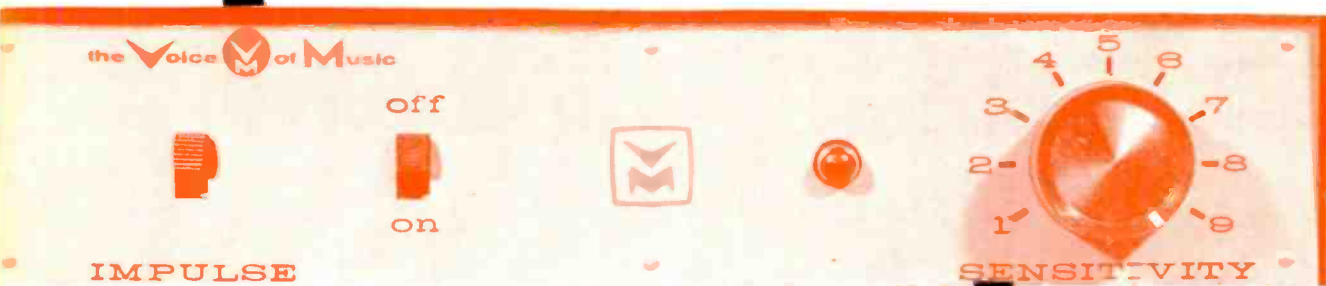


TAPE RECORDING

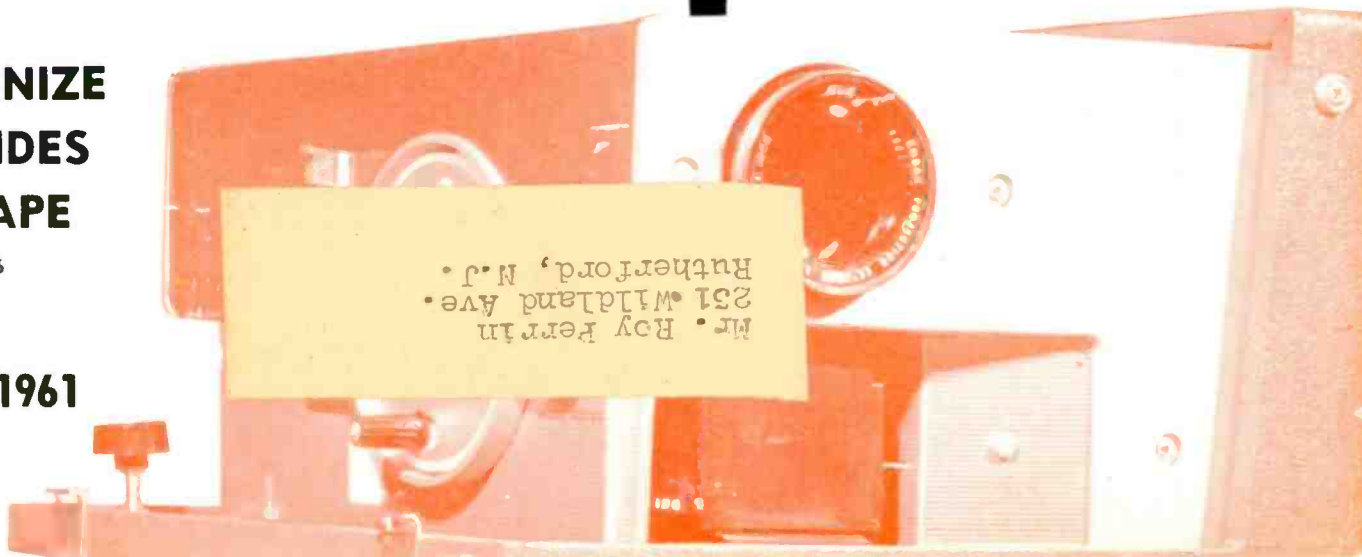


**SYNCHRONIZE
YOUR SLIDES
WITH TAPE**

See Page 16

**January 1961
35c**

Mr. Roy Perrin
231 Wildland Ave.
Rutherford, N.J.





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



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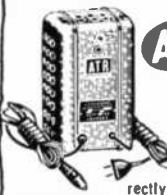
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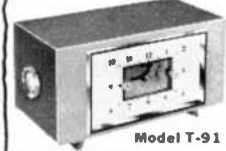


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TAPE RECORDING

VOL. 8 NO.2 JANUARY 1961

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.

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Cover: Pentron Astrosonic Recorder, V-M Synchronizer, Kodak Cavalcade Automatic Projector



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CROSSTALK

from the Editors

THE HISTORY OF TAPE recording has been marked by a progression to narrower tracks and lower speeds. In the early days of the German Magnetophone, the immediate forerunner of today's tape recorder, the speed used was 30 inches per second and the tape was recorded its full width.

* * * * *

EARLY MACHINES in this country, the design of which was based on the Magnetophone, retained the 30 inches per second speed and the full track. The primary reason was because the materials available in those days, both the electronics and the tape itself, were rather crude when compared to today's standards.

* * * * *

IMPROVEMENTS IN TAPE and electronics dropped the speed to 15 inches per second, which is still the standard for professional recording and following this to 7-1/2 ips which today is the standard for almost all of the recorded music and is also the standard where the best fidelity is of concern.

* * * * *

THE NEXT DROP was to 3-3/4 ips, half of the 7-1/2 ips speed, which in turn was half of the 15 inches per second speed. Nowadays most machines have both the 7-1/2 and the 3-3/4 speeds available on them at the flick of a switch.

* * * * *

SOME MACHINES NOW HAVE a speed included that is half of the 3-3/4 ips speed — 1-7/8 and a few have even dropped to 15/16 inches a second. At this speed you almost have to look twice at the machine to see if the tape is moving.

* * * * *

WITH THE DROPS IN SPEEDS has come a narrowing of the tracks. As the electronics were improved and less noisy amplifiers designed, it made it possible to get a good output from a smaller input. As the track size was halved from full track to half track and recently to quarter track, each drop meant a loss of half the current that the head was able to pick up from the tape, hence the need for better amplifiers — and also better heads.

* * * * *

ON A REEL OF STANDARD 1-1/2 mil tape you can record, at the 7-1/2 ips speed, on a 7" reel, approximately 30 minutes at full track. Using half track you can record for one hour and quarter track will permit recording up to two hours.

* * * * *

EACH DROP IN SPEED coupled with an increase in the number of tracks will again double the times. Full track at 3-3/4 gives an hour, dual track, two hours and four track, four hours. Now if we again cut the speed in half, to the 1-7/8 inches per second speed which is now found on a good many machines, the recording times border on the fantastic. Full track would give two hours, dual track four hours and quarter track eight hours.

* * * * *

AGAIN WE CAN INCREASE recording times by going to a thinner tape. Standard now for four-track use is 1 mil tape. A seven inch reel of this at the 1-7/8 ips speed will give a recording time of 12 hours and half-mil, or double play tape, can produce better than 16 hours of recording on one reel.

* * * * *

WE BELIEVE THAT IN these lower speeds may lie the ultimate value of a tape recorder. Educational material, books and other similar items may be able to be produced in the audible form as cheap or cheaper than the printed. To people with tired eyes, or who are sightless, this could be a great boon. Even music, where top fidelity is not important, could be recorded at the lowest speeds and, in fact, we understand the Stereophonic Music Society is experimenting with just that.

* * * * *

ENGINEERS NEVER STOP working to improve heads, electronics, and tape. In view of the past history, (beginning about 1935), we see no reason why progress should not continue to be made over the years ahead.

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CLASSICAL

Reviewed by Robert E. Benson



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

"POP OVERS" Russian Sailors' Dance (Gliere); Liebestraum (Liszt); Polka from The Age of Gold (Shostakovich); Prelude in G Minor (Rachmaninoff); Procession of the Nobles (Rimsky-Korsakov); Clair de Lune (Debussy); Love's Dream After the Ball (Czibulka); Hora Staccato (Dinicu)

Eastman-Rochester "Pops" Orchestra, Frederick Fennell, cond.

MERCURY STB 90222

4 track, 7 1/2 ips
\$6.95 . . . 30 min.

A typical example of Mercury's best recording techniques, with extraordinary clarity and wide dynamic range. The orchestra sounds rather small for such high-powered showpieces as the Gliere and Rimsky-Korsakov, but performances are of a high caliber. The disc version of this collection also includes *Finlandia* of Sibelius and the *Schwanda Polka and Fugue* by Weinberger; it's unfortunate the tape omits them. Most prospective purchasers probably wouldn't mind paying a bit more to have them. Regardless, this is a highly recommended tape for light listening in ideal stereo.



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

RICHARD RODGERS: *Victory at Sea* (Volume 1) (Orchestral Suite from the NBC Television Production, arranged by Robert Russell Bennett)

RCA Victor Symphony Orchestra conducted by Robert Russell Bennett

RCA VICTOR FTC 2000

4 track, 7 1/2 ips
\$8.95 . . . 45 min

This is unquestionably one of the outstanding scores ever written for films or television, and is well known to just about everyone from either the television show or the two disc versions on RCA. So far as this music is concerned, Victor seems to be regressing technically. The first recording (LM 1779) was well played and nicely recorded; the second shows obvious lack of rehearsal and brilliant but blasty sound. RCA has also issued Volume II of *Victory at Sea* as a separate tape (FTC 2020, \$8.95). These two would have made a perfect Twin-Pack.



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

MOZART: Eight Overtures (Don Giovanni, Il Seraglio, Marriage of Figaro, Cosi fan Tutte, Titus, Impresario, Idomeneo, Magic Flute)

Hamburg Pro Musica Orchestra conducted by Harry Newstone

FORUM FTB 601

4 track 7 1/2 ips
\$6.95 . . . 42 min.

Surprisingly good quality in performance from what appears to be a pickup orchestra. Reproduction is very good; however, it's difficult to imagine anyone wanting to hear more than two or three Mozart Overtures at one time. Using the counter on your tape recorder, it would be a good idea to index this sort of repertory so one could easily locate particular selections.



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

VERDI: *Aida* (complete opera in four acts)

Cast includes Renata Tebaldi, soprano; Giulietta Simionato, mezzo-soprano; Carlo Bergonzi, tenor; Cornell Macneil, baritone; Arnold van Mill, bass, and Fernando Corena, bass, with the Singverein der Gesellschaft der Musikfreunde and the Vienna Philharmonic Orchestra conducted by Herbert von Karajan

LONDON LOR-90015 (Twin-Pack)

4 track, 7 1/2 ips
\$21.95 . . . 2 hrs. 30 min.

This set was warmly received when first issued on stereodiscs and deserves the plaudits, for its high quality is uniform, both in sound and performance. In spite of the technical excellence of the recording and the varied perspectives achieved by the London engineers, at times I personally would prefer more hall sound, particularly in the scenes for massed chorus and orchestra.

Renata Tebaldi's *Aida* is considered to be one of the best of our time, although I find her vocal production somewhat unfocused. The rest of the cast is uniformly fine, particularly Giulietta Simionato's *Amneris*. The Vienna Philharmonic Orchestra is, of course, magnificent.

Technically, these two tapes are even better than the fine stereo discs, and the slight additional cost of the tapes is worth the expenditure. It is unlikely that a better tape *Aida* will be along for some time to come.



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

TELEMANN Don Quixote Suite
 HANDEL: Oboe Concerto in G Minor;
 Largo for Two Horns and String Orchestra;
 Arias 1 and 2 for Winds

FERRODYNAMICS FD 1002-S
 4 track, 7 1/2 ips
 \$8.95 . . . 34 min.



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

HANDEL: Double Concerto No. 3 in F
 VIVALDI: Flute Concerto in D "Il Cardellino"

GEMINIANI: Concerto Grosso in C Minor,
 Op. 2 No. 2
 FERRODYNAMICS FD 1001-S
 4 track, 7 1/2 ips
 \$8.95 . . . 38 min.



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

MOZART Quartet in B Flat, K. 458 "Hunting"
 HAYDN: Quartet in D, Op. 76 No. 5
 FERRODYNAMICS FC 1005-S
 4 track, 7 1/2 ips
 \$8.95 . . . 40 min.

These new tapes are welcome, greatly enhancing the four-track tape catalog in one of its weakest areas—that of chamber music. On these three tapes—the first in the FerroDynamics initial release—we have ten previously unavailable baroque works, ranging in interest from the Geminiani *Concerto Grosso* to the Mozart *Hunting Quartet*. Most of this is music worthy of having in permanent form. Packaging is attractive, each box having a reproduction of a Picasso watercolor on its cover.

The packaging of these tapes is not up to the level of their musical interest. None of the performers are identified on the tape labels, nor do the program notes always state who the performers are. As a premium price is being charged for tapes in this series, one would expect details such as these would have been taken care of, and doubtless they will be in future copies.

From a sound standpoint, in all cases the reproduction is good, particularly in the Quartets, although additional resonance would have helped the string tone. This type of sound brings the musicians into your room, rather than taking you into the concert hall.

This entire project must be greeted with enthusiasm for the enterprising repertory.

CHRISTMAS



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

NOEL NOEL

Silent Night, The First Noel, Deck the Halls, Alleluia, Angels We Have Heard on High, We Three Kings of Orient Are, God Rest Ye Merry, Gentlemen, Good King Wenceslas, Touro Louro Louro, It Came Upon a Midnight Clear, O Little Town of Bethlehem, Jesus the Christ is Born

Arranged by Anne Phillips; sung A Cappella by the Anne Phillips Singers

FERRODYNAMICS CD 1225-S
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 \$7.95 . . . 35 mins.

This is quite a group of singers—quite a group. They are perfectionists and I know this is one of the best choral assemblages I have ever had the good fortune to hear. By golly, they almost give me goosebumps.

Every singer from the lowest bass of the men to the highest soprano of the girls is superb, and under the arrangement and direction of Anne Phillips they become as one.

Perfectly lovely in every detail, including the magnificent stereo effect.

With all their choral perfection, these singers are still able to also inject feeling into their songs to enhance them even more.

Four stars all the way—and even without musical accompaniment. Let's have more FerroDynamics.—*J. Cover*



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

MUSIC FOR A MERRY CHRISTMAS

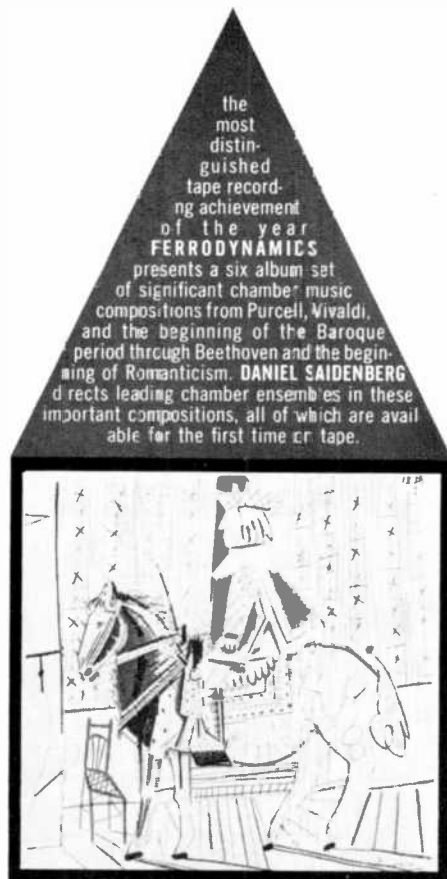
O Come All Ye Faithful, Silent Night, God Rest Ye Merry, Gentlemen, The First Nowell, Good King Wenceslas, White Christmas, The Skaters' Waltz, Away in a Manger, Once in Royal David's City, Greensleeves, Good Christian Men Rejoice, Alpine Sleigh-Ride

Frank Chacksfield & His Orchestra
 RICHMOND (LONDON) RPE-45014
 4 track, 7 1/2 ips
 \$4.95 . . . 34 mins.

This charming orchestral release would be excellent background music for your Christmas dinner or perhaps that after-dinner breather when everyone just sits, probably because they're too full to move. It has a lilting, smooth quality.

Frank Chacksfield & His Orchestra are a well rounded aggregation. There is no overpowering section of brass over percussion, or percussion over strings, etc. The blending produces a silken evenness.

Pleasant listening indeed.—*J. Cover*



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Beethoven:	Quintet for Piano and Winds, Opus 16.
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Haydn:	Quartet in C Major, Opus 76, No. 5.
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Music ★★★★★
Performance ★★★
Fidelity ★★★★★
Stereo Effect ★★★★★

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ing Santa Claus, Rudolph The Red-Nosed
Reindeer, Christmas Island, White Christ-
mas, I Saw Three Ships, Once In Royal
David's City, Greensleeves, The Holly And
the Ivy, Silent Night

Cyril Stapleton and His Orchestra with
Children's Chorus

RICHMOND (LONDON) RPE-45015

4 track, 7 1/2 ips
\$4.95 . . . 28 mins.

This Christmas release is different in
that it contains a chorus of English chil-
dren. Their speech and diction is purely
British and they are a delight to hear sing-
ing these Christmas favorites.

To me Christmas is the best holiday on
the calendar. It is because of many, many
reasons, but to boil it all down, I'd guess
it's mainly because it's a holiday which
inspires a host of feelings—a myriad of
moods—all pleasant to experience.

You can't know Christmas without also
knowing the joyous atmosphere it creates.
There is a friendliness everywhere. To
many, there is a feeling of peaceful serenity
in celebrating Christ's birthday. Others
revel in the beauty of gifts and decorations
all about them.

Even your sense of smell quickens with
the scent of pine, baberry, turkey roasting,
pumpkin pie, etc.

And of course, there is this once a year
Christmas music which at any other time
just does not fit in. It does much to create
the moods of Christmas, and this tape is
one that gives inspiration a gentle shove.

Cyril Stapleton and His Orchestra are
(as Jackie Gleason would say) a "good
group." They, plus the children's chorus,
are a happy combination indeed.

