

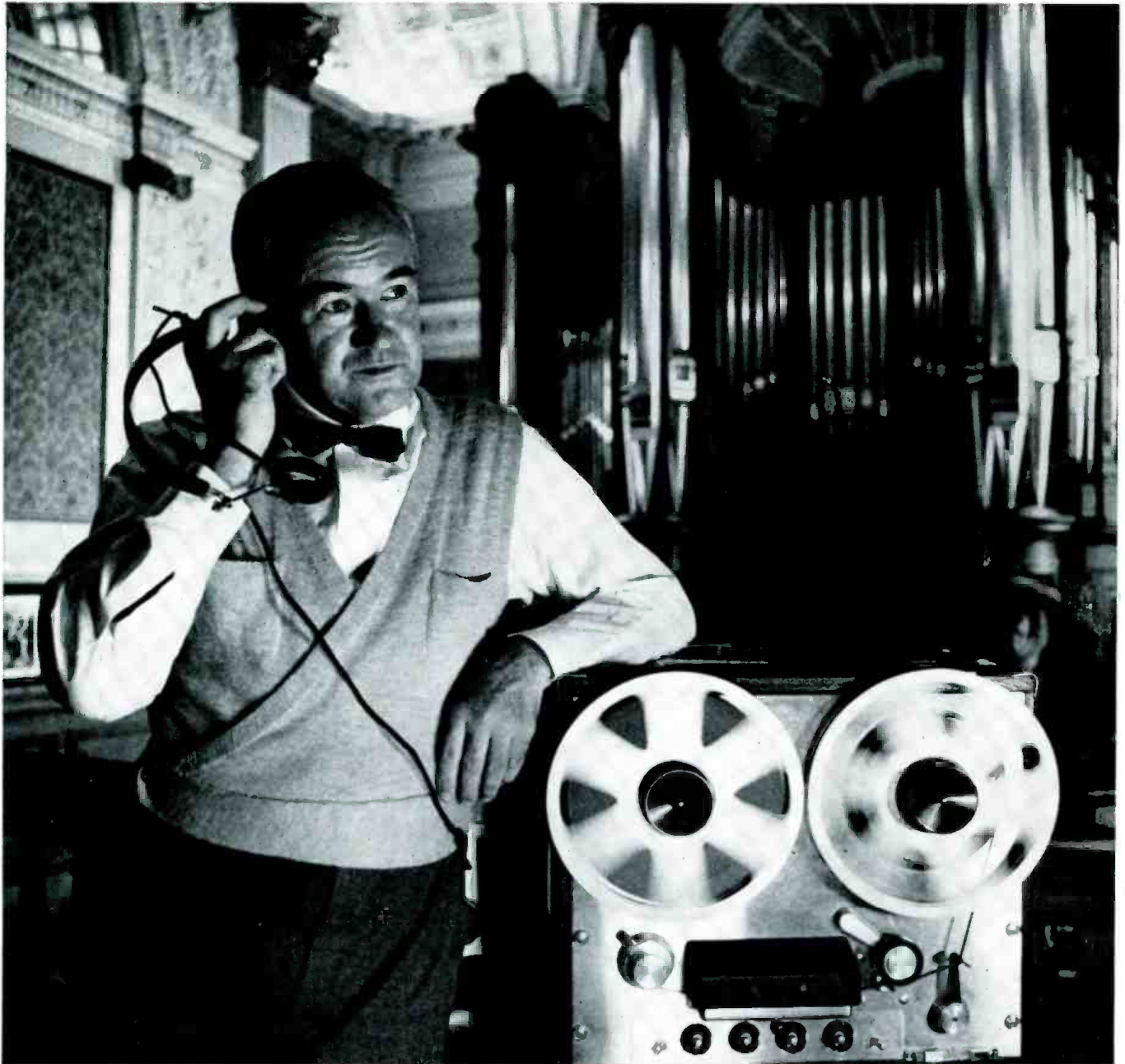
TAPE RECORDING



RECORDING WITH CONTACT MICROPHONES

See page 26

Mr. Sydney G. Brooks
Brooks Jewelry
Cadiz, Ohio



Why E. Power Biggs makes his own recordings on tough, long-lasting tapes of MYLAR®



"Tapes of 'Mylar' give me more time on a reel. They're more convenient to use... and they save space."

"Tapes of 'Mylar' let me evaluate my own performances as though I were sitting in the audience," says E. Power Biggs, world's most recorded classical organist. "They provide the dependable fidelity required for critical appraisal of my work. They assure me that the sound won't be distorted by stretching; won't be lost by a break. That's why I always use tapes of 'Mylar'* polyester film.

"Tapes of 'Mylar' won't dry out or get brittle with age. They need no special storage care. A performance recorded on 'Mylar' is there to stay."

When you buy your next reel of tape,

remember the exclusive advantages of "Mylar". Then, like E. Power Biggs, get a reel of your favorite brand . . . made with "Mylar".

*"Mylar" is Du Pont's registered trademark for its brand of polyester film. Du Pont manufactures "Mylar", not finished magnetic recording tape. All manufacturers make tapes of "Mylar".



Better Things for Better Living
... through Chemistry



BE SURE OF SUPERIOR PERFORMANCE...LOOK FOR THE NAME "MYLAR" ON THE BOX

Revere



Stereo



New Revere Recorders feature Automatic Stop, Matched Bass and Treble Speakers, Simple Drop-in Load and Light-weight Compactness!

For the critical stereophile . . . a professional instrument that fulfills all expectations. Sound? The specifications tell the story. Operation? Easiest—electronic pushbutton keyboard control! What's more, the *in-line* Revere T-204 offers many important innovations. Notable, is Revere's exclusive "Balanced-Tone" which emphasizes both highs and lows to achieve unparalleled tone realism. The lower channel has a built-in preamplifier, permitting it to be plugged directly into hi-fi system, radio or TV. An automatic stop shuts off recorder and hi-fi components when tape runs out. Dual speeds of $7\frac{1}{2}$ and $3\frac{3}{4}$ ips, simple straight in-line drop-in loading, matched treble and bass speakers with cross-over network, two-level record indicators, bias control lamp, index counter, external speaker and auxiliary amplifier output jacks all add to the pleasure of monaural recording and stereophonic playback.

MODEL T-204 STEREOGRAPHIC TAPE RECORDER—Stereo playback and monaural recording—with microphone, hi-fi cable, stereo cable, radio-TV attachment cord, two reels and tape **\$237.50**

MODEL T-202 MONAURAL TAPE RECORDER—with microphone, hi-fi cable, radio-TV attachment cord, two reels, tape. **\$207.50**

Revere

HI-FIDELITY TAPE RECORDERS

GUARANTEED SPECIFICATIONS—Playing time up to 4 hours, using LP tape $3\frac{3}{4}$ ips, 7" reel. Frequency Response -- Upper Channel: 40-15,000 cps. ± 3 db. at $7\frac{1}{2}$ ips.; 40-8,000 cps. ± 3 db. at $3\frac{3}{4}$ ips.; Lower Channel: 40-15,000 cps. ± 3 db. at $7\frac{1}{2}$ ips. (NARTB Standard Equalization). Wow and flutter less than 0.3%; Signal to noise ratio greater than 50 db.; Signal from lower channel pre-amp output 0.5—1.5 volts; Crosstalk—50 db.



REVERE T-1120 STEREO IN-LINE RECORDER

Built-in lower channel preamplifier, "Balanced-Tone", dual speakers, index counter, molded fibre-glass 360° sound distribution case, single knob control; dual speeds. Complete **\$199.50**

T-1100—Monaural—single knob control, \$169.50

REVERE CAMERA COMPANY, CHICAGO 16, LOS ANGELES 7

Operate your...

- tape recorder
- P. A. system
- portable TV set
- hand tools

FROM YOUR CAR, Boat or Plane!

with



INVERTERS



for changing your storage battery current to A.C. HOUSEHOLD ELECTRICITY Anywhere... in your own car!

OPERATES
PORTABLE TV SET
directly from your car!

- OPERATES**
- RADIOS
 - RECORD PLAYERS
 - MIXMASTERS, ETC.
- directly from your car!



MAKE YOUR CAR, BOAT OR PLANE
"A ROLLING OFFICE!"



- OPERATES**
- TAPE RECORDERS
 - DICTATING MACHINES
 - PUBLIC ADDRESS SYSTEMS
 - ELECTRIC SHAVERS
- directly from your car!



mounted out of sight under dash or in trunk compartment



UNIVERSAL INVERTERS

Especially designed to change 6 or 12 volt D.C. to 110 volt A.C. 60 cycles.

for...

- EXECUTIVES
- SALESMEN
- OUTDOOR MEN
- POLICEMEN
- REPORTERS
- FIREMEN
- PUBLIC OFFICIALS

MODELS 6U-RHG (6 volts) 125 to 150 watts. Shipping weight 27 lbs. List price\$99.50
DEALER NET PRICE.....\$66.34

12U-RHG (12 volts) 150 to 175 watts. Shipping weight 27 lbs. List price\$99.50
DEALER NET PRICE.....\$66.34

Write for literature on other Sites and Models of ATR INVERTERS, priced as low as \$11.95 list.

SEE YOUR JOBBER OR WRITE FACTORY

- ✓ NEW MODELS ✓ NEW DESIGNS ✓ NEW LITERATURE
- "A" Battery Eliminators • DC-AC Inverters • Auto Radio Vibrators



AMERICAN TELEVISION & RADIO CO.

Quality Products Since 1931

SAINT PAUL 1, MINNESOTA, U. S. A

TAPE RECORDING

VOL. 7 NO. 5

APRIL 1960

MARK MOONEY, JR.

Editor and Publisher

JOHN L. ALLEN

Circulation Manager

JEAN COVER

Assistant Editor

ROBERT W. LAPHAM

Art Director

JAMES H. MILLS, SR.

Technical Consultant

ANTHONY J. MORIN, JR.

National Advertising Manager

274 Madison Ave., New York 16, N. Y.

IN THIS ISSUE

ORGAN MUSIC ENTHUSIASTS	Stanley R. White	18
FULL-TRACK, HALF-TRACK, QUARTER-TRACK		22
USING CONTACT MIKES	Mark Mooney, Jr.	26
TAPING SHORTWAVE	Jean Cover	29
NEW TAPES		6
CROSSTALK		12
NEW PRODUCTS		13
TAPE CLUB NEWS		14
TAPE IN EDUCATION	Robert C. Snyder	15
QUESTIONS AND ANSWERS		16
FEEDBACK		17
NEW PRODUCT REPORT: UHER UNIVERSAL		32



TAPE RECORDING is published monthly by Mooney-Rowan Publications, Inc., Severna Park Md. (Severna Park 548). Entered as second class matter January 7, 1954 at the Postoffice Severna Park, Md. under the Act of March 3, 1879. National Advertising Representative: J. V. Associates, 274 Madison Ave., New York 16, N. Y. (Oregon 9-0030). Subscriptions, U. S. and Possessions, Canada and Mexico \$3.75 for one year, all others add \$1.00 a year. Two years \$7.00. Contents copyrighted by Mooney-Rowan Publications, Inc., 1960. Printed in U. S. A.

POSTMASTER—Send all address labels clipped from undeliverable copies with Form 3579 to Tape Recording, Severna Park, Md.



FREE foreign language course when you buy any WEBCOR Tape Recorder!

*Learn a language faster—and better—
with a wonderful Webcor
Learn Spanish—French—
German—Italian
prepared by Institute
for Language Study*



**You listen to the lesson on your language records—
then practice with your Webcor Tape Recorder**



Dozens of other ways
to enjoy your
Webcor Tape Recorder

TO RECORD AND PLAY BACK—

- Children's voices
- Family and party fun
- Concerts and jazz sessions
- Dramatic performances
- TV and radio programs
- Favorite phonograph records
- "Talking letter" correspondence
- To play pre-recorded tapes
—and many other uses

*Hurry! This offer good for
limited time only!*



Shown above:
Webcor Regent High-Fidelity Tape Recorder

**SEE YOUR WEBCOR
DEALER TODAY FOR
DEMONSTRATION
AND DETAILS**

Prices slightly higher South and West.

The student simply follows his text and listens to his "Record Time" lessons on phonograph records. He reads the lessons back into his Webcor Tape Recorder and *listens to his own voice on the tape*. He then compares his pronunciation with that on the records.

In this connection, more and more elementary schools are teaching foreign languages, and they are using the easy "listen-and-imitate" way to do it. No longer need a child wait till high school. And the elementary school student who learns a language this way finds that language study in high school and college is greatly facilitated.

And, of course, advanced students—in high school and college—are finding this new method a tremendous aid in

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.

So it is fortunate that these new Spanish, German, Italian, or French courses make learning languages easier than ever before—especially when you have a Webcor Tape Recorder. Webcor Tape Recorders from \$139.95.



Webcor Royalite
High-Fidelity Tape Recorder



Webcor Regent Coronet
Stereo High-Fidelity Tape Recorder



Webcor Royalite
Stereo High-Fidelity Tape Recorder

NEW TAPES

★—Fair

★★—Good

★★★—Very Good

★★★★—Excellent

CLASSICAL

We are pleased to welcome a new reviewer to our staff. The gentleman's name is Robert S. Benson and he will be doing all Classical reviews beginning with this issue.



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

BEETHOVEN CONCERT

Symphony No. 3 in E Flat Major, Op. 55 "Eroica"
 Symphony No. 5 in C Minor, Op. 57, Egmont and Coriolan Overtures
 Sir Adrian Boult conducting the Philharmonic Promenade Orchestra of London
 VANGUARD VTF 1605
 4 track, 7 1/2 ips, reel-to-reel
 \$11.95

It is surely remarkable to have two major Beethoven symphonies, plus two overtures, all in stereo on one seven-inch reel of tape. Several years ago none would have thought that the day would come when one could hear two lengthy works such as these without interruptions in stereo and for such a reasonable price.

Unfortunately, the two symphonies here receive rather undistinguished performances, and particularly disturbing is Boult's cavalier treatment of the main theme of the *Funeral March* of the *Eroica*. There's a big, open stereo sound on this tape, with satisfactory spread and depth. In the review copy there was a momentary fading of sound in the *Egmont Overture*.

If you are interested in adding these two symphonies to your 4-track, 7 1/2 ips tape collection, the present version would serve the purpose; doubtless there will be better performances and recordings of the Beethoven Symphonies in the near future. You might investigate the recently-announced London tape containing the *Eroica* and the *Symphony No. 7*, both performed by the Vienna Philharmonic under Georg Solti (London LCK 80031, \$11.95).



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

SHOSTAKOVITCH

Symphony No. 5 in D, Op. 47
 Stadium Symphony Orchestra of New York, Leopold Stokowski, cond.

EVEREST T4-3010

4 track, 7 1/2 ips, reel-to-reel
 \$7.95

BARTOK

Concerto for Orchestra
 Bamberg Symphony, Heinrich Hollreiser, cond.

This symphony is a specialty of Stokowski's, and he does not disappoint. The Stadium Symphony Orchestra of New York plays very well, and the only drawback to this release is the sound, which is not quite up to Everest's usual high standards. The stereo sound is big and impressive in many places, but the sound is almost too cavernous, and there is some distortion in the high-powered passages. The tympani are muddy blurs of sound, with no real "whack." The sound of the tympani on the Rodzinski monophonic record (Westminster 18001) is far superior to this stereo recording; for example, compare the openings of the last movements in the two recordings.

In spite of these reservations, this is a performance to own. A comparison with the Everest two-track 7 1/2 ips tape of the same performance (Everest STBR-3010, \$8.95) shows no appreciable difference in quality.

CROWN
Professional Tape Recorder

CROWN
4-Track Recording Performance Today Surpasses the Best Traditional Performance Standards of Yesterday

GOLD CROWN ROYAL



Model 714-C/A 30-30

RECORD PERFORMANCE

±1 FREQUENCY RESPONSE	IPS SPEED	FLUTTER & WOW	NOISE RATIO
±2 db 50-28000 CPS	15	.06%	57 db
±2 db 40-17000 CPS	7 1/2	.09%	54 db
±3 db 30-9000 CPS	3 3/4	.18%	51 db

*Write to Dept. TR-1 for FREE Catalog—also data on professional tape duplicator.

CROWN INTERNATIONAL NOW OFFERS YOU THESE OUTSTANDING FEATURES



Worldwide recognition for high professional quality and built-in guaranteed performance.



29 years of electronic experience combined with skilled technicians.



Complete line of tape recording equipment.



Exclusive, basic-patented features bringing the finest in operating functions.



Unsurpassed design, dependability, and durability.



4 or 2-track combination heads.



Long play machines for industrial, commercial, and consumer usage.



238 franchised dealers throughout the USA to sell and service CROWN. Write for name of your nearest dealer.



