor

4T-13 FOUR TRACK \$7.95
 2T-13 TWO TRACK \$9.95



Music ★★★★★
 Performance ★★★★★
 Fidelity ★★★★★
 Stereo Effect ★★★★★

TSCHAIKOWSKY—CONCERTO IN D,
 OP. 35

Heifetz-Reiner-Chicago Symphony Orchestra
 RCA KCS-3002

4 track, 3 3/4 ips, cartridge
 \$6.95 . . . 28 mins.

Definitely Russian and typically Tchaikovsky, this Concerto, plus the wizardry of Jascha Heifetz on the violin, is a masterpiece. To quote Charles O'Connell, "One is convinced that the solo violin and the orchestra, alone or together, can do no more."

Richly expressive, this music is meant to invoke all the resources of tonal coloring the violin is capable of producing. And so it does at the hands of Heifetz. The distinguished polish of the Chicago Symphony conducted by Reiner is ever present.

Fidelity on this cartridge is more in keeping with the high standards of RCA reproduction than some of the cartridges we have heard.

POPULAR



Music ★★★
 Performance ★★★
 Fidelity ★★★
 Stereo Effect ★★★

JANE IN SPAIN

Side 1: The Moon Was Yellow, Adios, Perhaps, Perhaps, Perhaps, Perfidia, You Belong To My Heart, Baia

Side 2: Granada, I Get Ideas, Be Mine Tonight, What A Difference A Day Made, Let Me Love You To-Night, Magic Is The Moonlight



High Spirits

*A happy reel of spirited classics
... available in a special Audiotape bonus package*

DETAILS OF THE PROGRAM

"High Spirits" includes these bright selections:

Strauss	...	Frisch ins Feld
Strauss	...	from Fledermaus Waltz
Beethoven	...	from Symphony No. 1 in C
Tchaikovsky	...	from Capriccio Italien
Bizet	...	from Carmen Suite
Berlioz	...	Rakoczy March

DETAILS OF THE OFFER

This exciting recording is available in a special bonus package at all Audiotape dealers. The package contains one 7-inch reel of Audiotape (on 1½-mil acetate base) and the valuable "High Spirits" program (professionally recorded on standard Audiotape). For the entire package, you pay only the price of two boxes of Audiotape, plus \$1. And you have your choice of the half-hour two-track stereo program or the full-hour monaural or four-track stereo versions. Don't wait. See your Audiotape dealer now.

LIKE your classics bright and melodic? Do you enjoy music of the toe-tapping variety? Then "High Spirits" is just for you. This reel of sparkling classics shows you how vibrant and colorful music can be when it's recorded on *Audiotape*.

The makers of Audiotape have not gone into the music business. They are simply using this reel to allow Audiotape to "speak for itself."

"High Spirits" is available RIGHT NOW from Audiotape dealers everywhere. (And only from Audiotape dealers.) Ask to hear a portion of the program, if you like. Then, take your choice of a half-hour of two-track stereo, a full hour of four-track stereo, or an hour of dual-track monaural sound — all at 7½ ips. Don't pass up this unusual opportunity to put yourself in high spirits.

"High Spirits" makes an ideal companion to Audio's first bonus reel, "Blood-and-Thunder Classics," still available at Audiotape dealers.



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Side B contains the actual sounds broadcast by the satellite as it sped 560 miles above the surface of the earth at a speed of 18,000 miles per hour. Captured by short-wave radio.

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Jane Morgan with orchestra conducted by Frank Hunter

KAPP KT-41016

4 track, 7½ ips
\$7.95...34 mins.

Romance, Latin style, is the theme of this release. Various moods and rhythms are tastefully presented.

Jane Morgan has an appealing voice which lends itself well to these love songs of the Latin lands. She sings with an inviting warmth, and adds a touch of authenticity by mixing the mother language from time to time with the English version.

Bouquets to Frank Hunter for delightful arranging and backing. His use of the guitars, castanets and other instruments representative of the Latin beat is most engaging.

Fine stereo and fidelity.



Music ★★★
Performance ★★★
Fidelity ★★★★★
Stereo Effect ★★★★★

TAHITI

Drums of Tahiti, My Sweet Sweet, Ulili E, My Wahine & Me, Song of Old Hawaii, Tiare

Kou Kino Mambo, South Sea Island Magic, Beauty Hula, Kuu Lei, Kalua, Nane Waimea

The Surfers

HIFITAPE R 417

4-track, 7½ ips, reel-to-reel
\$7.95...28 mins.

It's hard to resist the rhythmic temptation Hawaiian music evokes. You can become transfixed by the ringing sounds of a steel guitar.

The lively and tender songs of the South Seas are charming indeed and The Surfers too, while they do not have exceptionally thrilling voices, have a charming style and pleasant voices which blend well with island music. The amazing agility with which they sing out the Beauty Hula is just great.

Would like to hear more of Eddie Bush playing the steel guitar—he was just a mite lost by the singing.

Excellent stereo on this one, sterling fidelity.



Music ★★★
Performance ★★★
Fidelity ★★★
Stereo Effect ★★

A MAN AIN'T SUPPOSED TO CRY

Side A: It's the Talk of the Town, I'll Never Smile Again, I'm Through With Love, Where Are You, I've Only Myself to Blame, What's New

Side B: Say It Isn't So, What Will I Tell My Heart, You've Got Me Crying Again, Can't We Talk It Over, I Laugh To Keep From Cryin', A Man Ain't Supposed To Cry

Joe Williams, arrangements by Jimmy Mundy
ROULETTE RTC-506

4 track, 7½ ips
\$7.95...34 mins.

While Joe Williams is well known as a jazz singer, he proves here his agility with ballads as well. Without any fancy styling, his renditions are still quite savory. He uses simplicity in phrasing a song.

These tear jerker melodies are all mellow and yawny. Give too much sameness to a number of selections, however, and they can make you want to rewind and forget entirely about playing the second side. Can't say we weren't a wee bit tempted here.

We note that Joe seems to float between the two channels, first he's on the left side, then the right. Sound, however, is good fidelity-wise.

JAZZ



Music ★★★
Performance ★★★★★
Fidelity ★★★★★
Stereo Effect ★★★★★

DUKES OF DIXIELAND, Vol. 3

Tromboneum, Lassus Trombone, My Home Town, Scobey Strut, Dukes of Dixieland March, McDonough Let The Trombones Blow, Bourbon Street Parade, When Johnny Reb Comes Marching Home, Eyes of Texas, Glory to Old Georgia, With A Pack On My Back, Just A Closer Walk With Thee

AUDIO FIDELITY AFST 1851

4 track, 7½ ips
\$8.95...38 mins.

Reall-ly Big Dixieland brethren. The Dukes are just great. They play Dixieland as it was meant to be played.

Swinging, sassy, toe-tapping rhythms. It your taste in music runs along this line, you'll want this tape for your collection.

Pure, beautiful sound. At times the clarinet cuts through the air like a streak of lightning. These fellows play together, weaving a well-knit pattern of melody.

Fidelity—the greatest.

FOLK



Music ★★★
Performance ★★★★★
Fidelity ★★★★★
Stereo Effect ★★★★★

CHAIN GANG SONGS

Side 1: Trouble, 'Twas On A Monday, Going Home, Boys, Nine Foot Shovel, Crying Who? Crying You

Side 2: Dip Your Fingers in the Water, The Old Ship of Zion, Mary Had Baby, Did You Ever Love A Woman, Every Time I Feel The Spirit

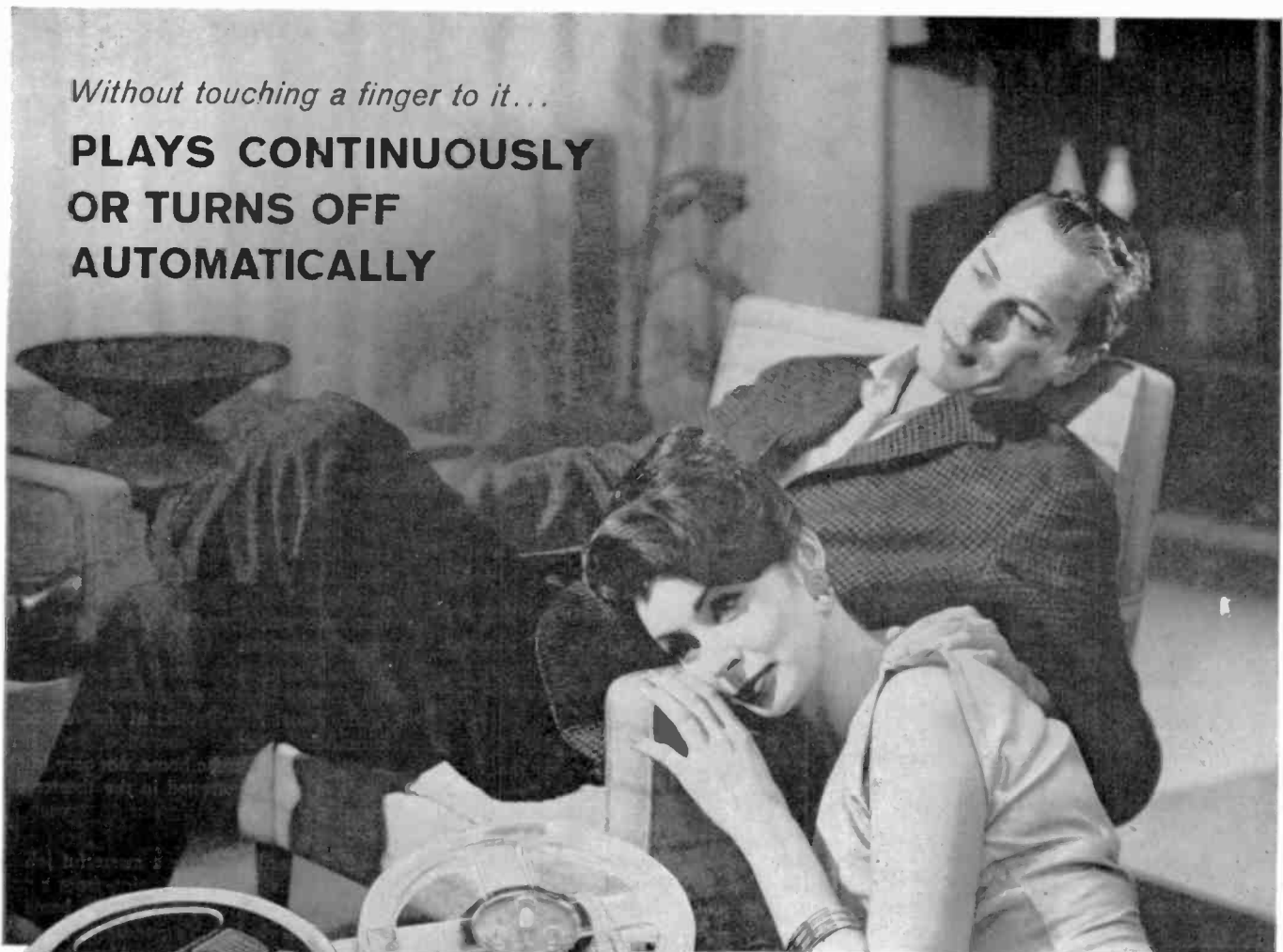
Josh White
ELEKTRA ETC-1505

4 track, 7½ ips
\$7.95...34 mins.

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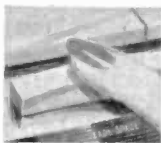
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lieve, reek with expression and feeling. Chain gang songs all speak of trouble and misery. They have a beat that is hypnotizing and all tell a story of woe. Most of these chain gang songs reveal the distress associated with being colored.

Negro spirituals have a charm all their own. Josh White shows us they don't have to be shouted, but rather just sung with understanding and emotion. However, the hand-clapper "Every Time I Feel the Spirit" really rocks on this tape.

Josh White has a voice ideally suited to this type of music. He delivers each song as he feels it, as he imagines those in a chain gang would feel it.

Recommended for anyone whose tape library contains a section of Negro folk songs and spirituals.

MISCELLANEOUS



Music ★★
Performance ★★
Fidelity ★★
Stereo Effect ★★

THE QUEEN'S BIRTHDAY SALUTE

Side 1: The Royal Regiment, The Royal Artillery Slow March, The Keel Row, Bonnie Dundee, The British Grenadiers, Royal Birthday, Hark the Bonny Christchurch Bells, The Screw Guns, tune of Eton Boating Song, The Post Horn Galop

Side 2: Fanfare Militaire, March of the Peers, from "Iolanthe", "Around the British Isles", Rule Britannia, Greensleeves, The Lincolnshire Poacher, On Ilkla Moor, Blaydon Races, Loch Lomond, Fairy Dance, Comin' Thru' the Rye, Will Ye No Come Back Agin, The Mountains of Mourne, The Londonderry Air, St. Patrick's Day, The Irish Washerwoman, Come Back to Erin, Land of My Fathers, David of the White Rock, Sospen Fach, We'll Keep a Welcome, There'll Always Be An England, The Floral Dance, Glorious Devon, I Be Up From Somerset, Sussex by the Sea, Old Father Thames, Watcher, Maybe It's Because I'm a Londoner, Land of Hope and Glory, A Fanfare for a Jubilant Occasion Recorded in Hyde Park, London, featuring The Herald Trumpeters and Band of the Royal Regiment of Artillery, Major S. V. Hays, director.

VANGUARD VTC-1602

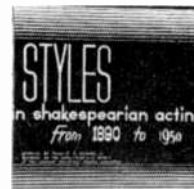
4 track, 7 1/2 ips
\$7.95...42 mins.

Jolly good ol' boy. The first portion of this tape is an actual recording of the Royal Birthday Celebration of the Queen, made in Hyde Park, London, in 1957. It is resplendent with its stirring marches, booming guns, the clatter of horses, and narration by Major Hays, who also is director of the band.

There is a band concert on the remaining tape and a most stimulating concert it is. We have seldom heard as good. The selections, as you can see from the listing, are impressive in themselves and the band and trumpeters are excellent. We like this one and do not hesitate to recommend it.

Excellent fidelity.

EDUCATIONAL



STYLES IN SHAKESPEAREAN ACTING—1890-1950

Creative Associates, Boston 25, Mass.
Produced and narrated by Frederick C. Packard, Jr., Harvard University.
7 1/2 ips, dual track, 1 hour.
\$5.95 plus 25c postage and handling.

Your reviewer admits to little interest in the theater and our approach to this tape was a little on the "so what" side when we put it on the recorder.

It took but a very few minutes for it to capture first our interest and then our attention. The "so what" feeling vanished very quickly and in its place came the conviction that here was a tape of wide interest, and even fascination.