Stereo separation is excellent as is
fidelity.—*J. Cover*



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

MANTOVANI CHRISTMAS CAROLS

The First Noel, Hark, the Herald Angels
Sing, God Rest Ye Merry, Gentlemen,
White Christmas, Good King Wenceslas,
O Holy Night, Adeste Fideles, Joy to the
World, Silent Night, Holy Night, O Tan-
nenbaum, Midnight Waltz, Nazareth, O
Little Town of Bethlehem, Skaters' Waltz

Mantovani and His Orchestra

LONDON LPM 70036

4 track, 7 1/2 ips
\$6.95 . . . 40 mins.

Mantovani's father once told him that
music without feeling was little more than
a noise. He never forgot this, as his music
indicates.

As hard as it is to come up with a new,
fresh approach to music, particularly music
as familiar as these Christmas melodies,
Mantovani has done just that by giving
them feeling in a new, exciting scoring.

All encompassing stereo effect on this
one.—*J. Cover*

POPULAR



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

MERENGUES AND MAMBOS

The Ingenue Mambo, Timbales Mambo,
El Guapo, The Panther Mambo, Top Hat
Mambo, Mambo Loco, Merengue, Meren-
gue, Haitian Merengue, Pineapple Meren-
gue, Hop, Skip Merengue, Sliding Meren-
gue, Si Si Merengue

Fred Astaire Dance Studio Orchestra

SMS 546-C

4 track, 7 1/2 ips
\$7.95 . . . 28 mins.

Well loosen up the hip joints, limber
up the torso, and relax. Its Mambo and
Merengue time. Ever since these fascinat-
ing dance steps invaded this country, folks
have been moving parts of their bodies they
never moved before, at least not on a dance
floor.

The steps are lively and catching. Once
you're in the hypnotizing swing and sway,
it's hard to break the spell. These selec-
tions are played by the Fred Astaire Dance
Studio Orchestra and are used in teaching
students. They are, therefore, perfect for
dancing.

In fact, the box containing this tape also
contains an instructional sheet on the basic
steps for the Mambo and Merengue. Pre-
sent this sheet at any authorized Fred As-
taire dance studio and you may receive a
free dance lesson.

Even without this added incentive, how-
ever, this tape is one well worth having on
hand for any dancing shindig.

Perfect rhythm all the way through.
Reproduction is faultless.—*J. Cover*



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

BACKGROUNDS FOR BRANDO

Side 1: Katsumi Theme, Love Theme,
Serenata Mexicana, Love Like Ours, Fugue
For Tin horns

Side 2: Blanche, August Moon, Song From
Desiree, Brutus Soliloquy, Blues For Brando

Elmer Bernstein and Orchestra

OMEGATAPE SST 828

4 track, 7 1/2 ips
\$6.95 . . . 26 mins.

A selection of ten musical themes from
ten of the outstanding movies in which
Marlon Brando has starred. The orchestra
conducted by Elmer Bernstein includes 44
musicians and an imposing list of jazz

artists and soloists of outstanding reputation. Names and other details of interest are thoughtfully described in the cover text.

The music itself is not quite as imposing as the orchestra. Like most music written and orchestrated to supplement a combined visual-auditory presentation such as the movies, it lacks the development necessary to be completely appreciated by itself. There is no doubt that this type of music adds immeasurably to the emotional appeal of the movies in each case and represents the development of a special branch of music requiring as much talent, artistry and sensitivity for its creation as the older and more appreciated art forms in which music plays the major role, that is, musical comedy, ballet, opera, etc.

This then is strictly background music, certainly pleasant to listen to, and might well find a place in your library for just this purpose.

The performance, of course, is very good; the fidelity, while not outstandingly impressive because there are no gimmicks included for this purpose, is more than adequate.

There is very little stereo effect which may not be too important to the purpose of this music, but should be noted just for the record.—*C. Parody*



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

BASIE/ECKSTINE INCORPORATED

Side A: Stormy Monday Blues, Lonesome Lover Blues, Blues, The Mother of Sin, Jelly Jelly, Don't Cry Baby, Trav'lin' All Alone

Side B: Little Mama, I Want A Little Girl, Drifting, Song of the Wanderer, Piano Man

Count Basie, Billy Eckstine
ROULETTE RTC-507

4 track, 7½ ips
\$7.95...36 mins.

Professionalism sticks out all over this tape—the Court and Billy are a great pair of true professionals. What I can't understand is why such talents record selections of such poor caliber as these. Is it copyright retractions or what?

I have been reviewing tapes for hours today and it appears that approximately 80% of all reviewed contain music that is foreign to me. The artists and the fidelity are fine, but their choice of material is so poor.

Can't say this tape is dull or lifeless because Basie and Eckstine just couldn't produce such a one even if they tried. All it lacks is the proper music.

Fidelity here is superb.—*J. Cover*



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

TV JAZZ THEMES

Side 1: Richard Diamond, 77 Sunset Strip, Thin Man

Side 2: Peter Gunn, Session at Pete's Pad, Brothers Go to Mothers, Fallout, Dreamsville

Video All Stars conducted by Skip Martin
BEL CANTO ST-90

4 track, 7½ ips
\$6.95...30 mins.

The three selections on Side 1 are strictly functional music to provide the appropriate emotional backdrop for the TV weekly thrillers of the same names. For this intended purpose they are no doubt extremely effective. As music for music's sake they are a bit disconcerting.

On Side 2 after running through the Peter Gunn theme to which the aforesaid comments equally apply, we run into two real terrific jazz numbers which are really worthwhile, these are "Session at Pete's Pad" and "Brothers Go to Mothers." With the exception of the conductor, Skip Martin, none of the musicians are mentioned by name, but it is obvious they are all exceptionally talented. For the jazz enthusiast, these two numbers might well be worth the price of the tape. The selection "Fallout" is more of the theme variety and once again when heard out of context with its visual counterpart is of academic interest only.

"Dreamsville," the last selection on the tape, is a tranquilizing bit of music, of the smooth, sweet variety that should get you out of your emotional mess in time to remove the tape and replace it in the box where it will probably stay for a long, long time.

Technically, the tape is very good. Stereo is about perfect and there can be no quibbling about fidelity.—*C. Parody*

NEW TAPES RECEIVED

REEL-TO-REEL

Capitol, The Music Man, Original Broadway Cast, ZO 990, 4 track, 7½ ips

Columbia, More Johnny's Greatest Hits, Johnny Mathis, CQ 300, 4 track, 7½ ips

Kapp, Songs of The Fabulous Fifties, Roger Williams, KT-45008 (Twin-Pak), 4 track, 7½ ips

London, The Mikado, The D'Oyly Carte Opera Company, with The New Symphony Orchestra of London, conducted by Isidore Godfrey, LOH 90001, 4 track, 7½ ips

Mercury, Let's Dance Again, David Carroll and His Orchestra, STB 60152, 4 track, 7½ ips

RCA, Lena Horne, Songs by Burke and Van Heusen, FTP-1004, 4 track, 7½ ips

SMS, Bruckner, Symphony No. 4 in E Flat Major "Romantic," Bamberg Symphony Orchestra, Heinrich Hollriesser, conductor, S41-A, 4 track, 7½ ips

Westminster, Mendelssohn, Violin Concerto in E Minor, Op. 64; Bruch, Violin Concerto No. 1 in G Minor, Op. 26, Julian Olevsky, violin, Vienna State Opera Orch., conducted by Julius Rudel, WTC-129, 4 track, 7½ ips



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"The professional's speed of the future."

Tandberg Series 6 3 SPEED 4 TRACK Stereo Tape Deck

The breathtaking performance and brilliant versatility of this remarkable instrument can be matched only by pride of ownership. From every aspect... design, engineering and styling... it is the stereo tape deck demanded by the critical user for incorporation into existing Hi-Fi systems. Review the major features. Hear, see, try it. The results will be more than convincing.

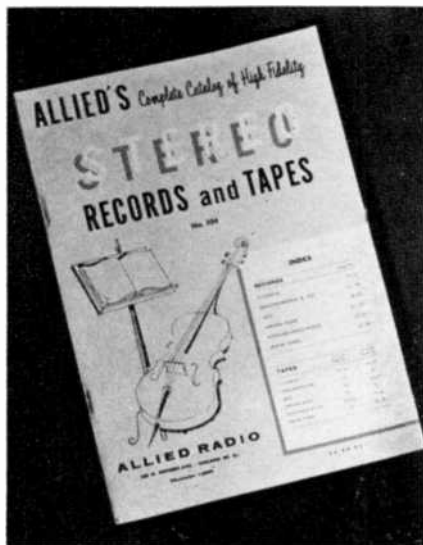
- 3 separate heads for record, playback, erase. (.00052" recording head gap; .00012" playback head gap.)
- Self-demagnetizing circuit; Pabst Hysteresis motor.
- 4 track stereo or monaural record; built-in remote control.
- Sound-on-Sound simultaneous record and playback.
- Direct monitor from signal source or active recording.
- High and low level input; wide range of frequency response.
- Silent pause, start-stop, control; push button operation.
- Digital counter; dual pulsating recording level indicator.

Remote control switch available.

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NEW PRODUCTS

NEW CATALOG FROM ALLIED



Allied Radio Corporation, 100 N. Western Avenue, Chicago 80, Illinois, is giving free upon request a copy of its Stereo Record and Tape Catalog No. 104. This handy reference lists over 1000 records and 400 tapes. It is divided into three sections: records, 2-track tapes, and 4-track tapes. The catalog lists classical records and tapes alphabetically by composer. Popular, jazz and other types of music are listed by performing artist, group, orchestra or title. In almost every case, a complete run-down of selections is given. Write to Allied for your free copy.

TAPE GUIDE CONNECTOR

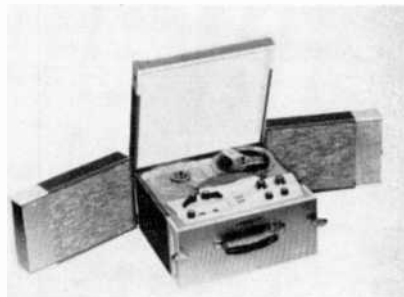
Tunetime Recording Enterprises is marketing a tape guide connector which is a threader for properly connecting tape to reels. According to the manufacturer, it completely eliminates pigtail threading, prevents tape fraying and holds a loaded reel from spilling. The guide connector grips the take-up reel securely, and on empty reels it releases automatically. It is approximately 5" in length and is made of cellulose acetate which incorporates a special non-slip surface on one side with a pressure sensitive adhesive tongue ready for joining to tape ends. The item retails at 5 guide connectors for \$1.00 or 10 for \$1.50, available from the manufacturer, Tunetime Recording Enterprises, P.O. Box 652, Adelaide St. Postal Strn., Toronto, Canada.

TAPE TIMING DEVICE

General Transcription of America, 1830 S.W. 4th St., Miami 35, Florida, markets a tape timing device which is printed on stiff, heavy paper and which can be used in three ways: as a ruler to paste down on your tape recorder; as a ruler in your hand; or it can be purchased on a tape

reel ready for use. By itself it sells for 50¢; on a reel ready to use it sells for \$1.75. This timing device covers the 7½ and 3¾ ips speeds of tape in one scaling. For additional information, write to the producer.

4T STEREO RECORDER KIT



Heath Company, Benton Harbor, Michigan, has just announced a new 4-track stereo recorder kit. The AD-40 has a 4-track stereo head which makes it compatible for recording and playing any stereo or monophonic tapes. In addition to 4-track stereo recording, four individual tracks of monophonic material can be recorded on a single reel of tape, and by using an external "mixer," sound-on-sound recordings are possible. Versatile controls include "fast-forward" and "rewind," and the "function-selector" offers a wide list of unusual performance possibilities. Other features include: individual tone and volume controls; monitoring switches; pause button; and two eye-tube recording level indicators. Power response is plus or minus 2 db 50 to 15,000 cps at 3 watts; total harmonic distortion is less than 2% 50 to 15,000 cps at 3 watts; hum and noise is -45 db or better at 3 watts; and power requirements are 105-125 volts, 60 cycles, 110 watts. "Swing-out" speaker wings form the sides of the cabinet in carrying position and may be detached for proper stereo spacing. Each speaker wing contains a 7½" woofer and a 2" x 6" oval tweeter. This kit is priced at \$179.95. Write Heath for more details.

NEW RCA TAPE

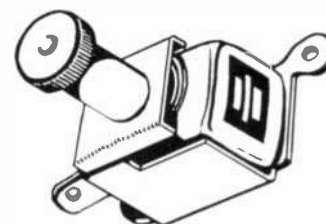
RCA, Harrison, N. J., has announced the addition of four new "Mylar" magnetic sound tapes to their Vibrant series tape line. They are as follows: (1) Extra-play (900 feet) 1.0-mil by ¼ inch "Mylar"—base tape on a 5" reel (Type 707C1). (2) Extra-play (1800 feet) 1.0-mil by ¼ inch "Mylar"—base tape on a 7" reel (Type 708C1). (3) Double-play (1200 feet) ¾-mil by ¼ inch tensilized "Mylar"—base tape on a 5" reel (Type 709C1). (4) Double-play (2400 feet) ¾-mil by ¼ inch tensilized "Mylar"—base tape on a 7" reel (Type 710C1). For prices and additional information on these and other tapes, contact the manufacturer.

VEGA-MIKE



Vega Electronics Corp., 10781 N. Highway 9, Cupertino, Calif., has introduced the Vega-Mike. This wireless microphone weighs only 7½ ounces complete, and it measures 1" in diameter by 5" long. It affords completely unrestricted mobility to the speaker. It is actually a completely self-contained miniature FM broadcast station, including transistors and battery. Even the neck strap which supports the mike is part of the system, acting as an antenna element. Power output of the FM Vega-Mike is no more than 20 thousandths of a watt, but its useful range may be a half mile or more. Operating frequencies range from 25 to 45 megacycles, in channels assigned by the FCC for general business and broadcast relay use. Price of the Vega-Mike alone is \$249.75. A specially-designed FM receiver for use with it is priced at \$267.75. When purchased together as a complete system, the combination sells for \$495.

WEBCOR CONVERSION KIT



Webcor, 5610 W. Bloomingdale Ave., Chicago 34, Ill., is marketing a stereo conversion kit which will convert all series 2800, 2900, and 2000 (except 2020) monophonic and stereo Webcor tape recorders to 4-track stereo playback, while retaining all existing record and playback facilities. The kit features a Nortronics laminated 4-track r/p head mounted in a convenient head-shifting assembly which readily permits shifting between 2-track and 4-track stereo playback positions. Completely assembled for easy installation. Designated the Model W-6, this Webcor kit nets at \$36.00.

INDUSTRY NEWS

VIKING OF MINNEAPOLIS is expanding its manufacturing facilities to the tune of \$250,000. It has completed an 11,000 sq. foot addition and plans another 23,000 feet in nearby Savage, Minn. The additional area will be used for the making of background music equipment and educational systems.

REVERE CAMERA COMPANY announces the appointment of J. C. Landen as Director of Marketing, a newly created position. He will be directly responsible to Theodore S. Briskin, Vice President and General Manager. Mr. Landen came from the Reflective Products Division of Minnesota Mining. Dave Gassner continues as Sales Manager.

ROBINS INDUSTRIES has revised its Tape Recording Head Reference Guide which it sells for 50 cents. The booklet gives all original and replacement head numbers for a wide variety of machines.

AMPEX CORPORATION will merge with Telemeter, with Ampex being the surviving corporation following stockholder approval. This will increase Ampex's abilities in the field of data processing and computer system manufacture.

RCA has expanded its tape line and also has developed a low cost "drift field" power transistor which makes it more practical to include transistors in regular sound equipment. The transistor is a p-n-p germanium type which can be used in both Class A and B audio amplifiers.

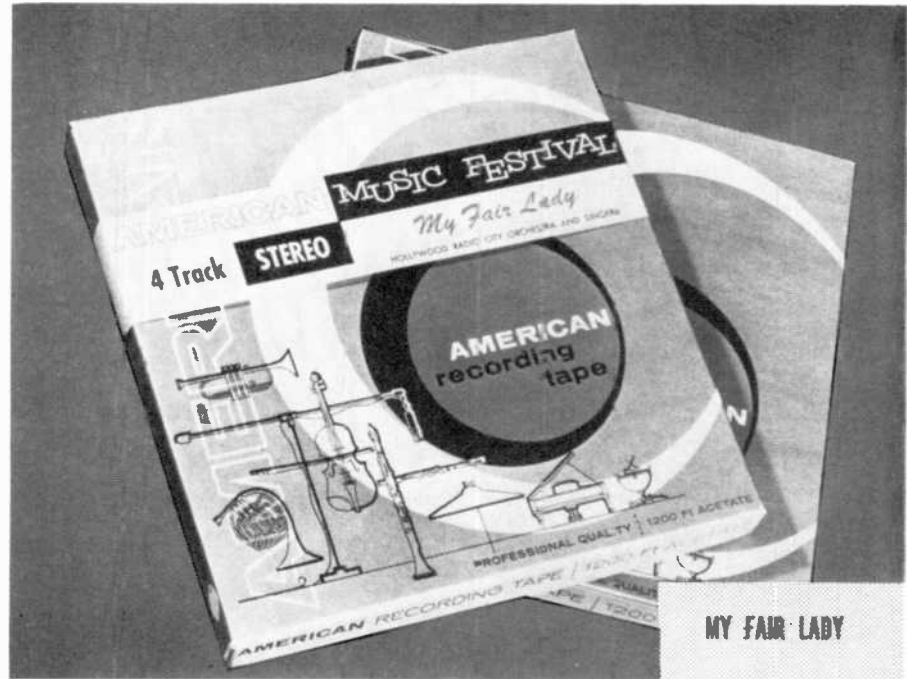
AMERICAN CONCERTONE has issued a new tape recorder Merchandising Manual for dealers which includes sales promotion ideas, merchandising techniques and service programs including complete details on their recorder line. It is available to dealers only.