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

VOX XTC 704

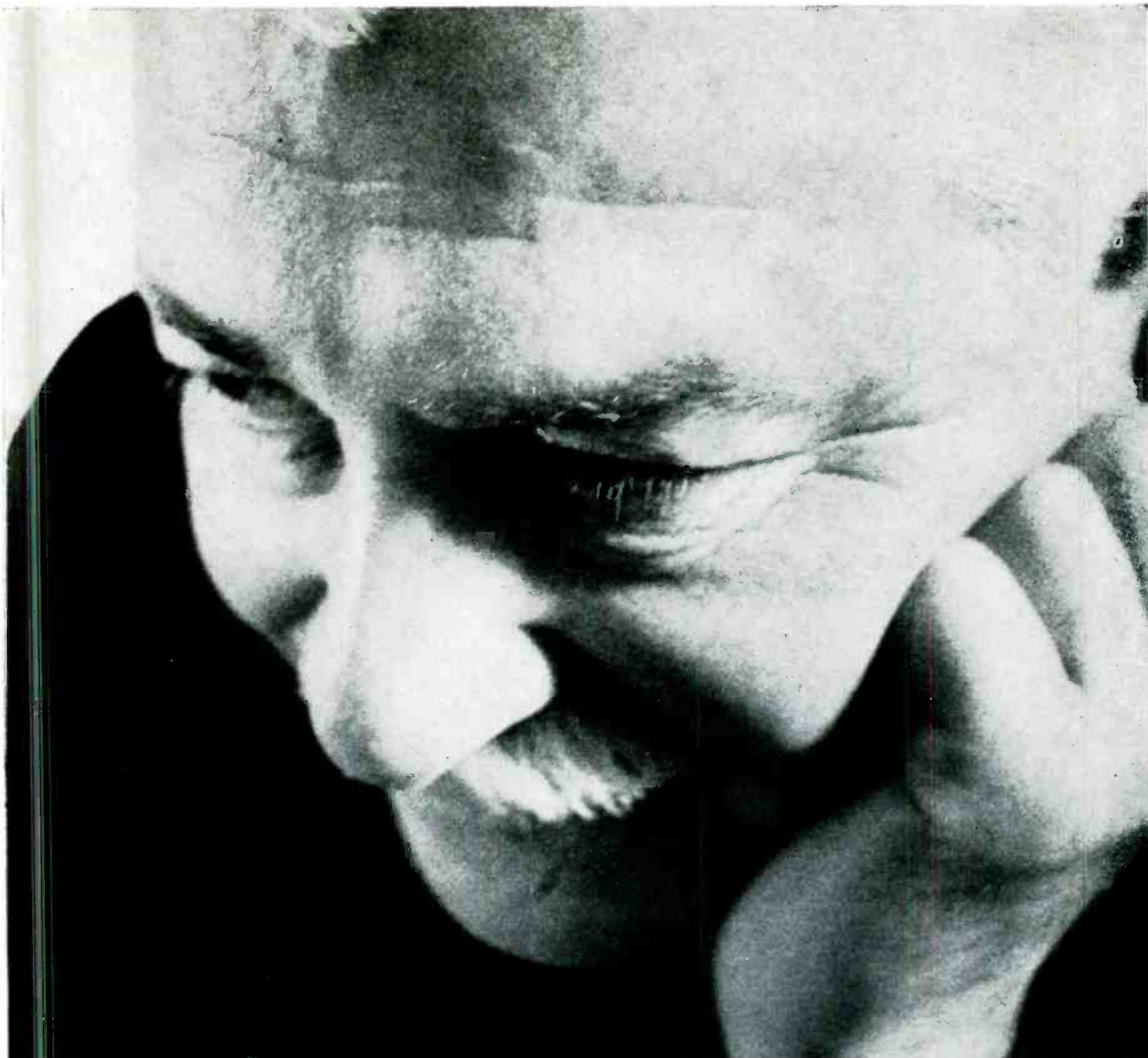
4 track, 7 1/2 ips, reel-to-reel
 \$7.95

This is a good performance of a colorful score, with impressive stereo spread, placement and depth. The brass instruments are particularly well recorded, and Hollreiser has some interesting points to make in his interpretation. The Bamberg Symphony first-desk players are good, but not quite the equal of the Chicago Symphony conducted by Fritz Reiner (RCA 2-track, 7 1/2 ips tape ECS-9, \$11.95), and the Victor recording has the edge over the Vox release from a sound standpoint as well. However, the Victor recording is not yet available on 4-track, 7 1/2 ips tape, and the excellent Vox version can be recommended very highly. How unfortunate it is that Epic (Phillips) did not record in stereo the magnificent Concertgebouw Orchestra—van Beinum performance of this music.



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

CROWN INTERNATIONAL
Division of
INTERNATIONAL RADIO & ELECTRONICS CORP.
ELKHART, INDIANA



Arthur Fiedler is an **irish**-man! He wields a baton instead of a shillelagh, but Arthur Fiedler, Conductor of the Boston Pops Orchestra and RCA recording star, is a faithful Irish-man! In the studio, this gifted artist chooses his music with meticulous care. His orchestrations, his every nuance of interpretation ...all are the result of painstaking choice. And he selects the tape for his home recordings as carefully as he evaluates his orchestrations. Of course, he chooses Irish! For only Irish tape offers the ultimate in fidelity and sonic brilliance. It makes no difference to Arthur Fiedler, but Irish costs no more than ordinary brands.

irish high fidelity recording tape

BRAND
Manufactured by Orr Industries Company, Opelika, Alabama

Export: Morban Exporting Corp., New York • Canada: Atlas Radio Corp., Toronto



MARTIN DENNY plays the most exotic sounds you've ever heard in EXOTICA—exciting, new Stereo Tape by

bel canto

At your dealer's on 2-track or 4-track reel-to-reel or new tape cartridges. Write for free catalog X of over 100 Bel Canto releases.

Bel Canto Stereophonic Recordings
a subsidiary of Thompson Ramo Wooldridge Inc.
1977-1985 McAllister Avenue
COLUMBUS, OHIO

ROBINS TAPE BOOK SHELF



"Television Tape Recording" by George B. Goodall, 48 page illus. (TE-48). A semi-technical book by Robins on methods and techniques in the amazing new field of video tape recording, just published Price \$1.00.

"How To Get The Most Out Of Tape Recording" by Lee Sheridan. For the non-professional recordist, this book tells about how to buy and operate a tape recorder, developments in stereo, legality of tape recording, making money with a tape recorder, etc. 128 pages illus. (TE-128) \$1.00. (shown in illustration)

Another Robins book "Tape Editing and Splicing" TE-24, 24 pages illus., 35c.

AT DEALERS EVERYWHERE!
Write for FREE catalog

Robins Industries Corp.
36-27 Prince Street
Flushing 54, N. Y.
Att.: Miss Tohl
Please send catalog to:
Name
Address
City Zone State

BRAHMS

Hungarian Dances Nos. 1, 2, 3, 5, 6, 7, 17, 19 and 21

DVORAK

Slavonic Dances Op. 46 Nos. 1 and 8;
Op. 72 Nos. 2 and 7

Bamberg Symphony Orchestra, Jonel Perlea conducting

STEREOPHONIC MUSIC SOCIETY SMS 14
4 track, 7 1/2 ips, reel-to-reel
\$8.95

Pleasant music, with nicely paced performances by the Bamberg Symphony. The sound is rich and warm and almost overly resonant, with a nice spread to the stereo. The Brahms Dances are particularly successful; the Dvorak excerpts do not have the ring of authority that a conductor such as Talich or Szell might produce. Regardless, this is a satisfying performance of easily accessible music, well-recorded and highly recommended.



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

SYMPHONY OF DANCE

Dance of the Buffoons (Rimsky-Korsakov);
Valse Triste (Sibelius); Minuette (Bizet);
Russian Sailor's Dance (Gliere);
Overture to Ruslan and Ludmilla
(Glinka);

Polovetsian Dances (Borodin)

Musical Arts Symphony, Leonard Sorkin, cond.

CONCERTAPES 4T-3003
4 track, 7 1/2 ips, reel-to-reel
\$6.95

A collection of familiar classical favorites, played by a rather small-sounding orchestra. The acoustics are big, with impressive stereo spread. The sound is bright and full, with some particularly effective percussive passages.

However, the review copy of this tape had a most disconcerting drop in pitch on the last bars of the *Polovetsian Dances*, mirrored on the reverse track by a rise in pitch at the beginning of the *Dance of the Buffoons*. As the 4-track 7 1/2 ips stereo tape library grows, there will doubtless be many other collections similar to this, played by bigger and better orchestras than the Musical Arts Symphony, with equally good sound. Before buying this, make certain your copy doesn't have the changes in pitch mentioned above.

POPULAR



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

GEORGE FEYER AND HIS ORCHESTRA PLAYS JEROME KERN AND COLE PORTER

The Way You Look Tonight, Bill, Lovely to Look At, Can't Help Lovin' Dat Man, I Won't Dance, They Didn't Believe Me, The Last Time I Saw Paris, She Didn't Say Yes,

Smoke Gets In Your Eyes, The Song Is You, The Waltz in Swing Time, I've Told Every Little Star, Who Easy To Love, I Get A Kick Out of You, Why Can't You Behave, In the Still of the Night, True Love, Begin the Beguine, So In Love, It's Delovely, Night and Day, Anything Goes, My Heart Belongs To Daddy, It's All Right With Me, You Do Something To Me, Wunderbar

VOX XTP-710

4 track, 7 1/2 ips
\$11.95...70 mins.

Take the music of two show business greats like Jerome Kern and Cole Porter, stir in the piano tinkling of George Feyer, blend well with his orchestral arranging and capable musicians, and you come up with a delectable concoction indeed. Sunny, happy music, charmingly interpreted.

This is a fine tape for background music or for dancing. No fancy arrangements, just an even flow of good music played as it was written.

Can't locate any great deficiencies in stereo balance or fidelity.



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

PAT SUZUKI

The Song Is You, Star Dust, Black Coffee, Anything Goes, I've Grown Accustomed to His Face, Daddy

With Henri Rene and His Orchestra
RCA BPS-239

2 track, 7 1/2 ips
\$6.95...16 mins.

A small package of dynamite is the best description for Broadway's Pat Suzuki. Her refreshing youthfulness shines out in her vibrant singing. She has been likened to various performers, but her individuality is now firmly established.

This upcoming singer has a pure, clear voice, bright as a new penny. She is most ably backed by Henri Rene and his orchestra.

Pure, uncluttered sound.



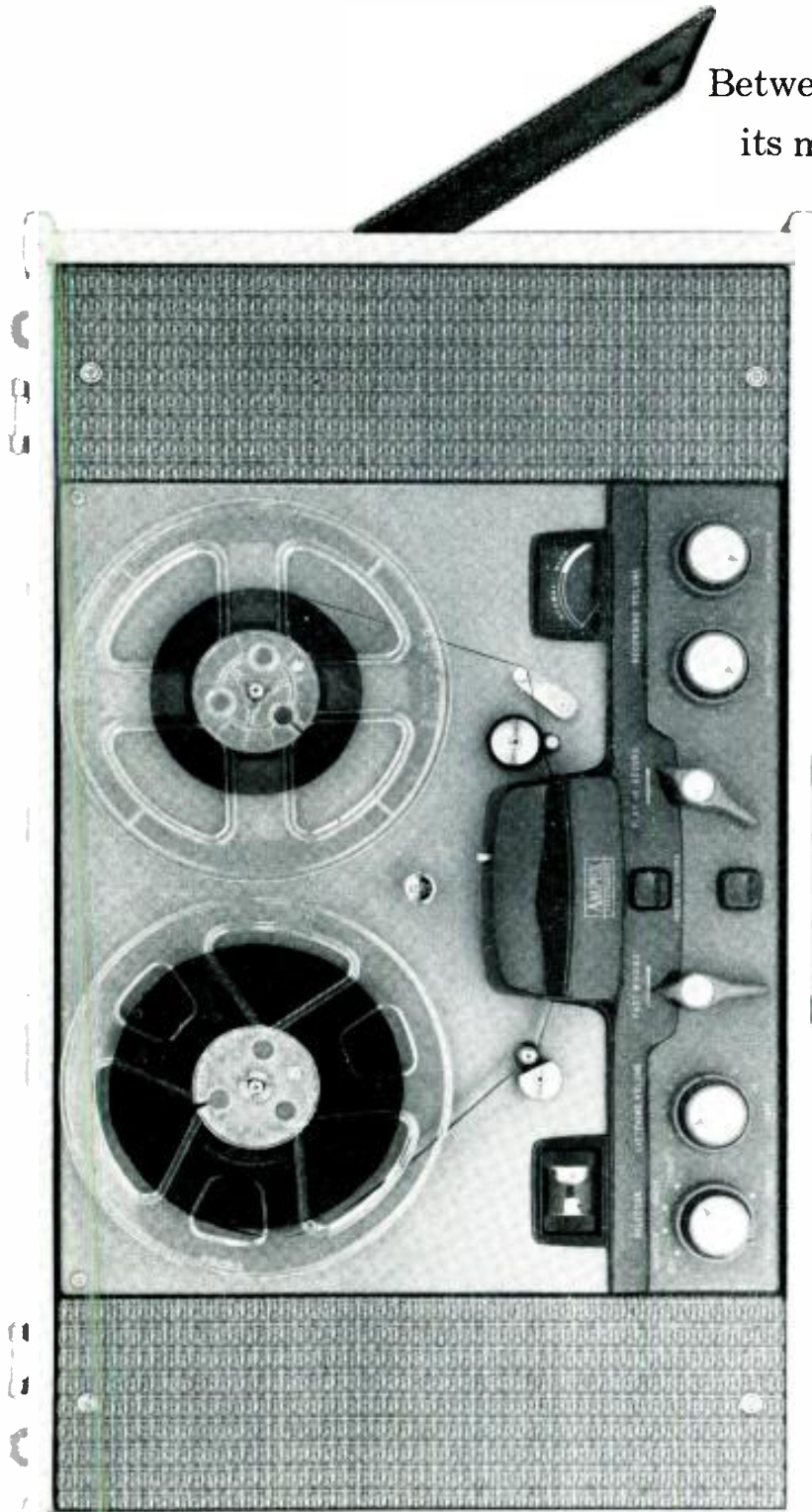
Music ★★
Performance ★
Fidelity ★★
Stereo Effect ★★

THE GLENN MILLER WAY

Side 1: Did I Remember, Johnson Rag, Stairway To The Stars, Elmer's Tune (Cha Cha), My Blue Heaven
Side 2: One O'Clock Jump, My Reverie, Chattanooga Choo Choo (Cha Cha), Ebb Tide, You Stepped Out Of A Dream

Ray Eberle Sings & Plays
TELECTROSONIC TT-401

4 track, 7 1/2 ips
\$4.98...30 mins.



Between this adjustable baffle and its mate below, both directing sound from matched 7" speakers, is the most unique stereo tape system on the market. It's just one single piece (only the lid comes off) that lets you enjoy all the benefits of stereo sound. Records stereo live, from records, or off-the-air; plays new 4-track and earlier tapes.

This marvel is the **New Ampex Monitor 970 Stereo Recorder/Player** from the world leader

in the field of magnetic recording. This new unit has separate record and playback pre-amps, dual-channel amplifier; operates at two speeds, $3\frac{3}{4}$ and $7\frac{1}{2}$ ips.; can record sound on sound, monitor what you record as you're actually recording it. The price for the complete unit with its own gray luggage case is just \$750, and you can buy it on convenient budget terms.



FREE TAPE

Your choice of any \$7.95 4-track pre-recorded stereo tape from the U.S.T. catalog FREE with the purchase of a Nortronics R/P Stereo Conversion Kit.

CONVERSION KITS

Now you can convert your own tape equipment to 4-track stereo playback or stereo playback/record with these new stereo conversion kits from Nortronics. All kits come complete with hardware and instructions.



WOLLENSAK-REVERE

WR-35 Converts 2-track stereo to 4-track play. \$25.50
 WR-40 Converts mono machines to 4-track play 32.50
 WR-45 Converts any machine to 4-track play/rec. 37.50

VM

V-6 Converts all machines to 4-track play. \$25.50
 V-7 Companion Stereo Erase for V-6 kit for rec. 14.50

WECOR

W-6 Converts two-direction machines to 4-track play—includes head shifter. \$36.00

Write for FREE U.S.T. catalog and specific conversion information for your tape recorder. Nortronics stereo tape heads are the very finest available and are used by most leading American manufacturers. Nortronics also produces the world's most complete line of tape heads and accessories.



Nortronics CO. INC.
 1015 So. 6th St., Minneapolis 4, Minn.



HOME RECORDER TRICKS

By DICK JURGENS

One of America's foremost orchestra leaders has written an easy-to-follow guide which contains a whole hatfull of recording tricks.

THE ONLY BOOKLET OF ITS KIND AVAILABLE

Here are some of the professional sounds you can duplicate:

- Animals (Chipmunks, etc.) speaking or singing — with you!
- Duets and trios — with the same voice!
- Duets — famous vocalists and you!
- Demonstration tapes!
- Echoes, garbles, weird voices — and many other effects!

Home Recorder Tricks, in addition to complete instructions for sound effects, contains a programming guide to help you prepare your scripts.



DICK JURGENS

RECORDING ASSOCIATES

1405 South 8th St., Colorado Springs, Colo.

For six years Ray Eberle was the featured vocalist with the Glenn Miller band. He has remained a favored singer for many years.

We get a tinge of the well-remembered Miller style on this tape and it is pleasing to hear Ray once again. Taken as a whole, the tape is fair, but there is nothing emphatic, nothing particularly appetizing about it. It doesn't exactly set us ga-ga, but it is nevertheless mildly pleasant listening and the fidelity is clean and sharp.



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

BAHIA

Bahia, Jungle Jalopy, Caribbean Nights, Bamboo, Return To Me, Tropical, Quiet Village, Happy Voodoo, Busy Port, Maui Chimes, Beyond The Reef, Legend Of The Rain

Arthur Lyman and His Group

HIFITAPE R815

4 track, 7 1/2 ips

\$7.95... 34 mins.

Arthur Lyman and his group are the perfect answer to those who like something musically different. It isn't hard to tire of one particular type music. We all like variety. Variation is something Mr. Lyman certainly does not lack. His arrangements are exciting, almost on the verge of being daring in some instances.

This recording was made in the Kaiser Aluminum Dome, on the grounds of the Hawaiian Village Hotel in Honolulu. We have heard others recorded in this dome where the acoustics are perfect and all are excellent fidelity-wise. So too, is this release.



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

HERMAN'S HEAT & PUENTE'S BEAT

Blue Station, Pillar To Post, Midnight Sun, Woodchopper's Ball, Balu, Lullaby of Birdland, Latin Flight, New Cha-Cha, Mambo Herd, Cha-Cha Chick, Tito Meets Woody, Carioca

Woody Herman, Tito Puente

EVEREST STBR-1014

4 track, 7 1/2 ips

\$7.95... 35 mins.

My, oh my, how the brass does blare out on this release. It predominates the whole band. This is quieted somewhat when Tito Puente blends in his Afro-Cuban, Latin-American rhythms.

Wouldn't recommend this tape for dancing, and it makes for rather wild listening. Perhaps it is the selections chosen for this tape that just don't sit well. Woody Herman and Tito Puente are both fine musicians; it may be that their talents were not meant to be combined.

† JUST RELEASED † IN TIME FOR EASTER HANDEL'S MESSIAH

First time on stereo tape—
 over two hours.

Recorded by the famous Handel and Haydn Society chorus of 180 voices accompanied by the Zimbalist Sinfonetta.

Never before has this magnificent work been presented on stereo tape.

Excerpts have received rave reviews and have been listed among the top 10 recordings of the year. Now you can secure the entire matchless performance on stereo tape.

Order your Deluxe Edition today.

2 track (3 reels), 2 M-1\$44.95

4 track (3 reels), 4 M-1\$29.95

DELUXE EDITION, ATTRACTIVELY BOXED
 from your dealer or order direct.

**SMS, National Sales Agency for
 Livingston Audio Products Corp.**

303 Grand Avenue
 Palisades Park, N. J.

In any event, those of you who favor jazzy jazz, with a mixture of Latin rhythm, will like this one. Fidelity is marvelous.