While originally created for students of the theater under the sponsorship of the Audio-Visual Aids Project of the American Educational Theater Association, we believe it will find a welcome home, not only in the hands of those interested in the theater but for those with any interest in speech or dramatics.

Mr. Packard has done a masterful job in gathering his material, ranging from a wax cylinder found in the attic of the home of the great Edwin Booth's grandson to modern recording of such greats as Maurice Evans and Sir Lawrence Olivier.

The entire reel is excellent listening and like a good book, it is good for more than one playing for you can find new things in it each time. The transition from the days of the tremulous, gasps and groans of the rhetorical spellbinders of yesteryear to the realistic speech of today makes fascinating listening.

Mr. Packard's narration is excellent and his comparisons of various styles done with a sure touch.

The recordings presented on the tape have come from a wide variety of sources including the Harvard Vocabulary, Columbia, RCA, Linguaphone and others. The individual excerpts are skillfully woven into the whole.

Accompanying the reel is a printed text of the selections and on the reel you will find such actors as Julia Marlow, Paul Robeson, Dame Ellen Terry, Orson Welles, Otis Skinner, John Barrymore, Judith Anderson and many more, in addition to those mentioned earlier.

Mr. Packard's narration has a way of drawing you into the "act" and because there is a little Hamlet in all of us, you begin to make the comparisons he desires you to make and even begin to wonder how you would say it.

This reel is very enjoyable and, at the modest price asked for it, a real buy in our opinion. It may be ordered from Frederick C. Packard, Jr., 502 Boylston Hall, Harvard University, Cambridge 38, Mass. We hope to see more like it.

The
Campus Library

The Epic: Its History and Development
English Series, Campus Library, Campus
World, Inc.

By Dr. Walter M. Crittenden, Associate
Professor of English, University of Southern
California. Approximately 2 hours, 3¾ ips.
dual track, \$11.95

This tape traces the history of the epic,
defines it as to its form and content, shows
the development of the genre and points
out epics of the various nationalities.

Summary given of the action of the folk
epics: The Odyssey, Gilgamesh, Ramayana,
Song of Roland and The Cid.

The second half of the tape is devoted
to the literary epics: the Aeneid, Lucians,
Paradise Lost, Faust and John Brown's
Body.

Dr. Crittenden has a pleasant voice and
the narration is well done. The tape should
be of value to those engaged in the study
of the subject.

NEW TAPES RECEIVED

REEL-TO-REEL

- Bel Canto, The Five Pennies, Danny Kaye—
Louis Armstrong, 4-track, 7½ ips, ST/68
Concertapes, Beat Tropicale, Jose Bethan-
court & His Orchestra, 4-track, 7½ ips,
4T-3009
Decca, Russian Fair, Don Cossack Choir,
Serge Jaroff, conductor, 4-track, 7½ ips,
ST7-10016
Decca, The Eddy Duchin Story, Carmen
Cavallaro, 4-track, 7½ ips, ST7-8289
Hifitape, Here Come the Coachmen, The
Coachmen, 4-track, 7½ ips, R 412
Livingston, Show Tunes and Old Favorites,
Lenny Herman, 4-track, 7½ ips, 4T-5
Livingston, Target for Tonight, The Starlight
Music Orchestra, 4-track, 7½ ips, 4T-7
Mercury, Music of Leroy Anderson, Fred-
erick Fennell Eastman-Rochester "Pops"
Orchestra, 4-track, 7½ ips, STB 90043
Mercury, The Cats in Stereo, The Harmoni-
cats, 4-track, 7½ ips, STA 60028
Stereophonic Music Society, Grofe Grand
Canyon Suite, The Oslo Philharmonic
Orchestra, Oivin Fjeldstad, conductor,
4-track, 7½ ips, S 21

CARTRIDGES

- RCA, Mister Guitar, Chet Atkins, 4-track,
3¾ ips, KPS-2012
RCA, Songs of Battle, The Ralph Hunter
Choir, 4-track, 3¾ ips, KPS-3067
RCA, Sticks and Bones, Marty Gold and His
Orchestra, 4-track, 3¾ ips, KPS-3065
RCA, Chet Atkins in Hollywood, Chet At-
kins, 4-track, 3¾ ips, KPS-3068
RCA, On Stage, The Robert Shaw Chorale,
4-track, 3¾ ips, KCS-6009
RCA, Sound Spectacular, 1812 Overture &
Bolero, Morton Gould Orchestra and
Band, 4-track, 3¾ ips, KCS-3004
RCA, Ravel Concerto in G, d'Indy, Sym-
phony on a French Mountain Air,
Munch/Boston Symphony, Nicole Hen-
rior-Schweitzer, 4-track, 3¾ ips, KCS-
4016

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ALL...**



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tape recorder
guild-crafted by
Philips of the
Netherlands

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CROSSTALK

from the Editors

THERE WAS A SMALL sized flurry of concern in some quarters when the General Electric company unveiled its new recording method last month. The new development might be called a tape recorder although it does not use magnetic tape and it might be called a motion picture projector although it uses no film.

* * * * *

ACTUALLY IT IS A thermoplastic recording medium, a new concept of recording information. Actually anything in electrical pulse form can be recorded.

* * * * *

THE NEW SYSTEM can concentrate 100 times as much information in the same space as magnetic recording can do at the present. A 1500 page book can be recorded in five minutes on a half-inch reel. It can also record anything that comes from a TV set, mike or other electrical gear.

* * * * *

THE DEVICE USES a three ply plastic film. The top layer is a plastic which will melt and flow under heat, the base is similar to regular motion picture film and in-between is a transparent layer which will conduct electricity. An electronic beam scans the film surface leaving electrical charges on the plastic surface. The film is then passed over a heater which softens the plastic. As this happens, a current is induced in the middle layer and the attraction of the electrical charge to this middle layer depresses the surface of the plastic in minute ripples. This is all conducted in a vacuum. The film is cooled and the lines are retained. To erase the film it is again heated and the surface tension of the material will pull it out flat again.

* * * * *

THE SIGNALS can be reproduced from the film either by electronic means, as is the case with magnetic tape, or with a special projector which will show the film like a movie. It will handle either color or black and white. Its bandwidth is so great it is capable of recording, for instance, all of the 13 regular TV channels at once, which then could be picked off one by one later.

* * * * *

THIS DEVELOPMENT is still in the laboratory stage and even when perfected it is doubtful that it would have any general use because of the high vacuum system required. The military is interested in it for defense purposes. One of the chief drawbacks is the fragility of the film which is grooved like a record. One good fingernail scratch might destroy quite a bit of data.

* * * * *

BEL CANTO has moved to Columbus, Ohio from the west coast in order to be more centrally located for shipping tapes quickly. Bearded Russ Molloy, Bel Canto prexy, was working night and day to get the new installation completed so there would be no interruption of service.

* * * * *

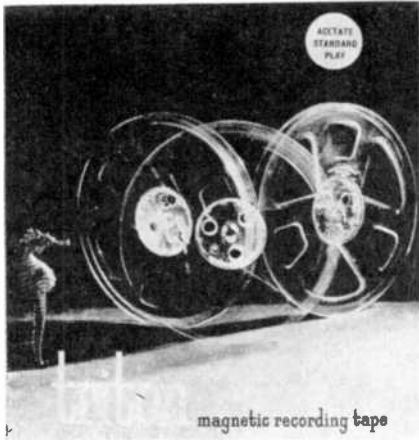
WE HAVE NOW COME full circle. Back in the old days, salesmen used to tell their customers that the tape recorder threaded just like a movie projector. Just now we happened upon an ad for a new, nice looking, editor-viewer made by the Elgeet Company of Rochester. Guess what—one of the features was the fact that it loads like a tape recorder!

* * * * *

LATEST WORD FROM the west coast is that the hi-fi show sponsored by the Magnetic Recording Industry Association in San Francisco had a better attendance than the one run in Los Angeles by another group.

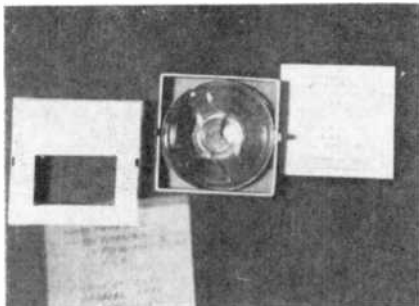
NEW PRODUCTS

NEW TAPE



Brand Products, Inc., 256 East 49th Street, New York 17, N. Y. has introduced its new Triton tape. It comes on a heavy plastic reel, in a hermetically sealed polyethylene bag, and a tape retainer clip comes on the reel as an extra bonus to hold the tape tight on the reel. All Triton tape is splice free and comes wound on non-warp, non-squeal reels, and includes a heavy duty DuPont Mylar leader at both ends to protect and facilitate labeling of recordings. Boxes are color coded for identification, and the tape is available in both acetate and Mylar in a wide range of reel sizes. For details, contact the manufacturer.

MAILING BOXES



Lightning Calculator Company, Box 6192, St. Petersburg Beach 36, Florida, has introduced their mailing boxes originally designed for the blind. They require no external string or other fastening means. Two clasps on lower part of box go through two slots in upper part of box and bend over. The lid of the box has an opening into which a two sided address label can be inserted. Once the two addresses are on the label a blind person has no further addressing to do. When he is ready to return a tape, he merely turns the card over (a notch on upper right hand corner of the address card tells him which way to insert it in lid) and slips it into the lid. These boxes are not wholly for the blind, they can be used by anyone. For details and prices, contact above company.

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- HOW-TO-DO-IT** articles for home enthusiasts
- NEWEST** of the new products on the market
- WAYS AND MEANS** of getting the most from your recorder
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TAPE CLUB NEWS

Blind Voicеспondent Uses Tape in Work

Voicеспondence member Josephine Peebles of Charlottesville, Virginia, has another very practical use for her recorder in addition to voicеспonding. Josephine is blind and is a telephone solicitor. When the new telephone directory came out she had her local friends record on tape all the numbers in her territory so she could check the recording against her braille notes and bring the latter up to date. The Voicеспondence Club helps and encourages its blind members to make greater use of tape in handling the many affairs of everyday life, and its Service Committee assists them to this end. It is interesting to note that about one out of every five members of the club is visually or otherwise handicapped.

Contest Winner

Nils C. Roed, operator of T-R-1 Tape Network Station T45NCR, Oslo, Norway, was the winner of the 1959 Tackard Contest, sponsored by Tape-Respondents, International. Nils' prize was an 1800' reel of Irish Ferro-Sheen tape, presented by Orr Industries, Inc., of Opelika, Alabama. Tackard contest winners in previous years were Roy Trumbull, 76QRM, Corte Madera, Calif., in 1957; and Bill Murphy, T6KAT, Tokyo, Japan, in 1958. In the Network, tackards are similar to ham radio Q-S-L cards. Literally, TACKARD means Tape ACKnowledgment CARD.

A.T.E. Mailing Labels

The American Tape Exchange has some new mailing labels available to its members at a cost of fifty for 40¢. These labels have a chocolate brown, wood-grain finish, plenty of room for return address and sending address, and appropriate customs and post office information is included.

South African WTP Exhibit

World Tape Pals had an exhibit at the Kimberley Hobbies Fair in South Africa. For a week ten thousand visitors to the fair kept local WTP's busy playing and making tapes, answering questions and recording events. An excellent location, provided by the fair directors at a nominal fee, professional decorating of the booth by WTP Billy du Toit, display artist, assisted by Johnny Albertse and Len Follet, and the presence of some member at the booth at all times combined to win a special award for the display.

WTP representative Johnny Albertse expresses special thanks to Billy and Len for help in constructing the booth, to Dan Grundlingh for lending valuable equipment, keeping the members in attendance supplied with refreshments, and to all the above and William Cross for assisting at the booth.

We would like to add Hi-Fi Tape Recording's congratulations to World Tape Pals for the fine activities planned by headquarters and for the splendid active partici-

pation they give to their club. Keep up the good work.

Looking For An Australian Tapespondent?

The secretary of the Australian Tape Recordists' Association informs us that he has a list of forty Australians who are looking for contacts overseas. ATRA's two youngest members, Mel Epstein of Omaha, and Jim Roloff of Kirkwood, Mo. are both 14 years old and are assured of a warm greeting from their Aussie counterparts.

JOIN A CLUB
AMERICAN TAPE EXCHANGE
Stuart Crouner, Secretary
181 E. Main St.
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AURORA SCIENCE TAPE SOCIETY
Walt Richard Sheasby, Jr.
215 North Baldwin Ave.
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BILINGUAL RECORDING CLUB OF CANADA
Rene Fontaine, Secretary
1657 Gifford St.
Montreal 34, P. Que. Canada

CATHOLIC TAPE RECORDERS OF AMERICA, INTERNATIONAL
Jerome W. Ciarrocchi, Secretary
26 South Mount Vernon Avenue
Uniontown, Pennsylvania

CLUB DU RUBAN SONORE
J. A. Freddy Masson, Secretary
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ORGAN MUSIC ENTHUSIASTS
Carl Williams, Secretary
152 Clizbe Avenue
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TAPE RESPONDENTS INTERNATIONAL
Jim Greene, Secretary
P. O. Box 416, Dept. T, St. Louis 66, Mo.

THE VOICESPONDENCE CLUB
Charles Owen, Secretary
Noel, Virginia

UNITED RECORDING CLUB
Richard L. Marshall, President
2516 S. Austin Boulevard
Chicago 50, Ill.

WORLD TAPE PALS, Inc.
Marjorie Matthews, Secretary
P. O. Box 9211, Dallas 15, Texas

FOREIGN

AUSTRALIAN TAPE RECORDISTS ASSOC.
John F. Walton, Hon. Secretary
Box 970. H., GPO. Adelaide, South Australia

TAPE RECORDER CLUB
A. Alexander, Secretary
123 Sutton Common Rd.
Sutton, Surrey, England

THE NEW ZEALAND TAPE RECORDING CLUB
Murray J. Spiers, Hon. Secretary
37 Ponsonby Road
Auckland, W.I., New Zealand

Please enclose self addressed, stamped envelope when writing to the clubs.

TAPE IN EDUCATION

Robert C. Snyder

WE want to thank the many readers who have written letters on various aspects of Tape in Education. To the best of our ability we will try to answer these letters in person as quickly as possible. Month after next we plan to give a round-up of recent letters with our comments.

The month after that, we plan to start on the use of tape in teaching modern foreign languages. It is our present plan to go into the background of various philosophies and methods in "language laboratories," then into a discussion of the latest equipment available, and from there into a discussion of possible improvements and the possible future direction of language laboratory methods of teaching modern languages.