TELECTRO has set up a new affiliate Telectro-Mek for the development and manufacture of electronic and electro-mechanical products for determining and controlling jet engine performance. Telectro-Mek will have offices in Fort Wayne and South Bend, Indiana.

INSTITUTE OF HIGH FIDELITY MANUFACTURERS has set show dates of April 4 through 9 for Los Angeles. The Ambassador Hotel will be the site.

AMPLIGRAPH CORPORATION, Sudbury, Mass. is a new recorder manufacturer offering the Model 66 Stereo Tape Deck for use with audio components. The prototypes have had a two year field test. New firm is at Box 103, Sudbury, Mass.

SHURE BROTHERS has started construction of a 38,000 square foot manufacturing addition at the Evanston location. . . . Edward Schmidt, VP of New Product Development of Reeves Soundcraft has been elected a manager of the New York Section of the Society of Motion Picture and Television Engineers. . . . Dave Libsohn has been named sales manager for General Magnetics and Electronics, Inc. makers of the new Gemark recorder. . . . Audio Engineering Society has elected



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Your choice of 10 complete Stereo Tape Albums valued at \$6.95 and \$9.95 for the price of standard blank magnetic recording tape. One reel of music with one reel of blank tape (1200 ft. 1½ mil acetate - 7½ ips - 2 track or 4 track) in American's beautiful Twin-Pack. This exciting offer brilliantly demonstrates the superior quality of American Recording Tape.



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Dr. Harry F. Olsen of RCA Labs as president. Hermon H. Scott, L. R. Burroughs and Pell Kruttschnitt are new vice presidents. C. J. LeBel was re-elected secretary and R. A. Schlegel, treasurer. . . . Frederick G. Ramback is now national sales manager for Ampex Professional Products. . . . Irving Rossman was elected president of Pentron Electronics Corporation. He was previously president of Pentron. . . . Theodore Rossman was elected to Chairman of the Board. . . . Hugh J. Daly is now vice president in charge of sales for Globe Electronics in Omaha. Paul Bunker will become the new Magnecord sales chief. . . . John D. Worrell is new vice president in charge of sales at Nortronics. . . . Joseph F. Dundovic will become administrative vice president.

* RECORDING TAPE

 <p style="font-size: small;">SEND FOR FREE CATALOG plus postage</p>	<p>*Outside guaranteed not to rub off or squeak—no 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.</p> <table border="0"> <tr><td>800' acetate (plastic), 5"</td><td style="text-align: right;">.75</td></tr> <tr><td>900' MYLAR (Polyester), 5"</td><td style="text-align: right;">.95</td></tr> <tr><td>1200' MYLAR, ¼ mil, 5" reel</td><td style="text-align: right;">1.28</td></tr> <tr><td>1200' Acetate (plastic), 7"</td><td style="text-align: right;">1.29</td></tr> <tr><td>1200' MYLAR, 1½ mil (strong)</td><td style="text-align: right;">1.95</td></tr> <tr><td>1800' acetate (plastic), 7"</td><td style="text-align: right;">1.79</td></tr> <tr><td>1800' MYLAR 1 mil thick, 7"</td><td style="text-align: right;">2.69</td></tr> <tr><td>2400' MYLAR, untoned, 7"</td><td style="text-align: right;">2.69</td></tr> <tr><td>2400' MYLAR, toned, 7"</td><td style="text-align: right;">3.49</td></tr> </table> <p style="font-size: x-small;">Studios, Large Users Even Lower</p>	800' acetate (plastic), 5"	.75	900' MYLAR (Polyester), 5"	.95	1200' MYLAR, ¼ mil, 5" reel	1.28	1200' Acetate (plastic), 7"	1.29	1200' MYLAR, 1½ mil (strong)	1.95	1800' acetate (plastic), 7"	1.79	1800' MYLAR 1 mil thick, 7"	2.69	2400' MYLAR, untoned, 7"	2.69	2400' MYLAR, toned, 7"	3.49
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TAPE CLUB NEWS

World Tape Pals on TV



Harry Matthews, founder-president of World Tape Pals, Inc., was interviewed about the organization on the ABC-TV nation-wide program, "About Faces" on October 31.

World Tape Pals was featured in a coast-to-coast television program October 31.

Harry Matthews, president of WTP, was interviewed by Ben Alexander on the ABC network program, "About Faces."

Matthews told of getting the idea for World Tape Pals after learning how a tape he sent his son in Korea brought a bit of cheer to a company of homesick marines on Christmas.

He also identified photos of WTP members which his wife, Marjorie, had provided for the unrehearsed program. These included school children making tapes in Germany and the Cook Islands and Gerald Burnett of Honolulu with a Hawaiian teacher taping music from a native reed organ for World Tapes for Education. This branch of WTP is directed by Bob Brunson of the Oklahoma City school system.

"About Faces," a Ralph Edwards production, also flew Mrs. Matthews to Hollywood as a surprise, and Harry did not know she was there until she appeared on the program. The producers estimate that each program is viewed by more than 20 million persons.

Matthews was presented with 132 reels of tape for the educational branch in Oklahoma City.

Distaff Tapes

Jane McDowell, the only woman radio announcer on Station 3SR, Shepparton, Victoria, Australia, wants tapes from the distaff side of World Tape Pals about how women live in other countries. She received an extremely interesting and easy-listening tape recently from Gina (Mrs. Frank) Weston of Tanganyika about how the European women in East Africa manage their households.

New Chartered Reels



Two groups of World Tape Pals members on opposite sides of the United States have applied for Charters as Chartered Reels #2 and #3. The above photograph was taken as WTP's in the vicinity of Seattle, Wash., organized Reel #2 at the home of Dorothy and Ito DiLuck, on Sept. 17. Paul Dickinson, 6223 N.E. 184th St., Seattle 55, was elected president of Reel #2.

Application for a Charter was received from WTP members in the vicinity of New York City. List of officers and complete list of members has not yet been received. Reel #3 is being organized under the leadership of Arthur Schlesinger, 1 West 64th St., New York 23, N.Y.

New ATE Director Buckles Down

The new director of American Tape Exchange, Cortlandt Parent, Jr., is hard at work carrying on the functioning of the club now that Stuart Crouner is no longer managing it. Stu did an excellent job of organizing and running this club and the enthusiasm Cort shows indicates that he will do equally as well. There will be no changes in ATE policy. We urge all members to cooperate with Cort in continuing the fast build-up this club is experiencing. This club has grown faster than any other new one in recent years. Good luck Cort.

CTRI Contributes Tape

Catholic Tape Recorders, International, recently contributed fifteen reels of magnetic tape to Rev. Father Molina, S.J., of Quito, Ecuador, for his new radio station just founded by him. The tape was originally contributed to the club by Karl Byarski of Kinde, Michigan. The new radio station plans to combat Communist propaganda over another radio station in that country. We couldn't think of a much better use for the tape.

Illiana District Election

Elections are now under way in The Voicesspondence Club's Illiana District to fill its vacancy on the Club's official board. The Illiana District consists of the States of Illinois and Indiana, and Dr. Ernest Norris of Culver, Indiana, has been nominated for the post. Other VS members in the District are also eligible for election, and only those residing in the District may vote. The Club's official board is com-

posed of representatives from each of the Districts into which the U. S. and Canada are divided, and each representative is elected by the members in his District.

South African Representative

The Voicesspondence Club recently appointed Mr. Jan Abraham de Villiers of Cape Town as South African Publicity and Membership Representative of the club. Jan is active in the Cape Town Recording Club and is most enthusiastic about getting new members for VS. His signature tune for most tapes is "I Believe in Friendship," and he will be pleased to receive tapes from members in any part of the world. South African members especially are invited to write or tape him relative to VS matters and he will send on to club headquarters anything requiring their direct action.

JOIN A CLUB

AMERICAN TAPE EXCHANGE
Cortlandt Parent, Secretary
Box 324
Shrub Oak, N. Y.

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

STEREO INTERNATIONAL
c/o Roland Hahn
2001 W. Devon Ave.
Chicago 45, Ill.

THE VOICESPONDENCE CLUB
Charles Owen, Secretary
Noel, Virginia

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

ENGLISH SPEAKING TAPE RESPONDENTS' ASSOCIATION

Robert Ellis, Secretary and Treasurer
Schoolhouse, Whitsome By Duns
Berwickshire, Scotland

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's column is a continuation of a series begun in September on the theory and practice of instruction in modern foreign languages.)

It is not unusual to hear that language teaching should begin in the third or fourth grade. Actually, it would be far better to start language learning in the first grade, or, better still, in kindergarten. Ample practical experience exists to show that children who start learning a foreign language in kindergarten or in the first grade have little or no difficulty learning the language from the beginning without translation. They learn directly in the new language.

A first essential in direct language learning (i.e., learning directly in the new language without translation, and usually with little or no instruction, direction, or comment in the basic "mother" language) is a teacher who is fluent in the language to be learned and who is personally convinced that the new language can be taught without constant recourse to the base language.

A second essential is a clear understanding of the type of programming of instructional materials that will create strong, clear images and good retention of the new language even though only a few hours a week can be spent on the new language.

"Programming" is a relatively new term which has developed in connection with electronic computers. Programming refers to establishment of a sequence of steps of feeding information and instructions into the computer. If the computer is properly programmed, it will have all the instructions and information necessary to solve a given problem.

In a similar fashion, the term "programming" is now in common use in connection with teaching machines. Teaching machines are devices which present information and/or questions to the learner in a sequence which is intended to produce learning, testing, and self-correction by the student. In this connection, "programming" refers to the sequencing process by which the information is presented.

Recent studies in instructional programming requirements for teaching machines have shown clearly that the improved teaching-machine techniques of presenting information can equally well be used in presenting instruction through a teacher, or even through a non-teaching-machine self-learning program.

The programming requirement, of course, varies from individual to individual and from subject matter to subject matter. Nonetheless, the principles remain the same. *Information must be presented in small, logical, manageable bits.* Each bit should be learned, thoroughly instilled into the mind, and tested for retention before the instructional process moves on to the next bit of informa-

tion. Presentation of too large a chunk of information at a time results in confusion, failure to grasp the desired bit of information, and—consequently—inefficient learning or no learning.

The size of the "bit" of information which can be learned depends in considerable measure upon the inherent capabilities of the individual learner as well as his learning readiness for the particular sequence of information or instruction.

Similarly, the speed of progression from bit of information to bit of information is also dependent upon the abilities and learning readiness of the individual student.

As a converse, of course, it is worth noting that introducing information in excessively small bits, or progressing at too slow a rate results in boredom, loss of interest, lack of attention, and inefficient learning.

It is the potential ability of teaching machines to permit the learner to receive information and instruction in bits that are the right size for him and to move forward at his own proper rate of advance which produces so much optimism about the value of teaching machines in future educational processes. Upon completion of this series of columns on instruction in modern foreign languages, we intend to do a short series on teaching machines so we will not go into great detail about teaching machines at this time.

Suffice it to say for the moment that the principles being developed for machine teaching will undoubtedly also have great impact on classroom instruction techniques.

Unfortunately, at the moment, much of what is new and potentially valuable in understanding the processes of language learning is being clouded by efforts to make the new knowledge conform to traditional thinking and traditional classroom teaching practices.

The consequence in language instruction is frequently to produce a language situation in which the learner may have had much instruction, yet not be able to make any real use at all of the materials taught to him.

In many ways this is like the experience all of us have had at one time or another of going into the kitchen and finding the refrigerator and cupboards full of meat, vegetables, spices, flour, and so on *and yet not being able to find anything to eat.* The elements are there, but not yet assembled in usable form.

The fundamental errors, of course, stem from the fact that most foreign language teachers in this country *are not fluent in the foreign language they are supposed to teach.* As a result, the teacher teaches in English and teaches *about* the foreign language. The students think in English, ask their questions in English, and do not ever learn to think in the foreign language.

(To be continued next month)



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FEEDBACK

Excerpts from readers' letters will be used in this column. Address all correspondence to: The Editor: TAPE RECORDING, Severna Park, Maryland.

Magazine Tape Deck



The Simon Minstrelle machine uses the Garrard magazine tape deck.

To the Editor:

An article by Jean Cover in your issue for November 1960 encourages the undersigned to mention that here in Great Britain, we have a magazine loaded tape deck which is being used by a number of manufacturers with great success. So versatile is the magazine that no material need be lost since a new magazine can be loaded onto the machine in about two seconds, and indeed the whole operation can be executed during a pause either in music or speech.

The principle is entirely different from anything which has appeared in the United States. The quality of the machine is of a very high order and, in all technical press has been highly commended. With the magazine deck there are no cumbersome operations, such as spillage, threading or other mechanical operations which do not contribute to recording progress.—G. E. Spark, Garrard Engineering and Manufacturing Co. Ltd., Swindon, England.

Ed. Note: One of the machines is the Simon Minstrelle which incorporates the Garrard magazine tape deck. It runs at 3 3/4 ips and is dual track with a playing time of 35 minutes per track. The tape is housed in a transparent plastic case.

Hip Subscriber

To the Editor:

Hey cats. Hit me with your cool magazine like Fastville, man. Do not delay. Okay Man, like I'm impatient. Roger and out. Findsville one American Dollar enclosed.—Fred Apelian, Jr., Clifton, N. J.

You've been bit, dad. Issue left this pad like a gone rocket.

Ho Likos Acotate Tape

To the Editor:

I would like to complain about some of the advertising that appears in your magazine as well as others. I refer to those companies who advertise that their "Mylar" tapes will stretch before breaking. This is just like having a warped record. This type of advertising only encourages me to

use acetate tapes because it will break clean before stretching should anything malfunction with the recorder. It is probably true that "Mylar" can withstand a wide range of temperatures but do the average person's tapes ever come into contact with anything else other than what may be called a "Normal range of temperature." My acetate tapes (while in their boxes) have been subjected to rain and cold in the process of being carried around without any noticeable defect in fidelity. With this in mind, why pay extra for "Mylar?"—Leonard Zandel, Washington, D. C.

As we recall, the point at which Mylar begins to stretch is above the breaking point of acetate. We have also seen reels of acetate tape which have been subjected to low humidity contract to the point where the center hub was actually crushed by the pressure and the reel flanges bowed out of shape. Both acetate and Mylar tapes have their place and advantages, that's why both are on the market. The double play tapes, for instance, are only possible with a Mylar base. As you have mentioned, Mylar is neither affected by heat nor changes in humidity and to some people, this complete freedom from storage worries is more than worth the slight extra cost. Under normal operating procedures, the stretch point of Mylar is not reached on a tape recorder. The exception is the double-play tapes which must be handled with extreme care.

Classical Music Timetable

To the Editor:

In reference to article "Plan Ahead" in your November '60 issue, your readers may be interested in the "Time Table for the Classical Repertoire" by William Colbert, published by William Colbert, c/o The Audio Exchange, Inc., 153-21 Hillside Ave., Jamaica 32, N. Y., 34 pp., soft cover, \$2.75.

This is an inexpensive little booklet, but it may be worth the money to tape recorder fans who do a lot of recording off the air. Listed therein is the average time for over 1200 compositions, allowing the recordist to select the optimum length of tape for most classical selections.

Mr. Colbert claims an accuracy of plus or minus 10% for orchestral and plus or minus 20% for solo performances. Operas, however, due to various cuts made in performances, are more variable in playing time.

The So. Calif. Gas Company's monthly program (local) also lists the playing time for selections.—Alice L. Bethel, Gardena, Calif.

Our thanks to M's. Bethel for this information which we are sure our readers will appreciate.

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." TAPE RECORDING, Severna Park, Maryland. The most interesting and widely applicable questions will be used in this department.

Now It Works—Now It Doesn't

Q—I have a problem in tape recording which I think you might be able to solve for me.

I have a Gibson Electro Harp (which is a Hawaiian guitar with harmony pedals). With it and two Webcor recorders I have been making recorded duets and trios with a plain mixer.

To accomplish this I first plug the Electro Harp direct into the input jack of one of the recorders to make a recording. Then, I play that recording through the external amplifier jack of one of the recorders through a cable to a connection on the mixer and also the Electro Harp to another connection on the mixer to record duets and, later, sometimes a trio on the other recorder; all of which is done without the use of a microphone.

When using a mixer for this procedure, it works very well for a little more than an hour and then the recording stops and I can't get any recording at all from either recorder. But after they are left out of use for two or three days they will again work about the same for a short period.

I can make better recorded duets and trios with the use of a mixer instead of a microphone as long as it will work, so I would like very much to learn a way to make the mixer work as long and as often as desired, instead of such a short period. If you know what causes this trouble please let me know.—*F. L. B., Quincy, Wash.*

A—You apparently are plagued with what is known as an intermittent. This is a difficulty which shows up only after a period of operation and which disappears after a period of time only to recur again.

It is usually caused by a faulty tube, resistor, capacitor or other component which works while cool but shorts out or opens after it reaches a certain temperature.

Your problem is to pinpoint which of the three units has the difficulty. We would suggest you disconnect the two recorders from the mixer and turn them all on. Leave them this way and, after a few hours, try each separately. Play and record on each recorder. If both machines perform then the trouble most probably is in the mixer. Check this by plugging the guitar into it and then plugging it into each recorder separately.

You can check on the guitar pickup and/or amplifier by recording directly into one of the machines without the mixer. Failure will probably occur on one of these tests and from there it will be the job of a serviceman to determine exactly which component is failing and to replace it with a new one.

Timing Off

Q—I have an answer for those who have quite a collection of monophonic records and who want to preserve them

and, at the same time, make them sound a little better.

Taping records is "old hat" but try recording them in stereo with the help of a stereo recorder (I have a brand new Uher Stereo Record recorder) using a Y audio cable connector from the amplifier or phonograph. The Y cable can be had from any radio supply house (I got mine from Lafayette Radio for a nominal amount). Incidentally this method can be used in recording from radio or television.