MISCELLANEOUS



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

ARMY BLUE

When Johnny Comes Marching Home, Four Bales, Rally 'Round the Flag, Tramp, Tramp, Tramp, The Yellow Rose of Texas, Tenting on the Old Camp Ground, Dixie, Battle Hymn of the Republic, Simon the Fisherman, Careless Love, Don't Go Home, Sound of the Wind, Four Jolly Coachmen, Brothers, Sing On!, Eight Bells, Shenandoah, Away To Rio, Hospodi Pomilui, Little Innocent Lamb, The Long Day Closes, Hallelujah, Amen

The West Point Cadet Glee Club
 STEREPHONIC MUSIC SOCIETY S19

4 track, 7 1/2 ips

\$7.95... 36 mins.

A male chorus is always stirring, you just want to sing along. We think the West Point Glee Club is especially good. They sing unitedly, as a single body, never losing their harmonious solidarity.

There is an unusual group of selections on this tape, and for some of them the Cadet Glee Club Quartet does the honors. The two tenors and two baritones in the quartet blend well and they too are a credit to the club.

On Hospodi Pomilui there is an unusual vocal effect which leaves you wondering if the group wasn't quite breathless when it finished.

Pure pleasure—pure fidelity.



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

SONGS OF A RUSSIAN GYPSY

Side 1: Beryuzoviye Kalyechke, Yekhali Tsigane, Dve Gitari, Kagda Ya Pyann, Svyetit Myesats, Kak Stranno, Nichevo, Nichevo, Nichevo
 Side 2: Chto Mnye Gorye, Oyen I Noch, Metyelitsa, Shilsya Mnye Sad, Karobushka, Karabli, Sudarinya

Theodore Bikel
 ELEKTRA ETC-1501
 4 track, 7 1/2 ips
 \$7.95... 40 mins.

There must be folks around who hanker for this type music—I'm not among the group. It's a type folk music—Russian Gypsy folk music. Most of the time it is fast and quite wild, not to mention the fierceness of Theo's singing.

Since I don't comprehend either Russian nor the Gypsy dialect, I don't know what the heck the songs are all about. With my imagination I can come up with some game guesses. Actually, Mr. Bikel's enunciation is quite good and for those of you familiar with Russian this tape may have great appeal. After you've listened to it three or four times, it begins to grow on you. The gentleman certainly sounds as if he enjoys singing this type music, he does so with great gusto.

Fidelity, stereo balance, engineering are great, but if you are in the market and have the opportunity, we would suggest you bend an ear to this one before deciding to purchase.

NEW TAPES RECEIVED

REEL-TO-REEL

- Decca, Furioso, Sabicas, Dolores Vargas and Lo; Companeros Del Flamenco, 4-track, 7 1/2 ips, ST 7-8900
- Everest, Job, "A Masque For Dancing," Sir Adrian Boult conducting The London Philharmonic Orchestra, 4-track, 7 1/2 ips, T-43019
- Kapp, Music for Trumper and Orchestra, Roger Voisin & Armando Ghitalla, soloists Unicorn Concert Orchestra, 4-track, 7 1/2 ips, KT -49000
- Livingston, Danceable, featuring the golden sound of Mel Connor's trumpet, 4-track, 7 1/2 ips, 4 T-6
- Livingston, Symphony in D Minor, Cesar Franck, The Graz Philharmonic Orchestra, Dr. Hans Wolf, conductor, 4-track, 7 1/2 ips, 4 T-8
- Mercury, Saint-Saens Symphony No. 3 in C Minor, Op. 78, Marcel Dupre organist, Detroit Symphony Orchestra, Paul Parav, 4-track, 7 1/2 ips, STC 90012

CARTRIDGES

- RCA, Brahms Concerto No. 1, Graffman, Boston Symphony Orchestra, Munch, 4-track, 3 3/4 ips, KCS 4017
- RCA, Esquivel Exploring New Sounds in Stereo, Esquivel and His Orchestra, 4-track, 3 3/4 ips, KPS-3060

SOUND TALK



Protect your heads

REALLY EXCELLENT RECORDING depends on two heads . . . the one you use in selecting equipment, tape and methods and the one on your recorder, which needs tender care. You can use one head to protect the other by making sure you use "SCOTCH" Brand Magnetic Tapes.

ABRASIVE ACTION of some tapes on the head can cause wear resulting in a frequency drop of as much as a full octave. That can't happen if you use "SCOTCH" Brand Tapes with patented Silicone Lubrication, which lasts the life of the tape. "SCOTCH" Brand is the *only* tape that has it!

MAXIMUM HEAD PROTECTION is assured, but there is nothing gummy to attract dust or clog the head gap. No mechanical polishing is involved in the making of "SCOTCH" Brand Tapes, so there is no need to worry about breakdown of oxide quality. And Silicone Lubrication is impregnated throughout the coating . . . nothing haphazard or temporary about it.

MUTUAL ADMIRATION of tape and head results. Tape glides over the head without abrasion. The head doesn't gouge or scratch the tape, which keeps lubricating the head, and so on to longer tape life and better tape recording.

SILICONE LUBRICATION plus the finest uniform high potency oxides have made "SCOTCH" Brand Tapes the standard of the broadcast industry. You cannot buy better tapes.

"SCOTCH" BRAND TAPES are made by the 3M Company, whose pioneering research leads the magnetic tape field. This is the only company able to meet the fantastic standards of Video Tape. Play the favorite . . .

"SCOTCH" and the Plaid Design are Registered Trademarks of the 3M Co., St. Paul 6, Minn. Export, 99 Park Ave., New York, Canada, London, Ontario.

MINNESOTA MINING AND MANUFACTURING COMPANY
 ... WHERE RESEARCH IS THE KEY TO TOMORROW



CROSSTALK

from the Editors

BEFORE YOU WRITE to tell us we omitted the "Hi-Fi" from the cover and the masthead of this issue, we'll tell you we did it deliberately—and for what we consider to be a number of good reasons. It won't be back.

* * * * *

FOR A NUMBER of years the term "hi-fi" meant something. That was before it became so popular that the admen seized upon it to describe everything from lipsticks to lollipops. We wouldn't be surprised to see some enterprising breakfast food manufacturer bring out a "hi-fi" cereal that would say grace in pear-shaped tones instead of snap, crackle and pop.

* * * * *

SINCE THE TERM "hi-fi" has been so debased as to have lost its meaning we see no reason to perpetuate it. Once it stood for faithfulness of reproduction but now it has simply become a synonym for the word "phonograph" irrespective of the quality. You frequently hear people say "I'm going to buy a hi-fi."

* * * * *

FURTHERMORE, tape recording is, in itself, the highest form of hi-fi—in its original meaning. No matter which way you get your sound, from tape, records, or radio, it was first recorded on tape.

* * * * *

WITH TAPE RECORDING as our name, there can be no confusion as to what our magazine is devoted to. We're not even going to add the word "stereo" as some of our readers have suggested because the field of tape recording is much broader than this one segment.

* * * * *

THE USES FOR tape recorders are like the sands of the sea and their very number has made our job both fascinating and difficult. Looking over the issues of the past six years we find we have brought you a great variety of articles from recording the beeps of satellites to how tape machines can control industrial processes and machine tools. All of these have to do with the art and science of tape recording but none of them had anything to do with "hi-fi".

* * * * *

ALTHOUGH OUR NAME will undergo this slight change the magazine itself will not—except to get better and more interesting. For those who have been asking for more technical articles, we have plans underway that we are sure will please them. For those who are just starting out in this fascinating business of tape recording there will be stories on how to get the most pleasure and profit from your home recorder. You will still find the latest word on the new machines, the availability of new tapes, both musical and educational and all the other goodies—plus.

* * * * *

IF IT HAS TO DO with tape—you'll find it in Tape Recording.

* * * * *

WHILE FOREIGN RECORDERS are numerous on the American market, up to now no foreign tape has been imported. Now comes word that the well known West German photographic firm, Agfa, will introduced two types of polyester base tapes and a kit of tape accessories to the American market. The trade name will be Agfa Magneton.

NEW PRODUCTS

ENGLISH FI-CORD



Kingdom Products, Ltd., 514 Broadway, New York 12, N. Y. is distributing the English Fi-Cord 8-transistor portable tape recorder. This battery-operated machine has speeds of $1\frac{1}{8}$ and $7\frac{1}{2}$ ips, a frequency range from 50 to 12,000 cps, plus or minus 3 db, wow and flutter of 0.4%, a small built-in loudspeaker, and a changer that enables the 4 miniature batteries to be recharged simultaneously. It comes complete with a dynamic microphone which has an on/off switch which also controls the motor; all controls are built-in and the unit is enclosed in a padded leatherette case. This machine is priced at \$330. For literature, write to Kingdom Products.

GERMAN UHER



Kimberley International Ltd., 1650 Broadway, New York 19, N. Y., is distributing the new, German Uher three speed ($1\frac{1}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ ips) stereo recorder. It has facilities for 4 track stereo and monaural recording and playback, plus playback of 2 track stereo, $\frac{1}{2}$ and $\frac{1}{4}$ track monaural. Signal-to-noise ratio is 55 db below highest recording level; wow and flutter is 0.1% at $7\frac{1}{2}$ ips; frequency response is 30 to 20,000 cps at $7\frac{1}{2}$ ips. Other features include automatic stop, tape counter, and safety record interlock. Self contained matched stereo speakers, employed when external channel speakers are connected, offers you three channel stereo listening. Write to Kimberley for price and complete information.

STEREO MIKE



North American Philips Co., Inc., High Fidelity Products Div., 230 Duffy Avenue, Hicksville, Long Island, N. Y., is marketing a new Model EL3752/01 stereo microphone. This mike consists of two elements (left and right channels) mounted in a single housing. They are dynamic type with a cardioid pattern. Impedance is 25,000 ohms, and the elements are encased in aluminum and cadmium plated iron. The housing is of very strong plastic, attractively finished in blue and gray. The unit can tolerate temperatures up to 75 deg. C and it withstands humidity and rough handling under normal circumstances. A felt layer in front of the diaphragm protects the unit from dust. This mike comes with 16 feet of shielded cable and a three-conductor telephone plug. It is priced at \$39.50. For additional information, contact the manufacturer.

COMPACT EXECUTIVE



A new pocket-sized, transistorized, Executive TR-10 recorder and dictating machine is now available. This compact instrument weighs only $3\frac{1}{2}$ pounds; it operates on penlite batteries or on AC current or car battery; it has six transistors and one diode; it is dual track and operating speeds are $3\frac{3}{4}$ and $1\frac{1}{8}$ ips. Other features in-

clude built-in speaker and amplifier, safety interlock button, and remote control jack. Uses 3" tape reels; a single knob controls all operations, and it offers up to a full hour of recording. The Executive TR-10 costs \$169.95. Literature can be obtained from Scopus, Inc., 404 Fourth Ave., New York, N. Y.

CONTINUOUS PLAYER



A tape player that will play 8 hours of continuous music in stereo or monaural and then repeat the program automatically has been introduced by Tape-Athon Division, Anthony Brothers, 523 South Hindry, Inglewood, Calif. The tape player has a 4-track playback head and operates at speeds of $7\frac{1}{2}$ or $3\frac{3}{4}$ ips (it can be adapted for $1\frac{7}{8}$ ips). Signal-to-noise ratio is 45db at $3\frac{3}{4}$ ips, wow and flutter less than .2% and flat response from 50 to 12,000 cps. The player is now available in 7" and 10" models in a portable version, and/or a cabinet version. Complete data and prices may be obtained by writing Tape-Athon, Inc., above address.

TRANSCORDER



American Concertone Division, American Electronics, Inc., 9449 W. Jefferson Blvd., Culver City, Calif., has introduced a new, book-size, portable tape recorder, which operates from its own built-in batteries. 110 volts AC, or from the cigarette lighter receptacle of a car. The complement includes six transistors and two diodes. This portable, known as the Transcorder, also features dual meter to monitor audio level and instantly show the condition of built-in batteries. Accessories include hand and foot operated remote controls, telephone pickup, stetho earphone holder, and adaptors for 12 volt DC and 110 volt AC power supplies. The price is \$199.95. Contact manufacturer for details.

STEREO TAPES!

2-track, 7 1/2 ips and 3 3/4 ips Inline.

ABC-PARAMOUNT to ZODIAC. Over 700 titles in stock, priced at less than 4-track! Catalog \$1.00, refunded first order. Shipped POSTPAID and INSURED in the United States and Canada only. Mail order only and no local sales within 50 miles of San Jose.

CAL-WESTERN STEREO

1544 Cross Way
San Jose 25, California



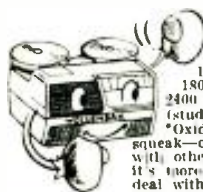
YOUR TAPES NEED FILMAGIC!

Filmagic automatic silicone lubrication (pat. pend.) makes tapes and heads play better, store better ... last longer. END tape squeals and "wows". Keep heads clean. Send \$2.95 for COMPLETE KIT (either type pylon base, sleeves and fluid). Year's supply, postpaid U.S.A.

The Distributor's Group, Inc.
204-14th St., N.W. Atlanta 13, Ga.



Suction-cup or Flange



TAPE RECORDERS

*Recording Tape
1200 foot acetate (plastic) 1.29
1800 foot Acetate (plastic) 1.79
1800 foot MYLAR (Polyester) 2.39
2400 foot MYLAR (Polyester) 3.49
(studios, large users even lower)

*Oxide guaranteed not to rub off or squeak—or money back. Compare ours with other "bargain" tape. You'll find it's more than just "price" when you deal with us. We are original pioneers in the tape recorder business and our reputation means everything to us.

SEND FOR FREE CATALOG.

COMMISSIONED ELECTRONICS CO.
1776 Columbia Rd. Washington, D.C.

RECORDS FROM YOUR TAPES

Meetings, concerts, training aids, etc economically re-recorded on permanent hi-fidelity discs. Professional quality—overnight service—all speeds—any quantity. Write for Free Folder and Prices

RECORDED PUBLICATIONS LABS.
1568-1580 Pierce Ave. Camden 5, N.J.



HI-FI SOUND EFFECTS

Newest sounds — airplanes — DC8 — Electra prop-jet — Boeing 707 — Air Force F-104 Starfighter — Regulus I — missile launching — carrier sounds — also autos — music — trains — household — industry. More than 12 classifications; over 1500 real-life sound effects. See your dealer or send 25c for 32-page catalog. BOX K
MP-TV SERVICES, 7000 Santa Monica Blvd., Hollywood, Calif.

IF YOU MOVE

Please notify us immediately so you will not miss an issue.

TAPE RECORDING
Severna Park, Md.

TAPE CLUB NEWS

Voicespionage Reunion

It has been said many times that coincidences are common in Voicespionage. The latest evidence of this comes from VS member Greg Wise of Wisconsin. Recently Greg was looking through his Voicespionage Club Directory of Members, and in it he noticed the name of Colin Dohnt of Adelaide, Australia. The name aroused a latent memory in Greg, a memory of his days in the Army during World War II when he was stationed in Australia. At that time he was dating Levena Marr, a lovely Australian girl, and was spending a good deal of time at the home of her sister and brother-in-law, Mr. and Mrs. Roy Dohnt. The coincidence of last names prompted Greg to send off a tape to Colin Dohnt asking if he could possibly know Roy. Imagine Greg's delighted surprise to receive in a few weeks a tape from Colin explaining that Roy is his brother and then including a fine family get-together that brought Greg the voices of his friend Levena, her husband, and the Roy Dohnts. Included among the voices were those of the Dohnts' twin boys who were only 3 years old when Greg was in Australia. Greg says that tape recording is rather magical to him anyway, but the real magic—miracle, almost—has been the finding of these old and dear friends after a 17 year separation.

Appeal Answered

In response to an appeal, members of The Voicespionage Club have come through generously in volunteering to read for the blind. More than enough members offered their services. It is this membership spirit which makes a club's foundation strong and lasting.

Interview With Liberace

We received a copy of the taped interview some members of Catholic Tape Recorders of America, International had with the entertaining Liberace between shows in one of the supper clubs where he was appearing. It was most interesting and we understand that the club has sent it to many of its members throughout the world.

Liberace stated the need for international peace and understanding which tapespionage helps promote. He told of his getting started in his profession and of being raised in the Catholic faith. He already has done a great deal of traveling and plans much more and was delighted that so many members of CTRA would hear his taped message.

This club certainly has much active participation by its members and we wish it continued success.

Merit Certificate Issued

World Tape Pals has issued a Certificate of Merit to their representative for the Mascarene Islands, Louis A. Teck-Yong, who reported exchanges with 17 WTP's. Louis has also arranged publicity for the organization in local newspapers, and has made the island of Mauritius (off the coast of Madagascar in the Indian Ocean) well

known to school children in the U. S. and other countries through his efforts. Louis is a teacher in the city of Port Louis and speaks Chinese, English and French.

Join A Committee

With the ever increasing expansion of the American Tape Exchange, there is a greater need for more members on the club's Welcoming Committee. The committee's chairman, Larry Duhamel, could use some more helping hands.

JOIN A CLUB

AMERICAN TAPE EXCHANGE

Stuart Crouner, Secretary
181 E. Main St.
Gouverneur, N. Y.

AURORA SCIENCE TAPE SOCIETY

Walt Richard Sheasby, Jr.
215 North Baldwin Ave.
Sierra Madre, Calif.

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
Grosse Ile, Cte, Montmagny,
P. Que., Canada

ORGAN MUSIC ENTHUSIASTS

Carl Williams, Secretary
152 Clizbe Avenue
Amsterdam, New York

TAPE RESPONDENTS INTERNATIONAL

Jim Greene, Secretary
P. O. Box 416, Dept. T, St. Louis 66, Mo.

THE VOICESPIONAGE 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. Wallen, 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
39 Ponsonby Road
Auckland, W.I., New Zealand

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

TAPE IN EDUCATION

Robert C. Snyder

THIS month we are going to break into our series on use of the tape recorder in elementary schools to give you a report on the National Audio-Visual Association (NAVA) Mid-Winter Conference held in Washington, D. C., February 18-20.

As we have pointed out in past columns, the tape recorder is a significant member of the over-all audio-visual equipment family. The recorder alone, of course, is audio, but when coupled with illustrations, synchronized slides, demonstrations, or other visual devices it becomes audio-visual.

The National Defense Education Act (NDEA), which provides for purchase of audio-visual and other equipment for improvement in teaching of science, mathematics, and modern foreign languages, makes it possible for your school to obtain these items, including tape recorders, under a matching-funds program which must be established by your state department of education.

Details of this procedure are far too long to go into here at this time, but you should be able to get necessary information from your local school, school board, state department of education, or from the U. S. Office of Education in Washington, D. C.