Last month we began a discussion of the use of the tape recorder in the elementary school classroom in reply to Mrs. Nancy B. Lane of Wellesley, Mass. We covered the essential characteristics of the tape recorder as a record player and a record maker. We commented on the use of the recorder for the preparation of pre-recorded instructional materials and presentations. Our comments continue:

The truly serious teacher can make great use of the tape recorder for self-analysis and improvement in diction and clarity in such subjects as spelling, reading, and pronunciation. In many areas of the country sectional accents common among teachers do a severe disservice to the student.

Many natives of my part of Maryland mispronounce words such as *chair* and *fair* to sound like *cheer* and *fear*. *Study* is sometimes pronounced *steady*. Boston gets *pabk* for *park*, *cab* for *car*, and so on. Almost every section of the country has some of these local mispronunciations. The serious teacher can greatly benefit his or her own students by using the tape recorder to correct his or her own errors of pronunciation or reading interpretation.

A candid tape recording of an average day's class in any subject might allow the teacher to see himself as his students and others see him. Just set up the recorder in class with the record volume fairly high and forget that it is there. Don't worry about the quality of the recording, just get your reactions to little Mildred who often asks difficult questions. See if you yourself could really make sense out of the answer you gave to Johnny when he asked for an explanation of a technical detail of some subject.

"Would God the giftie gie us . . .," the poet wrote. Your candid tape recorder used occasionally in your own class room can be this gift.

Although this use of the tape recorder for self-analysis and improvement is not the usual way of using tape in education, it certainly should not be minimized. After all, improving our own performance is surely a major first step to improving the performances of our students who are very likely to copy us.

Another analytical use of the recorder, of course, is to record the student in his

performance of any type of recitation or other rendition. This can be particularly valuable in the so-called language sessions in which the child gives talks in his own native tongue.

As a pedagogic comment, we would advise that these recordings not be used in playback so as to become a device for ridiculing any student. Instead, record the student as he gives his performance and then allow immediate class comment on the performance itself just as you would without the recording.

After the comments, play the recording and let the student hear his own performance in light of the comments already made.

After playing back the tape, either allow no further comments or only comments which would correct errors in the previous comments.

The student should not be encouraged to defend his performance or reply to his critics, for he is not likely to be able to learn from analyzing his own errors if put in the position of defending himself.

Student evaluation recordings, in my opinion, should be retained for reasonable periods and students should be encouraged to listen to themselves privately after class. Self-evaluation and analysis can be one of the greatest learning aids for any person.

From what has been written so far, it

can be seen that the greatest benefit from the tape recorder will be realized only if each teacher has his own recorder. Either the school should provide one for each teacher, or the teacher should provide one for himself just as he probably has his own portable typewriter.

The recorder must be available to the teacher where he needs it and when he needs it—in school and out—if greatest use and benefit is to be obtained.

In the usual elementary school there is one recorder for the whole school or perhaps two or three at the most. The recorder is not available when needed or is found not to be in operating order when the scheduled time arrives.

Like any other piece of equipment, a tape recorder used by many different people is not likely to get proper maintenance.

A disappointing or unsatisfactory experience with the inadequately maintained school-owned tape recorder is likely to be the last experience for many a teacher.

Invest in your own, it need be, or get permission to have free use of the school recorder for a few days until you are thoroughly familiar with its operation and capabilities.

Then you are ready to begin creating your own instructional materials. Once you have mastered the technique of putting together a whole piece of instructional material for yourself, you will have little difficulty in adapting materials available from other sources.



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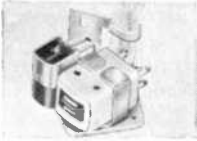


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QUESTIONS AND ANSWERS

Questions for this department may be sent by means of a postcard or letter. Please address your queries to "Questions and Answers," HI-FI TAPE RECORDING, Severna Park, Maryland. The most interesting and widely applicable questions will be used in this department.

Tape Problem

Q—I have a "tape problem." Hope you can help me out.

I recently purchased a Wollensak 1515-4 (4 channel) stereo machine. With it came a reel of regular brand tape. Works fine.

However, I formerly had an old machine and some so-called cheap or discount tape that sells out here for \$1.00 to \$1.25 per 1200 ft. This tape doesn't sound good on the machine. It even peels off (and did on my own machine too). It also has a tuzzy sound, etc.

This cheap tape is generally called "acetate" tape. Just what does this mean? Is it the tape itself or merely the coating that is "acetate"?

And, finally, can I get good results with anything but the tape that came in my recorder? This brand is a trifle expensive and I would like to get something a little less expensive for general use. I have a lot of tape to take off on 3 3/4 ips from the old 7 1/2 machine—nothing with great fidelity but old records, family tapes, etc. I'm sure that there are some other tapes that would do an adequate job.

So what do I ask for—"acetate" (a different brand maybe) or some other type and if so, what other types or materials specifically if not "acetate"?—W. J. E., La Cresenta, Cal.

A—The term acetate is applied to the base material on which the oxide is coated. This material is cellulose acetate (same as cellophane) and is the most widely used base material for all tapes.

The other base material is DuPont Mylar which is stronger and impervious to heat or humidity.

These two base materials are the only ones on which tape is presently coated. Formerly, tape was also coated on paper.

So the designation "acetate" or "Mylar" tells you only the nature of the base material and nothing at all about the quality of the oxide coating.

There is an old adage—"You get what you pay for" and this is as true of tape as with anything else. You can pick up a bargain here and there in tape, as in anything else, but sometimes you get stuck with an inferior product.

You can use any of the recognized brands of tape on your machine and expect consistently good results. Bargain tapes may give you poor sound or excessive head wear.

Address Wanted

Q—In your January issue there is an article entitled "New Slide Synchronizer" which describes the Meston Synchronomatic head which fits any tape recorder.

There is no address of the manufacturer nor was there any price. We would appreciate it if you would furnish us with that information.—C. W. B.

A—The address of the manufacturer is Meston's Travels, 3801 N. Piedras Street, El Paso, Texas. We would suggest you write to them regarding prices.

Recording Skips

Q—Could you please give me a clue as to the occasional skips that occur in my tape recordings? They happen infrequently and inconsistently, but often enough to cause me concern. They are apparently spots of recording failure and do not recur necessarily when re-recorded.

I use a standard brand tape and this trouble has appeared at least just a bit on each of four machines, the last a stereo model. The 7 1/2 speed is the least affected.

—M. L. G., Lockport, N. Y.

A—Using different reels of tapes and different machines, even though all are of the same make, immediately rules out such things as bad tape, loose connections, etc., and leaves a real puzzler.

The usual causes of skipped spots in a recording are dirt on the heads, worn heads or pressure pads, glazed or dirty pressure pads, poor quality tape, or bad connections somewhere between the signal source and the heads.

Inasmuch as the tape you are using is a standard brand, that possibility (bad tape) is definitely out of consideration. We would suggest that you check your tape guides and pressure pads on all machines and also clean the heads if this has not been done.

If this routine maintenance has been taken care of then there remains the possibility of poor connections. We would suggest you do your recording in the normal manner but bend the mike cord, or other cord leading to the input, back and forth. Work down the length of the cord while recording and also inspect the plug and the place where the cord enters the mike. If the trouble is in a defective cord your recording should have quite a few skips in it and it would be a sign that you should replace the cord.

It would be very unusual for this trouble to develop in so many different machines, unless you have used the same cords with all of them.

If this does not reveal the trouble and the other items mentioned above have checked out OK then the trouble must be in the recorders themselves and we would suggest you contact the manufacturer for we are at a loss to diagnose further.

TAPE RECORDERS

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Low cost, high quality recording tape, in boxes or cans. FREE 1960 CATALOG

DRESSNER, 89-02 AA, 174 St., Flushing 65, N. Y.



FEEDBACK

Excerpts from readers' letters will be used in this column.

Address all correspondence to: The Editor, HI-FI TAPE RECORDING, Severna Park, Maryland.

Pressure Pads

To the Editor:

Tape recorder owners are still having grief due to faulty pressure pads. It's ironical to buy good equipment and then have such an inexpensive item throw everything out of kilter.

One gentleman writes to you that he makes them out of old felt hats. That material varies in thickness and causes too much or too little spring tension on the pressure pad arm. Another of your readers would like to experiment with Doe Skin material.

Your magazine also recommends Dr. Scholl's Kiro felt which comes with an adhesive backing. All this is comparable to building a custom automobile and skimping on a ten-cent cotter pin.

If some manufacturer would come right out and advertise pressure pads for sale I'm positive he would build up a good business.

If they would clip or snap on to the pressure pad arm, frequent changing would be easy. At any rate, like Dr. Scholl's pads, they could have an adhesive backing. They could be advertised as special material and specially treated and lubricated to eliminate tape squeal and better all-around efficiency.

From my own experience, I found that the use of too such glue easily penetrates the pad and makes the whole thing hard as a rock. This produces a beautiful squeal.

Everything from fingernail files to bobby pins are recommended for roughing up the pads. Couldn't the manufacturer make available a tiny brush with stiff bristles to do the job?

I can see the enthusiastic owner of a fine machine running the nail file across the pads and, as there isn't much room to stroke a file, he makes all sorts of hi-fi nicks in the recording head and he will do a still better job if his file is magnetized.

I sincerely hope my letter will be of some benefit to the readers of your column.

I had tape recorders since my first "Brush" model in 1948 and would never want to be without one. At the price and quality of blank rolls today, I run them through on one side only so I can splice and edit. I like to keep baby's first words separated from Louis Armstrong's TV appearances, etc.

Does anyone know what became of the 1/8" wide demi-tape?

As for stereo—you force something too complicated on the public and you will serve only a minority. That is why there are so few large orchestras—people want to relax—not concentrate, when they have time to get away from their everyday drudgeries. —Harvey Last, Grafton, Wis.

Demi-tape was born too soon. We first reported on it in 1955 in a story by H. J. Hasbrouck who apparently was the first to do any serious experimentation with it. Now there is talk of this size tape for a new cartridge.

Not Enough Info

To the Editor:

I received a tape recorder for a Christmas present. A little instruction booklet came with it.

Nothing was in the booklet on when and why to use the 3 3/4 and 7 1/2 ips speeds. No mention was made about where recorded tapes could be purchased. There was nothing said about where one could learn more about how to use a tape recorder to best advantage.

I happened to mention to a fellow photographer that I had a tape recorder. He said he would send me a copy of TAPE RECORDING magazine which I have enjoyed. Wouldn't it be a good idea for the manufacturers to enclose some literature from the tape makers, names of magazines, etc. There must be someone else as much in the dark as I am. — O. L. Harringer, Jr., Rocky Mount, N. C.

One of the prime reasons why we started TAPE RECORDING magazine six years ago was to remedy the same situation that existed then. Perhaps the publication of your letter will help the cause. It is indeed a shame that buyers of tape recorders are not made fully aware of all the goodies available to them to increase the enjoyment of their machine.

Real Bargain

To the Editor:

After wearing down one pencil and using considerable scratch paper and a reel of recording tape I arrived at the following figures which I thought you would like to pass on to the great many readers of your most interesting and informative Hi-Fi Tape Recording Magazine.

Out of pure curiosity I was interested in knowing first, exactly how much recording tape is used for each spoken word recorded. Second, how much each recorded word cost at the 3 3/4 ips speed.

The result of my findings is as follows: For slow speech, two inches of tape is used per word. For rapid speech only three-quarters of an inch of tape is used per word.

Now for the cost of each word of recording. I bought 1200 feet of tape for two dollars. That figures out to be 144 inches of tape for one cent (using both tracks). So at a normal rate of speech, one can record 96 words at a cost of only one cent!

After five years of amateur tape recording, I ask you where else can one get so much for so little? Where else except from reading your magazine? — Ernest Jensen, Seattle, Wash.

The chap who first said "talk is cheap" apparently had the tape recorder in mind even though the first one was yet to be built. Thanks for your kind comments about the magazine and for the interesting figures. Sounds like tape correspondence would be a lot cheaper than long distance phone calls. At the 1 7/8 ips speed it might be cheaper than writing.

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HI-FI TAPE RECORDING
Severna Park, Md.



If you're both recording engineer and organist put the recorder on a bench close to the organ. Here Charles Sipes of the Hammann Music Company of Glen Burnie, Md. demonstrates the proper set-up with a V-m 720 recorder in the foreground.

RECORDING THE HAMMOND ORGAN

... learning is faster and pleasure greater if you record your playing.

by Mark Mooney, Jr.

THERE is only one way to find *The Lost Chord* and that is to record it before it becomes lost.

With the electronic organ fast becoming the number one home musical instrument, the interest in recording individual efforts has grown also.

Two factors make recording worthwhile: one is more rapid progress in the art of organ playing and the other satisfies the desire to be able to hear your performance over and over again, as many times as you like.

Then too, it seems a little sad to realize that the golden notes you have produced, the expression and feeling you have put into your playing, and the pride you feel in a fine performance are doomed to die and become a memory the moment you lift your fingers from the keys. With a recorder this need not be so.

Recording with the Microphone

The obvious way to record the organ is with the micro-

phone, just as you record your voice but this is not necessarily the best way.

For one thing, you will also pick up any extraneous noise that occurs while you are recording. Should the phone ring, the baby cry or a jet fly over, the mike will pick this up too and spoil the purity of the recording.

Also, there is the possibility of picking up the mechanical sounds of your feet on the pedals or, if you are a foot tapper that will record also.

If a microphone pickup is desired the mike should be placed far enough away from the organ so that any mechanical sounds will not be picked up. It is best to put the mike on a stand or, lacking a stand, to place it on a soft cushion or a piece of foam rubber so that vibrations transmitted through the floor will not reach it.

The exact position of the microphone in relation to the organ speaker will have to be found by experiment as the acoustic qualities of the room will have an effect on the sound of the organ.

We would suggest that you try a few mike positions and from the playback, determine which best suits your taste.

When recording with the mike, or electrically, as we shall describe below, the recorder itself should be placed in a convenient operating position. If you have someone to act as recording engineer for you, the recorder may be placed anywhere but if you are acting as your own recording engineer then place the recorder on a small table or bench alongside the organ bench where you can reach the controls easily and quickly.

Recording Volume

The organ is capable of producing tones that vary from a thin, reedy whisper to floor shaking bass. This wide dynamic range can be handled by the average tape recorder, however, once the volume is set it should be left alone.

The best method is to have the organist sound and hold for a moment the loudest combination of stops and organ volume that will occur during the actual playing. Put the recorder in record position and adjust the recording volume so that the indicator on your machine indicates a peak but not a distortion. Some recorders have the "magic eye" type of indicator. This should just close. Some have two neon bulbs, one to indicate distortion. The regular record light should glow but the distort light should stay out. On a recorder having a VU meter, the needle should not pass the 100% modulation point or go into the red area of the scale.