I also have a question, or rather, a problem. I have a portable transistor Grundig Niki recorder which, for a miniature and modest-priced recorder, works fine. The problem is that I cannot play back the tapes on my Uher recorder. The tape speeds— $3\frac{3}{4}$ —do not quite match, although both are specified according to international standards. The Grundig tape is slow at the beginning and fast at the end. There are a few moments in the middle of the tape when everything is OK. What gives? Can anything be done about it?

As far as I'm concerned, your magazine is the one and only tape recording news media on the market. Keep up the good work and especially your stereo tape reviews.—*W. H. H., Williamsport, Pa.*

A—Assuming that the Niki plays back the tapes satisfactorily, the simplest solution would be to feed the output of the Niki into the Uher and thus obtain a true speed copy. The original tape can be reused and the copy kept. If the Niki uses the same drive system as the Grundig dictating machine, which has no capstan and roller but instead pulls the tape directly from one reel to the other, there will be the speed variation you mention due to the increasing diameter as the amount of tape increases on the takeup reel. This would produce the slow at the beginning and fast on the end difficulty which you mention.

We know of no other practical way to correct the difficulty except through the use of a variable speed recorder of which there are only a very expensive few on the market. Your stereo taping of mono records sounds interesting and should produce some fine results.

Answers W. E. H.

Here is another possible answer to W.E.H., on his question on page 17 of the November issue. (difficulty with crosstalk between channels—Ed.)

He may be playing through tape head inputs of a stereo amplifier. To play one track only he switches the amplifier to monaural position but leaves both channels connected to the tape inputs; preamp section might still pick up some of channel 2. To see if this is the trouble, simply disconnect lead from channel 2.—*Chas. S. Miller, Jr., Tampa, Fla.*

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SYNCHRONIZE YOUR SLIDES WITH TAPE

by Mark Mooney, Jr.

... a number of synchronizers makes it easy to have slide shows for home, business or school.

WITH the increasing versatility of slide projectors, which will go forward, backward and even focus by remote control, has come a number of devices to make the operation completely by utilizing signals on tape to operate the projector while presenting the narration at the same time.

Slide-tape shows have a number of important advantages in home, school and business. They are adaptable to a wide variety of purposes and are very much less expensive than a similar time value in motion pictures.

They can be produced by anyone and can bring the family color slide album alive. They permit changes in narration or slide cuing and even the same set of slides may be used over again for different purposes with a change in narration.

In the present article we will cover only those synchronizers and projectors which may be used with any recorder. Combination recorders and projectors, of which there are a number, or recorders with built-in synchronization have been omitted. These will be covered in a later issue.

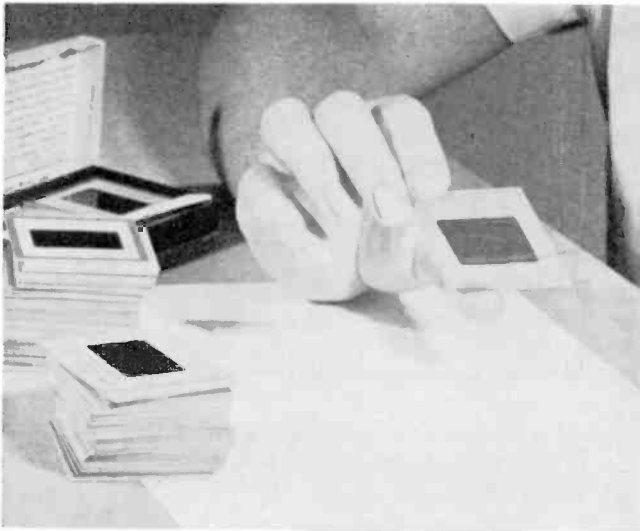
Planning the Slide Show

In many cases the slide show can be planned in advance, long before the first picture is shot or the first word taped. This is especially true where the show is intended for instructional or promotional purposes.

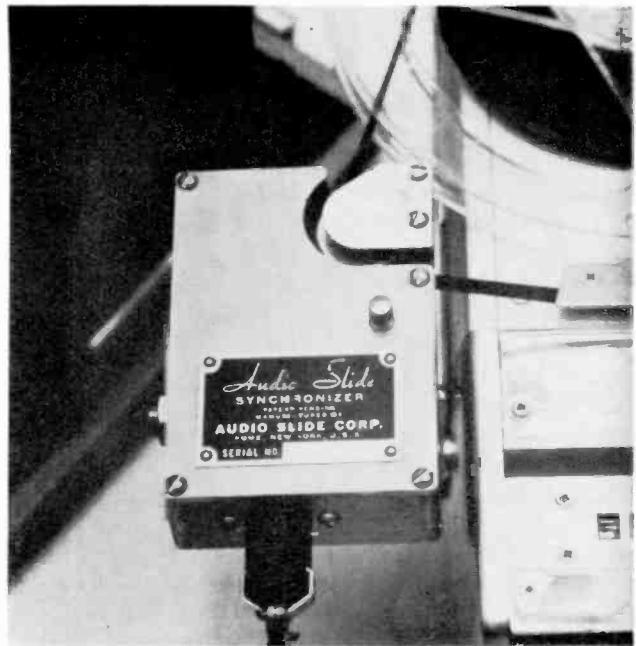
Vacation slide films do not, generally, lend themselves to advance planning for it may not be possible to decide what pictures you will shoot until you actually arrive on the scene. Even so, some basic continuity can be lined out.

Slide shows that can be planned must be thought out carefully. There are a number of important points for consideration:

- 1—To whom will the presentation be shown? The general public, school children, salesmen, trainees in industrial processes? What is the specific and most important audience?
- 2—Is the show for instruction, entertainment or promotion?
- 3—What is *the* story of the picture sequence?
- 4—How is the story to be told?
- 5—How long will the show run?



Above: slides may be quickly viewed by looking through them at a white illuminated paper on the desk top. This saves time. Right: the Audio Slide synchronizer which employs slits in the tape to actuate the projector. Middle right: the Synchroslide unit has a lamp and photocell which picks up a reflection from white tabs on the tape. Lower: the Meston synchronizer uses metallic tabs on the tape which form a conductive path across two contacts.



6—Technical details, subjects, locations, narration, background music, etc.

The determination of the nature of the audience will in a large measure, determine how the subject is approached. Obviously a sequence intended for school children would have to be on a much lower level than one intended for a more mature and sophisticated audience. Likewise, a sequence aimed at telling salesmen how to sell would be unsuitable for general public showing. A training film on an industrial process can speed the learning of folks on the job but would make a general audience fidget. Determine first your *principal audience*.

Of course, the same slide sequence, with different narration, might be used for a number of purposes equally well and it is here that slide shows can outperform movies, especially when the cost is considered.

A second point of great importance is "What is the story to be told." There should only be one story to a program, especially if you are interested in putting that story across with dramatic impact. Any slide or narration which does not contribute to the central theme should be eliminated. This is best done in the planning stage before the slides are shot, or the script written.

Many times the story can be summed up in one word and then every part of the production should be tied to it. For instance, supposing a sequence is made for a charity, to solicit contributions. The obvious thing to get across to the audience is "Give." Toward that end the *need* must be stressed in every sequence until the audience feels like reaching down in its pocket to help alleviate some of the conditions shown in the pictures.

Pictures of the charity headquarters or the person in charge relaxing after a 72-hour week, for instance, would do nothing to depict the *need* and hence such shots should be excluded.

An instructional sequence would have as its key the word "instruct" and every frame should show clearly and concisely one step in the process to be taught.

Sequences designed for entertainment, such as vacation experiences, are not so demanding as other types but even



so a central theme should be followed. It might be "beauty" or "historic interest" or just plain "fun." In presentations like this, usually designed for a general audience, the central theme can be accompanied by side themes. There is no reason why historic interest cannot be combined with beauty, for instance.

How the story is to be told should likewise be settled in advance. What is the most effective method for the subject at hand? What method will have the greatest impact on the audience and create the most lasting impression. Naturally, the subject and the prospective audience will, to a large measure, determine the most appropriate kind of story telling.

Returning to our charity drive example, would it be better to show the progress of a bum dredged out of the gutter and his rehabilitation step by step, or should the sequence show a number of different cases of need, hungry and ragged children, destitute families, a charity worker delivering food and clothing to people obviously in need.

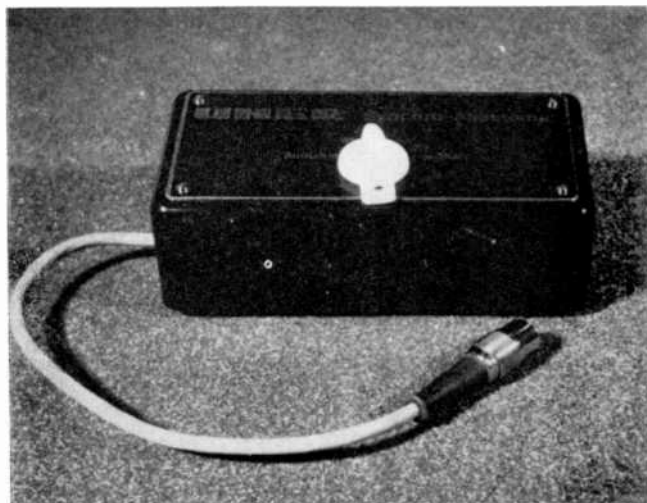
What will have the greatest impact?—what does your prospective audience want to hear?—how do you want your audience to react?—thought on these things should enable you to determine how the story should be told.

How long will the show run? Experience has shown that an hour is about tops for almost anything. Beyond this point some members of the audience are likely to get the fidgets and this in turn seems to spread to others.

One of the theories involved in the running of games for youth states that the game should be discontinued at its height and another game substituted. Then the memory of the game is one of great enjoyment and the next time it is suggested it will meet with an enthusiastic response.

The same principle might well be applied to slide presentations. Take your audience to the peak, wrap up your subject and leave them there with a fine, enthusiastic impression that will make them remember your point. Belaboring the issue will only add to the mental confusion of the audience, especially if the subject is new or strange. So plan for as much time as you need—to tell your story well—and no more.

Of technical details there are many. Some of them such as the subjects, actors, locations needed, etc. will hinge upon your earlier decisions as to the purpose of the show, how it is to be told, etc.



The Akustomat device for the Uher recorder will either operate the recorder in voice actuation or may be used to operate a projector for slide shows.

As with the production of a movie, you should make up a story board for a slide sequence. This consists of putting a brief description or sketch of each scene on a separate card and then arranging the cards in the sequence desired. By this means, the cards are easily shifted to new positions if a change is deemed in the best interests of the continuity.

Again, as in the case of motion pictures, the technique of long shot, medium shot and closeup can be employed in slides. The long shot serves as an introduction to a new subject, as the camera is brought in closer, more detail becomes apparent and in a closeup or closeups, individual parts or people may be shown and explained. A card for each shot in the sequence should be included on the story board.

Once the lineup on the board is satisfactory, the script may be written using the cards as a guide.

It will be necessary to rough out, on the basis of the total time available, how much time may be devoted to each shot or series of shots and the script must be tailored to match these times.

The long shot, medium shot and closeup shots might be changed from one to the other during a continuous narration which covers all three.

You will also have to tailor the time change sequence to the slide-tape synchronizer you are using. Some require a definite interval to elapse between slide changes and one operates on a four to eight second silent period on the tape. Others may zip slides through one after another with no regard to interval and with some projectors and synchronizers it is possible to back up in the slide sequence as well as go forward. So the script should be written to take advantage of whatever your equipment can do.

The script should be written, whether it is for a film sequence on your vacation or a professional presentation. Only with a written script is it possible to achieve accurate timing and positive delivery.

The selection of the voice to do the narration is important to the final effect of the presentation also. Where a somnolent voice with pear shaped tones might be fine for a travelogue or a sequence depicting the beauties of a region, such a voice would not be suitable for a sales presentation film designed to enthuse a bunch of hard-boiled sales representatives.

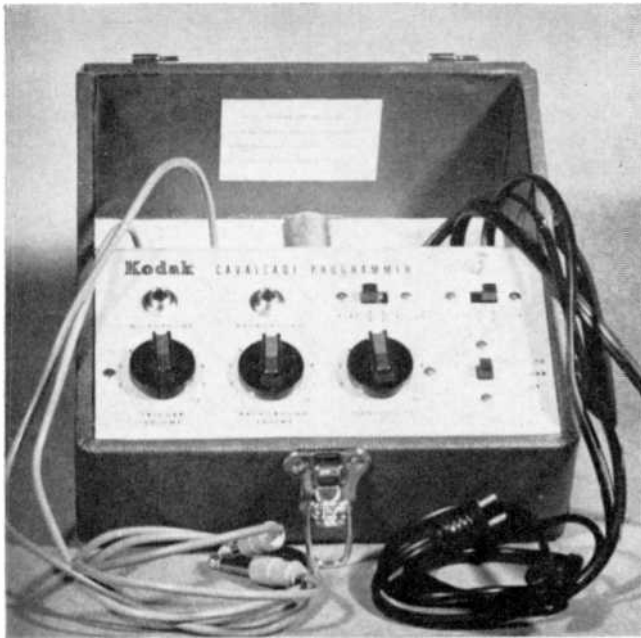
Vacation type shows or shows built around the home might well be narrated by the family members, thus providing a close and more logical tie with the surroundings.

In the matter of background music for use in presentations care is needed on two points. 1—the music must be suitable to the theme and tempo of the presentation and 2—it must be legal to use it.

The latter is true if the shows are made for commercial purposes. Music for such shows should be secured from tunes in the public domain or from some of the sound effects libraries which have collections of music cleared for such use. Composers and musicians make their livings from the sale of their products—in this case music—and using the result of their efforts without compensation to them has been viewed very dimly by the courts.

For your home slide shows, however, which are non-commercial, it is doubtful that any complaint would be raised.

The sound effects libraries also have hundreds of records of recorded sounds of all descriptions which may be used freely wherever needed.



Above: the Cavalcade Programmer by Eastman Kodak acts as a mixer as well as a synchronizer. It uses a 6000 cycle tone placed on the same track as the narration. Right: the Bausch and Lomb Balsync puts the signal on the second track of a stereo pair to operate the projector.

Only when your plans are complete and you know just what you are going to do, should you begin to assemble and record your show. While it may seem like it is making a big production out of something simple, you must remember that your efforts will be unconsciously compared to professional productions which do follow a complete routine.

The Slides

We are not going into the actual photographic problems connected with the making of the color slides. We should mention, however, that in quality they must be the best you can do. Each slide should be clear and sharp and the color accurate. If it isn't, do not hesitate to discard it—or at least keep it out of the show. Your audience should see nothing but the best that you have, presented as dramatically as you know how.

The elements of good picture composition should not be overlooked for it is through the use of these elements and the placement of the subjects in the picture space that you are able to make a forceful picture that will carry the impression you wish to convey. Confused slides will mean a confused audience.

The preliminary sorting of slides is easiest done by viewing them against a white card placed on the desk top and illuminated with a lamp or on a sheet of illuminated frosted glass. The bad ones will become obvious quickly and this saves time in running them through the projector.

Of course, when the selection has been narrowed to close to final, the slides should be projected full size and any which do not contribute to the story line or which do not project well should be removed.

The Synchronizers

The simplest form of synchronization goes back to the old days—with the use of a bell sound or "cricket" to indicate when a slide is to be changed. This is recorded on the tape between pauses in the narration and the



slide projector is operated by hand on this signal.

Even with a simple setup like this the results are superior to making an extemporaneous talk in the dark while showing the slides. In addition, the use of taped narration permits identical show repeats, important in teaching and sales work, and the use of music in the background.

Next in order of simplicity is the Revere synchronizer which operates on periods of silence. Any quiet spot on the tape from four to eight seconds in length will trip the synchronizer and cause the projector to change slides. This method, of course needs no tabs or signals on the tape and may be worked on both tracks of a dual track tape, or all tracks on a four-track tape.

The Audio Slide device employs a slit cut in the tape parallel to the tape edges. This does not reduce the strength of the tape appreciably and since the slit is cut in the center of the tape, it will not cause interference with either of the tracks on a dual track tape. Since the slits are centered the tape may be used only in one direction.

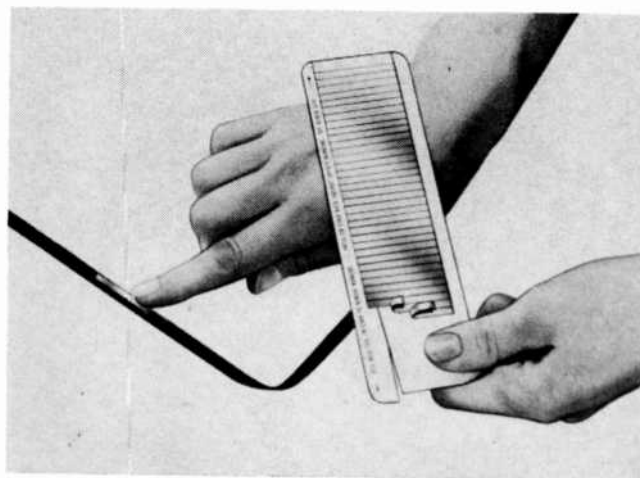
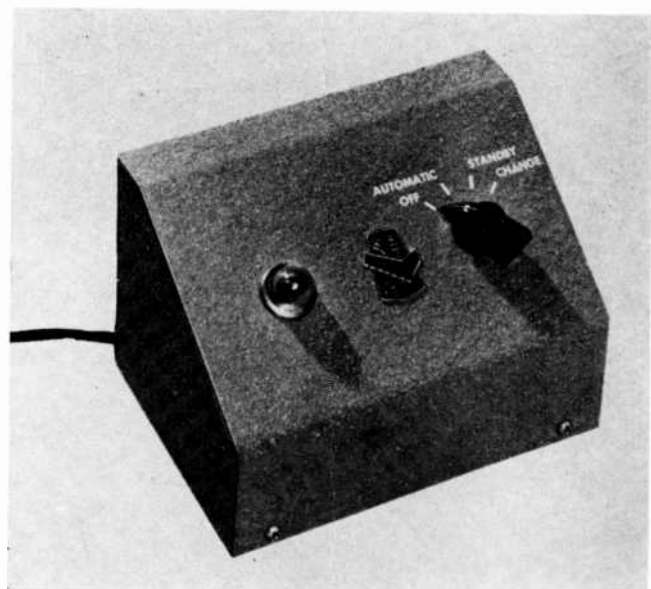
In recording with this device, the narration is first done and then the slitter is attached to the side of the recorder and the slits cut at the proper points as the tape is played or, the slits may be cut during the narration by pausing and actuating the slitter.