Dr. John Ludington, Director, Aid to State and Local Schools Branch, U. S. Office of Education, Washington, D. C., reported to the Conference that all of the 50 states now have approved NDEA programs and that all but perhaps a half-dozen of the states are already spending money under their programs. He indicated that as of June 30, 1959, there were more than 10,500 NDEA Title III Acquisition Projects approved and that the number has undoubtedly increased appreciably since then. He reported that the federal government appropriated \$52.8 million for fiscal year 1960 Title III equipment acquisition programs.

Dr. Ludington also reported sizeable increases in the number of modern foreign language students, teachers, and state supervisory personnel as well as foreign language institutes and centers established to train teachers and students since passage of the National Defense Education Act in 1958.

Dr. James J. McPherson, New Educational Media Branch, U. S. Office of Education, Washington, D. C., spoke on Title VII of the NDEA, which provides for research in more effective utilization of audio-visual equipment and techniques for educational purposes. He reported that out of 480 projects submitted to a recent date, 81 had been approved and funded in institutions in 29 of the 50 states.

Dr. McPherson had a very interesting series of transparencies showing media research work done in the past, work now under way, and work needed to be done in the media fields. Because the data was cross tabulated by media and by area of study, it is far too comprehensive to try to discuss here.

Individuals and agencies who are interested in conducting this type of research should contact the U. S. Commissioner of

Education in Washington for instructions on how to apply.

Title VII provides for research and experimentation to be conducted by public or non-profit agencies, organizations, and individuals, but it appears that substantially all the money to date has gone to the educational institutions. An often heard criticism is that little or no money appears to be going to engineers or others outside the educational institutions who might bring other points of view into these studies.

The problem is substantial because the intent of the law was to subsidize only studies for the benefit of the whole public and not for companies with commercial interests in the products or techniques developed. Nonetheless, it would seem possible to find a way to take advantage of the kind of individualistic thinking which does not seek the institutional environment. Historically, most of our basic discoveries and inventions have been made by individuals pursuing an independent course of action often considered folly by those around them.

Let's hope some of these funds can bring to light some of the possible findings of those who are not in the educational institutions but who are equally interested in this work and who may represent a surprising amount of untapped talent.

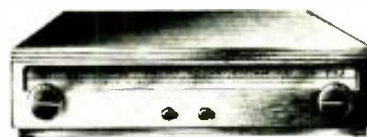
Dr. Dan Desburg, Head, French Section, Foreign Service Institute, U. S. Department of State, Washington, D. C., gave a most entertaining and instructive talk on "The Theory and Practice of Electronic Language Teaching." We will hold discussion of his address for inclusion in our forthcoming series of columns on this subject. Dr. Desburg's remarks met with our approval because he stressed the fundamental differences in principle and technique in learning a spoken language as contrasted with a written language.

A really outstanding publication, *The Audio-Visual Equipment Directory (Sixth Edition)*, arrived from the printers just in time to be on view at the Conference. Subtitled, "A Guide to Current Models of Audio-Visual Equipment," this guide is remarkably complete, including pictures, specifications, available accessories, and prices for over 700 items in twenty-two major categories of equipment and a miscellaneous equipment section, covering almost everything imaginable. The *Directory* is topped off with several useful Appendices. Price, \$4.75. Order it from National Audio Visual Association, Inc., Fairfax, Virginia.

It seems appropriate to close this column with the concluding remarks of President William G. Kirtley's report:

"As schools become more and more 'laboratories of learning,' teaching aids and materials grow in proportionate importance. Vigorous effort must be exerted to provide assistance and service to all users of audio-visuals to see that these newly acquired tools are properly used and effectively utilized. Herein lies the greatest challenge facing audio-visual businessmen and educators as we look to 1960, the beginning of a new decade of opportunity."

TAPING YOUR FAVORITE FM PROGRAMS?



DEMAND

RCA SOUND TAPE

Proud of your hi-fi rig? Every component carefully selected for top performance and reliability? You owe it to yourself to choose your magnetic recording tape with the same care, to assure superb recording and playback. RCA Sound Tape will give you high fidelity reproduction...full frequency response from the thrilling highs to the powerful lows...and the best sound reproduction your tape recorder can deliver.

RCA Sound Tape is available in the popular and economical 5" and 7" reel sizes, on splice-free Mylar* and acetate bases. Ask for RCA Sound Tape wherever superior quality magnetic recording products are sold.

*Dulux registered trademark



**RADIO CORPORATION
OF AMERICA**
Electron Tube Division
Harrison, N. J.

Another Way RCA Serves You through Electronics

Record Anything, Anywhere with "The Magnemite"



Battery-operated, spring-motor tape recorder designed for professional field use. Assures complete independence from AC power. Meets National Association of Radio and Television Broadcasters standards. 60 Models available.

Write for free literature and direct factory prices to Dept. HF:

AMPLIFIER CORP. of AMERICA
398 Broadway • New York 13, N. Y.

RENT stereo tapes

- over 1000 different albums
- all major labels
- no deposits on tapes rented
- postpaid to and from your home

Free catalog

stereo-parti 

811-A CENTINELA AVE., INGLEWOOD, CALIF.

TAPE RECORDERS



**HI-FI COMPONENTS
SLEEP LEARN KITS**

MERITAPE (Unusual Values)
Low cost, high quality recording tape, in boxes of 60. **FREE** 1960 CATALOG
DRESSNER, 89-02 AA, 174 St., Flushing 65, N. Y.

SPECIAL OFFER

BACK ISSUES OF
TAPE RECORDING

New low prices on full volume lots
Volume 6 (1959) Complete ..\$2.75
Volume 5 (1958) Complete ..\$2.75
Volume 4 (1957) Complete ..\$2.75
Any 2 Volumes\$4.48
All 3 Volumes\$5.96

- The quantity of these issues is limited, so send your order today
- All orders shipped prepaid
- Sorry No C.O.D.'s or Bill Me's

Mail Coupon Today

TAPE RECORDING

Severna Park, Md.

Please send Volumes of back issues checked below. I enclose \$.....

- Volume 4 @ \$2.75
Volume 5 @ \$2.75
Volume 6 @ \$2.75
2 Volumes (specify which 2) @ \$4.48
3 Volumes @ \$5.96

Name

Address

CityZone.....State.....

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.

Q—I am in the market for a new 4-track stereo recorder.

What bothers me the most is the noise you hear when listening to a violin or any solo instrument of a concerto. It sounds like Hiss-s-s or Sh-h-h-h, when the tone controls are in the full treble position. The high priced recorders have the same noise as the lower priced recorders.

Is there any way of reducing this noise that is heard during playback of pre-recorded or home recorded material?

The same type of noise is sometimes heard when no tape is being played but the volume is turned all the way up.

Will a tape lubricant reduce this noise which is heard while the tape is being played?

What can be done about the noise that you hear when the volume is turned up but there is no tape being played?—C. M. B., Brooklyn, N. Y.

A—You are concerned with two kinds of hiss, although both sound very much the same. The last one you mention, a hiss that is present when the volume is turned up but no tape is on the machine, is known as amplifier hiss.

This is caused in the tubes of the amplifier and is always present to some degree. It is believed to be the "electronic wind" noise caused by the passage of the electrons from the cathode of the tube to its plate. It may also be caused by noisy resistors, leaky condensers or bad switch contacts.

Tape hiss, and there is always some slight amount present, is due to random noise on the tape. This may be made more noticeable if the recording level is too low and it may also be caused by a magnetized playback head, erase head, tape guides or rollers.

Machines which have permanent magnet erase heads are more prone to hiss than those which employ an oscillator type of erase. Since the hiss is caused by electrical means, the use of tape lubricant, which simply makes the tape slide easier, would have no effect upon it. Frequent and regular demagnetization of the heads is the best preventative.

Usually, in good quality machines, the hiss level is so much below the level of the signal that it is never noticed.

The bass and treble controls may be said to permit selective amplification of the signal. When you boost the treble control you are amplifying the highs out of proportion to the rest of the signal. It is in this region that the hiss, both tape and amplifier, lies.

The ideal reproduction of sound is achieved by flat playback, that is neither the highs or lows are over-accentuated. Tone controls are primarily for the purpose of correcting any deviations from a flat response, not for bumping up one part of the curve at the expense of the rest.

We would suggest that you do not boost the treble so much and then either form of hiss will not be noticeable.

Another factor is driving the amplifier to the limit of its amplifying power thus reducing the ratio between the signal and the noise. If loud sound is desired it is better to get a more powerful amplifier and run it only part way open than to have a weak amplifier and run it wide open.

It is possible, although it would be unusual, that your hearing is such that you are keenly sensitive to the high end of the audio band and hence would hear the hiss louder than normal. If so, you have very sensitive hearing as most people, especially older folks, have a distinct hearing loss in the high region and simply cannot hear the highs no matter how loud they are played.

Q—It seems to me that I read or heard of a method for copying stereo phono discs in stereo by the use of two tape recorders.

At the time it was entirely academic since I owned only one recorder but since acquiring a second machine, I've been trying to remember what I read about it.

So far I have had no luck whatever, the problem of synchronizing the two tracks has been insuperable.

The machines I own are a Webcor Royal Coronet and a Telectro Model 333, both with stereo play only. The Webcor has a preamplifier in the stereo channel, the Telectro has two complete amplifiers but no stereo record.—R. C. S., Denver, Colorado.

A—We published an article on this about five years ago, long before stereo became popular and only monaural machines were available.

One method is to place the two machines side by side. Put a reel of DOUBLE COATED tape on the supply spindle of the left hand machine, thread the tape through the slot, give it a half-twist and run it through the slot of the right hand machine and onto the takeup reel.

After recording, the tape may be played back but the machines must be in exactly the same positions or they will not be synchronized.

You might try this. Using a shielded cable, detach the wires from the top pair of terminals on either machine and attach the cable in their place. Detach the bottom pair of wires on the other machine and attach the other end of the cable to those terminals.

With both machines in record and using virgin tape, you may secure stereo recordings depending upon whether or not the electrical characteristics of the two recorders and the heads are compatible. Be very careful in detaching the leads and mark them so you can replace them correctly. If soldering is necessary grasp the terminals with needle nosed pliers so that the heat will not reach the heads.

FEEDBACK

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

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

Multiplex FM Standards

To the Editor:

With reference to the published letter in the February issue of your reader Mr. A. E. Foster, I feel that the information which I received from Ampex in regards to the four track conversion of their model 612 will be of interest to him and others. They stated in a letter "... we can give you some reassurance regarding your Ampex 612; that is, that within the next few months we plan to have available a conversion kit that will permit the 612 to play the new recorded 4 track stereo tapes. We suggest that you check with your local Ampex dealer from time to time regarding this modification."

I think you are guilty of some editorial neglectfulness because you haven't been "beating the drums" for action by the FCC to establish standards for multiplex FM broadcasting. The development will be a tremendous boon to the ones among us who are looking forward to the making of high fidelity stereo recordings off the air; at present, depending upon the other available arrangements for stereo broadcasting, it just isn't possible for one to do a decent job at making his own stereo tapes from broadcasts. The industry, and particularly, the FCC needs to be prodded to "get off the dime" on this thing. The technology has been worked out and the situation is entirely in readiness for the several multiplex systems to be evaluated.—*John H. Johnson, Berkeley 5, Cal.*

It is extremely difficult to prod any government agency into action, especially on an important decision like this where several large companies all have their hats in the ring (and pocketbooks too) with different systems. No matter which way the FCC jumps they are going to be wrong in some quarters. Adding our voice to the clamor wouldn't help much, although we would like to see the matter settled too. About the only avenue open to John Q. Citizen is to write to his own Congressman and ask him to find out why no action is forthcoming. If enough Congressmen start calling the FCC in behalf of their constituents, then FCC might get the idea that some action was necessary or risk the wrath of Congress.

Ferrograph Aluminum Reels

To the Editor:

In glancing through the January issue of your magazine, we noted on page 17 a query by one of your readers concerning what he describes as "steel tape reels." In your reply, although you do not refer to steel, you have not, on the other hand correctly informed the correspondent of the meta. that is used.

Ferrograph tape reels are made of aluminum and they additionally have a

moulded center hub feature which provides not only an automatic lock-on device to prevent the reel moving once it is on the mounting but has also a patented tape clip which retains the tape adequately without recourse to irritating threading and other somewhat unscientific methods of tape attachment. We mention this fact not in order to correct your own reply but in order that your correspondent shall be fully informed and the correct information given to him.—*R. W. Merrick, Director, British Ferrograph Co. Ltd., London, England.*

Reel Winding

To the Editor:

As I am now in the process of recording an LP I have decided to write a few lines.

I have been recording with a Revere T-700-D and I must say I am very proud of the outfit.

With all the splicing and editing I have done, I have never seen an article on what to use for winding my reels. So I found my own solution.

If any of your readers are home movie fans they know what the solution is.

I use a pair of Craig movie reel rewinds. These rewinds can handle the 7 inch plastic reels and the fall out stop can be used so that the reels cannot fall off for the hub has two sets of latches.

One is square for the movie reels. The second one has three tips. These tips will take the three notches in the tape reel hubs. With a pair of these rewinds mounted on a board one can also mount a Robins tape splicer.

My board is 20 inches long by five inches wide and it does make a nice looking accessory in my hi-fi cabinet.

Incidentally, these rewinds cost about \$15.00 at a camera shop and have come in very handy, especially in rewinding from damaged reels.

I believe I will close for it is time to change records. I now have a bit of a collection made over the last two years. I do hope someone can use this idea.—*Anthony J. Miriam, Detroit, Mich.*

Thanks for the worthwhile tip which we are sure some of the readers can use. Heath also has a power winder in kit form which we covered some issue ago.

Liked "CPS" Article

To the Editor:

As some one who earns his living selling tape recorders I should like to take this opportunity to congratulate you on the excellent article in the February issue of TAPE RECORDING.

The article is "What's a CPS?"—how helpful that will be. Once again full thanks for the article.—*Bernard Howell, Weston, Ontario, Canada.*

We are pleased that you liked the article and will try to have more like it.



faith

If having faith in one's product is old-fashioned, we're guilty. So much so, in fact, that we back it with this unprecedented satisfaction guarantee: **If the quality of Triton Tape is deficient for any reason whatsoever, we will replace it with whatever brand you prefer.** A qualifying Guarantee Certificate is included with every reel you buy.



TRITON TAPE COMPANY, WOODSIDE 77, N. Y.

For complete information write:

BRAND PRODUCTS INC.

256 E. 49th St., N. Y. 17, N. Y.

National Marketing Organization for Triton



"Honorary" club member, 17 year old John B. Ledwon at his own Wurlitzer organ. John has appeared on numerous radio and TV programs, has given recitals, played at various shows, benefits, etc. He began the study of the organ when he was 11.

Organ

by Stanley R. White

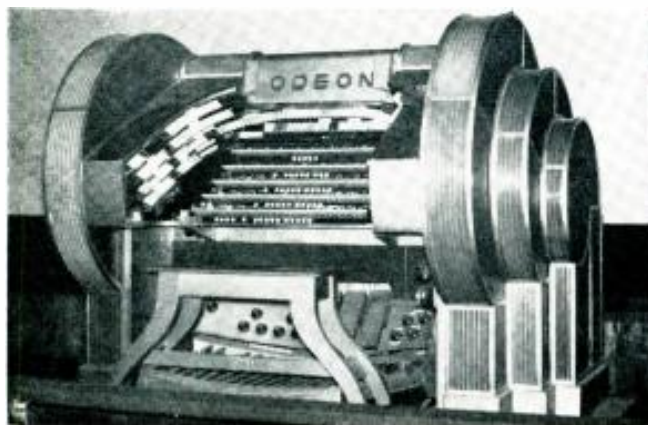
. . . . new tape club

It gives me a great deal of pleasure to be able to write about the Organ Music Enthusiasts club. I was asked to do so by club secretary and founder—Carl Williams of 152 Clizbe Avenue, Amsterdam, New York. I was one of the first persons to join the club, and as a journalist in the organ music field, I can vouch for the success of the club to-date.

Membership enquiries for the club should be sent to Carl Williams, I mention this before I leave his address (above) far behind. Carl Williams is a far-sighted person, for he alone saw the tremendous possibilities of forming a tape club which would cater for the specific needs of the organ enthusiast. People told him that his plan would fall-through, they said that it would be impossible for him to find enough tape recordists interested in organ music to make the club a success. How wrong those people were, they did not bargain with the active brain of Carl Williams. For Carl advertised his club well, he invited members of the regular tape clubs interested in the organ to join him, and his message was repeated in several club journals.

Carl could also see the possibilities of the international exchange of organ tapes, and lost no time in presenting the outline of his new and specialized tape club to yours truly—over here in England. I fell for his idea right away, and lost no time in presenting news of the new club in the British Press, I also asked my other journalist friend who writes a weekly organ column in the "Worlds Fair"—to help, this was Basil Bonner—and he actually beat me to it for making the first announcement. Almost at the same time, Carl Williams sent news of the club to this publication, and a column about the club appeared in the June '59 edition.

The response to this campaign was beyond our wildest dreams. Applications for membership reached Carl—from people interested in every sphere of organ music. It is also important to relate that during this first big membership drive, the club, acting upon the requests of the new members—introduced its own library, to be made up of tape recordings of organ music submitted by members, both for the purpose of ready made entertainment programs for

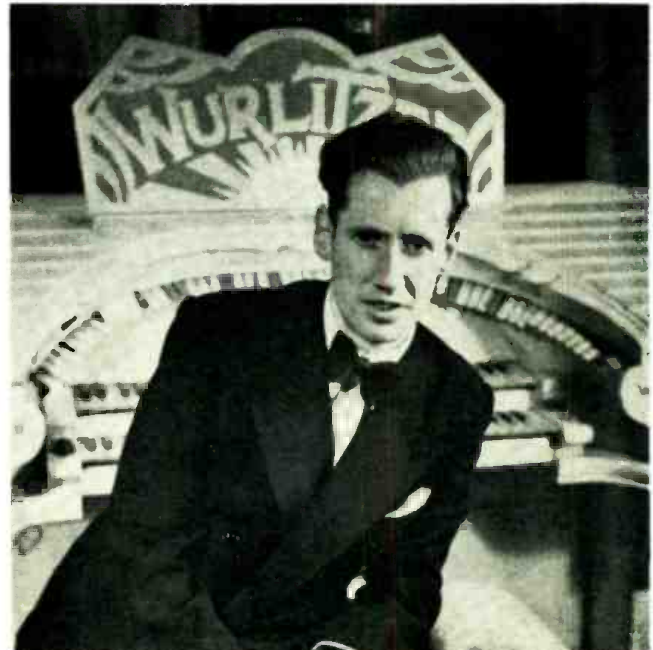


Left: the console of the British Compton organ in the 'Odeon' theatre, Leicester Sq., London. This organ is played by club member Gerald Shaw. Right: Wurlitzer keyboard. Quite a few American Wurlitzers are found in other countries, but each must be tuned to that particular country's climate, and quite often they produce a different tone than in their country of origin.