The importance of letting the volume control alone once it is set can be easily understood. One of the organ controls, the swell pedal, or the knee volume control, allows the organist to put expression in the music. Should the recordist increase the record volume when the organist drops the organ volume the two will cancel each other and on the tape there will be no noticeable change. Conversely, if the volume has been increased on the recorder and the organist suddenly shifts to a high volume level on the organ, the signal on the tape will be distorted and spoil the recording.

So, basically, set the recorder for the loudest peaks and let it alone. If the soft tones fail to register properly you can either have the organist increase the volume on these



The large console type Hammond organ may have integral speakers or a separate tone cabinet. Recording takeoff can be made at pre-amplifier. Output voltage at speakers may go as high as 10 volts.

by not dropping so low or you may "ride the gain" and increase the recording volume. However, if you do so, do it cautiously.

If you are both organist and engineer, set the recording volume and forget it.

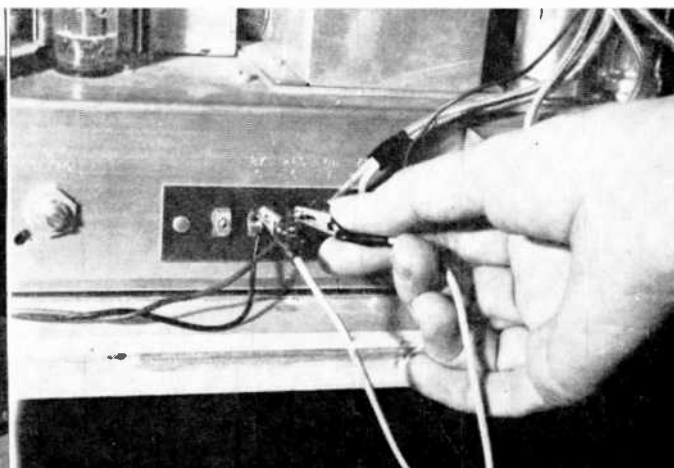
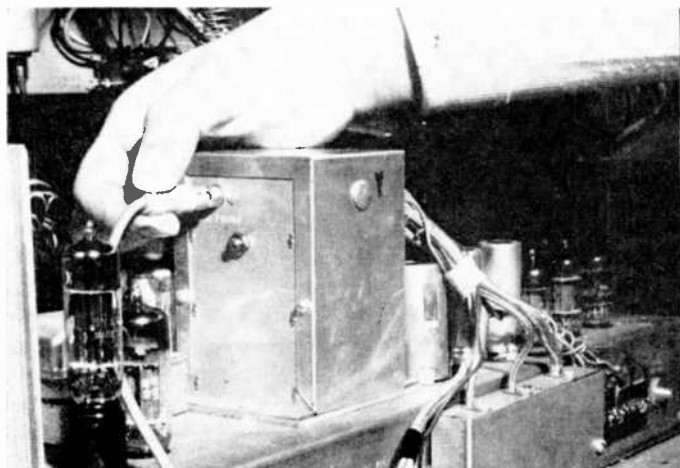
Recording Electronically

Recording electronically is the best method. By taking the current directly from the organ and not using a microphone any extraneous noises are eliminated.

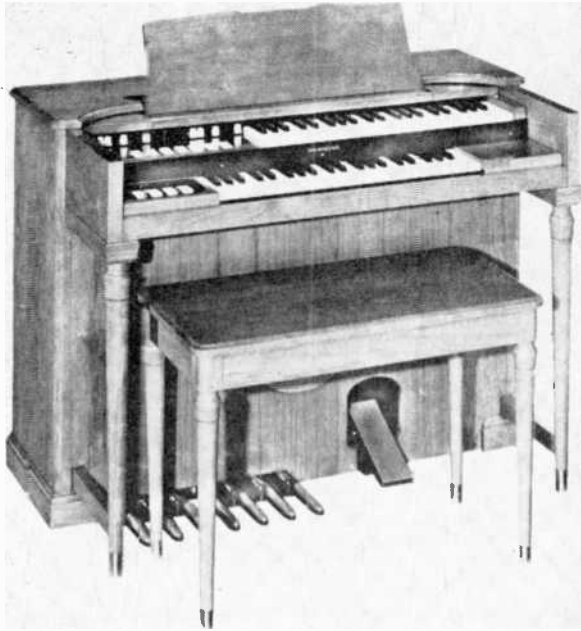
On all larger models of the Hammond organ, the takeoff for recording can be the voice coil speaker terminals of the tone cabinet. This point permits recording of the reverberation with which these organs are equipped.

The only difficulty is that the organs may, depending upon the number of keys depressed and the number of stops used, put out as much as 10 volts to the speaker. This may be more than your recorder can handle.

The connection is made by using the accessory cord of the recorder, clipping the alligator clips to the voice coil



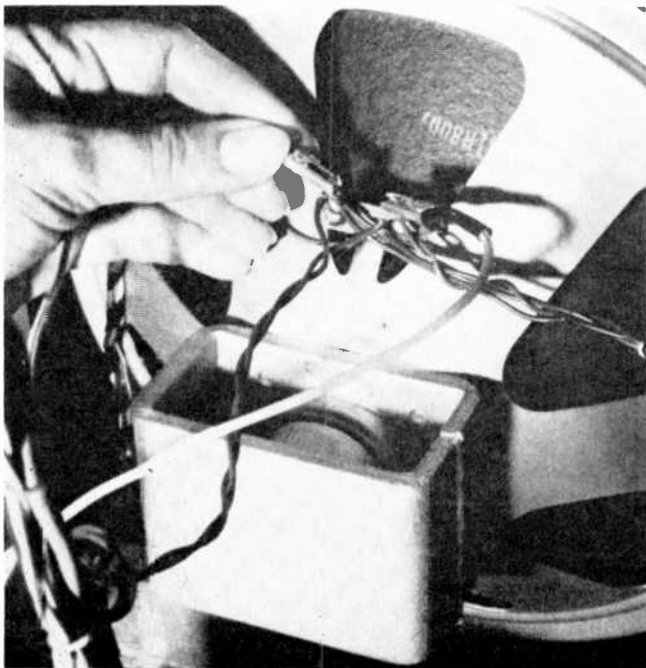
Left: to play the recorder back through the console organ the amplifier output of the recorder is plugged into the radio-phono input. A volume control must be placed in line. Right: recording takeoff on organ preamplifier is terminals marked "G." Current may be cut in half by using one G terminal and ground. Playback signals may also, be fed into same point, instead of using radio/phono input.



The Hammond Spinet has two manuals. Foot pedal controls volume and recording take off is done at speaker voice coil terminals. Pedals give added base notes.

terminals and plugging the other end into the radio/phone input of the recorder.

If you do get overload and distortion then you must insert a volume control between the organ and the recorder. Purchase a 100,000 ohm volume control (or potentiometer) from your local radio supply house. You will find it has three connections on it. Fasten a short length of wire (solder if possible) to the two outside connectors. Then attach the other ends of these wires to the two voice coil terminals of your organ speaker. Next take the accessory cord that came with your recorder and clip one of the alligator clips to the center connector of the volume control and the other to the right hand connector (looking at the volume control from the back). That's all there is to it. Adjust to suit.



The Hammond Chord Organ has a keyboard for the right hand and buttons to play the chords for the left. Volume control is by means of a knee lever. Recording take off on speaker.

Better than a straight volume control is a control called an attenuator. This will cost four or five dollars. These are constant impedance controls and are called also L pads or T pads. The 8 ohm unit is the one to get. The hookup for this is shown in the direction sheet accompanying the control. When buying at your parts jobbers store explain to the clerk just what you want and how you intend to use it. Most clerks in these stores are well versed in matters of this sort and will see that you get the proper control. If you are hesitant about making the connections yourself your local Hammond service man can do it for you quickly.

On the Chord, Extravoice and Spinet organs the power must be taken from the speaker voice coils.

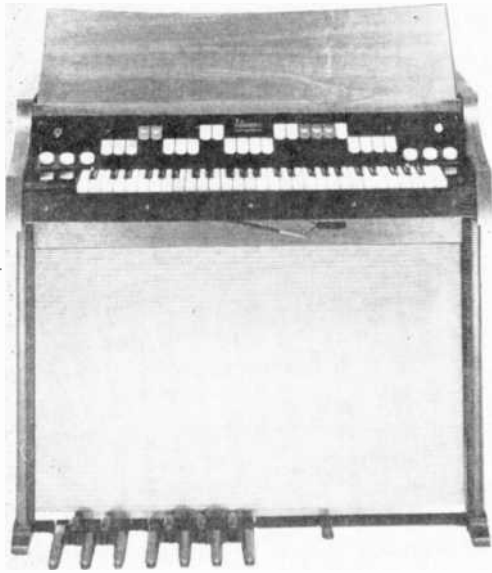
On the console organ, which has a separate speaker cabinet the point to take off for recording can be the terminal board of the preamplifier. On this you will find two terminals marked "G." You may clip an alligator clip to each of these. or, if the amount of current is too great, hook one clip to a G terminal and the other to the chassis, or ground, of the organ. This will cut the current in half. If, after trying these connections your recorder still overloads then insert an attenuator and adjust it until good, clear recordings are obtained.

Because the signal is being taken from the preamplifier, the reverberation will not be present. This may be added if the recorder is played back through the organ by attaching the leads to the same terminals, but more of this later.

Some of the later models of tone cabinets used with the large organs have two and three channel systems. Hence making a connection to the voice coil terminals of any one channel will not give the full range for the recording.

If you are recording the large console for your own practice or amusement make the pickup from the G terminals or use a mike. If you are recording professionally drop

Photo shows how alligator clips are attached to voice coil leads on speaker. If power is too great for radio/phone input of recorder to handle then a volume control must be inserted in line.



The Hammond Extravoice, like the Chord and Spinet organs may be recorded by taking the power from the voice coil terminals. Like the others it also has a radio/phono input.

a note to the Hammond Service Department for the hookup necessary for recording from the multiple channels.

Playback

Playback, of course can be had by simply rewinding the tape and playing it through the recorder. But better than this is to play it back through the organ itself and thus take advantage of the fine amplifier and speaker system.

Here, oddly enough, the shoe is on the other foot for the tape recorder will put out more current than the radio/phono input of the organ can handle. Hence it will be necessary to install a volume control in the connection between the recorder and the organ input as was done between the organ speaker and the tape recorder.

The connection to the recorder should be made to the

amplifier output, which most recorders have, to the radio/phono input of the organ. You might try making the connection from the external speaker output of the recorder to the organ. In this case, the volume control on the tape recorder will be effective. After putting a tape on the machine, put it in play and turn the volume up cautiously. If you get too much sound and distortion of the music then this method will not work with your recorder and you will have to use the preamplifier output with a volume control as described above. Since both the tape recorder output and the organ input are high impedance you will need a high impedance volume control ($\frac{1}{2}$ or 1 megohm) or high impedance attenuator.

By playing back through the organ you will be able to hear your music exactly as you played it, since you will be using the same amplifiers and speaker system.

Adding A Track

Since it is possible for you to make a recording and play it back through the organ speaker from the recorder, at the same time you can also play another part along with it and, in effect, play a duet with yourself.

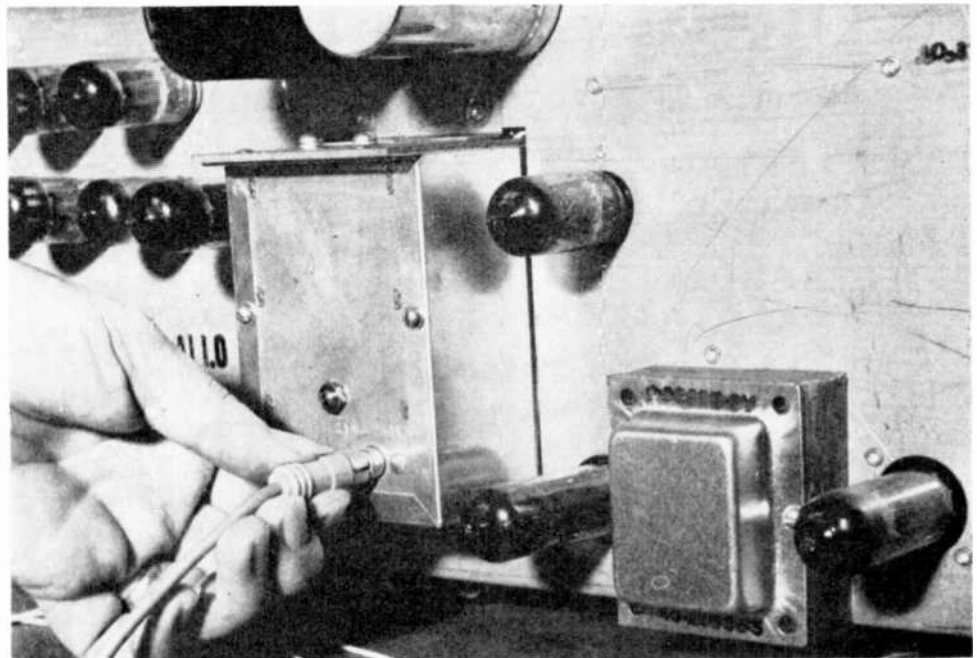
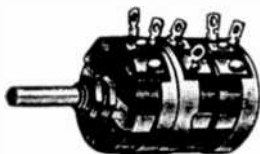
But even better than this is to use a recorder which has the ability to record one track while playing another, such as the V-M 720, shown in the picture heading this article.

On this machine, which is a four track recorder, you can make a recording on track 3 then, after rewinding the tape, put the machine in the Add-A-Track position and make another recording on track 1. When the tape is played back with the recorder in Add-A-Track, both recordings will come through together. If you again add another part you will be a trio!

This capability has widespread uses. For instance suppose you are to play a duet with another organist. If you both owned this kind of machine, you could each record your separate parts and practice without the other person being there—and know how you will sound.

The recorder and the organ are truly a "ham and eggs" team and the slight expense in hooking your recorder up so it can both record from and play back through the organ will be quickly repaid in added pleasure and faster learning.

Right: radio/phono input on Chord, Spinet and Extravoice is identical to that on the large organ. It will be found on back of organ panel. Below: A Clarostat attenuator, or constant impedance volume control. These units, while more expensive than an ordinary volume control are superior. Control may be needed in both organ to recorder line, when recording, and recorder to organ line when playing back through organ amplifier and speaker.



WOW and FLUTTER

TAPE RECORDER specification: Wow and Flutter less than 0.3%.

Next to the frequency response of a tape recorder the amount of wow and flutter in its recording or reproduction has more to do with how good it sounds than anything else.

The word "Wow" is frequently used at the beaches in the summertime when a gorgeous gal passes by and even audio engineers have been known to use it this way. But applied to tape recorders it has quite another meaning.