On playback, the tape is threaded in the recorder and through the Audio Slide synchronizer which fits in the same mounting bracket as the slitter. The bracket is screwed to the side of the tape recorder, where it may be left on without interference with the operation of the machine. To rewind the tape, it is removed from the synchronizer and rewound in the regular manner.

Mistakes in slitting may be rectified by merely putting a piece of splicing tape over the slit.

The unit operates by means of a feeler which goes through the slit and actuates a switch which in turn actuates the projector.

Tabs on the tape are used by two synchronizers. The Synchronomatic employs white tabs applied to the back of



Left: the Revere 888 Projector-Recorder synchronizer operates by periods of silence on the tape. Any pause of four or more seconds will cause the slide to change. Right: metallized tabs are available at dealers. The Brady Quick-Cue Tabs are on cards.

the tape at the spots where slide changes are desired. As these pass through the unit, a light beamed on the tape is reflected into a photocell, the output of which is amplified and used to actuate a relay to make the projector operate.

Metallized tabs on the tape are used for the Meston synchronizer which is simply a device containing two contacts which are shorted out by the metallized tape.

In both cases, the tabs may be removed and placed in different spots or all tabs may be taken off and the tape reused for another recording.

Since the tabs are placed the full width of the tape, the recording may go in one direction only.

A third device employing tabs on the tape is now under redesign by Tech Photo Products. This uses a feeler which detects a change in thickness due to the presence of the tab. In this case the tabs can be placed on half the width of the tape and the tape used for dual track operation.

From these mechanical units the next step is into the "black box" category which depend upon electronics for their function. With the exception of the Revere unit, mentioned earlier, which operates from silent intervals on the tape, all the others use either an audible or inaudible signal recorded on the tape along with the narration or music.

Inaudible signals may be either in the sub-sonic range (usually about 25 cycles per second) or in the supersonic range (above 15,000 cps.).

Michigan Electronics, which specializes in tailor-made devices for specific applications even has a Radioslide device which operates the projector via radio from a signal on the tape, so the recorder and projector can be placed far apart, if need be. They also have a voice actuated device which operates the projector when the person speaks.

The Uher Akustomat device may be used in conjunction with the Uher recorder to either operate the recorder on the voice-actuated principle or to operate a slide projector from signals placed on the tape.

The Bausch & Lomb Balsync synchronizer uses one channel of a stereo tape for the projector signals and the other for the commentary.

The Kentron Tape Synchronizer is a transistorized unit which employs an easily replaceable 9 volt battery for

power, hence there is no need to connect it to the power line. The control signal is placed on the same track as the narration.

The V-M synchronizer, designed primarily for use with V-M recorders may also be used with other machines. This device uses a 60 cycle control pulse either on the same track with the narration or on a second track. The tone is usually completely masked by the music or voice.

The Kodak Cavalcade Programmer combines the functions of a synchronizer and a mixer having an input for background music on the panel. It operates through the use of a 6000 cycle tone which is audible but of extremely high pitch (about the top note on a piano).

From this wide variety of units available it can be seen that almost any method of slide synchronization desired by the user may be obtained—from silent intervals on the tape to radio control.

Recording the Show

Once the narration script has been satisfactorily written it should be read aloud and timed to make sure it will fit within the limits imposed. It should then be practice read, with or without recording so that the person doing the voicing becomes thoroughly familiar with it. This will reduce the number of flubs and also help to get good, lively presentation of the voice.

If background music is desired, and in many cases it gives a real professional touch to the presentation, it may be added through the use of a mike mixer, combining music from a phono or second recorder with the voice on the same tape track.

In doing the actual recording, the synchronizer is hooked up to the recorder and projector and the impulses recorded as the narration proceeds (in the case of the electronic type units).

This is one point where difficulty may be encountered for most of the projectors make some noise, either from the slide changing mechanism or from the fan motor which cools the lamp. This will be picked up by the mike hence the projector should be positioned as far from the recording position as the synchronizer cords will allow and, if it is not enough, then the synchronizer cords should be lengthened. If the projector can be placed in

another room with the screen visible to the narrator through a doorway, so much the better.

The room in which the recording is done should be a bit on the "dead" side so that boominess or hollowness will be avoided.

If you would like to add music but lack a mixer, you can have a recorder or phono play in the background so that the music is picked up by the mike along with the voice.

The level of the music should be raised during slide changes and held down while narration is being done so that it will not interfere with the intelligibility of the voice. This may be accomplished through the use of the mixer control or by changing the volume of the phono or recorder playing in the background, or by turning up the record volume.

The narrator should be seated and the mike put on a stand. A comfortable chair should be provided as well as a good light to make script reading as easy as possible.

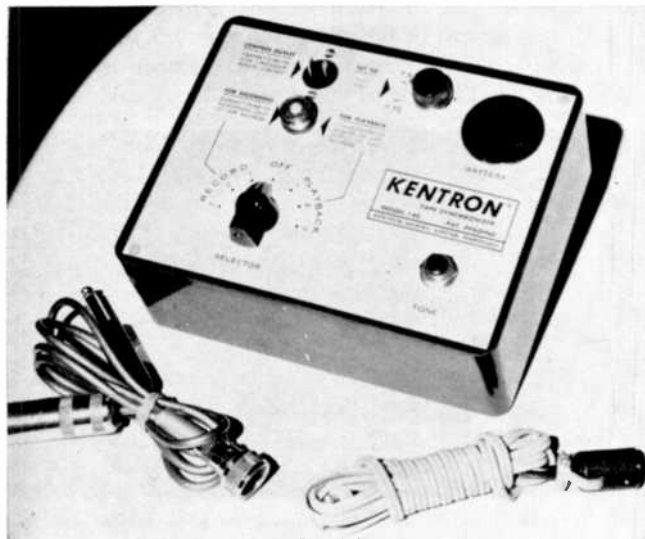
Depending upon the type of synchronizer used, the narration may be done first and the synch pulses, slits or tabs added later or both done together. Narration may be done on one track and the pulses put on another if Add+A+Track or stereo recorders are used.

The type of synchronization used will also determine the tracks used on the tape. Some permit the reel to be used in only one direction, as mentioned earlier, others using one track for narration and the other for signal require stereo recorders or Add+A+Track. Methods which combine the synch pulse with the narration can, of course, even be used for four track recording. If you contemplate the purchase of a synchronizer and/or projector, make sure the limitations of the devices are suited to your needs.

The slides should be inserted in the projector and shown while the narration is being done and the whole show should be checked both for synchronization and narration before the setup for recording is dismantled.

Giving the Show

The projector, screen and synchronizer should be set up and connected before the audience arrives. A reel of music may be placed on the recorder which may be played as background music as the audience assembles and takes



The Kentron synchronizer, made in Hawaii, is a completely transistorized unit with its own battery. It uses tone signals placed on the tape between narration segments to operate the projector.

seats. If the slide show is of short duration, the music may be spliced to the narration tape ahead of it and the entire show, including the background music put on one reel.

All wires and cords should be run under carpets and along walls so that no one will trip over them. Wire connected to projectors and recorders should be looped around a table leg before being connected to the machine so that in the event someone does trip over a cord it will not bring the machine crashing to the floor.

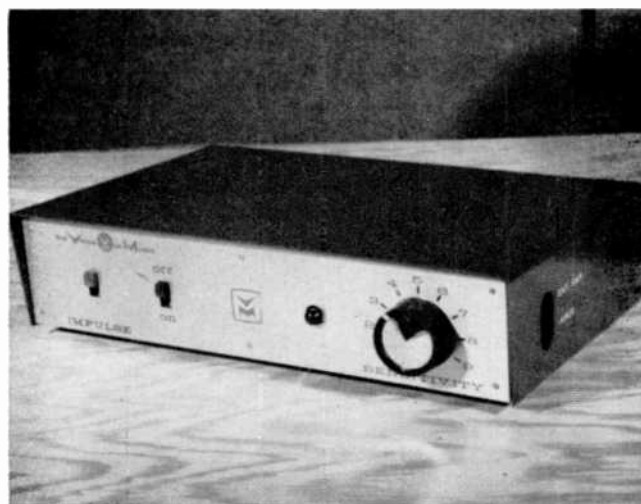
Arrangements should be made to have someone turn out the lights at the proper moment, the projector and recorder should be on and warmed up so that there is no hitch. The more professional you can make your presentation, the more interest and applause it will bring—and, after all, those are your rewards.

Automatic Projectors

Airequipt, Superba 77; Ansco, Anscomatic, JN-276; Argus, President, 526, 527; Bausch & Lomb, Balomatic, 300, 305, 500, 655 755; Bell & Howell 735RF, 754A, 754RF; DuKane, 576-39, 576-47, 14A190, 14A290, 14A390; Eastman Kodak, Cavalcade, 510, 520; Keystone, K-511; Realist, Realist 990, 3160, 3162, Revere 808, 888, 888-D; Sawyer's, 500R, 500T; Tower (Sears) 1850, 1860; Wollensak 815.

Synchronizer Manufacturers

Audio Slide Corp., Rome, N. Y., "Audioslide"
Bausch & Lomb, 648 St. Paul Street, Rochester, N. Y., "Balsync"
Eastman Kodak Co. Rochester 4, N. Y., "Cavalcade Programmer"
Kentron Corp., 1140 Waimanu St., Honolulu 14, Hawaii, "Kentron"
Michigan Electronics, 1744 N. Dayman St., Chicago, Ill.—specialized applications including radio control
Jerome Mendell Co., 141 E. 44th Street, New York, N. Y., "Synchroslide"
Meston's Travels, 3801 N. La Piedras St., El Paso, Texas
Revere Camera Co., 320 E. 21st St., Chicago, Ill.
Tech Photo Products, 1945 McDonald Ave., Brooklyn, N. Y. (under development at present)
V-M Corporation, Benton Harbor, Michigan, Model 1412 Synchronizer



The V-M synchronizer may be used to put signals on the same track as the narration or on a second track of a stereo pair. It employs a 60 cycle tone which is usually masked by the voice or music placed on the tape.



The Wonderful "Echo Master"

by Tommy Thomas

... an extra playback head on your machine affords new and varied recording fun

Fig. 1: Whatever you say into the mike comes right back to you out of a loudspeaker placed across the room ... a second or several seconds later. A hilarious fun-maker, it's also perfect for studying languages, mimicry, etc.

AN easy way to enormously expand the usefulness of your recorder is by the simple expedient of *adding an extra playback head*. It's easy, doesn't cost too much, and offers you the opportunity of doing many things that normally could only be accomplished by the more expensive machines. In fact, you'll be able to create an effect or two that even the most expensive recorders are *not* regularly able to do. Having an extra head available on your

recorder permits so many new recording possibilities that there's not nearly space enough here to go into all of them. So I'll start out this time with the "Echo Master" effect, and with the promise that future articles will show you more and more uses for variations of this marvelous device.

With this system of recording you pick up your recording microphone, talk into it, and a moment later your voice comes right back to you from a loudspeaker across

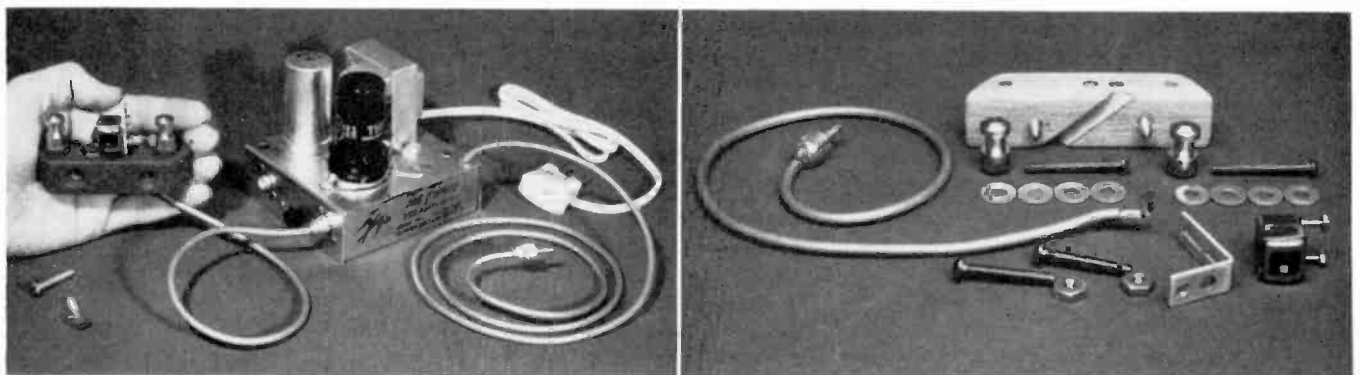


Fig. 2, left: An auxiliary playback tape head assembly, which you can easily put together yourself, and a special tape preamplifier are the basis of the Echo Master system. Hook them up to your recorder, and also to your console TV set's power amplifier and loudspeaker, and you're all ready to "make with the echoes." Fig. 3, right: These are the separate components that go into the making of the extra head assembly. The small block of wood may be of almost any design, as long as it is large enough to hold the head and the tape guides in perfect alignment. Here you see it from the rear, showing the diagonal "channel" filed out for the head cable.

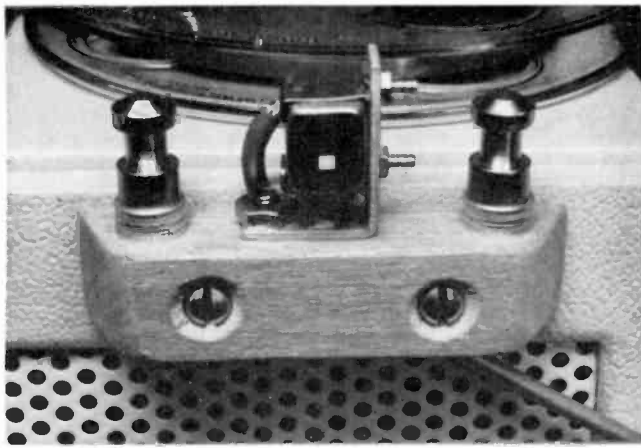


Fig. 4: Though still unpainted, here is the unit fastened to the side of the recorder. The face of the playback head is about $\frac{3}{8}$ " in front of the tape guides on each side of it. This supplies just enough "wrap-around" so that usually a separate pressure-pad is not needed. Note the use of the washers for height adjustment.

the room. It has first been recorded in the regular manner by your recorder, then it travels a bit further on to the auxiliary playback head which is hooked up so that you can listen immediately.

Just the novelty of this alone is sensational. A fascinatingly continuous "echo" is produced because the mike keeps picking up your loudspeaker voice over and over again a half dozen times or so, until it finally fades away.

Or perhaps you're only interested in hearing your voice come back to you but once. That's easy. Use earphones instead of a loudspeaker so your microphone can't pick up the playback. Either way, it's a most useful effect. And it's easily the life of any party. This system of recording is new and endlessly enchanting, and everyone is involved, since the slightest comment around the room is picked up *and repeated* a moment or so later. Then give your guests an assortment of cups and glasses and spoons and such for making noises. As you know, your tape recorder can do strange and wonderful things with even the tiniest of sounds. And played back immediately, a whole new frontier of creating sound effects is open to you. Not only for fun at parties, but more seriously perhaps for a play you're working on. Here at last, because you hear the result right away each time, is the perfect method of searching for new sound effects.

Or maybe you've always had a yen to try your hand at mimicry, or you're involved in learning a foreign language. The Echo Master can be a terrific aid to you in either direction. It's an ideal *supplementary* aid for this sort of studying. So as you can see, the possibilities for this new system are quite exciting.

But now let's get down to the actual construction. Besides the extra head assembly, you'll need a special tape preamplifier, a regular power amplifier and a loudspeaker. To keep the cost down, the system worked out here makes use of the power amplifier and speaker of a television set. Most console TV sets can be easily adapted for this purpose, so it's an inexpensive solution to this part of the problem. Or if you wish, you can substitute the power amplifier and speaker of your component hi-fi set-up.