Music Enthusiasts

promotes interest in organ music

the benefit of members, and also to preserve the sounds of different types of organs—so that the historian of the future, and the student then—and now, can have the library to call upon, when a certain type of organ is required. In this way, great organists can also be honored by having their playing preserved. The library is administered by Seward Orton. Lists of the available organ material are circulated to all members, and all the member has to do when an item is required, is to send along the correct length of blank tape together with the return postage. The selected program is then dubbed.



Top: Club member, Stanley Whittington, pictured at a British Conacher theatre organ. Bottom: Michael Donald of Coventry, England is another club member. He, too, is a theatre organist, as well as Musical Director of the Coventry Orpheus Choir. Left: author Stanley R. White, who was one of the first to join the club. He is a journalist in the organ music field.

Church and concert organists, together with enthusiasts of that type of organ music were quick to join the club, for here was their chance to exchange recordings of their local organs with enthusiasts many miles away—often abroad. And before long, the sounds of concert and church organs from Europe and America, were traveling back and forth across the Atlantic. This type of exchange between members is very popular, for it enables the different voicings of foreign organs to be studied, discussed and above all, enjoyed for the very first time.

Popular organ enthusiasts were also keen about the club, although it soon became obvious that these people fall into several distinct categories; some prefer the sounds of the modern electronic organ, others the mighty sounding theatre pipe organs of the twenties and thirties, whilst still others have a peculiar but understandable interest in the music of mechanical organs, these are instruments which play by means of perforated music rolls which pass through their intricate machinery, and so make the organ play;—other mechanical organs use different systems, usually found on German, Swiss, Dutch and Italian made instruments. One such system is pins stuck into revolving drums which strike or open the pallets—and allow wind to pass into the selected pipes.

Often, the sounds of any one of hundreds of the types of organs mentioned are rare, some are fast becoming extinct and have never before been recorded until the tape

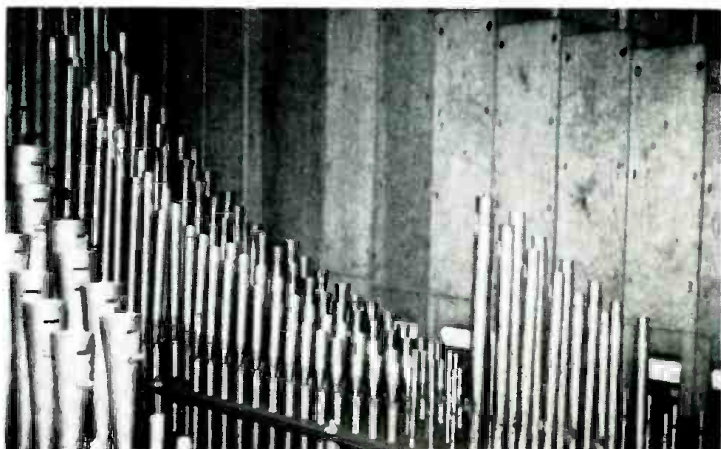
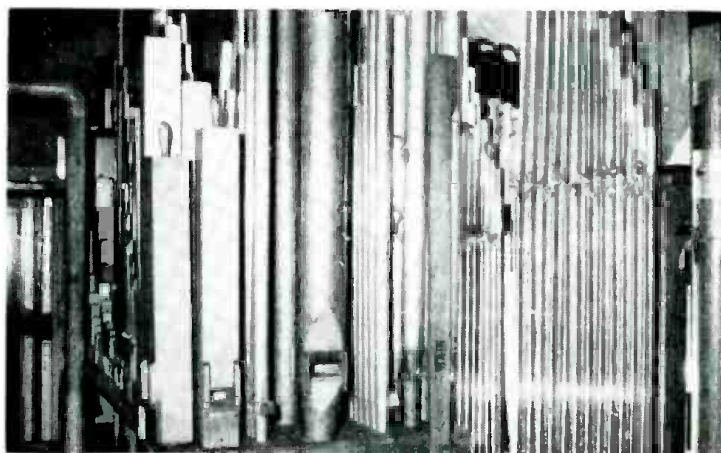
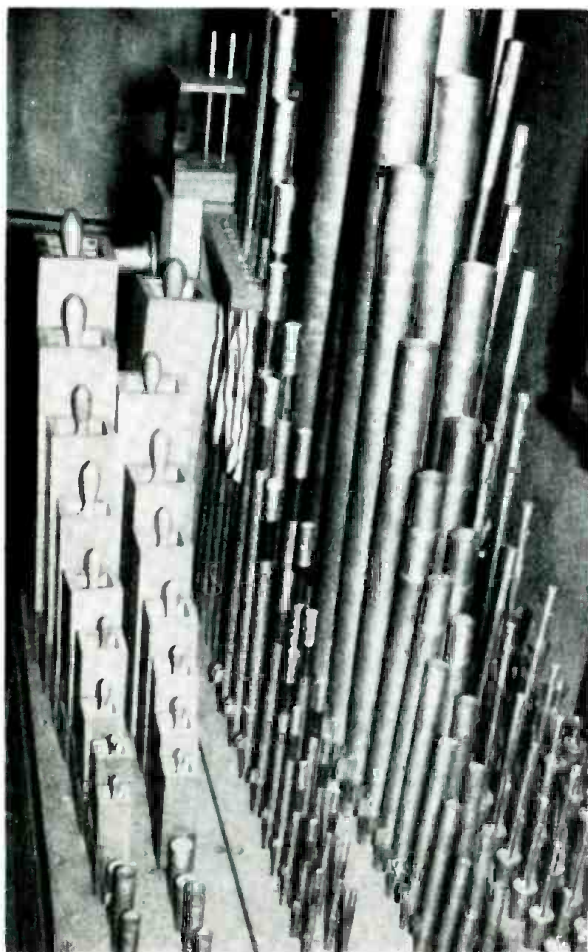
Below: Sections of the myriad of pipes contained in monstrous theatre organs. Some Wurlitzers have over two thousand pipes and even these are not the largest. Such organs are costly to maintain and must be serviced several times a year.

recording enthusiast decided to take the matter in hand.

One such type of organ is the theatre pipe organ, cinemas today all over the world have been hit hard by TV and rising overheads to do with entertainment duty and tax in different countries, and the managements can no longer maintain in good order, the expensive pipe organs which need to be serviced quite often, sometimes several times each year, while in most cases, they can no longer afford to pay an organist to play their organs.

Quite a few theatre pipe organs have been removed—and sold for scrap. Others have found new homes in the houses of organ enthusiasts. A glance at the tape organ club roster will reveal that quite a number of members have church, concert and theatre pipe organs installed in their homes. Others of course have the modern electronic organs.

To install a theatre pipe organ of any size in the home takes a lot of space, rooms for the pipes, relays and blower mechanism have to be found, quite apart from the sizable console. To give you an idea of such an organ, I will mention the fourth largest Wurlitzer theatre organ in Europe, this is found in the 'Odeon' cinema, Leeds, England. It was installed many years ago and fortunately—it is still used today, both for special concert work, and more often for broadcasting purposes by The British Broadcasting Corporation. This Wurlitzer has over two thousand pipes, and together with its console and various effects and traps, weighs over seventeen tons. And that is by no means the largest of theatre organs, especially when compared with some American cinema monsters.



The club library is preserving the sounds of the theatre pipe organ and the organists who play them. The famous American Wurlitzers are to be found in many countries, but even they are tuned to the climate, and so produce a different tone than they do in their country of origin. It is interesting to note that in the British Isles, whilst there are plenty of Wurlitzers, we have no examples of another American organ, the Robert Morton. According to all reports, there are very few if any, British Compton Theatre pipe organs in America, in the British Isles they out-number the Wurlitzers. There are dozens of other lesser known makes in all countries where these instruments were installed. And so you see the organ club library has a big job to do.

Fortunately several of the club's members are famous organists in their own countries. Billy Nalle the American recording organist is a member, so is Gerald Shaw—the organist at the huge 'Odeon' cinema, Leicester Square, London. Gerald often broadcasts the theatre's five manual Compton organ. Another broadcasting organist who has joined the club ranks is Hubert Selby, he is also the founder and Chairman of the British Cinema Organ Society.

Local broadcasts of all types of organ music are captured on tape by members. But it is the live recordings which members make on location which are of paramount importance to the club library. Some members have the finest equipment it is possible to obtain for the purpose of recording the organs, whilst all have recorders which can play-back the fruits of the labors of those who go out to capture the mighty organ on tape.

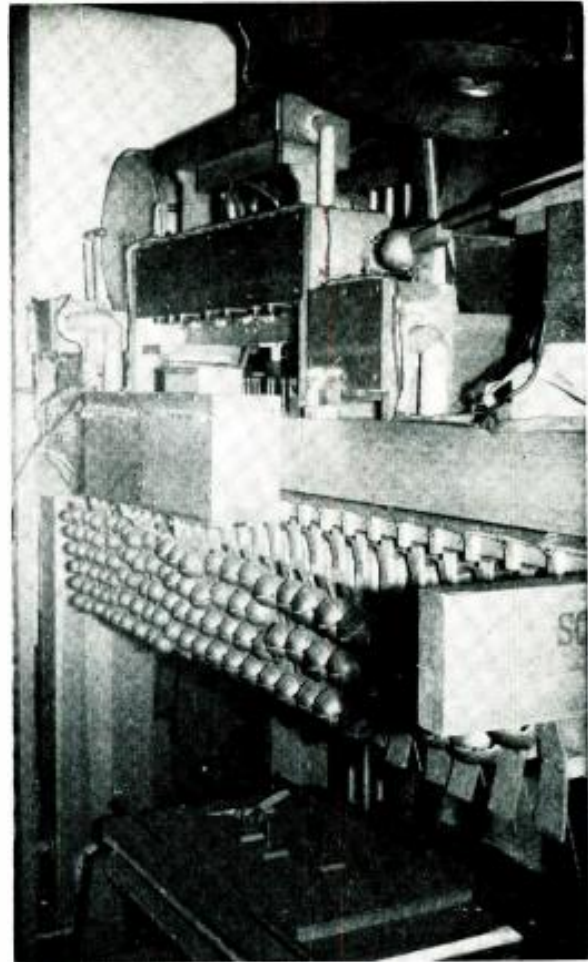
One of our most enthusiastic playing members is Stanley Whittington. He is an ex-professional organist who now plays church and theatre organs in his leisure hours. He plays dozens of different theatre organs in the course of a year, at special recitals organized in cinemas in the British Isles for members of the Theatre Organ Club and Cinema Organ Society. One such recital was recorded for the tape club library, this was played on the little used Wurlitzer organ of the 'Granada' cinema, Bedford, England.

One special recording which Stan undertook for the club, and which I had the pleasure of arranging and recording, I should like to tell you about.

The organ in question is a very early model Two Manual Five Pipe Rank, Wurlitzer. (It has no stop-key lighting). It was originally installed in the 'Madeleine' theatre, Paris, France. In 1926 it fell into disuse, and in 1938 was brought over to England and installed in the small private theatre of the Stanford Hall, Rempstone, near Loughborough, Leicestershire. The Stanford Hall was then a private residence and the theatre was used for the amusement of its rich owner. The organ was played upon its opening recital at Stanford, by the famous organist, Reginald Foort.

Today the Stanford Hall is a training college for the Co-Operative Society, fortunately the theatre and organ still remain and the organ is maintained in good working order. The reason why the sounds of the organ were required for the library is because it is the only known Wurlitzer in Europe which can play mechanically—using music rolls cut by Jesse Crawford and other American organists over thirty years ago.

I moved my equipment into the theatre, a Ferrograph recorder with Reslo ribbon mikes, while Stan Whittington had a run through on the organ. The console is on a central lift which rises from the orchestra pit. The organ



Various theatre organ effects. Coupled with pipes, traps, etc. these organ insides make the instruments weigh over seventeen tons. Many of these organs are becoming extinct, but thanks to groups like Organ Music Enthusiasts, their sounds will live forever on tape.

chamber is situated high in the wall on the left hand side of the theatre near the front, and above and just to the rear of the organists left ear—as he plays.

After trying several mike positions, I finally decided to use one mike raised on its stand to a height of seven feet from the floor and placed in line with the organ chamber about half way across the theatre and with the face of the mike facing upwards towards the chamber in order to capture a good strong signal, in backing the mike half way across the width of the theatre, it was possible to capture the full depth of the organ together with the correct amount of echo to demonstrate how the organ actually sounds in its natural surroundings.

The tapes began to roll and Stan played a selection of music (on this grand old American-French lady who came to live in England)—using special arrangements to demonstrate to the full, the sounds of the pipe ranks, traps and effects. The organ boasts a very lovely and effective set of Cathedral Chimes. About thirty minutes of the organ at work was then selected from the finished recording, to be sent to the tape club library in America. And another unique organ is now available to club members.

An occasional club newsletter called, "Pipe, Reed and Pedal" is also supplied to members with other club literature. Tape is certainly doing a worthwhile job in the organ field.

FULL-TRACK

HALF-TRACK HALF-TRACK

QUARTER-TRACK QUARTER-TRACK QUARTER-TRACK QUARTER-TRACK

TAPE RECORDER specification: equipped with the new quarter-track heads, records monaurally, plays back stereophonic tapes, either two or four track.

Perhaps, before plunging into the latest thing in head equipment in recorders, it might be profitable to go back to the beginning, the days of the full-track head.

The Full-Track Head



The full-track head was the first to be used on tape recorders. At first, the track was not quite "full" as only a single strip down the center of the tape was used but after a while real full-track came into being.

The full-track head is one in which the gap extends the entire width of the head and the head is as wide as the tape used on it. In the case of audio recording this is the standard one-quarter inch tape.

Full-track heads were a necessity back in the old days for neither the tapes, heads or tape recorder amplifiers could compare with what we have today. By using the full-track head, engineers were able to maintain a good signal to noise ratio and get a good strong signal off the tape.

Even today, for fine audio recording, full-track heads are used. This is true in broadcasting also. Today's full-track head, with its much smaller gap than the old heads, and coupled to the fine amplifiers we now have can turn out a real recording job.

One of the principal advantages of using full-track equipment is the ability to edit the tapes. Since there is only one track on the tape, cutting through it will not destroy another track, as it does on multiple track tapes. In addition,

if the recording speed is 15 or 30 inches per second, as most professional recording speed is, then even a single note or the "s" on the end of a plural word will occupy quite a bit of tape. This makes it easy to snip out single sounds or letters, to get rid of clicks and pops or to substitute one note for another if necessary.

In addition, the higher tape speed provides the maximum in fidelity, making use to the utmost of the abilities of the head, tape and amplifiers to record sound.

If you are not interested in stereo, if you care little about tape economy and must close edit much material that you record, then you will find the full-track head a greater convenience.

The Half-Track Head



The next development was the half-track or dual-track head. This was introduced amid loud cries that it would not be satisfactory, that the quality would suffer because of the narrower head, that you could not edit easily, etc.

Some of these things, of course, were true. You cannot edit a dual-track tape for if you cut one track you are also cutting the other. The only way to successfully edit a two track tape is to copy off the portions you want on another recorder.

The half-track head was made with one pole piece which

occupied slightly less than one-half of the width of the tape. The recording was made along the top edge of the tape (on a machine running from left to right, as do most recorders) then the reel was turned over without being rewound which put the recorded track on the bottom. This permitted recording again on the same reel.

Inasmuch as the half-track pole piece is stationed to cover the top half of the tape, the new recording is made on the top track while the previous recording, now being on the bottom, slides by out of harm's way.

The erase head on such machines also covers only the top half of the tape.

The end result is a tape recorded on both tracks, one track being backward in relation to the other because of the reel turnover.

Obviously, as we have mentioned, editing is impossible but if it must be done, and your recorder is of this variety, then the only solution is to record on one track only (which will be the top one). Then you can edit since, in effect, you will have the same thing as a full-track tape except, of course, the track will cover only half the tape width.

If you are ever called to make a tape for use by a radio station and have a dual-track recorder, then record on just one track. The station engineers will thank you.

Dual tracking the tape thus provides twice as much recording time and when this development took place some years ago, monaural music on tape began to be produced since the cost, while higher than records, was still within reason.

The half-track head put out slightly less than half the signal strength of the older full-track head but improvement in amplifiers and in the manufacture of the heads made it possible to hold the same fidelity even with the lesser output.

The fidelity of a recording is not a function of width of the track, except as to how it might affect the signal to noise ratio. The fidelity depends primarily upon the speed of the tape, the length of the gap in the head and the associated components, such as the tape, amplifiers, speakers, etc.

So the drop from one to two tracks on the tape was accomplished without appreciable loss.

A dual-track recorder will give greater tape economy than a single track recorder. Tapes recorded in both directions cannot be edited. Fidelity is more than adequate for everything but professional recording techniques which must be tops because of the losses suffered in duplication as records, etc.

Thus if you have some interest in tape economy, an interest in good quality and are not interested in stereo, a dual track recorder will be adequate.

Two-Track Stereo

In a relatively short time after the introduction of the dual-track head, some genius thought "why not place another of these heads upside down in relation to the first? Then we could record both tracks at the same time or make stereo tapes with one track on the top and one on the bottom, both being recorded in the same direction."



This was done and "staggered" stereo was born. It flourished slowly at first and then gained momentum. When

about to take off in full flight, a new development took place. The head manufacturers had found a way to put both heads in one piece, rather than having them spaced apart or "staggered."



Since this was the most logical way in which to do things, the manufacturers switched over to the new "in-line" or "stacked" heads.

This move caused some consternation. There was another blast of discussion of the same variety that greeted the introduction of the dual-track head. Some said the crosstalk (interference of the current in one head with that in the one adjacent to it) would be too high, etc., etc. Like the former complaints, they were proved unfounded.

Stacked stereo took off like a rocket and its growth was phenomenal. Those who had the older staggered machines had the choice of getting a new recorder or converting the old one to stacked operation. Most of the manufacturers made kits available to enable the owners of the staggered machines to convert to the stacked variety.

Monaural Record, Stereo Play

With the advent of the stacked head and the commercially produced stereo tapes, manufacturers arranged their wiring of the recorders so that the machines would record monaurally, as they always had on the top track, and the bottom track was a play track only.

Thus the recorder equipped with stacked stereo heads of the two track variety was no different insofar as the recording and playback of monaural material was concerned.

The only advantage of the stacked stereo head was that it permitted the playing of stereo tapes.

Some units incorporated preamplifiers which this lower head fed so that it was only necessary to connect an external power amplifier and speaker to get the second channel for stereo.