Simply stated, wow is called wow because that is what it sounds like . . . wow. Its cause lies in only one reason—that the motion of the tape past the head of the recorder is not even. Suppose, for example, that a constant tone has been recorded on the tape. On a machine with no wow, this would emerge, when played back, as a steady tone, the same as it was originally recorded.

Now let us imagine that a spot of sticky material, such as adhesive from a splice made with ordinary cellophane tape instead of splicing tape, has gotten on the tape guide or the heads. This grabs the tape once in a while and, when it does, the tape naturally slows down momentarily because of the added drag. This in turn lowers the pitch of our steady note. As the gook lets the tape go, the proper speed will be resumed and the note will again sound properly. If

this action is repeated over and over you will get, in spots, a sort of undulating tone, like an air raid siren, instead of the steady tone.

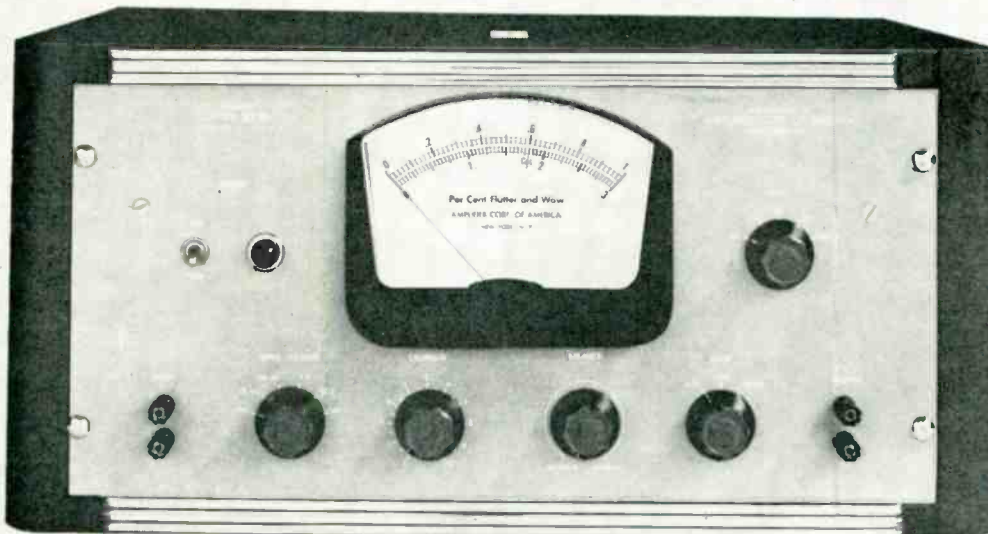
If you still cannot imagine what wow sounds like we suggest you thread up your recorder and play a tape. As the tape plays, touch your finger to the supply spool in rhythmic fashion and you'll have it.

Flutter, as might be imagined, is simply a high speed wow. It is exactly the same thing except it will occur many times a second, sort of like the tremelo on an organ and its causes are exactly the same.

The thing to remember is that wow and flutter are purely mechanical in nature and indicate that something is wrong with the tape drive system or the tape.

A recorder should have less than 0.4% wow and flutter, and most of them fall below this figure. This will vary with the speeds of the machine, for a higher speed is less likely to wow and flutter than a lower. The amount of wow and flutter is expressed as a percentage and this is determined through the use of a flutter meter such as the Amplifier Corporation of America unit shown here.

This percentage is defined as the ratio of the rms (root mean square) deviation in frequency of a standard recorded signal to the average frequency expressed as a percentage. The standard recorded signal is usually 3000 cps



Wow and flutter are measured on a flutter meter which indicates on a dial the percentage of flutter in the unit being tested. In addition to tape recorders, other sound gear such as record cutters and players, sound movie machines, etc. may also be tested. It has a built-in 3000 cps sine wave oscillator to provide the test standard.

and the flutter meter also provides other bandwidths on which tests may be made. In the unit a frequency discriminator is used to modulate the flutter signals which are then read directly on the scale. A limiting circuit prevents false readings by screening out any amplitude modulation components. These meters are lab instruments and run in the neighborhood of \$500.

The "root mean square" mentioned above is there because the current that has to be measured is an alternating current which, as we saw last month in the cps story, varies from zero to maximum to zero on the plus side and then does the same thing on the minus side. The RMS voltage is the square root of the average of the squares over a given angle. Sometimes, instead of rms figures you will see figures given as peak to peak. The peak voltage, is, of course, the voltage at the highest point of the sine wave and is equal to 1.414 times the rms voltage. The Institute of Radio Engineers use the rms as the standard.

As was mentioned earlier, wow and flutter are caused by mechanical defects, either in tape or recorder although sometimes a low line voltage will cause it by not allowing the recorder to operate at the proper speed.

A good test for tape is to grasp the reel as shown in the photo and rotate it so the tape will unwind. The tape should spool off freely without sticking or binding. If the tape is defective, one layer will adhere to another and it either will not come off the reel easily or will come off by fits and starts. Such a reel should be consigned to the ashcan.

Splices made with ordinary tape instead of splicing tape can also be a cause of wow and flutter. The soft adhesive on the former will ooze out and cause one layer of tape to stick to the next in the vicinity of the splice. When the tape is played on the recorder the capstan and roller will have to pull it free of the sticky spots and this will cause a speed variation.

Bent reels are another cause and if the wow occurs in time with the rotation of the reel you might look to the reel as the cause. As the tape pulls free it scrapes the edges of the reel or the reel itself may scrape the deck of the recorder.

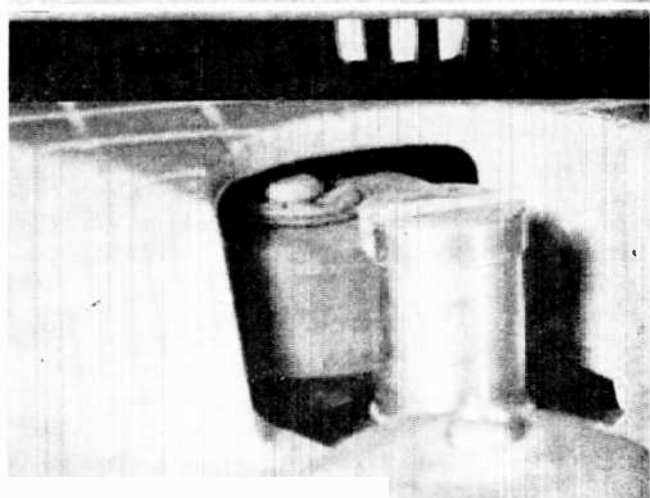
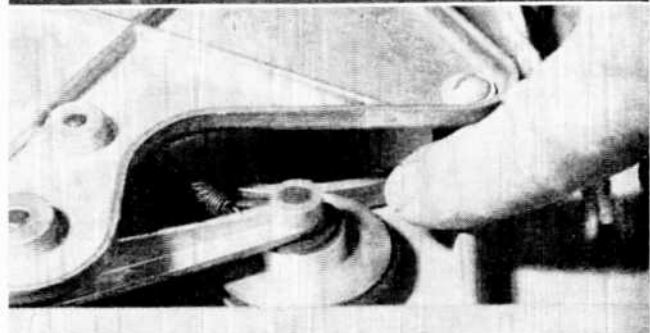
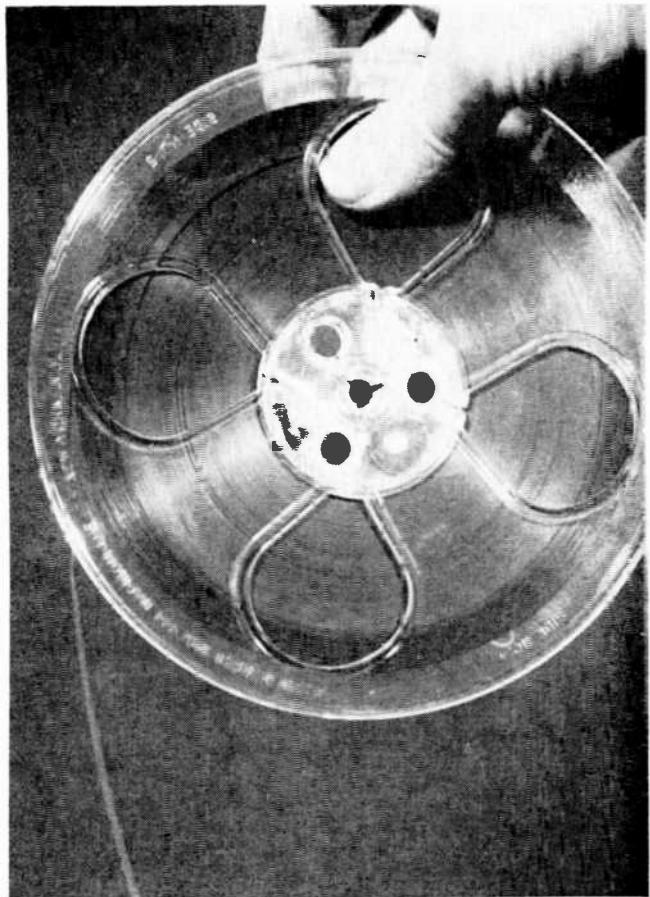
Bent tape guides or improper alignment of the guides with the head can cause difficulty as can tape which has not been cut to the proper width. This latter is highly unlikely.

Next check point is the capstan and roller. These should be free from foreign matter and should be round. A roller with a hump in it or on it will cause uneven tape speed too. So will dirty or glazed pressure pads.

The other possible trouble spots are all under the deck of the recorder. These include worn belts, slick spots on rollers or idlers, bent motor fan blades, sticking reel brakes, or, in fact, anything that interferes with the smooth transmission of power from the motor shaft to the capstan and pressure roller.

Slick spots can often be removed by holding a hard typewriter eraser against the drive roller so that the rubber is roughed up slightly. Over oiling of recorders, especially if the oil is not confined exactly to where it should be will cause slippage if it gets on belts or drives. If you oil—use the oil very sparingly and place it well.

Fortunately, wow and flutter of serious proportions is usually the result of some simple maladjustment and should it appear, its cure is usually relatively easy.



Top: bad tape or sticky splices can cause wow. To test the tape, hold as shown and let the tape unwind. If it falls freely from the reel it is OK. Warped reels will also cause difficulty. Center: drive rollers, worn belts or lumpy belts will cause uneven tape motion and should be checked. Lower: Flats on pressure rollers or foreign material on capstan or roller may cause wow or flutter.



"Bess, You is Mah Woman Now," sings Porgy (Sidney Poitier, mouthing the voice of Robert McFerrin) to Dorothy Dandridge while Todd-AO technicians "mix" music, dialogue and effects, "swinging" the six sound tracks to follow the action across the screen. Six VU meters in front of curved screen register sound levels of each track. Counter above meters keeps tab of film footage.

TODD-AO SOUND AND TAPE

by Richard A. Enger

STEREO—newest hi fi wonder—is old hat to a man named Hynes who would consider it rudimentary to use two tracks for stereophonic sound.

He uses six.

Fred Hynes is the backbone of Todd-AO's sound department which copped an Oscar last year for their six-track recording of "South Pacific." Current reviews indicate Hynes and his staff have scored again with their sound work in the latest Todd-AO big screen production, "Porgy and Bess."

Saturday Review recently reported the new motion picture "... offers a fidelity of recording rarely heard in theatres ... the music achieves an unprecedented richness and sonority, while the carefully selected singing voices emerge from the loudspeakers clear, pure and powerful ..."

The answer to how such plaudits are earned may be found at the old Charles Chaplain studios in Hollywood—now the Amco Studios, home of Todd-AO Sound.

This is where Hynes, sound director who was instrumental in developing the system, and his 18-man staff devote months to capturing on a few reels of film the hundreds of reels of recorded sound that go into Todd-AO's six-channel track.

According to Newton Woltz, assistant sound director, actual filming time consumed only 93 days of the year

"Porgy and Bess" was in the works. In comparison, time spent perfecting the multi-channel sound amounted to five months—60 days pre-recording vocal, chorus and music, and another 90 days cutting, editing and re-recording.

A typical 1,600-foot reel "composite print" (including both picture and sound) contains an average of 10 reels of special effects alone, not to mention music and dialogue. And one—reel No. 10—incorporates on a single reel, 19 reels of effects.

Woltz listed as the four main functions at Todd-AO Sound: recording, cutting, scoring and dubbing.

After the picture has been filmed, he pointed out, the pre-recorded sound undergoes "cutting"—an editing process in which the proper tracks are matched with the parts of the picture that are to be used. Added music, called "scoring," then is recorded and edited.

When the cutters have finished, all sound tracks are blended and mixed—the "dubbing," or re-recording phase. First the dialogue tracks are placed to coincide with location of voices on the screen—a procedure termed "panning" or "swinging" the sound to follow the action. "This is especially important and necessary because of the immensity of the screen," Woltz said.

Next, sound effects are swung in the same manner. Vocals, and sometimes choruses also are swung.

"Swinging and the use of six tracks are among the main reasons Todd-AO is superior to other sound processes," Woltz added. "Other processes have a maximum of four tracks and don't swing them as much, if any. Most pictures are released with only one track."

After the swinging process, the dialogue, effects and vocals are merged with the music. This final dubbing is completed at the approximate rate of one reel a day. All music is recorded originally on six channels and this original recording is used only in final dubbing.

As transfers or copies lose something, Woltz pointed out, they try to transfer as few times as possible.

The last step is the blending and adjusting of sound levels to create emphasis throughout the film by means of fades, dissolves, or other accentuated sound. Mixing of sound from reel-to-reel is accomplished with a bank of 16 Westrex re-recording (playback) machines which can handle at one time 16 reels played back through a 20-foot console to a pair of six-track recorders, one being for protection.

Up to 96 tracks can be run at one time on the equipment. In this process 357 amplifiers are used.

Seated at the console, four men known as "mixers"—one each mixing effects, dialogue and music, and another for equalizing music—manipulate sound levels by means of "mixing groups" or control panels. Each man controls many re-recording machines.

An equipment cabinet directly behind the mixers houses a "patch bay," providing 1300 jacks and 400 patch cords for controlling placement of tracks through the console.