THE PLAYBACK HEAD—This idea can be adapted to any monaural-recording machine, no matter what the width of the track, but my machine has a half-track head,

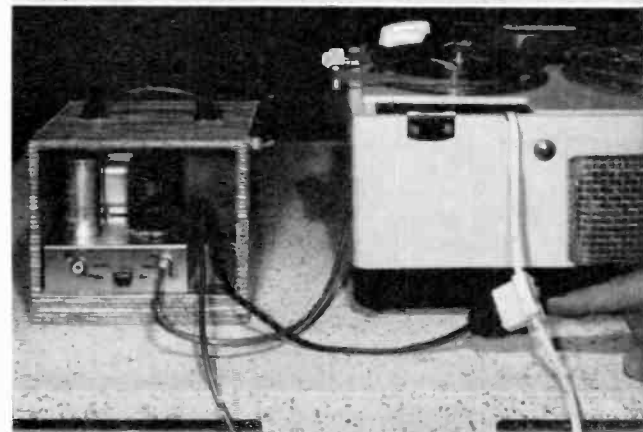
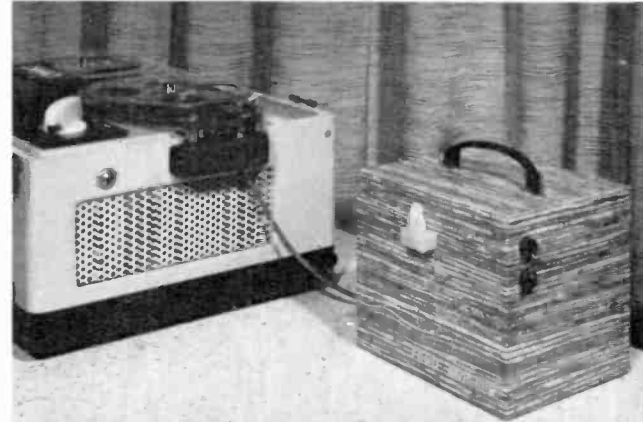
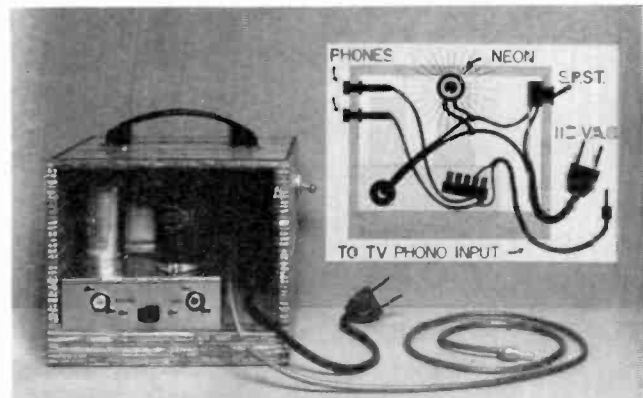


Fig. 5, top: The tape preamplifier was built into this handy little carrying case (complete with switch and neon "ON" light and phone tip jacks) mostly for ease of handling. It's not completely necessary, really, but future articles will find so many extra uses for this preamp that it might as well be as convenient as possible. Fig. 6, middle: A large part of the fun of the Echo Master is in showing it off to friends, so it's nice to dress it up a bit. You can give the head assembly a more professional appearance through the use of the easily-applied "wrinkle" varnish. And covering the preamp case with patterned adhesive-back plastic will do wonders for it. Fig. 7, bottom: The rear view shows the wire that leads from the recorder to the preamp, and from the preamp it disappears down to the TV "phono" input. The white recorder wire goes to a 110-volt A.C. wall outlet, and a special "tap-in" outlet (from the 5810) lets me plug the preamplifier directly into this same 110-volt supply.

so that's the one I'll be describing. If yours is a full-track or a quarter-track recorder, make the appropriate substitution. I bought a Nortronics Type SLS-1, 2-track mono record/play tape head from the Allied Radio Corp. (their No. 90R914, \$8.10, 6 oz. shpg. wt.). This comes with a *side* mounting, for which I ordered the necessary Nortron-

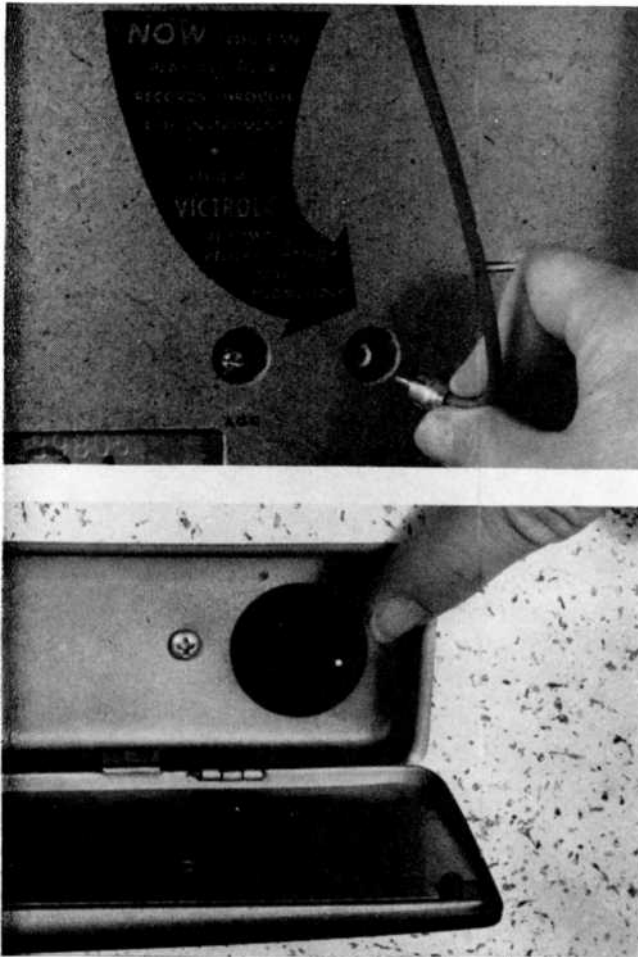


Fig. 8, top: Most console TV sets have an input at the rear where a record player can be plugged in, using the TV's power amplifier and speaker. This same input will amplify the sound from the auxiliary tape head, once the tiny signal has first been properly pre-amplified. Bottom: And be sure to change from TV to "Phono," shutting off the picture tube.

ics L-5 "L" Bracket for 50¢. Also, I bought several Nortronics TG-5 Guide Posts for 70¢ each . . . all from Allied (100 N. Western Ave., Chicago 80, Ill.).

The various photographs indicate how I hooked up this extra head for playback use. The first recorder shown here plays at 7½ ips (and plays from left to right, please note), so I located the head on the right side of the recorder approximately 7½ inches away from the recording head . . . so as to give myself a full second of delay between the recording and the playback. **IMPORTANT!** Many expensive recorders have an extra playback head already built right in, complete with all necessary extra electronics for monitor playback. But this is useless for the special effect we are after here, as the extra monitor head *is located right next to the recording head* and therefore does not allow time for the necessary pause in between recording and listening. The extra playback head *must* be located some distance away from the recording head. Brown "Wrinkle" Varnish was used, by the way, to add a professional look to the completed assembly (No. 60 "Ruf-Koat" Varnish, Allied's No. 43N481, 82¢, 8 oz. shpg. wt.).

PREAMPLIFIER—I used a Fisher PR-6 Preamplifier (Allied No. 98S528, \$12.95, 1½ lbs.). This is absolutely necessary to provide the voltage gain *and equalization* needed to operate the tape playback head with a standard audio amplifier. So, unless you have an amplifier that has

a special tape head input (meaning that it already has a pre-amp as part of the regular amplifier), you'll be needing this extra preamplifier. I had a \$12.95 Fisher pre-amp on hand so I used it. But I noticed in the latest 1961 Burstein-Applebee Co. (1012-14 McGee St., Kansas City 6, Mo.) catalog that they list a similar tape pre-amp for less money (No.17A876, \$7.95, 2 lbs.). It's not a Fisher unit, but from the specs given and the illustration, it must be pretty nearly an exact twin. I found out too late to buy it myself, but it sure sounds like an easy way to save five bucks.

You'll notice that I went to the trouble of mounting the preamplifier in its own little portable case, complete with On-Off switch (SPST, 40¢ or so at your local hardware), neon "ON" light (Drake Type-105 "Post-lite," Allied No.78E062, 58¢, 2 oz.), and phone-tip jacks (Type 202, Allied No.41H115, 2/26¢, 4 oz.). This case isn't absolutely necessary, but it certainly makes for extra convenience. The phone tip jacks are for possible future uses, so you may wish to forget this feature for now. But the switch and the neon light are quite important, as it's all too easy to forget and leave the unit on, when it's not in use.

You'll also need some shielded wire (Belden Type 8411, Allied No.47T601, 15 feet for 70¢, 6 oz.) and a couple of shielded phono pin plugs (Allied No.46H212, 3/13¢, 1 oz.). To minimize the possibility of hum pick-up, keep your shielded wire connections as short as possible.

FINAL HOOKUP—This is the easiest part. Fasten the tape-head unit to the side of the recorder and lead a length of *pre-recorded* tape (music is best) through the recorder, past the extra set of tape guides on either side of the added playback head and then to the take-up reel. The final height adjustment of the guide posts-extra head assembly can be made by changing the number of aluminum or brass washers under the guide posts. Now plug the extra head into the preamplifier, which in turn is plugged into 110 volts A.C., and also into the phono input on the back of your TV set. Turn the TV on (set for "phono") and turn up the volume. Now start the pre-recorded tape *playing* through the recorder but with the recorder's volume set at minimum . . . so you can listen to the extra head playing back through the TV set. Complete head-alignment instructions come with the Nortronics tape head. For our use here, it amounts to moving the head up and down, and wiggling it back and forth until

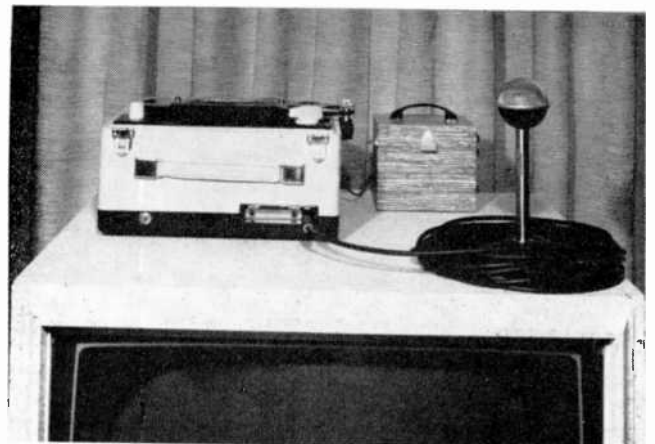


Figure 9: Here, atop the TV, is the complete system ready to operate. To prevent a "squeal" from building up when not using ear-phones, you must keep an adequate distance between the microphone and the TV speaker being used for immediate playback. The shorter this distance, the lower the playback volume will have to be.



Fig. 10: An excellent use for the Echo Master is as a supplementary aid in studying a foreign language. And to still further enhance its value, it is necessary to extend the delay period of the "echo" so that more can be said . . . hence the use of a system that furthers the distance between the record and the playback heads.

the music sounds best, and that's it. Tighten the nuts and you're in business. As a comparison, you can occasionally turn the TV volume OFF and the recorder volume ON, to hear the tape as it sounds playing in its regular manner.

LITTLE SIR ECHO—Now you're all ready to go. Sit across the room from the TV loudspeaker (or as far as your mike cable will let you go, to prevent feedback squeal through mike and speaker), and adjust the two volume controls: the *recording* volume on the recorder and the playback volume on the TV set. I usually adjust for maximum volume, meaning just a little under what will cause the TV speaker to start squealing. Start the tape recording.

Now say something! Anything at all, it doesn't matter. Make it short, and then pause to listen. If all goes well, you'll be absolutely delighted with what you hear. **YOU!** Sure, you've heard yourself on tape before, but never quite this way. Somehow, the immediate response makes all the difference in the world, and it's absolutely fascinating.

EDUCATIONAL USAGE—For this use, it's likely that you'll want to extend the time-delay from one to five seconds, say. This gives you extra space to get more on the tape before pausing to listen, thereby greatly extending the usefulness of the repetition. Also, by using earphones you can sit closer to the recorder, and you'll avoid the continuous echo effect.

Figure 12 shows the extra tape "deck" hooked up and ready to go, with a five second delay from record to earphone playback. Under "A" is the recorder's regular recording head. At "B" is located the first tape guide post, serving double duty by getting the tape started at correct height and (more importantly) keeping it from *scraping* a protruding metal part just past the speed capstan. I didn't want to damage the recorder deck, so I soldered the tape guide post to a large washer and then rubber-cemented it in place. Both "C" and "E" are ordinary roller-rink skate wheels, mounted on ball bearings and with an extra "flange" of thin masonite glued to the lower side to keep the tape from falling too far down when the recorder is stopped and tension released. I bought these for less than two dollars at a local rink, complete with bearings, axles, etc. At "F" (indented a little) is another guide post, serv-

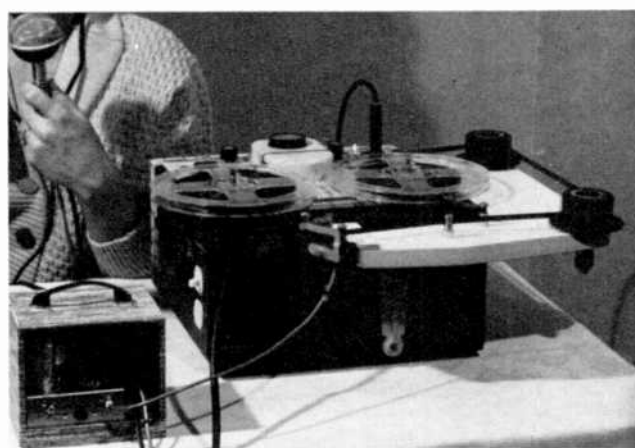
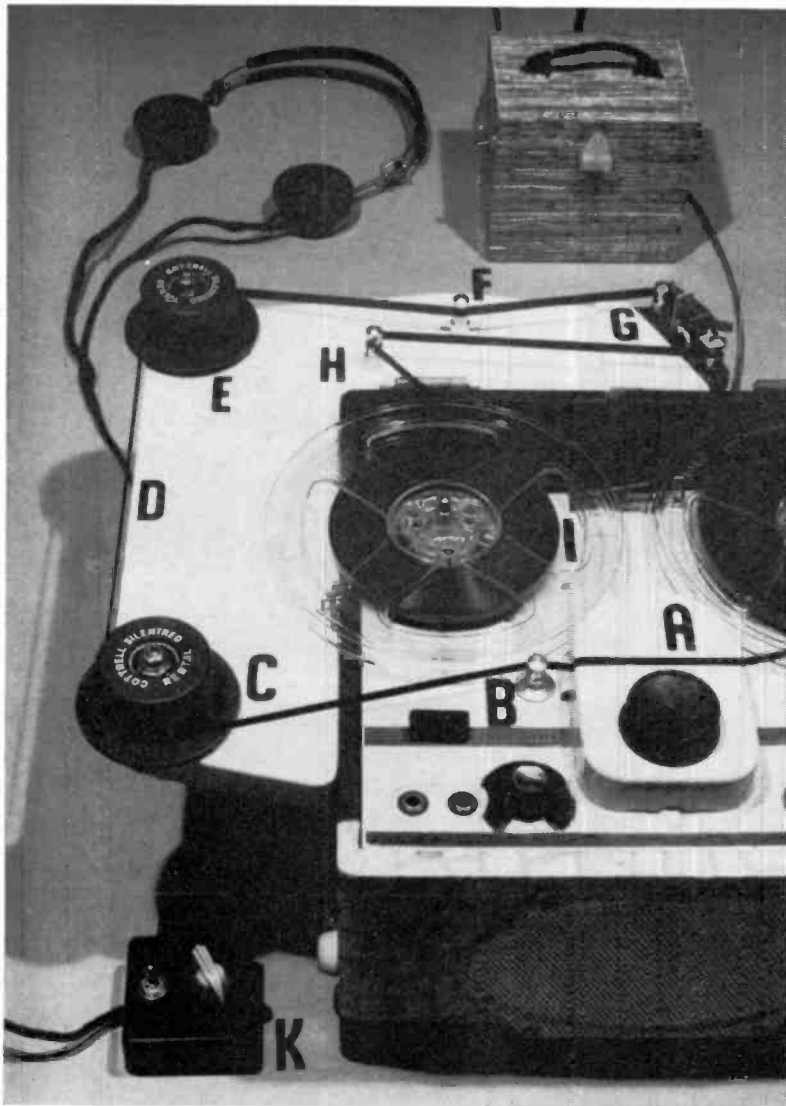


Fig. 11: By fastening a special "sideboard" to the recorder, it was possible to lead the tape around and about—using extra tape guides and even a couple of skate wheels—so that there was a full five second delay between the time the first word was recorded and when it reached the auxiliary head that played it back.

ing both to maintain the correct tape height and to add a little tension back to the tape (it was beginning to flutter a bit). The extra playback head, complete with its own guide posts, is located at "G." Then the tape doubles back to another guide post at "H," and from there to "I," the take-up reel. I had a lot of trouble at first, keeping sufficient tension on the tape so that *flutter* wouldn't develop. The extra "indented" guide posts at "F" and "H" helped considerably, but didn't quite remove all of it. I had to add a simple pressure pad arrangement (which wasn't necessary in the first hook-up for the 1-second delay), and that finally gave me the results I wanted. Even then, though, I ended up with my tape going a bit slower than the normal 7½ ips. But since the recording and playback were both at this same speed (naturally), it didn't really matter and the playback results were excellent.

The object at "K" is a Cannon TV Headphone Kit (Allied No.59J177, \$4.41, 9 oz.), which leads to the TV speaker for a very simple hook-up. This allows you to plug one or two earphone sets into the system, and it has

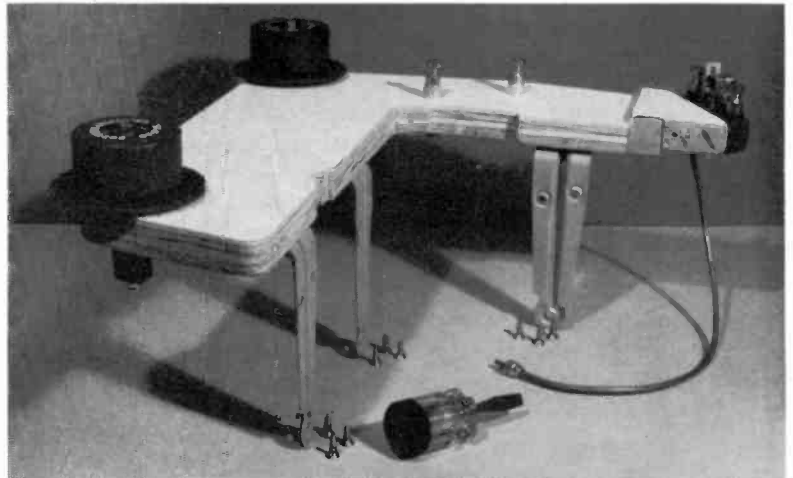


**WATCH FOR FOLLOW-UP
ARTICLE "MONITORING
WITH THE ECHO-MASTER"
IN THE COMING FEBRUARY
ISSUE.**

Fig. 12: These photos should help you get started on an arrangement of your own. Tape length from recording head "A" to playback head "G" is just over 37 inches, though you can design for any reasonable length (time) you wish. And note that this recorder plays from right to left, hence the sideboard has been fastened on the left side (to be near the take-up reel).