Others simply brought out the connection from the lower head to a jack on the case and this was used to feed an external preamplifier, amplifier and speaker. Others included all the elements in the case and sometimes put the necessary second speaker in the lid so that the unit was complete.

Stereo could not be recorded with these units because there was no recording amplifier connected to the lower pole of the head.

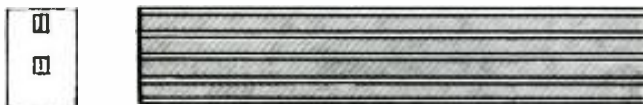
Some fans got around this by detaching the leads and

feeding a record current in from an external recording amplifier but most folks were content to be able to record monaurally and play back the stereo tapes which were on the market in good quantity although at a cost about twice that of records.

Since two track stereo tapes were the only means of having stereo in the home, it enjoyed a boom and there were over a thousand stereo tapes available for playing on the machines.

So a machine with stereo play and monaural record was essentially the same recorder that we had in the dual track days except for the incorporation of the playback facilities for stereo. It would record and play monaural signals as good as ever. The stereo was a plus feature.

Four-Track Heads



The stereo boom in tape lasted until the introduction of the stereo disc when it went bust. Dealers felt that the public would not pay a premium price for the quality offered by tape and the recorded tape field came to a screeching halt.

To counter the competition of the lower cost but inferior quality stereo disc, the industry now has switched to four tracks on the tape instead of two, thus cutting in half the cost of the tape while retaining its quality. Thus prices of tapes are but a dollar or two higher than disc prices and tapes will last indefinitely.

Let's look at the head which, together with further improvements in gap length, amplifier construction and duplication, has made today's tape recorder possible.

As you will recall from previous paragraphs, the dual or two-track head had only one pole piece which recorded the top track of the tape. But because the tape was turned over and recorded a second time, this one pole piece recorded two tracks.

The four-track head has two pole pieces and is so aligned in relation to the tape that tracks 1 & 3 (top and lower middle) are recorded in one direction and tracks 2 & 4 (upper middle and bottom) are recorded in the other.

It is the old principle of the dual-track recorder applied this time to a dual-head. You might consider this system to be "dual-track dual-track."

The pole pieces are a little less than half of the depth of the dual-track pole piece. This naturally means that

there will be less signal picked up from the narrower track on the tape hence, to get the same volume, more amplification must be used.

This in turn means that the amplifiers must be better and more quiet than an amplifier that is designed for two track operation.

All amplifiers have some noise in them and generally it is so far below the level of the signal that it is never noticed. As the volume is advanced, the noise level increases but so does the signal so again the effect is satisfactory.

This is one point to consider if converting to four track is considered. If the amplifier in the recorder is ample for two-track, and has a signal to noise ratio that has some reserve, then conversion to four-track can be made satisfactorily.

If, however, the tape recorder amplifier can just about handle two-track satisfactorily and it is used on four-track, the results may be unsatisfactory.

As was the case in the switch from full-track heads to half-track, a burden was imposed on the head makers who had to provide a still smaller gap to maintain the quality of the reproduction. This they were able to do, with the consequence that the reproduction of four-track tapes on good, modern equipment is practically indistinguishable from the two-track of only a year ago.

Since the four-track recorder is relatively new it is probable that there are more two-track machines capable of playing stereo in the hands of owners than four-trackers.

But inasmuch as most of the new tapes appearing on the market are four-track, and because the cost of the new tapes is considerably below the two-track price, the cost of conversion to four-track will quickly be made up through tape purchases.

The placing of four tracks on the tape has called for closer tolerances and good guiding of the tape past the heads to maintain the proper alignment. That this has been accomplished by the manufacturers seems evident from the satisfactory results being obtained from recorders now on the market. The problem of crosstalk between channels, which once was felt to be a serious problem, also proved to be satisfactory.

Four-Track Combinations

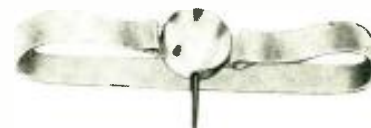
Four-track recorders come in a variety of track combinations and it is well to ascertain what you are buying to be sure it will fit your needs.

The first of these is monaural *two-track* record and four-track stereo play. This is about the same as the monaural record, stereo play two-track machine except that it also permits the playing of four track stereo tapes.

This machine records only with the top pole piece in the head, laying down a single quarter-track on the top edge of the tape. The lower pole piece in the head is for playback only, no recording can be done with it.

You still can record "dual-track" with this machine since, when the reel is turned over and run through again, you will have a sound track on each edge of the tape and a wide gap of nothing in the middle. Tapes made on this machine can be played on a regular half-track recorder, or a four-track machine.

When a commercial stereo tape is placed on it, both pole pieces will play and you will have the benefits of the lower cost of the musical tapes.



USING CONTACT MIKES

by Mark Mooney, Jr.

WHAT do you think of when you hear the word "microphone?" Dollars to doughnuts you'll have a mental picture of the kind of mike furnished with your recorder or perhaps one you saw being used for PA purposes or in a broadcast studio.

But there is another kind of mike which is made to pick up the vibrations of an object directly without any transmission of sound through the air.

These are called contact microphones. You've probably seen them too, most likely attached to a guitar or accordion in a dance band and connected to an amplifier or speaker on the platform. This is used to bring the playing of the weaker instruments up to a level where they can hold their own against the louder instruments.

But did you ever think of the fact that these contact mikes can also be attached to your tape recorder? They can and, in most instances, will produce some startling results.

There are two factors which make them of interest to the tape recorder owner. First: their output is high enough to be handled by every tape recorder. Of course, the better the preamplifier in your recorder, the louder you will be able to record the sounds. Secondly: they are remarkably inexpensive. Lafayette Radio Company's Harmonica Contact mike is \$1.49 (catalog No. PA-35) their String Instrument Mike is \$1.95 (catalog No. PA-41) and their Throat Mike costs \$1.95 too (catalog No. PA-14). Their address is 165-08 Liberty Ave., Jamaica 33, N. Y.

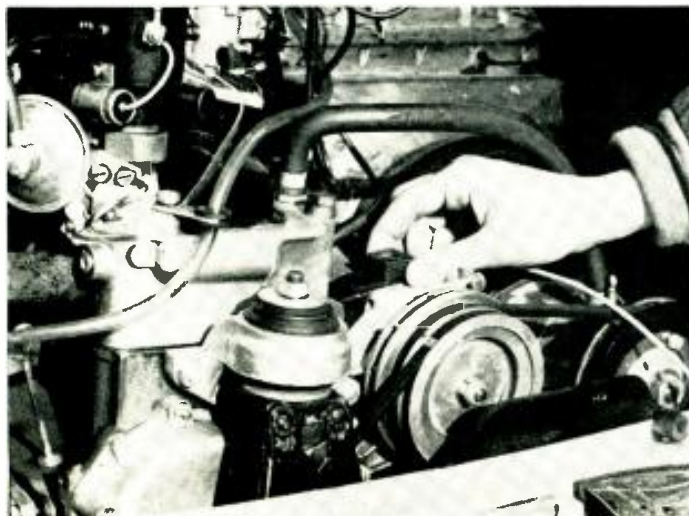
The Amperite mike which can be used in a wide variety of applications can also be had from Lafayette for \$7.06 (catalog No. M-60). All these prices are plus postage. The Amperite mike can also be bought through your local parts distributor at about the same price. Amperite also has available a volume control model of their mike and a foot volume control. These would be of most use to those who hook the mike to an instrument and amplifier.

For such a small investment you are sure of getting many hours of fun with your recorder and some surprises at the way things record when the vibrations are picked up directly from the object.

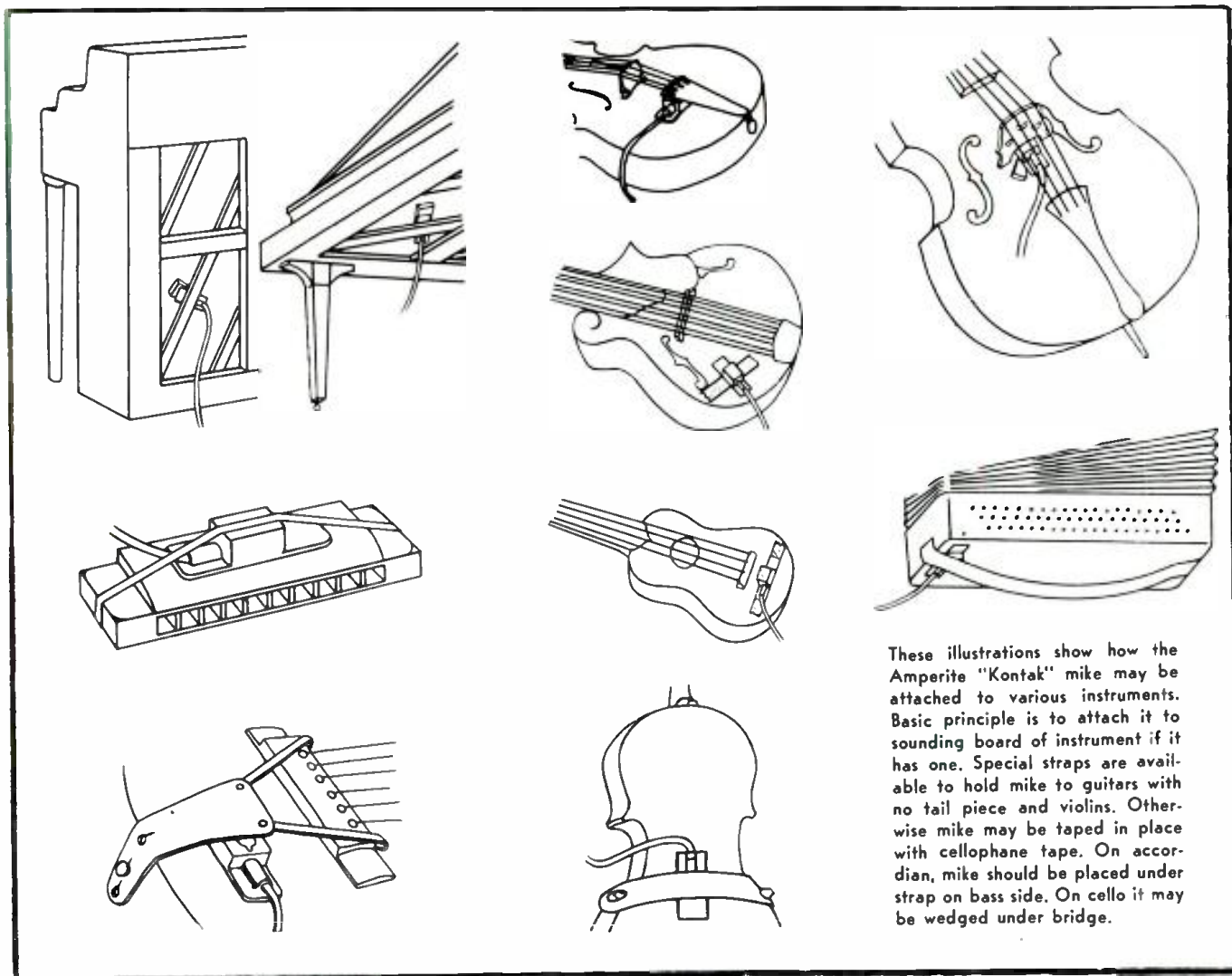
For instance, we attached the mike to a tin pie plate using cellophane tape. We then put it in the sink under a dripping faucet—the pie plate protecting the mike from the water and also providing a good sounding board.

The resulting sound was excellent, every drip came through loud and clear, especially loud. Someone with a fiendish sense of humor suggested making a tape loop of the drip and putting it on the recorder after everyone had gone to bed. It would be guaranteed to drive anyone to distraction trying to hunt down the leak. Or at the very least to get them out of bed to shut the spigot off.

But of course we wouldn't do anything like that. (Note: to make a tape loop simply record four or five feet of the drip and then cut the tape and splice the ends together



The contact mike offers the sports car enthusiast a means of checking the performance and timing of his mill. Left, the mike is held on the generator and right, is shown on the distributor cap. Mike must be held firmly in place or taped down to avoid introduction of extraneous noises.



These illustrations show how the Amperite "Kontak" mike may be attached to various instruments. Basic principle is to attach it to sounding board of instrument if it has one. Special straps are available to hold mike to guitars with no tail piece and violins. Otherwise mike may be taped in place with cellophane tape. On accordion, mike should be placed under strap on bass side. On cello it may be wedged under bridge.

using splicing tape. This is put on the recorder in the regular way.

You may have to short out any automatic stop device or end-of-the-tape cutoff on your recorder to make this work. Route the tape so that it will not catch on spindles or other above the deck objects.)

One kind of contact mike, the throat mike, is made to pick up the voice directly from your larynx. This is a small plastic disc type that is available with either a neck strap or plastic neck band.

The voice sounds quite good over this but not quite as clear as when using a regular standard type microphone. As might be imagined, it has a slightly muffled sound although it is perfectly intelligible and recordable. Any of the contact mikes may be used in this fashion. The Amperite unit worked particularly well in this respect; simply by pressing it against the Adam's apple the voice came through quite well.

For recording in noisy locations, such as in an airplane, boiler factory or construction project this kind of mike will produce acceptable voice recordings without the background noise.

With any of the mikes you are expected to provide your own plug to fit your recorder. This may be obtained at any tape recorder dealers for a few dimes. The shield side of the mike wires (the woven wire) is attached to the out-

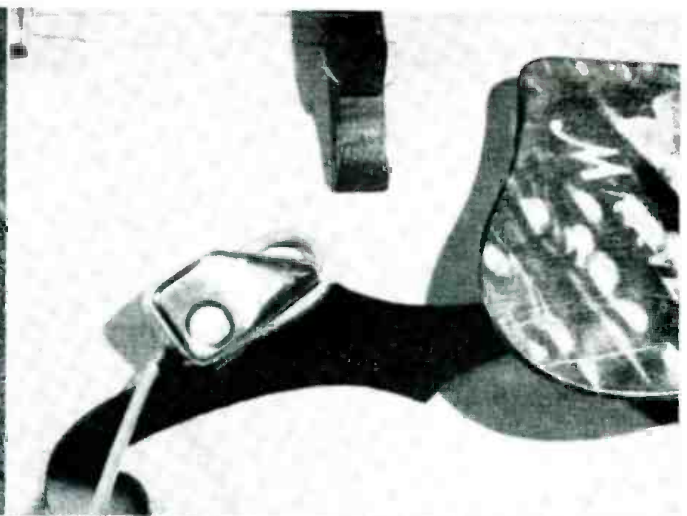
side terminal of the plug and the center wire to the center plug terminal. It is but a few minutes work.

If your recorder has a monitor switch you can hear what you are recording. Some recorders without a monitor have a PA position on the selector switch and you can use that. As with a regular mike, feedback is possible if the volume is turned up too high with the speaker in the recorder in operation and in close proximity to the mike. Keep the mike away and you'll have no difficulty.

A contact mike attached to a recorder or amplifier will make any small sound into a very big sound. The more powerful your recording amplifier is, the bigger the sound you will get.

We found that by putting a postage stamp on the Amperite and turning the volume up, we could actually get the sound of a stamp being licked. We didn't have time to try it but we imagine one of these mikes attached to a dog's metal feeding dish and some milk placed in the dish might prove very interesting. You can try that one.

Taking the heartbeat of a sports car not only proved interesting but worthwhile. The owner suspected a sticking valve and by making the recording at 7 1/2 inches per second speed and then playing it back at 15, 16 inches per second, we were able to hear each separate component working. The mike is held on various motor components and—most important—before putting the mike on the par-



Upper left: Lafayette harmonica mike clips under one edge of cover as shown. Upper right: stringed instrument mike attached to S hole of guitar by means of mike clip. Lower left: a contact mike taped to the underside of a tin pan placed under a dripping faucet produces some loud drip noises. Lower right: throat mike picks up sounds from larynx.

particular car part, hold it to the throat and record the name of the part and keep a written list too. In addition, put some signal on the tape, such as a consecutive number of

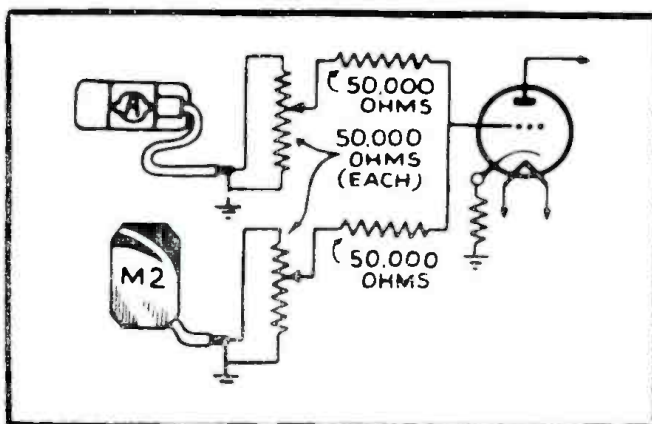
beeps before each segment. Then when you slow down the tape and the voice slows down to intelligibility, you will still be able to identify that particular tape section. If you have two recorders, you can slow things down as much as you wish by recording at $7\frac{1}{2}$ and then playing the tape into another recorder with the playing recorder at $3\frac{3}{4}$ or $1\frac{7}{8}$ and the receiving recorder at $7\frac{1}{2}$. This tape copy can in turn be played slower, ad infinitum.

Make the recording at a good, solid level for when it is played back slower, it will lose some volume.

This technique will enable you to spot sticking valves, uneven carburetor intakes, uneven rhythm, etc. In fact, some enterprising mechanic who knows sports cars might even be able to start a consulting service via tape.

Stringed instruments, harmonicas and even an ocarina record excellently. We didn't have much success with children's xylophones because the "klunk" of the hammer was disturbing—but maybe you will have better luck. Good dinner chimes should sound like cathedral bells.

There are legions of things on which you can try a contact mike. We'd suggest you add one to your equipment.



Up to four high impedance or Amperite Kontak units can be fed into one input by using variable controls and resistors connected as shown. Tube shown is first preamplifier.

Taping Shortwave

by Jean Cover

Illustrations courtesy Hallicrafters Corp.



... a whole new selection of recordable material is available on shortwave.

WITHOUT packing your bags, braving immunization shots, applying for a passport, or hitching a costly ride, you can hear genuine Swiss yodelling, the bells of St. Peter's in the Vatican, Radio Free Europe, on-the-spot news broadcasts from around the world, all direct—all FREE for the listening, on shortwave.

More and more people today recognize the value of taping music, educational programs, lectures, and other items of interest from the radio, but how many have considered the immense wealth of recordable material available through shortwave reception?