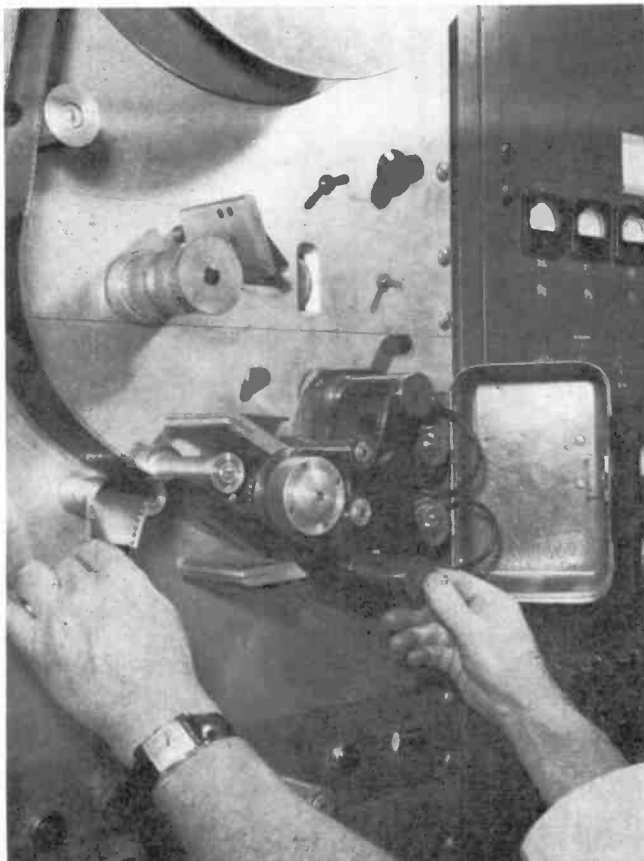


Seated at control console directly in front of screen, "mixers" (left to right) mix effects, mix dialogue, equalize music, and mix music, electronically juggling 96 sound tracks at a time.

In addition to the four mixers, Todd-AO Sound's staff includes a projectionist, a music coordinator, a supervising film editor, a sound effects cutter, a dialogue cutter, a picture cutter, two music cutters, two recordists, two machine operators, a maintenance man and an engineer.

At one end of the sound stage is a 58' x 26' curved screen. Directly in front of the screen are six giant sound level indicating meters, one for each channel. These permit the mixers to watch relative levels of sound at the same time they view the picture. A counter above the meters keeps track of film footage.

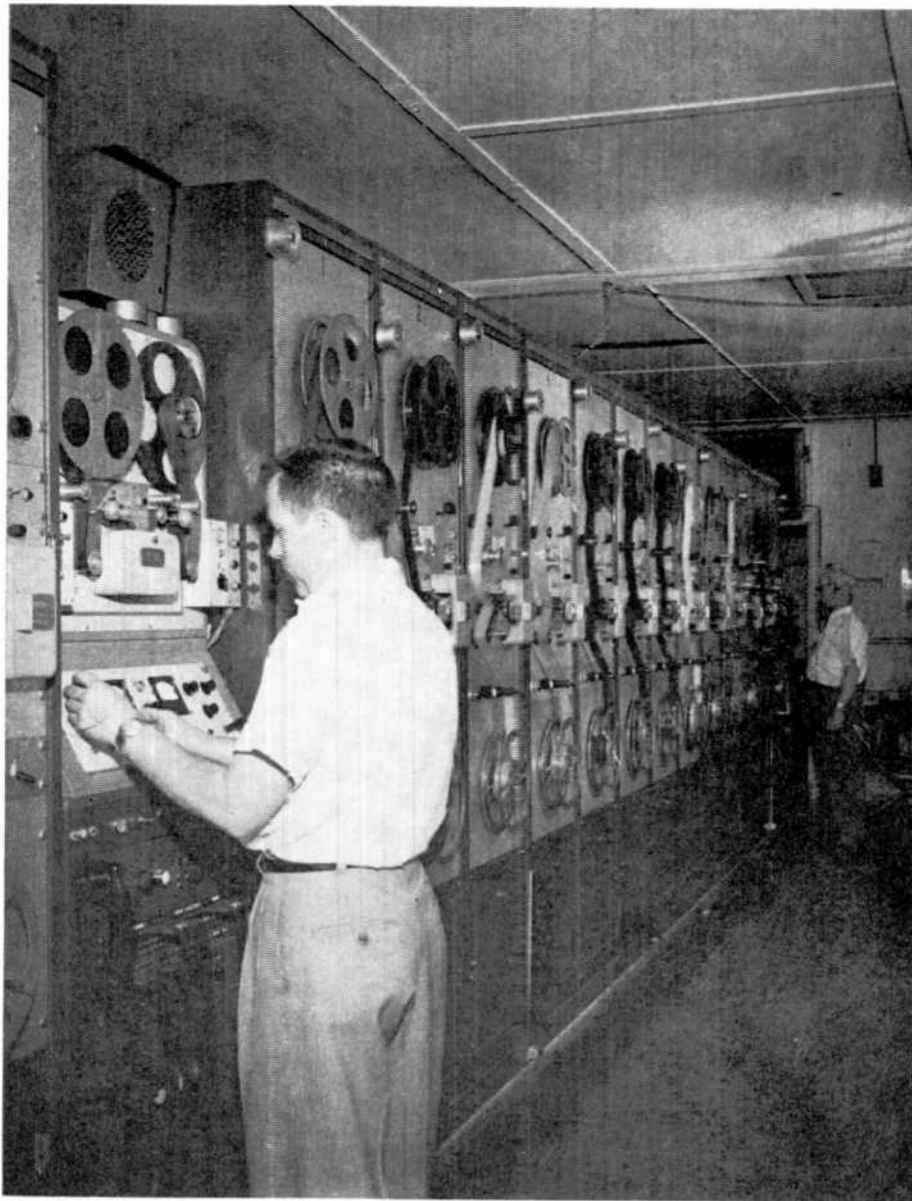
The meter on the extreme right—rose lighted in contrast with the white lights of the others—indicates level of sound transmitted to several high fidelity surround speakers located in the rear half of the theatre. The other five meters indicate



Preparing to transfer sound from a reel of magnetic film to magnetic tracks on 70mm film, machine operator threads the 2 3/4" wide picture film around guideposts and past the recording heads.



Eyeballing levels of sound on VU meters, machine operator uses ear plugs to listen in while recording from six-track 35mm magnetic sound film (right) to six tracks of 70mm picture film (left).



With the help of these 16 re-recording (playback) machines, hundreds of original reels of sound on magnetic film are boiled down and recorded on the 14 reels that make up the completed motion picture. This equipment can handle at one time 16 reels played back through a console to a pair of six-track recorders.

level of five tracks of sound to five regular two-way theatre speakers which are mounted behind the screen from left to right to cover the screen area.

At the rear of the room, a projection booth controls synchronization of picture film with the multiple sound tracks. Projector, re-recorders and recorders are kept in perfect synchronized speed by an electric distributor.

Todd-AO, with its own special cameras, photographs on 65mm stock, which is increased to 70mm on the release prints. Magnetic oxide stripes then are laminated to the film on either side of the sprocket holes. When cutting, dubbing and mixing have been completed, all tracks end up on one reel of 35mm magnetic sound film per picture reel. This is then transferred onto the magnetic stripe of the 70mm picture film.

Todd-AO Sound used some 3 million feet of magnetic film throughout the pre-recording, cutting, dubbing and mixing processes of "Porgy and Bess."

A more complex version of recording tape commonly used on home-type recorders, the magnetic film—"Scotch" brand No. 125—features a high output green oxide on a 5 mil cellulose acetate backing. The oxide is especially designed for great dynamic range, freedom from distortion on

signal peaks and high signal-to-noise ratio.

Woltz pointed out that the first Todd-AO film, "Oklahoma," used magnetic film which had a red oxide coating.

"Since switching to the green oxide for 'Around the World in 80 Days,'" Woltz explained, "we have gained six db signal-to-noise ratio, thus elevating our final product far above what previously had been attainable for six tracks."

He indicated they lose some level when the final 70mm film is fed through the projector's narrow magnetic heads. Each of the six tracks on an original reel is 100 mils wide, the final tracks on the finished print are 60 mils wide and the reproduce heads in the projectors are 50 mils wide—thereby losing half the energy that was on the original track.

"However, by using the green oxide," he said "we maintain 70 db signal-to-noise ratio."

Frequency response of Todd-AO's six magnetic tracks runs flat from 40 to 12,000 cps, as compared with the single optical track of an ordinary motion picture which has a frequency response of 100 to 8,000 cps.

The final 14-reel package making up the 2½-hour long "Porgy and Bess" is a concentration of some 300 reels of music, dialogue and special effects—representing recorded sound 56 miles long, if the magnetic film were unreel.



ADD SOUND TO YOUR 8mm FILMS

With new talkie projector, sound may be added via microphone, recorder or disc player through a mixer. Provision is also made for monitoring the recording through headphones. Soundtrack may be changed at will.

by **Bart Pierson**

ANY 8 mm silent movie film can easily be converted to a sound film with the new Elite 8 mm recording projector being imported from Norway by Tandberg of America.

It does not matter how old the film may be, it may be an oldie from your files or one you recently completed. The sound stripe, which is added between the outside of the sprocket holes and the edge of the film, can be applied by a number of laboratories, including Tandberg at a cost of about 3.5 cents per foot. Once the stripe has been applied you may record and re-record on it just like ordinary tape.

In preparing a film for the addition of sound, it is best to do all editing first. If an old film is used, go over it carefully for any bad sprocket holes, or bad splices and eliminate them. Since the purity of the sound depends upon its steady passage past the sound head, any torn sprockets or bad splices may introduce wow.

If you are starting a new film production, the script should be written in both shooting and sound forms. This is especially important in films intended for sales presentations where the narration must get across certain facts. In such a case, the narration should be written first and the scenes timed to fit. This will avoid retakes and delays.

For instance, suppose you wish to show and explain the function of a certain part of a machine. You write out the narration for a scene and find it comes to 90 seconds. Thus, when you shoot the pictures, you will know that you

must run the film for 90 seconds, at least, on that particular shot. It is usually wise to allow a bit over. Transition to the next shot can easily be made with a bit of background music.

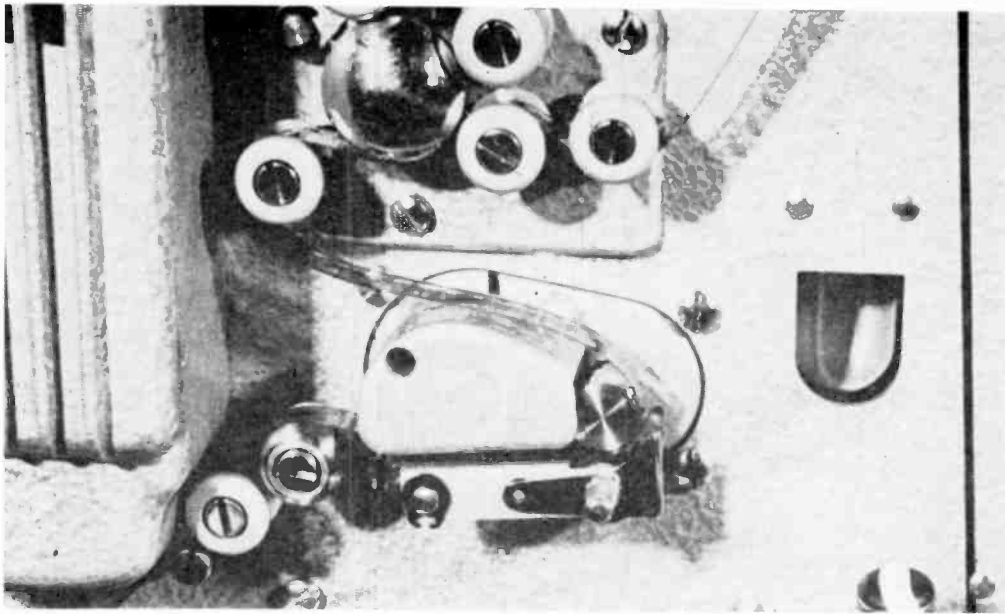
When you are finished writing the script and have determined the proper sequence and time for each of your scenes, then the 8 mm camera should be brought into play and the picture shot. If the views can be made in sequence, it will save cutting and splicing later, which is all to the good.

If any number of prints are to be made, perhaps for the use of a group of salesmen, then the original should be retained as the master and the dubs sent out to take the wear and tear of constant use. In home films, this is not so important as the projector proved to be very gentle on films.

If you are planning to voice an old film then you must, of course, fit your narration and/or music to the scene lengths you have since these cannot be changed, except that they might be shortened by judicious cutting.

Here the process is reversed. Run the film through the projector and note the content and time of each scene. Once you have this list at hand, the narration must be written to fit the scenes you have.

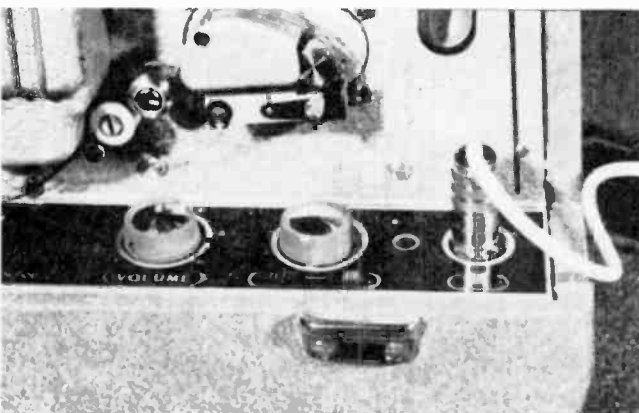
Narration should be written out—no matter how good you are at ad-libbing. And some practice should take place in reading the script so that you will have good expression and animated delivery. Even an ad-lib job full of



Left: film threading follows standard procedure for motion picture projectors with sound facilities and is easily done. Sound recording and pickup head is shown in lower center of photo. When not in use a small piece of foam rubber may be inserted to keep pressure roller off capstan and avoid flats.



Left side of recorder control panel showing amplifier on-off switch, speed shift lever, function control (motor and lamp on and off) and rewind button which is depressed to rewind.



Right side of control panel has volume control, record/play switch, record indicator light and input jack for microphone, tape recorder or mixer. Opening above houses magic eye type of recording level control.

"eh's" and "er's" is better than a script read in wooden fashion. But since neither is necessary—plan to do the job right. Fortunately, as with a tape recorder, the sound stripe may be recorded as many times as is necessary to get the result you want.

The narration and music may also be put on tape first, should you so desire and here you can edit the sound as you would edit the film. When it is completed, the signal from the tape recorder is fed directly into the projector and the sound transferred to the movie film.

This method has one advantage, it eliminates the possibility of any projector noise getting on the stripe if you record using the mike and have it too close to the projector. Its disadvantage would lie in getting the narration out of step with the pictures should the projector and tape recorder not maintain speed. Since the sound can be monitored as it goes on the film, this provides a check.