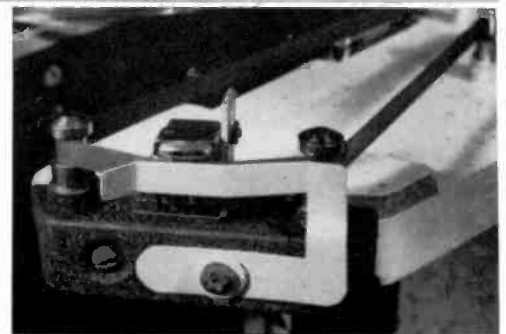
Fig. 13, right, top: I soon discovered, in making this experimental sideboard attachment, that there was more involved than just running the tape around a few "corners." It'll be necessary to try out a number of versions, depending upon the type recorder you have, to get the best results. Wow and flutter are the big enemies here.

Fig. 14, right, bottom: Though not needed before, this pressure pad attachment had to be added now to keep a final tiny flutter from distorting the recording. Thin spring brass (being non-magnetic) works perfectly. Just cut and bend it to shape, then glue on a little square of felt that will gently press the moving tape against the head.



a toggle switch for switching from speaker to phones . . . and there's even an individual volume control for the earphones so you don't have to always go over to the TV. The earphones that worked best were 2000-ohm units, similar to Cannon-Ball CC-2 "Chief" Phones (Allied No.59J172, \$2.35, 1¼ lbs.). Hooked up to the recorder via the TV set, they'll give you all the volume you'll want.

That about covers it. Not actually, of course, because there are so many areas for exploration, but enough so that you can get started. And *do* get started because here's one of the genuine thrills of a lifetime: *instant recording*.



SOUNDS OF YOUR LIFE

by Jean Cover

... family sound albums
are treasured items.



And now a few words from our star problem child, Debbie, aged 2 years, 3 months. "OOOooooooo—mommyyyyyy—brrrrrrr." Soon Debbie will be 5, then 10, and so it goes, but anytime her "mommyyyyyy" wishes to hear again her child's 2 year old chatter, she merely pushes the button on her tape recorder.

DO you keep a diary? Perhaps you are a fastidious keeper of a family photo album. Maybe you have an old trunk in the attic brimming over with keepsakes from the past. Many folks cling to faded letters written years ago. Modern collectors build libraries of home movies. Why? Why do people consider these things as treasures more precious than valuable material things?

The answer is simple of course, such things are mementos of life—your life. Some are sad mementos which



The bonds that hold a family together are strong only if their strength is constantly renewed by every member sharing in the work, the problems, the fun, the tediousness, of every day living. Here one family listens to a recording they made together. Some families have businesslike meetings to discuss home affairs, which make excellent additions to a family album.

give a twinge of melancholy and provoke a feeling of sorrow. Even so, the sorrow is a gentle reminiscence of something which probably played a part somehow in your growing up or taught you a lesson in the study of life.

Most of the mementos, however, bring happy remembrances of parts of your life that you never want to forget—your childhood, your school days, your courtship years, your marriage, your home, your children. While this is a blueprint of the ordinary pattern of life, very few people actually follow it without countless miscalculations and problems along the way, which after all add spice to an otherwise staid existence.

Whatever your life brings, it is different from every other person's. You are an individual in your own right and thus your lifetime mementos are also individualistic and become prized possessions to you and your family.

Besides pictures and written words, there is now available a much more realistic medium of preserving lifetime mementos. We refer, of course, to sound.

Through the strides made in magnetic recording, sounds can be captured on tape and preserved for many years. Now instead of a written diary, you can keep a sound diary. Instead of a photo album, or home movies library, you can create a "Sounds of Your Life" album or a library of family sounds. It isn't hard, it is an interesting hobby, and it is another link in the chain of family unity.

To plan a complete album is impossible because of those miscalculations of life we mentioned earlier. Very often—in fact, most of the time—you will discover everyday events happening which you did not expect, but which you will want to preserve in sound.

For instance, Junior might suddenly lose that loose front tooth which has been threatening to dislodge for some time. His funny, faltering speech with the added



All the "ohs" and "ahs" of Christmas morning can be preserved on tape for all time. Each such recording should, of course, be dated on the tape ahead of the recording. Many secret recordings can be made by concealing the mike in some inconspicuous spot such as the branches of your Christmas tree, or perhaps in a bouquet of mistletoe. Always be sure to play these kind of recordings privately before letting others hear them.

whistle overtones, which he can't control at the moment of such a loss, will add a humorous touch to your sound album, and when Jr. becomes a Sr. he too will have a chuckle over his boyish pitfalls of life.

By chance your daughter will come rushing home from school one day breathless, walking on air. She was asked to go on her first date by a boy she is (at the moment) ecstatic over. Can't you see this girl years later as she listens to a recording of that momentous occasion. How else but by sound could you so authentically preserve such a moment.

No, it would be impossible to plan your sound album, but you can generally outline its progress something like this: SOUNDS FROM PHASES OF LIFE: (a) Infancy: cries, gurgles, goos, first words; (b) Adolescent Years: games, parties, homework, school activities; (c) Teen Years: high school, first prom, school plays, telephone yakety-yak, graduation; (d) Courtship: first love, heart-breaks, special dates, boy-girl gifts; (e) Marriage: preparation, wedding; (f) Establishing Home: budget discussions, home decorating thoughts, arguments (often playing these back helps settle them); (g) Children: here we are back where we started, but now you have become a grandparent and the babies are your children's. Years have passed, but if you have built up your sound album you have a treasure incomparable to any other.

Editing will be necessary, of course, to end up with a well balanced presentation. There will be numerous occasions when you make a recording for your "Sounds of Your Life" tape which cannot be spliced into your master tape until sometime later. In order to facilitate an orderly

system of handling these short recordings we suggest a method on the order of the "pill box filing system" referred to in an earlier issue of this magazine.

Using this system you cut out the individual recorded items and file them away in numbered pill boxes (obtainable at many drug stores), together with separately filed-away 3 x 5 cards indicating what each contains.

To be able to store your recorded items in the pill boxes without having them on individual reels you first wind them onto a "loader reel." This is nothing more than an ordinary 3" plastic reel from which one flange has been removed right down to the hub, and which has about a 1/8" thickness of cloth tape wound around the hub. When you have wound your item onto this reel, you merely lift it off the hub (remember, there is no flange on one side) and place the coiled tape in a pill box.

When you are ready to splice the item into a master tape you take it out of its box and place it over an "unloader reel" hub (same as loader reel, only minus the 1/8" thickness of cloth around the hub). It will fit easily over this hub since you have the 1/8" difference in the diameter of the coiled tape and the diameter of the "unloader reel" hub. This is then spliced onto the take-up reel containing your main tape.

How you organize your own individual tape is up to you. For instance, you may wish to use a *time sequence* whereby you splice events together in the order of their happening and involving all members of the family.

Or, using the outline we listed above, you may wish to use a *person sequence* making a tape for each member of the family.

Since each individual's life is tied so closely to others, it follows that their album will contain recordings of others involved in happenings which affect them. For instance, a mother considers what happens to her husband and children as being the most important part of *her* life and therefore any family incidents involving them would become a part of her "Sounds of Your Life" album.

There is so much that can be entered in each phase of your child's life, or in your own, the length of your sound album is entirely of your own choosing. You cannot put in every detail without ending up with something ridiculous like 30-50,000 feet of tape. Therefore, you must choose the choicest bits of living such as special events, holidays, social affairs, birthdays, graduations, showers, weddings, vacations, and the like.

This time of year with Christmas and New Years approaching is a perfect time to begin an album. Every *planned* item for the album can be somewhat organized beforehand. For instance, for Christmas you may plan to record the decoration of the tree, the opening of gifts, the chatter at dinner, the singing of carols, friends who drop by, and any other traditional family holiday sharing habits.

For New Years you might record the tolling of bells or strike of a clock at midnight, horns blowing, the singing of Auld Lang Syne, family resolutions (it's fun to check back on these later in the year to see who kept or broke what resolution).

When you have a goodly amount of sound pieces prepared for inclusion in a master tape, and have decided upon the sequence you wish to follow, you are ready to splice your album together, or at least the beginning of it.

Items in these sound diaries should all be dated before the event, and on occasion should even stipulate the

time, such as the exact time of a birth. Such a record can perhaps become most useful in future years.

It would be well to begin your sound album with a concise narrated foreword. A script for this prepared ahead of time will make a smoother recording possible. Some short introductory comment before each item linking it to the one preceding will give the whole production conformity. These comments should be spliced onto the beginning of each item before it is filed away, while the date and happening are still fresh in your mind.

Also, to create a more finished tape, you may desire to insert musical bridge passages in appropriate spots. For instance, you may have made a recording of sounds from your vacation in New York. Preceding this on your album tape was Jr.'s graduation exercises.

These items are not even remotely connected in any way. So in order to keep conformity you could perhaps have some overture music from the score of "My Fair Lady," which you attended in New York, begin to play in the background after the graduation bit is finished. As it plays, you comment something like this: "June 6, 1960—On this day activity in our household was really bustling, for this was the day we left for our vacation in New York. Sally didn't know which cocktail dress to take, so she ended up packing all three. Mike couldn't find his best blue tie, and all in all confusion reigned supreme, but we finally got away." Music fades out. "Here we are registering at the hotel ———." Sound recording of discussion with clerk at registration desk. And so it goes, until the New York vacation event has been covered.

Following your vacation sounds may be recorded sounds of a 4th of July celebration you attended and between the two could be some bridge music relative to the 4th, such as Yankee Doodle Dandy.

You will find these musical connecting links enhance the charm of your tape. To add them you will need a phono or second recorder to play the music as you record into the microphone input of your first recorder.

Splicing is now an easy matter thanks to the various fine splicers now on the market which you should find

available at your local shop. Always be sure to use recommended splicing tape instead of trouble causing, sticky substitutes.

Oftentimes some happening you wish to include in your album cannot be recorded. In such cases a vivid description of the event, complete with adjectives, enthusiastic comments, and background music, will suffice.

Whenever possible, it is well to record comments of friends and relatives on special occasions. Not only does this make the tape more colorful and interesting, but all too often we lose track of old friends and having their voices on tape is better than any autograph book.

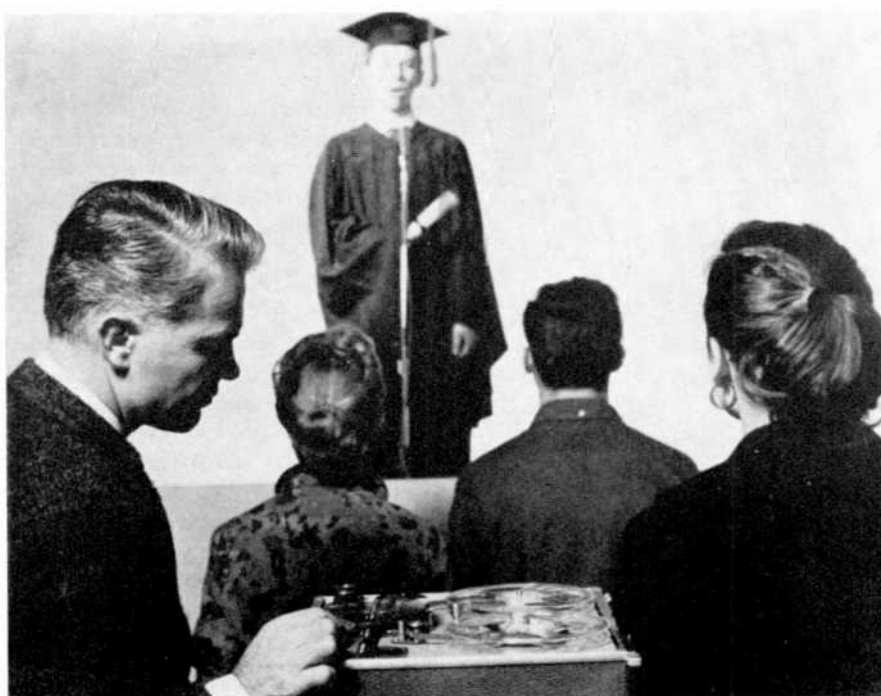
Have you ever considered a "Sound Autograph Tape" rather than just an autograph book? Think how wonderful it would be to have a high school autograph tape with identification and comments from all your school chums to play back years after your graduation. Or, if you were lucky enough to talk to some personality, how grand it would be to have their voices personally addressing you right there on the tape to play for all your friends.

I remember the time one of our favorite counter girls at a local store had to leave us to move to another state where the service was stationing her husband. We wanted to give her a remembrance to take with her, so we went to the store where she worked and was so well liked, and had her boss and all her fellow employees identify themselves and record some personal farewell comment on tape. Then we went about the community doing the same with her other friends including ourselves.

After acquiring the voices and comments of everyone we could, we added a short opening introduction and ended it by a group of us singing "Auf Wiedersehn" (she was of German descent).

The appreciation she expressed made any effort on our part well worth the doing.

Actually, putting a sound album, diary, library, or autograph book together can and should be fun rather than a chore. It requires time, imagination and patience, but you will find that the wealth of cherished memories preserved do indeed belong in the family treasury.



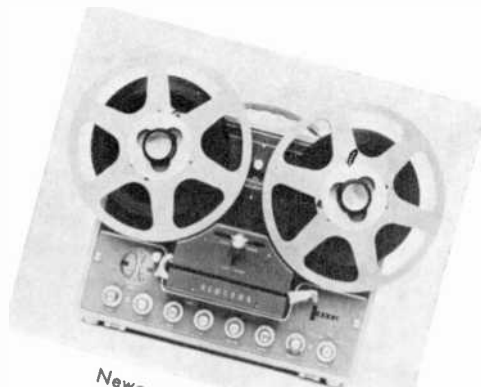
A big day—graduation—and dad's taping his son's speech. Perhaps one day his son will play it back to a son of his own. In any event, it is not a memory lost forever, but instead will sound just as clear ten or even twenty years from now as it does today—on tape.



American Concertone 505.4



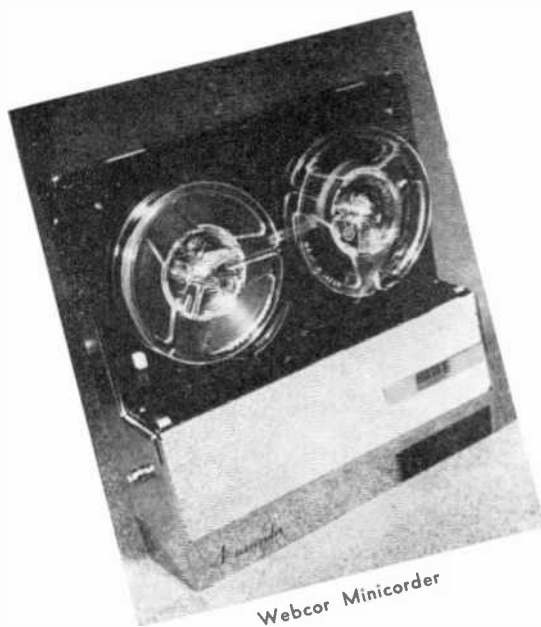
Pentron Astrosonic



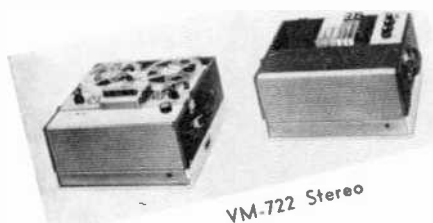
Newcomb SM-310.4T



3-M Tartan Series Tapes



Webcor Minicorder



VM-722 Stereo

1960 ROUNDUP

THE year of 1960 saw no great excitement in the tape recording field. There was none of the mix-up that was prevalent in the two previous years when the stereo disc and the cartridge concept were introduced, with tape switching to four track to maintain a competitive price structure for recorded tapes.

If anything, 1960 was a year of solidification with 4-track taking firm hold in machine production and with a continuous production of new tapes for the recorders. During the year both Columbia and RCA started to issue 4-trackers and their entrance into the 4-track field was preceded by Capitol. All "majors" are now represented. By the end of the year approximately 25 companies had music available on tape.

Two new developments looking toward the future were revealed during the year. One was the CBS-Minnesota Mining cartridge which ran at $1\frac{7}{8}$ inches per second and which would play automatically and the other was the beginning of work on a recorder for the blind by the Division for the Blind of the Library of Congress with the view in mind of switching the entire operation to tape.

Activity in the raw tape field included the entrance of RCA as a manufacturer of tape and the announcement by Sarkes-Tarzian and the Burgess Battery Company that they would do likewise. Triton tape, by Brand Products was introduced and Minnesota Mining launched its Tartan series of tapes and its Tenzar base while Reeves Soundcraft came up with its FA-4 formulation, the development of which cost \$9,000,000. Audio

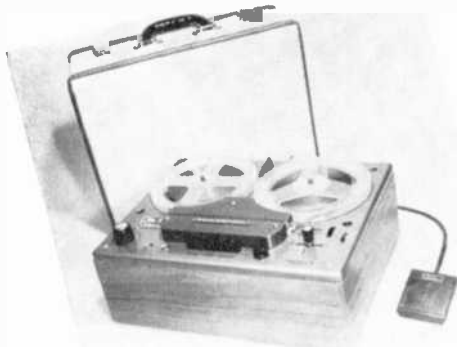
Devices repeated its offer of a recorded tape and continued its plant expansion, including a new Research & Development Lab. Also in the tape field was American Tape, a division of Greentree Electronics. Ampex also brought out a line of tapes after acquiring Orradio Industries.