Every time you turn your radio on and listen in between 535 and 1605 kc on your dial, you are listening to the standard broadcast band. These radio waves are long ground wave signals and such waves soon dissipate or they pass through the ionospheric layer of particles surrounding the earth. Much information abounds in this standard broadcast band area of your radio and possibly you utilize your recorder to capture that which you wish to preserve on tape.

But have you ever stopped to wonder about what can be heard above 1600 kc? The complete spectrum of radio frequencies goes up to 1000 mc. or 1,000,000,000 cps and beyond—what sounds are heard here where signals are traveling in short waves and frequencies are high?

Shortwave signals travel up and outward away from the earth's surface. When they reach the heavy layer, or ionosphere, above the earth they are refracted downward again.

As they strike the earth, they bounce up again to the layer. Thus they can travel great distances just by bouncing back and forth.

Shortwave receivers pick up sound strongly when these waves hit the ground. Therefore, if you are able to pick up Sydney, Australia clearly one time when the waves sent from there are touching earth in your vicinity, you may not be able to get that spot as distinctly the following day. The ionosphere is constantly changing and it produces varying degrees of refraction, which in turn causes varying changes in shortwave reception.

There are thousands of shortwave stations throughout the world. Every station is licensed to broadcast on certain assigned frequencies or bands of frequencies.

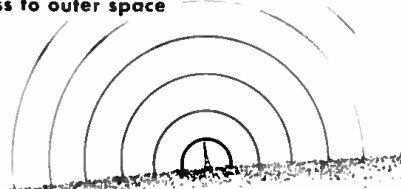
Music from around the globe is yours for the taping when tuned to shortwave, whether its a disc jockey spinning platters in Germany, or a marimba dance band in Guatemala. Of course, you cannot expect to get the same quality reception of music as you get on your local FM station.

Now you can travel to Alaska, Moscow, China, and (even more recently) to the realm of outer space, via a dial and some sensitive shortwave receiving equipment.

Signals from the first, and subsequent, earth satellites were picked up by many shortwave sets. Think how wonderful such things as this preserved on tape will be for your children and their children to hear in future years.

With the world in such a state of turmoil as it is, interest

Long waves mostly absorbed or pass to outer space



Short waves mostly refracted



Long radio waves have lower frequencies and are mostly absorbed or pass through ionosphere or layer of particles above the earth. Short waves, however, have higher frequencies and when these hit the ionospheric layer they are refracted and bounce back to earth. Again they bounce and head upward once more toward the layer. Thus they travel, bouncing back and forth as they go.



in hearing news broadcasts from foreign lands should be more acute than ever before. Many of the foreign stations broadcast part of the news in English as well as their own tongue. Now, with shortwave, you can hear the news directly before you read it in your own newspaper and possibly more accurately and emphatically than any correspondent reporter can put it in words.

All these marvelous sounds can remain intact on tape for any length of time and for any reason. Perhaps simply for entertainment purposes, perhaps as a guide reference to those actually planning to travel, and certainly for their historical and educational possibilities.

Anyone learning a foreign language will find his shortwave recordings of immeasurable aid in home study. While actually learning, he enjoys trying to decipher what he hears over the shortwave receiver. And the lessons are enhanced by the fact that you hear the language not only properly spoken, but properly pronounced.

Foreign countries broadcast programs of the same general type as American stations, including soap operas. These are particularly good for students of a foreign tongue, as is listening to commercials.

Just recently, Moscow radio began broadcasting lessons in the Russian language. Each lesson lasts about nine min-



utes. You cannot only learn to speak Russian, but be taught directly by the Russians.

The lessons are to be broadcast every Sunday at 8:15 and 11:15 P.M., E.S.T., and are to be repeated on Tuesday and Friday at the same time.

There are four Russian transmitters beamed toward the U.S. You should be able to pick up Radio Moscow on one of the following spots on the dial: 9716 kc, 11,810 kc, 9710 kc, or 11,830 kc.

Russia also broadcasts the news in English (their interpretation of it) and you will be able to listen to some of the cold war Russian news branding Americans as "decadent capitalists" and "warmongers."

Shortwave can bring a world of adventure to you in your own home. In addition to traveling to other countries, you can also pick up local police squad cars, taxicabs, fire department: and radio telephone calls.

While you are reclining lazily in a comfortable chair, you may hear calls on a shortwave receiver from Armed Forces ground communications, the Coast Guard, ship to shore radios, Civil Defense and government agencies, weather stations, inland waterways, commercial airports and airliners, and you can also hear the Bureau of Standards time signal. The British Broadcasting Commission uses Big Ben for its identification signal. You may even experience hearing emergency calls from planes or ships in distress, or perhaps a hurricane warning.

At times too, you may encounter humorous or unusual spots. For instance, some foreign broadcasts do not always end exactly at the time for which they are scheduled. We can remember one time hearing a British announcer who ran short. He announced that we would hear Big Ben strike in a few minutes, but since he ran short, he proceeded to fill in the time with an account of his experience of being stuck in a lift between floors. This narration ran on



so long, he finally had to admit it was too late to hear Big Ben, it had already struck, therefore they would proceed with the following broadcast.

There is so much more listenable material from shortwave than just from local radio. It follows then that there is also a greater area from which to choose tapable information.

The quality of reception from your shortwave receiver depends not only upon how well the signals are received, but also upon the grade of equipment you have and upon your antenna. For hearing good shortwave, you'll do best with a communications receiver. Receivers or kits can run anywhere from \$50 up. But many radios of the "home type" that cover short-wave bands will produce acceptable results.

You also need a decent antenna. One of a length that is cut to band widths picks up more energy than a general type.

Should you develop a great liking for shortwave, you may eventually look into becoming an amateur radio ham. At present there are more than 160,000 licensed amateur radio stations in the United States. Obtaining a license is no easy feat and you must be able to meet certain FCC requirements such as being able to send Morse Code at a

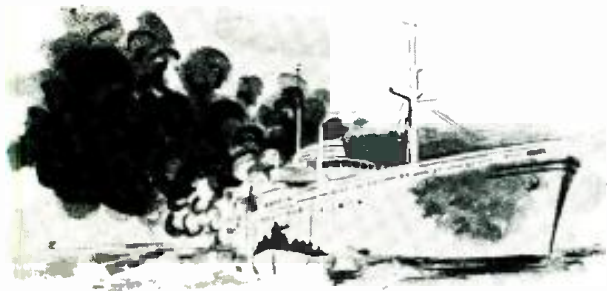


specified speed. Being able to transmit shortwave is therefore limited to a selected group, but anyone can, of course, have a receiver.

A hobbyist who can also transmit, however, has the advantage of being able to converse with fellow amateurs throughout the country and the world. While he is permitted to talk to them in their own tongue, if he can, he must first identify himself and his station in English. Coded messages of any kind are prohibited by the Federal Communications Commission.

Friendly, world-wide conversations can be most informative and interesting, and worth keeping on tape.

A handy reference for shortwave enthusiasts is *The World Radio Handbook for Listeners*. Published yearly in Denmark, this handbook is also put out in English and is distributed in this country. In it can be found an alpha-



berical listing of countries having radio stations, networks, frequencies, controlling interests—even the station's theme music, as well as a showcase of stations throughout the world.

Another, more popular radioman's guide, is *White's Radio Log*. This has now been incorporated into *Science & Mechanix Radio-TV Experimenter*, which is published by S & M Publishing Co., 450 E. Ohio St., Chicago 50, Illinois.



The latest copy containing the Log is #565, spring 1960 which is now on the newstands at 75¢ a copy.

Shortwave stations around the world are interested in knowing if you receive their signals and how clearly they come through. If you will contact them, they will enjoy hearing from you and will send you a verification card.

Recording from your shortwave is no more of a problem than recording from your radio. You simply attach alligator clips to the receiver speaker terminals and feed this into the input of your recorder.

If you are using a tuner to hear the shortwave, you must first feed the sound through an amplifier-speaker in order to hear what you are recording. This does not apply, however, if the recorder you are using has a monitor switch. In this case, the monitor switch can be used to hear what you are recording, so you would connect directly from the tuner to the recorder.

The world and, more important, the people in it, are fascinating. Through the magic of shortwave, everyone, including yourself, is extended a welcome to become a world traveler. Why not accept the invitation?

Frequency Allocation Spectrum

100-200 kc.—	Domestic Public, Maritime Mobile
200-300 kc.—	Aeronautical Mobile, Aeronautical
400-535 kc.—	Maritime Radio, Navigation, Direction Finding, Maritime Mobile, Aeronautical Mobile, Mobile Distress
535 kc.-1.605 mc.—	Standard Broadcast AM
1.605-3.500 mc.—	Police, Public Safety, Maritime Mobile, Homing Signals
3.500-4.000 mc.—	Amateur
4.000-7.000 mc.—	Aeronautical Fixed, Fixed-Alaska, International Fixed Public, Industrial, International Broadcasting, Marine, Aeronautical
7.000-7.300 mc.—	Amateur
7.300-14.000 mc.—	Marine, Aeronautical, International Broadcasting, Miscellaneous
14.000-14.350 mc.—	Amateur
14.350-21.000 mc.—	Aeronautical, International Broadcasting, Marine, Miscellaneous
21.000-21.450 mc.—	Amateur
21.450-50 mc.—	International Broadcasting, Aeronautical, Marine, Public Safety, Government, Miscellaneous
50-54 mc.—	Amateur
54-72 mc.—	Television
72-88 mc.—	Operational-Fixed, Television
88-108 mc.—	Broadcasting FM
108-132 mc.—	Aeronautical
132-420 mc.—	Government, Public Service, Television
420-470 mc.—	Amateur, Miscellaneous
470-1000 mc.—	Television, Marine, Aeronautical
1000-2000 mc.—	Aeronautical, Amateur, Government, Miscellaneous
2000-2300 mc.—	TV Remote Pickup, Studio Transmitter Link-TV, Government, Miscellaneous
2300-3500 mc.—	Amateur, Marine, Public Service, Aeronautical Radio Navigation
3500-5650 mc.—	Public Service, Aeronautical Radio Navigation, Government, Aeronautical
5650-10,500 mc.—	Amateur, Public Service, TV Broadcast, Government, Aeronautical Radio Navigation, Fixed Marine, Miscellaneous
10,500-30,000 mc.—	Public Service, Government, Amateur, Fixed Mobile
30,000-100,000 mc.—	Experimental and Amateur



Courtesy Hallicrafters Corp.

Top: Hallicrafters S-38E receiver, which sells for \$59.95. Bottom: Hallicrafters SX-100 receiver, which sells for \$295. There is quite a range of quality and price differential in shortwave receivers from which to choose. Your choice depends upon how much you wish to spend and how much use you will make of the instrument.

NEW PRODUCT REPORT



UHER UNIVERSAL RECORDER

... three speeds, push button controls, automatic play and repeat, back-spacing, dictation type mike.

WE have been testing and reviewing recorders in these columns for quite a few years but this Uher Universal has more features packed in its small case than any other that we recall.

It is a dual-track machine with a top speed of $3\frac{3}{4}$ inches per second. The other speeds are $1\frac{7}{8}$ ips and $15/16$ ips. Maximum reel size is 5 inch.

Early in this article, before we run out of space, which we know now we are going to do, it might be best to give a quick run-down on the features.

The machine can be used for dictation as the mike has controls built in for record, stop, rewind and repeat. Foot and typewriter controls for transcribing are available as accessories. It will record just as any dual track monaural machine will from radio, TV, phonograph or telephone (with a pickup coil). It will play through, stop, rewind and automatically replay the reel, and, with the accessory Akustomat it becomes a voice actuated machine starting on the first syllable and stopping automatically when the talking ceases, it can also provide for synchronizing slides with sound or movies with

sound. It has a speech-music control which accentuates the voice frequencies when in the speech position, it has means for making sound on sound recordings using a "trick key" which holds the tape away from the erase head on the second go round. It has a pause button for stopping the tape motion and an end of tape stop (both stop and automatic replay require metal tabs on the tape). To render dictation unintelligible after it has been transcribed the record and fast rewind keys are depressed and the tape will have superimposed a whistle tone which will be erased when the next recording is made. It also has an automatic modulation control, brought into effect by pulling the record level knob up. This levels out variations in volume during dictation or conference recording. Needless to say, it is not used when recording music for then it would make all passages equally loud and undo the conductors interpretation of the score.

The audio output is rated at 3 watts, which is adequate for ordinary purposes and the current drain is 50 watts which makes it a good machine to run from an inverter in auto, plane or boat.

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

Product: Uher Universal Recorder

Distributed by: Kimberly International, Ltd., 1650 Broadway, New York, N. Y.

Price: \$299.95

Its small size and light weight also help in this respect.

The instruction book that comes with the recorder is complete and detailed and we strongly suggest that it be read from cover to cover. The Universal has so many functions that a complete understanding of them is the only way in which the utmost can be obtained from the machine.

For instance, the trick key. The directions state that the key should be inserted, the tape threaded, and connect the signal source, mike or phono that you wish to superimpose on the tape. The signal selector switch is placed in the proper position and the start playback key depressed. The playback volume is turned up and when the point is reached where the second recording is to be added over the first the record key is pressed in addition, so that both keys are locked in.

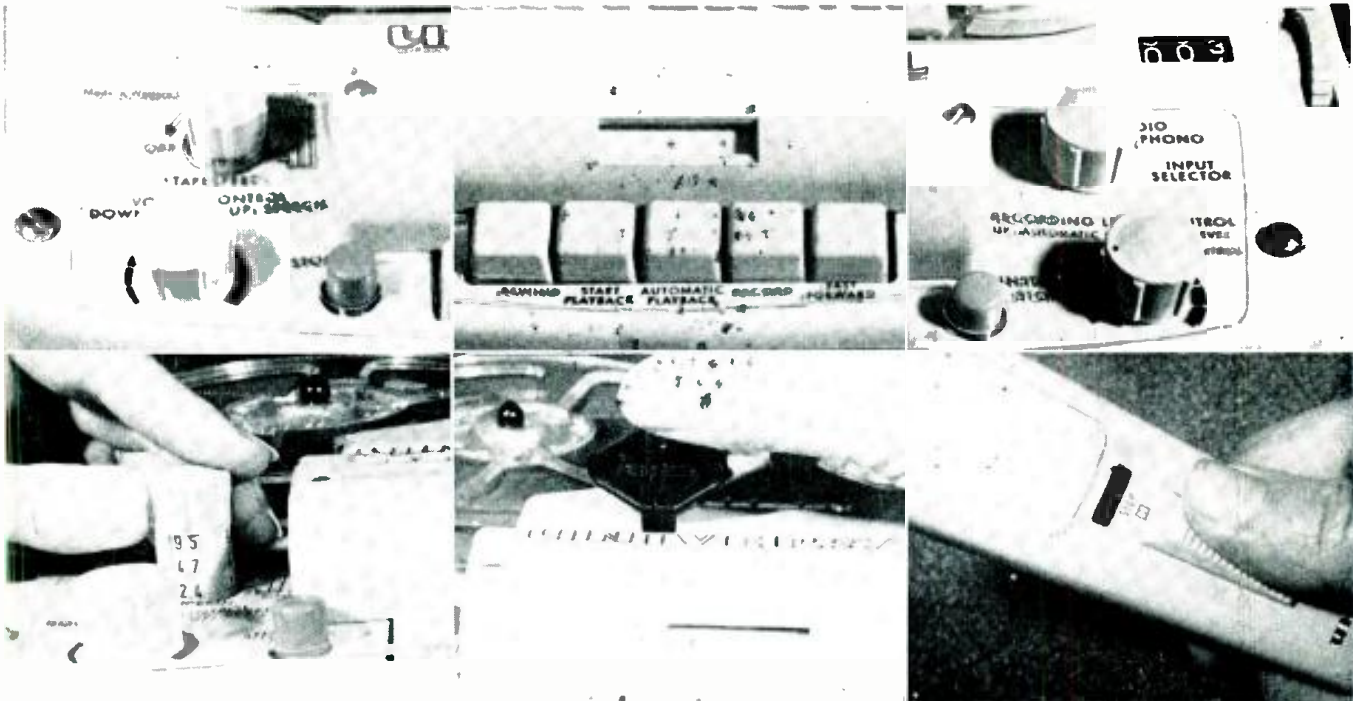
The record volume is operated as usual and on the playback you will find the two recordings, the one already on the tape and the one added have been combined on the one track.

The only difficulty in using this is the fact that when the record key is pressed, you can no longer hear the tape, so careful timing of commentary would be necessary.

We found that the instruction book meant what it said—first put in the key and then thread the tape. If it is not done in this sequence then the tape will not be held away from the



The Universal with the case closed. Pockets are provided in the lid for the microphone, cords and reels. Unit weighs only 17 pounds.



Upper left: left hand side of deck showing speed control lever, volume control and speech-music switch, and stop button. Upper center: control keys include, rewind, start and playback, automatic playback, record and fast forward. Recording level indicator above keys. Upper right: odometer counter, input selector, pause button and record level control. Lower left: speed control is pulled up to select speed. Center: Trick key holds tape away from erase head for sound on sound recordings. Right: microphone controls tape recorder in record, stops, repeat and rewind.

erase head and you will completely erase the first recording and have only the second on the tape.

There is an old adage "When all else fails, read the instruction book." We suggest you read it first.

The Uher Universal is not a complicated machine to operate, however for its controls are all push button and are jam proof. For dictating purposes, the controls on the mike handle make it a joy to use. With the key pushed all the way up, a red light appears to show that the machine is recording. Brought back one notch, the machine stops. Brought back another notch, it plays and, in the last position, rewinds. Thus it is possible to repeat back what has been dictated and if an error has been made to flip the switch

to record and correct it on the tape.

Of special interest is the accessory Akustomat which sells for \$44.95. With this device plugged into the recorder the machine will start recording whenever a sound hits the mike and stop after the sound ceases. The Akustomat plug is put in the receptacle provided on the right hand side of the recorder, the microphone plug is placed in its receptacle and the machine Start Playback and Record buttons are both depressed. The record volume control is turned up to the point where the general background noise will not start the machine but any spoken word or sound that should be recorded, will cause the device to operate. The Akustomat control should be placed in Start-Stop.

It is almost uncanny to start speaking and see the recorder start at the same time. You will lose perhaps the first syllable of the word. The machine will shut off anywhere from a half second to four or five seconds after the recordable sound ceases.

The same device is used to synchronize talks with slides and will operate the automatic slide projector. Plugs are provided for making the necessary connections.

Frequency response claimed is 4000 cps tops at the 15 16 speed, 8000 at the 1 8 and 16,000 at the 3 3/4. On these counts the machine performed adequately and had excellent response.