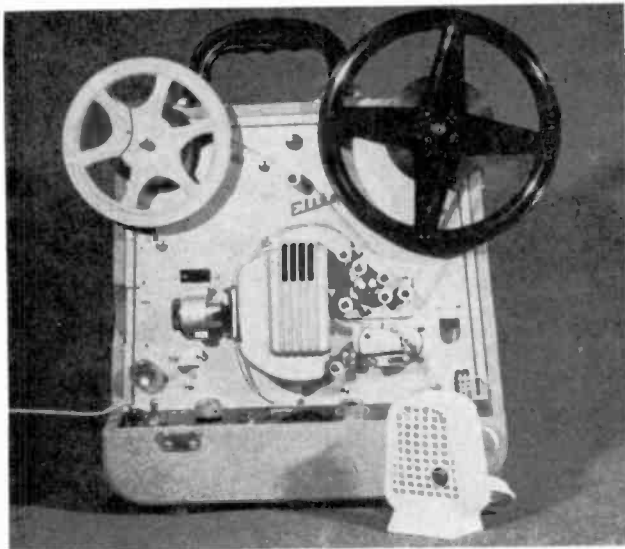
For picking up sound on location when shooting the picture a lightweight unit such as the Tandberg tape recorder may be used. Here the problem is one of keeping the mike out of the picture area and this may require the use of a home-made boom similar to those used in TV production.

A clapboard should be used at the start of each scene. This is a board hinged in the middle which can be clapped together to make a sharp sound and its closing is also visually recorded by the camera so you have a perfect synch point for sound and picture.

Although this is a very quiet running projector, care should be taken when recording with the mike to keep any projector noise off the film. Have one person do the narration and another work the controls if possible so that maximum distance between mike and projector may be achieved.

The Elite mixer, which is a companion piece to the recorder is an absolute "must" piece of equipment in our opinion. With it you can mix voice and background music to make a finished production. The volume control should be turned up about half-way on the projector and then let alone, the mixer controls doing the volume controlling from that point on.

One of the nice features of this three channel mixer is the control for the music. This has a built in resistance



Above: recorder-projector and microphone. Mike fits in top of carrying case with cords. Upper right: mixer available as an accessory. Cleverly made, it has provision for fading music when voice announcement is made. Lower right: projector may take music from recorder and voice through mike as shown in upper photo by use of mixer or may take entire feed from recorder if program has been put on tape first.

to turning although it may be forced without harm through its entire range. When turned clockwise until resistance is felt, it raises the level of the background music to proper volume (the eye should just close on the peaks) when narration is to be added, the mike knob is turned open and the music control knob turned counter-clockwise until resistance is felt. This drops the background music to the proper level for the voice to override it. When narration is finished, the mike control is closed and the music control turned up until resistance is again felt, which will return the music to its original volume.

We used this projector for both music and speech and on the latter we would rate it as being excellent and on the music, good. It has adequate volume, in fact surprising volume considering the narrow width (about 1/16") of the sound stripe—more than enough volume to fill an average room. An external speaker may be connected by means of a plug in the back and this run to the screen position if desired. The amplifier is rated at six watts.

The projector comes equipped with an f1.5 coated lens and uses a 12 volt pre-focused bulb as a light source. Screen brilliance is good. Other features include a high-speed rewind, secured by pressing the rewind button, gear and cam film drive, three-blade shutter, two blower systems for cooling and two speeds, 16 and 24 frames per second.

The 24 frames per second is best for sound although the sound may be applied to either of the two speeds.

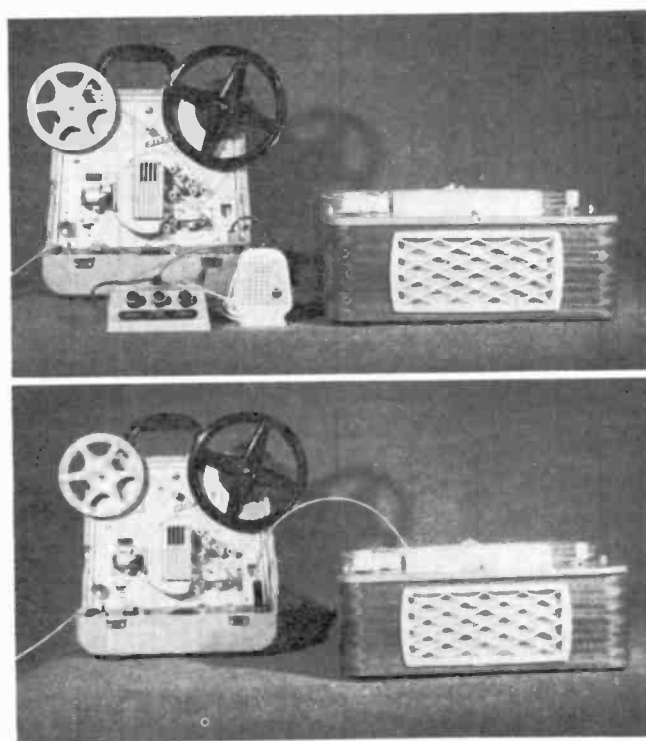
The projector is lightweight and compact and of fine craftsmanship.

When setting up to record it is a good idea to use a film loop to get the proper volume setting and to check the sound. With a loop you can immediately play back what you have recorded. If you record on a film then you must unthread and rethread the projector, as well as rewinding to your starting point to hear your trial runs.

When storing the projector a small piece of felt or foam rubber should be placed between the pressure roller and the sound drum roller to prevent flats from forming.

The usual rules for good movie making apply to the production of films for sound—perhaps even more so. The camera should be placed on a tripod, if possible and scenes should be a very minimum of 8 to 10 seconds each. Some amateurs wave a camera around like a garden hose which produces films looking as though they had been made on the bounding main. The rule is to hold the camera steady and let the subjects move.

Scenes which are too short do not permit time for adequate narration, they come and go before the audience is aware of them. It is easy to cut a scene if it is too long but if it is too short you are out of luck and it might be better to eliminate it entirely. When shooting a film, imagine you are seeing it on your home screen. This will help some in making sure your scenes are of proper length.



This little projector should provide the answer to sound movies of home and family in addition to making it possible to produce very low budget sales films for presentations to clients.

Identifying Tape

by Jean Cover

. . . . build an orderly tape library with properly identified recordings.

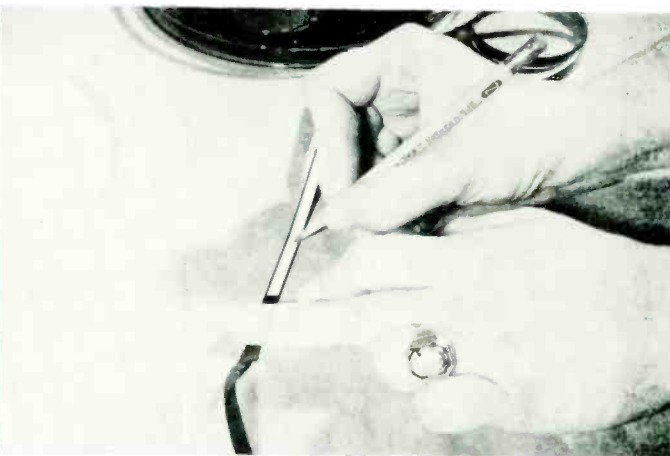
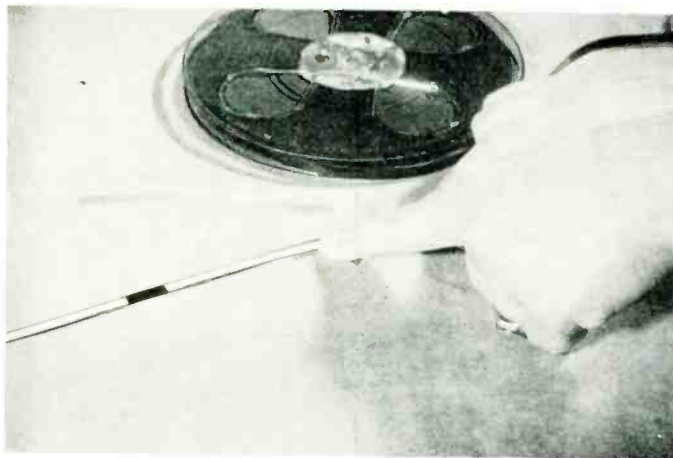
AS your tape collection grows, it can develop into either a botched mass of unidentified recorded sound or a well organized library of easily located tapes. Our reference here is to your own recordings, not to commercially recorded tapes, although even in this area there is room for more identification.

While recorded tapes are handsomely packaged in boxes containing bright, eye-appealing labels, once they become separated from the box they immediately become simply reels of unidentifiable recorded music or sound. Unfortunately, such separation has been our sad experience and on many an occasion we have had to listen to a tape, try to

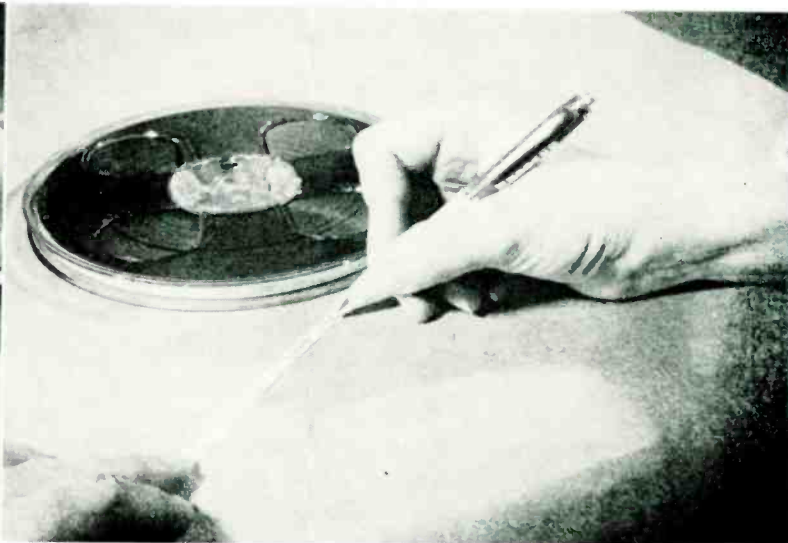
pinpoint the selections or artists performing and with a shove from Lady Luck locate the empty box it belongs in.

Some manufacturers have helped this situation by attaching a small label to the reel itself, but this too is fallible for all too often someone forgets to rewind or simply considers it unnecessary since the tape is either dual track or four track stereo and does not require rewinding. Hence, the tape is lifted off the machine on the blank takeup reel and the reel with the label finds itself empty.

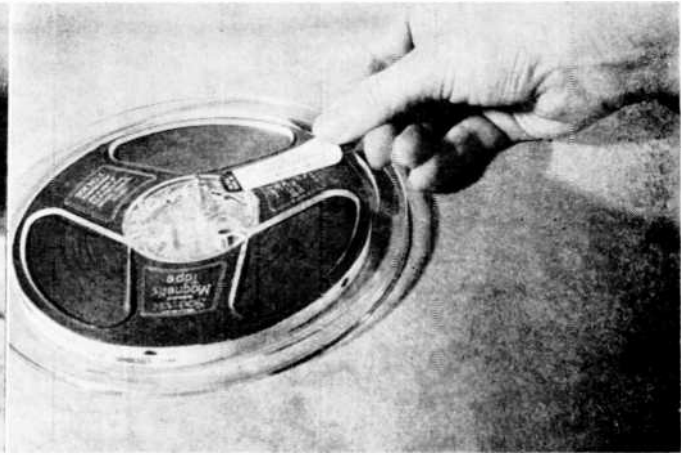
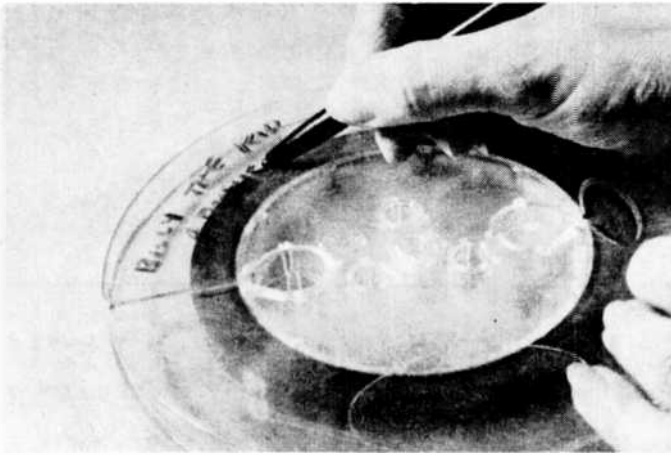
Because of these two seemingly unimportant oversights (separating a reel of tape from its box and winding it on a different reel), it is apparent that there is a need for



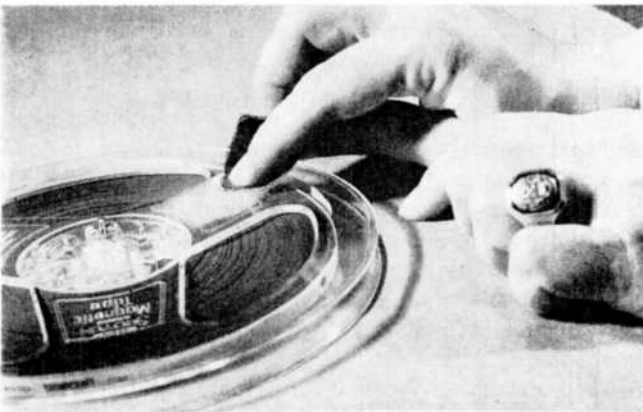
Left: Attaching self adhesive identification tape to a shiny side of recorded tape. This eliminates splicing. Right: This tape can be written on with pencil or ink. Should the information be lengthy it is better to use a few short strips of tape rather than one long one. These are easier to apply and to spot on the reel.



Left: Splicing leader tape to the beginning of a recording. This helps protect the tape as well as providing space for identification. Right: Leader tape is easy to write on.



Left: A grease pencil may be used to label a tape reel, but this is apt to wear away in time. It will do, however, for quick, on-the-spot labeling. Right: Several companies supply pressure sensitive labeling strips to apply to a reel. Most of these contain lines for information such as reel numbers, speed, length, and subject. There is a label-on-tape available at most stationery stores which is fine for this purpose.



Some tape manufacturers provide a rough surface space on their reels for labeling. If not, and you wish to write directly on the reel, you can rough up a space yourself with a piece of sandpaper, hard typewriter eraser, or other such agent.

actually labeling the tape itself. It is our hope that all recorded tape manufacturers will recognize this need and, in the business tradition of serving their customers, fill it.

This method of tape labeling was begun at one time by a few manufacturers who found such a process too costly and discontinued it shortly after its conception. We believe, however, that such a process can be developed which would not be excessively expensive and that its usefulness would offset the small added outlay.