This was also a year of consolidation for the Magnetic Recording Industry Association under the presidency of Herb Brown. It now has a firm foundation for future growth and all of the important companies in the tape field are members. Unfortunately standards work continued at a pedestrian pace.

A number of price reductions in the price of raw tape came about and small, transistorized portable recorders, mostly of Japanese manufacture or European origin began to take hold and sell. Some 23 makes, of which only about a half-dozen were American were on the market by the close of the year.

As with any line of business these days there were mergers and acquisitions. The American Tape Company became part of Greentree Electronics, Minnesota Mining purchased the Revere Camera Co. and also the CBS Labs., Keystone Camera acquired the Amplifier Corporation of America and Astro-Science became the parent company of American Electronics. The Distributors Group merged with Long Life, both in the field of cleaning and preserving solutions for tape.

1960 also saw a very much stepped up tempo in the field of education, with language laboratories using tape machines springing up all over the nation. A rush to provide material to



Tandberg Series 6



Revere T-2200



CBS-3M Cartridge Machine

use in these labs was underway. Most of this growth was due to the outpouring of government funds under the National Defense Education Act.

New recorders were introduced by almost all companies during the year embodying improvements as they were discovered. In many cases it was the introduction of new models with four-track heads as standard equipment.

Tape also played a big part in the space effort from the recording of data at ground stations to the use of video tape in the Tiros and other satellites which would take pictures and then transmit them to ground stations on command. The use of video tape by the nation's TV networks and stations also grew with some shows being taped instead of filmed.

The Armour Research Foundation, holder of many basic tape and machine patents showed its version of a cartridge and automatic player but had no takers.

Plant expansion was undertaken by some firms including Telectrosonic and Bell Sound and Bel Canto moved from the west coast to Columbus, Ohio.

Tape Recording magazine added sound to the printed word by offering

three-inch reels of recorded material that tied in with some stories published in the magazine.

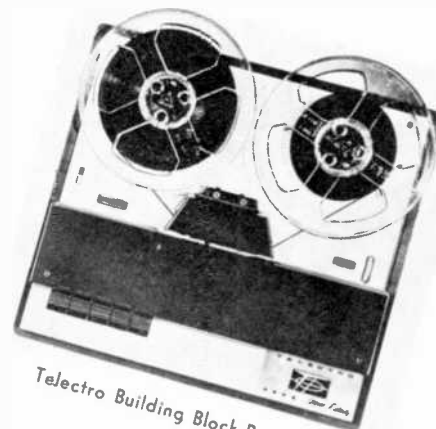
The creative use of recorders, akin to the creative use of cameras, continued to lag in the United States while gaining abroad.

A number of firms brought out stereo recorders in the medium price range offering the potential of stereo recording in the home becoming more widespread.

Another phenomena more or less identified with 1960 was the appearance of a number of tape-slide synchronizers. While such devices had been on the market for a number of years, the increasing number of remote control projectors augered well for an increase in this type of activity in the hobby, school and business field.

Growth in the "non-audio" uses of tape, telemetering, video, programming and the like was using an increasing share of total tape production.

Stabilization might be considered the keyword for 1960, a year in which the industry smoothed out the road and gained a firm base for further expansion.



Telectro Building Block Recorder



Reeves FA-4



Triton Tape

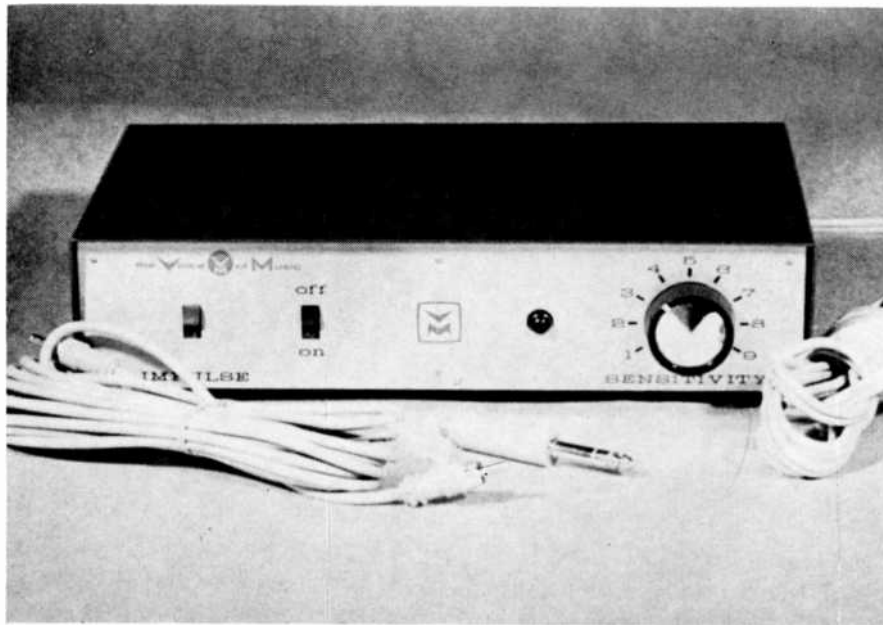


Ampex Custom Line



Tape Recording
Sound Stories

NEW PRODUCT REPORT



V-M TAPE-SLIDE SYNCHRONIZER

... device permits synchronization of slides and tape by use of 60 cycle tone

THE V-M Model 1412 Synchronizer is a small device, measuring 2½ x 6¼ x 10 inches and is intended to synchronize the operation of a remote controlled slide projector with a tape recorder.

This is accomplished through a signal which the synchronizer puts on the tape in the record mode and which it interprets on playback to close a relay and actuate the projector.

While designed for use with any of the V-M recorders, the unit may be used with any recorder having an external amplifier output, provided a microphone mixer is employed while the recording is made.

This is necessary because the signal from the synchronizer to be recorded on the tape goes through the "back door" so to speak. The output of the synchronizer is fed into the external speaker jack of the V-M recorder which, under normal circumstances is an output, not an input.

While this is possible on the V-M line of recorders, it does not necessarily follow that it would work on other makes. Thus to use the synchronizer with another make of re-

recorder the signal must be recorded in the normal manner through the mike jack. To get the voice and signal on the tape it thus becomes necessary to use a mike mixer.

The signal itself is a 60 cycle tone which is inaudible under ordinary circumstances being completely covered up by narration or music on the tape. Only where the signal is impressed on a silent spot on the tape or where the program material is low in record level will it be apparent.

In setting up the synchronizer to use with a V-M recorder, the projection trip cord is plugged into the synchronizer and its other end into the projector. (Note: due to the fact that



Left side of face of synchronizer has impulse switch and on-off switch. The duration of the pulse should be just enough to make the projector operate.

STAFKSTED

Product: V-M Model 1412

... Synchronizer

Price: \$49.95

*Manufacturer: V-M Corporation,
Benton Harbor, Mich.*

projector connectors are not standard, the V-M Corporation encloses a certificate which may be forwarded to their service department to obtain the correct cord to fit the projector you have).

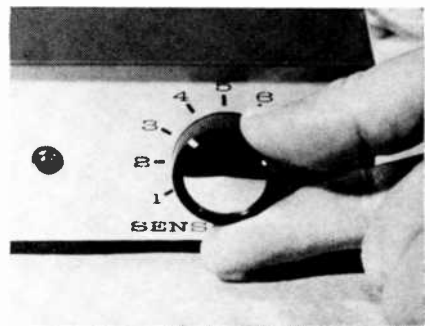
The next connection is from the output of the synchronizer to the *External Speaker* output on the tape recorder using the 15 foot cord which is furnished with the synchronizer. The plug is put in only to the first position which gives a power takeoff but does not cut the speaker in the recorder.

Using the accessory cord, which is furnished with the recorder, a connection is made between the External Amplifier output on the recorder and the Input receptacle on the synchronizer.

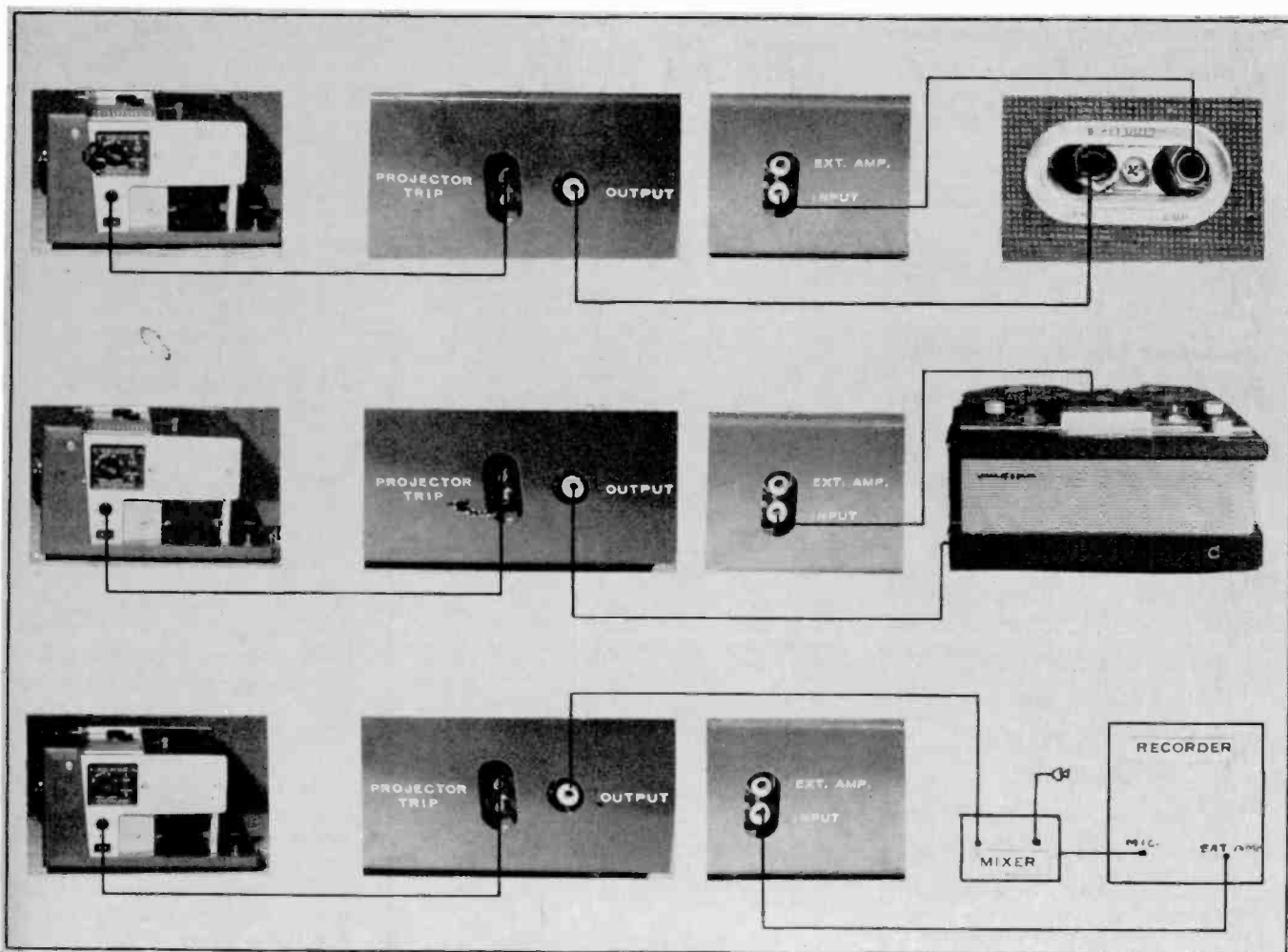
The projector and synchronizer are then turned on and warmed up, the first slide is advanced to position and the Sensitivity control set to No. 1. The recorder is put in the record mode and the volume control set at the proper point.

The recording is then made and at each spot where a slide change is desired the impulse switch is pressed downward only long enough to cause the projector to operate.

A ten second interval must be allowed between slide changes.



The sensitivity control on the right side of the face of the synchronizer is used both in recording and playback. It is adjusted until projector fires on signal.



Top: showing how the connections are made using the V-M synchronizer with a V-M recorder. The projector trip cord is connected to the projector and the output from the synchronizer goes to the external speaker jack on the recorder (first position only). The external amplifier jack is connected to the synchronizer input. The external amplifier jack on the synchronizer is for connection to an external amplifier-speaker system. Center: the synchronizer and V-M Add+A+Track recorder hooked up to put the signal on a track other than the narration track. Note connection to external amplifier jack from stereo output jack in back of recorder. Lower: for connections to other recorders, the output of the synchronizer must be fed into a mike mixer which is connected to recorder mike input. Recorder must also have an external amplifier jack connected as shown.

On playback, the Sensitivity control is set to the No. 4 position where the pulse should cause the projector to operate as the tape is played. If it does not, then advance the control to a higher number. If the slides change where no signal is present on the tape, turn the control down so that only the pulses operate the projector. This setting should be noted for future use.

The external amplifier jack on the synchronizer is for use any time an external amplifier and speaker system is used instead of the speaker in the recorder.

If a stereo or Add+A+Track V-M recorder is owned, the narration may be placed on one track and the pulses on another.

Using the Add+A+Track recorder in this fashion the connections are the same as outlined above except that the synchronizer input is connected to the Stere-O-Matic output on the recorder or the Channel B External Am-

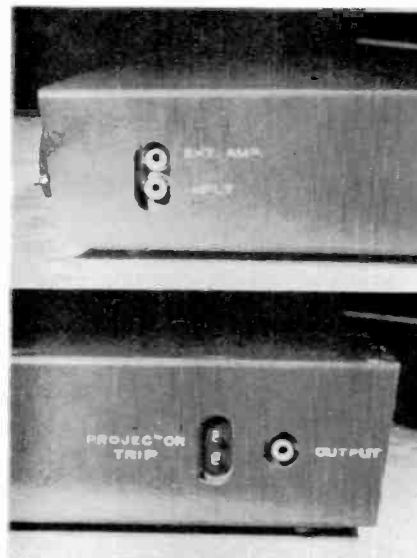
plifier receptacle. The narration is done on track 3, the tape rewind and, as it plays the pulses are added with the selector switch in the Add+A+Track position. Background music may be added to this track at the same time if desired. For playback put the selector switch in the four-track position.

If a stereo recorder is used the narration may be recorded on one track and the pulses on the other at the same time. The synchronizer input is connected to the Channel A External Amplifier and the microphone to the Channel B input.

By placing the pulses on one track and the narration on the other, either may be changed at will without disturbing the other.

Under test the unit performed as specified, using it in conjunction with a V-M Model 720 recorder with Add+A+Track and a Kodak Model 510 Cavalcade Projector.

All indications are that this is an excellent unit, well worth the price.



The External Amplifier jack and the Input jack are found on the right side of the case. The Projector Trip and the Output jacks are on the opposite end of the case.

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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.

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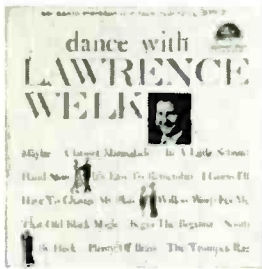
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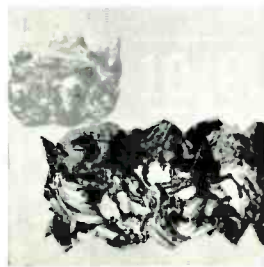
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BENNY GOODMAN



LOUIS and KEELY



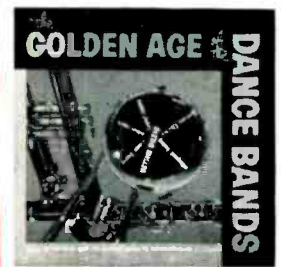
"Soul of Spain"
101 STRINGS



TCHAIKOWSKY'S
1812 OVERTURE

Now look what
bel canto
has for you on
2 and 4-Track and Cartridge
STEREO TAPE

(and there's more
where these came from)



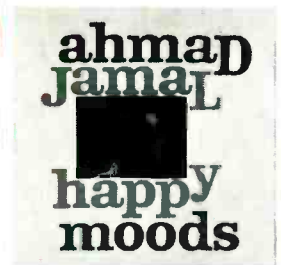
The GOLDEN AGE
of DANCE BANDS



"Golden Saxophones"
BILLY VAUGHN

bel canto Stereophonic Recordings
a subsidiary of Thompson Ramo Wooldridge Inc.
1977-1985 McAllister Avenue • COLUMBUS 5, OHIO

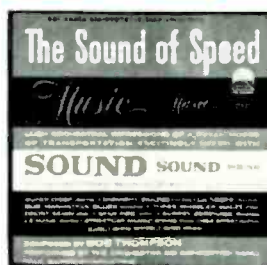
WRITE TODAY FOR FREE BEL CANTO
CATALOG OF STEREO TAPE HITS



"Happy Moods"
AHMAD JAMAL



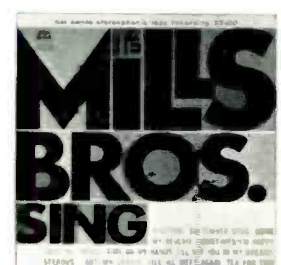
"Leave it to Jane"
ORIGINAL CAST



"Sound of Speed"
(Exciting Sounds of
Vehicles in Motion)



Voices and Strings of
LAWRENCE WELK



The MILLS
BROTHERS SING

• 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 “talk” 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

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