If you are considering the purchase of a general type recorder, this one is worthy of your consideration.



The Akustomat is an accessory which permits the recorder to be voice operated, turning itself on when the first words are spoken and stopping when the voice stops. It will also record supersonic signals on the tape for slide projector operation. It is shown at left. Center, plugs are furnished to connect to slide projector for automatic operation. Right: the input and output panel of the Universal showing microphone, radio/phonograph, loudspeaker, earphones, remote control and Synchro-Akustomat receptacles.

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, \$.30 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.

BURLESQUE SHOW. 7 in. reel. Your tape \$2.00. Paul Baribeault, 154 Lovell St., Worcester 3, Mass.

WANT GOOD BATTERY-POWERED recorder. Give all details, condition, price. Box 1001, New Brunswick, N. J.

FOR SALE: AR-3 Mahogany Speaker new—\$175; Breciner 30 watt power amplifier—\$47; Leak 12" Arm, cartridge, diamond needle, transformer—\$25; Blaupunkt AM/SW push-button car radio—\$48; Dynakit—Mark III, 60 watt amplifier kit—\$70. Will refund if not satisfied. S. Saltzman, 1221 So. 17th St., Las Vegas, Nevada.

RENT STEREO TAPES—over 1,000 different—all major labels—free catalog. Stereo-Parti, 1608-F Centinela Ave., Inglewood 3, California.

SELL: MAGNECORDETTE PT6A portable, record and playback, 2 speeds, excellent condition, used very little. Best offer. Uhlinger, 61 Monadnock Road, Worcester 9, Massachusetts.

CROWDS, PLANES, TRAINS, SCREAMS, guns, animals, bells! 5000 sound effects! Free catalog! Delco Productions, Box 140, Grand Island, Nebraska.

WANTED: 7½ doubletrack tapes from world broadcast transcriptions, particularly jam session series, others. Also NBC thesaurus, some standard and MacGregor, Richard Sears, Box 183, Belize, British Honduras.

SELL—SLIGHTLY USED TAPE decks 2 & 4 track—pre-amplifiers, accessories. Bargain, L. M. Stone, Route 1, Arab, Alabama.

RECORDERS, TAPES. Ampex, Bell, Wollensak, Viking, Bayla Co., 1470-T Elmer Road, Wantagh, N. Y.

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

TAPE RECORDERS, RECORDING TAPE, Bell tape decks, Hi-Fi, Norelco speakers. We will not be undersold! Send for our free catalog and see why. Commissioned Electronics, 1776 Columbia Road, Washington, D. C.

LOW QUOTES ON EVERYTHING Hi Fi & Stereo Tapes. Bargain List: Hi Fi, Dept. TR, Roslyn, Pa.

LEARN HYPNOTISM, SELF-HYPNOSIS from recorded tapes! Other helpful Tapes, Books, Recordings! Free Catalog. Write Philanthropic Library, Drawer TR697, Ruidoso, New Mexico.

METALIZED TAPE ON ROLLS, PS adhesive. For Norelco, Wollensak, Tandberg and other recorders with automatic stops. Use for repairing printed circuits or experimental breadboard wiring. Dealers inquiries invited. Quantity discounts. ¼" and ½" widths. Postpaid U.S. \$1.00-\$1.25. E. L. Products Co., Dept. A, Box 771, Havertown, Pa.

We specialize in **TRADE-INS**—highest allowances—Ampex, Concertone, Magnecord, Norelco, Pentron, Presto, Tandberg, Viking, Hi-Fi Components—Fisher, Scott, Sherwood, etc. Write for lists of new and used items.

BOYNTON STUDIO
10 Pennsylvania Ave., Dept. TR
Tuckahoe, N. Y. Tel. SP 9-5278

LEARN WHILE ASLEEP, hypnotize with your recorder, phonograph or amazing Electronic Educator endless tape recorder. Free catalog lists over 200 unusual tapes, records, equipment for experimenters. Sleep-Learning Research Association, Box 24-TR, Olympia, Washington.

FOR SALE: Viking stereo tape deck FF75. Hardly used. Best offer. Vincent Castagna, 879 Alabama Street, San Francisco 10, Calif.

CONVERT ANY TAPE RECORDER to 4-track stereo. 2-track to 4-track \$20, monaural to 4-track \$30. Martens, 204 S. Cochran, Charlotte, Mich.

SWAP: Minifon P-555 pocket recorder. Used less than ten hours. Microphone, ac power supply, two spools wire, foot control switch, stethoscope earphones. Total list \$314. Wanted: Stereo tape equipment, speakers and such. Write best offer. All queries answered. Norman Tant, Morehead, Kentucky.

WANT TAPES OR DISCS Five O'Clock Whistle, other Patex, WHB, 520 La Belle, Oconomowoc, Wisconsin.

FOR SALE: MAGNECORDEE PORTABLE F35B, 3.75/7.5 ips half-track, as new: \$175.00. Microphones: EVs 35, 654, 655C; RCA M88, M44 Velocity; Altec 660, 633 "Saltshaker," all excellent. Want RCA 77DX mike, Marantz Consolee, full-track recorder, consider trading. Contact soonest: F. L. Tonne, 4465 N. 149th St., Brookfield, Wisconsin.

WANTED: TAPE OF Dean Martin & Jerry Lewis show, and Red Blanchards program "What Is It." Will borrow or rent to duplicate, or accept duplicates. Vincent Castagna, 879 Alabama Street, San Francisco 10, Calif.

TAPE RECORDING FOR CASH! Up to \$100 weekly, spare time! Great fun! New! Country wide open! Free Facts. Dixieland Sound, Asheboro, N. C.

SPECIAL OFFER! Concertone 20/20 (Half-Track) tape recorder; with cases. Perfect condition, Last one; only \$345.00. B. K. Balch, 611 Livingston Rd., Linden, N. J.

CANADIANS. Brand name recording tape at lowest prices. Audioape, Irish, Scotch, Price list on request. Tape Sales of Canada, 35 Carmichael Ave., Toronto 12, Ont.

GRANDVIEW MURALS—Natural color "47x 34½" sturdy quality paper. For your Den, Music or Recreation Room. \$2.98 postpaid, Alexander Podstepny, 1652 Dounton, Phila. 40, Penna.

100 TERRIFIC BARGAINS from America's cleanest trade-in department: Ampex 601-2s, 960s, Signatures; Concertones; Marantz Consolees; Fisher components; Altec speakers; Gelsco Stenorettes; etc. All items like new, fully guaranteed. Liberal trade-in allowances on new merchandise. Harmon-Kardon expertly wired kits. State needs for big savings. P-J Associates, Greenwich, N. J.

WANTED: Tape pop music montage "Fabulous Fifties" TV show. Swap other interesting material? R. Levy, 89 Oak, Buffalo 3, N. Y.

WISH TO EXCHANGE Country, Western, and Gospel music. Tape or write John Ross, 5217 N. Winthrop St., Chicago 40, Illinois.

LOOK! LOOK! A REAL Buy: Magnecord Magnacordette Model 101 tape recorder, Records professional quality stereo and monaural. Recorder with dual record preamplifiers and meters all contained in one luggage case. Cannot be told from new, used only about 20 hours. Original cost \$449.95. Will sell for only \$350.00 and ship in original factory carton. Also, one Heathkit Model TR-1A Tape Recorder (Tapedeck, Recorder Electronics and Mike). Completely assembled and in perfect working condition. Used less than 10 hours. \$60.00. J. P. Litt, Box 892, Bismarck, No. Dak.

MAIL ORDER HI-FI
You can now purchase all your Hi-Fi from one reliable source and be assured of perfect delivery. Carston makes delivery from NY stock on most Hi-Fi Recorders and Tape within 24 hours. SEND US A LIST OF YOUR HI-FI REQUIREMENTS FOR OUR WHOLESALE QUOTATION and our FREE wholesale catalogue.
CARSTON STUDIOS
125-C East 88 St. New York 28, N. Y.

TAPE-RESPONDENTS, Wish to swap tapes with persons collecting Comedy, Sound Effects, Documentary, Hypnosis, and Unusual Recordings. Mr. Herman Bary, 11116¼ Camarillo St., North Hollywood, Calif.

HAVE 2 PENTRON EMPERORS, will sell or trade. One records-plays 1 track, 2 track, 4 track. Latest 1960 machine in original carton, cost \$575.00. Geo. F. Bischof, 1503 E. Vickery Blvd., Fort Worth 4, Texas.

WHEN WAS THE LAST time you touched a live wire? Make contact with K.O.S. Don't bother if you're people or folks, but if you're not, get that tape out today! Tape Station K.O.S., 2 Wainright Avenue, Yonkers 2, N. Y.

SALES, BANKRUPT STOCK of Hi-Fi magnetic recording tape, first class, no splices, 1200 ft., 5 for \$7.85, postage paid in U.S. Ask about other sizes. Geo. F. Bischof, 1503 E. Vickery Blvd., Fort Worth 4, Texas.

PROFESSIONAL RECORDING TAPE. First quality of prime manufacturer. Full frequency response. Polished and permanently lubricated. Full year money back guarantee. Acetate 1200', 1½ Mil, 4/\$5.20; 1800', 1 Mil, 4/\$6.75. Mylar 1200', 1½ Mil, 4/\$6.60; 1800', 1 Mil, 4/\$9.00; 2400', ½ Mil, 4/\$12.80. Postage 20¢ each. Hisonic, Box 86CC, New York 63, N. Y.

TEST YOUR AUDIO ACUITY! Ultra-sensitive recording techniques capture and amplify the essence of sounds that ordinarily go unheard. Using this technique we've recorded the everyday 'small' sounds of the home. The results will challenge your sound judgment. Makes an entertaining and informative sound game. The fantastic sounds of peeling a potatoe is worth the price alone. Introductory offer of twenty sound surprises on tape for \$2.00 postpaid. Tapes are full-track, 7½ recordings made on Ampex. Audio Specialties, Dept. T, Box 8203, San Antonio, Texas.

DON'T READ THIS . . .

UNLESS YOU KNOW AND APPRECIATE QUALITY

—because a quality item is what we have to offer.

The quality of sound on tape is unsurpassed. It follows then that a magazine devoted to this medium must be based on quality.

When you invest in TAPE RECORDING, you do so without any risk since we have always maintained a "moneyback guarantee" policy should you not be satisfied with your investment.

This magazine stands solidly behind tape and the unmatched reproduction and versatility of which it is capable.

Fill out the coupon below and drop it in the mail today. If your check book isn't handy we'll be glad to bill you later.

2 Years \$7.00
1 Year \$3.75

TAPE RECORDING
Severna Park, Md.

Please enter or renew my subscription as indicated below:

2 years \$7.00
 1 year \$3.75

Payment enclosed. Bill me later.

Name

Address

City Zone State

FOR YOUR AUDIO BOOKSHELF

YOUR TAPE RECORDER

by Robert and Mary Marshall

This is the first book for nonprofessional users and includes the photographs and specifications of 55 recorders as a guide to selecting the proper machine for various uses. The book does not deal with technicalities. It was written after some 2500 experiments had been conducted, using recorders in the fields of education, camps, meetings, business and the home. Part of the book is devoted to an explanation of hi-fi principles and terminology.

5 3/8" x 8", cloth bound, 288 pp. Illustrated **\$4.95**

TAPE RECORDERS AND TAPE RECORDING

by Harold D. Weiler

The latest book by the well known author of "Hi-Fi Simplified" which has sold over 65,000 copies. Written so that anyone can understand it the book covers Room Acoustics; Microphone Techniques; Recording From Records; Radio and TV; Sound Effects; Tape Recorder Maintenance; and Adding Sound to Slides and Movies. Over 100 illustrations and diagrams in 13 chapters of practical down-to-earth suggestions make this book the beginners bible.

5 1/2" x 8 1/4" — 190 pages —
illustrated — paper bound **\$2.95**

HIGH FIDELITY SIMPLIFIED

by Harold D. Weiler

This book has sold more than 65,000 copies and is one of the most popular books on the subject. It covers the How, What, Why and Where of Hi-Fi, Sound, Acoustics, The Simple Loudspeaker, The High-Fidelity Loudspeaker, Loudspeaker-Enclosures, The Basic Amplifier, The Amplifier, The Record Player, Tuners, Use of a Home Music System, and Tape Recorders. It is illustrated with numerous drawings, charts and pictures. While authoritative, it is written in an easy-to-read style.

5 1/2" x 8 1/2", paper bound, 208 pp. Illustrated . . **\$2.50**

HOW TO MAKE GOOD TAPE RECORDINGS

by C. J. Le Bel, Vice President Audio Devices, Inc.

A complete handbook of tape recording containing 150 pages of up-to-the-minute information of practical value to every tape recordist. Easy reading for the most inexperienced of home recordists. Sections include: How A Tape Recorder Works, Characteristics of a Tape Recorder, Selecting A Tape Recorder, Selecting A Recording Tape, Using the Tape Recorder, Making A Microphone Recording, Acoustically Treating the Studio, Tape Editing, Binaural or Stereophonic Recording, Putting Together A Recording Show, and a Glossary of Tape Recording Terms. 5 1/4" x 8", 150 pp., paper bound, illustrated **\$1.50**

TAPE RECORDERS—HOW THEY WORK

by Charles G. Westcott and Richard F. Dubbe

This book is based on the principle that to get the most from a recorder, one must first understand thoroughly how it operates. It contains diagrams and schematics and explains in not too technical language "what's under the cover" of a recorder.

5 1/2" x 8 1/2", 177 pp., paper bound, illustrated **\$2.75**

TECHNIQUES OF MAGNETIC RECORDING

by Joel Tall

This book translates the complexities of a science into practical, easy-to-follow techniques. It is a book for the professional who wants new ideas, new standards of excellence, and a book for the amateur just introduced to magnetic recording. Beginning with a description of Poulsen's invention of magnetic recording, the author presents a condensed history of developments since 1900. Then he treats the many problems that arise in magnetic recording. Individual chapters are devoted to recording in such areas as medicine, education, and public entertainment and advertising. The inclusion of descriptions written by the originators of various techniques, extensive quotation from the laboratory notes of pioneers, an extensive glossary, and a comprehensive bibliography make this book invaluable to the amateur and to the professional.

8 1/2" x 5 1/2", 472 pp., cloth bound, illustrated **\$7.95**

BASIC ELECTRICITY

by Van Valkenburgh, Nooger and Neville, Inc

These five volumes, and the five listed below on Basic Electronics are the texts of those subjects as currently taught at Navy Specialty Schools. They are simplified, clearly illustrated and one basic concept is explained at a time without the use of complicated mathematics. Vol. 1—Where Electricity Comes From, Electricity in Action, Current Flow, Voltage and Resistance, Magnetism, DC Meters. Vol. 2—DC Circuits, Ohm's and Kirchoff's Laws, Electric Power. Vol. 3—Alternating Current, AC Resistance, Capacitance and Inductance, Reactance, AC Meters. Vol. 4—Impedance, AC Circuits, Resonance, Transformers. Vol. 5—DC Generators and Motors, Alternators.

BASIC ELECTRONICS

Vol. 1—Introduction to Electronics, Diode Vacuum Tubes, Dry Metal Rectifiers, Power Suppliers, Filters, Voltage Regulators. Vol. 2—Introduction to Amplifiers, Triode Tubes, Tetrodes and Pentodes, Audio Voltage and Power Amplifiers. Vol. 3—Video Amplifiers, RF Amplifiers, Oscillators. Vol. 4—Transmitters, Transmission Lines & Antennas, CW Transmission and Amplitude Modulation. Vol. 5—Receiver Antennas, Detectors and Mixers, TRF Receivers, Superhets. 6" x 9", 128 pp. Each Volume \$2.25. Complete set, 5 volumes **\$10.00**

BOOK DEPARTMENT
HI-FI TAPE RECORDING MAGAZINE
Severna Park, Md.

Please ship immediately the books checked.

I enclose

NAME

ADDRESS

CITY..... ZONE..... STATE.....

All books shipped postpaid from stock same day order is received. If not satisfied return books within 5 days and money will be refunded.

- Tape Recorders and Tape Recording
- Techniques of Magnetic Recording
- How To Make Good Tape Recordings
- Tape Recorders—How They Work
- High Fidelity Simplified
- Your Tape Recorder
- Basic Electricity Vols. Set
- Basic Electronics Vols. Set

• TAPE RECORDING PROBLEMS—AND HOW AUDIOTAPE HELPS YOU AVOID THEM



Listening to a recording with excessive harmonic distortion is like looking at a picture through a thin film of translucent material.



Reducing the distortion is like removing a curtain that was hanging between you and the sound source—all tones are clear and sharp.

Lifting the “film” of harmonic distortion

IF A TAPE RECORDING sounds “fuzzy”—as if the music were coming to you through an invisible curtain—harmonic distortion may well be your problem. This rather formidable term is simply the engineer’s way of expressing the degree to which harmonics or “over-tones” of a fundamental frequency are altered or distorted in recording or reproduction. Obviously, a good tape recording should have as little distortion as possible. Some of it may be introduced by the circuitry of your recorder, or be caused by recording at too high a level—but it can also be caused by the tape itself. A good check on where it’s coming from is to record on a tape that is *known* to have *low distortion* and see if any difference is noted.

Audiotape is especially formulated and manufactured to provide the lowest possible distortion—so low

that it is impossible for the human ear to detect. One reason for this distortion-free quality is that the minute oxide particles in Audiotape are *magnetically oriented*, so that they all point in the same direction. This means that all oxide particles are magnetized uniformly, and playback at maximum effectiveness.

No matter how you measure tape performance, you’ll find that professional-quality Audiotape will *always* give you the cleanest, clearest sound which your recorder can produce. It is available in a size and type to meet every sound recording tape need. Ask your dealer for Audiotape—made *by* audio engineers for audio engineers—and backed by over 20 years of research and manufacturing experience in sound recording materials. It costs no more than ordinary recording tape—and its performance speaks for itself.



Make a “sound diary” of your youngsters

How many times have you listened to your tiny youngster “talking” himself to sleep? Haven’t you wished that you could preserve those cute mispronunciations forever? With a tape recorder you can make yourself an unrehearsed “sound diary” of your children (or nephews or nieces) as they grow up. We suggest you use a 5” reel of LR Audiotape (type 961) on durable 1-mil “Mylar.” This will give 24 minutes of uninterrupted recording time. Or you can use type 261 (in the self-mailer package) for a shorter version.

audiotape
TRADE MARK

AUDIO DEVICES, INC., 444 Madison Ave., N. Y. 22, N. Y.
In Hollywood: 840 N. Fairfax Ave. • In Chicago: 5426 N. Milwaukee Ave.