In the meantime, there is no reason why anyone who wishes to maintain an orderly tape library cannot do so now. It is just a matter of labeling and indexing. With the introduction of four track tape, in those instances where all four tracks are recorded individually, the necessity for this has now become a *must*. Such tapes on a 7" reel, running at $3\frac{3}{4}$ ips can contain up to four hours of recordings, and locating a particular section on such a tape will be difficult without proper labeling and indexing. There are products on the market designed specifically to help you do this.

We do not wish to imply, however, that you should discontinue labeling reels and boxes in favor of labeling only the tape itself. On the contrary, while this is most important,

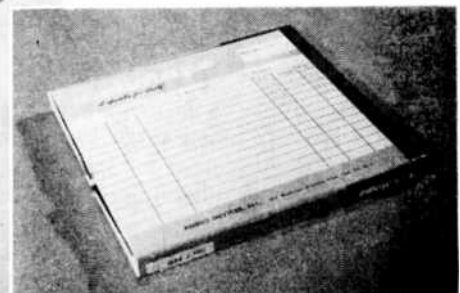
putting the tape back on its proper reel and in its rightful container are equally as helpful in maintaining a completely organized library. But finding these becomes much easier and certainly more accurate when you simply glance at the tape beginning and are immediately aware of what it contains. Should the reel and box become permanently misplaced (and inanimate objects sometimes have a way of doing this) you can quickly prepare a duplicate from the information on the label of your tape.

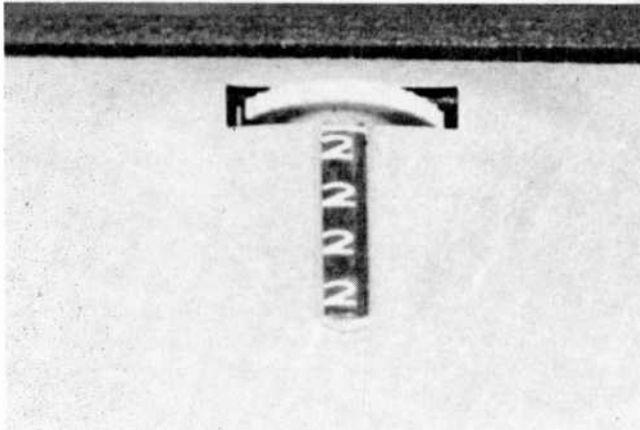
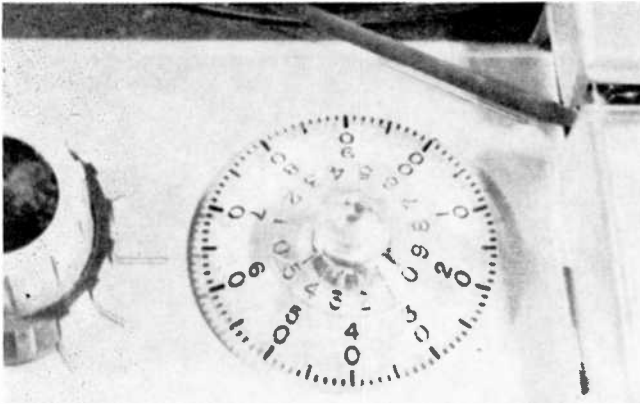
A reel can be labeled easily with a soft grease pencil or crayon, but this is rather a poor method since it will eventually wear off. Special pressure-sensitive labeling strips, containing space for necessary information are available for attaching to the reel (label-on-tape, available in most stationery stores can also be used), and in some cases the raw tape manufacturer has provided an area on their reels for this purpose. Reels can also be written on if you first rough up their surfaces with something on the order of sandpaper, emery paper or a hard-grain typewriter eraser.

Most brands of raw tape carry space on their boxes for labeling statistics both on the back and the side. Even if this space should be lacking, the details could be put on paper and glued to the box. It is also sometimes helpful to utilize the inside of the box for writing or gluing in information such as an index rundown sheet. Those hobbyists who like a more artistic touch can perhaps find pictures or advertise-



Left: Most raw tape manufacturers provide box space for labeling on the side. Below: Convenient back of box labeling space.





Two different index indicators. Top is type used on V-M machine, which has a three number counter. Bottom is that used on the Norelco, and it uses four numbers. Both are equally adept for logging purposes.

ments which illustrate what is in the recording and attach these to the box lid.

Leader tape is available from most leading tape manufacturers and is adequate for labeling and attaching to the beginning of a tape. It also helps protect the tape itself.

This tape can also be spliced in at various sections of a single track or two track stereo tape, but it cannot be used throughout a dual track, four track stereo, or four track monaural recording where the tape is reversed.

There is, however, a self-adhesive identification tape being marketed, manufactured by the P. R. S. System, Inc., which is not spliced to a tape, but rather applied to the shiny side. It can be written on with pencil or ink, and since it eliminates splicing, it can be used on any track recording without disturbing any of the tracks. If the information is lengthy, rather than use a long strip of identification tape, it is perhaps better to use several short strips for easier application and spotting.

P. R. S. also has form adhesive labels for marking reels.

From the above observations then, it is best to use leader tape at the beginning of a reel of tape because of the protection it affords the tape. On the other hand, it is best to use self-adhesive identification tape throughout the reel, since it alleviates any need for splicing.

All too often the index indicator on a recorder is forgotten and seldom used by its owner. This is most unfortunate since indexing is just as, if not *more* so, important as labeling.

0-150: AUNT ELLEN'S BIRTHDAY PARTY
 151-290: DAD'S BUSINESS SPEECH
 291-362: BETTY'S RECITAL
 363-401: JR.'S POEM
 402-631: CHURCH CHOIR
 632-790: PARROT'S JIBBERISH
 791-834: JENKINS' VISIT

Typical written index log for recording. This can be pasted in box lid or put in a card file. Beside this reference, before making a recording it is well to use a verbal countdown on the tape, set your indicator on zero and then just note the beginning and ending numbers of the indicator on the tape.

Many recording enthusiasts put a series of recordings on one reel of tape and neglect to index what begins where. All of which only leads to frustration later on when they find themselves frantically throwing the machine into fast forward and rewind to locate a particular section.

Your machine is equipped with an index indicator to relieve you of this unnecessary chore and it is there just wanting to be used.

An index indicator does just what it says, it indicates the beginning and ending position of a recording; it does not count time nor tape footage since it is not designed to do so. Either the supply reel spindle or the takeup reel spindle drives the indicator.

Logging recordings, using the indicators as your guide and keeping a written record attached to the box lid or in a card reference file will prove most rewarding in time saved locating a recording.

A more complete method is to record data directly on the tape before each recording. Included in this data would be reel number, track number, date, subject, source of signal, and a "count down." Using a "count down" such as 5, 4, 3, 2, 1, 0 and then setting your indicator to zero at this point makes a perfect beginning for a day's recording. From then on it is just a matter of noting the number on the indicator at the ending and start of each individual recording.

Should you make an unplanned, spontaneous recording, it is well to leave a blank space on the tape before the recording for later inserting identifying data.

The Datrel Company introduced a system of indexing by using tabs which they call Tape Indx. These tabs are made of 1½ mil Mylar and the adhesive on them is the same as that used on splicing tape.

When indexing, the numbered tabs are easily applied to the shiny side of the tape right after the particular spot you wish to mark has passed the playback head. Although they protrude slightly above the tape and get bent as they go under the reel, it does not matter since they are entirely flexible and resume their upright position at all times. Even with these tabs, you must still keep a log of what is recorded at each numbered spot.

This company also has a master file with removable cards for keeping an index on a library of tapes, as well as a perma-file wallet which holds 60 or more selection labels.

The pride with which you exhibit your tape collection, as well as the time and trouble it ultimately saves will more than compensate for the extra effort you put forth in labeling and indexing.

NEW PRODUCT REPORT

STA **OK** STED

Product: Turner 200D Microphone

Manufacturer: The Turner Company, Cedar Rapids, Iowa

Price: \$35.00



TURNER 200 MICROPHONES

... Small dynamic with good frequency response, attractive appearance.

THE Turner 200 series microphones are available in Crystal (200 X), Ceramic (200 C) and Dynamic (200 D).

All are housed in the same zinc alloy, brushed aluminum finish case and all are the same dimensions.

The mikes weigh 10 ounces, are supplied with a 12 foot cable and have available as accessory items an adapter for stand use, a lavalier clip and a desk stand mounting.

The crystal and ceramic units are available in high impedance only, which is suitable for most tape recorders while the dynamic, top end of the line, is available in both low impedance (50-200 ohms—model 200 A) or high impedance, Model 200 D.

The units which we had for examination and test were two of the 200D Dynamic mikes as we wished to note the effectiveness in stereo pickups as well as monaural.

The frequency response is given from 60 to 13,000 cps with a practical-

ly flat curve between 100 and 10,000 cps. The low impedance mike has a little better response on the high end than the high impedance unit and may be rated to 14,000 cycles.

The mike measures only 5 1/16" long with a diameter at the top of 1 3/4". A rubber ring at the top serves as a cushion when putting the mike down and the top has a perforated wind screen to cut blasting and wind noise. It is chrome plated.

The actual microphone diaphragm is of Turner's Dynaflex which is impervious to temperature and humidity effects.

The output of the dynamic is well within the range of a tape recorder so that excessive amplification is not necessary for a good signal.

The frequency response given is based on the 12 foot cable. If more cable is used, there will be some loss in the high frequency end, the 13,000 cps will drop 3 to 6 db with the addition of another 10 feet of cable. For

most uses this is unimportant, for instance, it would not affect voice recording at all and it is still beyond the range of many tape recorders.

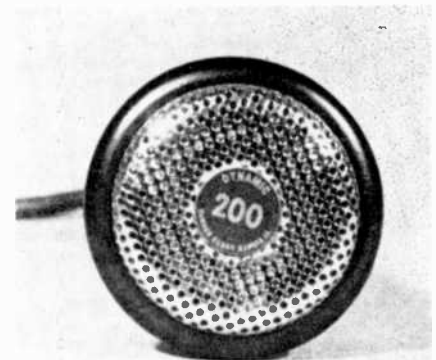
The model 200A, low impedance dynamic, may be used with any length of cable but it will require a microphone transformer at the tape recorder to match the mike input, which is usually high impedance. This mike uses a three wire cable with black wire being ground. The 200D has a single wire cable with the shield going to ground.

The microphones behaved well under test and were clean cutting and gave crisp sound. In addition to trying them with a tape recorder, they were also used for ham radio operation and the reports received on transmissions made using them were all good.

Just as a camera lens determines the sharpness and definition of a picture so the microphone used with a recorder to a large extent, determines the kind of sound you get on your tape.

The crystal microphone of this new series has a rising curve on the high end to compensate for the fall off that usually occurs in tape recorders in this range.

We found the 200D Dynamic lived up to its specifications and is worth your consideration.



Grille of microphone is perforated steel chrome plated. Rubber ring prevents shock damage when putting mike down.

SHOP OR SWAP

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

RATES: Commercial ads, \$3.00 per word. Individual ads, non-commercial, \$.05 a word.

In figuring the number of words in your advertisement, be sure to include your name and address. Count each abbreviation, initial, single figure or group of figures as a word. Hyphenated words count as two words. The name of your city, local postal zone and state count as two words. Maximum caps first four words. Proofs are not submitted on classified ads.

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

TAPES COPIED to Hi-Fi discs. All speeds. Free price list. Dick Vance, 3409 Grand Ave., Oakland, Calif.

PROFESSIONAL RECORDING TAPE — First quality of a prime manufacturer. Full frequency response, finest polished and lubricated tape available. Money back guarantee. Acetate 1200', 1 1/2 mil, 4/\$5.20; 1800', 1 mil, 4/\$6.75. Mylar 1200', 1 1/2 mil, 4/\$7.00; 1800', 1 mil, 4/\$9.00, 2400', 1/2 mil, 4/\$13.00. Postage 15c per reel. Hi-Sonic, Box 86BB, New York 63, N. Y.

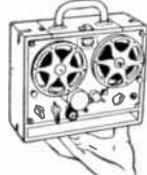
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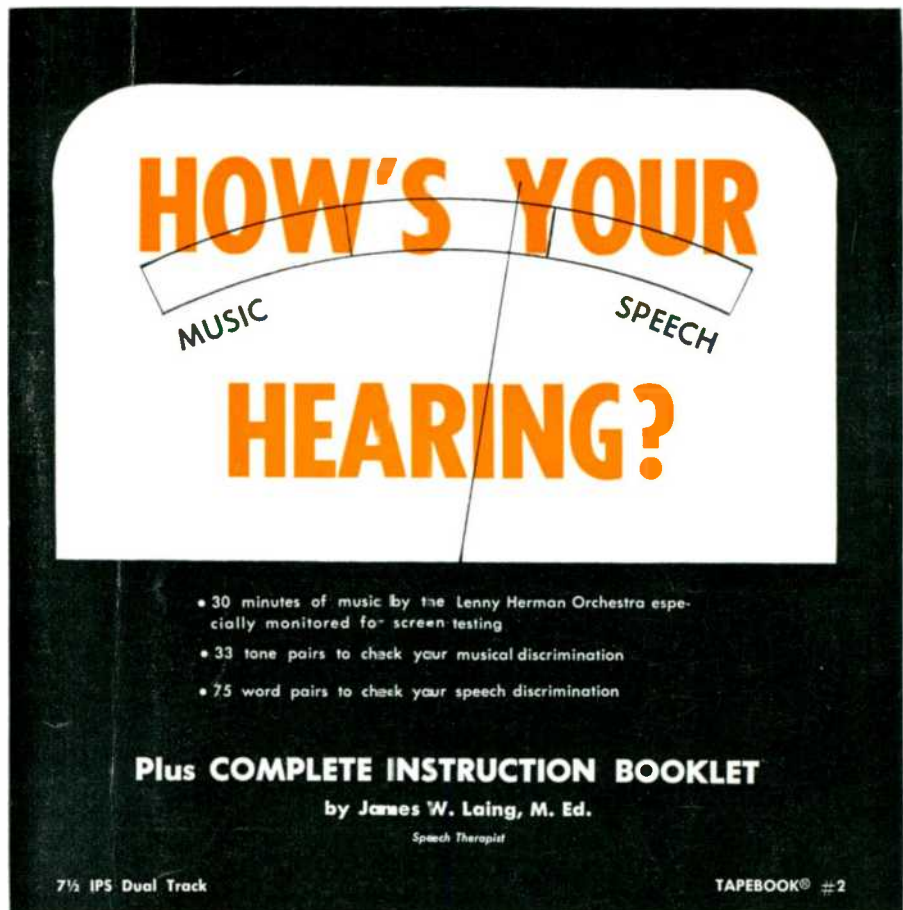
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